



***Lake Qaraoun Pollution Prevention Project***

**EXPANSION OF THE WASTEWATER COLLECTION NETWORKS  
(ANJAR, MAJDEL ANJAR & QABB ELIAS) TO CONNECT TO  
ANJAR EL MARJ WASTEWATER TREATMENT PLANT  
Construction Environment & Social Management Plan  
(CESMP) LOT 1**

**12/09/2022**

**Prepared by**

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## Abbreviations

BOQs	Bill of Quantities
BTD	Bureau Technique pour le Développement
BWE	Bekaa Water Establishment
CAE	Child Abuse/ Exploitation
CBD	Convention on Biological Diversity
CDR	Council of Development and Reconstruction
CESMP	Construction Environnemental and Social Management Plan
CO	Carbon Monoxide
COM	Council of Ministers
EA	Environmental Assessment
EHS	Environmental, Health and Safety
EIA	Environmental Impact Assessment
ELARD	Earth Link and Advanced Resources Development s.a.l.
ESHS	Environment, Social, Health and Safety
ESMP	Environmental and Social Management Plans
GBV	Gender Based Violence
GRM	Grievance Redress Mechanism
HKBros	Hanna Khoury and Brothers
IBA	Important Bird Area
IFC	International Finance Corporation
LARI	Lebanese Agriculture Research Institute
LRA	Litani River Authority
MoA	Ministry of Agriculture
MoC	Ministry of Culture
MoE	Ministry of Environment
MoEW	Ministry of Energy and Water
MoIM	Ministry of Interior and Municipalities
MoL	Ministry of Labor
MoPWT	Ministry of Public Works and Transportation
MoT	Ministry of Tourism
NAAQS	National Ambient Air Quality Standards
NGOs	Nongovernmental Organizations
NOx	Nitrogen Oxides
PIU	Project Implementation Unit
PPE	Personal Protective Equipment
SEA	Sexual Exploitation and Abuse
SH	Sexual Harassment
UNCCD	United Nations Convention to Combat Desertification
UNFCCC	United Nations Framework Convention on Climate Change
VAC	Violence Against Children
WB	World Bank
WBG	World Bank Group
WHO	World Health Organization

## 1 INTRODUCTION

### 1.1 General Information

As part of the Lake Qaraoun Pollution Prevention Project (LQPPP), EXPANSION OF THE WASTEWATER COLLECTION NETWORKS (ANJAR, MAJDEL ANJAR & QABB ELIAS) TO CONNECT TO ANJAR EL MARJ WASTEWATER TREATMENT PLANT – LOT 1, is funded by the World Bank (WB). The Council for Development and Reconstruction (CDR) acting as an executing agency on behalf of the Lebanese Council of Ministers (COM) awarded a contract (1) to the Bureau Technique pour le Développement (BTD) who prepared a detailed design of the network in October 2020. Earth Link and Advanced Resources Development s.a.l. (ELARD) submitted an Environmental and Social Management Plan (ESMP) and Land Acquisition Plan (LAP) for the construction of sewage extension networks for 12 villages, namely Bouerij, Chtaura, El Mraijet, Jlala, Makse, Taalabaya, Taanayel, Wadi Ed Delem, Zebdol, Saouiri and the lower part of Qabb Elias that will connect to El Marj Wastewater Treatment Plant (WWTP), in November 2020, which was approved by the CDR and the World Bank.

This report presents the construction ESMP (CESMP) for the extension of the wastewater collection networks in Lot 1, which constitutes the villages of Bouerij, El Mraijet, Zebdol, the lower parts of Qabb Elias, Makse, and the border of Jdita, hereby referred to as the Project to support the Contractor, Hanna Khoury & Bothers (HKBros), in applying the mitigation measures and implementing the monitoring plan during the construction phase as specified in Chapters 6 and 8 of the ESMP report related to the awarded lot. SU YAPI/ KREDO will act as supervising consultant to monitor the implementation of works in this Lot, as awarded by CDR.

### 1.2 CESMP Objectives

The objective of this CESMP is to provide an overview of potential Environmental, Social, Health and Safety (ESHS) impacts during the extension of the wastewater network and describe the management, mitigation and monitoring measures to protect the environment and other sensitive receptors, both on and off site. Specifically, the CESMP aims to provide/develop:

- an overview of the construction activities
- a definition of roles and responsibilities of the Site construction team
- guidance on compliance with relevant environmental, social, and health and safety national, international, and WB policies and legislation
- a means of implementing appropriate mitigation measures for the key environmental, social, and health and safety issues (refer to the project ESMP)
- a commitment to identified monitoring and reporting requirements.
- an institutional setup along with capacity building requirements
- a Grievance Redress Mechanism (GRM).

### 1.3 Structure of the CESMP

To meet the above objectives, the CESMP is structured to cover the following:

- Project Description including project location, activities, equipment, staffing, site facilities, schedule, etc.
- Environmental, Social, Health and Safety (ESHS) Management including policy statement, environmental and social management systems, roles and responsibilities, communication and reporting, risk assessment, environmental training and awareness, emergency response

and incident reporting, social aspects and procedures, COVID-19 response and prevention procedures, environmental auditing and site monitoring, steps to address non-compliance, etc.

- Environmental and Social Management Plans during construction covering the regulatory framework, mitigation and monitoring measures per identified impact
- Forms, checklists and notes

## 2 PROJECT DESCRIPTION

### 2.1 Project Location and Activities

The proposed El Marj Wastewater System includes the construction of 81.1 km of additional/extension and the rehabilitation of 23.5 km of existing sewer lines (gravity lines and laterals) in the villages of Bouerij, El Mraijet, the lower part of Qabb Elias, Makse, and the border of Jdita, in the Zahleh Caza, within the public domain along the existing roads' Right-of-Way (Figure 2-1). Unplasticized Polyvinyl Chloride (uPVC) sewers will be used for diameters less than or equal to 315 mm and concrete for diameters greater than or equal to 350 mm. Table 2-1 summarizes the distribution of the sewer lines by pipe diameter and function.

Due to the considerable number of local and foreign nationals living in the Bekaa region who already work in the construction sector, it is likely that workers will be already living near the project areas, and thus no labor camp will be needed, and no labour influx is expected.

Activities involved in the site preparation and construction works of the additional sewer lines are:

- Site clearance
- Excavation
- Backfilling
- Pipe works
- Concrete works
- Plastering
- Waterproofing
- Metal works
- Testing and commissioning
- Road reinstatement

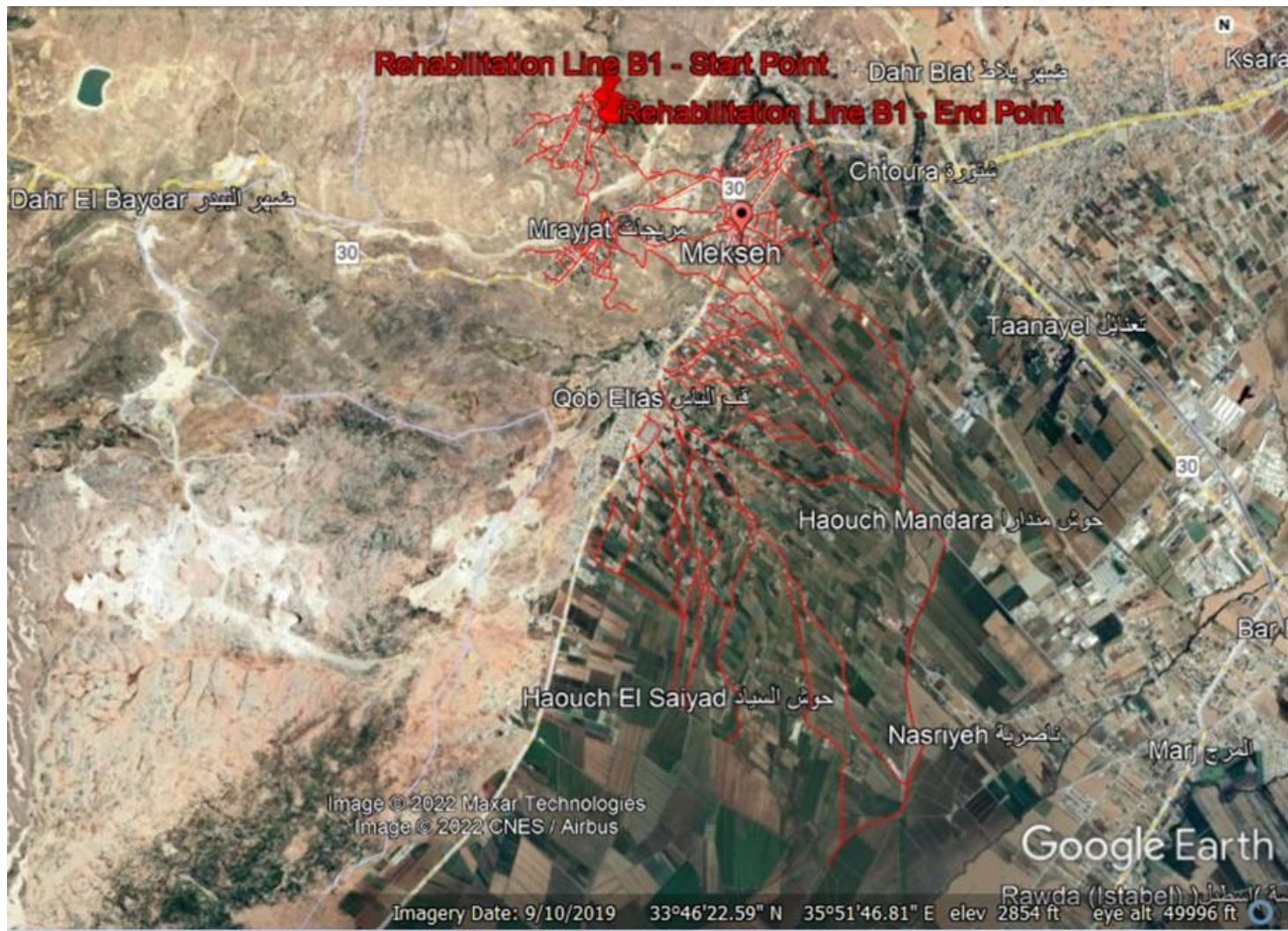


Figure 2-1: Overall layout of sewage network (Source: Google Earth, 2022)

**Table 2-1: Distribution of sewer lines by diameter and function (As per Contractor's BOQ)**

Pipe diameter	Quantity (Linear meters)	Main Lines	Secondary Lines								Lateral Connections
			Mraiijat 1	Bouarej 1	Bouarej 2 & Mraiijat 2	Makse 1	Makse 2	Qabb Elias 2	Zebdol	Qabb Elias to Italian	
200 mm	10,000										10,000
250 mm	36,335		1,550	4,040	7,260	3,930	5,120	1,285	3,200	9,950	
300 mm	21,725			1,450	1,420	720	2,840	155	2,300	12,840	
400 mm	1,640						730			910	
500 mm	6,000	3,880					2,120				
600 mm	700	700									
700 mm	3,110	3,110									
1000 mm	1,640	1,640									
<b>Total</b>	<b>81,150</b>	<b>9,330</b>	<b>1,550</b>	<b>5,490</b>	<b>8,680</b>	<b>4,650</b>	<b>10,810</b>	<b>1,440</b>	<b>5,500</b>	<b>23,700</b>	<b>10,000</b>

The main construction-related materials associated with the additional sewer lines are listed in Table 2-2. The quantities have been extracted from the Bill of Quantities (BOQ) prepared by HKBros.

**Table 2-2: Main Construction-related Materials Associated with the Sewer Lines**

Construction Material	Unit	Quantity
Pipes	Lin.m	81,150
Sand or gravel bedding and surrounds	Lin.m	71,023
Reinforced concrete bedding and surrounds	Lin.m	10,127
Sand backfilling of trenches below paved main roads	Lin.m	3,642
Backfilling of trenches below paved roads and concrete pavement and staircases	Lin.m	60,746
Backfilling of Trenches in Open Areas	Lin.m	16,762
Pre-cast or cast in situ concrete manholes with cover and frame	Nb	2,502
Reinstatement of paved main roads including base, sub-base and wearing courses	m <sup>2</sup>	4,855
Reinstatement of paved internal roads including base, sub-base and wearing courses	m <sup>2</sup>	106,110
Reinstatement of Concrete pavement or staircases	Lin.m	4,022

Sourcing of raw materials will be provided by private suppliers (Abou Hamdan-CDC and New Bekaa Co-NBC) in addition to HKBros from duly permitted sites that will be specified at a later stage.

In addition to the construction of new sewer lines, the project includes the rehabilitation of around 23.48 Km of existing sewers. The rehabilitation activities, along with the associated quantities as per the BOQ, are summarized in Table 2-3. Annex A presents the BOQ for the Project.

**Table 2-3: Rehabilitation Activities of Existing Sewer Lines**

Activity	Unit	Quantity
Cleaning existing sewer by jetting (diameter less than 800 mm)	Lin.m	23,480
Demolish and remove existing manhole including backfilling with subbase material	Nb	916
Adjusting manhole level; height difference not exceeding 0.5m	Nb	117
Connection of existing sewer to manhole, all types, including dealing with flows	Nb	21
Connection of new sewer to existing manhole/ chamber all types, including re-benching and dealing with flows	Nb	35
Rehabilitation of existing manholes	Nb	587
CCTV survey	Lin.m	23,480

## 2.2 Project Equipment and Machinery

The main equipment and machinery that will be used for the construction of additional/extension sewer lines and the rehabilitation of existing sewers include:

- Compressor (working pressure 3.5 kg/cm<sup>2</sup>)
- Tilting drum concrete mixer (up to 200-liter wet capacity)
- Lorry mounted concrete pump with boom, piping & pipe cleaning equipment (up to 50m<sup>3</sup>/hr capacity)
- Concrete vibrator poker, petrol driven
- Mobile rubber-tyred full circle slew crane, including all crane equipment (up to 25 tonne capacity)
- Dumper trucks (up to 1000 kg capacity)
- Asphalt/coated macadam spreader (up to 56 kW capacity)
- Asphalt cutter
- Trucks (up to 28 tonne capacity)
- Roller, steel, 3-wheeled (up to 10.5 tonne capacity)
- Roller, rubber tyred (up to 3.0 tonne/wheel capacity)

- Tractor (crawler) with bull or angle dozer, marker's rated flywheel (up to 100 kW capacity)
- Motor grader, variable blade/flywheel (up to 110 kW capacity)
- Mobile water tanker (up to 4450 liter capacity)
- Wheel loader (90 hp max. power, toothless shovel)
- Backhoe loader (90 hp max. power, toothless bucket)
- Skid steel loader, similar to "Bobcat" (70 hp maximum power)
- Surveyor Equipment
- Bobcats
- Welding & Saw Cutting Machines
- Pick-ups
- Plate Compactor
- Dewatering & Pressure Pumps
- Ladder& Tools
- Safety & Warning Signs

## 2.3 Labour Force

Table 2-4 presents the estimated labour force required per activity.

**Table 2-4: Estimated labour force by labour type and activity**

Activity \ Labor type	Trench Excavation	Pipe Laying	Pipe Bedding and Surround	Reinforced Concrete Bedding and Surround	Backfilling of Trench	Manholes	Manhole Covers	Reinforced Mass Concrete	Channels	New Pavement Construction	Rehabilitation Works
1. Site Engineer	1	1	1	1	1	1	1	1	1	1	1
2. Safety Officer	1	1	1	1	1	1	1	1	1	1	1
3. Flagmen	3	2	2	2	2	2	2	2	2	3	3
4. Foreman	1	1	1	1	1	1	1	1	1	1	0
5. Surveyor	1	1	1	1	0	1	1	1	1	1	0
6. Surveyor Assistant	1	1	1	1	0	1	1	1	1	1	0
7. Skilled Carpenter	0	0	0	1	0	1	1	1	1	0	1
8. Semi-Skilled Carpenter	0	0	0	1	0	1	1	1	2	0	1
9. Skilled Bar Bender	0	0	0	1	0	1	0	1	1	0	1
10. Semi-Skilled Bender	0	0	0	1	0	1	0	1	1	0	0
11. Steel Fixer	0	0	0	2	0	1	1	1	2	0	1
12. Skilled Pipe Layer	0	1	0	0	0	0	0	0	0	0	0
13. Equipment Operator	2	1	1	1	1	1	0	0	0	4	2
14. Bobcat Driver	1	1	1	1	1	1	1	1	1	1	0
15. Truck Driver	2	1	1	1	1	1	1	1	0	1	1
16. Pick Up Driver	1	1	1	1	1	1	1	1	1	1	1
17. Transit Mixer Driver	0	0	0	1	0	1	1	1	1	0	0
18. Grader Operator	0	0	0	0	0	0	0	0	0	1	0
19. Finisher, Roller Operator	1	0	0	0	1	0	0	0	0	3	0
20. Semi-skilled Laborer	0	0	0	0	0	0	0	0	0	2	1
21. Laborer	2	2	2	6	2	5	4	5	5	4	4
<b>Total</b>	<b>17</b>	<b>14</b>	<b>13</b>	<b>24</b>	<b>12</b>	<b>22</b>	<b>18</b>	<b>21</b>	<b>22</b>	<b>25</b>	<b>18</b>

## 2.4 Site Facilities

The Contractor rented a 15,000 m<sup>2</sup> land plot in Makse (Lot # 153) to serve as (1) project site offices, (2) material storage area, and (3) potential parking for construction vehicles and equipment. The plot is surrounded by agricultural land (mainly olive trees), some currently cultivated and some not. Kayani School borders the area where the site offices will be installed, to the South-West. The site is accessible by a 6-m wide paved road. The yard behind the offices is accessible by a 4-m dirt road. Land use surrounding the Makse site offices and yard is presented in Figure 2-2. Pictures of the site and its surroundings are presented in Figure 2-3 below. The location of the yard in relation to the project activities' location is presented in Figure 2-4. Note that the site is located at almost mid distance from all project activities.



Figure 2-2: Land use surrounding the yard (Adapted from Google Earth)



a) Area for offices and car parking



b) Area for material storage and potential construction equipment and vehicle parking



c) Fence of school bordering the site



d) Olive trees to the North-West of the plot



e) Paved road accessing the site



f) Dirt road

**Figure 2-3: Site and surrounding**

Prefabricated offices will be installed (8 offices and one meeting room) and used by the Contractor engineers, technical skilled workers and Supervising Consultants. The offices will be equipped with a total of 6 toilets and a kitchenette (including drinking water and appliances), lockers and other supplies needed for the daily administrative activities. Parking spaces (15) will also be available for Contractor and Consultant staff and visitors. The layout of the offices is presented Figure 2-5. The toilets will be connected to the sewage network in Makse (approval from the municipality is obtained) and potable water will be provided through the BWE network (currently in process). A 10 KVA power generator will be provided on-site with a 200-L fuel tank. No additional fuel will be stored on site. An emergency evacuation plan is developed for the yard including the exit paths, location of fire extinguishers and assembly points (Figure 2-6).

Construction appurtenances, including manhole covers and pipes will be stored in the yard. Construction chemicals (water proofing chemicals/ oils/ lubricants (Annex G-1) will also be stored in the yard within a shipping container equipped with a door and a window. The sealed chemical drums will be placed on wooden pallets. The quantities stored will be sufficient for a maximum of two weeks of works (a maximum of 800 L in total on site). No chemicals for equipment maintenance will be stored at the yard. No construction material (sand, gravel, base course) will be stockpiled at the yard. The material will be brought directly to the worksite when needed.

With regards to the construction vehicles and equipment, some of them will be parked at the rented yard, while the others will be parked at the company headquarters in Hamames, Marjaayoun. This land will be fenced and used for parking purpose only. Unless absolutely necessary, the Contractor will not perform any repair at the yard and will execute vehicle and equipment maintenance at repair and maintenance garages in the project area. Furthermore, the Contractor will not perform any vehicle or equipment refuelling at the yard.

The on-site rest points for workers will be decided by the Contractor at the time of works.

The Contractor will rent rest-areas equipped with toilets for the workers. Where this is not feasible, the contractor will service the site with portable cabin toilet. The porta-cabin is mobile and its placement depends on the length of the work zone. Accordingly, the Contractor will move it based on the progress of works. The Contractor, and with the full approval of the concerned municipality, will connect the porta cabin toilet to a storage tank. Wastewater will be emptied regularly in a nearby approved municipal discharge location, or by the local sewer truck service contractors upon agreement with the concerned Municipality and the Bekaa Water Establishment (BWE) were applicable. The E&S expert and Supervising Consultant shall inspect it on a regular basis and ensure the application of proper mitigation measures.

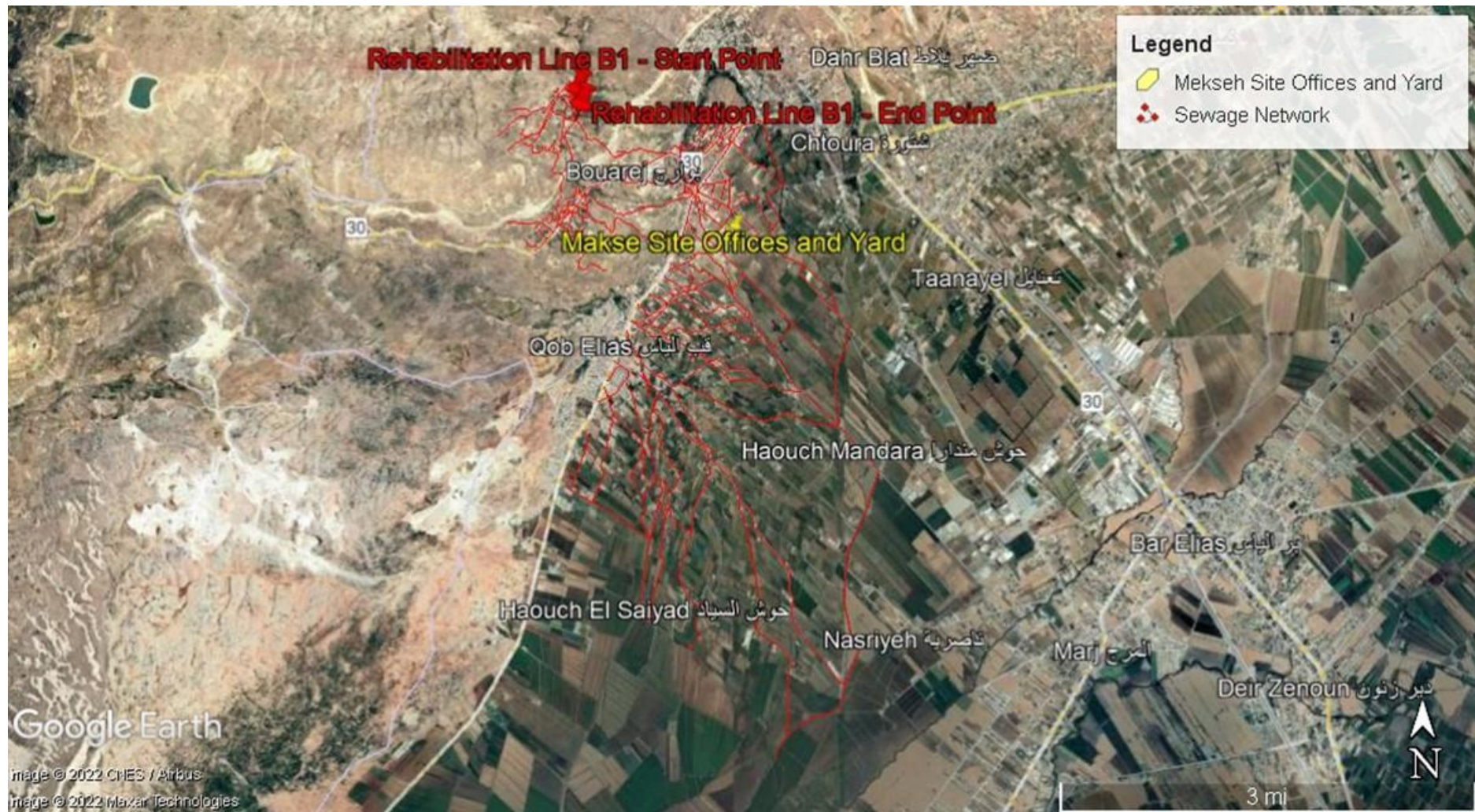


Figure 2-4: Location of rented land lot in relation to project sites





Figure 2-6: Emergency Evacuation Plan

## **2.5 Project Schedule**

The overall duration of construction activities for the Project is 18 months. A high-level project schedule is presented in Figure 2-6. A detailed schedule will be provided separately at the onset of the works.

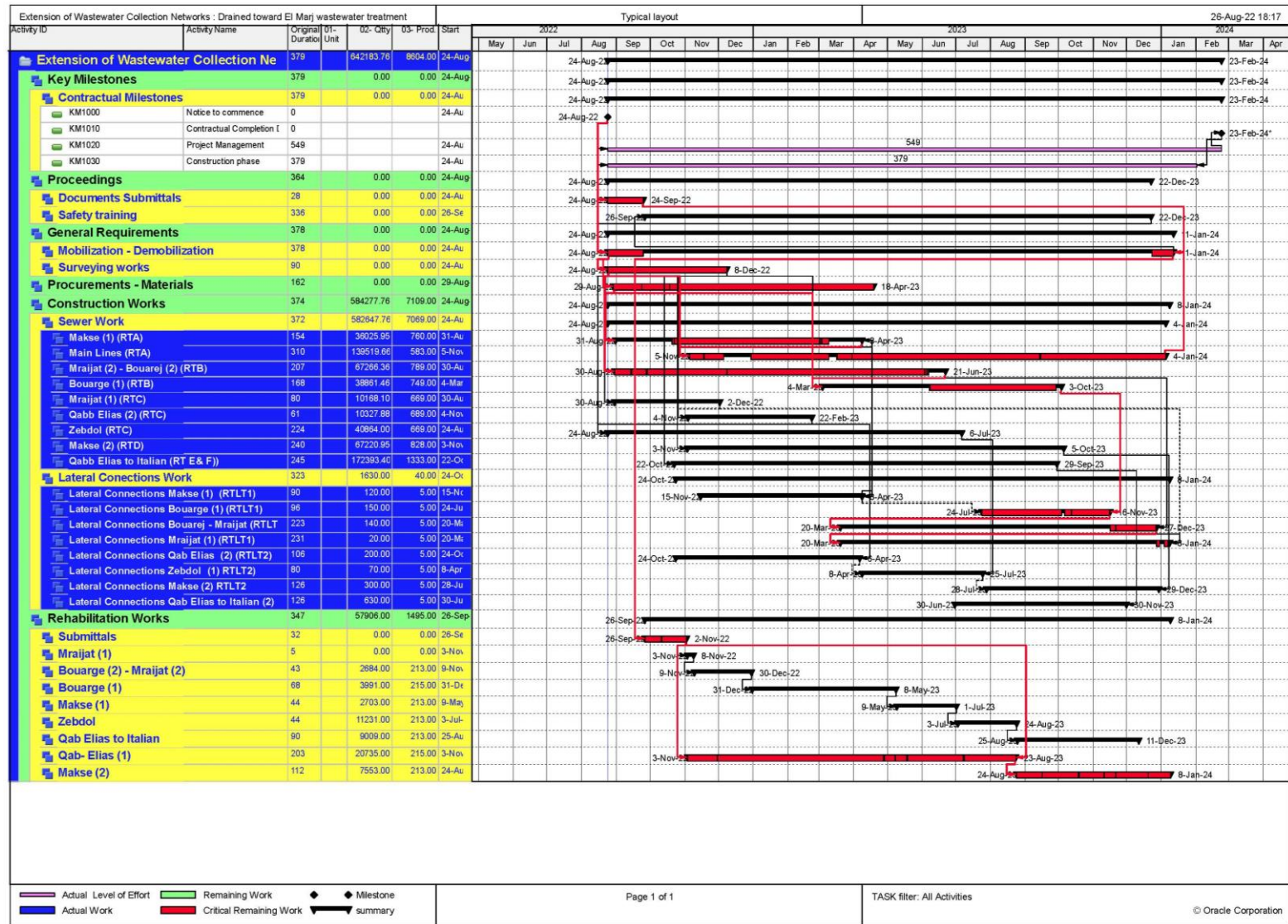


Figure 2-7: Project Schedule Summary

### 3 ESHS REGULATIONS

#### 3.1 National Environmental and Social Legal Framework

The extension and rehabilitation of sewers involves a variety of activities that need to abide by national legislations enforced by various government institutions. Table 3-1 describes a legal framework governing Lot 1, taking into consideration that no land acquisition or expropriation will be required during its implementation.

**Table 3-1: National Legal Framework related to the Project**

Year	Legislation	Title	Relevant Provisions
<b>Labor</b>			
<b>1946</b>	Labor Law	The Lebanese Labor Code	The Labor Law covers the industrial accident prevention and compensation. It regulates the minimum wage, the minimum age of employment based on their ages and the workplaces, resting periods and vacations for adolescent workers. It also sets the working hours, and the penal code regulation of strikes and lock out in essential employments.
<b>2001</b>	Law No. 335	Pursuant to International Labor Organization (ILO) Convention No 128	This ratified convention addresses the minimum age of employment.
<b>2002</b>	Law No. 400	Pursuant to the ILO Convention No 138	Elimination of the worst form of child labor.
<b>2012</b>	Decree 8987	Prohibition of employment of minors under the age of 18 in work that may harm their health, safety or morals	This Decree restrict the employment of minors under the age of 18 in activities and works that can be harmful to their health, morals and that can limit their education.
<b>2016</b>	Decree 3791	Minimum Wage	Raises the minimum daily wage to 20\$/day.
<b>2018</b>	Decision 29/1	Businesses, professions, crafts and jobs that must be restricted to Lebanese only	Restricts a substantive number of jobs to Lebanese citizens in order to protect the workforce and reduce unemployment. These consist of all jobs practiced by Lebanese citizens include tiling, plastering, gypsum board, iron, wood and aluminum profile installation and other decorative tasks. Engineering is also restricted to Lebanese citizens. On March 21, 2018, a clarification letter was issued by MoL regarding Decision 29/1, which states that Syrians are allowed to occupy jobs in the construction sector that are not restricted to the Lebanese as per Decision 29/1 of 2018.
<b>2000</b>	Law 207	Amendment of Articles in Labor Law	Prohibits all forms of discrimination between men and women in the workplace concerning employment type, remuneration, employment, promotions and raises, vocational training and attire.

Year	Legislation	Title	Relevant Provisions
<b>Environment</b>			
<b>1933</b>	Decree 2761	The prohibition of wastewater discharge into water streams	States the characteristics of channels and reservoirs where wastewater is discharged. In addition to the prohibition of direct or indirect wastewater discharges and waste disposal
<b>1974</b>	Decree 8735	Conservation of Public Hygiene	Solid waste management including collection and disposal is under the control of the municipality. It restricts disposal of wastes in public or private lands adjacent to roads and residential districts Protection against pollution from solid and liquid waste (prohibiting the digging of wells for the disposal of raw sewage, banning sewage infiltration from septic tanks and the use of untreated sewage for the irrigation of vegetables and some fruit trees), and assigning solid waste
<b>1996</b>	Law 558	Protection of forests	Classifies protected forests and defines the prohibited activities and works into the mentioned forests. It also contains offences and penalties.
<b>1996</b>	MOE Decision 52/1	Requirements to protect air, water, and soil pollution	Allowable noise level according to type of areas and the permissible duration of exposure
<b>2001</b>	MOE Decision 8/1	Revised standards for air emissions, liquid effluents and wastewater treatment plants	The decision sets limits for discharge of wastewater into water bodies
<b>2002</b>	Law 444	Framework Law for Environmental Protection	Protect the natural environment against all forms of degradation, air and water and soil pollution, and the promotion of sustainable use of natural resources and conservation of biodiversity
<b>2002</b>	Decree 8803 and its amendments	Organizes the activity of quarries and crushers, licensing procedures, as well as the operation, management, and rehabilitation of quarries.	Ensures the provision of construction material and the disposal of construction waste comply with the decree
<b>2012</b>	Decree 8633	Fundamentals of Environmental Impact Assessment (EIA)	Includes the requirements for conducting and EIA
<b>2017</b>	Circular 7/1	Integrated Solid Waste Management guidelines on the for Municipalities, Union of Municipalities, Qaem maqams and Governors.	Includes information regarding: Sorting at source, List of establishments accepting recyclables, Positive Environmental Impact related to sorting at source, and the scope of use of recyclables.
<b>2018</b>	Law 77	Water Law	Tackles protection of water resources from pollution and management and monitoring of public wastewater treatment facilities
<b>2018</b>	Law 78	Air Quality Law	The investment in any facility or establishment that emanate foul or toxic odors should abide by the different environmental conditions issued by a decision from MOE

Year	Legislation	Title	Relevant Provisions
<b>2018</b>	Law 80	Integrated Solid Waste Management	Covers the management of non-hazardous and hazardous waste, and responsibilities and penalties related to violations of waste management laws
<b>2019</b>	Decree 5605	Management of domestic solid waste	Specifies the principles for sorting domestic solid waste at the source into three categories: organic waste, recyclables, and inert waste.
<b>2019</b>	Decree 5606	Management of hazardous waste	The decree specifies the principles of management (sorting, storage, transport, and disposal) of hazardous waste.
<b>Health and Safety</b>			
<b>2008</b>	Decree 11802	Occupational prevention, safety, and health in all enterprises subject to the Code of Labor	Provides the general regulations for the prevention of occupational hazards and accidents, and the promotion of health and safety in all industrial establishments subject to the Labor Law. These cover prevention and safety, occupational health, the safe use of chemicals at work, as well as
<b>Cultural and Municipal</b>			
<b>1933</b>	Law 166 amended by law 37 of 2008	Antiquity Law	This law defines heritage and antiquity, identifies its ownership, states legislation for excavation and judicial procedures due to violation
<b>1977</b>	Decree-Law 118	Municipal Act	Defining the responsibilities of municipalities
<b>1983</b>	Decree-Law 68	Organizing drilling to extend lines of public services in roads	Organizing drilling to extend lines of public services in roads
<b>1990</b>	Law 21		Ratification of the UNESCO convention for the protection of antiquities.
<b>1998</b>	Ministerial decree		Prohibits the illicit trafficking of cultural artifacts
<b>2008</b>	Law 37	Cultural Policy Law	Any archaeological artefact located in Lebanon and deemed to be of historical, artistic, architectural or anthropological significance by the Ministry of Culture must be protected
<b>2016</b>	Decree 3057	Procedures for the preventive and rescue excavations	Defines and regulates the procedures followed by the DGA for the preventive and rescue excavations
<b>Traffic</b>			
<b>2012</b>	Law 243	New Traffic Law	Provide general driving rules and defines the penalties upon violation of the law
<b>General</b>			
<b>1943</b>	Legislative Decree 340	Penal Code	The law defines the type of crimes such as rape; lewd acts by threat, violence, or against minors; and other similar crimes. It also states punishments and legality of penalties
<b>1997</b>	Law 623		Implementing penalties for vandalism of water, telephone and electricity infrastructure

Year	Legislation	Title	Relevant Provisions
1991	Law 58	Expropriation law	States general and specific provisions for land acquisition. Also includes improvement tax resulting from the implementation of public works
2016	Law 340	Amendment of Penal Code	Under sexual violence Article 522 of the Penal Code exonerated a perpetrator of kidnapping and adultery who married his victim. This was abolished in this law.
2016	Law 293	Law on Protection of Women and Family Members from Domestic Violence.	Advances women's rights and safety. Establishes important protection measures and related policing and court reforms.

### 3.2 Institutional Framework

Numerous governmental public institutions will be involved in the different stages of the implementation of the ESMP/ CESMP of the Project. They are described in Table 3-2, along with their mandate and relevant responsibilities.

**Table 3-2: Relevant Institutions**

Institution	Relevant Role
<b>Council for Development &amp; Reconstruction (CDR)</b>	<p>The CDR will lead the execution of the project components and designate competent parties to implement them. The CDR will also supervise the implementation of the Environmental and Social Management Plan (ESMP) and will make sure that the recommendations are included in the Terms of Reference (TOR) of the contractors executing the construction activities.</p> <p>The CDR will oversee the implementation of Environmental and Social Safeguards to ensure compliance with the World Bank safeguards policies. In addition to that, the CDR will prepare the necessary reports to be submitted to the World Bank. Finally, CDR will share reports on CESMP and OESMP implementation as needed with the MoE focal point who is part of the LQPPP PMU. No reports will be sent officially to the MoE during the construction period.</p>
<b>Ministry of Energy and Water (MoEW)/ Bekaa Water Establishment (BWE)</b>	<p>The MoEW, through the BWE, is responsible for wastewater and potable water management. The MoEW will be responsible for approving the design of wastewater networks, and other matters related to water resources management. The BWE will monitor the implementation of the ESMP for the project activities during the operation phase.</p>
<b>Litani River Authority (LRA)</b>	<p>LRA has overall responsibility for the management of the Litani River and the Qaraoun lake. As part of the Lake Qaraoun Committee, it shall oversee the implementation of this project which contributes to the protection of the quality of the River and the Qaraoun</p>

Institution	Relevant Role
<b>Ministry of Environment (MoE)</b>	MoE is the national competent authority responsible for the protection of the environment in Lebanon. MoE is responsible for setting regulations and standards, and approving implementation and the development of projects sustainably. MoE is responsible to enforce and supervise the implementation of the Environmental and Social Management Plan (ESMP), through reviewing and approving the Construction Environmental Management Plan (CEMP) and the Operation Environmental Management Plan (OEMP) prepared by the contractor and submitted by CDR and BWE respectively, imposing regular reporting on their implementation by CDR (construction phase) and BWE (operation phase) to monitor their proper implementation, conducting regular audits/inspections during construction and operation activities, pointing out non-compliances, and mandating corrective action) as needed. Moreover, MoE is responsible for making sure the environmental monitoring plan is being implemented by requesting that CDR and BWE provide the monitoring results for the construction and operation phases respectively in the periodic reports to be submitted to MoE and verifying them.
<b>Ministry of Public Works and Transportation (MoPWT)</b>	According to Decree 13379/1998, the Directorate General of Roads and Buildings of the MoPWT is responsible for the inspection of sewage networks. Moreover, classified road networks fall under the MoPWT authority. Consequently, it is important to coordinate with the MoPWT when implementing the project.
<b>Ministry of Interior and Municipalities (MoIM)/ Municipalities</b>	The MOIM is responsible for law enforcement and stopping infractions and violations and oversees the affairs and operations of local authorities. On the other hand, responsibilities of municipalities include general programs of works, cleanliness, health, water, lighting projects, the implementation, rectifying and enlarging of roads, transportation organizing. In addition, it includes preparation of general plans related to sanitary projects, maintenance of infrastructure including wastewater networks, as well as working for the protection of the environment. Local road networks fall under the municipalities' authority. Consequently, it is important to collaborate and coordinate with the municipalities when implementing the project, especially for the communication with the impacted communities. The municipalities and Unions of Municipalities will supervise the implementation of the ESMP and facilitate the implementation of some mitigation measures. The municipalities and Unions of Municipalities may be involved if complaints are received during Project implementation, including communication with the impacted community.
<b>Ministry of Labor (MoL)</b>	The MoL is responsible for ensuring that the labor law is applied for all workers present on the working sites
<b>Ministry of Culture (MoC)</b>	Any artefacts of potential historical importance that can be found on a rehabilitation site fall under the jurisdiction of the Directorate General of Antiquities at the MOC

### 3.3 Word Bank Policies

#### 3.3.1 Safeguards Policies

The Project activities should comply with two safeguards operational policies and procedures of the World Bank– specifically OP/BP 4.01 on Environmental Assessment and OP/BP 4.12 on Involuntary Resettlement.

