CONSULTING SERVICES FOR:

Detailed Designs, Tender Documents and Supervision of Solid Waste Management Facilities (GC2C2d)

TERMS OF REFERENCE (TOR)

GATE

DATE: JUNE 2, 2026

TABLE OF CONTENT

Terms of Reference

1. Background

The Republic of Lebanon (The Borrower) represented by the Council for Development and Reconstruction (CDR) will implement the Green, Agri-food Transformation for Economic Recovery (the **"GATE"** or **"Project"**), funded by the International Bank for Reconstruction and Development (IBRD or the World Bank or the Bank*)*. The total project cost is Two Hundred Million United States Dollars (US$ 200,000,000).

The Project is structured into five main components, each designed to strengthen the resilience of Lebanon's agri-food sector and support farmers and SMEs.

Component 1: Climate Smart Investments in Agri-food Value Chains (US$71 million):
The objective of this component is to provide access to finance to strengthen the resilience and improve the competitiveness of farmers and SMEs involved in agri-food value chains. The component will promote climate smart practices, create higher value addition, improve links between farmers, agribusinesses, and markets, and unlock diversification opportunities. The project will finance activities specifically designed to benefit women and seek to contribute to reducing some of the gender gaps identified in terms of access to finance, inputs, markets, technical capacity building activities, improved confidence and negotiation skills as well as addressing social norms through a carefully designed behaviorally informed outreach campaign, also targeting men.

Component 2: Climate-Smart Infrastructure and Services for Agri-Food Sector Development (US$100 million):
The objective of this component is to restore service delivery, build operational capacity and ensure the sustainability and climate-resilience of public infrastructure underpinning the agri-food sector. It will be structured across two subcomponents: Subcomponent 2.1. Improving rural community infrastructure for agriculture; and 2.2. Restoring access and protecting agency-managed infrastructure and services underpinning agriculture.

Component 3: Improving the Enabling Environment and Restoring Support Services (US$21 million)
The objective of this component is to restore and strengthen the capacity of sector institutions to support the recovery and transformation of the agri-food sector.

Component 4: Project and Knowledge Management (US$8 million)
This component will support the coordination and management of the implementation of the project. It will finance overall project management, including inter alia: (a) coordination among different stakeholders; (b) monitoring and evaluation (M&E), including reporting climate benefits to the MoE to comply with the Paris Agreement reporting requirements; (c) project Environmental and Social Standards (ESS); (d) hiring of a gender specialist; (e) project fiduciary administration, internal controls, and audits; (f) communication and information activities, and (g) the establishment and maintenance of a grievance mechanism (GM) and a citizen's engagement mechanism. timely communication of results. This component will also finance a third-party

monitoring (TPM) mechanism, as well as timely communication of results. In addition, the project will recruit a Service Provider (NGO) specialized in child labor prevention and response and who will be responsible for supporting the project in preventing, mitigating, monitoring, and responding to such risks during implementation. It will finance the development of an action plan to combat child labor and a roadmap to improve social protection for farmers.

Component 5: Contingent Emergency Response Component (CERC) (US$0 million allocated initially)

This component will have zero funding allocation at the onset and will only be triggered in emergency circumstances; the project will support the preparation of a procedure manual governing the CERC operations.

Each component is designed to work together, ensuring a holistic approach to strengthening Lebanon's agri-food sector and supporting economic recovery.

Under Sub-Component 2.2, The Green, Agri-food Transformation for Economic Recovery (GATE) project supports improvements in solid waste management systems, recognizing that inadequate waste management infrastructure has significant environmental and public health impacts, including pollution of soil and water resources that directly affect agricultural production and rural communities. Accordingly, the GATE project will support the development and rehabilitation of solid waste management infrastructure in selected service zones across Lebanon.

The GATE project will conduct specific studies to implement Solid Waste Management (SWM) interventions in Lebanon through the Council for Development and Reconstruction (CDR) in close coordination with the Ministry of Environment (MoE).
In this context, the CDR is aiming to recruit a consultant for the provision of technical assistance to allow the rehabilitation and construction of needed SWM infrastructure at the level of several SWM service zones (SZ). The interventions aim to improve SWM in lagging areas where the project will intervene based on local solid waste master plans at the SZ level. The interventions will consider the sustainability of these investments and needed measures to ensure that a cost recovery model is established as part of this assistance.

All activities under this assignment shall be carried out in accordance with the World Bank Environmental and Social Framework (ESF) and the applicable Environmental and Social Standards (ESS), as well as relevant Lebanese environmental legislation and regulations. Environmental and social risks and impacts associated with the proposed solid waste management infrastructure shall be managed in accordance with the applicable environmental and social instruments prepared for the Project, including Environmental and Social Impact Assessments (ESIAs) and Environmental and Social Management Plans (ESMPs). The Environmental and Social Impact Assessments (ESIAs) and Environmental and Social Management Plans (ESMPs) for the proposed subprojects are being prepared under a separate assignment. The Consultant shall coordinate closely with the ESIA/ESMP preparation team and ensure that all Detailed Designs, Tender Documents, and Supervision activities are fully consistent with and integrate the findings, mitigation measures, and requirements of these instruments. The Consultant shall ensure that no construction works commence prior to the preparation and approval of the Contractor's Construction Environmental and Social Management Plan (CESMP) by CDR. In case of any inconsistency between the engineering design and the ESIA/ESMP requirements, the ESIA/ESMP

provisions shall prevail. The Project shall also follow Good International Industry Practice (GIIP), including the World Bank Group Environmental, Health and Safety (EHS) Guidelines for Waste Management Facilities.

2. Objective of the Assignment

The Main objective of this assignment is the provision of Engineering/Consulting Services needed for the implementation of the following activities (additional details about each phase are provided in subsequent sections), on a retainer basis:

Phase 1: Design services for the construction and/or upgrade of SW infrastructure. These could vary from assessing needs of existing facilities and developing refurbishment and expansion plans, construction of new facilities (sorting, composting and landfills), improvement to the management of existing landfills (expansion, leachate and gas management) and Preparation of Tender Documents and assistance during the tendering stage.

Phase 2: Supervision services for the construction and/or upgrade of SW infrastructure whose design and tender documents have been prepared under phases 1 and 2.

The Engineering/ Consulting firm shall perform the assignments in a manner that would fully attain and fulfill the objectives and outcomes described in the following sections.

3. Phase 1 - Engineering Design for Solid Waste (SW) Infrastructure

3.1 Phase 1 Objectives

The objective of Phase 1 is to develop the most cost-effective and affordable engineering design of selected SW infrastructure projects (sorting plants, treatment plants, sanitary landfills, improvement to existing infrastructure, etc,) as requested by CDR in coordination with MoE, with needs assessments, final design drawings, construction details, cross-sections, final quantities, cost estimates, and technical specifications. The Consultant shall ensure that the design of all facilities incorporates environmental protection measures, including leachate management systems, landfill gas management, stormwater control, environmental monitoring systems, and community health and safety considerations. The investment projects that might require development of detailed designs, preparation of tender documents and supervision services include, but are not limited to the below projects:

Service Zones	Nature of sub-projects	Required services Phase 1	Required Services Phase 2 (Initiated when triggered by the Client after Financing is secured)
SZ1 Akkar	Construction of Srar 2 sanitary landfill	Preparation of detailed design and tender documents for building a sanitary landfill. Assistance with bidding	Supervision of works.
	Refurbishment and expansion of the Srar MBT facility	Preparation of detailed design and tender documents for refurbishment and expansion of the Srar MBT facility. Assistance with bidding	Supervision of works of the Refurbishment and expansion of the Srar MBT facility.
SZ10 Tyre	Construction of an MBT facility in Abbassiyeh	Preparation of detailed design, tender document Assistance with Bidding	Supervision works for building an MBT facility and a sanitary landfill
	Construction of a sanitary landfill in Abbassiyeh		
SZ13 West Bekaa - Rachaya	Construction of a sanitary landfill in Kherbet Qanafar or Halwa	Preparation of detailed design and tender document for building a sanitary landfill Assistant with bidding	Supervision of works.
SZ17 Hermel	Construction of a sanitary landfill in Hermel		

CDR reserves the right to modify or add projects of a similar nature to those listed above, in coordination with the Ministry of Environment (MoE) where relevant. Detailed site-specific information will be provided in a separate annex in the RFP.