The OP 4.01 is triggered as the project could have impacts on the environment due to the extension and rehabilitation of wastewater networks and associated civil works. Under this policy, this project falls under Category “B” according to the Project Appraisal Document (PAD) and the Environmental and Social Management Framework (ESMF).

Although OP 4.12 was triggered by this project. A Resettlement Policy Framework was developed for the LQPPP. No involuntary resettlement or land acquisition will take place in Lot 1, the subject of this CESMP.

### 3.3.2 Access to Information

This Policy governs the public accessibility of information in the WB's possession. The WB allows access to any information in its possession that is not on a list of exceptions. This Policy is based on five principles:

- Maximizing access to information;
- Setting out a clear list of exceptions;
- Safeguarding the deliberative process;
- Providing clear procedures for making information available; and
- Recognizing requesters' right to an appeals process.

### 3.3.3 Consultation and Disclosure Policy

According to OP/BP 4.01, a public consultation with project-affected people and local nongovernmental organizations (NGOs) must be conducted for all projects under Category A and Category B. The aim of the consultation is to present to the public the components of the project along with potential environmental and social impacts and takes their comments and concerns into consideration.

Accordingly, during the preparation of the ESMP, ELARD organized a public consultation on August 28, 2018 at the Chamber of Commerce Zahle to discuss the findings of the ESMP. In addition, this ESMP is disclosed on the CDR website.

### 3.3.4 Guidelines and Manuals

The World Bank Group (WBG) Environmental, Health and Safety (EHS) Guidelines are mandatory and need to be adopted throughout the project duration. In addition, the WB has developed guidelines and manuals that need to be adopted during the ESMP implementation phase of the project. These guidelines and manuals include technical reference documents with general and sector-specific examples of good practices during all phases of the proposed project. Guidelines and manuals include:

- WBG Environmental, Health and Safety (EHS) Guidelines.
- Disclosure Handbook.
- The World Bank Participation Sourcebook.
- Doing Better Business through Effective Public Consultation and Disclosure – A good Practice Manual, issued by IFC.
- Good Practice note addressing Gender Based Violence in Investment Project Financing involving Major Civil Works.

## 3.4 International Treaties and Conventions

Table 3-3 presents the international conventions that Lebanon is a signatory to whose provisions may be relevant to the project.

**Table 3-3: Relevant International Treaties and Conventions**

Agreement	Date of Ratification	Relevance to Project
Convention on Biological Diversity, Rio de Janeiro – 1992	Ratified in 1994	Protection and conservation of biodiversity during construction and operation activities
Convention to Combat Desertification – 1994	Ratified in 1994	Control land clearance and Project footprint size
The Framework Convention on Climate Change, or Global Warming Convention (UNFCCC)– 1992	Ratified in 1994	Reduce greenhouse gas emissions from construction and operation activities
The Kyoto Protocol – 1997	Ratified in 2006	
Paris Agreement – Paris Climate Conference (COP21), part of the UNFCCC – 2015. Agreement Entered into force in October 2016.	Signed in 2016. Not yet Ratified.	
Vienna Convention for the Protection of the Ozone Layer – 1985 Montreal Protocol on Ozone- Depleting Substances – 1987 and its amendments	Ratified between 1993 and 1999	Regulate the use of ODS (ozone depleting substances) during all phases of the Project
Convention on the Means of Prohibiting and Preventing the Illicit Import, Export and Transfer of Ownership of Cultural Property; Paris, 14 November 1970	Ratified in 1992	Protection of any potential cultural properties and natural heritage found in the project sites
Convention concerning the Protection of the World Cultural and Natural Heritage; Paris, 16 November 1972	Ratified in 1983	
Convention 120 concerning Hygiene in Commerce and Offices	Ratified in 1977	Protects workers health and ensures proper sanitation and hygiene.
Convention 136 concerning Protection against Hazards of Poisoning Arising from Benzene	Ratified in 2000	
Convention 139 concerning Prevention and Control of Occupational Hazards caused by Carcinogenic Substances and Agents	Ratified in 2000	

### 3.5 Environment, Health and Safety Standards and Guidelines

#### 3.5.1 Wastewater Discharge Targets

Table 3-4 represents the allowable contaminants concentration for wastewater when discharged into the surface water bodies, or the public sewers, according to the MOE decision 8/1 dated 30/1/2001, as well as the corresponding EHS guidelines for treated sanitary sewage discharges into surface water bodies that are adopted by the IFC of the World Bank Group in the Environmental, Health, and Safety Guidelines for environmental wastewater and ambient water quality (WBG-IFC, 2007). Note that the limits that will apply for the project are those of WBG EHS guidelines for treated sanitary sewage discharges where they are more stringent.

**Table 3-4: Limits for Wastewater Discharge into Receiving Water Bodies and Public Sewers (MOE Decision 8/1 for 2001) and WBG EHS Treated Sanitary Sewage Discharge Guidelines**

Parameter	(MOE Decision 8/1 for 2001)		WBG EHS guidelines
	Discharge into Public Sewers	Discharge into Surface Water Bodies	Treated Sanitary Sewage Discharge
Color	none	none	
pH	6-9	6-9	6-9
Temperature	35°C	30°C	
BOD (5-day 20°C)	125 mg/l	25 mg/l	30 mg/L
COD (dichromate)	500 mg/l	125 mg/l	125 mg/L
Total Phosphorus	10 mg/l	10 mg/l	2 mg/L
Total Nitrogen	60 mg/l	30 mg/l	10 mg/L
Suspended solids	600 mg/l	60 mg/l	50 mg/L
AOX	5	5	
Detergents	-	3 mg/l	
Coliform Bacteria 37°C in 100 ml	-	2,000	400
Salmonellae	Absence	Absence	
Hydrocarbons	20 mg/l	20 mg/l	
Phenol Index	5 mg/l	0.3 mg/l	
Oil and grease	50 mg/l	30 mg/l	10 mg/l
Total Organic Carbon (TOC)	750 mg/l	75 mg/l	
Ammonia (NH <sub>4</sub> <sup>+</sup> )	-	10 mg/l	
Silver (Ag)	0.1 mg/l	0.1 mg/l	
Aluminum (Al)	10 mg/l	10 mg/l	
Arsenic (As)	0.1 mg/l	0.1 mg/l	
Barium (Ba)	2 mg/l	2 mg/l	
Cadmium (Cd)	0.2 mg/l	0.2 mg/l	
Cobalt (Co)	1 mg/l	0.5 mg/l	
Chromium total (Cr)	2 mg/l	2 mg/l	
Hexavalent Chromium (Cr <sup>VI</sup> )	0.2 mg/l	0.2 mg/l	
Copper total (Cu)	1 mg/l	0.5 mg/l	
Iron total (Fe)	5 mg/l	5 mg/l	
Mercury total (Hg)	0.05 mg/l	0.05 mg/l	
Manganese (Mn)	1 mg/l	1 mg/l	
Nickel total [Ni]	2 mg/l	0.5 mg/l	
Lead total (Pb)	1 mg/l	0.5 mg/l	
Antimony (Sb)	0.3 mg/l	0.3 mg/l	
Tin total (Sn)	2 mg/l	2 mg/l	
Zinc total (Zn)	10 mg/l	5 mg/l	

Parameter	(MOE Decision 8/1 for 2001)		WBG EHS guidelines
	Discharge into Public Sewers	Discharge into Surface Water Bodies	Treated Sanitary Sewage Discharge
Active (Cl <sub>2</sub> )	-	1 mg/l	
Cyanides (CN <sup>-</sup> )	1 mg/l	0.1 mg/l	
Fluorides (F)	15 mg/l	25 mg/l	
Nitrate (NO <sub>3</sub> <sup>-</sup> )	-	90 mg/l	
Phosphate (PO <sub>4</sub> <sup>3-</sup> )	-	5 mg/l	
Sulphate (SO <sub>4</sub> <sup>2-</sup> )	1,000 mg/l	1,000 mg/l	
Sulphide (S <sup>2-</sup> )	1 mg/l	1 mg/l	

Source: EHS 2007 and MOE Decision 8/1 for 2001

### 3.5.2 Air Emissions Targets

Table 3-5 shows the WHO Ambient Air Quality Guidelines (WHO, 2005) that are adopted by the IFC of the World Bank Group in the Environmental, Health, and Safety Guidelines of Air Emissions and Ambient Air Quality and the National Ambient Air Quality Standards (NAAQS) of MOE Decision 52/1-1996. As can be noted from comparison of these levels, the NAAQS maximum levels of the ambient air quality are much higher for several pollutants comparing to the same pollutants of the WHO. These elements are SO<sub>2</sub>, NO<sub>2</sub>, PM10, Lead and Benzene. However, the other pollutants have similar values. Therefore, for this project, the WHO standards apply.

**Table 3-5: WHO Guidelines for Ambient Air Quality of 2005 and NAAQS of MOE Decision 52/1-1996**

Parameters	WHO Guidelines (µg/m <sup>3</sup> )	NAAQS Maximum Levels
Sulfur dioxide (SO <sub>2</sub> )	500 (10 minutes) 20 (24 hrs)	-
Nitrogen dioxide (NO <sub>2</sub> )	200 (1 hr) 40 (Annual)	200 (1 hr) 150 (24 hrs) 100 (Annual)
Carbon Monoxide (CO)	30,000 (1 hr) 10,000 (8 hrs)	30,000 (1 hr) 10,000 (8 hrs)
Ground-level Ozone (O <sub>3</sub> )	100 (8 hrs)	150 (1 hr) 100 (8 hrs)
Total Suspended Particles (TSP)	150 (24 hrs)	120 (24 hrs)
PM10	50 (24 hrs) 20 (Annual)	80 (24 hrs)
PM2.5	25 (24 hrs) 10 (Annual)	NA
Lead	0.5 (annual)	1 (annual)
Benzene	Unit Risk Life 6x10 <sup>-6</sup>	16.2 (annual)

Source: WHO 2005 and MOE Decision 52/1-1996

### 3.5.3 Noise Emissions Targets

Article 46 of Law 444 recognizes that loud noises, particularly noises caused by machinery and vehicles, may be harmful to human health and the environment. Table 3-6 shows the noise level guidelines according to the EHS Guidelines (WHO Noise Levels) and the national noise standards as per MOE Decision 52/1. Comparing these levels, although some characteristics differ for WHO in reference to the type of area and the day hours that extend to 10 pm instead of 6 pm for the national standards, the noise limits for institutional and educational areas by the WHO are more stringent and therefore apply. Noise limits for residential, industrial and commercial areas are more stringent in the national standards and therefore apply.

**Table 3-6: WHO Noise Level Guidelines Compared to National Levels**

Type of Area	WHO Noise Level (dB)		Noise Standards as per MOE Decision 52/1-1996		
	Day (7 am -10 pm)	Night (10 pm - 7 am)	Day (7 am- 6 pm)	Evening (6 pm - 10 pm)	Night (10 pm – 7 am)
<b>Residential</b>	55	45	45-55	40-50	35-45
<b>Institutional</b>	55	45	-	-	-
<b>Educational</b>	55	45	55-65	50-60	45-50
<b>Industrial</b>	70	70	60-70	55-65	50-60
<b>Commercial</b>	70	70	55-65	50-60	45-50

Table 3-7 presents the hours of work permitted under noise levels exceeding 90 dB.

**Table 3-7: Hours of Work Permitted under Noise Level**

Noise Level (dB)	95	100	105	110	115
<b>Hours permitted to work</b>	4	3	1	0.5	0.25

## 4 ENVIRONMENTAL, SOCIAL, HEALTH AND SAFETY (ESHS) MANAGEMENT

This CESMP provides a framework for ensuring that specific ESHS conditions are met during the construction activities. It describes actions that will be carried out and who will be responsible for them. These actions can be categorized into three groups:

- Construction techniques that mitigate ESHS impacts to acceptable levels;
- Monitoring programs that check the accuracy of impact predictions made in the project ESMP; and
- Response procedures that ensure corrective actions are taken if impact mitigation is not being implemented or results of environmental monitoring indicate environmental objectives are not being met.

**The CESMP is to be considered a mandatory reference document by HKBros and the subcontractors. Its content will define subcontractors' obligations and will provide general guidance to conform to the ESHS requirements such as stated in this document. Each subcontractor involved in the construction activities shall be provided a copy of the document for compliance.**

The preparation of this CESMP is only a starting point. The most crucial steps will be taken throughout the construction activities as the CESMP is actively used as a tool for achieving environmental and social commitments. The following describes how this CESMP is to be implemented.

### 4.1 Policy Statement

HKBros is committed to the safe operation of the Project in accordance with all contractual and statutory requirements. Their belief is that leadership lays the foundation upon which a solid program is built and reflects management commitment in its implementation. Effective leadership and program administration are vital to the success of the Environment, Social, Health & Safety (ESHS) protection measures.

HKBros' ESHS Policy is attached in Annex B.

### 4.2 Environmental, Social, Health and Safety Management Systems

This CESMP must be viewed as a tool reflecting HKBros' overall Environmental and Social Management Systems. To be effective, this must start at the most senior levels in the organization. HKBros's management will provide strong and visible leadership to promote a culture in which all employees and workers share a commitment to ESHS.

This will be achieved by managers:

- putting ESHS matters high on the agenda of meetings, from Board downwards;
- highlighting the importance of ESHS considerations in business decisions and communication with stakeholders;
- establishing an organizational capacity and maintaining competency that is conducive of ESHS;
- evaluating all ESHS aspects before final decisions are reached;
- being fully aware of the main ESHS hazards associated with the project activities and the systems, procedures and field practices in place to manage these hazards;
- ensuring adequate monitoring of project activities and mitigation measures in place, and continuous review of procedures and outcomes;

- immediately and visibly responding and being involved in investigating incidents or other abnormal events related to ESHS;
- maintaining ongoing reporting of activities and mitigation measures to affected communities;
- seeking internal and external views on ESHS issues; and
- recognising ESHS achievement.

### **4.3 Roles and Responsibilities**

HKBros will be fully responsible for implementing this CESMP and obtain the necessary permits, consents and authorisation from relevant authorities prior to the construction works. Also, HKBros will ensure that all involved sub-contractors comply with the provisions of the CESMP - by reviewing their environmental and social performance and carrying out regular environmental awareness sessions, audits and inspections.

#### **4.3.1 Team Structure**

Figure 4-1 presents HKBros's organization chart during the project.

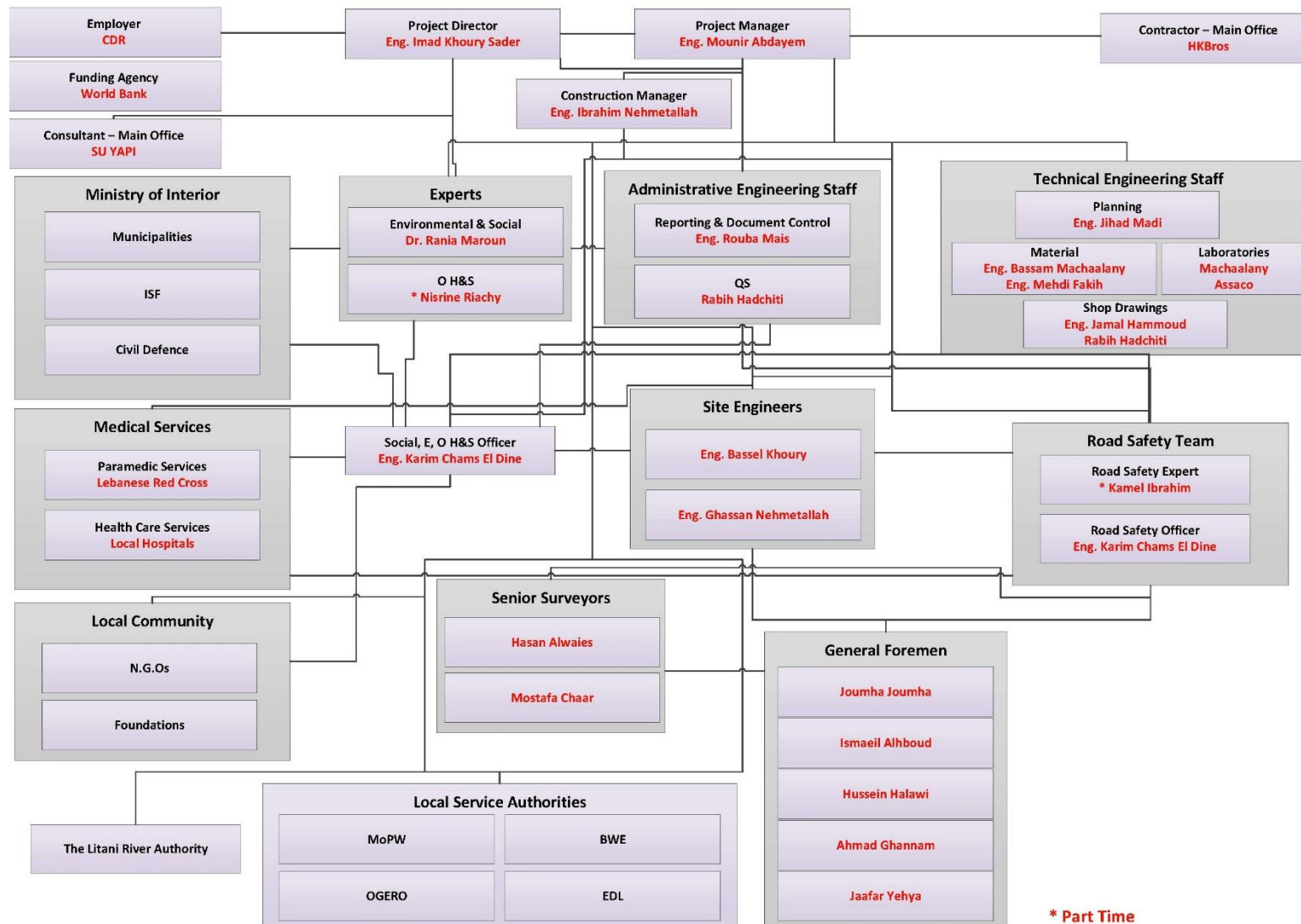


Figure 4-1: HKBros' organizational chart for project implementation

### 4.3.2 CESMP Implementation Responsibilities

Specific project ESHS roles within the HKBros team are described below.

#### 4.3.2.1 Project Director

- Coordinating and liaising with different bodies and stakeholders involved in the project (WB, CDR, and SU YAPI/ KREDO).
- Acting as the primary contact person and liaison.
- Providing strategic leadership and technical, operational, and financial leadership.
- Providing oversight on the project progress and quality.
- Conducting monthly reviews to ensure accurate and timely reporting of financial deliverables and obligations, and to ensure accountability on all major project activities.
- Dealing with the project strategic decisions.
- Ensuring that all legal and financial papers, permits, and bonds are secured on time.
- Managing project managers on macro level.
- Meeting and coordinating with different project experts (Environmental & Social, Occupational Health and Safety (OH&S), and Road Safety), to ensure the development and implementation of an approved CESMP.

#### 4.3.2.2 Project Manager

- Ensure that the project works are carried out in accordance with Company policies and in accordance with the requirements of the quality plan, specifications and contract.
- Coordinate with the Project Director on multiple issues.
- Ensure the full compliance of subcontractors, suppliers, and with the Company Quality policies and with applicable national legislation.
- Ultimate responsibility for the implementation of the CESMP.
- Follow-up on the site officers' daily work
- Ensure all required resources including manpower, equipment, and material are in place to maintain full compliance with ESHS requirements of the project
- Ensure compliance with requirements.
- Ensure that all levels of staff receive adequate and appropriate training.
- Ensure that all the equipment required to execute the works according to the construction programme are available, in good condition, and provide any additional equipment that might be required.
- Coordinate with the Site Engineers, Planner, Foremen and Surveyors for a safe and proper execution of the works.
- Provide specific attention to all safety measures in full coordination with the health and safety officer.
- Ensure that the project activities are implemented on time and within the budget.
- Draft contracts with subcontractors.
- Manage the weekly and monthly project site meetings.
- Oversee and approve the monthly report.
- Oversee and approve all documents and drawings prepared.

#### 4.3.2.3 *Site Engineer*

- Organize the site so that work is carried out to the required standard with minimum risk to people, equipment and material
- Ensure construction methods minimize risk to public & workers e.g. through adequate Traffic Management.
- Know the requirements of the CESMP and regulations and other relevant legislation and how they apply to the project.
- Make certain that all personnel on site are only employed for that which they have been thoroughly trained.
- Check that all repair and maintenance work carried out on site is done in a proper manner and that emergency repairs are dealt with properly as soon as possible. Call the attention of site management to the need for dangerous equipment to be put out of service.
- Maintain proper housing-keeping on site.
- Implement arrangements with subcontractors and other contractors on site to avoid any confusion about areas of responsibility.
- Make sure that suitable PPE is available and used.
- Ensure that a qualified first-aider and all items of first-aid equipment, as required by the CESMP, are available and their location known to employees.
- Cooperate with the Environmental & Social, OH&S, and Road Safety experts; act on recommendations provided.

#### 4.3.2.4 *Environmental and Social Expert*

- Supervise all environmental and social aspects and protection measures during construction activities and ensure the implementation of the CESMP.
- Provide necessary environmental and social induction for all employees and workers involved in the construction activities, including training on gender-based aspects, internal and external GRM and Code of Conduct
- Promote regular environmental training and awareness raising amongst construction workers.
- Provide special training for the HSE officer
- Provide initial awareness presentation to the municipalities/community at the onset of the project
- Provide advice on environmental and social aspects during the construction phase and provide for any necessary update of the CESMP or any corrective actions, if required.
- Coordinate environmental and social mitigation and monitoring activities in collaboration with the Site HSE Officer during the construction works and ensure appropriate documentation of monitoring results
- Coordinate with community representatives (concerned municipalities, etc.)
- Coordinate with other experts, especially the Occupational Health & Safety expert
- Conduct meetings, field visits, additional requested training, and provide guidance and supervision
- Participate in site meetings between HKBroS and CDR regarding environmental issues.
- Ensure that the required environmental and social reporting is completed.

#### 4.3.2.5 Occupational Health and Safety (OH&S) Expert (Part Time)

- Provide guidance and supervision to the Contractor, to apply the health and safety system and measures including:
  - The Council for Development and Reconstruction (CDR) regulations
  - Lebanese laws and regulations
  - Those stated in the tender documents, especially in the ESMPs
- Develop an OHS plan for the project
- Provide the following services throughout the project duration:
  - Training:
    - Induction and in-depth training for the HSE Officer
    - Induction training for all the site personnel involved in the project
  - Implementation of the OH&S system
  - Continuous monitoring and control of the OH&S system, with regular reviews and updates
  - Auditing, follow-up, and attending requested regular meetings
  - Following up on the outputs of the OH&S system, and coordinating with the key responsible personnel on any H&S issues.
  - Completing, checking, reviewing and approving the monthly progress reports on the compliance of OH&S system.

#### 4.3.2.6 Road Safety Expert (Part Time)

- Preparing road safety management plans.
- Strengthening and reviewing the safety plans.
- Developing road safety tools, guidelines, and policies.
- Identifying and treating black spots.
- Conducting road safety monitoring and evaluation.
- Preparing work zone safety plans and traffic diversion plans.
- Conducting accident data analyses.
- Coordinating with the site engineer and foremen on the safety conditions of the project.
- Ensuring that all the parties involved in the road works are aware of the safety road plans.
- Ensuring that all measures defined in the safety road plans are implemented.
- Coordinate with the local authorities on the various components of the safety plans.
- Coordinate with the municipalities police on the traffic diversion plans.
- Prepare and update accident response incident management system.
- Monitor and supervise the application of the safety plans by all the components of the project.

#### 4.3.2.7 HSE officer

- Ensure implementation of all environmental, social, health and safety measures related to the nature of works being carried out, and in accordance with the CESMP & TMP.
- Ensure that all the persons involved in the works are aware of their responsibilities, and that they have enough understanding of the Environmental, Social, Health and Safety (ESHS) and road safety procedures.

- In coordination with the Project Manager, ensure that all the implemented safety measures are effective enough to maintain safe working on site.
- Assign and train personnel on each site to act as safety supervisors and coordinate with them on a daily basis to ensure the implementation of the CESMP.
- Maintain continuous inspections of the site activities, advise and train persons on a daily basis to prevent accidents and personnel injury.
- Give special attention to housekeeping and ensure that the site is maintained clean and tidy.
- Ensure all the relevant safety sign boards for different works are in place.

#### 4.3.2.8 Subcontractor

The 'Subcontractor' is any company hired directly or indirectly by HKBros to carry out project related tasks including the construction works.

All Subcontractors that have at least one interface activity with identified key environmental and social aspects are responsible to comply with the requirements of this plan. The Subcontractors are called to demonstrate a proactive behaviour towards ESHS concerns. It is their responsibility to provide information requested by HKBros regarding their scope of activities and to demonstrate compliance with the applicable ESHS requirements and particularities.

### 4.4 Communication and Reporting

#### 4.4.1 Internal Communication and Reporting

HKBros will keep all relevant parties informed on pertinent ESHS matters during construction activities. Communication will typically be through informal means, formal progress meetings and documentation (Form F-001 in Section 6.1). ESHS issues will form part of the progress meeting agenda, where such meetings are instituted.

HKBros will ensure that suitable and relevant information relating to ESHS at the workplace is disseminated to all staff in the form of induction and refresher training, access to safety legislation and information, and safety meetings.

During the construction phase, regular monitoring results will be documented in order to track and analyse the frequency of potential impacts and accidents that might occur.

HKBros will submit the Contractor's Environmental and Social Compliance Reports with the Environmental and Social requirements as listed in the ESMP to the Supervision Consultant (SU YAPI/ KREDO) on monthly basis. It will cover the following:

- Implementation of Environmental & Social Mitigation Measures On-Site
- Environmental, Social & Occupational Problems/Incidents/Accidents encountered and measures taken
- Field Measurements Conducted Onsite
- Environmental, Social & Workers' Health and Safety Training/Awareness
- Community Grievance Redress Mechanism
- Pictures related to Environmental & Social Management Compliance
  - Including geo-tagged and dated photos to demonstrate compliance/non-compliance, corrective actions, good practice

After documenting, the supervision consultant will submit the reports to the Project Management Unit (PMU) at the CDR on monthly basis. In addition, there will be immediate reporting of severe incidents (such as fatal accidents) (Refer to Section 4.6.3).

#### 4.4.2 Coordination with External Public Entities

The Project Director will coordinate all administrative and technical issues with external public entities, mainly to get the required permits and coordinate construction activities together with the project manager. The trained HSE officer on site will communicate directly with the concerned municipalities throughout project implementation, with direct guidance from the environmental and social experts.

### 4.5 Training and Awareness

HKBros acknowledges that training of personnel is a contractual requirement. HKBros will ensure that all employees and workers will receive the necessary training to perform their tasks in the safest manner. The purpose of training is to show and create an understanding of the ESHS management system.

#### 4.5.1 Induction

Prior to the commencement of construction activities, the Environmental, Social & OHS experts will hold a full training session for the staff listed with specific responsibilities, all other senior staff with authority to implement impact mitigation commitments, as well as the workers on-site (construction, drivers, logistics, etc.). Two separate sessions will be held, one for the senior staff and one for the workers, to ensure the training is adequately tailored to all target groups.

The training session will cover:

- environmental and social protection approach;
- responsibilities for CESMP implementation;
- committed environmental and social impact mitigation;
- environmental and social monitoring programs; and
- all environmental procedures including impact mitigation auditing, environmental monitoring, incident reporting and corrective actions;
- Grievance Redress Mechanism (GRM);
- Codes of Conduct;
- Covid 19 prevention and protection;
- OH&S topics including:
  - General hazards present at the work sites and measures adopted to respond to them
  - Personal Protective Equipment (PPE)
  - Emergency procedures
  - Fire protection and prevention provided by certified trainers
  - First Aid provided by certified trainers
  - Electrical safety
  - Equipment's operation and safety precautions
  - Handling and storage of hazardous material/chemicals
  - Lifting heavy objects
  - Trenching and excavation safety
  - Working in confined spaces
  - Slips, trips, and falls protection/prevention, etc.

#### - Incidents Management Procedure

Subsequent training sessions (Refresher Trainings) for the general level environmental, social, and health and safety commitments will be held on regularly to maintain awareness and also train any new staff. Environmental, social, and health and safety commitments will be included as part of the Induction Training programme for all new staff.

All trainings will be documented for the duration of each and will include the date, topic, attendees, recommendations, and additional comments (Form F-002 in Section 6.2). Records of trainings will be maintained by the HSE Officer and reviewed periodically.

The HSE Officer will ensure that all visitors to the site are made aware of the HSE Standards HKBro is implementing for the protection of the public and HKBro personnel on site. Visitors to the site will be provided with PPE before entering the site.

### 4.5.2 Toolbox Talks

Daily toolbox talks shall be held for work groups by the HSE Officer, the relevant supervisors and/ or OHS expert. The meetings should:

- Review any safety or process safety issues occurring since the last meeting;
- Review new relevant hazards and incidents;
- Cover specific OHS issues of interest; and
- Plan, communicate, and delegate the day's work.

Weekly toolbox talks will be conducted by the environmental and social expert and/or the HSE officer targeting specific environmental and social topics such as dust emission control, solid waste management, oil spill response, GRM, GBV, code of conduct, Covid 19, etc.

Ad-hoc on-the-spot Toolbox Talks will also be conducted by the environmental and social expert, the OHS expert, and/or the HSE officer as the need arises, following incidences or issues of non-compliance observed during regular site inspections and audits.

## 4.6 Emergency Response and Incident Reporting

### 4.6.1 Emergency Response Procedures

#### 4.6.1.1 Purpose

To detail the basic steps needed to prepare for emergencies in the workplace. Emergencies can be identified as Medical, Fire, Chemical Spills, etc. The highest priority of this procedure is the safety and health of all personnel at or near the site.

#### 4.6.1.2 Evacuation Procedures

- Any individual discovering a situation which presents a real or potential threat to the safety and health of personnel within the site shall immediately notify the Health, Safety and Environmental (HSE) Officer or any high authority individual (Project Manager, Site engineer, Experts...).
- In the event of an EMERGENCY and required EVACUATION, a warning [Horn/Verbal Alert] will sound.

- When the warning sign is heard, all personnel will immediately discontinue activities and proceed to the nearest exit. All personnel shall not linger, or attempt to collect personal items before vacating the site. Once outside of the site, all personnel shall go directly to designated assembly points and report to the Health, Safety and Environmental (HSE) Officer. The assembly points depend on the area being evacuated:
  - For the site Offices: The assembly point will be designated outside the offices in a fixed place outside the boundary of the office building, where a visible assembly sign will be placed.
  - For the open sites: The assembly point will be changed upon the progress of the works and it will be assessed each 2 weeks or as needed by the HSE Officer and the Site Engineer to ensure the proper designation of this point. A visible assembly sign will be placed and its location will be continuously informed to all personnel on a weekly basis.
- The HSE Officer will determine that all personnel are accounted for and have evacuated the site. He will also be prepared to brief arriving fire and rescue services on the problem; accountability of personnel; or if personnel are not accounted for, their possible location.
- All personnel will remain at the assembly point until they receive further instructions from upper management and Fire/Emergency Rescue Personnel.

An emergency evacuation plan for the site offices and yard is illustrated in Figure 2-6.

#### 4.6.1.3 Project Emergency Contact Numbers

The following are the emergency contact numbers. This contact list will be posted in Arabic at all project work sites and offices.

Service	Telephone Number	Name/ Details/ Address
<b>Project Manager</b>		ENG. MOUNIR ABEDAYEM
<b>Site Engineers</b>	03-752323 71-796789	ENG. BASSEL KHOURY ENG. GHASSAN NEHMATALLAH
<b>Health, Safety and Environmental (HSE) Officer</b>	71-714787	ENG. KARIM SHAMSEDDINE
<b>Site First Aid Givers</b>	71-714787	ENG. KARIM SHAMSEDDINE
<b>Hospitals</b>	08-544022/3/4/5 08-543150/1/2 08-545100/99 08-543919/20	Chtaura Hospital Bekaa Hospital Taanayel Governmental Hospital
<b>Ambulance Service</b>	140	LEBANESE RED CROSS EMERGENCY NUMBER
<b>Nearest Fire Service</b>	125	CIVIL DEFENSE EMERGENCY NUMBER
	175	CIVIL DEFENSE FIRE EMERGENCY NUMBER
<b>Nearest Military Service</b>	1701	LEBANESE ARMY HOTLINE
	117	MILITARY OPERATIONS ROOM

Service	Telephone Number	Name/ Details/ Address
<b>Nearest Police Service</b>	112 70-747311 03-540900 76-944159 03-207819	INTERNAL SECURITY SERVICES EMERGENCY NUMBER Bouerij Municipal Police (Bilal Chahine) El Mraijet Municipal Police (Hassan Hammoud Saieed) Qabb Elias Municipal Police (Khalil Kahwaji) Makse Municipal Police (Wassim Monzer))
<b>Water / Electricity / Phone Service</b>	03 805915 03-853675 03-716160 70-817496	Bekaa Water Establishment (Khalil Azar) EDL - Chtaura Authority Head (Issam Sleiman) EDL - Chtaura Department (Nadim Layoun) Ogero Zahleh Area (Tony Ramia)
<b>Health and Safety Expert</b>	03-852556	MS. NISRINE RIACHY
<b>Environmental and Social Expert</b>	03-396318	DR. RANIA MAROUN
<b>Road Safety Expert</b>	03-0918754	MR. KAMEL IBRAHIM

#### 4.6.1.4 Types of Emergencies

Response procedures for the types of emergencies listed below will be posted on all project sites in Arabic.

##### **Medical Emergency**

- Call medical emergency phone number (check applicable):
  - ☐ Paramedics
  - ☐ Ambulance
  - ☐ Fire Department
  - ☐ Other
- Provide the following information:
  - Nature of medical emergency,
  - Location of the emergency,
  - Your name and phone number from which you are calling.
- Do not move victim unless absolutely necessary.
- Call the personnel trained in CPR and First Aid to provide the required assistance prior to the arrival of the professional medical help.
- If personnel trained in First Aid are not available, as a minimum, attempt to provide the following assistance:
  1. Stop the bleeding with firm pressure on the wounds (note: avoid contact with blood or other bodily fluids).
  2. Clear the air passages using the Heimlich Maneuver in case of choking.
- In case of rendering assistance to personnel exposed to hazardous materials, consult the Material Safety Data Sheet (MSDS) and wear the appropriate personal protective equipment. Attempt first aid ONLY if trained and qualified.

## **Fire Emergency**

*When fire is discovered:*

- Activate the nearest fire alarm (if installed)
- Notify the nearest Fire Service.
- If the fire alarm is not available, notify the site personnel about the fire emergency by voice, phone or any other mean

*Fight the fire ONLY if:*

- The Fire Department has been notified.
- The fire is small and is not spreading to other areas.
- Escaping the area is possible by backing up to the nearest exit.
- The fire extinguisher is in working condition and personnel are trained to use it.

*Upon being notified about the fire emergency, occupants must:*

- Leave the site using the designated escape routes.
- Assemble in the designated assembly area
- Remain in the area until the competent authority announces that it is safe to reenter.

*Designated Health, Safety and Environmental (HSE) Officer must:*

- Disconnect utilities and equipment unless doing so jeopardizes his/her safety.
- Coordinate an orderly evacuation of personnel.
- Perform an accurate head count of personnel reported to the designated area.
- Determine a rescue method to locate missing personnel.
- Provide the Fire Service personnel with the necessary information about the site.
- Ensure that all employees have evacuated the site.

*How to extinguish small fires*

- **Class-A** Extinguish ordinary combustibles by cooling the material below its ignition temperature and soaking the fibers to prevent re-ignition. Use pressurized water, foam or multipurpose dry chemical extinguishers.
- **Class-B** Extinguish flammable liquids, greases or gases by removing the oxygen, preventing the vapors from reaching the ignition source or inhibiting the chemical chain reaction. Foam, carbon dioxide, ordinary dry chemical, multi-purpose dry chemical and halon extinguishers may be used to fight Class B fires.
- **Class-C** Extinguish energized electrical equipment by using an extinguishing agent that is not capable of conducting electrical currents. Carbon dioxide, ordinary dry chemical, multi-purpose dry chemical and halon fire extinguishers may be used to fight Class C fires. DO NOT USE water extinguishers on equipment.

- **Class-D** Extinguish combustibles such as magnesium, titanium, potassium and sodium with dry power extinguishing agents specially designated for the material involved. In most cases, they absorb the heat from the material, cooling it below its ignition temperature.
- Multi-purpose chemical extinguishers leave a residue that can harm sensitive equipment, such as computers and other electronic equipment. Carbon dioxide or halon extinguishers are preferred in these instances because they leave very little residue.

#### *How to identify the proper Fire Extinguisher*

- All ratings are shown on the extinguisher faceplate. Some extinguishers are marked with multiple ratings such as AB, BC and ABC. These Extinguishers are capable of putting out more than one class of fire

#### *How to use a portable Fire Extinguisher*

<b>P</b>	Pull the pin.
<b>A</b>	Aim Extinguisher nozzle at the base of the flames.
<b>S</b>	Squeeze trigger while holding the extinguisher upright.
<b>S</b>	Sweep the extinguisher from side to side, covering the area of the fire with extinguishing agent.

#### *What to do if someone catches on fire*

##### **If you should catch on fire:**

STOP - where you are

DROP - to the floor

ROLL - around on the floor.

This will smother the flames, possibly saving your life. Just remember to

**STOP DROP and ROLL.**

If a co-worker catches on fire, smother the flames by grabbing a blanket or rug and wrapping them up in it. That could save them from serious burns or even death.

### **Hazardous Material Spill or Release**

*When a Large Chemical Spill has occurred:*

- Immediately notify the designated Health, Safety and Environmental (HSE) Officer.
- Contain the spill with available spill kit material (e.g., pads, booms, absorbent powder, etc.).
- Secure the area and alert other site personnel.
- Do not attempt to clean the spill unless trained to do so.
- Attend to injured personnel and call the medical emergency number, if required.
- The materials used for cleaning the spill should be rejected as Hazardous Waste.
- Evacuate the site as necessary

*When a Small Chemical Spill has occurred:*

- Notify the Health, Safety and Environmental (HSE) Officer and/or supervisor
- If toxic fumes are present, secure the area (with caution tapes or cones) to prevent other personnel from entering.
- Deal with the spill in accordance with the instructions described in the MSDS.
- Small spills must be handled in a safe manner, while wearing the proper PPE.

#### **4.6.2 Contamination and Remediation**

To minimize the risk associated with leakage and spills of fuel/ oil and other hazardous materials on to the surrounding environment, HKBroS will implement the following measures:

- A fuel/oil spill clean-up kit will be kept at all main fuel storage facilities within the rented yard and protected area to facilitate any clean up in the event of a spill. This kit must include the following list of fuel/oil spill clean-up equipment:
  - Hand operated fuel pumps;
  - Recovery containers such as empty drums;
  - Long-handled shovels;
  - Impervious soil (silt or clay bearing gravel);
  - Low-density rope;
  - Absorbent pads;
- If a fuel spill occurs the flow must be stopped immediately if possible. This may entail repairing a leak, pumping out a tank or shutting off a valve. If necessary, culverts may be blocked off by earth or wooden barriers to contain fuel, provided the threat of flooding is addressed.
- Any fuel spill at any storage site and in excess of 70 litres must be reported immediately to CDR.

For chemical spills:

- A hazmat spill clean-up kit will be kept at all chemical storage facilities within the rented yard and the protected area, along with the MSDS's of the stored chemicals, to facilitate any clean up in the event of a spill. This kit must include the following list of spill clean-up equipment:
  - Recovery containers such as empty drums;
  - PPE (Nitrile Gloves/ Vinyl Apron/ Vinyl Sleeves/ Safety Goggles/ Socks)

- Emergency Response Guidebook
- Poly Bag
- Absorbent Pads
- Plastic Pail
- If a chemical spill occurs the flow must be stopped immediately if possible. The MSDS of the spilt material will be consulted by the HSE officer who will manage the clean-up of the chemical accordingly.
- Any chemical spill at any storage site and in excess of 20 litres must be reported immediately to CDR.

#### 4.6.3 Incident Reporting

All serious incidents including near misses will be reported, investigated, and documented immediately. The report (F-003 in Section 6.3) will include all pertinent information including copies of gathered documents. The report shall be completed and reviewed by the E&S and OHS Expert no later than 24 hours after the occurrence of the incident and will be submitted to the Consultant E&S expert, who in turn submits to CDR.. The report contains the following sections:

- Description of the incident (type, details....)
- Information collection (photos, witnesses' reports...)
- Details of the harmed person if existing
- Root cause analysis
- Investigation Outcomes (immediate cause, secondary cause, corrective and preventive actions...)

A log of all incidents will also be compiled (Form F-004 in Section 6.4)

### 4.7 Social Aspects and Procedures

#### 4.7.1 Grievance Redress Mechanism (GRM) for Local Communities

The project GRM for local communities will be accessible to all communities, business and institutions which may be affected by the construction works, and all complaints, comments, suggestions, and objections will be recorded, registered, communicated, and followed up on.

The GRM will be properly publicized. HKBroS will display clear notices at affected municipalities, at contractors' and consultants' offices, and at the construction site on project-installed fixed and movable sign boards, which display the GRM channels and procedure, keeping in mind accessibility to all potentially affected parties. The public note will also include the CDR GRM email address and the CDR GRM telephone number (Annex D).

If any person has any complaint, concern or suggestion regarding the project implementation (e.g., noise, dust, hindrance of access, etc.), they can follow the procedures below:

1. The affected person should file their grievance orally or in writing, to the Contractor's Site Supervisor/ Site Engineer/Manager.
2. The grievance note should be signed and dated by the aggrieved person, or by the receiving person in case the aggrieved person is illiterate or cannot write.
3. The above issue shall be resolved within the **maximum of one week**.
4. If the aggrieved person does not receive a response within the specified period or is dissatisfied with the outcome, they lodge their grievance to the Project Management Unit

(PMU) at the CDR (CDR's phone number: 01-980096; extension number to be provided once the project execution starts), and a response should be given within a **period of two weeks**.

- HKBros will govern the GRM by an internal committee, consisting of the Project Manager, the Site Manager, the Social and Environmental Expert.
- Any grievance received shall be immediately documented in the grievance register ( Form F-005) and logged in the grievance log (Form F-006) by the HSE Officer ( Section6.5).
- The HSE officer shall ensure the communication of the grievance to the project manager and the social/ and or environmental expert depending on the nature of the grievance. Every grievance will be considered and investigated in a timely manner (**maximum of one week**).
- Resolution options will be developed taking into consideration stakeholders' preferences, project policy, experience, current issues, and potential outcomes.
- The HSE officer shall clearly communicate the response to the grievance with the complainant and the action taken.
- The GRM committee will meet periodically to ensure all grievances are closed and actions are tracked.
- An audit of the GRM will be done as part of the ESHS audit by HKBros, to ensure the proper implementation and documentation of the GRM.
- HKBros will report the summary of complaints received and resolved to the Supervision Engineer on a monthly basis except for urgent cases. The report will inform also the Supervision Engineer of complaints that could not be resolved by HKBros and are being elevated to level 2 according to the project GRM.

#### 4.7.2 Gender-based Violence (GBV) and Child Abuse/Exploitation (CAE)

HKBros has a zero-tolerance policy to Gender-based Violence (GBV) and Child Abuse/Exploitation (CAE). All workers, contractors and sub-contractors will sign the Code of Conduct (Annex C), which will be explained to them as part of the environmental and social management training before commencing to work. The project manager will respond to the reported incidents of sexual abuse exploitation as a matter of priority.

#### 4.7.3 Grievance Redress Mechanism (GRM) for Workers

A worker GRM is put in place to ensure all employees are afforded both the rights and the means whereby grievances can be formally raised, logged and resolved. The GRM allows employees to formally discuss and resolve any complaint that they may have and to provide a channel for the equitable settlement of complaints and grievances. Grievances refer to individual or group work-related problems, concerns or complaints that may arise in the nature of the work relationship with a co-employee or manager. A grievance can be about any act, behaviour or decision that has or is likely to have an unreasonable negative impact on the ability of a staff member to undertake their duties. A grievance can relate to almost any aspect of employment, for example:

- Workplace discrimination;
- Safety in the workplace;

- Staff development or training;
- Leave allocation;
- Performance appraisal;
- Discrimination;
- Abusive language; and
- Sexual harassment.

The GRM will:

- Ensure that grievances are expressed openly and transparently, and could be discussed anonymously;
- Ensure that there will be no retaliation or discrimination against those who express grievances and that any grievances will be treated and resolved confidentially;
- Result in grievances being settled as close to the point of origin and as quickly as possible;
- Ensure that vulnerable employees (such as ethnic or religious minorities, migrant workers, or employees with disabilities) should not be deterred from logging a grievance;
- Ensure fairness and equity; and
- Promote a harmonious working environment.

If the affected employee feels prejudiced or considers that his/her rights were not preserved, they can follow the procedures below:

#### Stage 1

The worker must raise the grievance verbally with the direct supervisor. The direct supervisor will, to the best of his / her ability:

- Listen to the worker in private; without any other parties present including HR;
  - Encourage the worker to express the grievance freely and openly; and
  - Obtain all relevant facts about the grievance, distinguishing fact from opinion.
1. The direct supervisor will endeavour to resolve the grievance as quickly as possible and within **three (3) working days** (unless a longer time frame is justified) and keep record of the resolution, with the acknowledgement of receipt of resolution by the employee;
  2. If the direct supervisor's decision is not satisfactory to the employee, Level Two becomes effective and the immediate supervisor must advise the employee of the subsequent stages of the procedure and of the employee's right to seek the assistance of a representative; and
  3. Any employee making use of the grievance procedure may nominate a fellow worker to act as a representative during the meeting with Management in Stage Two.

#### Stage 2

1. With the assistance of a representative, if so required, the worker can formally raise the grievance with the next level of management above the immediate supervisor (Site Engineer), by completing a grievance register (F-005 in Section 6.5);
2. Acting as a chairperson, the designated Site Engineer concerned, in consultation with the worker relations representative, will endeavour to resolve the grievance within **three (3) working days** (unless a longer time frame is justified) by convening a meeting of all parties concerned;
3. The chairperson must communicate his / her decision to the worker by completing the grievance form and forward a copy to the worker; and

4. If the outcome of the grievance meeting is still not satisfactory to the worker, then he may appeal and refer the matter for final review to the next level of management, senior to the chairperson of the grievance meeting.

#### Stage 3

1. The worker must complete the previous grievance form and forward it to the designated Project Manager, senior to the one in Stage Two;
2. The designated Project Manager shall review and evaluate all facts and conclusions reached in all previous Levels (stages);
3. The designated Project Manager shall have the right to call for any additional facts or information he / she may require; and
4. The designated Project Manager shall make his decision **within three (3) working days** (unless a longer time frame is justified), from the date of receipt of the grievance.

#### Stage 4

1. The worker must complete the previous grievance form and forward it to the HR Manager.
2. The HR Manager shall review and evaluate all facts and conclusions reached in all previous Levels (stages).
3. The HR Manager shall have the right to call for any additional facts or information he / she may require.
4. The HR Manager shall make his / her decision within three (3) working days (unless a longer time frame is justified), from the date of receipt of the grievance.
5. His / her decision will be final in terms of this grievance procedure. They must be recorded on the grievance form and circulated to all concerned parties.

Where the grievance to be raised affects a group of workers, then the workers concerned may either:

- Nominate a delegation of not more than three (3) workers from amongst themselves to raise the matter with their respective immediate superior;
- Nominate a delegation of not more than three (3) workers from amongst themselves to consult their respective shop steward; and
- Once the workers concerned have nominated their delegation and/or consulted with their respective shop steward, the three (3) stages of the grievance procedure as detailed above shall be followed.

**The maximum time allocated to resolve a complaint is twelve (12) days, unless a longer timeframe is justified. Additionally, a grievance complaint register (F-005) and a grievance complaint log (F-006) are provided in Section 6.5.**

## 4.8 COVID-19 Response and Prevention Procedures

Covid-19 outbreak has been declared by WHO as a pandemic since March 2020. When someone who has Covid-19 coughs or exhales they release droplets of infected fluid. If people are standing within one meter of a person with Covid-19 they can catch it by breathing in droplets coughed out or exhaled by them. In addition, most of these droplets fall on nearby surfaces and objects - such as desks, tables or telephones. People could catch Covid-19 by touching contaminated surfaces or objects – and then touching their eyes, nose or mouth. (WHO, 2020).

The most common symptoms of Covid-19 are fever, tiredness, and dry cough. Some patients may have aches and pains, nasal congestion, runny nose, sore throat or diarrhea. These symptoms are

usually mild and begin gradually. Some people become infected but do not develop any symptoms and do not feel unwell. However, according to current knowledge, around 1 in 6 cases of Covid-19 results in serious illness and the development of breathing difficulties (WHO, 2020). Those who are more likely to develop a serious illness include older people and people with underlying medical problems.

At the project sites, the following procedures will be implemented, as adapted from the “ESF/ Safeguards interim note: COVID-19 Considerations in Construction/ Civil Works Projects” and the “Covid 19 Guidance Employment-Intensive Projects in Lebanon. EIIP Lebanon/ ILO Regional Office for Arab states. May 2020.”

#### 4.8.1 Procedure to follow in a suspected case

- If a worker develops a **mild symptom** similar to that of COVID-19, the worker will immediately be requested to self-quarantine, reported to health authorities and tested. If tested positive, stay at home for at least 10 days, and according to the MOPH memo dated 12/01/2022, return normally to work after the 10th day provided there are no more symptoms.
- If a worker develops a **serious symptom** such as difficulties in breathing or high fever, the HSE Officer will immediately contact the nearest hospital for testing and arranging logistics (Chtaura, Bekaa, and Taanayel hospitals). Care will be taken to ensure that risk of contact with other people is minimized as the project managers and contractors will create an environment in which all workers feel safe to report a symptom if they were exposed to a risk and that confidentiality is maintained
- Extensive cleaning procedures with high-alcohol content disinfectant should be undertaken in the area where the worker was present, prior to any further work being undertaken in that area. Tools used by the worker should be cleaned using disinfectant and PPE disposed of.
- Co-workers (i.e. workers with whom the sick worker was in close contact) should be required to stop work, and to quarantine themselves as follows:
  - If they are fully vaccinated (2 doses or more), quarantine for 7 days, and return to work without a PCR, provided there are no symptoms.
  - If they are fully vaccinated (2 doses or more), quarantine for 5 days, and return to work with a negative PCR.
  - Quarantine for 10 days for those vaccinated with single dose or non-vaccinated, and return to work without a PCR, provided there are no symptoms.
  - Quarantine for 7 days for those vaccinated with single dose or non-vaccinated and return to work with a negative PCR.
- Family and other close contacts of the worker should be required to quarantine themselves as listed above, even if they have no symptoms.
- If a case of COVID-19 is confirmed in a worker on the site, visitors should be restricted from entering the site and worker groups should be isolated from each other as much as possible.

- If workers live at home and has a family member who has a confirmed or suspected case of COVID-19, the workers should inform their superior quarantine themselves and not be allowed on the project site as per the requirements of the MOPH Memo listed above, even if they have no symptoms
- Workers should continue to be paid throughout periods of illness, isolation or quarantine, or if they are required to stop work, in accordance with national law
- Medical care (whether on site or in a local hospital or clinic) required by a worker should be paid for by the employer
- If a worker tests negative he or she will be allowed back to site to recuperate the days missed due to self-quarantine. If a worker tests positive he or she will be entitled to a maximum of 10 days paid sick days at minimum wage

#### 4.8.2 Good practices and Preventive Measures

- Establishment of a project reception area, including sanitization stations and protective gear, to monitor and register the entrance of everyone entering the project site including any outside visitors.
- Placing posters and signs at the office entrance and around the site, with images and text in Arabic.
- Ensuring the availability of soap and water and/ or hand sanitizer that contains at least 60% alcohol on site and at offices.
- Provision of face masks on site and in offices and ensuring that workers are wearing face masks all the time.
- Provision of sufficient safety gears to prevent sharing. Each worker should mark their safety gears (gloves, helmets, vests, etc.) and they are to be washed and disinfected daily.
- Use of infrared non-contact forehead thermometer to monitor the temperatures of everyone entering the site and monitor other symptoms such as respiratory symptoms or difficulties in breathing. Those who have a fever (i.e. a temperature of 37.3 degrees Celsius or higher) should be requested to stay at home.
- Maintain a Health Register - since many cases are asymptomatic – the daily use of control checklists, to register appearance and monitor exposure factors, is required (recent travels, exposure to people with recent travel, close contact to sick people, or participation in large gatherings etc.).
- Oblige everyone to sanitize their hands or wash them with soap and water upon their arrival at site and remind contractors, site supervisors, and workers of the importance of regularly sanitizing/ washing their hands with water and soap, and to avoid touching eyes, nose, and mouth with unwashed/ unsensitised hands.
- At the start of each work shift remind contractors, site supervisors, and workers of the best practices and preventive measures on-site, in household and at community level, including safe procedures for disposal of solid wastes (e.g. tissues, and other used cleaning consumables and materials).

- Daily disinfections of the work-site common surfaces and of the hand tools before and after usage.
  - Providing cleaning staff with adequate cleaning equipment, materials and disinfectant.
  - Review general cleaning systems, training cleaning staff on appropriate cleaning procedures and appropriate frequency in high use or high-risk areas.
  - Where it is anticipated that cleaners will be required to clean areas that have been or are suspected to have been contaminated with COVID-19, providing them with appropriate PPE: face masks, gowns or aprons, gloves, eye protection (goggles or face screens) and boots or closed work shoes. If appropriate PPE is not available, cleaners should be provided with best available alternatives.
  - Training cleaners in proper hygiene (including handwashing) prior to, during and after conducting cleaning activities; how to safely use PPE (where required); in waste control (including for used PPE and cleaning materials).
- Social distancing
  - Site Supervisors will ensure that **workers maintain safe working space of at least 2m** distance between each other. If this is unavoidable, explore the option of having work done in shifts of smaller groups.
  - The requirement **for social distancing must also be applied when transportation of workers is included** as part of the project, taking into consideration special needs for women and disabled workers.
  - Remind contractors, site supervisors, and workers of the **importance of social distancing outside of work**, during lunch break, at home etc. and emphasize that hand shaking and other ways of physical greetings should also be avoided at all time during the crisis and after the crisis as long as the virus still remains a threat.

In terms of communication and contact with community:

- Eng. Karim Shamseddine is appointed as the focal point to deal with COVID19 issues on-site. He is responsible for coordinating preparation of the site and making sure that the measures taken are communicated to the workers, those entering the site and the local community.
- During the community briefing at the onset of the rehabilitation activities, the community will be made aware of procedures put in place at site to address issues related to COVID-19. This will include all measures being implemented to limit or prohibit contact between workers and the community. The community will be made aware of the procedure for entry/exit to the site, the training being given to workers and the procedure that will be followed by the project if a worker becomes sick.
- If project representatives, contractors or workers are interacting with the community, they will practice social distancing and follow other COVID-19 guidance issued by relevant authorities, both national and international (e.g. WHO), including wearing of face masks.

#### 4.8.3 Protective Measures and Personal Hygiene Habits

- No Handshake Policy: (Limit all physical contact and promote this culture to be adopted in the community)
- Maintain safe distance between workers at all times: (At least 2 meters)
- Refrain from Smoking and other activities that weaken the lungs
- Frequent washing of hands with soap and water for over 30 seconds
- Do not touch face before washing hands;
- Keep hydrated at all times – eat and rest well to boost your immunity.
- Constantly disinfect high touch surfaces (i.e. door knobs, hand tools) with soap and water or bleach and try to avoid touching them with hands (open with elbows);
- Adopt proper coughing and sneezing etiquette (cover mouth with tissue or sleeve – Do Not Cough/ Sneeze in hands)
- Make sure that enough space for maintaining safe distance is ensured as well during break times
  - if space is confined, advise workers to take breaks in shifts

#### 4.8.4 Procedural Checklist & Health Register for on-site use

All personnel should be trained and aware of:

- What is COVID-19
- Modes of Transmission
- Prevention
- Symptoms

A weekly procedural checklist will be completed by the HSE officer. Refer to forms in Section 6.16.

### 4.9 ESHS Auditing and Site Monitoring

Continuous monitoring during construction and rehabilitation will be performed to ensure the effectiveness of the proposed mitigation measures. Through sound environmental management and implementation of a monitoring plan, the construction and rehabilitation of the sewage networks in the project area will avoid incurring the major adverse impacts. The aims of the monitoring plan are:

- Verify the environmental, social, and health and safety impacts predicted in the ESMP study
- Determine project compliance with national and international requirements and standards
- Monitor the performance of the project and the effectiveness of mitigation measures
- Take remedial action if unexpected problems and unanticipated impacts arise.

#### 4.9.1 Site Inspections and Monitoring

Visual observation and photographic documentation of the conducted works, impacts and mitigation measures will be conducted on a daily basis by the HSE officer, focusing on good housekeeping at the work areas, traffic congestion, accidents and injuries to workers, accidents and injuries to the public,

activities generating air and noise pollution. Monitoring measures are detailed in Section 5. A non-compliance register will be filled (Form -009 in Section 6.7) upon the identification of non-compliances and immediate corrective action will be ensured.

A comprehensive database will be established for all monitoring activities (including type of activity monitored, date, number of samples, results, etc.). OH&S and E&S training sessions will also be monitored and tracked (dates, topics, attendees, etc.). All monitoring data will be submitted to the supervising consultant as part of monthly progress report as detailed in Section 4.4.

#### **4.9.2 Weekly Audits**

Weekly audits will be conducted by the HSE Officer/environmental and social and OHS experts. These include visual observations and photographic documentation of the conducted works, impacts and mitigation measures. Weekly checklists (Form F-010 in Section 6.8) will be completed, and incidence and grievance registers and environmental measurements will be reviewed. Weekly audits will focus on good housekeeping, availability of MSDS's, spills, pipe connections, wastewater discharges, ecological disturbances in surrounding areas, safety measures for all the hazards present at work sites, documentation completion, etc.

#### **4.9.3 Ad Hoc Audits and Inspections**

Ad Hoc audits and inspections will be conducted by the environmental and social and OHS experts on a monthly basis (Forms F-011 and F-012 in Section 6.8) and in the case of incidences and lack of commitments. These audits will include a general visual observation of the site and will inspect the implementation of ESHS management system, the effectiveness of the workers' training, and will review all registers.

### **4.10 Steps to Address Non-Compliance**

The below steps ensure that all non-compliances are identified and recorded, and that the appropriate corrective action is immediately taken to rectify all identified non-compliances, preventing their reoccurrence in the future.

#### **4.10.1 Responsibility**

All members of staff are responsible for notifying the HSE officer on site and / or the Environmental Consultant of any identified non-conformances.

The HSE officer on site is responsible for the completion of Non-compliance log form F-009 (Section 6.7) and for determining and implementing corrective action.

Once the corrective action has been completed the Environmental Consultant is to undertake a verification check to ensure that corrective action has been effective.

#### **4.10.2 Procedure**

1. All identified non-compliances are to be reported by the HSE officer on site. to the E&S and OHS Experts/ Consultant.
2. HSE officer is to record all identified non-compliances on a Non-compliance Register (Section 6.11).

3. The source or cause of the non-compliance is to be identified, allowing for the development of appropriate and effective corrective action.
4. Corrective action is to be documented, together with an agreed timeframe for implementation.
5. A review of the effectiveness of the corrective action will be undertaken by the E&S and OHS Experts/ Consultant.
6. If the non-compliance persists after the implementation of corrective action alternative solutions are to be examined until the closure of the non-compliance can be successfully achieved.
7. On the successful closure of the non-conformance, the Non-compliance Report will be signed off by the E&S and OHS Experts.
8. Reoccurring non-compliances, significant deviations from legislation, procedures or environmental policy or non-compliances that pose an environmental, social or OHS risk will be reported to senior management for further investigation and action, including warnings, probation, penalties, and potential termination as a final resort.

#### 4.11 Risk Assessment

A hazard assessment register was prepared by the OHS expert (Annex E). It identified and assessed physical, chemical and ergonomic hazards associated with the following activities:

- Site preparation
- Use of heavy mobile equipment
- Excavation works
- Concrete/ incidental works
- Installation of pipes
- Subbase and subgrade preparation
- Asphalt paving

The assessment was conducted using the following methodology:

1. Identification of all foreseeable hazards within the assessed activity
2. Rating of hazards (high/ medium/ low) depending upon the likelihood of an event occurring and the severity of the injuries that might arise if the event does occur. To calculate the rate, a number was allocated to the **Likelihood** (Table 4-1) of the risk arising and to the **Severity of Injury** (Table 4-2). The **Likelihood** was then multiplied by the **Severity** to calculate the **Rating** (Table 4-4).

**Table 4-1: Description of Likelihood (L) Rating**

Level	Likelihood	Description
1	Rare	Not expected to occur but still possible.
2	Remote	Not likely to occur under normal circumstances.
3	Occasional	Possible or known to occur.
4	Frequent	Common occurrence.
5	Almost Certain	Continual or repeating experience.

**Table 4-2: Description of Severity(S) Rating**

Level	Severity	Description
5	Catastrophic	Death, fatal diseases or multiple major injuries.
4	Major	Serious injuries or life-threatening occupational diseases (includes amputations, major fractures, multiple injuries, occupational cancers, acute poisoning, disabilities and deafness).
3	Moderate	Injury or ill-health requiring medical treatment (includes lacerations, burns, sprains, minor fractures, dermatitis and work-related upper limb disorders).
2	Minor	Injury or ill-health requiring first-aid only (includes minor cuts and bruises, irritation, ill-health with temporary discomfort).
1	Negligible	Negligible injury

**Table 4-3: Resultant Risk Matrix with Ratings**

Likelihood Severity	Rare (1)	Remote (2)	Occasional (3)	Frequent (4)	Almost Certain (5)
<b>Catastrophic (5)</b>	5 (MED)	10 (MED)	15 (HIGH)	20 (HIGH)	25 (HIGH)
<b>Major (4)</b>	4 (MED)	8 (MED)	12 (MED)	16 (HIGH)	20 (HIGH)
<b>Moderate (3)</b>	3 (LOW)	6 (MED)	9 (MED)	12 (MED)	15 (HIGH)
<b>Minor (2)</b>	2 (LOW)	4 (MED)	6 (MED)	8 (MED)	10 (MED)
<b>Negligible (1)</b>	1 (LOW)	2 (LOW)	3 (LOW)	4 (MED)	6 (MED)

Based on the results of the conducted risk assessment, adequate control/mitigation measures were documented for each hazard.

The workforce shall be briefed on the contents of appropriate Risk Assessment(s) prior to works commencing.

The Risk Assessment(s) will be amended as necessary to ensure that the works progress in a safe manner.

All personnel have the authority to stop any activity that has the potential to cause injury or damage property until such times as the works are managed in a safe manner.

A Job Hazard Analysis (JHA) Form F-013 (Section 6.9) will be used for analyzing the critical work activities. It will identify the tools, materials and equipment needed to develop work methods and procedures for accomplishing the tasks, as well as the existing and potential hazards as per the Risk Assessment Register (Annex E), including methods to eliminate these hazards or protect against them.

## 5 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLANS DURING CONSTRUCTION PHASE

The ESMP concluded that most of the negative impacts will occur during the construction phase. These impacts are mainly related to the disturbance of nearby residents by the construction activities along with some impacts on the surrounding environment such as deterioration of soil and water quality if the generated wastewater and solid waste were not managed properly. In addition to the negative impact on air quality that might arise as a result of construction activities. Most impacts were assessed to be of moderate significance (Score range between 5 and 9). The impact of soil clearance, excavation, backfilling, and construction activities on archaeology and soil and groundwater resources was assessed to be of high significance. On the other hand, job opportunities will be created for the local community during the construction phase. It is worth mentioning that these impacts are short term in nature, may be adequately mitigated, and will diminish as soon as the project is completed. Table 4-1 summarize the impacts during the construction phase.

**Table 5-1: Summary of Impacts during Construction Phase**

Activity / Source of the impact	Receptors									
	Ambient Air Quality	Noise	Soil and Ground Water Resources Quality	Biological	Traffic	Water Resources Consumption	Energy Resources	Archaeology	Socio-economy	Occupational and Public Health and Safety
<b>Construction Phase</b>										
Site clearance, excavation, backfilling, and construction activities	9	9	12	9	9	3	9	12	9	6
Operation of equipment and generators	9	9					9		9	6
Accidental spills (fuels/chemicals) and material wash-off			5							
Waste Generation									9	
Inadequate Solid Waste Management			8						9	
Inadequate Wastewater Management			9						9	
Job creation									+++	
Child Labor									6	
Social tension between foreign and local workers									6	
Labor-induced sexual abuse and exploitation/ harassment									8	
Property loss									9	

The following sections elaborate on the Environmental Mitigation and Monitoring Plans as approved in the ESMP. All requirements will be implemented by HKBros under direct guidance from the Environmental, Social, and OHS experts and under the direct supervision of the Supervision Engineer. To ensure implementation of the plan during rehabilitation an HSE officer is appointed on site by HKBros at all times. The monitoring plan will be implemented in collaboration with the supervising consultant, CDR and local authorities.

## 5.1 Air Quality Management Plan

### 5.1.1 Mitigation Measures

Air emissions such as gaseous pollutants, dust or Particulate Matter (PM) and Odor are commonly encountered during construction works and can be emitted to the environment as follows:

- Dust generated during construction activities, vehicle movement and machinery.
- Combustion emissions from vehicles and machinery used during construction activities.

The most effective means of reducing dust emissions from vehicles is by regular watering. Moreover, the speed limit for project vehicles and machinery within working areas shall not exceed 20 Km/h. when practical Vehicles will be wheel-washed before departure from construction site.

All trucks transporting construction material to and from the site will be covered with canopies. Material from trucks will be unloaded at low heights.

Raw material stockpiles will be maintained at minimum heights and adequate slopes and shall be covered or sprayed with water on a regular basis if covering is not feasible.

Mixing of construction material will be done during low to no wind conditions and in enclosed or semi-enclosed areas where possible.

The exhaust emissions from heavy equipment's, vehicles and diesel generators will be minimized throughout reducing intensive operation of construction machineries and equipment and carrying out weekly inspection and maintenance. A Maintenance Plan and Schedule will be put in place for employed site machinery, vehicles, and power generators, along with maintenance records. Unnecessary idling of vehicles and equipment engines will be avoided. Monthly fuel consumption records will be maintained to keep track of consumption levels and identify overuse.

Finally, sensitive receptors will be informed of the scheduled construction works, ahead of time in conjunction with the concerned municipalities, especially for dust-generating activities.

### 5.1.2 Monitoring Measures

Dust and exhaust emissions from project site will be monitored by the HSE Officer on a daily basis and during activities that generate significant amounts of air emissions.

Monitoring will be conducted via visual observation and photographic documentation of the colour of fumes from equipment and generators at the stack level before they are put into operation, and on a daily basis at the stack level and at nearby sensitive receptors.

Records that will be monitored on a monthly basis include:

- Maintenance record of all machinery, vehicles, and generators on site
- Monthly fuel consumption records
- Reported workers' respiratory problems

## 5.2 Noise Management Plan

### 5.2.1 Mitigation Measures

Almost all of the activities during the construction phase will increase noise levels. These include equipment operation activities, vehicle engines, emission of exhaust, aerodynamic sources.

HKBros will ensure that no workers in the workplace will be exposed to noise levels higher than levels specified in the Table 3-7. Whenever the workers are exposed to more than 85 dB as 8-hour time weighted average (TWA), hearing protectors shall be provided (ear plugs) and their use shall be enforced.

HKBros will also ensure that no noise is emitted outside the normal allowed working hours (7:00 am-6:00 pm) and that all machinery, vehicles and generators will be maintained on a weekly basis and on a per-need basis. In the case where it is absolutely necessary to conduct some activities outside the normal working hours, prior approval of the concerned municipality and CDR will be obtained.

HKBros will also ensure that unnecessary idling of machinery is avoided and that engines are switched off when not in use. Where possible, noisy equipment will be placed away from sensitive receptors, behind stockpiles to provide acoustic barriers. Speed limits of vehicles will be controlled (less than 20 Km/hr) on site and in the surrounding area.

HKBros will notify the residents of the plans and expected duration prior to initiating the works, in conjunction with concerned municipalities; and will remind of the grievance mechanism in place.

At the yard, HKBros will place the generator on the side opposite to the school and will equip the generator with a noise muffler.

### 5.2.2 Monitoring Measures

Noise measurements will be conducted by the HSE Officer throughout the project area near sensitive receptors, three times daily during grading and excavation and once daily during concrete pouring and pipes laying, or upon receiving a complaint. Leq, Lmin and Lmax will be measured per location (average 10 min reading- 30 sec intervals and values will be compared to national and WHO standards (Table 3-6).

Records that will be monitored on a monthly basis include:

- Maintenance record of all machinery, vehicles, and generators on site
- Daily noise levels that are being monitored

## 5.3 Water and Soil Management Plan

Surface, ground water and soil quality may be at risk from several activities during network extension and rehabilitation, namely:

- (1) Site clearance, trenching, excavation, backfilling, grading, and compaction activities
- (2) Accidental spill of oils and chemicals from vehicles, machinery and generators (also addressed under Sections 4.6.1 Emergency Response Procedure and 4.6.2 Contamination and Remediation)
- (3) Improper disposal of solid waste generated from workers and the used materials, construction waste from excavation and drilling activities (Refer to Solid Waste Management Plan in Section 5.4)
- (4) Improper disposal of wastewater from construction activities and from workers (Refer to Wastewater Management Plan in Section 5.5)

### 5.3.1 Mitigation Measures

To minimize the risk associated with surface, ground water, and soil pollution, HKBros shall:

- Ensure international standards (i.e. ASTM Soil Compaction Standards) are met during any excavation works, compaction and grading activities, in order to minimize expected

disturbance

- Manage fixed routes for equipment movement and avoid multiple routes; and
- Re-use excavated/ cut materials as general fill where considered suitable.
- Install temporary structures to prevent runoff from reaching nearby water bodies
- Avoid working in rainy weather
- Prohibit littering
- Prohibit the discharge of wastewater into nearby water bodies under any condition

### Spill Prevention and Control

To minimize the risk associated with leakage and spills of hazardous materials on to the surrounding environment, HKBros will implement the following measures:

- Carry out regular maintenance of vehicles and machinery offsite. Prohibit maintenance of machinery onsite unless absolutely necessary, and under the supervision of the HSE Officer.
- Carry out all re-fuelling in designated areas with impervious surfaces and guarantee no fuel spills.
- Install a spill collection tray under generators and specific equipment requiring refuelling.
- Store all chemicals in dedicated areas on a paved or sealed floor and in tightly closed containers protected from adverse weather conditions
- Store used oil or chemical in an appropriate area until it is collected and disposed in licensed sites (refer to section 5.4.2)
- Minimize the use of chemicals
- Minimize soil exposure time
- Use secondary containment basins for long term storage of lubricants and fuels (refer to section 5.4.1)
- Abide by a Spill Response Plan (Refer to Section 4.6.1.4)
- A fuel/oil spill clean-up kit will be kept at all main fuel storage facilities within the protected area to facilitate any clean up in the event of a spill. This kit must include the following list of fuel/oil spill clean-up equipment:
  - Recovery containers such as empty drums;
  - Long-handled shovels;
  - Low-density rope;
  - Absorbent pads;
- If a fuel spill occurs the flow must be stopped immediately if possible. This may entail repairing a leak, pumping out a tank or shutting off a valve. If necessary, culverts may be blocked off by earth or wooden barriers to contain fuel, provided the threat of flooding is addressed.
- Any fuel spill at any storage site and in excess of 70 litres must be reported immediately to CDR.
- Ensure that the oil spill response plan is present at the construction site and that oil spill response kits are available
- Train all workers to implement this plan in case of accidental spillage

### 5.3.2 Monitoring Measures

HKBros will visually check the following on a weekly basis:

- Effluent from construction activities (Concrete mixing, dust minimizing, washing of equipment...) is not discharged into nearby water bodies or open areas

- Storage conditions of chemicals, oils and fuel
- Preparedness for chemicals, oils and fuel spill incidents
- Chemicals, oils and fuel spill incident logs
- Implementation of spill response plan in the case of an incidence
- Collection and disposal of oil and chemical containers and other related solid wastes

## 5.4 Solid Waste Management Plan

### 5.4.1 Mitigation Measures

#### 5.4.1.1 Waste Definition and Classification

For the purposes of this CESMP, waste is defined as any substance or object that is discarded, intended to be discarded, or required to be discarded and as such is subject to a number of regulatory requirements. Even if material is sent for recycling or undergoes treatment in-house, it can still be waste.

Wastes generated during construction activities are classified into three main categories as follows:

- Inert Waste** – wastes that are not biologically or chemically active in the natural environment, such as glass, concrete, brick materials, broken clay and manufactured rubber products.
- Domestic or Municipal Waste** – refuse, food waste, office waste, waste vegetation and other decomposable material resulting from the labour camp and offices.
- Hazardous Waste** – any solid, semi-solid, liquid, or contained gaseous waste, or combination of such wastes, which may, because of its quantity, concentration, physical or chemical characteristics pose a hazard or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of.

#### 5.4.1.2 Prohibited Waste Disposal Practices

During construction activities, it is prohibited to discharge the following substances to any water body, channel or drain.

- Pesticides and herbicides;
- Oil and / or solvent waste;
- Radioactive waste;
- Any waste material subject to the conditions of the Hazardous Materials Management according to the Lebanese legislations.

It is also prohibited to casually dispose of any solid or liquid waste by burying or dumping on land or into water courses.

#### 5.4.1.3 Safe segregation and storage of waste

- All the waste materials generated at work sites and offices will be segregated into domestic (organic/ paper and cardboard/ metals, glass and plastics) and hazardous waste and disposed into the color-coded containers, provided in dedicated locations.
- Inert waste (construction) will be segregated into bulky aggregates and fine aggregates and stored separately at designated areas.
- HKBroS will provide 2 separate heavy-duty plastic 'Refuse Containers' with tight fitting lids at construction site for disposal of all domestic waste (garbage or trash), one for the disposal of organic waste and one for recyclables (paper, cardboard, aluminium, glass and plastics).

Containers will be color-coded and clearly labelled. Containers shall not have openings that allow access of rodents.

- The domestic waste containers will be kept upright with their lids shut tightly. The organic waste containers will be emptied 2 to 3 times per week by the municipality to maintain construction site sanitation.
- The recyclable waste containers will be emptied by HKBros on a per need basis.
- To keep the area free of litter and garbage and prevent random disposal of waste, specific locations will be designated for consuming food and snacks. Suitable notices will be deployed prominently to be in strict compliance with these requirements.
- Workers will be trained on waste reduction and waste segregation procedures
- Domestic waste containers will be cleaned on a bi-monthly basis.
- Storage areas will be kept clean and materials neatly stacked.
- Waste disposal records and receipts from waste collector (where applicable) shall be collected and maintained for inspection and audit purpose.
- The work zone will be cleaned on a daily basis. Construction leftovers that are external to the working zone will be removed regularly. Site housekeeping will be maintained.
- Construction waste remaining overnight will be stored on site. The waste will be protected in a manner to avoid any spillovers.
- Construction waste will be collected by HKBros from the site to the designated disposal sites approved by the concerned municipalities as detailed below. Construction waste will be collected on a daily basis.
- Part of the excavation waste will be reused in backfilling; and the rest (if any) will be disposed in an adopted/authorized construction and demolition waste dump;
- Material stockpile side slopes will not exceed 2:1 and will be well covered and contained;

#### 5.4.1.4 Waste Disposal

- Domestic / Municipal Waste will be disposed of at the Zahle Solid Waste Facility as indicated by the concerned municipalities of Bouerij, El Mraijet, Qabb Elias, Makse, Jdita.
- Segregated recyclables will be sent separately by HKBros to the Zahleh Solid Waste Facility.
- Similarly, construction waste will be disposed of at the concerned municipalities' construction waste disposal sites, depending on the locations of the works:
  - Bouerij, Zebdol and Mreijet approved disposal site
  - Makse approved disposal site
  - Qabb Elias (disposal site to be determined)
- Locations of the disposal sites identified to date are presented in the figures below. Approval letters obtained to date from the concerned municipalities for domestic and construction waste disposal are presented in Annex F.



Figure 5-1: Location of municipal-approved construction waste disposal sites for Bouerij, Zebdol, Mreijet, and Makse and the Zahle SWM facility

#### 5.4.1.5 Hazardous Materials Management

To ensure the risks associated with the use of hazardous substances are minimized, no hazardous substance will be brought on site without prior approval from the Supervision Engineer, SU YAPI/KREDO. Its subsequent use will be subject to appropriate controls to ensure personnel knowhow to use the substance safely and only use the substance with the correct PPE.

It is mandatory that before any substance likely to affect the health or safety of persons is brought to the site, a Material Safety Data Sheet (MSDS) shall be provided prior to the product arrival and a copy maintained at the following locations:

- HSE department;
- At the place of storage of the hazardous substance

#### 5.4.1.6 List of Chemicals Used

Several types of chemicals will be used for the maintenance of construction vehicles, including antifreeze, batteries, grease, hydraulic oil, other oils, etc. In addition, construction chemicals will be used, including bitumen, bitumen coating, cement, and curing compounds. Annex G presents a list of chemicals used.

#### 5.4.1.7 Control Measures of Using Hazardous Materials

- Maintenance of machinery is prohibited on-site unless necessary.
- Workers dealing with hazardous substances/chemicals will be instructed on the risks associated with their use and the importance of suitable personal protective equipment.
- MSDS will be kept on site for each hazardous substance. MSDS will be easily accessible to all workers at construction site. Directions for use of hazardous substances/chemicals will be available from the manufacturer (MSDS) in the local language.
- If a chemical/hazardous substance is poured from the original container into a new one, the new container will be labelled properly.
- Smoking, drinking or eating is not allowed in the area where work with hazardous materials is carried out.
- Any waste oil and/or hazardous substances must be collected and contained in a secured area prior to offsite disposal or recycling. The collection area will be sized to store sufficient containers such that off-site transport and disposal is efficient.
- Any hazardous substances will be stored and handled in accordance with the manufacturer's instructions (MSDS) and local legislation.
- Any spill of hazardous substances will be contained and removed immediately.
- If a significant spill occurs, the authorities will be notified. Any required clean-up will be started promptly as required by the relevant manufacturer instructions (MSDS) and the emergency response plan.
- Personnel working with hazardous substances will always use suitable protective equipment.
- All spent chemical and oil containers shall be returned to the supplier when possible.
- Spill kits will be available in all areas that chemicals will be stored. Suitable spill absorbing materials will be readily available on the project site

#### 5.4.2 Monitoring Measures

- Daily visual inspection of good housekeeping practices will be conducted by the EHS Officer.