From a focused perspective, the consultancy assignment objectives comprise the following, which will be translated into general tasks to be undertaken by the Consultant for the full technical design purposes:

- Liaising with relevant local authorities on the ground and for all project's management deliverables
- Coordinating all on-the-ground assignment related activities with the various relevant parties,
- Establish all site's coordinates and required land info, etc… and coordinate for permitting procedures with relevant parties,
- Examine the proximity of the public utilities available at the project site (i.e. electricity, water, access, etc…) to the proposed, and access for use.
- Review of available information and collect specific site data and analyze pre-design data
- Inspection of the current environmental and social baseline conditions and review of the available Environmental and Social Impact Assessments (ESIAs) and Environmental and Social Management Plans (ESMPs), including site surveys, benchmarking, sampling, and testing for the selected site. The Consultant shall assess the compatibility of the proposed site and design with the physical and environmental conditions of the area, including but not limited to site topography, drainage patterns, soil conditions, geohydrology, surrounding land use, geotechnical findings and seismicity, and ensure that the environmental and social mitigation measures identified in the ESIA/ESMP are appropriately reflected in the engineering design

- Evaluate design conditions and report the engineering analysis, complete with identification of design issues and needs; in terms of technical, time, cost, quality and sustainability.
- Develop appropriate general conceptual layouts, and process design schemes including the preliminary engineering cost estimate, conduct stakeholder discussions and feedback, and proceed to get the required approvals and related consents from the relevant authorities.
- Preparation of technical specifications, sketches for the detailed design and construction and bill of quantities with estimated costs of the new waste management facilities (sorting/composting/landfill sanitary cells) and all site auxiliary infrastructure, developments, electro-mechanical works and relevant preliminaries.
- Produce the detailed drawings, specifications, and bill of quantities (BOQ) for each item according to the general requirements and in terms of the appropriate quantity and cost Estimates.
- Provide access, internal roads, ramps and traffic management systems for safe and efficient flow of traffic into and out of, as well as within the waste management facilities.
- Develop an operation and maintenance manual to enable site preparation, facility construction, soil cover, gas management, record- keeping activities, closure activities, and environmental monitoring to be conducted in a safe, efficient, and environmentally sound manner.
- Review the Contractor's CESMP and OHS Plan, and monitor their implementation throughout the construction and operation phases to ensure compliance with the approved environmental and social requirements.

In this context, the Consultant shall prepare, wherever needed, all engineering assessments, designs, drawings, specifications, BOQ, item by item cost estimations, supplementary documents etc.… associated with the above-mentioned elements.

3.2 Scope of Work

The scope of the required services has been divided into the following tasks, based on the nature and the need for each project:

3.2.1 Task # 1: Site Inspection, Survey and Assessment

Under this task, the Consulting Firm shall perform the following activities:

Task # 1.1: Site Inspection and Data collection for the assignments' sites.

a. Perform site visits and data collection- including collecting existing as-built drawings, notes of materials, existing design data, and all pertinent data from the concerned municipalities or any other relevant authority.
b. Conduct a comprehensive inspection and survey of the sites, including the inspection and survey of any existing structure(s), utilities and installations within the targeted areas of intervention, utilizing the topographic surveys to amend/ generate any as-built drawings where needed. For existing MBT, a comprehensive assessment should be conducted to identify status of installed equipment, rehabilitation and or refurbishment needs, and expansion needs of the facility.

c. Perform a detailed survey of any existing Mechanical, Electrical and Plumbing- MEP installations at the target sites of the assignment including those connected to utilities, e.g. clean water, sewage, electricity, telephone, etc. while providing description of their conditions, adequacy, capacity, efficiency and safe operation and determine whether any parts of the same can be retained and rehabilitated or to be totally dismantled and replaced;
d. Prepare a detailed survey and list of the demolition, dismantling, scrubbing, reinstatement, and rehabilitation works that might be needed prior to the commencement of the construction or refurbishment works.

Task #1.2: Geotechnical Assessment, Topographic Surveys, and Hydrogeological Study:

The Consulting Firm shall conduct all needed surveys included but not limited to topographical, geotechnical, etc… for the proper implementation of the projects. The Consulting firm shall provide its expertise as required to manage, coordinate and execute all the required services related to the Geotechnical Assessment and Topographic Surveys. The Consulting Firm shall conduct a comprehensive investigation based on existing records, site inspections and tests. These tasks are pre-requirement for the preparation of the Detailed Design
The Consulting Firm shall collect any geotechnical data available for the site and shall conduct additional geotechnical testing, all in coordination with the CDR PCU team.
Under this Task, The Consulting Firm shall perform the following activities:

a. Data Collection and On-Site Investigations/ Survey– this shall include, inter alia, the following:

i) Perform data collection (General notes of material, topographical and geological maps, geotechnical investigations etc.);
ii) Conduct visual survey and inspection of the site and its facilities; and other activities needed to perform geotechnical testing and topographic survey.
iii) With respect to the topographic survey, the services to be provided under this Task are aimed at preparing a comprehensive topographical investigation which is necessary for the design and construction of the facilities.

All existing physical features as well as existing surface and underground services will be surveyed and shown in the plan. The topographical survey will include, but not limited to, the following:

1) contour lines (i.e. elevations and other landforms) with 30mm minimum equidistance;
2) land boundaries, location of reference marks;
3) natural and manmade features within the land (e.g. natural features and structures, canals, trees with diameter above 15 centimeters, stream, fences, buildings, etc.);
4) access roads and street level; and,
5) such other information relevant to or important to take note of for construction projects, such as, drainage, earthworks, etc.
6) The trial pits or boreholes from the geotechnical investigation shall be clearly identified in the topo survey;
7) The survey of existing utilities from the site inspection shall be clearly identified in the topographic survey where possible;

b. Performing Tests and Desk Assessment– this shall include, inter alia, the following:

i) Field and lab tests: The Consulting Firm should on its own and as part of its scope under this study, in cooperation with a qualified certified testing lab, perform the minimum field and lab tests as per the below:

1) Conduct drilling and sampling of at least three (3) boreholes and 1 test pit for the project; The number and depth of boreholes and test pits shall be determined in coordination with
2) CDR PCU;
3) All excavations and boreholes to be carefully backfilled with suitable fill material;
4) Conduct field tests including Standard Penetration Test (SPT) through the soil at 1.5m depth intervals;
5) Determine the compactness of the soil strata at field at different elevations;
6) Explore the subsurface conditions at various locations underneath the proposed foundation locations and conduct the required in- situ tests; and
7) Conduct the necessary laboratory testing on the representative samples obtained during field investigation and drilling and evaluate relevant engineering parameters of the subsurface soils.
8) The field and laboratory testing shall be in accordance with international standards (BS EN 1997-2:2007, Eurocode 7 – Geotechnical design – Part 2: Ground investigation and testing, NA to BS EN 1997-2:2007, etc…)

ii) Desk assessment: The Consulting Firm shall perform the following tasks:

1) Prepare engineering analysis of field and laboratory findings;
2) Assess the relevant engineering parameters of the surface and subsurface soils; and
3) Identify the geological features, outcrops, topography, surface drainage, surficial materials and general site conditions.

c. Submission of Geotechnical Testing and Topographic Survey Narrative Report (GTTR) on Findings and Recommendations– - the Consulting Firm shall produce a Geotechnical Testing and Topographic Survey Report (GTTR) for the Selected Area whenever needed. The information provided shall be adequately detailed to enable an informed decision by CDR PCU, and shall include at minimum the following:

i) Brief Project background with the Methodology followed for the Geotechnical Surveys; Mechanical, physical and chemical laboratory tests shall be performed in accordance with the approved standards by an independent and governmental recognized institute. The tests shall comprise but not be limited to:

1. Grain-size distribution
2. Natural in place density moisture content.
3. Laboratory Moisture density relationships (ASTM D698 or D1557)
4. Atterberg limits for cohesive soil.
5. Laboratory Permeability and Coefficient of permeability
6. Shear box
7. Unconfined compressive strength.
8. Compaction proctor or modified proctor.
9. Consolidation.
10. Soil aggressiveness.

11. Soil plasticity
12. Groundwater chemical composition analysis.
13. Hydraulic conductivity of in place clay/soil materials

d. Submission of a Hydrogeological Study: In this study, the general geology and groundwater conditions should be described in the down to and including the lowest aquifer that may be affected by the landfill, including the following: stratigraphic, lithologic, and physical characteristics and thickness of each stratum, including the location and depth of each aquifer; the hydrogeologic characteristics of each aquifer, including hydraulic conductivity, groundwater hydraulic gradient and velocity, the geologic structure at the proposed facility and its relation to the regional geological structure, the uses of each aquifer, aquifer characteristics necessary to describe three dimensional groundwater flow underlying the proposed facility.

The scope of the hydrogeological study should cover the following key areas:

1) **Site Characterization:** This involves studying the existing conditions of the site, including the geology (stratigraphy, rock types and permeability, faults and fractures, slope stability, etc.), hydrology, and natural resources. It helps in understanding the subsurface conditions which are critical for the design of the landfill.
2) **Groundwater Flow Determination:** Mapping the direction and rate of groundwater flow is essential to predict the potential spread of leachate from the landfill and to design appropriate containment systems. The Consultant shall design an environmental monitoring system for the landfill facilities, including groundwater monitoring wells upstream and downstream of the landfill, leachate monitoring, and provisions for periodic sampling and analysis in accordance with international best practices.
3) **Hydraulic Conductivity**: Measuring the ease with which water can move through subsurface materials, which affects the potential for leachate migration.
4) **Water Table Elevation:** Determining the depth to the water table to ensure that the landfill base is above it, reducing the risk of direct contamination.
5) **Aquifer Testing:** This includes pumping tests to determine the hydraulic properties of the aquifers, such as transmissivity and storability, which are important for modeling groundwater flow and contaminant transport and aquifer characteristics. Studying the properties of aquifers, such as their depth, thickness, flow direction, and recharge rates, help understand how they might interact with potential contaminants.
6) **Water Balance Analysis:** This involves assessing the inflow and outflow of water in the area, including precipitation, evaporation, surface water runoff, and groundwater flow, to manage the leachate and surface water control systems.
7) **Leachate and Contaminant Transport Modeling:** Predicting how potential contaminants from the landfill might move through the subsurface environment is critical for assessing risks to groundwater and designing mitigation measures.
8) **Soil Permeability Tests:** These tests are conducted to determine the permeability of the soil, which is important for designing the base and cover systems of the landfill to prevent leachate migration.
9) **Assessment of Geological Hazards:** Identifying potential geological hazards such as fault lines, sinkholes, or landslides is important for ensuring the long-term stability of the landfill.

For guidance, please refer to Environmental Health and Safety Guidelines for Waste Management Facilities, dated December 10, 2007.

A specialized third-party laboratory chosen by the Consultant for carrying out the sampling and testing is subjected to a prior authorization from CDR PCU before commencement. The selected laboratory shall meet the relevant national and international standards.

i. Outline of the activities undertaken; A plot showing the location of test borings and/or excavations;
ii. Existing geotechnical e.g. surface and subsurface, Soil condition findings) conditions and assessment;
iii. Location of subsurface exploration logs on the site plan
iv. Earthquake seismicity parameters;
v. Documentation on tests undertaken and test results / reports, data analysis;
vi. Method statements for any remedial or retrofitting procedure that shall be executed where needed along with calculation sheets;
vii. Allowable soil bearing capacity and foundation recommendations, settlement, compaction requirements, ground-water levels, construction materials, and others; and
viii. For the Topographical Survey Report, the consultant should provide one topographical map in 1 set soft version in AutoCAD and PDF and 1 set hard copy on A3 size for the site. These shall include:
    i) the elements surveyed and mentioned in the earlier section (e.g contour lines, land boundaries, location of reference marks, natural and manmade features within the land etc…)
    ii) Photo records on all field tests, Information on all data collected from site; and
    iii) Conclusions/ Evaluation and recommendation.

Task #1.3: Survey Report (SR)

Upon completion of all the subtasks under Task #1, the Consulting Firm shall prepare a comprehensive Survey Report (SR) comprising the following:

a. Detailed description of the site survey and data collection activities;
b. The GTTR and its annexes; and
c. Clear description of the Findings and outcomes along with clear recommendations that need to be taken into account and feed into the completion of the following Tasks.

Upon submission of the SR and its approval by **CDR**, the Consulting Firm shall proceed with the preparation of the Detailed Design.

Notwithstanding the above, and subject to **CDR's approval**, subtasks under Task #2 may be initiated prior to the completion of Task #1, in coordination with **MoE and other relevant stakeholders**, in a manner that ensures the timeliness of the Project and the quality of the deliverables.

3.2.2 Task #2: Preparation of Detailed Design and Technical Support

Task #2.1: Preparation of Detailed Design

Under this Task, the consulting firm shall prepare full Constructible Detailed Design– ready for construction shop drawings– for all the disciplines (e.g. Architectural, Civil, Structural, Mechanical, Electrical, SPVHS, Landscaping, etc.) needed to rehabilitate, expand or construct the needed facilities.

Under this Task, the Consulting Firm shall conduct the following sub-tasks:

I. Task# 2.1.1 Design Brief
II. Task# 2.1.2 Concept Design
III. Task# 2.1.3 Detailed Design
IV. Task# 2.1.4 Design Review

Detailed Design Methodology

In preparing the detailed design, the Consulting Firm shall:

a. Verify the correctness and accuracy of the As- Built Drawings against the existing built structures and systems. In case of discrepancy between the As- Built Drawings and the existing built structures and systems, the Consulting Firm shall be responsible to either produce or modify the pertinent As-Built Drawings and to produce new drawings to reflect the actual situation on the ground, moreover in case of the unavailability of the As-Built Drawings, the Consulting Firm shall produce new drawings to reflect the actual situation on the ground.

b. Utilize the Narrative Reports on Findings & Recommendations related to the GTTS and the Survey Report prepared under Task #1, to prepare the detailed design in a manner that would maintain the integrity of the site and take into consideration the bearing capacity of the soil and the method statements indicated in the said Narrative Reports.

c. Take into consideration climatic data related to temperature, humidity, rainfall, wind speed, etc.

d. Be responsible for producing a new detailed design taking into consideration the actual situation on the ground, the social assessments, the results of the stakeholders' consultation sessions, and reflect, to the extent possible, the stakeholders' requests, concerns, and preferences. The proposed designs will be evaluated in terms of their feasibility, practicality, compliance with applicable design standards and guidance, and ability to meet the diverse needs of end users, and shall respond to the comments of **CDR PCU,** in coordination with **MoE where relevant**. The Consulting Firm shall also obtain the stakeholders validation on the Final Detailed Design package.

e. Prepare the Detailed Design in a manner that ensures meeting minimum requirements for safety and functionality as per international Minimum Health and Safety Requirements for Contractors.

f. Optimize the design to ensure value for money and compliance with applicable international standards and **relevant national regulatory requirements, including those of MoE where applicable**.

g. Utilize Specialized Computer Aided Design Software for the design of the various disciplines of each of the three assignments (e.g. 5D BIM- Building Information Modelling, etc.);

h. Provide full details (dimensions, sizes, distances, elevations, weights of the various sections/components/equipment of the design, etc.), clear technical specifications, calculation notes, scope of work, testing and commissioning procedures, operation and maintenance procedures, standards of procedure- SOP for the waste management system, and training requirements;

i. With respect to the equipment and materials specifications, these shall be prepared in a manner that guarantees highest performance, efficiency, reliability and availability, and

shall be in accordance with the applicable international standards. The Consulting Firm shall not extract from specific manufacturers catalog sheets.

j. Take into consideration that CDR PCU or other agencies will conduct procurement processes for the implementation of the construction works, based on the Detailed Design prepared by the Consulting Firm.

k. Ensure that the mitigation measures identified through the E&S assessments are integrated into the design as appropriate.

Detailed Design Components

The Detailed Design to be prepared by the Consulting firm shall comprise, inter alia, the following:

Task # 2.1.1: Design Brief

The Consulting Firm shall build on the Survey Report and set out the Technical Objectives, Functional Statements and Performance Requirements, as well as spatial requirements for all of the three assignments, and shall prepare the Design Brief to tackle/include, inter alia, the following:

a. Facility Data, site information and surveys, as well as all other technical surveys conducted/collected under the scope of this consultancy (Geotechnical and Topographic Surveys, etc.);

b. Detailed description of the existing above/underground systems, installations, and facilities, highlighting the configuration, type and make of equipment and the proposed enhancements;

c. Setting Out Technical Objectives, Functional Statements and Performance Requirements for each assignment's components and facilities;

d. Spatial requirements of the Project and linkages between its various sections as well as the neighboring buildings/structures/facilities, etc. including design sketches;

e. Proposed Detailed Design methodology and Approach;

f. Identification of design assumptions and criteria, design solutions to meet End-Users needs, including women and girls, PWD and other marginalized groups

g. Description of the various facilities, installations, equipment (e.g. civil, electrical, Solar, mechanical-HVAC and Plumbing, irrigation, drainage, storm water, water treatment and storage, fire protection/fighting, etc….);

h. Codes and standards (local and international) pertaining to all disciplines to be adopted, noting that the applicable codes and standards proposed by the Consulting Firm shall be subject to the approval of CDR, and shall comply with relevant national regulatory requirements, including those of MoE where applicable.

i. Forecast about the waste, types, proposed waste management system, size, operation and maintenance protocols and Standards of Procedure-SOP;

j. Detailed Design methodology and Approach, Implementation plan and schedule for the rehabilitation/construction works including list of risks and precautions to be considered;

k. List of licenses/permits that are needed to commence the Rehabilitation/ Construction works in the BHCC along with detailed requirements and steps needed to obtain the same;

l. Preliminary cost estimates for the whole Project (Rehabilitation, construction, including a breakdown of anticipated costs related to materials, labor, and other resources, operation and maintenance, management, etc.); and Annexes (e.g.SR, etc.)