- Weekly visual inspection of the frequency of removal of all types of waste including recyclables
- Weekly visual inspection by the Environmental expert will ensure that good housekeeping practice is established and maintained at the construction sites.
- Weekly inspection of waste management log form which includes all types of waste: generation rates, disposal sites, waste reused (Refer to SWM log form F-014 in Section 6.10)

## 5.5 Wastewater Management Plan

### 5.5.1 Mitigation Measures

To minimize the risk associated with domestic wastewater generation by workers on site HKBros shall:

- If no nearby rest area with toilet is available, install mobile porta-cabins and connect the generated wastewater from workers to a storage 1000 L polyethylene tank. The tank will be emptied in a nearby operating WWTP by municipality-owned or contracted wastewater tankers, as per approval letters to be obtained from the concerned municipalities or the Bekaa Water Establishment in due course.
- Prohibit the discharge of wastewater into nearby water bodies under any condition
- Restrict vehicle washing to contained maintenance areas offsite, with impermeable concrete pavement and proper drainage.
- Ensure that the quality of the hydro-test water is compliant with decision 8/1 for the discharge of wastewater into sewage network or surface water bodies
- Wash tail pipe of concrete mixer on-site on impervious surface before leaving
- Wash the concrete mixer off-site at the concrete batching plant.

### 5.5.2 Monitoring Measures

HKBros will visually check the following on a weekly basis:

- Check for leakages in the connections between the porta cabin toilets and the polyethylene tank.
- Check the discharge endpoint of the pumped wastewater from the polyethylene tank.
- Weekly inspection of wastewater management log form which includes wastewater generation rates and disposal sites (Refer to WWM log form F-015 in Section 6.11)

## 5.6 Biodiversity Management Plan

### 5.6.1 Mitigation Measures

Given that Lot 1 activities will be implemented in their entirety within the existing roads right of way in residential areas, with no site clearance required, the main construction activities having negative results on biodiversity are generation and inadequate disposal of domestic and construction waste material and wastewater effluent discharges. In addition, the transportation of equipment and materials to and from the project's sites might negatively affect biodiversity within the Key Biodiversity Areas (KBAs) if the roads used are within or in close proximity to the KBAs borders that coincide with the core zone of the Shouf Biosphere Reserve (SBR).

HKBros will implement the following measures to protect the ecology and wildlife in the construction work areas:

- Stay away as much as practically feasible, from the KBA of the SBR while transporting materials and equipment to and from the project's sites in Qabb Elias, Mraijet and Bouerij, i.e., use roads that are far away from its boundaries to minimize negative impacts on these areas. Figure 5-2 shows the villages where the network will pass and the KBA surrounding it.
- Avoid construction works during the peak Spring bird migration season (March to mid-May) and the Fall bird migration one (September and October) in the sections that falls within the buffer and transition zones of the SBR (Figure 5-3), namely the upper parts of Qabb Elias and Bouerij, because these areas fall on the migratory route of birds for both seasons.
- Waste will be stored within appropriate containers, lidded where necessary, to prevent attracting vermin and dangerous wildlife which may pose a threat to the workforce and local communities. Waste disposal into nearby areas will be prohibited.
- Proper disposal of domestic and construction waste at designated sites
- Suppress dust by sprinkling water during construction
- Enclose all fine earth materials during transportation to and from the site to prevent spillage and dust emissions
- Prompt transportation of construction material to prevent them from being washed away during rainfall or carried by wind; and
- If no nearby rest area with toilet is available, install mobile porta-cabins and connect the generated wastewater from workers to a storage 1000 L polyethylene tank. The tank will be emptied in a nearby operating WWTP by municipality-owned or contracted wastewater tankers, as per the approval letters obtained from the concerned municipalities or the Bekaa Water Establishment.
- Provide signage to indicate prohibited activities (i.e., hunting, collecting, and trapping of animals and bird).
- As part of their staff induction and environmental awareness programme, HKBros will highlight to workers the requirement to protect wildlife and habitats from unnecessary construction damage, hunting and general disturbance.

### 5.6.2 Monitoring Measures

The E&S Expert will check activity scheduling against restricted bird migration season and will conduct weekly visual site inspections to monitor construction activities and ensure that the protection measures are implemented.

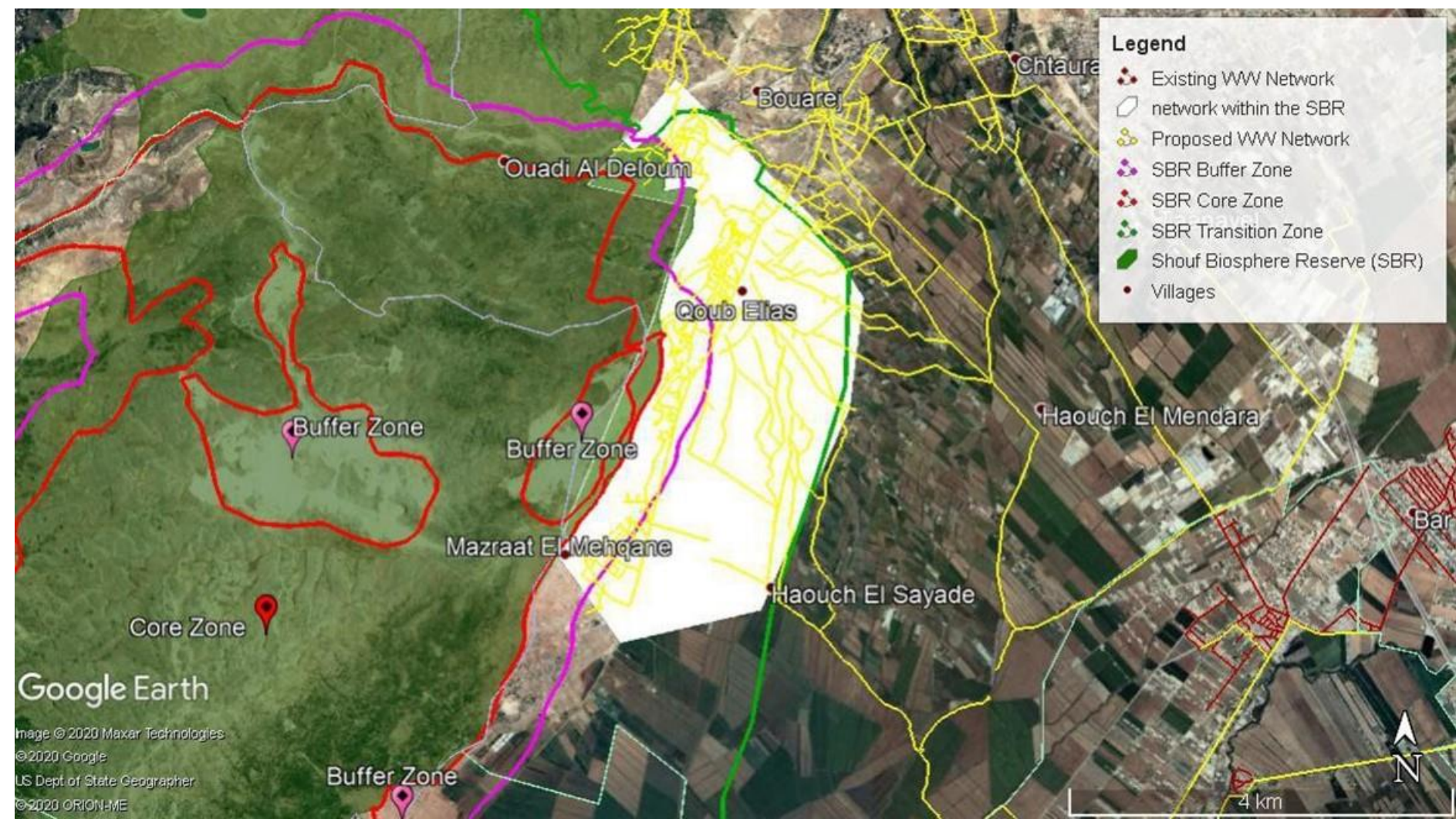


Figure 5-2: Map zooming in on the villages where Lot 1 network will pass and the SBR

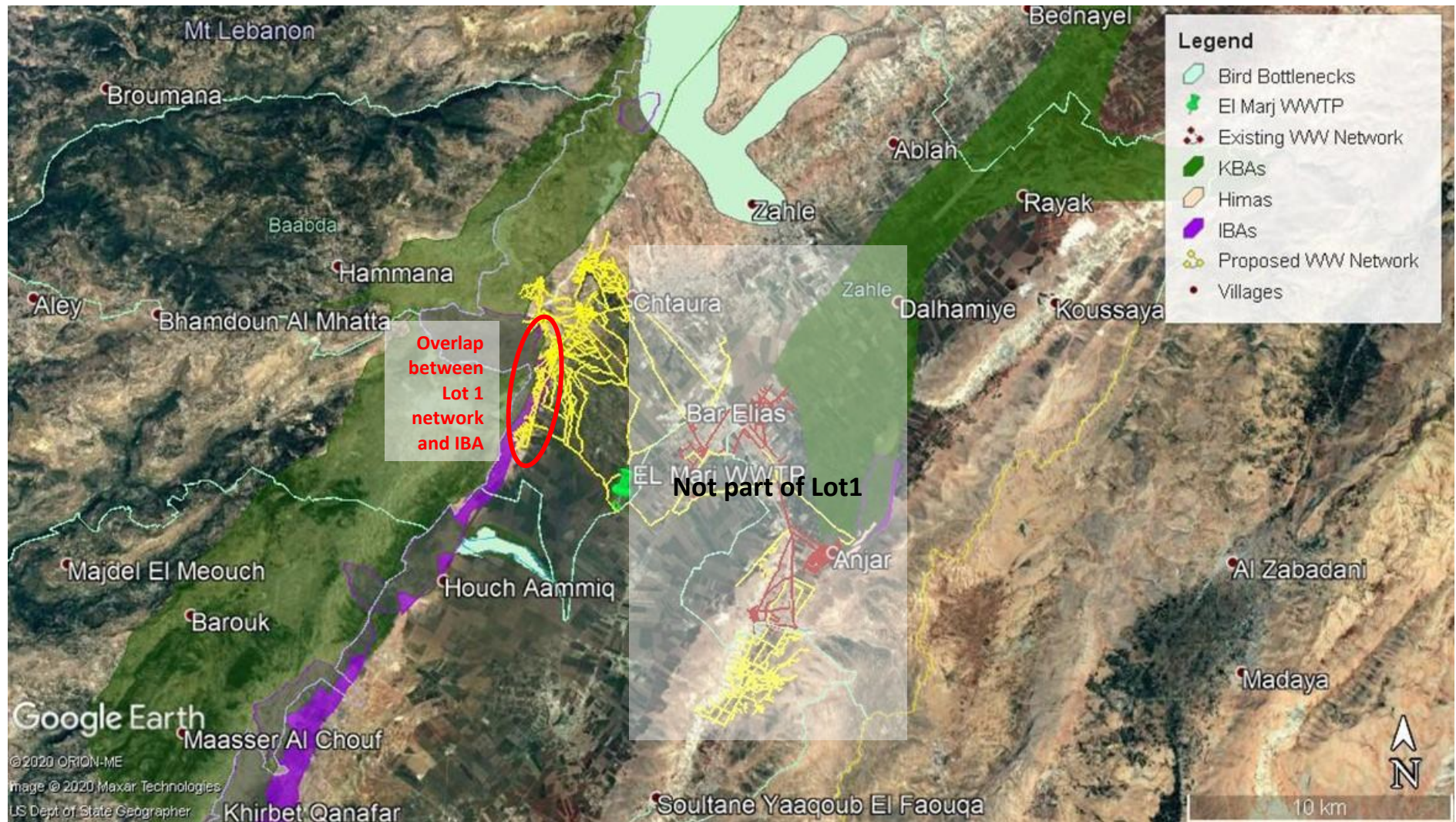


Figure 5-3: Map showing overlap between Lot 1 networks and IBA as surrounding KBAs, IBAs, and Bird Bottlenecks

## 5.7 Water and Energy Consumption Management Plan

### 5.7.1 Mitigation Measures

The following measures will be implemented to ensure efficient use of water and energy:

- Regular site inspection to detect water leakages
- Whenever possible, use dry-cleaning instead of wet cleaning
- Use equipment with higher fuel efficiency when possible
- Adopt a periodic inspection and maintenance schedule for power generators and equipment engines, as per manufacturer specifications, and maintain maintenance logs
- Light in the site offices turned off during the night
- Machinery and equipment must be turned off when not in use or kept on idle mode when necessary.
- Maintain a log of fuel and energy consumption records to keep track of consumption levels and identify overuse

### 5.7.2 Monitoring Measures

Monthly inspection of:

- Log of the quantities and types of the used fuel and oils (fuel and oils purchase bills)
- Electricity bills
- Water purchase bills

## 5.8 Archaeology and Cultural Resources Management Plan

### 5.8.1 Mitigation Measures

According to the ESMP, archaeological remains are identified in some of the villages where the extension of wastewater networks is planned, including Qabb Elias and Jdita as part of Lot 1. Hence, where historical remains, antiquity or any other object of cultural or archaeological importance are unexpectedly discovered during construction in an area not previously known for its archaeological interest, a “Chance-Find Procedure” will be applied in accordance with the Lebanese regulations (Decree 3057/ 2016) and the World Bank Guidance – OP 4.11. HKBros will take the following actions:

- Stop construction activities.
- Delineate the discovered site area.
- Notify the responsible foreman/archaeologist who in turn should notify the Directorate General of Antiquities (DGA) (within less than 24 hours).
- Secure the site to prevent any damage or loss of removable objects.
- In case of removable antiquities or sensitive remains, a night guard should be present until the responsible authority takes over
- Responsible authorities would be in charge of protecting and preserving the site before deciding on the proper procedures to be carried out.
- An evaluation of the finding will be performed by the DGA.
- Decision on how to handle the finding will be reached based on the above assessment and could include changes in the project layout (in case of finding an irrevocable remain of cultural or archaeological importance), salvage excavations, in situ conservation, preservation or restoration.
- Implementation of the authority’s decision concerning the management of the finding.

- Construction works can resume only when permission is given from the DGA after the decision concerning the safeguard of the heritage is fully executed

In case of archaeological finds, HKBros will refer to the Conditions of Contract (General Conditions of Contract (FIDIC); and CDR Safety, Health, and Environmental Regulations). These include the following:

- In case of delay incurred in direct relation to archaeological findings not stipulated in the contract (and affecting the overall schedule of works), the contractor may apply for an extension of time. However, the contractor will not be entitled for any kind of compensation or claim other than what is directly related to the execution of the archaeological findings works and protections.
- The duration of any actions needed in case of Chance Finding cannot be determined ahead of time. As for the estimated price, it varies according to the needed manpower / time frame for the needed procedures, and can only be determined in accordance with the needed works.

### 5.8.2 Monitoring Measures

Continuous supervision during excavation drilling with photographic documentation of the presence of any artefacts of archaeological significance.

Supervision of the implementation of chance find procedures.

## 5.9 Social Management Plan

### 5.9.1 Mitigation Measures

#### 5.9.1.1 Job creation, social tensions and discrimination against foreign (non-Lebanese) workers

During the construction phase, no labour influx into the area is expected. However, social tensions may arise toward the project contractors, and discrimination and maltreatment from the local community and local workers against foreign workers are possible as a result of perception that foreign workers being offered a major proportion of the jobs created by the project. To mitigate such nuisance, HKBros and sub-contractors will: -

- a. Provide equal employment opportunities to all qualified candidates regardless of color, citizenship status (when applicable), race, religion, gender, and marital status through clear selection criteria
- b. Communicate clearly related commitments and the code of conduct to the local community
- c. Raise awareness of workers about the internal GRM for reporting problems and complaints
- d. Raise awareness of Lebanese citizens about the external GRM in case they face problems with workers, or if they have any complaints

#### 5.9.1.2 Child labor

HKBros prohibits any engagement of children who are under the legal age as workers on the site in construction works and recognizes the site as a hazardous environment to children. To safeguard against the hiring of children, HKBros and all sub-contractors shall commit to: -

- a. Ensure daily registrations of workers and verification of their age to prevent child labour, and
- b. Strictly abide by the National Labour Law through the CDR tender documents which explicitly prohibit child labour

#### 5.9.1.3 Gender-based violence (GBV), child abuse, sexual abuse, harassment and exploitation

- a. Ensure that all workers understand, and sign the code of conduct written in their native language
- b. Mandatory training on sexual abuse and exploitation/harassment, and Gender-Based Violence, and internal and external GRM that includes an anonymous channel for protection of complainants' identity and confidentiality
- c. Availability of a GRM with multiple channels to initiate a GBV complaint, which ensures confidential reporting with safe and ethical documenting of GBV cases, including Sexual Violence Against Children (VAC), Exploitation and Abuse (SEA), and Sexual Harassment (SH)
- d. Respond to the reported incidents of sexual exploitation and abuse as a matter of priority
- e. Ensure that all allegations are investigated, and if these allegations are proven, strict disciplinary measures are promptly taken

#### 5.9.1.4 Traffic disruptions

Works are likely to cause a temporary disruption to the local community's access to services as a result of temporary road closures or diversions. To mitigate this, HKBros will:

- a. Secure alternative routes to relevant destinations for all temporary road closures
- b. Inform the local community about the location of detours, road blockages or diversions through public announcements and proper diversion signage
- c. Coordinate with the municipal and local police, and
- d. Ensure access to external GRM through clear signage around the sites.

HKBros will make all efforts to minimize potential for road congestions and increased traffic accidents due to the transportation of construction materials or materials falling on the road, by committing to:

- a. Inform residents and place signs near the working areas.
- b. Place a flagman near the working area to warn the passing cars and ensure the traffic is not blocked;
- c. Ensure traffic is not blocked during transportation of materials.
- d. Operate well maintained vehicles.
- e. Label construction vehicles so the community knows the contractor in case they have any complaint.
- f. Cover transported material.
- g. Abide by traffic regulations.
- h. Ensure communities have access to external GRM on sign boards and at municipalities

#### 5.9.1.5 Impact on existing infrastructure

The network pipelines will be installed along the roads and connected to existing wastewater networks. Potential damage might take place to underlying water supply pipelines, electricity power cables, and telecommunication lines during excavation and trenching works. HKBros will mitigate such impacts by:

- a. Regular coordination with relevant municipalities by the E&S expert, Site Engineer, and the project management
- b. Checking the infrastructure locations and that excavation works do not interfere with

infrastructure (Refer to letter send to Ogero and BWE in this respect in

- c. Executing trial pits along the network route to locate the existing infrastructure components
- d. Installing sewer lines 3 meters horizontally from and 0.3 meters lower than existing water main lines. Where the separation requirements cannot be met due to topography, inadequate right-of-way easements, or conflicts with other provisions of these regulations, lesser separation is permissible if:
  - The water main and the sewer are located as far apart as feasible within the conditions listed above;
  - The water main and the sewer are not installed within the same trench; and
  - The sewer line is appropriately constructed to prevent contamination of the water in the main by sewer leakage.
  - No water main lines should pass through or come into contact with a sewer manhole
- e. Ensure the community GRM is properly disseminated and implemented.

#### 5.9.1.6 Impact on livelihoods

Works may temporarily disrupt access to economic activities, impacting the livelihoods of local business owners. HKBroS will mitigate such impacts by:

- a. Timely completion of the rehabilitation phase,
- b. Maintaining a passing corridor within the alignment to grant access to nearby properties,
- a. Informing the shops' owners ahead of time about rehabilitation dates,
- b. Ensuring access is not blocked by installing overpass structures from the road to the shops, small snack and coffee stations impacted by the road works, where necessary
- c. Ensuring business owners are aware of and have access to the external GRM
- d. Encouraging contractors to purchase goods and services from the local communities when possible,
- e. Proper installation of safety sign boards in Arabic and English.

#### 5.9.1.7 Public health and safety

Accident and injuries to the public because of rehabilitation activities are always possible in projects of this nature. HKBroS will minimize those risks by committing to: -

- a. Develop a site-specific Traffic Safety Plan, Public Health and Safety Plan, and Occupational Health and Safety Plan
- b. Apply best applicable practices on road safety
- c. No children are allowed to be present on the work site, reminding workers and community members of this in all related communications
- d. Secure the site and restrict access to it
- e. Provide site boundaries by installing suitable physical barriers (roadblocks, tape, fence, etc.);
- f. Provide sufficient lighting;
- g. Prohibit keeping trenches unnecessarily open and install barriers to avoid falling and tripping;
- h. Mark excavation holes and openings with physical boundaries (barriers, tape or fence), or cover them;

- i. Store and stack work materials (such as pipes, manhole rings, and cement bags) in a safe manner so that they cannot topple or roll over;
- j. Tidily stack, protect and cover materials and equipment where necessary. Additionally, ensure an adequate space for new materials to be stored in secured covered areas to avoid damage, theft, and to protect these items from weather conditions.
- k. Keep machinery and vehicles passages clear;
- l. Properly manage trucks and heavy machinery entering and exiting the construction site.
- m. Train heavy machinery drivers about road safety;
- n. Implement a speed limit of 20 km/h for vehicles arriving to and leaving the construction sites;
- o. Inform the local community about the rehabilitation schedule and abide by assigned timing.
- p. Inform residents and place proper safety and diversion signs at sensitive areas within the project area (i.e. near schools, shops hospitals and agriculture areas) as well as physical obstacles such as bumps and rumble strips
- q. Install pedestrian and vehicular passages near residential areas
- r. Control accidental oil spillage
- s. Ensure a first aid kit is present on the construction site
- t. Ensure access to hospitals is not impeded at any time
- u. Post an Emergency Contact List indicating the nearest police station and hospital with accident and emergency facilities;
- v. Encourage workers and communities to use the project GRM to report any health and safety issues.

### 5.9.2 Monitoring Measures

Monitoring of local workers employment from the same surrounding area within the limitation of the contractor capabilities.

Monitoring of daily registrations of the labour force:

- Proportion of Lebanese vs Syrian workers
- Worker's age

Weekly review of records including:

- Internal and External GRM log
- Attendance sheets to Social Induction Trainings (GBV, SEA, etc.)
- Number of workers who signed Code of Conduct
- Number of reported Sexual abuse and exploitation (SEA) incidents

Continuous visual inspection of traffic:

- Check traffic conditions during transportation of materials
- Ensure traffic is not blocked
- Ensure traffic is relocated properly
- Ensure all traffic safety precautions are abided by

Accidents/ injuries to community

- Visual observation of the installation of pedestrian and vehicular passages near residential areas
- Visual observation of road diversion and construction attention signs in place before works begin
- Weekly review of records of injuries and accidents within passers- by
- Visual observation of best practices is applied

- Community complaints
- Number of trainings addressing COVID-19 prevention, and number of COVID-19 cases reported

## **5.10 Traffic Management Plan**

Managing traffic at a construction workplace is an important part of ensuring the workplace is without risks to health and safety. Traffic includes cars, trucks and powered mobile plant like forklifts, and pedestrians include workers and visitors. Vehicles including powered mobile plant moving in and around a workplace, reversing, loading and unloading are often linked with death and injuries to workers and members of the public.

The most effective way to protect pedestrians is to remove traffic hazards and the occurrence of such incidents during construction. This will be done by designing the layout of the work zone to eliminate interactions between pedestrians and vehicles where possible. Examples include prohibiting vehicles from being used in pedestrian spaces or providing separate traffic routes so pedestrians cannot enter areas where vehicles are used. Where this is not possible, the risks will be minimised so far as is reasonably practicable. This will be done by careful planning and controlling vehicle operations and pedestrian movements at the workplace.

Accordingly, a Traffic Management Plan (TMP) will be produced by HKBro's qualified and experienced road safety expert, who will discuss and approve it with the CDR, and ensure that it is implemented correctly on site. The TMP will show the contractor's understanding of the traffic detours and road safety measures required to safely guide passing traffic through the construction zones based on international standards and measures. The TMP will lay out a set of coordinated strategies and will describe how these strategies will be used to manage the work zone impacts of a project. As per Part D - Environmental and Social (ES) Section L of the bidding forms, the TMP shall be prepared to ensure safety of local communities from construction traffic; Hence, a suitable TMP for the work zones will be prepared in line with the latest Manual on Uniform Traffic Control Devices issued by the FHWA and using the chart shown in Figure 5-4 (extracted from Section 630.1012 of the Work Zone Safety and Mobility Rule by the FHWA). The scope, content, and level of detail of the TMP will vary based on the anticipated work zone impacts of the project. Elaboration will be provided while preparing the full TMP. Two of the keys to ensure that the TMP is successful are, (1) developing it as early as possible, prior to commencement of construction works and (2) using a multidisciplinary approach.

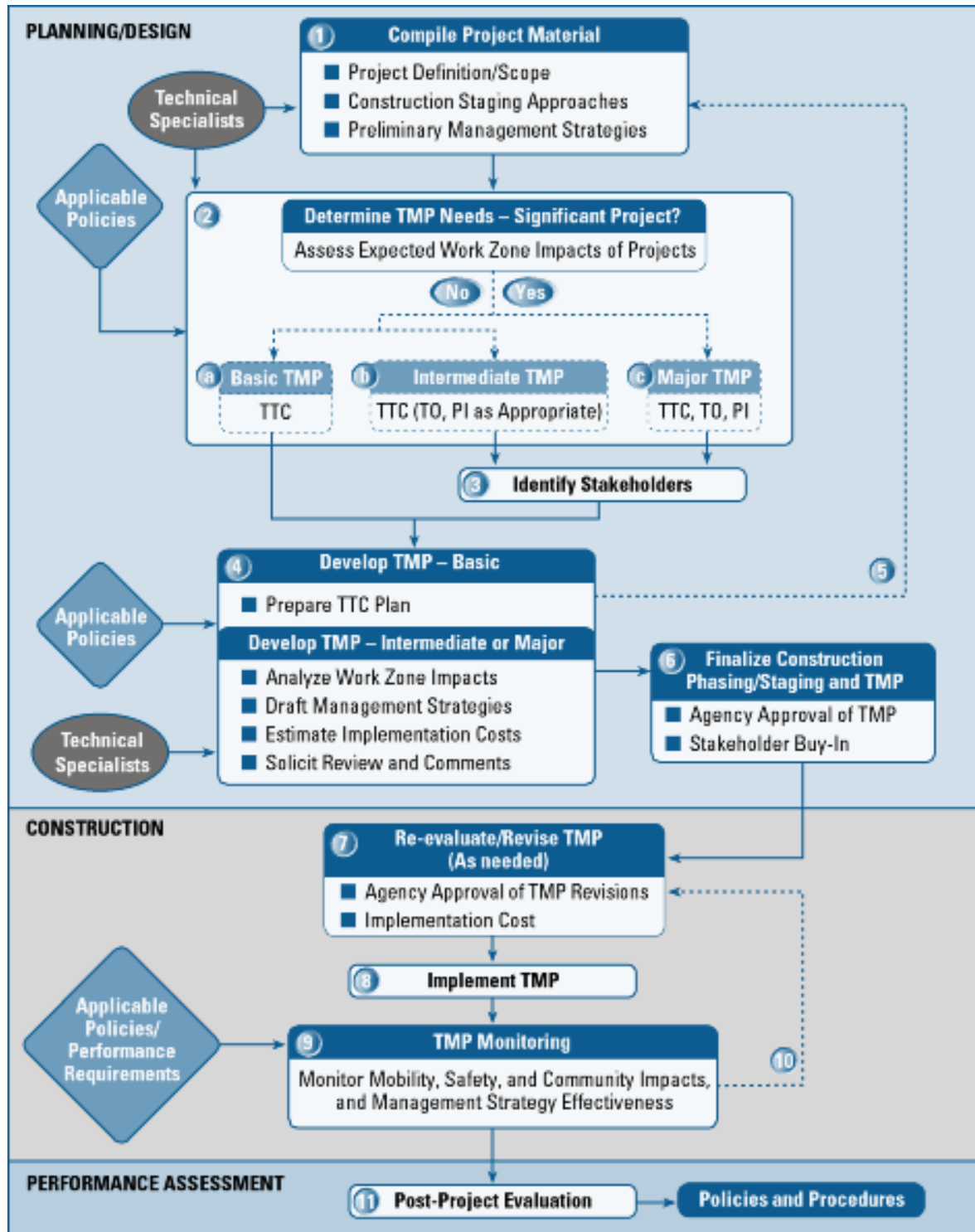


Figure 5-4: Chart Illustrating the Possible Development Steps of the TMP

#### 5.10.1 Mitigation measures

The key objective of the TMP is to ensure that traffic and transportation impacts due to construction of the project are minimised. To achieve this objective, HKBroS will:

- implement appropriate controls and procedures outlined in the TMP during construction activities to address potential traffic impacts along the Project corridor including:

- keeping pedestrians and vehicles apart including on site and when vehicles enter and exit the workplace;
  - minimising vehicle movements as practically possible;
  - eliminating reversing vehicles or minimising their related risks;
  - ensuring vehicles and pedestrians are visible to each other;
  - using appropriate traffic signs; and
  - determining the impact of traffic diversion on traffic flow and road capacity by carrying out traffic count at critical locations and ensuring that the traffic diversion plan can be accommodated without major delays or queuing to traffic.
- minimise the overall impacts on road users;
  - maintain access for the local community, transport operators and businesses;
  - regularly inform road users and local communities in relation to changed traffic conditions or access.

The Road Safety Expert will provide the appropriate information, training, instruction and supervision.

### 5.10.2 Monitoring Measures

- Visual observation that traffic signs and road safety measures are in place before works begin
- Continuous visual inspections to ensure that all road safety measures are in place
- Weekly review of worker training records including toolbox talks
- Weekly review of incident log recording injuries and accidents within workers and community

## 5.11 Occupational Health and Safety Management Plan

### 5.11.1 Mitigation Measures

#### 5.11.1.1 Management of Hazardous Materials

Occupational diseases may occur as a result of exposure to hazardous substances in the form of inhaled particulates, ingested materials or skin contact with substances. Such possibilities have been identified in the Risk Assessment(s) and appropriate controls put in place.

1. Hazardous materials/chemicals used at the site shall have Material Safety Data Sheets (MSDS). The MSDS are obtained from the manufacturer/supplier of the materials and should be requested with each purchase of products.
2. Material Safety Data Sheets will be made available to any employee or sub contractor or visitor who may interact with the materials/chemical substances onsite.
3. The management of hazardous substances and dangerous goods is detailed in Section 5.4.1.5.

#### 5.11.1.2 First Aid

1. First aid kits will be installed and available at all times at convenient locations in the work site.
2. Trained first-aiders will be present on-site. They will:
  - Carry out any first aid treatment required;
  - Record details of all first aid treatments
  - Ensure the transfer of cases of trauma or serious illness to nearby medical facilities

First aid kits contents are recorded and inspected monthly using (Form F-016 in Section 6.12)

#### 5.11.1.3 Personal Protective Equipment (PPE)

Personal Protective Equipment (PPE) provide additional protection to workers exposed to workplace hazards in conjunction with other facility controls and safety systems. PPE is a last resort that is above and beyond the other facility controls and provides the worker with an extra level of personal protection. All workers will wear and use the PPEs appropriate to the task while delivering the services.

1. Mandatory PPEs:

- Safety plastic helmet with top and side impact protection
- Safety footwear with non-slip soles and steel toes for protection against moving & falling objects, liquids and chemicals
- High visibility fluorescent clothing, or fluorescent safety vest.

2. Mandatory - must be worn if instructed to do so:

- Eye protection (safety glasses with side shields)
- Ear protection (ear plugs or earmuffs)
- Hand protection (gloves made of rubber or synthetic materials (Neoprene), leather, etc)
- Respiratory protection (facemasks with appropriate filters for dust removal and air purification (chemicals, mists, vapors and gases))
- Sunscreen
- Safety harness (full body whenever a worker is exposed to the hazard of falling from more than two meters)
- Confined spaces equipment.

The HSE Officer will ensure proper maintenance of PPE, including cleaning when dirty and replacement when damaged or worn out. Proper use of PPE will be part of the recurrent training programs for employees.

#### 5.11.1.4 Fire Precautions

Fire extinguishers will be available in each vehicle, on-site, at the offices, and in the rest areas, as per the recommendations of the Risk Assessment Register. These will be inspected on a monthly basis using Form F-017 (Section 6.13) and will be maintained in good working order and be readily accessible.

Refer to Section 4.6.1.4 for Fire Emergency Procedures.

#### 5.11.1.5 General site rules

- a. Proper signage in and around the site in local languages and access to an internal GRM;
- b. Fire-fighting measures;
- c. Guard rails and toe boards on all openings and edges;
- d. Proper storage and signage of materials including Material Safety Data Sheets;
- e. Safety measures according to type of equipment;
- f. Provide workers with the appropriate PPE (goggles, masks, helmets, hearing protection equipment, safety boots, etc.) and enforce their use;
- g. Maintain the PPE (cleaning when dirty and replacement when damaged or worn out);
- h. Fencing around the construction site at all times;
- i. Sanitary facilities to be covered, easily accessible, ventilated, well lit, maintained, and sanitized;
- j. Safe drinking water in accordance with regulations.

- k. Ensure the availability of adequate loading and unloading space;
- l. Inspect ladders on a weekly basis where available (Form F-018 in Section 6.14)
- m. Segregate passageways for pedestrians and vehicles and ensure easy, safe and appropriate access
- n. Keep walkways free of tripping hazards such as work materials, and debris;
- o. If work involving the use of flammable materials is being carried out, prohibit smoking and do not allow other work activities involving potential ignition sources to take place nearby;
- p. Prohibit littering;
- q. Avoid burning of materials on-site;
- r. Provide easily accessible first aid kits at the active work site with the appropriate number of materials given the number of workers on-site. The locations of the first aid kits must be indicated to all workers;
- s. Post adequate signs at visible locations throughout the construction area indicating type of operation, potential risks, and appropriate medical/emergency action response;
- t. Perform staff training about the fundamentals of occupational health and safety procedures, and about handling hazardous material containers and related wastes;
- u. Implement the required air emissions and noise mitigation measures listed in sections above
- v. Follow the COVID-19 procedures (Section 4.8)

No contractor, subcontractor, visitor or any other individual will commence works without notifying the Supervisor that they are on site and ready to start work and without undergoing an induction training.

#### **5.11.2 Monitoring Measures**

- Visual observation that signs are in place before works begin
- Continuous visual inspections to ensure that all site safety measures are in place
- Continuous visual inspections to ensure that all workers are wearing their PPEs
- Weekly review of OHS supervisor notes including JHA implementation
- Weekly review of worker training records including toolbox talks
- Weekly review of accident log recording injuries and accidents within the workers

### **5.12 Demobilization and Cleaning Management Plan**

#### **5.12.1 Mitigation Measures**

As the sewage network extension and rehabilitation activities will be done in phases and as segments, HKBros will ensure the complete demobilization and cleaning of each segment as soon as the works are completed in the particular segment.

HKBros will ensure the removal of all construction vehicles, equipment, and material following the same mitigation measures outlined above, to minimize water and soil pollution.

HKBros will ensure that all types of solid waste are completely removed from the site as follows:

- All remaining domestic solid waste is collected by the concerned municipality and the solid waste bins are removed from the site.

- All remaining construction waste is collected by HKBros and disposed of at the approved sites, and the bins are removed from the site.
- All hazardous waste is collected by a certified contractor as advised by the Ministry of Environment.

HKBros will ensure that the porta-cabins and associated storage tanks are adequately dismantled with no release of wastewater into the environment and are transported out of the site.

HKBros will ensure that the constructed and rehabilitated networks and appurtenances (manholes, etc.) are cleaned and ready for use.

#### **5.12.2 Monitoring Measures**

Daily visual observation and photographic documentation of the site cleaning activities.

Final visual inspection of the decommissioned site.

## 6 FORMS, CHECKLISTS & NOTES

### 6.1 Minutes of Meetings Form (F-001)



#### MINUTES OF MEETING F-001

Meeting No: \_\_\_\_\_

Meeting Date		Meeting Location	
Minutes Issued By			
ATTENDEES			
Name	Position	Signature	

BRIEF DESCRIPTION/AGENDA
•

ACTIONS/DISCUSSIONS				
No.	Description	Responsible	Due Date	Status or Comment



## 6.2 Training Attendance Sheet (F-002)



### TRAINING ATTENDANCE SHEET F-002

Project Title	AMQ- LOT 1	Site	
Topic		Date	
Conducted by		Signature	

Employee /Visitor Name	Title/ Position	Signature

### 6.3 Incident Report (F-003)



## INCIDENT REPORT F-003

<b>Project</b>	AMQ- LOT 1		
<b>Report date</b>			
<b>Reported by</b>		<b>Title/role</b>	

#### I. DETAILS OF THE INCIDENT

<b>Incident date</b>	
<b>Incident time</b>	
<b>Incident place</b>	
<b>Incident Serial Number</b>	

#### II. IDENTIFICATION OF TYPE OF INCIDENT

Select the type of the incident from the list below. An incident can be classified at the same time as H&S/environmental/social.

Type of Incident - H&S		Type of Incident – Social
Moving Machinery/vehicles	Dust, Fumes, Vapors	Theft
Fall from height	Noise	Misuse of property
Powered Hand tools	Temperature or heat	Willful Damage
Hand Tools	Overexertion	Damage to Cultural Heritage
Animals or insects	Structural Failure	Occurrence of infringement of labor rights
Fire or Explosion	Chemical/biological	Occurrence of infringement of human rights
Trips & smaller falls	Stress	Stakeholder/community complaint
Drowning	Violence, aggressions	Strike, demonstration
Borrow-pit Management	Other (please specify)	Other (please specify)

Type of Incident –Environmental	
Chemical/Oil Spill	Damage to ecosystems (e.g. damage to flora/fauna)
Improper Disposal of Waste	Odor/ Air/ Noise Emissions
Disasters (Earthquake, Flood, etc)	Dust, Fumes, Vapors, Air pollution
Water Pollution/ Sedimentation	Other (please specify)

### III. DESCRIPTION OF THE INCIDENT

Record all facts prior to and including the incident that can help clarifying its dynamics and its causes:

--

### IV. INFORMATION COLLECTION

List all the information available about the incident. Use additional pages if required and attach photographs where possible

Factual/Documented Information	Testimony of witnesses	Scene/Environment inspections

### IV. ROOT CAUSE ANALYSIS

Select the root cause(s) of the incident from the list below. If "Other" please specify.

Root causes	Yes	No
Improper Planning		
Poor Maintenance		
Poor Supervision		
Poor Quality of Equipment		

No rules, standards, or procedures		
Lack of knowledge or skills		
Improper motivation or attitude		
Failure to comply with rules		
Other		

#### V. DETAILS OF HARMED PERSON(s) (Only for Health & Safety Incidents)

Name		Age	
Address/Contact details			
Occupation			
Insurance paid/covered (Please attach evidence in case of insurance paid/covered)			
Date injury reported		To Whom Reported	
Did person return to work the same day?	<div>Yes</div> <div>No</div>		
Treatment of injury	None	On Site First Aid only	<div>Doctor</div> <div>Hospitalized</div>
Details of treatment			
Were any emergency services in attendance?	Yes	No	
Details of emergency services if in attendance			
<b>Injury Details</b>  <b>Injury type:</b> (e.g. cuts/abrasions, bruising, sprain/strain, fracture, dislocation, unconsciousness, other)  <b>Body part:</b>			
Date of return to work			

## VI. OUTCOME OF INVESTIGATION

<p><b>Causes</b></p> <p>What unsafe/inappropriate acts or conditions caused the event? Note contributing factors that have made the incident worse (e.g. incorrect use of ladder, lack of PPE, absence of drip trays/containment)</p> <p>What human, organizational or job factors contributed/caused the event (e.g. poor housekeeping, poor planning, incorrect work method, lack of supervision/training, improper attitude, lack of hazard control etc.)? Also review the adequacy of risk assessments.</p>		
<p>Lessons learned</p>		
<p>Recommended preventative action(s)</p>	<p><input type="checkbox"/> Training of personnel</p> <p><input type="checkbox"/> Improve risk/impact Identification</p> <p><input type="checkbox"/> Improve hazard/risk control</p> <p><input type="checkbox"/> Increase supervision</p> <p><input type="checkbox"/> Discuss during HSSE meeting</p> <p><input type="checkbox"/> Other (please specify)</p>	
<p>Preventative action(s) to be carried out by:</p> <p>(Name of responsible person and target completion date)</p>		
<p>Close out</p> <p>(Agreed actions have been completed and situation now is satisfactory)</p>	<p><i>[Before closing out, ensure that the preventative action has been implemented for a reasonable period of time and it is showing to be effective.]</i></p>	
<p>Signature of lead reviewer</p>		<p>Date</p>

#### **6.4 Incident Log (F-004)**

Refer to form F-004 in Excel Sheet

#### **6.5 GRM & Complaints Register (F-005) and Log Forms (F-006)**

Refer to forms F-005 & F-006 in Excel Sheet

#### **6.6 COVID-19 Forms (F-007 & F-008)**

Refer to Forms F-007 Weekly COVID Checklist & F-008 Monthly COVID cases

#### **6.7 Non-Compliance Log (F-009)**

Refer to form F-009 in Excel File

#### **6.8 Site Inspection Checklists (F-010, F-011 & F-012)**

Three site inspection checklists have been developed namely, form F-010 for weekly ES & OHS inspection, form F-011 for E&S monthly inspection and form F-012 for OHS monthly inspection, as presented below.

**F-010- WEEKLY Checklist for ES & OHS Inspection**

Date (DD/MM/YYYY):	Site (Village/Station):
Completed by:	Signature:
Approved by:	Signature:

Topic/ Potential Impact	Observation		Means of Verification	Findings/ Observations <sup>1</sup>	Recommended Corrective Action
Management Measures	Yes	No			
General Requirements for ESHS Management					
1. Are the activities limited only to the site boundaries (i.e., is it encroaching outside the activity area)?	<input type="checkbox"/>	<input type="checkbox"/>	- Visual Inspection		
2. Are all workers familiar and comply with the ESHS requirements and specifications of this CESMP?	<input type="checkbox"/>	<input type="checkbox"/>	- Review record of induction training		
3. Are incidents, accidents, observations, and near misses being recorded?	<input type="checkbox"/>	<input type="checkbox"/>	- Review record of incidents reporting		
Protection of the Environment					
4. Is the site kept clean and tidy?	<input type="checkbox"/>	<input type="checkbox"/>	- Visual Inspection		
Waste Management and Segregation					
5. Is all waste stored in designated storage containers?	<input type="checkbox"/>	<input type="checkbox"/>	- Visual Inspection		

<sup>1</sup> **Color Code for Findings/ Observations:**

Red Flag. Major Non-compliance with ESMP requirements. Urgent Action needed to protect ecological and human environment and avoid risks to the Project schedule.
Minor Non-compliance. Action needed but no immediate threat for ecological and human environment or Project schedule.
In compliance with ESMP commitment.

Topic/ Potential Impact Management Measures	Observation		Means of Verification	Findings/ Observations <sup>1</sup>	Recommended Corrective Action
	Yes	No			
6. Are bins/skips/containers properly labelled, secured, and protected i.e., from rain, animals	<input type="checkbox"/>	<input type="checkbox"/>	Visual Inspection		
7. Are hazardous waste and non-hazardous waste segregated?	<input type="checkbox"/>	<input type="checkbox"/>	- Visual Inspection		
8. Is hazardous waste stored in in sealed, non-leaking, bunded area	<input type="checkbox"/>	<input type="checkbox"/>	Visual Inspection		
9. Is the frequency of emptying bins, waste disposal/recycling according to plan	<input type="checkbox"/>	<input type="checkbox"/>	Visual Inspection		
10. Are all types of solid waste transported and disposed based on the legal requirements in consultation with local authorities?	<input type="checkbox"/>	<input type="checkbox"/>	- Proof of municipality approval certificates. - Visual Observation		
<b>Oil/chemical Storage</b>					
11. Are chemicals/oils stored in a secured dedicated and appropriately marked area which is:	<input type="checkbox"/>	<input type="checkbox"/>	Visual Inspection		
12. Well ventilated and well lit.	<input type="checkbox"/>	<input type="checkbox"/>	Visual Inspection		
13. Separated from ignition sources.	<input type="checkbox"/>	<input type="checkbox"/>	Visual Inspection		
14. Secured from the public.	<input type="checkbox"/>	<input type="checkbox"/>	Visual Inspection		
15. Protected from temperature fluctuations and direct sunlight.	<input type="checkbox"/>	<input type="checkbox"/>	Visual Inspection		
<b>Drainage, dewatering, spillage control</b>					
16. Is any type of wastewater from the construction site discharged into nearby water bodies?	<input type="checkbox"/>	<input type="checkbox"/>	- Visual Inspection		
17. Are porta-cabins provided as toilets for workers leaking?	<input type="checkbox"/>	<input type="checkbox"/>	- Visual Observation		
18. Are all types of liquid waste transported and disposed based on the legal requirements in consultation with local authorities?	<input type="checkbox"/>	<input type="checkbox"/>	- Proof of municipality approval certificates. - Visual Observation		

Topic/ Potential Impact	Observation		Means of Verification	Findings/ Observations <sup>1</sup>	Recommended Corrective Action
	Yes	No			
19. Is there evidence of any oil/ fuel spills at the construction site?	<input type="checkbox"/>	<input type="checkbox"/>	- Visual Inspection		
20. Is there evidence of any spills / leaks from the waste containers?	<input type="checkbox"/>	<input type="checkbox"/>	- Visual Inspection		
21. Are workers aware of the spill response measures and the spill response kits available?	<input type="checkbox"/>	<input type="checkbox"/>	- Review record of induction training - Visual inspection		
22. Are there any indication of sharp, dangerous objects and organic wastes at and around the activity area?	<input type="checkbox"/>	<input type="checkbox"/>	- Visual Inspection		
<b>Dust/ Odour/ Air Emissions</b>					
23. Are big plumes of dust generated from construction activities near sensitive receptors (residential and commercial area, and vegetation)	<input type="checkbox"/>	<input type="checkbox"/>	- Visual Observation - Photographic Documentation - Review grievance & complaints records		
24. Dust control measures, excavated material stockpiles covered, dust suppression system (sprinklers), traffic around the site controlled, trucks transporting excavation waste properly covered	<input type="checkbox"/>	<input type="checkbox"/>	- Visual Observation		
25. Is mixing of construction material conducted down-wind and in a semi-enclosed area?	<input type="checkbox"/>	<input type="checkbox"/>	- Visual Inspection		
26. Are vehicles and equipment left idling on-site?	<input type="checkbox"/>	<input type="checkbox"/>	- Visual Inspection		
27. Are vehicles and equipment maintained on a weekly basis?			- Vehicle/ Equipment maintenance record		
28. Are there burnings on site, waste burning prohibited on site	<input type="checkbox"/>	<input type="checkbox"/>	Visual Inspection		
<b>Noise and Vibration</b>					

Topic/ Potential Impact	Observation		Means of Verification	Findings/ Observations <sup>1</sup>	Recommended Corrective Action
	Yes	No			
29. Are any construction activities conducted outside working hours?	<input type="checkbox"/>	<input type="checkbox"/>	- Visual Inspection		
30. Are noise levels being measured weekly?	<input type="checkbox"/>	<input type="checkbox"/>	- Review noise level record		
31. Are noise levels exceeding acceptable standards?	<input type="checkbox"/>	<input type="checkbox"/>	- Review noise level record - Review grievance & complaints records		
<b>Ecology, Archaeology and Heritage</b>					
32. Is there any ground clearance or re-grading beyond the defined project areas?	<input type="checkbox"/>	<input type="checkbox"/>	- Visual Inspection		
33. Are all employees aware of the requirement to protect wildlife and habitats from unnecessary construction damage, hunting and general disturbance	<input type="checkbox"/>	<input type="checkbox"/>	- Review of induction training record - Worker interview		
<b>Public Protection</b>					
34. Appropriate barricades, fencing, hoarding, gantry secure and in place	<input type="checkbox"/>	<input type="checkbox"/>	-Visual Inspection		
35. Signage in place	<input type="checkbox"/>	<input type="checkbox"/>	-Visual Inspection		
36. Suitable lighting for public access	<input type="checkbox"/>	<input type="checkbox"/>	-Visual Inspection		
37. Footpaths clean and free from debris	<input type="checkbox"/>	<input type="checkbox"/>	-Visual Inspection		
38. Work site access controlled	<input type="checkbox"/>	<input type="checkbox"/>	-Visual Inspection		
39. Traffic control procedures in place	<input type="checkbox"/>	<input type="checkbox"/>	-Visual Inspection		
40. Are drivers abiding by speed limits?	<input type="checkbox"/>	<input type="checkbox"/>	- Review incident reporting - Interview with drivers		
41. Are Covid-19 prevention measures implemented?	<input type="checkbox"/>	<input type="checkbox"/>	- Review health register - Review weekly procedural checklist		
<b>Labour and Community Relations</b>					
42. Are all available employees above 18 years of age?	<input type="checkbox"/>	<input type="checkbox"/>	- Do an ID check of available employees onsite		

Topic/ Potential Impact	Observation		Means of Verification	Findings/ Observations <sup>1</sup>	Recommended Corrective Action
	Yes	No			
43. Are all workers aware of their rights and treated equally?	<input type="checkbox"/>	<input type="checkbox"/>	- Review record of induction training - Review grievance & complaints records		
44. Are all workers aware about the code of conduct?	<input type="checkbox"/>	<input type="checkbox"/>	- Worker interviews - Review record of signed code of conduct		
45. Engage/ communicate/inform communities. Ensure consultations with the local authorities and communities regarding the construction.	<input type="checkbox"/>	<input type="checkbox"/>	- Review grievance & complaints records - Minutes of consultation meetings		
46. Are the Grievance Redress Mechanism & the Complaints Mechanism in place for both community and the employees begin utilised?	<input type="checkbox"/>	<input type="checkbox"/>	- Review grievance & complaints records		
47. Are grievances recorded?	<input type="checkbox"/>	<input type="checkbox"/>	- Review grievance & complaints records		
48. Are the complaints responded to in an acceptable time period?	<input type="checkbox"/>	<input type="checkbox"/>	- Review grievance & complaints records		

**F-011- MONTHLY Checklist for E&S Inspection**

Date (DD/MM/YYYY):	Site (Village/ Station):
Completed by:	Signature:

Topic/ Potential Impact	Observation		Means of Verification	Findings/ Observations <sup>2</sup>	Recommended Corrective Action
Management Measures	Yes	No			
General Requirements for ESHS Management					
Are the activities limited only to the site boundaries (i.e., is it encroaching outside the activity area)?	<input type="checkbox"/>	<input type="checkbox"/>	- Visual Inspection		
Are all workers familiar and comply with the ESHS requirements and specifications of this CESMP?	<input type="checkbox"/>	<input type="checkbox"/>	- Review record of induction training		
Is there an assigned ESHS responsible staff who is responsible for contract ESHS requirements and for relations with local community?	<input type="checkbox"/>	<input type="checkbox"/>	- Review the job description for the assigned staff - Review record of induction training		
Are incidents, accidents, observations, and near misses being recorded?	<input type="checkbox"/>	<input type="checkbox"/>	- Review record of incidents reporting		
Have the workers been informed of the code of conduct?	<input type="checkbox"/>	<input type="checkbox"/>	- Review record of induction training and signed CoC		
Have the workers been informed of the Grievance Redress Mechanism?	<input type="checkbox"/>	<input type="checkbox"/>	- Review record of induction training		

<sup>2</sup> **Color Code for Findings/ Observations:**

Red Flag. Major Non-compliance with ESMP requirements. Urgent Action needed to protect ecological and human environment and avoid risks to the Project schedule.
Minor Non-compliance. Action needed but no immediate threat for ecological and human environment or Project schedule.
In compliance with ESMP commitment.

Topic/ Potential Impact	Observation		Means of Verification	Findings/ Observations <sup>2</sup>	Recommended Corrective Action
Management Measures	Yes	No			
Protection of the Environment					
Is the site kept clean and tidy?	<input type="checkbox"/>	<input type="checkbox"/>	- Visual Inspection		
Are all chemicals/ fuels/ oils stored adequately?	<input type="checkbox"/>	<input type="checkbox"/>	- Visual Inspection		
Have loose materials that have potential to fall been secured?	<input type="checkbox"/>	<input type="checkbox"/>	- Visual Inspection		
Is there evidence of any oil/ fuel spills at the construction site?	<input type="checkbox"/>	<input type="checkbox"/>	- Visual Inspection		
Is there evidence of any spills / leaks from the waste containers?	<input type="checkbox"/>	<input type="checkbox"/>	- Visual Inspection		
Are workers aware of the spill response measures and the spill response tools available?	<input type="checkbox"/>	<input type="checkbox"/>	- Review record of induction training - Visual inspection		
Are there any indication of sharp, dangerous objects and organic wastes at and around the activity area?	<input type="checkbox"/>	<input type="checkbox"/>	- Visual Inspection		
Are all types of solid waste transported and disposed based on the legal requirements in consultation with local authorities?	<input type="checkbox"/>	<input type="checkbox"/>	- Proof of municipality approval certificates. - Visual Observation		
Are all types of liquid waste transported and disposed based on the legal requirements in consultation with local authorities?	<input type="checkbox"/>	<input type="checkbox"/>	- Proof of municipality approval certificates. - Visual Observation		
Is there any ground clearance or re-grading beyond the defined project areas?	<input type="checkbox"/>	<input type="checkbox"/>	- Visual Inspection		
Are all employees aware of the requirement to protect wildlife and habitats from unnecessary construction damage, hunting and general disturbance	<input type="checkbox"/>	<input type="checkbox"/>	- Review of induction training record		

Topic/ Potential Impact	Observation		Means of Verification	Findings/ Observations <sup>2</sup>	Recommended Corrective Action
Management Measures	Yes	No			
Labour and Community Relations					
Are the legal labour standards as per ILO regulations (child/forced labour, sexual assault, no discrimination, equal opportunities, working hours, minimum wages) met?	<input type="checkbox"/>	<input type="checkbox"/>	- Review grievance & complaints records - Review of induction training record		
Are all available employees above 18 years of age?	<input type="checkbox"/>	<input type="checkbox"/>	- Do an ID check of available employees onsite		
Are all workers aware of their rights and treated equally?	<input type="checkbox"/>	<input type="checkbox"/>	- Review record of induction training - Review grievance & complaints records - Spot interviews		
Where appropriate, are goods and services supplied by local community?	<input type="checkbox"/>	<input type="checkbox"/>	- Review procurement and employment records - Review grievance & complaints records		
Ensure consultations with the local authorities and communities regarding the construction.	<input type="checkbox"/>	<input type="checkbox"/>	- Review grievance & complaints records - Minutes of consultation meetings		
Are all workers aware about the code of conduct?	<input type="checkbox"/>	<input type="checkbox"/>	- Worker interviews - Review record of induction training		
Have there been any grievances regarding procurement process?	<input type="checkbox"/>	<input type="checkbox"/>	- Review grievance & complaints records		
Is there any child or forced labour?	<input type="checkbox"/>	<input type="checkbox"/>	- Visual inspection of suspected child labor		
Are the Grievance Redress Mechanism & the Complaints Mechanism in place for both community and the employees begin utilised?	<input type="checkbox"/>	<input type="checkbox"/>	- Review grievance & complaints records		

Topic/ Potential Impact	Observation		Means of Verification	Findings/ Observations <sup>2</sup>	Recommended Corrective Action
Management Measures	Yes	No			
Are grievances recorded?	<input type="checkbox"/>	<input type="checkbox"/>	- Review grievance & complaints records		
Are the complaints responded to in an acceptable time period?	<input type="checkbox"/>	<input type="checkbox"/>	- Review grievance & complaints records		

**F-012- MONTHLY Checklist for OHS Inspection**

Date (DD/MM/YYYY):	Site (Village/Station):
Completed by:	Signature:

Topic/ Potential Impact		Observation		Means of Verification	Findings/ Observations s <sup>3</sup>	Recommended Corrective Action
Management Measures		Yes	No			
Health and Safety Systems						
1.	ESHS policy displayed					
2.	Incidents Register available					
3.	Induction records available					
4.	Workplace inspection records available					
5.	Training records available					
6.	Documented safe work method statements (SWMS) available					
7.	Proper PPEs are used					
8.	MSDS available					
9.	Risk assessment register available					
10.	Work permits available					

<sup>3</sup> **Color Code for Findings/ Observations:**

Red Flag. Major Non-compliance with ESMP requirements. Urgent Action needed to protect ecological and human environment and avoid risks to the Project schedule.
Minor Non-compliance. Action needed but no immediate threat for ecological and human environment or Project schedule.
In compliance with ESMP commitment.

Topic/ Potential Impact Management Measures	Observation		Means of Verification	Findings/ Observations s <sup>3</sup>	Recommended Corrective Action
	Yes	No			
11. Daily Job Hazard Analysis performed and reports available					
<b>General site layout &amp; Welfare (incl. housekeeping)</b>					
12. Is the general appearance of the worksite including portable toilets and rest rooms clean, tidy and free from oil and grease?					
13. Are the materials storage areas protected and tidy?					
14. Are security and site boundaries clearly marked/defined?					
15. Are safety signage displayed?					
16. Are work areas free from rubbish & obstructions?					
17. Rubbish bins available – covered					
18. Is there a clear access and egress in the workplace?					
19. Are surfaces safe and suitable and free from slip/trip hazards:					
20. Are AISLES unobstructed and clearly defined?					
21. Is there adequate lighting?					
<b>Personal Protection</b>					
22. COVID PPEs used as required by the COVID procedures					
23. Workers provided with PPE					

Topic/ Potential Impact Management Measures	Observation		Means of Verification	Findings/ Observations s <sup>3</sup>	Recommended Corrective Action
	Yes	No			
24. Workers trained in the use of PPE					
25. PPE being worn by workers					
26. Regular maintenance checks performed on PPE					
27. Correct signage at access points					
28. Hard hats available to visitors on work site					
29. Suitable PPE for specific tasks (i.e., dust masks, hearing protection, safety glasses...)					
<b>First Aid and Emergency Response</b>					
30. First Aid (first aiders, first aid kit – location availability), spill kits (availability, location)					
31. Stocks meet requirements					
32. First aiders names displayed					
33. Emergency procedures in place					
34. Information display (evacuation plan, assembly area marked, contacts, site rules, emergency procedures...)					
35. Has a primary healthcare center been identified for health care emergencies among workers?					
<b>Fire Control</b>					
36. Extinguishers in place					

Topic/ Potential Impact Management Measures	Observation		Means of Verification	Findings/ Observations s <sup>3</sup>	Recommended Corrective Action
	Yes	No			
37. Firefighting equipment serviced/tagged					
38. Appropriate signing of extinguishers					
39. Smoking/naked flame restrictions observed					
40. Trial evacuations conducted					
41. Personnel trained in use of firefighting equipment					
<b>Mobile Plant and Equipment</b>					
42. Plant and equipment in good condition					
43. Daily safety inspection procedures/checklists available					
44. Fault reporting/rectification system used					
45. Operators trained and licensed					
46. Warning and instructions displayed					
47. Warning lights operational					
48. Reversing alarm operational					
49. Satisfactory operating practices					
50. Tyres satisfactory					
51. Emergency stops appropriately placed and clearly identifiable					
52. 'Noisy' equipment, maintenance, noise mitigation measures i.e., is					

Topic/ Potential Impact Management Measures	Observation		Means of Verification	Findings/ Observations s <sup>3</sup>	Recommended Corrective Action
	Yes	No			
the equipment fitted with mufflers, screens, noise monitoring					
<b>Hazardous Substances</b>					
53. Hazardous Substances Permit used					
54. Clear and appropriate identification, labelling and storage					
55. Chemical register developed					
56. Adequate ventilation/exhaust systems					
57. Protective clothing/equipment available/used					
58. Material safety data sheets available					
59. Chemical handling procedures followed					
<b>Welding</b>					
60. Only trained personnel permitted to weld					
61. Gas bottles securely fixed to trolley					
62. Welding fumes well ventilated					
63. Fire extinguisher near work area					
64. Only flint guns used to light torch					
65. Flash back spark arresters fitted					
66. Vision screens used for electric welding					

Topic/ Potential Impact Management Measures	Observation		Means of Verification	Findings/ Observations s <sup>3</sup>	Recommended Corrective Action
	Yes	No			
67. LPG bottles within 10-year stamp					
68. Specific PPE provided and worn					
69. Hot Work permit system used					
<b>Excavation</b>					
70. Excavation Permit used					
71. Shoring in place and in sound condition for all trenches more than 1.5m					
72. Excavation well secured					
73. Signage displayed					
74. Banks battered correctly and spoil away from edge					
75. Sufficient clear areas and safe access around excavation					
76. Separate access and egress points from excavation					
77. Safe work procedure in place					
78. Excavation, trench protection available (shoring, sheet piles, placement of excavated material, fencing, railing)					
79. Special precautions available for confined space (gas monitor, evacuation procedure – tripod, topman etc)					
80. Dewatering arrangements					


Topic/ Potential Impact		Observation		Means of Verification	Findings/ Observations s <sup>3</sup>	Recommended Corrective Action
Management Measures		Yes	No			
Prevention of Falls						
81.	All work platforms have secure handrails, guarding or fence panels					
82.	Fall arrest systems maintained and used as required					
83.	Harness and lanyard or belts provided as required					
84.	All floor penetrations covered or barricaded					
85.	Unsafe areas signposted and fenced					
86.	Safe work procedure in place					
Stairs, steps and landings						
87.	Working at height permit used					
88.	No worn or broken steps, rungs or styles					
89.	Handrails in good repair					
90.	Clear of obstructions					
91.	Adequate lighting					
92.	Emergency lighting					
93.	Non-slip treatments/treads in good condition					
94.	Kick plates where required					
95.	Clear of debris and spills					
96.	Used correctly					

Topic/ Potential Impact	Observation		Means of Verification	Findings/ Observations s <sup>3</sup>	Recommended Corrective Action
Management Measures	Yes	No			
Electrical					
97. Is Electrical works permit used?					
98. There are no broken plugs, sockets, switches					
99. There are no frayed or defective leads					
100. All power tools are in good condition					
101. There is no work near exposed live electrical equipment					
102. Tools and leads are inspected and tagged					
103. There are no strained leads					
104. Switches/circuits are identified					
105. An Earth leakage system is used					
106. Start/stop switches are clearly identified					
107. Switchboards are secured					
Ladders					
108. Working at height permit used					
109. Ladders in good condition					
110. Ladders not used to support planks for working platforms					
111. Correct angle to structure 1:4					

Topic/ Potential Impact Management Measures	Observation		Means of Verification	Findings/ Observations s <sup>3</sup>	Recommended Corrective Action
	Yes	No			
112. Extended 1.0 meter above top landing					
113. Straight or extension ladders securely fixed at top					
114. Metal ladders not used near live exposed electrical equipment					
<b>Scaffolding</b>					
115. Working at height permit used					
116. Workers trained and records maintained					
117. Scaffold design complies with requirements					
118. Safe and suitable access and egress to scaffold					
119. Handover certificates recorded					
120. Repair and maintenance details held on work site					
<b>Confined Spaces</b>					
121. Confined spaces permit used					
122. Risk assessment undertaken					
123. Communication and rescue plan in place					
124. Safety equipment in good working condition					
125. Suitable training provided to workers					

Topic/ Potential Impact Management Measures	Observation		Means of Verification	Findings/ Observations s <sup>3</sup>	Recommended Corrective Action
	Yes	No			
126. All confined spaces identified and appropriately signposted					
<b>Demolition</b>					
127. Risk assessment undertaken in advance					
128. Access prevented to demolition area					
129. Overhead protection in place					
130. Protection of general public					
131. Safe work procedure in place					
<b>Equipment/Portable Tools/Electrical Appliances</b>					
132. Lifting equipment and management of lifting operations (cranes, hoists, davits, slings, chains, permit)					
133. Tools and equipment (condition, regular checking, maintenance, storage, guards in place)					
134. Transformers & Power Supply (security, connection, labelling, inspections)					

## 6.9 Job Hazard Analysis Form (F-013)

	JOB HAZARD ANALYSIS				Date /Time	
	Activity		Road		Site	
Prepared by HSE Officer		Reviewed by Site Engineer		Reviewed by Safety Supervisor		
PPEs required				Toolbox Talks done by		
Equipment and Tools required with Maintenance Check ( Mark✓)				Hazardous Substances		Emergency Response
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	None	<ul style="list-style-type: none"> <li>First Aider: _____</li> <li>Near Hospital: _____</li> <li>Follow emergency procedures</li> <li>First aid kit and fire extinguisher available on site</li> <li>Assembly Area defined</li> </ul>	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
ENSURE THAT ALL HAZARDS IDENTIFIED ARE ADDRESSED IN JHA BELOW (see OHSM-001 Hazard Assessment Register)						
Job Step		Hazards		Controls		

The persons who have signed below have attended the daily toolbox talks, have understood the above document and will adhere to all requirements and conditions.					
Date: _____		Date: _____		Date: _____	
Position/Name	Signature	Position/Name	Signature	Position/Name	Signature
Safety Approvals: Name: _____		Safety Approvals: Name: _____		Safety Approvals: Name: _____	
Start time: _____	End time: _____	Start time: _____	End time: _____	Start time: _____	End time: _____

### **6.10 Solid Waste Log Form (F-014)**

Refer to form F-014 in Excel Sheet

### **6.11 Wastewater Management Log Form (F-015)**

Refer to form F-015 in Excel Sheet

[illegible]

### 6.13 Fire Extinguisher Inspection Form (F-017)

Refer to form F-017 in Excel Sheet

### 6.14 Ladder Inspection Form (F-018)



#### WEEKLY INSPECTION OF LADDERS/ TRESTLES F-018

Project Title	Site	Date
---------------	------	------

Ladder ID Number	Description – ladder: length or number of rungs, scaffold - location

Date of inspection	Results of inspection										Signature person who made inspection
	Ladder/scaffold number										

#### Guidance

- Weekly inspections shall be carried out and report completed.
- The report should be kept on site until the project is complete.
- All ladders/trestles should be individually tagged.
- Ladders/Trestle's must be in good condition and correctly stored - check for splits or cracks in the stiles and rungs. Ensure that none of the rungs are missing or loose.
- Ladders shall not be painted - paint can hide damaged parts.
- Any defected ladders / trestles should be removed from site immediately

## 7 ANNEXES

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**Annex A: BOQ for the Project**

ITEM	DESCRIPTION	UNIT	QUANTITY	Main Lines	Secondary Lines	Lateral Connections
<b>1.0000</b>	<b>General</b>					
1.0001	Site Topographic Survey	km	71.15	9.33	61.82	
1.0002	Trial pit not exceeding 3m depth	nb	76.00	10.00	66.00	
1.0003	Trial Trench not exceeding 3m depth	Lin.m	76.00	10.00	66.00	
1.0004	As Built Drawings	km	71.15	9.33	61.82	
1.0006	Cleaning and access to site and clearance of site after completion of works	L.S	1.00	1.00		
<b>2.0000</b>	<b>Pipeworks</b>					
	<i>Supply of Pipes and fittings for gravity main and lateral sewers:</i>					
<b>2.1000</b>	<i>uPVC pipes for ID ≤ 300 mm; Concrete pipes for ID ≥ 350 mm.</i>					
2.1002	Supply of 200 mm dia Pipes	Lin.m	10,000.00			10,000.00
2.1003	Supply of 250 mm dia Pipes	Lin.m	36,335.00		36,335.00	
2.1004	Supply of 300 mm dia Pipes	Lin.m	21,725.00		21,725.00	
2.1006	Supply of 400 mm dia Pipes	Lin.m	1,640.00		1,640.00	
2.1008	Supply of 500 mm dia Pipes	Lin.m	6,000.00	3,880.00	2,120.00	
2.1009	Supply of 600 mm dia Pipes	Lin.m	700.00	700.00		
2.1010	Supply of 700 mm dia Pipes	Lin.m	3,110.00	3,110.00		
2.1013	Supply of 1000 mm dia Pipes	Lin.m	1,640.00	1,640.00		
<b>2.4000</b>	<b>Trench excavation</b>					
2.4001	Excavation of Trench Type T1-H1	Lin.m	33,895.00		23,895.00	10,000.00
2.4002	Excavation of Trench Type T1-H2	Lin.m	29,630.00		29,630.00	
2.4003	Excavation of Trench Type T1-H3	Lin.m	3,740.00		3,740.00	
2.4004	Excavation of Trench Type T1-H4	Lin.m	615.00		615.00	
2.4005	Excavation of Trench Type T1-H5	Lin.m	70.00		70.00	
2.4006	Excavation of Trench Type T1-H6	Lin.m	110.00		110.00	
2.4008	Excavation of Trench Type T2-H1	Lin.m	910.00		910.00	
2.4009	Excavation of Trench Type T2-H2	Lin.m	730.00		730.00	
2.4015	Excavation of Trench Type T3-H1	Lin.m	1,140.00	1,140.00		
2.4016	Excavation of Trench Type T3-H2	Lin.m	8,360.00	6,240.00	2,120.00	
2.4017	Excavation of Trench Type T3-H3	Lin.m	310.00	310.00		
2.4030	Excavation of Trench Type T5-H2	Lin.m	880.00	880.00		
2.4031	Excavation of Trench Type T5-H3	Lin.m	760.00	760.00		
<b>2.5000</b>	<b>Sand or gravel bedding and surrounds</b>					
2.5002	for 200 mm pipes	Lin.m	9,000.00			9,000.00
2.5003	for 250 mm pipes	Lin.m	35,172.00		35,172.00	
2.5004	for 300 mm pipes	Lin.m	16,531.00		16,531.00	
2.5006	for 400 mm pipes	Lin.m	1,640.00		1,640.00	
2.5008	for 500 mm pipes	Lin.m	4,870.00	2,750.00	2,120.00	
2.5009	for 600 mm pipes	Lin.m	700.00	700.00		
2.5010	for 700 mm pipes	Lin.m	3,110.00	3,110.00		

ITEM	DESCRIPTION	UNIT	QUANTITY	Main Lines	Secondary Lines	Lateral Connections
<b>2.6000</b>	<b>Reinforced concrete bedding and surrounds</b>					
2.6002	for 200 mm pipes	Lin.m	1,000.00			1,000.00
2.6003	for 250 mm pipes	Lin.m	1,163.00		<b>1,163.00</b>	
2.6004	for 300 mm pipes	Lin.m	5,194.00		<b>5,194.00</b>	
2.6008	for 500 mm pipes	Lin.m	1,130.00	1,130.00		
2.6013	for 1000 mm pipes	Lin.m	1,640.00	1,640.00		
<b>2.7000</b>	<b>Laying of pipes</b>					
2.7002	Laying of 200 mm Dia pipes	Lin.m	10,000.00			10,000.00
2.7003	Laying of 250 mm Dia pipes	Lin.m	36,335.00		<b>36,335.00</b>	
2.7004	Laying of 300 mm Dia pipes	Lin.m	21,725.00		<b>21,725.00</b>	
2.7006	Laying of 400 mm Dia pipes	Lin.m	1,640.00		<b>1,640.00</b>	
2.7008	Laying of 500 mm Dia pipes	Lin.m	6,000.00	3,880.00	<b>2,120.00</b>	
2.7009	Laying of 600 mm Dia pipes	Lin.m	700.00	700.00		
2.7010	Laying of 700 mm Dia pipes	Lin.m	3,110.00	3,110.00		
2.7013	Laying of 1000 mm Dia pipes	Lin.m	1,640.00	1,640.00		
<b>2.8000</b>	<b>Sand backfilling of trenches below paved main roads</b>					
2.8001	Sand backfilling of Trench Type T1-H1	Lin.m	692.00		<b>692.00</b>	
2.8002	Sand backfilling of Trench Type T1-H2	Lin.m	2,950.00		<b>2,950.00</b>	
<b>2.9000</b>	<b>Backfilling of trenches below paved roads and concrete pavement and staircases</b>					
2.9001	Backfilling of Trench Type T1-H1	Lin.m	27,622.00		<b>17,622.00</b>	10,000.00
2.9002	Backfilling of Trench Type T1-H2	Lin.m	22,709.00		<b>22,709.00</b>	
2.9003	Backfilling of Trench Type T1-H3	Lin.m	2,590.00		<b>2,590.00</b>	
2.9004	Backfilling of Trench Type T1-H4	Lin.m	525.00		<b>525.00</b>	
2.9005	Backfilling of Trench Type T1-H5	Lin.m	70.00		<b>70.00</b>	
2.9006	Backfilling of Trench Type T1-H6	Lin.m	110.00		<b>110.00</b>	
2.9009	Backfilling of Trench Type T2-H2	Lin.m	20.00		<b>20.00</b>	
2.9016	Backfilling of Trench Type T3-H2	Lin.m	6,790.00	4,670.00	<b>2,120.00</b>	
2.9017	Backfilling of Trench Type T3-H3	Lin.m	310.00	310.00		
<b>2.10000</b>	<b>Backfilling of Trenches in Open Areas</b>					
2.10001	Backfilling of Trench Type T1-H1	Lin.m	5,561.00		<b>5,561.00</b>	
2.10002	Backfilling of Trench Type T1-H2	Lin.m	4,001.00		<b>4,001.00</b>	
2.10003	Backfilling of Trench Type T1-H3	Lin.m	1,130.00		<b>1,130.00</b>	
2.10004	Backfilling of Trench Type T1-H4	Lin.m	90.00		<b>90.00</b>	
2.10008	Backfilling of Trench Type T2-H1	Lin.m	910.00		<b>910.00</b>	
2.10009	Backfilling of Trench Type T2-H2	Lin.m	720.00		<b>720.00</b>	
2.10015	Backfilling of Trench Type T3-H1	Lin.m	1,140.00	1,140.00		
2.10016	Backfilling of Trench Type T3-H2	Lin.m	1,570.00	1,570.00		
2.10030	Backfilling of Trench Type T5-H2	Lin.m	880.00	880.00		
2.10031	Backfilling of Trench Type T5-H3	Lin.m	760.00	760.00		

ITEM	DESCRIPTION	UNIT	QUANTITY	Main Lines	Secondary Lines	Lateral Connections
<b>3.0000</b>	<b>Manholes</b>					
<b>3.1000</b>	<b>Construction of pre-cast or cast in situ concrete manholes</b>					
SM	Side Manhole for lateral connections (1mx1m)	Unit	400.00			400.00
3.1001	Manhole Type M1-H1 or C1-H1	Unit	914.00		914.00	
3.1002	Manhole Type M1-H2 or C1-H2	Unit	720.00		720.00	
3.1003	Manhole Type M1-H3 or C1-H3	Unit	119.00		119.00	
3.1004	Manhole Type M1-H4 or C1-H4	Unit	31.00		31.00	
3.1005	Manhole Type M1-H5 or C1-H5	Unit	4.00		4.00	
3.1006	Manhole Type M1-H6 or C1-H6	Unit	2.00		2.00	
3.1008	Manhole Type M2-H1 or C2-H1	Unit	22.00		22.00	
3.1009	Manhole Type M2-H2 or C2-H2	Unit	23.00		23.00	
3.1010	Manhole Type M2-H3 or C2-H3	Unit	1.00		1.00	
3.1015	Manhole Type M3-H1 or C3-H1	Unit	24.00	24.00		
3.1016	Manhole Type M3-H2 or C3-H2	Unit	205.00	155.00	50.00	
3.1017	Manhole Type M3-H3 or C3-H3	Unit	6.00	5.00	1.00	
3.1018	Manhole Type M3-H4 or C3-H4	Unit	1.00	1.00		
3.1030	Manhole Type M5-H2 or C5-H2	Unit	17.00	17.00		
3.1031	Manhole Type M5-H3 or C5-H3	Unit	13.00	13.00		
<b>3.2000</b>	<b>Extra over for external drop manholes :</b>					
3.2001	Manhole Type M1-H2	Unit	3.00		3.00	
3.2002	Manhole Type M1-H3	Unit	47.00		47.00	
3.2003	Manhole Type M1-H4	Unit	17.00		17.00	
3.2004	Manhole Type M1-H5	Unit	1.00		1.00	
3.2005	Manhole Type M1-H6	Unit	1.00		1.00	
3.2014	Manhole Type M3-H3	Unit	1.00	1.00		
3.2015	Manhole Type M3-H4	Unit	1.00	1.00		
<b>3.5000</b>	<b>Manhole Cover &amp; Frame</b>					
3.5001	Manhole cover & frame Grade A ( heavy duty)	Unit	2,502.00	215.00	1,887.00	400.00
<b>4.0000</b>	<b>Testing and Commissioning</b>					
<b>4.1000</b>	<b>Sewer Lines &amp; Microtunnels</b>					
4.1002	Testing & commissioning of 200 mm dia sewer lines	Lin.m	10,000.00			10,000.00
4.1003	Testing & commissioning of 250 mm dia sewer lines	Lin.m	36,335.00		36,335.00	
4.1004	Testing & commissioning of 300 mm dia sewer lines	Lin.m	21,725.00		21,725.00	
4.1006	Testing & commissioning of 400 mm dia sewer lines	Lin.m	1,640.00		1,640.00	
4.1008	Testing & commissioning of 500 mm dia sewer lines	Lin.m	6,000.00	3,880.00	2,120.00	
4.1009	Testing & commissioning of 600 mm dia sewer lines	Lin.m	700.00	700.00		
4.1010	Testing & commissioning of 700 mm dia sewer lines	Lin.m	3,110.00	3,110.00		
4.1013	Testing & commissioning of 1000 mm dia sewer lines	Lin.m	1,640.00	1,640.00		
<b>4.2000</b>	<b>Testing &amp; Commissioning of Manholes , Chambers and Shafts</b>					
4.2001	Testing & Commissioning of manholes& chambers all types & shafts	Unit	2,502.00	215.00	1,887.00	400.00

ITEM	DESCRIPTION	UNIT	QUANTITY	Main Lines	Secondary Lines	Lateral Connections
<b>5.2000</b>	<b>Concrete works</b>					
5.2001	Mass concrete - Class C25 for pipe supports, thrust blocks, anchors, pipe surround at river crossing	M3	43.00	3.00	40.00	
5.2002	Reinforced concrete - Class C25 for pipe anchors, supports and thrust blocks including formwork, excavation, reinforcement, removal and backfill	M3	43.00	3.00	40.00	
5.2003	Reinforced concrete - Class C30 for drainage and irrigation channels including formwork, excavation, reinforcement, removal and backfill	M3	43.00	3.00	40.00	
5.2005	Extra Over for manhole extension in water courses	Unit	166.00	53.00	113.00	
<b>5.3000</b>	<b>Road Reinstatement</b>					
5.3001	Cutting of paved roads for sewers	Lin.m	60,366.00	4,980.00	45,386.00	10,000.00
5.3002	Cutting, breaking-out and removal of concrete pavement or staircases for sewers	Lin.m	4,022.00		4,022.00	
5.3003	Reinstatement of paved main roads including base, sub-base and wearing courses	M2	4,855.00		4,855.00	
5.3004	Reinstatement of paved internal roads including base, sub-base and wearing courses	M2	106,110.00	10,880.00	84,480.00	10,750.00
5.3005	Reinstatement of Concrete pavement or staircases	Lin.m	4,022.00		4,022.00	
<b>5.4000</b>	<b>Above ground pipe supports</b>					
5.4002	Extra Over for Arab Highway underground crossing (pipe diam 300mm)	Unit	1.00		1.00	
<b>6.0000</b>	<b>Rehabilitation works</b>					
6.0001	Cleaning existing sewer by jetting(diameter less then 800 mm)	Lin.m	23,480.00		23,480.00	
6.0002	Demolish and remove existing manhole including backfilling with subbase material	Unit	916.00		916.00	
6.0003	Adjusting manhole level; height difference not exceeding 0.5m	Unit	117.00		117.00	
6.0004	Connection of existing sewer to manhole, all types, including dealing with flows	Unit	21.00		21.00	
6.0005	Connection of new sewer to existing manhole/chamber all types, including rebenching and dealing with flows	Unit	35.00		35.00	
6.0006	Rehabilitation of existing manhole	Unit	587.00		587.00	
6.0007	Extra -Over for manhole inspection to locate, breakdown and reinstatement of road surface and adjustment of cover level	Unit	176.00		176.00	
6.0008	CCTV survey	Lin.m	23,480.00		23,480.00	

ITEM	DESCRIPTION	UNIT	QUANTITY	Main Lines	Secondary Lines	Lateral Connections
8.0000	<b>Wastewater Connections Using Boxes 60cmx60cm</b>					
8.1000	<b>Box 60cmx60cm for lateral connections and connecting pipe 200mm</b>					
8.1001	Supply all required materials and equipment, and construct the following Box 60cmx60cm for an approximate depth of 90cm for lateral connections in narrow roads, including but not limited to the following: <ul style="list-style-type: none"> <li>•Construction of the box 60cmx60cm including formwork, concrete, reinforcement and all related works</li> <li>•Box cover &amp; frame</li> <li>•Testing of the box</li> <li>•and all other related works, all as specified, shown on drawings, and with full coordination with relevant authorities.</li> </ul>	Unit	1,670.00			1,670.00
8.1002	Supply all required materials and equipment, and lay the 200mm connecting pipe to the following Box 60cmx60cm for an approximate depth of 90cm for lateral connections in narrow roads, including but not limited to the following: <ul style="list-style-type: none"> <li>•Breaking out and reinstatement of existing paved surfaces</li> <li>•All necessary excavation in any type of soil</li> <li>•Supply and laying of the 200mm pipe connecting the box to the sewer manhole with all related works</li> <li>•Testing the connecting pipe</li> <li>•Reinforced concrete bedding and surrounds</li> <li>•Backfilling with selected excavated or imported fill materials</li> <li>•and all other related works, all as specified, shown on drawings, and with full coordination with relevant authorities.</li> </ul> <p>Note: These boxes will be executed where the lateral manholes could not be executed due to very narrow streets congested with services and after getting a prior written approval from the supervising engineer.</p>	Lin.m	13,360.00			13,360.00

## Annex B: HKBros' ESHS Policy



H-ALH-1  
ID: 01-10-2013

### ENVIRONMENTAL, SOCIAL, HEALTH AND SAFETY POLICY

It is the policy of **Hanna Khoury & Brothers (HKBROS)** to conduct its business in a manner that protects the health and safety of its employees, of others involved in its activities, and of the public.