The Design Brief shall be submitted by the Consulting Firm to CDR/PCU for its review, comments and approval/disapproval.

The Consulting Firm shall respond to the comments provided by CDR/PCU and amend the Design Brief accordingly, in coordination with MoE where relevant.

Task # 2.1.2: Concept Design

The Consulting Firm shall build on the Design Brief and expand further to ultimately develop a mature and accurate Concept Design taking into consideration the pertinent international and local standards best practices, Stakeholders' requirements, and the situation.
The Consulting Firm shall:

- **a.** Perform any additional, necessary site assessments and surveys that emerge as a result of the design brief preparation;
- **b.** Attend meetings with stakeholders as may be required and requested by **CDR**/PCU, in coordination with **MoE where relevant**, including participatory consultations with communities.
- **c.** The Consultant shall prepare all required preliminary architectural and general engineering designs, drawings, calculations, plans, cost estimates, etc.… for all site development works with appropriate coordinates and topography including:
  1. The coordinates and topography- general layout
  2. Site layout plans for the waste management facility in question (sorting, composting, landfill, other components) including preparation works, internal roads, access roads, auxiliary facilities, connection to external facilities and utilities, etc.…
  3. Detailed architectural designs and drawings for the site facilities under the scope of work.
  4. Detailed site preparatory works (i.e. excavation, clearing, draining, filling, grading and consolidation, as needed) design, profiles and cross sections
  5. General/Detailed access roads design, profiles and cross sections.
  6. General/Detailed Earthworks plans of the requested facilities, profiles and cross sections
  7. General/Detailed excavation works layouts, reference points and slope construction profiles
  8. General/Detailed storm water collection and drainage sections and layouts
  9. Detailed equipment layout
  10. Civil and structural plans
  11. General/Detailed leachate collection system, leachate zone sections, pumping, sump/reservoir, conveyance Network, storage tank, drainage and pumping, layouts, sections, and profiles
  12. Detailed Lining (geo-membrane and geo-synthetic materials) bottom, manholes, reservoir and slopes of the sanitary cells sections and layouts
  13. General/Detailed geo-membrane contour and Leachate bottom drainage System sections, profiles, and layouts. All recommended lining materials should be in accordance with the specifications of GIR (Geosynthetic Institute Research)
  14. General/Detailed active barrier layouts, embankment cross section, and anchor trench layouts for geo-synthetics

15. General /Detailed bottom and lateral side containment barrier systems sections, and layouts.
16. Municipal utilities at the landfill site (power supply and water supply requirements & layouts).
17. Environmental monitoring and management systems (See more details in Task 3)
18. General layouts for the landfill cells closure works, final reshaping and plateau construction, final side slope development, final capping cover.
19. General Layout of the recommended gas collection system.
20. Electro-mechanical work design: perform engineering and undertake design of the following electro-mechanical work, in accordance with the findings and mitigative measures recommended by the environmental management plan outlined in the ESIA including public participation documentations.
21. Electrical power and distribution system; and
22. Pumping unit for leachate to the assigned leachate storage tank.
23. Others

d. Prepare and submit a Draft Concept Design following consultation with CDR PCU, in coordination with MoE where relevant, and the stakeholders.

e. Present the Draft Concept Design to the various stakeholders as requested by CDR PCU. As such, the Consulting Firm shall prepare presentations, layouts, and any other reports and visual materials that would be needed to clarify the draft concept design to the stakeholders.

f. Prepare a detailed report concerning the Stakeholders Consultation (SCR) meetings and validation workshops, including:

g. Details of meetings, participants, pictures (Upon consent of the participants);

h. Deliberations with, recommendations and requests from the stakeholders; and

i. analysis matrix by the Consulting Firm of these recommendations and requests and clear justification on why and how to include/exclude these in/from the concept design.

j. Amend the Draft Concept Design building on the findings from stakeholders' engagement activities, resonate with the stakeholders' input and incorporate in the design, to the highest extent possible (Taking into consideration constraints such as scope, technical, budgetary, location specific, etc.) the Stakeholders' requests, concerns, and preferences. Submit the amended Draft Concept Design to CDR PCU for its review, comments, and approval/disapproval.

k. The Consulting Firm shall respond to the comments that would be provided by CDR PCU and amend the Draft Concept Design accordingly and submit the Final Concept Design to CDR PCU.

l. Upon approval of the same by CDR/ PCU, the Consulting Firm may proceed with the execution of the tasks under the Detailed Design.

Task # 2.1.3: Detailed Design Package

The Consulting Firm shall fully develop and provide the Final Detailed Design from, and expand upon the approved Concept Design.

The design parameters need to be optimized to include all required rehabilitation and construction works to produce a complete and coherent holistic design.
The Consulting Firm shall prepare and submit a draft detailed design including all necessary execution drawings, including interior design packages where applicable, calculations, details, Bills of Quantities and Specifications, whilst abiding by the defined standards, codes and guidelines.
To revise the Detailed design package to incorporate and comply with the comments to be received from the CDR Design Review, and ensure that the detailed design and Construction Tender Package including technical specifications, BOQs, guidelines, and contractor qualification criteria adequately reflect the environmental and social mitigation measures and requirements identified in the Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Plan (ESMP), and the applicable provisions of the World Bank Environmental and Social Framework (ESF).
The Detailed Design must include, inter alia, the following:

a. Detailed Design Drawing Set which shall include the following packages (these are further detailed in **Annex 1**):

   i. Architectural Package
   ii. Civil Works Package
   iii. Structural Package
   iv. Mechanical Package
   v. Electrical System Package

   The above engineering disciplines drawings lists are not exhaustive. The Consulting Firm shall prepare other drawings as might be deemed necessary by the CDR PCU.
   The Consulting Firm shall provide fully coordinated plans/layouts/drawings showing the multi-disciplinary layers of the different engineering systems.

b. Construction details:
   The detailed design MUST provide construction details and schedules that can be executed without compromising the design intent.
   The Design shall provide full details, dimensions, sizes, distances, elevations, weights where applicable (e.g. Steel Structure, retaining walls, gates, manholes etc.) of structural elements to be constructed and all the centralized and stand-alone systems, in addition to schedules of equipment, welding methods, connections as well as the specifications of the materials, protection, painting, etc. where applicable.

c. Supporting Calculations Notes:
   The Detailed design must be supported by calculation notes (structural, electrical, mechanical, lighting, electrical, etc.). In preparing the design calculations, as indicated above, the Consulting Firm MUST use internationally recognized design software based on recognized standards and, when working manually, prepare neat and proper records of the design calculations. The design record MUST be made available for third party reviews and checks at any time and MUST be handed over as part of the end users Taking-Over package.

d. Construction Tender Package:

The construction tender package shall contain at minimum the compilation of drawing sets, specifications with technical preface, BOQs, Guidelines, contractor's qualification criteria, etc. The Consultancy Firm shall advise on the qualification criteria of the contractors including inter alia, administrative, commercial, financial and technical criteria, as well as the terms of payment and other procurement documents as deemed necessary.

e. Detailed Technical Specifications:
The Consulting Firm shall submit Technical and Functional Requirements and Technical Warranties of all the components and equipment;

f. Detailed Scope of Work:
The Consulting Firm shall submit the Detailed scope of the construction contractors in addition to general obligations (on Health Safety Security and Environment- HSSE and Prevention of Sexual Harassment and Abuse- PSEA Requirements, putting in place the pertinent Insurance policies- to be clearly identified by the Consulting Firm, Site office, Storage, Time Lapse Cameras, etc.).

g. Standards, codes and guidelines:
The Consulting Firm shall abide in the detailed design by International and local standards, codes and codes of practice.

h. Visibility:
The Consulting Firm shall provide high quality photos capturing the components and the impact of the project. Determine Training requirements:
The Consulting Firm shall determine the training requirements for operation and maintenance and management services (O&M of landscape areas, O&M of solar systems, O&M of MEP systems etc…), and SOPs for the waste management system.

i. Project Implementation Schedule:
Regular updates of the implementation schedule in MS Project.

j. Detailed Bill of Quantities and Detailed Cost Estimates: Including recommended Spare Parts list.

k. Other reports:

At the completion of the preparation of the Final Detailed Design stage:

a. All coordination exercises should have been profoundly conducted;

b. Layouts prepared, facilities and sections identified and indicated on the layouts along with clear and precise determination and design of the proposed equipment schedules and locations, Civil/Structural engineering information, Mechanical, and Electrical.

c. Any necessary government and other stakeholders would have been consulted, and the concerns/requirements of relevant stakeholders incorporated into the Final Design;

d. Approval by the concerned Municipalities of the Final Design has been obtained by the Consulting Firm;

e. All aspects of design have been completed and incorporated, including training requirements, operation and maintenance and management services, spare parts, health, safety and sustainability considerations and SOPs for waste management systems;

Task # 2.1.4: Design review process

The Consulting Firm shall take into consideration that the Deliverables under Tasks #1 and #2 (Under detailed Design Subtasks), would be subject to review by CDR PCU.

The Consulting Firm shall provide comprehensive clear and accurate Deliverables with full details in order to avoid a lengthy review process.

Submissions that do not include the required documentations will not be accepted for review by the CDR PCU.

The Consulting Firm shall provide the final Detailed Design in full, within the set deadlines and without omissions, for submission to CDR.

The deliverables shall not be considered Final until CDR PCU deem that the Design Documents substantially and fully meet the requirements, in coordination with MoE where relevant.

Design reviewer's' liability shall be limited to evaluating the compliance of the design against the minimum requirements set out in the design planning manual and shall not include any liability for the design itself, which shall remain with the Consulting Firm.

4. Preparation of Tender Documents & Assistance during Tendering

The Consultant shall prepare the **Construction Tender Documents** which shall contain, at minimum, the compilation of drawing sets, specifications with technical preface, BOQs, contractor's qualification criteria including inter alia, administrative, commercial, financial, EHS and technical criteria, terms of payment, and other procurement documents as deemed necessary.

The Construction Tender Document shall comprise the Following Volumes and Documents:

Volume 1: Request for Bid (RFB)

Volume 2: Specifications

Volume 3: Bill of Quantities

Volume 4: Detailed Drawings

Also, The Consultant shall support CDR PCU throughout the solicitation and evaluation of construction tenders. More specifically the Consultant shall:

- Provide CDR PCU with answers to the Clarifications Requests raised by the Prospective Bidders as might be requested, prior to **Bid Submission Date** (**BSD**)
- Support in the technical and financial evaluation of the offers received and prepare the evaluation reports needed.
- Preparing evaluation reports including scoring of **specific experience and detailed proposals**.
- The Consultant shall ensure that the tender documents incorporate environmental and social requirements derived from the ESIA and ESMP, including environmental technical specifications, occupational health and safety provisions, pollution prevention measures, waste management procedures, and community health and safety measures, and specific BOQ provisions for the implementation of the ESMP measures. The tender documents shall require the Contractor to prepare and implement a Construction Environmental and Social Management Plan (CESMP) consistent with the ESMP and the environmental and social requirements of the Project. The tender documents shall also include a Chance Finds Procedure to address the potential discovery of cultural heritage during excavation works in accordance with the World Bank Environmental and Social Framework (ESS8).

5. Phase 2 - Supervision Services for SW Infrastructures

The Consultant will perform all the duties of "the Supervisor" as identified in the General and Specific Conditions of Contract in supervising construction works in addition to any additional duties described above.
The supervision shall be organized to ensure an efficient administration of the activities, a timely implementation of the works as well as efficient use of the financial resources. The Consultant shall ensure the observance of the Lebanese legislation during the construction.

The Consultant shall work closely with CDR PCU to ensure the construction schedule is performed in an efficient and orderly manner. If works are not progressing satisfactorily for reasons beyond the control of the Consultant, he is responsible to inform CDR PCU on measures to overcome the situation to meet objectives and schedules of the works contracts.

The consultant shall provide construction support services to CDR during the construction. These services shall include as typically are provided by an architect-engineer to an owner during the course of the construction project, services of such nature and extent as are reasonably required to inform and advise CDR fully and completely and to enable CDR to adequately enforce the bid documents and contracts relating to the supply and construction of the above-mentioned downstream projects.

The consultant will act as a faithful representative of CDR during downstream construction and in this capacity will endeavor to:

a. Safeguard CDR against deviation from the requirements of the Contract Documents by the downstream contractor(s),
b. require the downstream contractor(s) to complete the downstream work within the time specified in the construction contract, and
c. Safeguard CDR against defective work.

The following principles shall be respected in performing the Supervision Activities:

1. Provide interpretations, clarifications, and advice on all design-related and technical issues. The Consultant shall advise and consult with **CDR**, in coordination with **MoE where relevant**, regarding solutions to conditions or problems arising during design or construction.
2. Review, approve or disapprove shop drawings, "as-built" drawings, samples, and other submissions of the downstream contractor(s) to determine compliance and conformance with the requirements of the contract documents.
    a. When the submittal conforms fully to the contract drawings and specifications, the Consultant shall approve it.
    b. When the submittal clearly does not conform to the contract drawings and specifications, the consultant shall either disapprove it, or refer it, along with his/her recommendations, to CDR PCU.
    c. When the submittal has only minor deviations from the contract drawings and specifications, the consultant shall note the deviations and omissions as may be appropriate and approve the submittal subject to the notations.
3. Designate tests on materials and/or equipment as necessary. Review and approve test results and materials and/or equipment used in the work. The consultant shall keep record of all measurements, tests, etc.…

4. Supervise the assembly, installation, preliminary tests, initial operation and preparation for commissioning of all installations and works on site.
5. Monitor progress, survey measurements and observation of completed work. This includes certification of progressed work, fully completed work, and accepted work. The consultant shall additionally take periodic photographs during construction and installation.
6. Monitor progress against a detailed programme of works prepared using a project management software and shall be regularly updated with actual figures and dates. The initial programme shall be submitted within the first week after appointment of a contractor(s); any required modifications shall be completed within one week of comments from CDR PCU. Delay in receipt of some details from the contractor(s) will not be accepted as a valid reason for delay in submission of the Consultant's initial programme. The consultant shall also submit within its progress reports analysis of delays or problems influencing the performance and progress of the contractor(s) as well as recommendations for recovering lost time (if any).
7. Interpret the requirements of the contract and make all decisions regarding performance of the downstream contractor(s). The consultant shall inform and advise the Contracting Authority in a timely manner regarding all claims of the contractor(s) relating to the execution, progress, and completeness of the work.
8. Advise MoE of any work that fails to comply with the specifications and requirements of the contract documents. Whenever considered necessary or advisable to ensure correction of defective work, the consultant may require inspection or testing of such work, whether or not such work is then fabricated, installed, or completed.
9. Anticipate potential claims and take steps to mitigate their effect. That notwithstanding, the consultant shall support CDR PCU in resolving contractor(s) claims and in preparing variations and change orders.
10. Provide the services of a project representative during the period from the date of downstream contract(s) award(s) until the contract(s) has been successfully completed. The consultant shall provide adequate presence on site during construction, installation, testing, commissioning and manufacturing (if applicable) as deemed necessary to fulfill its duties described in this section.
11. The consultant shall detail in the Organization and Methodology its exact intervention times and its plan to handle inspection and presence at site. At a minimum, presence at site shall be guided by the following requirements:
    a. Periodic Inspections: the consultant shall provide Periodic Inspections at intervals appropriate to the stage of the contractor(s)' operations and consistent with the size and nature of the work, but in any case, not less than an average of three inspections per week during construction. Exact intervention times shall be detailed in the Organization and Methodology. It shall remain the responsibility of the consultant to have satisfied itself with the same.
    b. Trade-specific Inspections and Tests: the consultant's qualified experts shall attend specified inspections and tests as necessitated in downstream contracts and as required to ensure compliance of the contractor(s) with contract documents
    c. Specialized Inspections: the consultant shall conduct those other inspections related to assessing claims, requests for extension of time, change orders, etc.… and other scheduled inspections as necessitated by the downstream contract documents. Included in this category are final inspections and acceptance tests prior to the issuance of the Taking Over Certificate

12. Use qualified inspectors (pursuant to the point above) from the various associated disciplines and trades to supervise the different aspects of the downstream projects to ensure compliance with the budget, design, drawings, specifications, schedule, quality, etc. specified in the contract documents.
13. Whenever, the above is expected to be breached, the consultant shall advise CDR PCU on solutions and alternatives.
14. Attend a regular meeting with CDR PCU and the downstream contractor(s), to be held at least every two weeks during the work period to report on progress and quality of work performed and to discuss work-related issues. The consultant shall prepare minutes of meeting and submit the same to CDR PCU.
15. Enforce safety, health, and environmental requirements. The Consultant shall also ensure that project implementation complies with the recommendations and requirements of the approved ESIA's and ESMP, and applicable national regulations, including those of **MoE where relevant**.
16. Provide other construction services as normally provided by an architect-engineer and as may be instructed by the Contracting Authority.