**HKBROS** will conduct its business in a manner that is compatible with the environmental and economic needs of the communities in which it operates.

**HKBROS** stresses on all employees, workers, subcontractors, and others working on its behalf their responsibility and accountability for health and safety performance whilst at work and encourages safe behaviour outside of work.

**HKBROS** takes all measures to protect the environment and to limit damage and nuisance to people and property resulting from pollution, noise, and other outcomes of its operations.

**HKBROS** does not engage in or support the use of child labour, forced labour, discrimination, or disciplinary practices in its activities neither in its partners' activities.

**HKBROS** respects freedom of association and the right to collective bargaining according to applicable laws and regulations, and applies responsible standards of the ILO Convention and the Universal Declaration of Human Rights where laws and regulations do not exist.

**HKBROS** undertakes appropriate reviews and evaluations of its operations to measure progress and to foster compliance with this policy.

**HKBROS** is committed to continuous efforts to improve health and safety, and environmental and social performance throughout its operations.

Hanna Khoury & Brothers Co. s.a.r.l



Hanna Khoury  
General Manager

## Annex C: Code of Conduct

### مدونة سلوك - Code of Conduct

مشروع تمديد شبكات تجميع مياه الصرف الصحي التي يتم تصريفها باتجاه محطة معالجة مياه الصرف الصحي في المرج  
الممول من قبل البنك الدولي، بإدارة وتنفيذ مجلس الائتماء والإعمار لصالح وزارة الطاقة والمياه

تعتبر مدونة السلوك هذه وثيقة ضرورية لحماية جميع العاملين في مشروع تمديد شبكات تجميع مياه الصرف الصحي من جميع مظاهر العنف القائم على أسس اجتماعية، التمييز، سوء المعاملة، التحرش والاعتداء والاستغلال الجنسي وأي سلوك اجتماعي آخر يخلّ بحقوق الإنسان، المجتمع المحلي والآداب العامة، بما في ذلك المعايير التالية:

<ul style="list-style-type: none"> <li>• الالتزام بمعاملة النساء والرجال والشباب باحترام بغض النظر عن انتمائهم الديني، العرقي، الطائفي، اللغوي، التوجه السياسي، الإعاقة، الجنسية، الجندرة، الخ.</li> <li>• احترام موقع العمل وأدوات العمل المشتركة: نظافة المكان، عدم التعدي على الممتلكات العامة المجاورة للأعمال، الخ.</li> </ul>	<p>١- التزام الاحترام والآداب العامة</p>
<ul style="list-style-type: none"> <li>• العنف القائم على النوع الاجتماعي: أي فعل مؤذٍ يُرتكب ضدّ إرادة الشخص. وهو مبنيّ على الفروق بين الذكور والإناث التي يُعزى وجودها لأسباب اجتماعية.</li> <li>• العنف الجنسي: الاغتصاب، الاعتداء الجنسي، التحرش الجنسي، الخ.</li> <li>• العنف الجسدي: الضرب، الصفع، الضرب المتكرر أو باستعمال أداة، الخ.</li> <li>• العنف العاطفي: الاستغلال النفسي، والابتزاز، الخ.</li> <li>• العنف الاقتصادي: الحرمان من الموارد، الحصول على أدوات العمل، عدم الالتزام بالأجر المتفق عليه، الخ.</li> </ul>	<p>٢- عدم استعمال العنف بشئ اشكاله</p>
<ul style="list-style-type: none"> <li>• الالتزام بالتصدي لأي شكل من أشكال التحرش أو التمييز أو التخويف أو الاستغلال أو الاعتداء الجنسي بما في ذلك التعليقات المهينة المتعلقة بالميل الجنسي، القذف باللقاب أو عبارات ذات دلالات جنسية، التحديق بطريقة ذات إيحاء جنسي، اللمس غير مرغوب فيه، القيام بحركات جنسية غير لائقة، تبادل الحكايات أو النكات الجنسية، توجيه رسائل ذات إيحاء جنسي بأي شكل من الأشكال، محاولة الاعتداء الجنسي أو ارتكابه، بما في ذلك الاغتصاب.</li> </ul>	<p>٣- التحرش والاعتداء والاستغلال الجنسي</p>

أنا الموقع أدناه، أقر بأنّي قرأت وتلّيت وفهمت وتلقّيت الشرح والتدريب والمعلومات الكافية عن مدونة السلوك التابعة للمشروع. وأوافق على الامتثال للمعايير الواردة فيها وأعرف أن أي إجراء يتعارض مع مدونة السلوك هذه قد يؤدي إلى اتخاذ إجراء تأديبي وقد يؤثر على استمرارية عملي ضمن مشروع تمديد شبكات مياه الصرف الصحي.

<p>أسم وامضاء المشرف على الاعمال (من قبل الاستشاري)</p> <p>التاريخ:</p>	<p>أسم وامضاء مسؤول الموقع (من قبل المتعهد)</p> <p>التاريخ:</p>	<p>أسم وامضاء العامل</p> <p>التاريخ:</p>
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☐ العامل يجيد القراءة، وقد دَوّن اسمه وإمضاءه

☐ العامل لا يجيد القراءة، وقد تُلّيت عليه مدونة السلوك وتمّ الامضاء نيابةً عنه من قبل الأخصائي الاجتماعي

Annex D: GRM Public Notice



مشروع الحدّ من تلوث بحيرة القرعون  
توسعة شبكة الصرف الصحي التابعة لمحطة المعالجة في عنجر - قب الياس (Lot 1)

آلية مراجعة الشكاوى (GRM)

للاستفسار أو لتقديم الإقتراحات أو الشكاوى، يرجى الإتصال بوحدة مراجعة الشكاوى لدى مجلس الانماء والإعمار  
من الاثنين إلى الجمعة بين التاسعة صباحاً والثالثة بعد الظهر، وذلك عبر:

- الهاتف: ٠١٩٨٠٠٩٦ – ٠١٩٨٠٠٩٧ / مقسم ١٤٩
- البريد الإلكتروني: [GRM.LQPPP@cdr.gov.lb](mailto:GRM.LQPPP@cdr.gov.lb)
- تسجيل كتاب رسمي لدى مجلس الانماء والاعمار على العنوان: تلة السراي - رياض الصلح، بيروت – لبنان

كما يمكن إبداء الرأي حول تنفيذ المشروع عن طريق مسح هذا الباركود:



مدير المشروع: المهندس سمير بلعيص (الهاتف: ٠٣٧٨١٣٤٥)

سيكون رأيكم مجهول المصدر



### Annex E: Hazard Assessment

**Table 1: 5x5 Risk Matrix with Numeric (quantity) and Word (quality) Ratings**

Likelihood \ Severity	Rare (1)	Remote (2)	Occasional (3)	Frequent (4)	Almost Certain (5)
Catastrophic (5)	5 (MED)	10 (MED)	15 (HIGH)	20 (HIGH)	25 (HIGH)
Major (4)	4 (MED)	8 (MED)	12 (MED)	16 (HIGH)	20 (HIGH)
Moderate (3)	3 (LOW)	6 (MED)	9 (MED)	12 (MED)	15 (HIGH)
Minor (2)	2 (LOW)	4 (MED)	6 (MED)	8 (MED)	10 (MED)
Negligible (1)	1 (LOW)	2 (LOW)	3 (LOW)	4 (MED)	5 (MED)

- 15-25: High Risk; immediate action required and senior management attention needed
- 4-12: Moderate risk; management responsibility should be specified
- 1-3: Low risk; manage by routine procedures

**Table 2: A Guide to Severity (S) Rating**

Level	Severity	Description
5	<b>Catastrophic</b>	Death, fatal diseases or multiple major injuries
4	<b>Major</b>	Serious injuries or life-threatening occupational diseases (includes amputations, major fractures, multiple injuries, occupational cancers, acute poisoning, disabilities and deafness)
3	<b>Moderate</b>	Injury or ill-health requiring medical treatment (includes lacerations, burns, sprains, minor fractures, dermatitis and work-related upper limb disorders).
2	<b>Minor</b>	Injury or ill-health requiring first-aid only (includes minor cuts and bruises, irritation, ill-health with temporary discomfort).
1	<b>Negligible</b>	Negligible injury

**Table 3: A guide to likelihood (L) rating**

Level	Likelihood	Description
1	<b>Rare</b>	Not expected to occur but still possible.
2	<b>Remote</b>	Not likely to occur under normal circumstances.
3	<b>Occasional</b>	Possible or known to occur.
4	<b>Frequent</b>	Common occurrence.
5	<b>Almost Certain</b>	Continual or repeating experience.

HAZARD IDENTIFICATION				RISK ANALYSIS				RISK CONTROL	
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/ EFFECT MAY CAUSE	L	S	RISK RATING		RECOMMENDED CONTROL MEASURES	RESPONSIBILITY
A-SITE PREPARATION WORKS									
1	Survey work	Expose to high speed moving vehicle	Struck by high speed vehicle and fatal	2	5	10	MED	<ul style="list-style-type: none"><li>Refer to Traffic Management Plan</li><li>To install traffic cone and safety warning signage to indicate man at work</li><li>To provide flagman to control traffic flow</li><li>Wearing of safety helmet, safety shoes/ boots and high visibility safety vest should be made mandatory</li></ul>	Contractor HSE Officer Supervisor Workers involved
		Expose to sharp protruding object	Potential to sustain legs injury	4	3	12	MED	<ul style="list-style-type: none"><li>To conduct visual site inspection prior to survey work</li><li>Wearing of safety helmet, safety shoes/ boots and high visibility safety vest should be made mandatory</li></ul>	Contractor HSE Officer Supervisor Workers involved
		Expose to direct sun heat	Potential to sustain dehydration	4	2	8	MED	<ul style="list-style-type: none"><li>To consume more clean drinking water.</li><li>Get frequent short break under shaded area.</li><li>To organize for work rotation.</li><li>Wearing of safety helmet, safety shoes/ boots and visible long sleeve shirt should be made mandatory.</li></ul>	Contractor HSE Officer Supervisor Workers involved
2	Site Access Preparation	Exposed to moving machinery	Potential to hit by machinery and cause physical injury	5	4	20	HIGH	<ul style="list-style-type: none"><li>To install hard barricade to indicate machinery working radius.</li><li>To provide and visibly display of safety notices and signage.</li><li>To engage flagman to control site vehicles movement.</li><li>Wearing of safety helmet, safety shoes/ boots and high visibility safety vest should be made mandatory.</li></ul>	Contractor HSE Officer Supervisor Workers involved
3	Site Access Preparation	Expose to direct sun heat	Potential to sustain dehydration	3	2	6	MED	<ul style="list-style-type: none"><li>To consume more clean drinking water.</li><li>Get frequent short break under shaded area.</li><li>To organize for work rotation.</li><li>Wearing of safety helmet, safety shoes/ boots, working gloves, safety vest, safety glasses and visible long sleeve shirt should be made mandatory.</li></ul>	Contractor HSE Officer Supervisor Workers involved

4	Mobilization of construction machineries	Poor access and egress	Machinery accident and overturned	3	4	12	MED	<ul style="list-style-type: none"> <li>To prepare safe designated access and egress road for construction Machineries mobilization.</li> <li>To provide guide to lead machineries to machinery yard.</li> <li>To install sufficient safety road signage and route indicator.</li> <li>To provide flagman to control machineries movement.</li> <li>Wearing of safety helmet, safety vest and safety shoes/boots should be made mandatory.</li> </ul>	Contractor HSE Officer Supervisor Workers involved
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HAZARD IDENTIFICATION				RISK ANALYSIS			RISK CONTROL		
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/ EFFECT MAY CAUSE	L	S		RISK RATING	RECOMMENDED CONTROL MEASURES	RESPONSIBILITY
B-USE OF HEAVY MOBILE EQUIPMENT									
1	Maintenance and pre-start checks	Malfunctioning of plant and tools	Plant may cause injury if not functioning properly.  Plant and tools may injure persons if faulty.	4	5	20	HIGH	<ul style="list-style-type: none"><li>• Ensure all plant, work items and tools pre-start checks are performed prior to operation or use, including daily maintenance check on the tires, lights, flashing lights, reverse beepers, signs, safety chains, secure attachment of connected items, locking pins, other safety items, correct function or fitment for task, and ensure any vehicle or towed item is in roadworthy condition at all times.</li><li>• Ensure hazard assessments and pre-start checks are completed on any hired in equipment.</li><li>• Ensure all operators are wearing appropriate PPE prior to use.</li><li>• All electrical leads, switches or high pressure hoses or fitting must be maintained to a very high standard and in accordance with the manufacturers original equipment specifications.</li><li>• Decommission any tool, plant or vehicle if safety faults are found, notify managers and remove keys or perform lock-out to prevent others using the item until faults are rectified.</li></ul>	Contractor HSE Officer Supervisor Workers involved
2	Maintenance and refueling of plant and tools	Untrained persons	Untrained persons may be injured during maintenance.	4	4	16	HIGH	<ul style="list-style-type: none"><li>• Ensure plant maintenance is completed regularly by qualified persons in accordance with manufacturers’ recommendations and all maintenance is recorded.</li><li>• Ensure vehicles or plant are fully shut down prior to inspection, cleaning or maintenance.</li><li>• Wait for radiator to cool before opening. Use a towel/cloth to open radiator cap after cooling.</li><li>• Only approved and trained persons are to access engine components or perform maintenance on vehicles or plant and do so only when shut down and sufficiently cooled with keys removed or starting controls isolated to stop others from switching on plant and wait until all movements have ceased prior to opening any access panels, covers or machine parts.</li></ul>	Contractor HSE Officer Supervisor Workers involved

		Exposure to chemicals or fumes during inspection, maintenance or operation of plant.	Potential to cause multiple respiratory or skin problems					<ul style="list-style-type: none"> <li>Do not operate or perform maintenance on unstable or steep inclines and ensure the plant is secured or braked to avoid the possibility of unexpected movement.</li> <li>In the event of a tire being changed on vehicles or plant ensure that the vehicle or plant is securely braked with wheels chocked and keys removed and it is correctly jacked with a jack rated to the load from a jacking location approved by the manufacturer and that back-up support from jack stands is present to avoid the item collapsing.</li> <li>Ensure locking devices or approved chocks are secure before conducting maintenance on or under raised items and that hydraulics are maintained in accordance with manufacturers' recommendations.</li> <li>Maintenance persons are to ensure to check and repair all fuel or oil leaks on plant.</li> <li>Ensure mufflers, spark arrestors, guards and manufacturer hazard management items and warning decals are present on plant and decommission and repair if faulty or not present.</li> <li>Operator to stop engine before refueling. Prior to filling fuel tank, ground nozzle against the fuel tank neck to avoid a spark. Refuel in a well-ventilated area. Ensure there are no naked flames in the area. Do not smoke. Avoid spilling fuel and collect any fuel run off and refer to MSDS for item and spill advice.</li> <li>Only operate plant or vehicles in a well ventilated keeping clear of engine and exhaust outlet.</li> <li>Persons are to use proper protective equipment during maintenance as follows; rubber gloves, safety glasses, protective clothing.</li> <li>Wash hands after any maintenance and don't eat or smoke during maintenance.</li> <li>Communicating chemical hazards to workers through labeling and marking</li> <li>Training workers in the use of the available information (such as MSDSs), safe work practices, and appropriate use of PPE</li> </ul>	
3	Use of: <ul style="list-style-type: none"> <li>Wheel Loader</li> <li>Dozer</li> </ul>	Lack of training	Persons may be injured due to lack of operator training.	4	4	16	HIGH	<ul style="list-style-type: none"> <li>Only licensed and trained operators are to operate vehicles, trucks or driven plant (from here on referred to as plant) and any attachments or lift mechanisms.</li> </ul>	Contractor HSE Officer Supervisor

	<ul style="list-style-type: none"> <li>• Truck</li> <li>• Grader</li> <li>• Asphalt Milling Machine</li> <li>• Bobcat Loader</li> <li>• Base Course Wheeled Compactor</li> <li>• Water Tank Sprayer</li> <li>• Spreader and Paver</li> <li>• Tandem Roller</li> <li>• Pneumatic Roller</li> <li>• Multi Wheeled Compactor Use</li> </ul>	Exposure to mobile plant or loads	Crushing or striking from contact with mobile plant or loads.					<ul style="list-style-type: none"> <li>• Drivers are to ensure plant is on a safe flat surface before driving or parking and ensure all persons are well clear of the plant and adjust driving speed, gear and switch to 4wd (if present) on slippery and uneven surfaces.</li> <li>• Drivers are to ensure to maintain safe driving speed and adjust speed relative to traffic, surface and weather conditions.</li> <li>• Operators are to ensure that when plant is bring loaded, unloaded or in operation that no person comes into contact with the plant or load and should stand away at all times and not ride any exterior surface or load area.</li> <li>• Operators are to secure loads and cover/close restraint devises &amp; tailgate prior to movement.</li> <li>• Prior to lift/lowering or transport, operators are to ensure contents are secure and within the rated capacity of the plant.</li> <li>• Operators are to perform a visual check of all plant fittings including attachments, covers, doors, pins, ropes or chains and check that loads are secure prior to operation or transport.</li> <li>• Operators are to ensure to maintain clear vision and turn and view or use mirrors when reversing or manoeuvring and when opening doors or protruding onto paths or roadways.</li> <li>• Ensure when manually loading or unloading that items cannot roll out and strike workers.</li> <li>• Workers are to ensure to stand well clear of load and storage areas when opening after transit as items may have moved.</li> <li>• Ensure all persons are wearing appropriate PPE including hard hat and steel capped boots.</li> <li>• Operators are to inspect site prior to raising loads and ensure ground levels will not contribute to plant instability or rollover and ensure when moving that loads are held as low as possible.</li> <li>• Drivers are to ensure truck is adequately braked prior to tipping operations.</li> <li>• Drivers are to maintain an exclusion zone around the plant during tipping or paving operations and ensure that when operating that all body parts and other persons are well clear of all movement, crush, pinch or drop zones.</li> </ul>	Workers involved
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								<ul style="list-style-type: none"> <li>• Drivers and passengers are to wear seat belts during operation of any vehicle or plant.</li> <li>• Where possible use a spotter whilst reversing and inspect area is clear of overhead services, persons, animals or obstacles prior to raising attachments, tipping or operation.</li> <li>• Operators are to be aware of people behind the plant when paving particularly workers performing scraping or clearing of debris.</li> <li>• Stop slow signs to be on site and used by the trained spotter when reversing in traffic areas.</li> <li>• Operators are to ensure handbrake is on at all times when stationary and the plant is in gear or park with hydraulic items fully lowered when not in use.</li> <li>• Ensure traffic management and exclusion zones are in place prior to set- up or any works operation and they conform to permits and the work plan and if they do not conform that managers are advised and work does not commence until items are rectified.</li> <li>• Operators are to report and decommission any plant if faulty items are found, notify managers, secure the plant and remove keys to prevent unauthorized access or use.</li> </ul>	
		Electrical works	Electrical shock from contact with live wires or conductors.	4	4	16	HIGH	<ul style="list-style-type: none"> <li>• Operators are to ensure that before setting up plant for work, extreme care is exercised to ensure that the plant will not make contact with any form of electrical sources (in particular overhead wiring) and/or conductors that could cause potential electrocution to the operator or other persons working on-site. And ensure to locate and identify any electrical dangers and allocate controls when conducting a site assessment.</li> <li>• They must also maintain limits of approach to power lines when raising hydraulic items, loads or carrying plant at height on other vehicles, and use a spotter when possible.</li> </ul>	Contractor HSE Officer Supervisor Workers involved
		Plant is fueled or lubricated by flammable substances.	Incidents due to handling of flammable materials	3	5	15	HIGH	<ul style="list-style-type: none"> <li>• Have MSDS's for fuel, oil and bitumen present with Plant at all sites and in transit and use MSDS's as a guide for safe handling, spills clean up and reporting.</li> <li>• No smoking or flames when fueling, lubricating or using Plant or associated plant.</li> <li>• Clean up any fuel or oil spills immediately using MSDS's as a guide.</li> </ul>	Contractor HSE Officer Supervisor Workers involved

								<ul style="list-style-type: none"> <li>Plant operators should be trained in the hazards/risks associated with exhaust fumes and not to use the plant in enclosed or poorly ventilated areas including checking and maintenance.</li> <li>Ensure Plant maintenance is completed regularly and only by a suitably qualified technician.</li> <li>Communicating chemical hazards to workers through labeling and marking</li> <li>Training workers in the use of the available information (such as MSDSs), safe work practices, and appropriate use of PPE</li> </ul>	
		Hydraulic hose may disconnect, split or tear on hydraulics for tipper	Injury may occur	3	5	15	HIGH	<ul style="list-style-type: none"> <li>Ensure the plant's maintenance on hydraulics is conducted regularly in accordance with the manufacturer's recommendations. All maintenance should be recorded.</li> <li>Ensure the machine is turned off and that operators and maintenance persons wear protective gloves and eye wear when connecting or disconnecting hydraulic hoses or fittings.</li> <li>Do not check for oil leaks with your hand and never allow your hand or other part of the body near a pressurized fluid leak. Always use a board or cardboard when checking for a leak and look for discoloration of the cardboard or wood.</li> <li>Do not operate the paver with frayed, kinked, cracked or damaged hoses, fittings or tubing.</li> <li>Stop the engine and relieve hydraulic system pressure before changing or adjusting fittings, hoses, tubing, or other system components and these tasks should only be performed by approved maintenance persons only.</li> <li>Operators are not to adjust any pre-set pressure settings of pumps or valves.</li> <li>Operators are to perform daily prestart checks including hydraulics and decommission plant if faults are evident.</li> </ul>	Contractor HSE Officer Supervisor Workers involved
		Plant's radiator fluid is under pressure when hot.	Injury may occur	3	5	15	HIGH	<ul style="list-style-type: none"> <li>Ensure when checking Plant's radiator that the motor is completely cool prior to opening the radiator pressure cap</li> </ul>	Contractor HSE Officer Supervisor Workers involved

		Exposure to engine, parts and exhaust.	Persons may be burnt on engine, parts and exhaust	3	5	15	HIGH	<ul style="list-style-type: none"> <li>Ensure exhaust guard on Plant is maintained and in place.</li> <li>Operators to keep clear of engine components and exhaust when inspecting or operating.</li> <li>Only authorized persons are to access Plant's engine compartment and are only to do so when the engine is off and sufficiently cool for the task.</li> </ul>	Contractor HSE Officer Supervisor Workers involved
		Spray hose may disconnect, split or tear.	Injury can occur if spray hose disconnect, split or tear.	3	4	12	MED	<ul style="list-style-type: none"> <li>Ensure the plant's maintenance on spray unit and hose is conducted regularly in accordance with the manufacturer's recommendations. All maintenance should be recorded.</li> <li>Ensure the machine is turned off and that operators and maintenance persons wear protective gloves and eye wear when connecting or disconnecting pressured hoses or fittings.</li> <li>Do not operate the Sprayer with worn, kinked, cracked or damaged hoses, fittings or attachments.</li> <li>Stop pump and relieve system pressure before changing or adjusting fittings, hoses, spray nozzle, or other spray components and this should only be performed by approved maintenance persons.</li> <li>Operators are to perform daily prestart checks including pump, hose if faults are evident.</li> </ul>	Contractor HSE Officer Supervisor Workers involved
		The hoses are not correctly laid	The hoses can create tripping hazards.					<ul style="list-style-type: none"> <li>Operators of the Sprayer should lay out hose in an orderly manner ensuring it does not constitute a trip hazard and is free of potential pinch or vehicle/plant crushing via driving over it.</li> <li>Operators are to ensure the correct mix is applied and it will dry adequately to prevent slip hazards.</li> </ul>	
		Exposure to sharp items	Cutting or puncturing from sharp items.	4	4	16	HIGH	<ul style="list-style-type: none"> <li>Operators are to ensure they wear gloves if handling any damaged or sharp fittings.</li> </ul>	Contractor HSE Officer Supervisor Workers involved
		Working at height and poor housekeeping	Slipping tripping or falling from plant, loads or debris.					<ul style="list-style-type: none"> <li>Ensure prior to inspection or cleaning the plant that all items are fully lowered and the plant is switched off and securely parked prior to any inspection or cleaning.</li> </ul>	

								<ul style="list-style-type: none"> <li>• If raised surfaces need to be entered operators should ensure surfaces are clean and dry and they maintain secure hand and foot placement at all times when ascending or descending.</li> <li>• Staff should wear high visibility safety vest, hardhat &amp; steel capped boots with a good grip at all times.</li> <li>• Use manufacturers' steps when accessing load areas when empty.</li> <li>• Ensure to sweep away debris from driving area, engine and gear box area on a regular basis.</li> </ul>	
		Fumes and dust created by the plant	Respiratory Problems	4	4	16	HIGH	<ul style="list-style-type: none"> <li>• Ensure that all plant is only operated in well-ventilated areas and are always positioned in a manner to reduce any person exposure to dust and debris.</li> <li>• Workers must wear dusk masks if working in dusty conditions.</li> </ul>	Contractor HSE Officer Supervisor Workers involved
		Manual handling of materials, tools, Plant attachments and debris.	Potential to sustain body injury and Musculoskeletal Disorder Syndrome (MSDs)	3	5	15	HIGH	<ul style="list-style-type: none"> <li>• Ensure to use mechanical aids or seek assistance with large volumes or heavy loads to minimize manual handling.</li> <li>• Ensure there are adequate numbers of staff on site to lift or move materials and debris.</li> <li>• Reduce loads to manageable sizes or volumes for any manual handling that needs to occur.</li> <li>• Rotate the workers throughout the day if symptoms of strain or fatigue occur particularly in hot or cold weather.</li> <li>• Ensure there is adequate water, shade or shelter present on site for worker breaks.</li> </ul>	Contractor HSE Officer Supervisor Workers involved
		Fatigue	Human error due to fatigue	3	5	15	HIGH	<ul style="list-style-type: none"> <li>• Ensure all staff are trained in recognizing and acknowledging fatigue symptoms and take regular breaks if operating Plant or shoveling for long periods.</li> <li>• Operators should advise managers prior to performing tasks if they feel unfit to drive or work from either fatigue, alcohol, drugs or illness</li> <li>• Work must be carried out by trained personnel.</li> <li>• Wearing of safety helmet, safety shoes/boots, safety vest and working gloves should be made mandatory.</li> <li>• Selecting and designing tools that reduce force requirements and holding times, and improve postures</li> <li>• Incorporating rest and stretch breaks into work processes, and conducting job rotation</li> </ul>	Contractor HSE Officer Supervisor Workers involved

								<ul style="list-style-type: none"> <li>Implementing quality control and maintenance programs that reduce unnecessary forces and exertions</li> </ul>	
		<p>Working under High temperature Direct sun light Dusty High wind</p>	<ul style="list-style-type: none"> <li>Heat exhaustion</li> <li>Heat stroke</li> <li>Dehydration</li> <li>Personal injuries due to high temperature, sunstroke &amp; tiredness</li> </ul>	4	4	16	HIGH	<ul style="list-style-type: none"> <li>Arrange adequate drinking water and rest shelter</li> <li>Drink plenty of water with electrolyte</li> <li>If feel something unusual immediately inform supervisor and report to site clinic.</li> <li>Makeshift to operate the routine work</li> <li>Do not allowed alone work</li> <li>Frequent breaks</li> <li>Proper supervision available</li> <li>Correct PPE must use</li> <li>Conduct toolbox talk</li> <li>Proper signage for drinking water</li> <li>Monitoring weather forecasts for outdoor work to provide advance warning of extreme weather and scheduling work accordingly</li> <li>Adjustment of work and rest periods depending on the temperature and workloads</li> </ul>	<p>Contractor HSE Officer Supervisor Workers involved</p>
		<p>Working at night time</p>	<ul style="list-style-type: none"> <li>Poor visibility due to darkness / poor illumination</li> <li>Lone worker</li> </ul>	3	4	12	MED	<ul style="list-style-type: none"> <li>Proper lighting system should be in place</li> <li>Ensure proper Communication / Coordination and close supervision</li> <li>Industrial safe torches to be available for emergency situations</li> <li>High visibility Traffic Vest for personnel in night shift</li> <li>Avoid lone working and always ensure buddy system while working at night</li> </ul>	<p>Contractor HSE Officer Supervisor Workers involved</p>

HAZARD IDENTIFICATION				RISK ANALYSIS				RISK CONTROL	
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/EFFECT MAY CAUSE	L	S		RISK RATING	RECOMMENDED CONTROL MEASURES	RESPONSIBILITY
C-EXCAVATION WORKS									
1	Mechanical excavation	Worker presence within the working radius of excavator	Hit by excavator or backhoe moving arm and bucket and cause Fatal	4	5	20	HIGH	<ul style="list-style-type: none"><li>Refer to Traffic Management Plan</li><li>To cordon machinery working vicinity.</li><li>To provide standing supervision by designated person.</li><li>Excavation work must be carried out by trained personnel.</li><li>Wearing of safety helmet, safety glasses, safety shoes/boots and high visibility safety vest should be made mandatory.</li></ul>	Contractor HSE Officer Supervisor Workers involved
		Inadequate protection for public	Public fall into excavated trench and cause serious injury	4	4	16	HIGH	<ul style="list-style-type: none"><li>Refer to Traffic Management Plan</li><li>To install guard rail or fencing along excavated area.</li><li>During darkness to provide adequate illumination and warning light.</li><li>To construct safe temporary foot walk for the public.</li><li>To provide flagman or watchman to warn public of the excavation work.</li><li>To erect sufficient safety warning signage and notices.</li></ul>	Contractor HSE Officer Supervisor Workers involved
		Poor shoring	Excavation wall collapse – buried alive/ Fatal	4	5	20	HIGH	<ul style="list-style-type: none"><li>To provide and maintain adequate and appropriate shoring.</li><li>Supervisor to inspect shoring every time prior commencing with excavation work.</li><li>Shoring design and calculation must be endorsed by Practicing Professional Engineer (PE) and periodically inspected</li><li>Wearing of safety helmet, safety vest and safety shoes/boots should be made mandatory</li></ul>	Contractor HSE Officer Supervisor Workers involved
		Spoils or heavy loads are place less than 600mm from excavation edge	Excavation wall collapse – buried alive/ Fatal	4	5	20	HIGH	<ul style="list-style-type: none"><li>To demark 600mm line along excavation area for easy identification of placing spoils and heavy loads.</li><li>To provide standing supervision by designated person.</li><li>Wearing of safety helmet, safety vest and safety shoes/boots should be made mandatory</li></ul>	Contractor HSE Officer Supervisor Workers involved

HAZARD IDENTIFICATION				RISK ANALYSIS				RISK CONTROL	
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/EFFECT MAY CAUSE	L	S	RISK RATING		RECOMMENDED CONTROL MEASURES	RESPONSIBILITY
C-EXCAVATION WORKS									
		Poor access and egress into trench	Slip, trip and fall and cause bodily injury	4	2	8	MED	<ul style="list-style-type: none"><li>• To provide proper ladder as safe access and egress from such excavation i.e. for 1.2 meter deep and more.</li><li>• To carry out inspection of excavated area by Supervision prior to excavation work commencement.</li><li>• Wearing of safety helmet, safety vest and safety shoes/boots should be made mandatory</li></ul>	Contractor HSE Officer Supervisor Workers involved
		Exposure to machine	Flying objects Noise and vibration Dust Over-exertion / strain injury Electrical hazard Machine malfunction Loss of control over machine Fatigue	4	5	20	HIGH	<ul style="list-style-type: none"><li>• Ensure work area is clear of other workers</li><li>• During excavation, operators must wear eye protection, safety footwear and gloves for handling sharp objects; dust mask if dust is present.</li><li>• During operation, the machine will generate hazardous levels of noise. Wearing hearing protection is necessary.</li><li>• Inspect and test the machine prior to use</li><li>• Make sure all manufacturer’s protective devices (guards) are in place and operational</li><li>• All operators must follow safe work postures and movements.</li><li>• Take regular breaks or switch with another worker (if excavating for a prolonged period of time) to relieve from fatigue.</li></ul>	Contractor HSE Officer Supervisor Workers involved
2	Manual Excavation	Excessive manual handling	Potential to sustain body injury and Musculoskeletal Disorder Syndrome (MSDs)	5	2	10	MED	<ul style="list-style-type: none"><li>• Excavation work must be carried out by trained personnel.</li><li>• Wearing of safety helmet, safety shoes/boots, safety vest and working gloves should be made mandatory.</li><li>• Use of mechanical assists to eliminate or reduce exertions required to lift materials, hold tools and work objects, and requiring multi-person lifts if weights exceed thresholds</li><li>• Selecting and designing tools that reduce force requirements and holding times, and improve postures</li><li>• Incorporating rest and stretch breaks into work processes, and conducting job rotation</li></ul>	Contractor HSE Officer Supervisor Workers involved

HAZARD IDENTIFICATION				RISK ANALYSIS			RISK CONTROL	
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/EFFECT MAY CAUSE	L	S	RISK RATING	RECOMMENDED CONTROL MEASURES	RESPONSIBILITY
<b>C-EXCAVATION WORKS</b>								
							<ul style="list-style-type: none"> <li>Implementing quality control and maintenance programs that reduce unnecessary forces and exertions</li> </ul>	
		Poor access and egress into trench	Slip, trip and fall and cause bodily injury	4	2	8	MED <ul style="list-style-type: none"> <li>To provide proper ladder as safe access and egress from such excavation i.e. for 1.2 meter deep and more.</li> <li>Work must be carried out by trained personnel.</li> <li>Wearing of safety helmet, safety vest and safety shoes/boots should be made mandatory</li> </ul>	Contractor HSE Officer Supervisor Workers involved
		Spoils or heavy loads are place less than 600mm from excavation edge	Excavation wall collapse – buried alive/ Fatal	4	5	20	HIGH <ul style="list-style-type: none"> <li>To demark 600mm line along excavation area for easy identification of placing spoils and heavy loads.</li> <li>To provide standing supervision by designated person.</li> <li>Work must be carried out by trained personnel.</li> <li>Wearing of safety helmet, safety vest and safety shoes/boots should be made mandatory</li> </ul>	Contractor HSE Officer Supervisor Workers involved
		Working under High temperature, direct sunlight, dusty, high wind	<ul style="list-style-type: none"> <li>Heat exhaustion.</li> <li>Heat stroke</li> <li>Dehydration</li> <li>Personal injuries due to high temperature, sunstroke &amp; tiredness</li> </ul>	4	4	16	HIGH <ul style="list-style-type: none"> <li>Arrange adequate drinking water and rest shelter</li> <li>Drink plenty of water with electrolyte</li> <li>If feel something unusual immediately inform supervisor and report to site clinic.</li> <li>Makeshift to operate the routine work</li> <li>Do not allowed alone work</li> <li>Frequent breaks</li> <li>Proper supervision available</li> <li>Correct PPE must use</li> <li>Conduct toolbox talk</li> <li>Proper signage for drinking water</li> <li>Monitoring weather forecasts for outdoor work to provide advance warning of extreme weather and scheduling work accordingly</li> </ul>	Contractor HSE Officer Supervisor Workers involved