The Consultant will provide support to CDR PCU at all stages of project implementation. In this regard, the Consultant will be called to execute related tasks which may include, without being restricted to:

1. The Consultant will ensure that the contractor constructs the works in accordance with the approved designs, specifications, terms of the contract, and relevant engineering standards and codes of practice;
2. The Consultant will ensure that the contractor achieves all construction performance measures and especially those related to time, cost, quantity and quality of the works, environmental protection, community relations, worker health and safety and protection of works;
3. The Consultant shall ensure a permanent presence of his key personnel at the works site in accordance with Contractors' work plan;
4. Supervise the implementation of the ESMP.
5. The Consultant is responsible to review the E&S instruments to be prepared by the Contractors;
6. The Consultant is responsible to promptly inform CDR PCU in case of likelihood or existence of deviation from the construction work plan, increase in costs and duration for completion of works;
7. Preparation of supplementary plans and additional technical studies and investigations that may be required in order to resolve actual unforeseen conditions on the site and as a consequence of carrying out the review of the contractor's detailed design and construction drawing;
8. Review and approval of shop drawings and specifications issued by the Works Contractor;
9. Review and approval of test results of laboratory tests;
10. Maintain a presence on the site, as well as specific visits by specialists in order to observe and to report on the progress and the quality of construction and the installation of equipment;
11. Reviewing and issuing payment certificates; Participation in weekly site meetings with the contractors and other affected parties;

12. Study and verification of the contractor's work program, organization and method statements, proposals for material sources and quality assurance plan: review and comment as necessary or recommend acceptance;
13. Review and verification of the Contractor's proposals for implementation of the Environmental and Social Management Plan (ESMP) and the Construction Environmental and Social Management Plan (CESMP
14. The Consultant shall set up a supervisory organization including monitoring systems to ensure a fast and efficient administration of the activities, a timely implementation of the works and an efficient use of the financial resources.

In summary to the above, the Supervision and follow-up of the project will comprise the following activities:

1. Site/field visits and inspections;
2. Review/approve shop drawings/ as-built drawings,
3. Review/approve/reject submittals presented by the contractor,
4. Review/approve/reject the implementation programme submitted by the contractor,
5. Ensure that works meet the technical specifications,
6. Ensure that works meet the E&S specifications (in accordance with the ESIA and ESMP),
7. Review/approve/reject the Works implemented by the contractor,
8. Designate, review and approve test results,
9. Supervise infrastructure all works and installations on site,
10. Monitor progress in accordance to the implementation programme and take active steps to mitigate any delays in implementation,
11. Anticipate potential claims and take steps to mitigate their effect,
12. Analyze and provide detailed reports on submitted claims, and
13. All other activities as deemed necessary for the good execution of the works in conformity with the requirements of the contract documents and best engineering professional practice.
14. Participation to meetings with the different stakeholders concerned with the project and prepare the relevant Minutes of Meeting;
15. Formulation of technical notes about the execution;
16. Preparation of the necessary contractual documentation to initiate the acceptance process;
17. Any other activity that might be deemed necessary to execute this technical assistance in a perfect manner
18. Provide assistance in Payments Validation through the approval on payment requests initiated by the contractor and issuing Interim Payment Certificates. The Consultant is expected to operate the required control and due diligence processes for the validation (existence of an original invoice submitted with the necessary justifications; conformity of the invoicing with the services rendered, supplies or works effectively provided, delivered or executed; conformity of the invoicing in terms of quantity, quality and schedule with the provisions of the contracts; conformity of the amounts invoiced with the unit cost and budget appropriation of the contracts; etc.).
    The technical validation of the payments will be operated by the Consultant; in this regard, the Consultant shall:
    a. Perform any necessary inspections (site visits, verification of documents, drawings and designs, approval on Requests for Inspections, etc.);.
    b. Produce "a certificate of conformity" for the expenses he deems receivable; and

c. Produce a technical note for the expenses he rejected or about which he has a certain reservation.

Any other activity that might be deemed necessary to execute this technical assistance in a successful manner;

6. Timeline, Deliverables and Reporting Requirements

6.1 Commencement Date and Period of Implementation

For Phases 1 the Commencement Date is the date of signature of the Contract and extends for a period of 12 months.

For Phase 2, 18 months from the selection of the construction contractor and defect liability period of 12 months.

6.2 Deliverables

The Consulting Firm shall submit to CDR the deliverables within the agreed detailed Implementation Schedule based on the activities that will be requested.

Phase No.	Deliverable	Timeline from Contract Notification Date (ND)
Phase 1 D1	Draft Assessment Reports including site inspection survey, detailed survey report, geotechnical testing and topographic study Report, and hydrogeological study report	ND + 4 months
Phase 1 D2	Submission of Final Assessment Reports	ND + 5 months
Phase 1 D3	Draft detailed design package, as applicable to the nature and scope of each selected sub-project, including the design brief report, concept design, and complete detailed design package for the selected projects.	ND + 8 months
Phase 1 D4	Final detailed design package for selected projects	ND + 9 months
Phase 1 D5	Preparation of tender documents	ND + 10 months
Phase 1 D6	Support during solicitation and evaluation of offers by providing answers to the clarification's requests raised by the prospective bidders as might be requested.	ND + 12 months
Phase 2	Monthly Supervision reports	Monthly
	Quarterly supervision reports	Quarterly
	Final Supervision Report	At end

6.3 Meetings and Reporting

The Consulting Firm and CDR shall hold weekly progress meetings and other ad-hoc meetings as may be requested by CDR, with the participation of MoE and other relevant stakeholders, as appropriate.
The Consulting Firm shall prepare technical reports and/or presentations as required by CDR.
The Consulting Firm shall attend all meetings (including those with stakeholders and other entities) as requested by CDR, with appropriate representation, and in coordination with MoE where relevant.
The Consulting Firm shall prepare regular updates of the implementation schedule and methodology.
Reports shall be submitted by the Consulting Firm as requested by CDR.
The Consulting Firm shall submit the Deliverables in both electronic and hard copy formats.
Following CDR's review and approval of the draft and final Deliverables, the Consulting Firm shall provide three (3) signed hard copies and one soft copy of the approved documents.
CDR shall be the sole owner of all documents and deliverables produced by the Consulting Firm under this Assignment and shall have full rights to use them at its sole discretion without restriction.
The Consulting Firm shall submit other reports as might be deemed necessary to comply with CDR Requirements.

7. Team Composition, Requirements & Qualification for the Key Experts

7.1 General Requirements

The Consulting Firm shall:

- Provide highly experienced staff (Environmental Engineers/Experts, Social Experts, Solid waste management experts, Architects, Electrical, Civil/Structural and Mechanical Engineers, Quality Controller, Quantity Assessors, Geologist/Hydrogeologist, etc.).
- Provide a description of the inputs/resources (team of experts, facilities, etc.) required to achieve the expected results.
- Describe the structure and composition of its key experts for provision of the services, including support staff and list the main activities of the Assignment, and the key expert(s) responsible for these activities. Including the division of gender of all staff that will be working under this contract.
- Provide an organigram illustrating the reporting lines together with a description of such organization of the team structure.
- Provide the curriculum vitae of all proposed key experts including their gender, annexed to the proposal
- Provide a schedule for the activities to be carried out within the noted assignment duration, annexed to the proposal
- Provide a methodology to carry out the required activities, annexed to the proposal.

7.2 Key Staff Requirements

The Consulting Firm staff shall deploy for the execution of the Assignment, as a minimum, the below key experts:

1- **Team Leader/Project Manager** – she/he shall:
   a. have a minimum 15-year experience in the Solid Waste management field;
   b. Have experience in technical coordination between different trades of a project;
   c. Have experience in project and/or design management:
   d. have a minimum of Bachelor degree in Environmental Engineering or any related field;
   e. be responsible for coordination and overseeing the activities of the Assignment;
   f. act as the key focal point for liaison and communication with CDR, and coordinate with MoE and other relevant stakeholders where required.