HAZARD IDENTIFICATION				RISK ANALYSIS			RISK CONTROL	
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/EFFECT MAY CAUSE	L	S	RISK RATING	RECOMMENDED CONTROL MEASURES	RESPONSIBILITY
C-EXCAVATION WORKS								
							<ul style="list-style-type: none"> <li>Adjustment of work and rest periods depending on the temperature and workloads</li> </ul>	
		Working at nighttime	<ul style="list-style-type: none"> <li>Poor visibility due to darkness / poor illumination</li> <li>Lone worker</li> </ul>	3	4	12	<ul style="list-style-type: none"> <li>Proper lighting system should be in place</li> <li>Ensure proper communication/ coordination and close supervision</li> <li>Industrial safe torches to be available for emergency situations</li> <li>High visibility Traffic Vest for personnel in night shift</li> <li>Avoid lone working and always ensure buddy system while working at night</li> </ul>	Contractor HSE Officer Supervisor Workers involved

HAZARD IDENTIFICATION				RISK ANALYSIS			RISK CONTROL		
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/EFFECT MAY CAUSE	L	S	RISK RATING	RECOMMENDED CONTROL MEASURES	RESPONSIBILITY	
D-CONCRETE/INCIDENTAL WORKS									
1	Formwork fabrication	Exposed to moving or dangerous parts machinery	Cut or entangle by moving part of machinery sustain serious injury	4	4	16	HIGH	<ul style="list-style-type: none"><li>To fix all machine with guarding or protection device.</li><li>To cordon off fabricating vicinity.</li><li>To provide standing supervision.</li><li>Work to be carried out by trained personnel.</li><li>Wearing of safety helmet, safety shoes/ boots, working gloves, safety vest and safety glasses should be made mandatory.</li><li>Turning off, disconnecting, isolating, and de-energizing (Locked Out and Tagged Out) machinery with exposed or guarded moving parts, or in which energy can be stored (e.g. compressed air, electrical components) during servicing or maintenance.</li></ul>	Contractor HSE Officer Supervisor Workers involved
		Excessive manual handling	Potential to sustain body injury and Musculoskeletal Disorder Syndrome (MSDs)	5	2	10	MED	<ul style="list-style-type: none"><li>To maximize usage of machinery aid to minimize manual handling.</li><li>Work must be carried out by trained personnel.</li><li>Wearing of safety helmet, safety shoes/boots, safety vest and working gloves should be made mandatory.</li><li>Use of mechanical assists to eliminate or reduce exertions required to lift materials, hold tools and work objects, and requiring multi-person lifts if weights exceed thresholds</li><li>Selecting and designing tools that reduce force requirements and holding times, and improve postures</li><li>Incorporating rest and stretch breaks into work processes, and conducting job rotation</li><li>Implementing quality control and maintenance programs that reduce unnecessary forces and exertions</li></ul>	Contractor HSE Officer Supervisor Workers involved
2	Rebar fabrication work	Expose to moving and dangerous part of machinery	Potential to be caught in between moving part of machinery and cause serious injury	4	4	16	HIGH	<ul style="list-style-type: none"><li>To install machine guarding on moving and dangerous part of machinery.</li><li>Work must be carried out by trained personnel.</li><li>To provide full time supervision.</li><li>Wearing of safety helmet, safety shoes/boots, high visibility safety vest and working gloves should be made mandatory.</li><li>Turning off, disconnecting, isolating, and de-energizing (Locked Out and Tagged Out) machinery with exposed or guarded moving parts,</li></ul>	Contractor HSE Officer Supervisor Workers involved

HAZARD IDENTIFICATION				RISK ANALYSIS				RISK CONTROL	
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/EFFECT MAY CAUSE	L	S		RISK RATING	RECOMMENDED CONTROL MEASURES	RESPONSIBILITY
D-CONCRETE/INCIDENTAL WORKS									
								or in which energy can be stored (e.g. compressed air, electrical components) during servicing or maintenance.	
		Excessive manual handling	Potential to sustain body injury and Musculoskeletal Disorder Syndrome (MSDs)	5	2	10	MED	<ul style="list-style-type: none"><li>To maximize usage of machinery aid to minimize manual handling.</li><li>To organize work rotation</li><li>Work must be carried out by trained personnel.</li><li>Wearing of safety helmet, safety shoes/boots, safety vest and working gloves should be made mandatory.</li></ul>	Contractor HSE Officer Supervisor Workers involved
3	Formwork and rebar installation	Excessive manual handling	Potential to sustain body injury and Musculoskeletal Disorder Syndrome (MSDs)	5	2	10	MED	<ul style="list-style-type: none"><li>To maximize usage of machinery aid to minimize manual handling.</li><li>Work must be carried out by trained personnel.</li><li>Wearing of safety helmet, safety shoes/boots, safety vest and working gloves should be made mandatory.</li><li>Use of mechanical assists to eliminate or reduce exertions required to lift materials, hold tools and work objects, and requiring multi-person lifts if weights exceed thresholds</li><li>Selecting and designing tools that reduce force requirements and holding times, and improve postures</li><li>Incorporating rest and stretch breaks into work processes, and conducting job rotation</li><li>Implementing quality control and maintenance programs that reduce unnecessary forces and exertions</li></ul>	Contractor HSE Officer Supervisor Workers involved
		Expose to sharp object	Potential to puncture and cause bodily injury	5	2	10	MED	<ul style="list-style-type: none"><li>To provide safe access and egress.</li><li>To fix capping for protruding rebar.</li><li>Work must be carried out by trained personnel.</li><li>To install capping to protruding rebar.</li><li>Wearing of safety helmet, safety shoes/boots, working gloves and safety vest should be made mandatory.</li></ul>	Contractor HSE Officer Supervisor Workers involved
		Exposure to moving load	Potential to be hit or crush and cause body injury	5	5	25	HIGH	<ul style="list-style-type: none"><li>To cordon working vicinity.</li><li>To use Tag Line to control pile movement.</li><li>Wisel to be used by signalman as warning during hoisting.</li><li>To provide standing supervision.</li></ul>	Contractor HSE Officer Supervisor Workers involved

HAZARD IDENTIFICATION				RISK ANALYSIS			RISK CONTROL	
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/EFFECT MAY CAUSE	L	S	RISK RATING	RECOMMENDED CONTROL MEASURES	RESPONSIBILITY
D-CONCRETE/INCIDENTAL WORKS								
							<ul style="list-style-type: none"> <li>To provide train signalman.</li> <li>Work must be carried out by trained personnel.</li> <li>Cordon off the work area to prevent unauthorized entry.</li> <li>Wearing of safety helmet, safety shoes/ boots, high visibility safety vest and working gloves should be made mandatory.</li> </ul>	
		Exposed to work at height	Potential to fall from height and fatal	4	5	20	<b>HIGH</b> <ul style="list-style-type: none"> <li>To provide safe access and egress.</li> <li>To provide safe working platform with perimeter guard rail.</li> <li>To install guard rail on opening edge.</li> <li>To install temporary guard rails as an edge protection.</li> <li>Hard barricade/cover to floor opening.</li> <li>To provide adequate lighting.</li> <li>To provide standing supervision.</li> <li>Employees must be trained to work at height.</li> <li>Wearing of safety helmet, safety shoes/boots, safety harness (Whenever a worker is exposed to the hazard of falling from more than two meters) and safety vest should be made mandatory.</li> <li>Use of control zones and safety monitoring systems to warn workers of their proximity to fall hazard zones</li> </ul>	Contractor HSE Officer Supervisor Workers involved
4	Manual Concrete Casting	Expose to contact with wet cement mixture	Potential to sustain Dermatitis	5	2	10	<b>MED</b> <ul style="list-style-type: none"> <li>To use concrete pump for concrete casting work.</li> <li>Work must be carried out by trained personnel.</li> <li>To organize for work rotation.</li> <li>Wearing of safety helmet with face protection, water proof safety boots, water proof working gloves, safety vest and working jacket should be made mandatory.</li> <li>Communicating chemical hazards to workers through labeling and marking</li> <li>Training workers in the use of the available information (such as MSDSs), safe work practices, and appropriate use of PPE</li> </ul>	Contractor HSE Officer Supervisor Workers involved
		Excessive manual handling	Potential to sustain body injury and Musculoskeletal	5	2	10	<b>MED</b> <ul style="list-style-type: none"> <li>To maximize usage of machinery aid to minimize manual handling.</li> <li>Work must be carried out by trained personnel.</li> </ul>	Contractor HSE Officer

HAZARD IDENTIFICATION				RISK ANALYSIS			RISK CONTROL		
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/EFFECT MAY CAUSE	L	S	RISK RATING	RECOMMENDED CONTROL MEASURES	RESPONSIBILITY	
D-CONCRETE/INCIDENTAL WORKS									
			Disorder Syndrome (MSDs)				<ul style="list-style-type: none"><li>• Wearing of safety helmet, safety shoes/boots, safety vest and working gloves should be made mandatory.</li><li>• Use of mechanical assists to eliminate or reduce exertions required to lift materials, hold tools and work objects, and requiring multi-person lifts if weights exceed thresholds</li><li>• Selecting and designing tools that reduce force requirements and holding times, and improve postures</li><li>• Incorporating rest and stretch breaks into work processes, and conducting job rotation</li><li>• Implementing quality control and maintenance programs that reduce unnecessary forces and exertions</li></ul>	Supervisor Workers involved	
5	Mechanical Aid Concrete Casting	Unsafe construction of formwork	Collapse of formwork	4	5	20	HIGH	<ul style="list-style-type: none"><li>• All formwork must be endorsed by Practicing PE.</li><li>• Work to be performed by trained personnel.</li><li>• To provide standing supervision.</li><li>• Formwork must be inspected prior to concreting.</li><li>• Wearing of safety helmet with face protection, water proof safety boots, safety vest and water proof working gloves should be made mandatory.</li></ul>	Contractor HSE Officer Supervisor Workers involved
		Expose to moving concrete load	Hit and crush by moving load and fatal	4	5	20	HIGH	<ul style="list-style-type: none"><li>• To cordon working vicinity.</li><li>• To use Tag Line to control pile movement if mobile crane is used for pipes unloading.</li><li>• To provide standing supervision.</li><li>• To provide trained signalman</li><li>• Wearing of safety helmet, safety shoes/ boots, high visibility safety vest and working gloves should be made mandatory.</li></ul>	Contractor HSE Officer Supervisor Workers involved
		Expose to contact with wet cement mixture	Potential to sustain Dermatitis	5	2	10	MED	<ul style="list-style-type: none"><li>• To use concrete pump for concrete casting work.</li><li>• Work must be carried out by trained personnel.</li><li>• To organize work rotation.</li><li>• Wearing of safety helmet with face protection, water proof safety boots, water proof working gloves, safety vest and working jacket should be made mandatory.</li></ul>	Contractor HSE Officer Supervisor Workers involved

HAZARD IDENTIFICATION				RISK ANALYSIS			RISK CONTROL		
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/EFFECT MAY CAUSE	L	S	RISK RATING	RECOMMENDED CONTROL MEASURES	RESPONSIBILITY	
D-CONCRETE/INCIDENTAL WORKS									
							<ul style="list-style-type: none"><li>Communicating chemical hazards to workers through labeling and marking</li><li>Training workers in the use of the available information (such as MSDSs), safe work practices, and appropriate use of PPE</li></ul>		
6	Dismantling formwork manually	Unsafe construction of formwork	Collapse of formwork	4	5	20	HIGH	<ul style="list-style-type: none"><li>All formwork must be endorsed by Practicing Professional Engineer (PE).</li><li>Work to be performed by trained personnel.</li><li>To provide full time supervision by designated person.</li><li>Dismantling work must be carried out as per the approved and appropriate dismantling sequence.</li><li>Formwork must be inspected by designated person prior to dismantling.</li><li>Wearing of safety helmet, safety boots, safety vest, safety harness (Whenever a worker is exposed to the hazard of falling from more than two meters) and working gloves should be made mandatory.</li></ul>	Contractor HSE Officer Supervisor Workers involved
		Wrong dismantling sequence	Hit by formwork components – serious injury	4	4	16	HIGH	<ul style="list-style-type: none"><li>Cordon the area of dismantling formwork.</li><li>To provide right dismantling sequence drawing and instruction to designated person.</li><li>To provide standing supervision.</li><li>To install safety warning signage at strategic location.</li><li>Wearing of safety helmet, safety shoes/ boots, safety vest, safety harness (Whenever a worker is exposed to the hazard of falling from more than two meters) and working gloves should be made mandatory.</li></ul>	Contractor HSE Officer Supervisor Workers involved
7	Manual mixing of concrete/ Mortar mixing	Expose to contact or splash by wet cement mixture	Potential to sustain dermatitis and eye injury	3	3	9	MED	<ul style="list-style-type: none"><li>To conduct periodic inspection on mixing works</li><li>Work must be carried out by trained personnel.</li><li>Wearing of safety helmet, waterproof safety shoes/boots, waterproof hand gloves, safety vest and safety face protection should be made mandatory.</li><li>Communicating chemical hazards to workers through labelling and marking</li></ul>	Contractor HSE Officer Supervisor Workers involved

HAZARD IDENTIFICATION				RISK ANALYSIS				RISK CONTROL	
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/EFFECT MAY CAUSE	L	S		RISK RATING	RECOMMENDED CONTROL MEASURES	RESPONSIBILITY
D-CONCRETE/INCIDENTAL WORKS									
								<ul style="list-style-type: none"><li>Training workers in the use of the available information (such as MSDSs), safe work practices, and appropriate use of PPE</li></ul>	
8	Stone/ Block Laying Works	Exposed to crush by material	Potential to sustain finger injury	4	2	8	MED	<ul style="list-style-type: none"><li>Work must be carried out by trained personnel.</li><li>Ensure compliances of Safe Work Instruction.</li><li>To grasp one block at a time.</li><li>Wearing of safety helmet, safety shoes/boots, safety vest and working gloves should be made mandatory.</li></ul>	Contractor HSE Officer Supervisor Workers involved
		Unsecured block or stone	Falling object potential to hit and cause head injury and fatal	4	5	20	HIGH	<ul style="list-style-type: none"><li>To install catch platform.</li><li>To cordon below of laying work location to prevent unauthorized entry.</li><li>To erect adequate and appropriate working platform.</li><li>To ensure that there are no loose block or stone pallets are placed too close to building edges.</li><li>To keep materials on platform only at minimum or allowable number.</li><li>To provide standing supervision.</li><li>Wearing of safety helmet, safety vest and safety shoes/boots should be made mandatory.</li></ul>	Contractor HSE Officer Supervisor Workers involved
		Excessive manual handling	Potential to sustain body injury and Musculoskeletal Disorder Syndrome (MSDs)	5	2	10	MED	<ul style="list-style-type: none"><li>To maximize usage of machinery aid to minimize manual handling.</li><li>Work must be carried out by trained personnel.</li><li>Wearing of safety helmet, safety shoes/boots, safety vest and working gloves should be made mandatory.</li><li>Use of mechanical assists to eliminate or reduce exertions required to lift materials, hold tools and work objects, and requiring multi-person lifts if weights exceed thresholds</li><li>Selecting and designing tools that reduce force requirements and holding times, and improve postures</li><li>Incorporating rest and stretch breaks into work processes, and conducting job rotation</li><li>Implementing quality control and maintenance programs that reduce unnecessary forces and exertions</li></ul>	Contractor HSE Officer Supervisor Workers involved

HAZARD IDENTIFICATION				RISK ANALYSIS				RISK CONTROL	
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/EFFECT MAY CAUSE	L	S		RISK RATING	RECOMMENDED CONTROL MEASURES	RESPONSIBILITY
D-CONCRETE/INCIDENTAL WORKS									
		Expose to contact with wet cement	Potential to sustain Dermatitis	5	2	10	MED	<ul style="list-style-type: none"><li>• Work must be carried out by trained personnel.</li><li>• To organize work rotation.</li><li>• Wearing of safety helmet with face protection, water proof safety boots, water proof working gloves and safety vest should be made mandatory.</li><li>• Communicating chemical hazards to workers through labeling and marking</li><li>• Training workers in the use of the available information (such as MSDSs), safe work practices, and appropriate use of PPE</li></ul>	Contractor HSE Officer Supervisor Workers involved
		Exposed to fall while working at height	Potential to fall from height and may cause fatal	4	5	20	HIGH	<ul style="list-style-type: none"><li>• To install horizontal and vertical life line.</li><li>• To install temporary guard rails as an edge protection.</li><li>• To provide standing supervision.</li><li>• Employees must be trained to work at height.</li><li>• Wearing of safety helmet, suitable foot wears, working gloves, safety vest and full body harness (Whenever a worker is exposed to the hazard of falling from more than two meters) should be made mandatory.</li><li>• Use of control zones and safety monitoring systems to warn workers of their proximity to fall hazard zones</li></ul>	Contractor HSE Officer Supervisor Workers involved
		Working under high temperature, direct sunlight, dusty high wind	<ul style="list-style-type: none"><li>• Heat exhaustion.</li><li>• Heat stroke</li><li>• Dehydration</li><li>• Personal injuries due to high temperature, Sunstroke &amp; Tiredness</li></ul>	4	4	16	HIGH	<ul style="list-style-type: none"><li>• Arrange adequate drinking water and rest shelter</li><li>• Drink plenty of water with electrolyte</li><li>• If feel something unusual immediately inform supervisor and report to site clinic.</li><li>• Makeshift to operate the routine work</li><li>• Do not allowed alone work</li><li>• Frequent breaks</li><li>• Proper supervision available</li><li>• Correct PPE must use</li><li>• Conduct toolbox talk</li><li>• Proper signage for drinking water</li></ul>	Contractor HSE Officer Supervisor Workers involved

HAZARD IDENTIFICATION				RISK ANALYSIS			RISK CONTROL		
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/EFFECT MAY CAUSE	L	S	RISK RATING	RECOMMENDED CONTROL MEASURES	RESPONSIBILITY	
D-CONCRETE/INCIDENTAL WORKS									
							<ul style="list-style-type: none"><li>Monitoring weather forecasts for outdoor work to provide advance warning of extreme weather and scheduling work accordingly</li><li>Adjustment of work and rest periods depending on the temperature and workloads</li></ul>		
		Working at night-time	<ul style="list-style-type: none"><li>Poor visibility due to darkness / poor illumination</li><li>Lone worker</li></ul>	3	4	12	MED	<ul style="list-style-type: none"><li>Proper lighting system should be in place</li><li>Ensure proper Communication / Coordination and close supervision</li><li>Industrial safe torches to be available for emergency situations</li><li>High visibility Traffic Vest for personnel in night shift</li><li>Avoid lone working and always ensure buddy system while working at night</li></ul>	Contractor HSE Officer Supervisor Workers involved
9	Painting works	Exposed to inhalation of chemical vapor/ fume	Potential to cause respiratory problem	4	3	12	MED	<ul style="list-style-type: none"><li>To perform solvent and paint mixing work at open or well-ventilated location or other wise to provide localized mechanical ventilation fan.</li><li>To provide and use mechanical stirring device.</li><li>To keep a distance between worker and paint mixer during stirring work.</li><li>Work must be carried out by trained personnel.</li><li>Wearing of safety helmet with face protection, safety vest, safety shoes/ boots, solvent resistant according to Safety Data Sheet (SDS) requirement should be made mandatory.</li><li>Communicating chemical hazards to workers through labelling and marking</li><li>Training workers in the use of the available information (such as MSDSs), safe work practices, and appropriate use of PPE</li></ul>	Contractor HSE Officer Supervisor Workers involved
		Exposed to flammable liquid i.e., thinner (solvent)	Potential to cause fire, burns and property	3	5	15	HIGH	<ul style="list-style-type: none"><li>Thinner or other solvents shall be kept in a secured container and adequately labelled.</li><li>To provide portable fire extinguisher within the reach of the paint mixing worker.</li><li>Mixing work to be carried out in well ventilated area.</li><li>To identify and remove combustible material with the paint mixing location prior to work.</li></ul>	Contractor HSE Officer Supervisor Workers involved

HAZARD IDENTIFICATION				RISK ANALYSIS			RISK CONTROL	
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/EFFECT MAY CAUSE	L	S	RISK RATING	RECOMMENDED CONTROL MEASURES	RESPONSIBILITY
D-CONCRETE/INCIDENTAL WORKS								
							<ul style="list-style-type: none"> <li>• Ensure no source of fire at mixing area.</li> <li>• To provide standing supervision.</li> <li>• Where the flammable material is mainly comprised of dust, providing electrical grounding, spark detection, and, if needed, quenching systems.</li> <li>• Defining and labeling fire hazards areas to warn of special rules (e.g. prohibition in use of smoking materials, cellular phones, or other potential spark generating equipment)</li> <li>• Providing specific worker training in handling of flammable materials, and in fire prevention or suppression</li> <li>• Wearing of safety helmet, safety shoes/ boots, safety vest and chemical resistant gloves should be made mandatory.</li> </ul>	
		Exposed to awkward body posture	Potential to sustain body injury and Musculoskeletal Disorder Syndrome (MSDS)	5	2	10	<ul style="list-style-type: none"> <li>• Work must be carried out by trained personnel.</li> <li>• Organize for work rotation.</li> <li>• Wearing of safety helmet, safety shoe/ boots, safety vest and working gloves should be made mandatory.</li> </ul>	Contractor HSE Officer Supervisor Workers involved
		Excessive manual handling	Potential to sustain body injury and Musculoskeletal Disorder Syndrome (MSDS)	5	2	10	<ul style="list-style-type: none"> <li>• To maximize usage of machinery aid to minimize manual handling.</li> <li>• Work must be carried out by trained personnel.</li> <li>• Wearing of safety helmet, safety shoes/boots, safety vest and working gloves should be made mandatory.</li> <li>• Use of mechanical assists to eliminate or reduce exertions required to lift materials, hold tools and work objects, and requiring multi-person lifts if weights exceed thresholds</li> <li>• Selecting and designing tools that reduce force requirements and holding times, and improve postures</li> <li>• Incorporating rest and stretch breaks into work processes, and conducting job rotation</li> <li>• Implementing quality control and maintenance programs that reduce unnecessary forces and exertions</li> </ul>	Contractor HSE Officer Supervisor Workers involved

HAZARD IDENTIFICATION				RISK ANALYSIS				RISK CONTROL	
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/EFFECT MAY CAUSE	L	S		RISK RATING	RECOMMENDED CONTROL MEASURES	RESPONSIBILITY
D-CONCRETE/INCIDENTAL WORKS									
		Unsafe construction working platform	Working platform collapse potential to cause fatal	4	5	20	HIGH	<ul style="list-style-type: none"><li>Working platform must be erected by competent erector.</li><li>Only approved materials must be used for the platform erection.</li><li>Topmost working platform is fixed with top rails, mid rail and toe board.</li><li>Cordon off work area to prevent unauthorized entry.</li><li>To provide standing supervision.</li><li>To inspect working platform prior to use.</li><li>Wearing of safety helmet, safety vest, working gloves and suitable foots wear should be made mandatory.</li></ul>	Contractor HSE Officer Supervisor Workers involved
		Exposed to fall while working at height	Fall from height and may cause fatal	5	5	25	HIGH	<ul style="list-style-type: none"><li>To install horizontal and vertical lifeline.</li><li>To install temporary guard rails as an edge protection.</li><li>To provide standing supervision.</li><li>Employees must be trained to work at height.</li><li>Wearing of safety helmet, suitable foot wears, working gloves, safety vest and full body harness (Whenever a worker is exposed to the hazard of falling from more than two meters) should be made mandatory.</li><li>Use of control zones and safety monitoring systems to warn workers of their proximity to fall hazard zones</li></ul>	Contractor HSE Officer Supervisor Workers involved
10	Saw cutting machine	Lack of training	Persons may be injured due to lack of operator training	4	4	16	HIGH	<ul style="list-style-type: none"><li>Only trained operators are to operate the machine</li><li>Operators are to ensure plant is on a safe surface and ensure all persons are well clear of the machine</li><li>Operators are to perform a visual check of all machine fittings</li><li>Ensure all persons are wearing appropriate PPE including Gloves made of rubber or synthetic materials (Neoprene), leather, steel, insulating materials, etc.</li></ul>	Contractor HSE Officer Supervisor Workers involved
		Exposure to machine	Flying objects, noise, dust over-exertion / strain injury electrical hazard/ contact with moving blade/ Machine	4	5	20	HIGH	<ul style="list-style-type: none"><li>Ensure work area is clear of other workers</li><li>During cutting, operators must wear eye protection, safety footwear and gloves for handling sharp objects; dust mask if dust is present.</li><li>During operation, the machine will generate hazardous levels of noise. Wearing hearing protection is necessary.</li></ul>	Contractor HSE Officer Supervisor Workers involved

HAZARD IDENTIFICATION				RISK ANALYSIS			RISK CONTROL	
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/EFFECT MAY CAUSE	L	S	RISK RATING	RECOMMENDED CONTROL MEASURES	RESPONSIBILITY
D-CONCRETE/INCIDENTAL WORKS								
			malfunction/ Loss of control over machine/ Fatigue				<ul style="list-style-type: none"> <li>Inspect and test the machine prior to use</li> <li>Make sure all manufacturer's protective devices (guards) are in place and operational</li> <li>For cutting, make sure the blade guard is in the lowered position.</li> <li>When starting machine, the operator must stand outside the path of the blade.</li> <li>While cutting, if the machine stalls, raise the blade, inspect the outside flange, and nut for tightness. When restarting, make sure the blade is aligned with the previous cut. Never start the machine with the blade inside the cut; raise blade to restart.</li> <li>Whenever possible, wet cut concrete and asphalt; they contain silica.</li> <li>Make sure there is adequate supply of water for cutting.</li> <li>Before touching blade with hands, make sure the engine is off.</li> <li>All operators must follow safe work postures and movements.</li> <li>For using hand-held saws that are electrically powered, use through a safety switch.</li> <li>Electric saws should be approved, double insulated. If not, it should be properly grounded and plugged into a GFCI-protected outlet.</li> <li>Cords should not lie in water.</li> <li>Never use portable hand-held saws for inverted cutting; use at or below shoulder height, and use only with blades rotating in opposite direction to cut.</li> <li>Use proper work practices that minimize the risk of "kick back"</li> <li>The saw operator should use any auxiliary handles that are on the saw to maintain control.</li> <li>The saw operator should make sure that he sets his feet properly before beginning to saw.</li> <li>Always shut the saw off before transporting it to another location.</li> <li>Take regular breaks from cutting or switch with another worker (if cutting for a prolonged period of time) to relieve from fatigue.</li> </ul>	

HAZARD IDENTIFICATION				RISK ANALYSIS			RISK CONTROL	
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/EFFECT MAY CAUSE	L	S	RISK RATING	RECOMMENDED CONTROL MEASURES	RESPONSIBILITY
D-CONCRETE/INCIDENTAL WORKS								
11	Plate Compactor Use	<p>Exposure to Compactor's pad</p> <p>Plate Compactor not secured prior to transit.</p> <p>Debris can be ejected when compacting.</p> <p>Compactor is used near exposed electrical</p>	<p>Compactor's pad could crush feet if placed near or beneath it.</p> <p>Plate Compactor may fall or shift if not secured prior to transit.</p> <p>Debris can be ejected when compacting and can cause injury</p> <p>Injury can occur if compactor is used near exposed electrical leads or live conduit.</p>	3	4	12	<p><b>MED</b></p> <ul style="list-style-type: none"> <li>Remove large sections of sawed materials with heavy equipment.</li> <li>Ensure that Plate Compactor operators wear steel capped boots and allocated uniform at all times.</li> <li>Ensure when using Plate Compactor that is well clear of other persons, holes or excavated areas where it could run off the edge and crush operators or workers.</li> <li>Operators are to remove or be aware of trip hazards in the work area and retain strong grip on the compactor at all times whilst motor is running.</li> <li>Seek assistance or mechanical aids when lifting plate compactors off transport vehicles and moving them into work positions</li> <li>When lifting plant via chains ensure the chains and plant lifting items are rated to the load and when guiding lifted plant ensure all body parts are clear of drop or pinch zones at all times.</li> <li>Ensure Plate Compactor is well secured prior to transit on vehicles.</li> <li>Operators must wear safety glasses at all times.</li> <li>Stop operation of compactor if person enters the work area.</li> <li>Do not operate plate compactor over holes, uneven surfaces or on top of material that may splinter or shatter at any time.</li> <li>Operators are to examine location for electrical sources, conduit, leads and fittings prior to operation and remove items or seek electrical isolation from a qualified electrician prior to commencing works.</li> </ul>	<p>Contractor HSE Officer Supervisor Workers involved</p>

HAZARD IDENTIFICATION				RISK ANALYSIS			RISK CONTROL	
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/EFFECT MAY CAUSE	L	S	RISK RATING	RECOMMENDED CONTROL MEASURES	RESPONSIBILITY
D-CONCRETE/INCIDENTAL WORKS								
		leads or live conduit.					<ul style="list-style-type: none"> <li>Operators must never operate the compactor near or on top of electrical leads or conduit that may crush and expose wires to the metal base plate.</li> </ul>	
		Work areas may contain uneven or loose gravel surfaces.	Work areas may contain uneven or loose gravel surfaces.				<ul style="list-style-type: none"> <li>Operators are to check site for holes or drops in levels of surfaces prior to operation and rectify where possible prior to use.</li> <li>Operators are to ensure secure foot placement and maintain good grip on compactor at all times particularly on loose or uneven surfaces being compacted.</li> <li>Operators are to ensure they and the compactor remain well clear of any level drops, projected items, persons animals or assets during use.</li> </ul>	
		Manual handling of Plate Compactors can injure.	Manual handling of Plate Compactors can injure.				<ul style="list-style-type: none"> <li>Ensure to reverse vehicle right up to works location and use mechanical aids or assistance for lifting/lowering to minimize manual handling.</li> <li>If manual handling is required ensure there are adequate numbers of staff on site to lift or move compactor.</li> <li>Wear insulating gloves to reduce vibration hazards.</li> </ul>	

HAZARD IDENTIFICATION				RISK ANALYSIS				RISK CONTROL	
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/ EFFECT MAY CAUSE	L	S	RISK RATING		RECOMMENDED CONTROL MEASURES	RESPONSIBILITY
E- INSTALLATION OF PIPES									
1	Delivering, unloading storing and installing of Pipes and fittings using pickup and unloading by manual handling	Exposed to Plant and Traffic movement	<ul style="list-style-type: none"><li>• Run over by vehicles/plants</li><li>• Hit by reversing equipment</li><li>• Overhead obstructions</li><li>• Vehicle break down</li><li>• Property damage</li><li>• Collision with other vehicles</li><li>• Personal injury</li><li>• Fatality accident due to poor lighting and visibility (operation at night)</li></ul>	3	4	12	MED	<ul style="list-style-type: none"><li>• Refer to Traffic Management Plan</li><li>• Delivery/ collection drivers shall be subject to induction/Training with regards to traffic management.</li><li>• Ensure exclusion zone is set up around the preparation work area and all plant movement and checked by supervisor</li><li>• Always use the pedestrian access provided</li><li>• Traffic light batons shall be provided for banks man at night</li><li>• All plant to have a fully trained banks man present all times.</li><li>• No plant to reverse without banks man.</li><li>• Ensure access route are sufficient and safe to use.</li><li>• Do not take rest in or under vehicles</li><li>• Proper barricade and safety signboard provided on open excavation</li><li>• All vehicles must be fitted with reverse alarm / Flashing light.</li><li>• The workplace and all access to be well illuminated.</li><li>• Enforce Speed limit</li><li>• Ensure all vehicles entering the site is properly maintained and reported if found any defect</li><li>• Ensure materials are secured/tied in pallet trolley to avoid fall from trolley.</li><li>• Ensure all persons are wearing appropriate PPE</li></ul>	Contractor HSE Officer Supervisor Workers involved
		Excessive Manual Handling	<ul style="list-style-type: none"><li>• Musculoskeletal disorders</li><li>• Hand injuries</li><li>• Cut &amp; bruises</li></ul>	3	4	12	MED	<ul style="list-style-type: none"><li>• Work must be carried out by trained personnel.</li><li>• Use of mechanical assists to eliminate or reduce exertions required to lift materials, hold tools and work objects, and requiring multi-person lifts if weights exceed thresholds</li><li>• Selecting and designing tools that reduce force requirements and holding times, and improve postures</li><li>• Incorporating rest and stretch breaks into work processes, and conducting job rotation</li><li>• Implementing quality control and maintenance programs that reduce unnecessary forces and exertions</li></ul>	Contractor HSE Officer Supervisor Workers involved

								<ul style="list-style-type: none"> <li>• Reduce the weight of a load to limit force exertion</li> <li>• If unsure of the load weight, check with supervisor.</li> <li>• Ensure adherence with sufficient and appropriate PPE including Gloves made of rubber or synthetic materials (Neoprene), leather, steel, insulating materials, etc.</li> <li>• Limit load carrying to 20kg per person</li> <li>• Supervisor must make sure while manual handling load individual task and environment to be considered to reduce the risk of manual handling.</li> </ul>	
		Poor house-keeping during material storing	Slips, trips and fall	3	4	12	MED	<ul style="list-style-type: none"> <li>• Ensure accesses are kept clear at all times.</li> <li>• Housekeeping to be carried out regularly throughout the day when required</li> <li>• Supervisor to ensure operatives are stacking material neatly and stacks are stable and in a safe condition</li> <li>• Provide adequate lighting especially during night hours</li> <li>• Appropriate space is allowed around storage areas for employees to move around safely without the risk being trapped between stacked materials.</li> <li>• Maintain good housekeeping.</li> <li>• Ensure all persons are wearing appropriate PPE</li> </ul>	Contractor HSE Officer Supervisor Workers involved
		Use of Glue Solvent, (Hazardous Substance)	<ul style="list-style-type: none"> <li>• Burns</li> <li>• Contact with skin</li> <li>• Acute/Chronic adverse health effect</li> <li>• Fire</li> </ul>	3	4	12	MED	<ul style="list-style-type: none"> <li>• Refer MSDS prior to any handling of hazardous substances and ensure MSDS is easily accessible at site while working with chemicals.</li> <li>• Ensure chemicals are properly stacked.</li> <li>• Ensure all chemical containers are properly labelled</li> <li>• Spill kits to be available at site.</li> <li>• Ensure operatives use the correct PPE</li> <li>• Competent person to oversee the storage, use and disposal of hazardous materials.</li> <li>• Ensure that correct welfare/first aid facilities are available in the area i.e. washing facility/eye wash.</li> <li>• Proper and adequate PPE to be used always</li> <li>• Ensure all chemical containers are properly labeled.</li> <li>• Adjust work schedules so that workers are not overexposed to a hazardous chemical.</li> </ul>	Contractor HSE Officer Supervisor Workers involved

								<ul style="list-style-type: none"> <li>• Wear respiratory protection</li> <li>• Ensure smoking only in designated area</li> <li>• Ensure appropriate Firefighting equipment's are in place and easily accessible</li> <li>• Communicating chemical hazards to workers through labeling and marking</li> <li>• Training workers in the use of the available information (such as MSDSs), safe work practices, and appropriate use of PPE</li> </ul>	
		Use of power tools such as Grinder/Cutter & Drill machine,	<ul style="list-style-type: none"> <li>• Damaged sockets &amp; cable insulation</li> <li>• Electrocution</li> <li>• Electric shock</li> <li>• Short circuit &amp; burns</li> <li>• Trip/ fall</li> <li>• Noise</li> <li>• Hearing loss</li> <li>• Vibration</li> <li>• Dust</li> </ul>	3	4	12	MED	<ul style="list-style-type: none"> <li>• All portable electrical equipment must be PAT tested and color coded. Make sure the test dates are visible on the equipment.</li> <li>• All disks shall be appropriate and expiry date is over.</li> <li>• Ensure all power tools are in good condition and appropriately maintained</li> <li>• Damaged industrial sockets and power cables must be removed.</li> <li>• Ensure the electrical cable is not damaged and has not been repaired with insulating tape or unsuitable connectors.</li> <li>• Ensure cables from power tools shall be organized so as not to present a tripping hazard</li> <li>• Only trained competent operatives to operate the power tools.</li> <li>• Ensure proper and regular maintenance of equipment that takes account of noise</li> <li>• Ensure proper hearing protection always.</li> <li>• Make sure people use the right tool for the job and are trained to use it correctly</li> <li>• Ensure defective tools that require maintenance is reported for repair or replacement.</li> <li>• Instruct workers to keep their hands warm and dry, and to not grip a vibrating tool too tightly</li> <li>• Ensuring proper job rotation and limiting time operatives working with power tools and hand tools</li> <li>• Use dust mask</li> <li>• Ensure proper earth leakage protection is provided</li> <li>• Inspect and test the machine prior to use</li> </ul>	Contractor HSE Officer Supervisor Workers involved

								<ul style="list-style-type: none"> <li>• Make sure all manufacturer's protective devices (guards) are in place and operational</li> </ul>	
		Working under high temperature, direct sun light, dusty, high wind	<ul style="list-style-type: none"> <li>• Heat exhaustion</li> <li>• Heat stroke</li> <li>• Dehydration</li> <li>• Personal injuries due to high temperature, sunstroke &amp; tiredness</li> </ul>	4	4	16	HIGH	<ul style="list-style-type: none"> <li>• Arrange adequate drinking water and rest shelter</li> <li>• Drink plenty of water with electrolyte</li> <li>• If feel something unusual immediately inform supervisor and report to site clinic.</li> <li>• Makeshift to operate the routine work</li> <li>• Do not allowed alone work</li> <li>• Frequent breaks</li> <li>• Proper supervision available</li> <li>• Correct PPE must use</li> <li>• Conduct toolbox talk</li> <li>• Proper signage for drinking water</li> <li>• Monitoring weather forecasts for outdoor work to provide advance warning of extreme weather and scheduling work accordingly</li> <li>• Adjustment of work and rest periods depending on the temperature and workloads</li> </ul>	Contractor HSE Officer Supervisor Workers involved
		Working at night-time	<ul style="list-style-type: none"> <li>• Poor visibility due to darkness/ poor illumination</li> <li>• Lone worker</li> </ul>	3	4	12	MED	<ul style="list-style-type: none"> <li>• Proper lighting system should be in place</li> <li>• Ensure proper Communication / Coordination and close supervision</li> <li>• Industrial safe torches to be available for emergency situations</li> <li>• High visibility Traffic Vest for personnel in night shift</li> <li>• Avoid lone working and always ensure buddy system while working at night</li> </ul>	Contractor HSE Officer Supervisor Workers involved
2	Pressure testing	Failure of Pressure Testing	<ul style="list-style-type: none"> <li>• High-pressure leak of water</li> <li>• Failure of hydraulic test pump</li> <li>• Electric shock</li> <li>• Electrocutation</li> </ul>	4	4	16	HIGH	<ul style="list-style-type: none"> <li>• All pressure tests must be conducted with due regard for the safety of life and property.</li> <li>• Precautions should be taken to see that people not directly engaged in the testing operations remain out of the test area during the test period.</li> <li>• During pressure testing events, distinct warning signs, such as DANGER – HIGH PRESSURE TESTING IN PROGRESS must be posted at the test work area with exclusion zone.</li> </ul>	Contractor HSE Officer Supervisor Workers involved