2- **Solid Waste Management Expert-** She/he shall:
   a. have a minimum 10-year experience in the Solid Waste management field;
   b. Have experience in waste management feasibility studies and detailed design for SWM infrastructure projects
   c. Have experience in coordination between different trades of a project;
   d. Have experience in project and/or design management:
   e. have a minimum of Bachelor degree in Environmental Engineering or any related field;

3- **Composting Expert-** She/he shall:
   a. have a minimum 10-year experience in the Solid Waste management field;
   b. Have strong experience in the design, construction, and operation of waste processing facilities including composting, organic material sorting and processing, odor control and management, leachate control and management.
   c. Have experience in coordination between different trades of a project;
   d. Have experience in project and/or design management:
   e. have a minimum of Bachelor degree in Environmental/Civil Engineering or any related field;

4- **Landfill Design Expert-** She/he shall:
   a. have a minimum 10-year experience in the Solid Waste management field;
   b. Have strong experience in the design, construction, and operation of sanitary engineered landfills, landfill liner barrier protection systems, and sanitation and leachate management systems.
   c. Have experience in coordination between different trades of a project;
   d. Have experience in project and/or design management:
   e. have a minimum of Bachelor degree in Geotechnical/Environmental/Civil Engineering or any related field;

5- **Geotechnical/Hydrogeologist Expert**– she/he shall:
   a. have a minimum 10-year experience in the geotechnical and hydrogeology fields;
   b. Have experience in geotechnical engineering and related design for SWM infrastructure projects
   c. Have experience in coordination between different trades of a project;
   d. Have experience in project and/or design management:
   e. have a minimum of Bachelor degree in Geotechnical Engineering or any related field;

6- **Civil/structural engineer – she/he shall:**
   a. have a minimum 10-year experience in civil and structural design;
   b. Have experience in civil and structural related design for SWM infrastructure projects
   c. Have experience in coordination between different trades of a project;
   d. Have experience in project and/or design management:
   e. have a minimum of Bachelor degree in Civil/Structural Engineering or any related field;

7- **Mechanical Engineer-** Specialized in Infrastructure Water, Irrigation and Drainage Systems Design - she/he shall:
   a. have a minimum 7-year experience in the mechanical engineering field;
   b. Have a demonstrated experience in the design and supervision of waste management facilities
   c. Have experience in coordination between different trades of a project;
   d. Have experience in project and/or design management:
   e. have a Bachelor degree in the Mechanical Engineering field;

8- **Environmental and social expert – she**/he shall
   a. Have a minimum of Bachelor degree in Health and Safety, Social Studies, Engineering or other relevant disciplines,
   b. Have a minimum 7-year experience in health and safety in the solid waste industry, including public consultation in the local context, community health and safety, and/or resettlement expertise, as required
   c. Languages: English and Arabic.

Other Supporting highly competent staff that are needed to conduct and deliver high quality Engineering Services and communication tasks (e.g., Social Specialist, Environmental Engineer, Geologist/hydrogeologist, Quality Controller, Quantity/Cost Assessor, Draftsperson, Surveyor, Communications Officers, Enumerators etc.)

For Supervision services, the Consultant shall deploy the following staff, at minimum, for the overall supervision of the works.

Key Staff:

1- Project Manager (1x):

University degree in Engineering (Civil, Mechanical, Agricultural Engineering, Environmental Engineering, Agronomy or any relevant discipline). Membership in an appropriate professional body. 15 years of experience since graduation with at least 10 years in similar assignments. Proficient in English language (Knowledge of Arabic is a plus).

2- Site Engineers (3x):

University degree in Engineering (Civil, Mechanical, Agricultural Engineering, Environmental Engineering, Agronomy or any relevant discipline). Membership in an appropriate professional body (for nationals of Lebanon). 10 years of experience since graduation with at least 5 years in similar assignments and or relevant assignments. Proficient in English language (Knowledge of Arabic is a plus).

3- Senior Site Inspectors (4x):

Technical diploma in Civil, Mechanical, Agricultural Engineering, or Agronomy or any relevant discipline. 5 years of experience in similar and or relevant assignments. Proficient in English and Arabic languages. One of the 2 site inspectors must have at least 5-year experience in health and safety aspects.

4- Surveyor (1x):

Academic or Technical Degree in Surveying. Membership in an appropriate professional body, such as the Order of Topographic Surveyors in Lebanon (for nationals of Lebanon). Minimum 5 years of experience since graduation in topographic surveying.

5- Environmental and Social Expert (1x):

University Degree in Environmental Science, Environmental Engineering, or a related field. Minimum 7–8 years of professional experience in similar assignments. The expert shall have proven familiarity with the World Bank Environmental and Social Framework (ESF) and relevant Environmental and Social Standards (ESS), in addition to knowledge of Lebanese environmental legislation and regulatory requirements.

6- Health and Safety Expert (3x):

A university degree in Occupational Health and Safety, Environmental Engineering, Civil Engineering, or a related field. A minimum of 5–10 years of relevant professional experience in occupational health and safety management, preferably in infrastructure, wastewater, or construction-related projects. Proven familiarity with applicable national OHS regulations

Support Staff including:

- Mechanical / Electrical Engineer
- Structural Engineer
- Geotechnical Engineer
- Draftsperson
- Secretary/Clerk

8. Terms of Payment

CDR will process the payments to the Consultant in accordance with the below terms for each sub-project:

TYPE OF SERVICES	FEES (USD)
Phase 1 - Design Phase and Bid Evaluation Services (Lump-sum)	
Sub-Total Phase 1 of Sub-Project 1	
Sub-Total Phase 1 of Sub-Project 2	
Sub-Total Phase 1 of Sub-Project 3	
Sub-Total Phase 1 of Sub-Project 4	
Sub-Total Phase 1 of Sub-Project 5	
Sub-Total Phase 1 of Sub-Project 6	
Phase 2 - Supervision Services (Time Based)	
Total (Excluding VAT & Local Taxes)	

Phase 1 (Lump-sum):

Service Zones	Projects	Required Services Phase 1	Percentage Fees of Phase 1 for each project	
SZ1 Akkar	Construction of Srar 2 sanitary landfill	Preparation of detailed design and tender documents for building a sanitary landfill. Assistance with bidding	Final Assessment Reports	30%
			Detailed design package	40%
			Tender documents	15%
			Bid evaluation reports.	15%
			Sub-Total Phase 1 of Sub-Project 1	**100%**
	Refurbishment and expansion of the Srar MBT facility	Preparation of detailed design and tender documents for refurbishment and expansion of the Srar MBT facility.	Final Assessment Reports	30%
			Detailed design package	40%
			Tender documents	15%
			Bid evaluation reports	15%
			Sub-Total Phase 1 of Sub-Project 2	**100%**
SZ10 Tyre	Construction of an MBT facility in Abbassiyeh	Preparation of detailed design, tender document Assistance with Bidding	Final Assessment Reports	30%
			Detailed design package	40%
			Tender documents	15%
			Bid evaluation reports	15%
			Sub-Total Phase 1 of Sub-Project 3	**100%**
	Construction of a sanitary landfill in Abbassiyeh	Preparation of detailed design, tender document Assistance with Bidding	Final Assessment Reports	30%
			Detailed design package	40%
			Tender documents	15%
			Bid evaluation reports	15%
			Sub-Total Phase 1 of Sub-Project 4	**100%**
SZ13 West Bekaa - Rachaya	Construction of a sanitary landfill in Kherbet Qanafar or Halwa	Preparation of detailed design and tender document for building a sanitary landfill Assistant with bidding	Final Assessment Reports	30%
			Detailed design package	40%
			Tender documents	15%
			Bid evaluation reports.	15%
			Sub-Total Phase 1 of Sub-Project 5	**100%**
SZ17 Hermel	Construction of a sanitary landfill in Hermel	Preparation of detailed design and tender document for building a sanitary landfill Assistant with bidding	Final Assessment Reports	30%
			Detailed design package	40%
			Tender documents	15%
			Bid evaluation reports	15%
			Sub-Total Phase 1 of Sub-Project 6	**100%**

Phase 2 (Tine Based):

Position	Tentative Time Input in Person/month
Project Manager	12
Site Engineer (Srar)	18
Site Engineer (Hermel and Halwa)	18
Site Engineer (Abbassiyeh)	18
Senior Site Inspector (Srar)	18
Senior Site Inspector (Halwa)	18
Senior Site Inspector (Abbassiyeh)	18
Senior Site Inspector (Hermel)	18
Topographical surveyor	3
Environmental and Social Expert	12
Health and Safety Expert (Srar)	12
Health and Safety Expert (Hermel and Halwa)	12
Health and Safety Expert (Abbassiyeh)	12
Defect Liability Period	
Project Manager	1
Site Engineer (Srar)	1
Site Engineer (Hermel and Halwa)	1
Site Engineer (Abbassiyeh)	1
Senior Site Inspector (Srar)	2
Senior Site Inspector (Halwa)	2
Senior Site Inspector (Abbassiyeh)	2
Senior Site Inspector (Hermel)	2
Mechanical / Electrical Engineer	As needed
Structural Engineer	As needed
Geotechnical Engineer	As needed
Draftsperson	As needed
Secretary/Clerk	As needed

ANNEX 1 - Detailed Design Drawing Sets

Architectural Package:

Complete set of detailed architectural design plans ready for construction: layout plan on a scale of 1:500 or 1:200, floor-plans, sections and elevations for all buildings/structures/components on a scale of 1:100, plans for the outdoor facilities and landscape elements on a suitable scale.