								<ul style="list-style-type: none"> <li>• Check that all high points have a tap or vent to facilitate removal of air during filling and that these are all closed. Blank, plug or seal any open ends and close all valves at the limits of the test section of the piping.</li> <li>• Start to fill the piping and then 'walk' the route of the piping under test, continuously visually checking for leaks and by listening for the sound of escaping air</li> <li>• Release air from all the high points systematically through the system to completely fill it with water</li> <li>• Check that the test gauge is functioning correctly has been calibrated and has the correct range of the test pump.</li> <li>• Check that a suitable hose is available for draining the system</li> <li>• Before attempting test, Supervisor will review the test specifications and procedures with the Test Inspector and any other relevant personnel to be certain that all equipment is adequate, and duties are organized and understood</li> <li>• All the electric live service must be temporary isolate to avoid electric shock and electrocution</li> <li>• PPE must in use with face shield</li> <li>• Ensure proper grounding and earthing.</li> <li>• After completion of the pressure test, release the water and disconnect all the temporary connections and close both ends</li> <li>• Exclusion zone must be removing and remove the danger signage after completion of pressure test.</li> </ul>	
3	Hand use of tools	<ul style="list-style-type: none"> <li>• Improper selection of hand tools.</li> <li>• Use of Damaged and Defective Hand tools.</li> </ul>	<ul style="list-style-type: none"> <li>• Hand injuries</li> <li>• Pinch point</li> <li>• Repetitive strain injury</li> </ul>	3	3	9	MED	<ul style="list-style-type: none"> <li>• Hand tools should be visually inspected for defects, prior to use.</li> <li>• Never use damaged, blunt or broken tools to avoid injury.</li> <li>• Select right tools for right Job</li> <li>• Ensure no Homemade or makeshift tools to be used at site</li> <li>• Remove from service any tool that shows signs of damage or defect</li> <li>• Ensure Hand tools are Stored in accordance with the manufacturer's instructions.</li> <li>• Ensure hands are not in direct line of fire while working with hand tools</li> </ul>	Contractor HSE Officer Supervisor Workers involved

								<ul style="list-style-type: none"> <li>• Ensure appropriate PPE at all times.</li> </ul>	
4	Using confined space	a <ul style="list-style-type: none"> <li>• Harmful levels of contaminants in the atmosphere</li> <li>• Deficiency or excess of oxygen</li> </ul>	<ul style="list-style-type: none"> <li>• Respiratory problems</li> <li>• Asphyxiation</li> </ul>	4	4	16	HIGH	<ul style="list-style-type: none"> <li>• Rescue equipment to be onsite at all times.</li> <li>• Correct PPE to be used.</li> <li>• Pre-start on equipment.</li> <li>• Spotter/Standby person to be in place outside of the confined space at all times.</li> <li>• Atmosphere monitored with gas detector prior to persons entering the confined space and while persons are in the confined space.</li> <li>• All internal combustion engine emissions are to be assessed and monitored before using inside a confined space.</li> <li>• Mechanical ventilation where ventilation is inadequate.</li> </ul>	Contractor HSE Officer Supervisor Workers involved
		<ul style="list-style-type: none"> <li>• Explosion or fire</li> </ul>	<ul style="list-style-type: none"> <li>• Injuries incidents due to explosion or fire</li> </ul>	4	4	16	HIGH	<ul style="list-style-type: none"> <li>• Atmospheric reading to be taken to ensure atmosphere is free of flammable airborne contaminants</li> <li>• Check any flammable gas or vapor concentrations is at concentrations below 5% of its Lower explosive limit (LEL).</li> <li>• Continual atmospheric monitoring of the space performed for the duration that a worker is in the space. Ensure no uncontrolled ignition sources can be introduced into the space.</li> <li>• If conditions change, workers must immediately exit the space and the space must be re-assessed.</li> <li>• No hot work to be conducted without ensuring that atmospheric conditions are suitable for the task.</li> <li>• Ventilation to be provided to ensure fresh air supply to entrants.</li> <li>• Ensure any services such as gas &amp; electricity are effectively isolated.</li> </ul>	Contractor HSE Officer Supervisor Workers involved
		<ul style="list-style-type: none"> <li>• Engulfment in a free-flowing solid or a rising level of liquid</li> </ul>	<ul style="list-style-type: none"> <li>• Suffocation or drowning</li> </ul>	4	4	16	HIGH	<ul style="list-style-type: none"> <li>• Ensure any services and utilities are effectively isolated. Flow controls and flow rates are to be continually monitored.</li> <li>• Ensure the structure and design of confined space is sound and there is no chance of collapse.</li> <li>• Ensure that any surrounding liquid bodies cannot enter, overflow or engulf the confined space</li> </ul>	Contractor HSE Officer Supervisor Workers involved

								<ul style="list-style-type: none"><li>If confined space is in an excavation, ensure that required benching, batters or shoring is in place.</li></ul>	
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HAZARD IDENTIFICATION				RISK ANALYSIS			RISK CONTROL		
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/EFFECT MAY CAUSE	L	S	RISK RATING	RECOMMENDED CONTROL MEASURES	RESPONSIBILITY	
F-SUBBASE AND SUBGRADE PREPARATION									
1	Asphalt saw cutting machine		See section D						
2	Use of: <ul style="list-style-type: none"><li>• Wheel loader</li><li>• Dozer</li><li>• Truck</li><li>• Grader</li><li>• Asphalt Milling Machine</li><li>• Bobcat Loader</li><li>• Base Course Wheeled Compactor</li><li>• Water Tank Sprayer Use</li></ul>		See section B						

HAZARD IDENTIFICATION				RISK ANALYSIS			RISK CONTROL		
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/ EFFECT MAY CAUSE	L	S	RISK RATING	RECOMMENDED CONTROL MEASURES	RESPONSIBILITY	
G-ASPHALT PAVING									
1	Traffic management (vehicles and pedestrians)	Traffic not clearly instructed on requirements.	Injury or illness may occur due to traffic not clearly instructed on requirements.	4	5	20	HIGH	<ul style="list-style-type: none"><li>Refer to Traffic Management Plan</li><li>Appropriate traffic cones or bollards been placed to show the path leading to and around the work site.</li><li>Appropriate temporary hazard markers been placed at the beginning of the works to show drivers which side of the cones or other obstructions they must go.</li><li>They place signs 1 meter clear of traffic paths wherever possible.</li><li>Signs have been mounted securely and will not blow over or around. Sandbag them if required.</li><li>Signs have been placed in the driver’s line of sight and not too far off to one side.</li><li>Early warning signs for works hidden around a bend have been sufficiently placed to warn drivers ahead of time.</li><li>Stand-alone roadside “No Stopping” signs are available and place appropriately when required to ensure signs are not obscured during the length of the works.</li><li>Signs do not obscure a driver’s view of any other signs or traffic on the road.</li><li>Traffic signs are placed in areas that do not create other hazards i.e tripping hazards, deflect vehicles into wrong or dangerous paths, forcing drivers to break the law etc.</li></ul>	Contractor HSE Officer Supervisor Workers involved
		Problems With warning signs	Injury may occur due to contradictory, distracting or superfluous signs being present.	4	5	20	HIGH	<ul style="list-style-type: none"><li>When creating a traffic management control plan ensure that existing traffic control signage is taken into account and markings or signs are covered where required.</li><li>Signs that are covered are uncovered at completion of works.</li><li>Traffic is not interfered with unnecessarily when setting up a traffic control.</li></ul>	Contractor HSE Officer Supervisor Workers involved
		Inadequate clearances or visibility of workers.	Injury may occur due to inadequate clearances or visibility of workers.	4	5	20	HIGH	<ul style="list-style-type: none"><li>Clearances between workers and adjacent traffic being maintained throughout the duration of the works, adjust them if necessary.</li><li>All employees are wearing high visibility clothing or vests when working on-site, near roads and footpaths.</li></ul>	Contractor HSE Officer Supervisor Workers involved

HAZARD IDENTIFICATION				RISK ANALYSIS			RISK CONTROL	
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/ EFFECT MAY CAUSE	L	S	RISK RATING	RECOMMENDED CONTROL MEASURES	RESPONSIBILITY
G-ASPHALT PAVING								
							<ul style="list-style-type: none"> <li>Operators of Plant are to cease all movement and operations if clear visibility of all other workers and plant around their operations cannot be obtained.</li> <li>Operators of Plant are to cease all movement and operations if clear communication cannot be maintained with traffic management personnel.</li> <li>In the event that signage is required at night time ensure to follow the regulations and specific guidelines for traffic control at night time and ensure to alter it appropriately.</li> </ul>	
		Traffic control not planned and implemented appropriately.	Injury may occur due to traffic control not planned and implemented appropriately.	3	5	15	<p><b>HIGH</b></p> <ul style="list-style-type: none"> <li>Refer to Traffic Management Plan</li> <li>Ensure at least one worker on site is trained, allotted and proficient in traffic control</li> <li>Advanced warning signs available to workers</li> <li>Speed limits accurately determined when discussing and organizing traffic management.</li> <li>Traffic flow areas are clearly defined and placed and to consider other road users when setting up a traffic management plan.</li> <li>Review the traffic management plan after set up and note down any specific adjustments made to the plan before commencing works.</li> <li>Safety barriers are installed correctly and checked regularly.</li> <li>On sites where designated traffic control personnel are required ensure a plan is drawn up and documented by trained personnel in accordance with traffic control regulations.</li> <li>The traffic control plan is relevant to the work.</li> <li>Ensure parked cars, works vehicles, work items or other obstructions do not obscure signs.</li> </ul>	Contractor HSE Officer Supervisor Workers involved

HAZARD IDENTIFICATION				RISK ANALYSIS			RISK CONTROL	
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/ EFFECT MAY CAUSE	L	S	RISK RATING	RECOMMENDED CONTROL MEASURES	RESPONSIBILITY
G-ASPHALT PAVING								
		Inappropriate or insufficient traffic control equipment being available or in place.	Injury or illness may occur due to inappropriate or insufficient traffic control equipment being available or in place.	3	5	15	HIGH	<ul style="list-style-type: none"> <li>Refer to Traffic Management Plan</li> <li>Appropriate traffic control signs, cones and batons are available to workers i.e.; – Stop/Slow baton, Cones x 12 minimum, Workmen signs x 2 - 4, Barrier Tape.</li> <li>On sites where designated traffic control personnel are required ensure a plan is drawn up and documented by trained personnel in accordance with traffic control regulations.</li> <li>Stand-alone roadside “No Stopping” signs are available when required.</li> </ul>
2	Use of : Spreader and Paver Bobcat Loader Bituminous Tack/Asphalt Sprayer Tandem Roller, Pneumatic Roller and Multi Wheeled Compactor						See section B	
3	Plate Compactor Use						See section D	
4	Air Compressor and Jack Hammer (Plant) Use	Jockey wheel not secured.	Injury can occur as Compressor may fall if jockey wheel not secured.	3	4	12	MED	<ul style="list-style-type: none"> <li>Ensure that Compressor and High Pressure Hose operators wear steel capped boots and allocated uniform at all times.</li> <li>Ensure compressor is parked on a stable, level surface and is well secured prior to use.</li> <li>Ensure when locating Plant and tools that is well clear of other operations that could affect safety of users or other persons.</li> <li>Prior to disconnection from towing vehicle ensure the jockey wheel is adjusted to take weight and securely fastened and the trailer is chocked to prevent movement.</li> </ul>
		Flying debris can be forced by air hose and Jack Hammer.	Injury can occur from flying debris				<ul style="list-style-type: none"> <li>Air hose operators must wear safety glasses at all times.</li> <li>Stop operation of air hose if person enters the work area.</li> <li>Do not direct air hose at a person or animal at any time.</li> <li>Do not operate Jack Hammer on brittle material that may splinter or shatter at any time.</li> </ul>	Contractor HSE Officer Supervisor Workers involved

HAZARD IDENTIFICATION				RISK ANALYSIS			RISK CONTROL	
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/ EFFECT MAY CAUSE	L	S	RISK RATING	RECOMMENDED CONTROL MEASURES	RESPONSIBILITY
G-ASPHALT PAVING								
		Operators blow high pressure air over flammable liquid near an ignition source.	Fire can occur If operators blow high pressure air over flammable liquid near an ignition source.				<ul style="list-style-type: none"> <li>• Ensure to check there are no ignition sources for fire when blowing tools or equipment that are petrol powered.</li> <li>• Never direct airflow over or near receptacles that contain flammable liquids.</li> <li>• Never operate compressor or air hose whilst smoking or near an open flame.</li> <li>• Defining and labeling fire hazards areas to warn of special rules (e.g. prohibition in use of smoking materials, cellular phones, or other potential spark generating equipment)</li> <li>• Providing specific worker training in handling of flammable materials, and in fire prevention or suppression</li> </ul>	
		Untidy work area or wrong lying of air hoses	Untidy work area or air hoses lying around may cause trip and slip hazards				<ul style="list-style-type: none"> <li>• Ensure work area remains tidy of tools, debris and hoses and cords are laid out in a manner to reduce trip hazards and stored correctly after use.</li> </ul>	
		Manual Handling when manoeuvring the compressor or loading or unloading for transport.	Potential to sustain body injury and Musculoskeletal Disorder Syndrome (MSDS)				<ul style="list-style-type: none"> <li>• Ensure to reverse vehicle right up to trailer and use jockey wheel for lifting/lowering to minimise manual handling.</li> <li>• If manual handling is required ensure there are adequate numbers of staff on site to lift or move plant.</li> <li>• Layout hose in orderly manner to avoid pulling or carrying volumes of hose.</li> <li>• Educate employees on the risks of manual handling and conduct regular refreshers.</li> </ul>	
		Exposure to Plant					<ul style="list-style-type: none"> <li>• Ensure that Operators wear steel capped boots and allocated uniform at all times.</li> <li>• Ensure when using Plant that is well clear of other persons and at a distance from the operator's body.</li> </ul>	

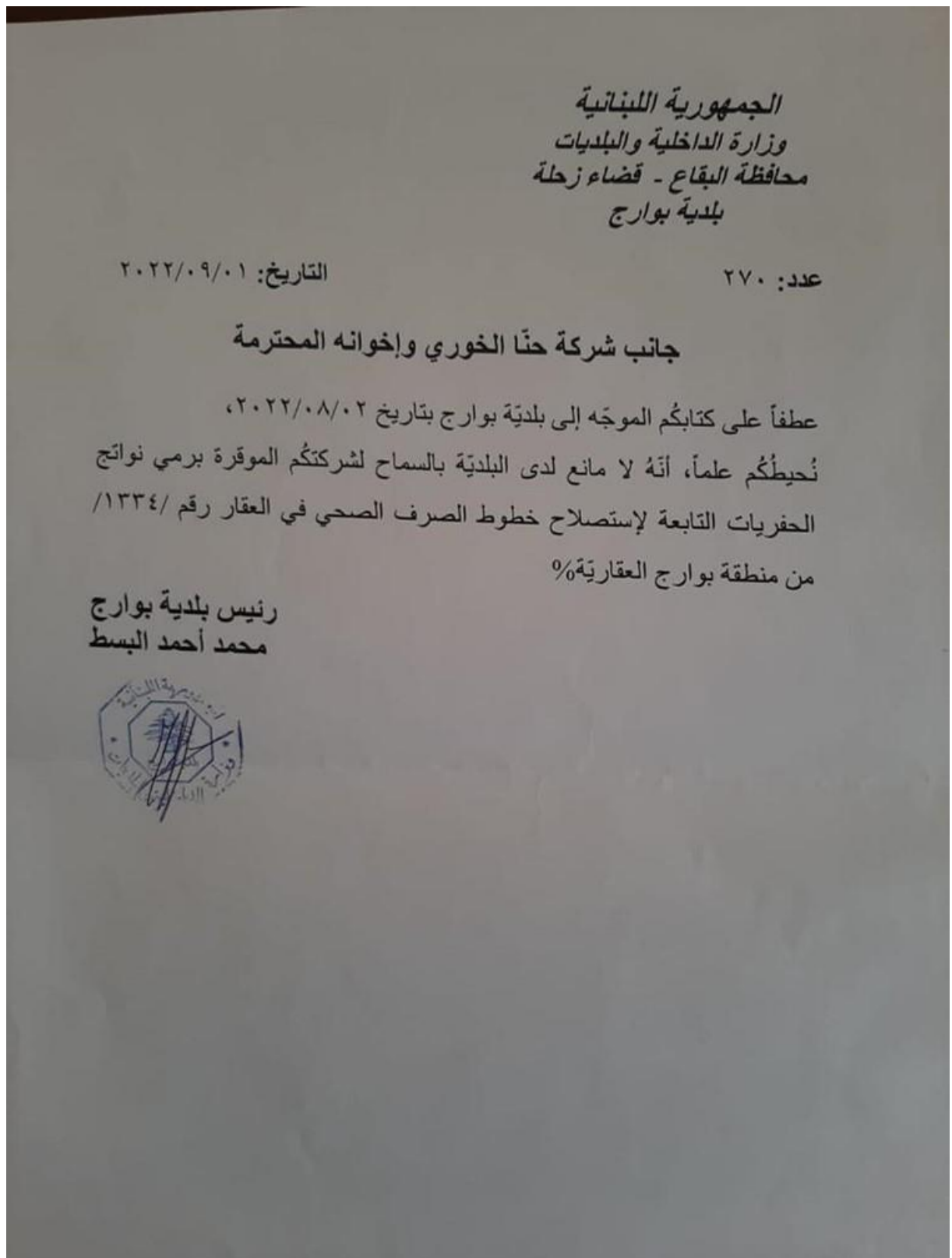
HAZARD IDENTIFICATION				RISK ANALYSIS				RISK CONTROL	
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/ EFFECT MAY CAUSE	L	S		RISK RATING	RECOMMENDED CONTROL MEASURES	RESPONSIBILITY
G-ASPALT PAVING									
		Plant vibrates while in operation and is hand operated.	Plant could crush feet or toes if placed near or beneath it.  Plant vibrates while in operation and is hand operated.					<ul style="list-style-type: none"><li>Operators are to remove or be aware of trip hazards including air hoses the work area and retain strong grip on the Plant at all times whilst running.</li><li>Seek assistance or mechanical aids when lifting work materials such as large slabs of rock or concrete.</li><li>The Operators are to take regular breaks throughout the working day.</li><li>Insulating gloves for vibration should be worn by all persons involved with the operation.</li><li>Vibration dampeners should be checked and replaced as part of routine servicing.</li></ul>	
		Jack Hammer penetrates electrical cables, pipes or services underground	Injury can occur if Jack Hammer penetrates electrical cables, pipes or services underground	3	5	15	HIGH	<ul style="list-style-type: none"><li>Operators are to call authorities (e.g. dial before you dig) before they Jack Hammer surfaces to locate underground services or fittings and ensure these are clearly marked on the work plan and referred to site and do not Jack Hammer in areas where services may be present.</li><li>An underground services pre-start check must be completed before commencing works.</li><li>Inspect work area for likely places where pipes, cables or fittings may be present before commencing works.</li><li>Ensure fire fighting equipment is close at hand when Jack Hammer is in operation.</li><li>No smoking or naked flames near machine whilst in operation or on the work site.</li><li>Only trained staff to operate Jack Hammer at all times and Jack Hammer must be shut down and secured when unattended.</li></ul>	Contractor HSE Officer Supervisor Workers involved
		Blade can shatter or debris can be ejected when sawing.	Injury can occur if blade shatter or debris are ejected .					<ul style="list-style-type: none"><li>Do not operate Paving Saw without adequate water in reservoir or on brittle material that may splinter or shatter at any time.</li></ul>	
5	Manual handling	Lifting, moving or shoveling	Potential to sustain body	3	5	15	HIGH	<ul style="list-style-type: none"><li>Ensure to manoeuvre Plant or Vehicles up to load or attachment to minimize manual handling.</li></ul>	Contractor

HAZARD IDENTIFICATION				RISK ANALYSIS			RISK CONTROL	
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/ EFFECT MAY CAUSE	L	S	RISK RATING	RECOMMENDED CONTROL MEASURES	RESPONSIBILITY
G-ASPALT PAVING								
		materials, loads or other work items.	injury and Musculoskeletal Disorder Syndrome (MSDs)				<ul style="list-style-type: none"> <li>• Ensure to use mechanical aids or seek assistance with large volumes or heavy loads to minimize manual handling.</li> <li>• Ensure to use lifting chain and Bobcat to move heavy hand operated plant such as the large Plate Compactor and ensure chain is tagged, checked and chain and bobcat are rated to the load/s.</li> <li>• Ensure there are adequate numbers of staff on site to lift and secure attachments or loads.</li> <li>• Reduce loads to manageable sizes for any manual handling that needs to occur.</li> <li>• Rotate workers performing manual tasks such as shoveling throughout the day if symptoms of strain or fatigue occur.</li> <li>• Ensure PPE such as insulating gloves are worn for plant vibration and conduct regular audits and checks of plant vibration dampeners.</li> </ul>	HSE Officer Supervisor Workers involved
6	Hazardous Substances and Dangerous Goods	Uncontrolled presence or use of Hazardous substances and /or dangerous goods.	Incidents due to handling hazardous Substances and/ or Dangerous Goods.				<ul style="list-style-type: none"> <li>• Managers are to ensure all relevant MSDS are accessible by staff at all times and staff are trained in the use, first aid and emergency procedures for the HS&amp;DGs on-site.</li> <li>• Workers are to remain alert to noticeable increases in dust, smoke, fumes or gases in the air and revise PPE, work tasks or actions accordingly.</li> <li>• That there is adequate ventilation and housekeeping practices in place.</li> <li>• Staff must only use approved and appropriately labelled containers for decanting or storage of HS&amp;DGs and never use other containers such as empty drink bottles, cans or jars.</li> <li>• Staff must be familiar in safest way to handle and use chemicals and wear required PPE as outlined on product instructions or MSDS when handling, pouring or spraying substances.</li> <li>• Staff must wash thoroughly before eating, drinking or smoking after handling HS&amp;DGs.</li> </ul>	Contractor HSE Officer Supervisor Workers involved

HAZARD IDENTIFICATION				RISK ANALYSIS			RISK CONTROL	
ITEM	WORK ACTIVITY	HAZARD	CONSEQUENCES/ EFFECT MAY CAUSE	L	S	RISK RATING	RECOMMENDED CONTROL MEASURES	RESPONSIBILITY
G-ASPHALT PAVING								
							<ul style="list-style-type: none"> <li>Staff must follow disposal regulations for HS&amp;DGs to protect the community and the environment. (do not pour into drains, or where others could come into contact with them).</li> </ul>	

**Annex F: Approval letters from the concerned municipalities for solid waste disposal**

**1. Bouerij Municipality- Construction Waste**



## 2. Qabb Elias Municipality- Construction Waste

الجمهورية اللبنانية  
وزارة الداخلية والبلديات  
محافظة القطيف قضاء زحلة  
بلدية قب الياس وادي الدلم

وثيقة احالة

رقم المعاملة وتاريخها: ٢٠٢٢/٧/٢٨

موضوع المعاملة: ...

العمل: ...

رقم التسجيل	جهة الإرسال وأسباب الإحالة	التاريخ و التوقيع
٣١	<p>رأى د. ... عن البلدية ؟</p> <p>ان هذا المشروع بحاجة الى دراسة مع البادئ شركة ... والدراسة ودراسة الخرائط المبدئية ...</p> <p>في الختام رأيت بالدراسة ... اما بالنسبة الى المالك فيمكن اذا تمت الموافقة ...</p> <p>في ... مكتب ... منطقة ...</p> <p>القرار ١٠٢٢/٧/٢٨</p>	<p>٢٠٢٢/٧/٢٨</p> <p>...</p>
٣٢	<p>ح. ... على ...</p> <p>... لل... الذي ...</p> <p>... ...</p> <p>... ...</p> <p>... ...</p>	<p>٢٠٢٢/٧/٢٨</p> <p>...</p>

### 3. Makseh Municipality- Construction Waste



4. Mreijet Municipality- Construction Waste (Approval letter in progress)
5. Zebdol Municipality- Construction Waste (Approval letter in progress)

### Annex G: List of chemicals used

#### 1- Chemicals used for construction works

- Rubberized Bitumen Coating (PLYKOTE)
- Curing Compound for Concrete (Weberad cure WH)

#### 2- Chemicals used for vehicle maintenance

Type	Code	Item
Antifreeze	00.005.023.010.0001	Super coldmaster A/F (5 lit) [antifreeze]
Antifreeze	03.073.027.000.3257	Antifreez Febi 1.5 litre
Antifreeze	03.073.027.000.0334	Oil super coldmaster A/F (1 lit) [antifreeze]
Batteries	03.015.027.000.0005	Battery GLB0SMF66AH*56638 GLOBAL [66A] بطارية
Batteries	03.015.056.055.0001	Battery global Nx100-S6LS [45A]
Batteries	00.015.027.000.0004	Battery Motor Mech 56638
Batteries	00.015.027.000.0006	Battery Med 100AH
Batteries	03.015.027.055.0001	Battery Global / SMF 150A
Batteries	03.015.027.000.0004	Battery GLB0SMF60044*DIN100 GLOBAL [100A] بطارية
Batteries	03.015.027.000.0006	battery GLB0SMF55AH*55559 GLOBAL [55A] بطارية
Batteries	03.073.027.000.8124	Battery Global N120 SMF120A
Batteries	03.015.027.000.0018	Battery Global 180AH SMF68032
Batteries	03.073.027.000.8141	Battery Global SMF N200A
Batteries	00.015.027.000.0007	Battery Concord N-150AH
Batteries	00.015.027.000.0005	Battery Concord N-120AH
Batteries	03.015.027.000.0012	Battery Marelli run M 47 (AMP)
Batteries	03.015.027.000.0014	Battery Marelli run 53 AH
Batteries	03.015.063.055.0001	Battery Global SMF Nx120-7 [90A]
Batteries	00.015.027.000.0003	Battery Yigit Aku 100AH
Batteries	00.015.027.000.0002	Battery Motor Mech SMF60044
Batteries	03.015.027.000.0020	Battery 120AH SMF135F51-1 Forte
Batteries	00.015.027.000.0001	Battery National 180AH
Batteries	03.015.027.000.0019	Battery Wolv 90AH MF105D31R
Batteries	03.015.027.000.0017	Battery Wolf 120AH /MF62034
Batteries	03.015.174.000.0001	Battery Forte SMF50B24L 45AH
Filter Hydraulic Oil	01.007.027.225.0001	filter Hydraulic 294073005 PUTZMEISTER بومب باطون [T12]
Filter Hydraulic Oil	01.157.208.096.0001	filter hydraulic 51482wix ٩٥٠ رفش
Filter Hydraulic Oil	01.073.027.000.0015	Filter Hydraulic CS1551H = 51482
Filter Hydraulic Oil	01.005.194.096.0001	filter hydraulic 51163wix ٩٦٦ رفش
Filter Hydraulic Oil	01.157..096.0001	filter hydraulic 51524wix ٩٦٦ رفش
Filter Hydraulic Oil	01.157.191.096.0006	filter hydraulic 51247 / 581/18063 JCB
Filter Hydraulic Oil	01.005.027.000.0009	Filter Hydraulic China 518670 CGR
Filter Hydraulic Oil	01.157.027.000.0006	filter hydraulics 1799806
Filter Hydraulic Oil	01.157.027.000.0007	Filter Hydraulic 093-7521 cat

Type	Code	Item
Filter Hydraulic Oil	01.157.191..0001	filter hydraulic 5I8670 BLUMAQ BQ حفارة
Filter Hydraulic Oil	01.157.191.096.0004	filter hydraulic 126-2081/CT1262081 320,322,324 حفارة
Filter Hydraulic Oil	01.157.027.210.0001	Filter Hydraulic CAT 93752 HF35018
Filter Hydraulic Oil	03.073.027.000.2680	Filter Hydraulic 5I-8670C 320 حفارة
Filter Hydraulic Oil	03.005.000.000.0091	filter hydraulic BT8876-MPG رفش ٩٦٣
Filter Hydraulic Oil	01.157.151.096.0001	filter hydraulic 51551wix محدة زفت
Filter Hydraulic Oil	01.157.191.096.0005	filter hydraulic 51621wix lube spin on 325 حفارة
Filter Hydraulic Oil	03.005.000.000.0087	filter hydraulic P/N7012314 S630 بوبكات
Filter Hydraulic Oil	03.073.027.000.8134	Filter Hydraulic 1446691
Filter Hydraulic Oil	01.157.151.096.0002	filter hydraulic 51586wix CAT محدة زفت
Filter Hydraulic Oil	01.073.027.000.0010	Filter Hydraulic 7248874 bobcat 630
Filter Hydraulic Oil	01.157.158.096.0001	filter hydraulic 51448wix [SFH8840] S220 بوبكات
Filter Oil	01.005.179.000.0001	Filter Cars Oil SP-1079 Nissan Alco
Filter Oil	01.005.027.096.0001	Filter Oil wix 51806 MP
Filter Oil	01.005.201.212.0001	filter oil FILTRON موتور لحام OP526/1
Filter Oil	01.005.191.096.0001	filter oil motor 51515wix tractor تركور حفارة
Filter Oil	01.005.151.096.0002	filter oil 51261 محدة + موتور جرة خلفي
Filter Oil	01.005.027.000.0001000 2	Filter Cars Oil VIC C-806 HONDA
Filter Oil	01.005.030.102.0001	filter oil HU12140x mann actros [this one]
Filter Oil	01.005.027.000.0003	Filter Cars oil FH006Z= 8200033408=WL7254 Rapid + Kango
Filter Oil	01.010.028.014.0001	filter oil motor 44 HU947/1Z-2 / E197HD23
Filter Oil	01.005.031.103.0001	filter oil motor E251hd11 hengst [LB] [ this one ]
Filter Oil	01.005.027.102.0002	filter oil H601/4 /wl7026 فلتر زيت دركسيون
Filter Oil	01.005.180.000.0002	Filter Cars Oil VIC C-111 Toyota
Filter Oil	01.005.031..0001	filter oil HENGST E174HD11 [8CYLINDER]
Filter Oil	01.005.030.102.0002	filter oil H623 mann actros فلتز زيت دركسيون اكتروس طويل
Filter Oil	01.005.158.096.0003	filter oil 92095E / 57037wix [BT7237] case 440 بوبكات
Filter Oil	01.005.151.096.0001	filter oil 51342wix / WL7070 / WL719/5
Filter Oil	01.005.163.096.0002	filter oil Wix 51792 cat جرارة
Filter Oil	01.005.153.096.0002	filter oil motor B76 / 51791 حفارة كرايدر [E7,E12]
Filter Oil	01.073.027.000.0017	Filter Oil CS1424VL = 51791
Filter Oil	01.005..096.0001	filter oil 51748wix رفش كوماتسو
Filter Oil	01.005..096.0004	filter oil motor 57233 wix JCB
Filter Oil	01.073.027.000.0009	Filter Oil 15613EV014
Filter Oil	01.005.034..0001	filter oil E243HD13 hengst [TURBO] تيرو
Filter Oil	03.005.000.000.0085	filter oil 51820 / 1173430 SP427 كومبريسا اطلس
Filter Oil	01.005.153..0001	filter oil 51970 / 10L2105 NAT كسارة رقم ٣
Filter Oil	01.005.027.096.0002	Filter Oil Wix 51660
Filter Oil	01.005.147.237.0001	filter oil E196HND03 HENGST

Type	Code	Item
Filter Oil	01.005.158.096.0004	filter oil 51347wix بويكات
Filter Oil	03.005.000.000.0094	Filter oil 51348MP wix محدة صغيرة
Filter Oil	01.005.027.000.0005	filter oil OP576/1 / 51307
Filter Oil	01.005.152.096.0001	Filter Oil 57521 Wix
Grease	00..027.000.0012	Grease رولمان شحم
Grease	00.004.027.000.0001	Grease lukoil EP3 (180KG)
Grease	03.073.027.000.8207	Grease Lukoil NLGI3 CA MP3 (15KG)
Grease	00.004.027.000.0003	Grease Fullexoil Red GR 15KG
Grease	711.004.027.000.0001	Grease Atlantic moly (15KG)
Grease	03.004.027.001.0001	Grease Cyclon complex NLGI2 Li - 15 KGS
Grease	00.004.027.000.0002	Grease Lukoil Polyflex EP3 (18KG)
Grease	00.004.168.001.0002	Grease cyclon NLGI3 CA [15KG] [this one] سطل شحم
Oil Hydraulic	00.005.014.000.0003	Oil Hydraulic ISO68 (205L) Champion
Oil Hydraulic	00.005.014.000.0004	Oil Hydraulic ISO68 (25L) Champion
Oils	03.073.027.000.8003	Oil 10w40 (5L) SilverHook Excel SS
Oils	03.073.027.000.8209	Oil Lukoil ATF DEXIII (1L)
Oils	03.073.027.000.8005	Oil 80w90 (25 L) Silverhook Gear Oil
Oils	00.073.027.000.0006	Release Oil (500ml)
Oils	00.005.014.000.0001	Oil Lukoil Geyser St ISO68 (200L)
Oils	00.005.026.007.0002	Oil ATM1L AQM RED comma trans fluid1 (1liter)
Oils	03.073.027.000.8004	Oil 10w40 (1L) SilverHook Excel SS
Oils	00.005.027.000.0008	Oil 25w50 Champion (205L) CH-4 Turbo Extra
Oils	00.005.016.007.0003	consumables oil 15w40 comma (205 L)
Oils	03.073.027.000.8006	Oil 20w50 (20L) Silverhook Diesel
Oils	03.073.027.000.8133	Oil DOT4 (500ml) SilverHook Brake fluid
Oils	00.005.018.000.0001	Oil 5W30 silverhook Supreme FS
Oils	03.073.027.000.8112	Oil comma 20w50 (1L)
Oils	00.005.015.000.0001	Oil 10W40 (4L) SilverHook Excel SS
Oils	00.073.027.000.0036	OIL CROWN THERM 68 (208L)
Oils	00.005.018.007.0001	Oil 5w30 comma XTC5L ( 5 lit)
Oils	03.073.027.000.8062	Oil 15w40 (20L) SilverHook LongDrain (sh-ld1540-020)
Oils	00.005.016.000.0001	Oil 15W40 Champion (205L) CI-4 TBN15
Oils	00.005.027.000.0013	Oil TOP ATF PETRO LIFCO DEXTRON III H
Oils	03.073.027.000.8065	Oil 15w40 (205L) SilverHook LongDrain
Oils	00.005.017.007.0001	consumables oil 20w50 comma (205 L)
Oils	00.005.016.000.0002	Oil 15W40 (208L) Petro Lifco
Oils	03.073.027.000.8187	Oil ACdelco (dexron 1L)
Oils	03.073.027.000.8132	Oil 20w50 (205 L) silverhook diesel
Oils	00.005.014.000.0005	Oil ISO68 (208L) Petro Lifco
Oils	00.005.027.000.0009	Oil 20W50 (200L) Rovel CH-4
Oils	00.073.027.000.0008	Oil DIESEL MAGIC 0.4 Lt (400ML) Blinker super treatmen
Oils	00.073.027.000.0007	Oil RAD SEAL (500ML)
Oils	00.005.051.007.0001	Oil 20w50 (20 lit) comma TFXP20L
Oils	00.005.027.000.0011	Oil 20W50 (25L) Champion SJ/CH-4
Oils	00.005.027.000.0002	Oil MVCHF MP2 زيت دبياج
Oils	00.005.016.007.0002	Oil 15w40 (5 lit) comma TFSD5L
Oils	00.005.027.000.0010	Oil 15W40 (25L) Champion CI-4 TBN15
Oils	00.005.016.008.0003	Oil 15w40 (20 lit) comma TFSD20L
Oils	711.005.152.007.0001	Oil Petrol Magic (400ml)
Oils	03.005.000.000.0010	Oil cyclon titanus Ep ISO 220
Oils	00.005.022.000.0002	Oil ADBLUE دواء M Germany ( 10L ) [this one]
Oils	00.005.015.007.0002	Oil Comma 10W40 (20L) Diesel

Annex H: Enquiry letters on existing networks of utilities

A) Letter to BWE

  
Hanna Khoury and Brothers, Co.

مصلحة الديوان

H-ALH-1  
ID: 01-10-2013

١٥٥٤  
٢٠٢٢/٧/٢٦

بيروت في 26/07/2022

رقم المرجع: AMQ/20873/PA/22-001

المادة: مؤسسة مياه البقاع  
عناية: القسم الفني

المشروع: توسيع شبكة تجميع مياه الصرف الصحي (عنجر، مجدل عنجر، قب الياس) - المجموعة 1  
عقد رقم 20873 (مجلس الانماء والاعمار)

الموضوع: طلب خرائط لشبكات المياه والصرف الصحي الموجودة ضمن نطاق المشروع

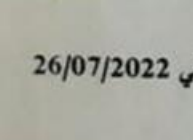
تحية وبعد،  
لما كانت شركتنا قد التزمت تنفيذ اعمال العقد المشار اليه اعلاه، ولما كان تنفيذ الأعمال المطلوبة يستوجب اجراء حفريات لزوم الصرف الصحي و أعمال البنى التحتية ضمن الطرقات والأماكن العامة، و بالاختصاص طريق عام ضهر البيدر قب الياس.  
وحرصاً من شركتنا على عدم الحاق اي ضرر بالبنى التحتية الموجودة،  
نطلب من حضرتكم تزويدنا بالخرائط العائدة لشبكات المياه والصرف الصحي الموجودة ضمن نطاق المشروع،  
كذلك تزويدنا باسماء الاشخاص و أرقام هواتفهم ضمن القضاء للتنسيق و المتابعة.

وتفضلوا بقبول الاحترام

شركة حنا الخوري وأخواته  
Hanna Khoury & Brothers  
Co. Sarl  
م. منير عبدالم  
مدير مشروع

رابطاً: خريطة لمواقع الأشغال

Hanna Khoury & Brothers Co. SARL New Rawda – Najarian Bldg 3<sup>rd</sup> Floor. Tel: 01-689665 Fax: 01-692056 Mobile: 03-357183  
Website: <http://www.hkbros.com>  
email: [info@hkbros.com](mailto:info@hkbros.com)


  
Hanna Khoury and Brothers. Co.

٢٠٢٢/٠٧/٢٦  
 رئيس قطاع شبكات المياه  
 أنطوان رميا

H-ALH-1  
 ID: 01-10-2013

رقم المرجع: AMQ/20873/PA/22-002

بيروت في 26/07/2022


السادة: اوجيرو المحترمين  
 عناية: القسم الفني

المشروع: توسيع شبكة تجميع مياه الصرف الصحي (عنجر، مجدل عنجر، قب الياس) - المجموعة 1  
 عقد رقم 20873 (مجلس الانماء والاعمار)

الموضوع: طلب خرائط للشبكات الموجودة ضمن نطاق طرقات المشروع

تحية وبعد،  
 لما كانت شركتنا قد التزمت بتنفيذ اعمال العقد المشار اليه اعلاه، ولما كان تنفيذ الاعمال المطلوبة  
 يستوجب اجراء حفريات لزوم الصرف الصحي و أعمال البنى التحتية ضمن الطرقات والأماك العامة،  
 وحرصاً من شركتنا على عدم الحاق أي ضرر بالشبكات الهوائية او الممدودة تحت الأرض، و بالاحص  
 طريق عام صهر البيدر - قب الياس.  
 نطلب من حضرتكم تزويدنا بالخرائط العائدة لشبكاتكم الموجودة ضمن نطاق المشروع، كذلك تزويدنا باسماء  
 الاشخاص و أرقام هواتفهم ضمن كل قضاء لكي نتمكن من التنسيق و المتابعة.

وتفضلوا بقبول الاحترام

شركة حنا الخوري وأخواته  
  
 مدير مشروع

ريفاً: خريطة لموقع الأشغال

Hanna Khoury & Brothers Co. SARL New Rawda - Najarian Bldg 3<sup>rd</sup> Floor. Tel: 01-689665 Fax: 01-692056 Mobile: 03-357183  
 Website: <http://www.hkbros.com> email: [info@hkbros.com](mailto:info@hkbros.com)