Detailed architectural drawings shall be prepared. Detailed plans shall be plotted to suitable scales in accordance with international standards, illustrating different parts of the works and systems, fully dimensioned and detailed. Sections, elevations and side views shall be prepared to illustrate the site preparatory works, earthworks, facilities footprints and final geometric shape (grades, heights, etc…) that allow for greater stability, all weather on-site road network (asphalted and tracks); equipment layout, contour bottom grading and drainage, storm water collection and drainage, leachate collection, drainage, pumping, conveyance, and storage, geo-synthetic lining bottom and lateral side containment barrier system, active barrier, embankment, anchor trenching, and any special purpose parts with the purpose of clearly portraying the scope of required works.
Preparation of the working drawings on a scale of 1:50, important details on a scale of 1:10, 1:5 or 1:1 where applicable and suitable and all outdoor facilities and landscape elements on a suitable scale. Below is an indicative list of the architectural drawings that shall be provided by the Consulting Firm:

1. Site plan
2. Demolition and material removal plans
3. Architectural Plans
4. Architectural Elevations
5. Architectural Sections
6. Architectural Details
7. Furniture Plans
8. Finishing schedules
9. Interior design drawings where applicable
10. Site landscaping layout
11. Fire escape plans
12. Signage plans
13. Layouts related to waste management handling.
14. Other required drawings as would be deemed necessary by MOE PM.

Civil Works Package:

Complete set of detailed civil works design plans ready for construction: plans, details, sections, schedules, and any other drawings and plans needed for the proper execution of the design, all on an appropriate scale. This package shall not only contain what constitutes civil works, and might be designed in other packages, such as internal roads, storm water, waste water, site hydraulics, etc. but shall assure coordination between the different disciplines and subjects (Domestic water supply and drainage vs power lines and stormwater, … etc.)
Below is an indicative list of the civil works drawings that shall be provided by the Consulting Firm:

1. Topographic Survey Plan where applicable.
2. Site plan sheet showing the proposed levels, storm water discharge features (ditches, Underground pipes, Surface trenches, gutters etc.) where applicable.
3. Site Hydraulics Plan in coordination with the mechanical package, along with a site hydraulics report (rainwater catchment areas, drainage etc.) where applicable.
4. Demolition and Excavation plans where applicable.
5. Typical Details of civil works (manholes, gutters, trenches, road sections, pavement sections etc.) where applicable.

Structural Package:

Complete sets of detailed full ready for construction drawings, plans, details, sections, schedules, formwork drawings, and any other drawings and plans needed for the proper execution of the design, all on an appropriate scale.
Below is an indicative list of the structural drawings that shall be provided by the Consulting Firm:

1. Foundations and columns detailed design, if applicable
2. Slabs, staircases, ramps, and bridges detailed design, if applicable
3. External works design, such as roads, boundary wall, water tanks, septic tanks, external rooms etc., if applicable
4. Structural details for all structural works
5. Structural calculations
6. Other required drawings as would be deemed necessary by CDR PCU

In this task, the Consultant shall prepare the following documents for the waste management facilities:

1. Complete set of final detailed construction drawings;
2. Technical detailed specifications for all facilities, systems, materials, and equipment (including codes and standards);
3. Draft all bidding documentations for selecting the appropriate contractor for construction of the waste management facilities.
4. A Draft Method Statement for construction operations;
5. Sequence of construction and implementation works;
6. Environmental Management Plan as part of the ESIA
7. Health and Safety Evaluation & Monitoring;
8. Construction quality assurance (CQA);
9. Key Personnel, machinery, delivery period, and site organization;
10. BOQ with appropriate preamble
11. Any supplementary Information attached to the bidding documents of the construction.
12. A detailed design for the gas collection system in the case of landfills.

Mechanical Package:

Complete sets of detailed Mechanical (HVAC, Plumbing, etc.) drawings ready for construction, plans, details, and any other drawings and plans needed for the proper execution of the design. Pertaining drawings on a scale of 1:100 or any other suitable scale.
Determination of the interconnection points with the electrical, water (Fresh and Sewage), telecommunication, etc. utilities and pertaining technical requirements.

Determination of technical requirements, ratings and capacities of all the installations and output values as well as dimensioning of all equipment and parts of installations.
Below is an indicative list of the Mechanical drawings that shall be provided by the Consulting Firm:

1) Site plans for main water, drainage, irrigation, rain water works
2) Rain water, sewage, domestic cold & hot water, firefighting, central heating, HVAC, LPG, Steam layouts, etc
3) R.O. Water Treatment Plant to supply critical Equipment
4) Risers for all mechanical and plumbing works
5) Mechanical & Plumbing details
6) Detailed layouts for Mechanical plant room
7) Septic tanks, wastewater network
8) Interconnection with utilities installations (Potable Water, waste water, etc.)
9) Mechanical equipment schedules and Calculations
10) Other required drawings as would be deemed necessary by MOE PM

Electrical System Package:

Electrical drawings shall include electrical power and distribution system at the site, collection, transfer, pre-treatment, and/or treatment and discharge system for leachate and contaminated surface runoff, as appropriate for site conditions, leachate pumping system, wiring diagrams, single line diagrams, site illumination, cabling, grounding, control, instrumentation, etc… for all components and for site. The drawings shall illustrate electric operation and control panels, switchboards, measurement equipment panels, and synchronizing equipment, etc.
Electrical Systems shall be designed to take into consideration the following:

1) All Solar PV and electrical installations MUST result in a high degree of life safety and building safety for the Project;
2) Provide complete calculation notes pertaining to solar, electrical aspects (yield, Short Circuit current, Voltage drops, Circuit Breakers sizing, selectivity and discrimination, storage, autonomy, etc.);
3) The design of mounting structures and poles (for lighting purposes) should ensure that they can be locally manufactured;
4) The design shall be prepared in a modular type, in a manner that would not necessitate a new design in case MOE decides to increase/decrease the capacities;
5) In case lighting fixtures are to be installed on existing structures, the Consulting Firm should be able to comprehensively justify the ability of these structures to handle the additional weight to be added;
6) Electrical rooms, where the energy storage system is installed, should be designed as per the highest international standards of quality and safety;
7) Provide the Technical Specifications, Functional Warranties, Data Sheets for all the equipment and goods, whether main, secondary or minor items, including but not limited to: Lighting Fixtures for area lighting/ PV modules/ Inverters/ Totalizer DC and AC Distribution Panels/ Batteries and storage units/ Controllers and sensors/ mounting structures/ AC, DC and communication cables/ Monitoring and Data Acquisition System- Data Logger- including hardware and software (Screen for Remote monitoring, Solar technology and temperature sensors, Energy meters, etc.)/ cable trays; conduits; combiners; connectors/ Earthing system/ Labeling and marking/ Panel

Boards/ UPS to power all monitoring and controller equipment/ Other ancillary items/systems.

8) include full detailed design for all the sections and parts of the SPVHS (Solar, Electrical, Mechanical, Civil and Steel Structure, etc.), in addition to fencing, security, gates that should be designed to prevent unauthorized access, and MUST be strong enough to resist the assessed threat, site clearance and leveling.
9) determine the functional configuration of the Solar PV Systems and the modes of operation in a manner that would guarantee the highest level of efficiency possible.
10) utilize Specialized Computer Aided Design Software for the design of the various sections of the SPVHS (e.g. PVsyst, Solargis, Matlab, AutoCAD, Revit, MathCAD, PLS-CADD, Staa Consulting Firmro, ETABS, SAP2000, PROKON, ETAP, PRAO, Digsilent, or similar).

Below is an indicative list of the Electrical drawings that shall be provided by the Consulting Firm:

1) External Electrical works and area lighting
2) Lighting and Power Electrical details
3) Power plans, including required outlets and installations for medical and mechanical equipment
4) Safety Extra Low Voltage- SELV plans
5) UPS System
6) Main Distribution Boards/ Automatic Transfer Switch/ Motor Control Centers/ Lighting and Power Panels
7) Detailed layouts for electrical & IT rooms
8) Main power supply design including Utility Source and Diesel Generators.
9) Solar PV Hybrid System (PV Panels, Inverters, Combiners, Connectors, etc.)
10) Earthing Layouts
11) Lightning Protection layouts
12) Electrical Risers and Single Line Diagrams
13) Electrical schedules of equipment and calculations
14) Other required drawings as would be deemed necessary by MOE PM

The above engineering disciplines drawings lists are not exhaustive. The Consulting Firm shall prepare other drawings as might be deemed necessary by CDR PCU.

The Consulting Firm shall provide fully coordinated plans/layouts/drawings showing the multi-disciplinary layers of the different engineering systems.