TERMS OF REFERENCE (TOR)

Detailed Design Works for the

Rehabilitation and Upgrading SIMA Street Network - Beirut and Bourj Hammoud

Sustainable Integrated Municipal Actions - SIMA Project - Lebanon

1. BACKGROUND INFORMATION

1.1 UNOPS

UNOPS is an operational arm of the United Nations, supporting the successful implementation of its partners' peacebuilding, humanitarian and development projects around the world. Our mission is to help people build better lives and countries achieve sustainable development. UNOPS areas of expertise cover infrastructure, procurement, project management, financial management and human resources.

1.2 Amman Hub

The UNOPS Hub in Amman implements projects on behalf of UN agencies and bilateral donors and in close coordination with the Government and national authorities. With an established presence across the region (Jordan, Iraq, Yemen, Turkey, Syria, and Lebanon), the office runs operations including large-scale procurement, project development, and technical management, and provides financial, human resources, and infrastructure-related services. The functional objective of UNOPS Hub in Amman is to deliver its projects in an efficient and effective manner and in line with the principles, rules, and regulations of UNOPS, in order to support the response to the current needs and national priorities in the region. As such, Amman Hub oversees all projects across the MENA region.

1.3 SIMA Project

More than three years after the Beirut Port explosion on 4 August 2020, Lebanon is facing a more multifaceted crisis than ever before, corroborating the collapse of Lebanon's political and socio-economic model. This crisis, compounded by the presence of an estimated 1.5 million displaced Syrian refugees and previously the COVID-19 pandemic, has disproportionately affected the lower-income Lebanese and already vulnerable refugees and migrants struggling to meet their basic needs and to access essential services. It also impacted the country's infrastructure and public institutions.

Aiming at improving the living conditions of the affected population within Beirut and Bourj Hammoud municipalities, UNOPS is currently implementing Phases I and II of the project entitled "**SIMA**" (Sustainable Integrated Municipal Actions) following the Beirut Port Blast.

This Project is funded by the German government through KfW Development Bank, and is fully managed by UNOPS as the direct implementer.

The Consultancy Service is concerned with the " Rehabilitation and Upgrading SIMA Street Network - Beirut and Bourj Hammoud sub-project which is part of "SIMA" project.

The "SIMA" project will contribute to the following Sustainable Development Goals (SDGs) and outcomes:

SDG 3	Good Health and	Ensure healthy lives and promote well-being for all at

	Well-being	all ages
SDG 5	Gender equality	Achieve gender equality and empower all women and girls
SDG 7	Affordable and Clean Energy	Ensure access to affordable, reliable, sustainable and modern energy for all
SDG 9	Industry, Innovation and Infrastructure	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation
SDG 11	Sustainable cities and communities	Make cities and human settlements inclusive, safe, resilient, and sustainable
SDG 16	Peace, Justice and Strong Institutions	Promote just, peaceful and inclusive societies

The “SIMA” Project includes the following three components:

- **Component One:** This component comprises (but is not limited to) the following:

  Upgrading/rehabilitation of roads to support soft mobility and ensure accessibility and inclusivity, which might include the construction of bike lanes, expansion and construction of sidewalks, and providing accessibility for Persons with Disabilities- PWD, as well as solar street lighting, etc.

  Upgrading public and communal spaces and gardens, including solar lighting solutions, and Rehabilitation of municipal and public service delivery buildings and infrastructure facilities, including solar energy systems where possible,Ensuring an integrative holistic urban approach, inclusive of the different types of sub-projects proposed for implementation throughout consecutive phasing.

- **Component Two:** This component comprises (but is not limited to) the following:

  Conducting specialized capacity building activities improving capacities of the personnel of Municipalities and Ministries, namely to complement and strengthen the outcomes under Component One.

- **Component Three:** This component comprises (but is not limited to) the following:

Promoting the operational management and maintenance of the sub-projects to be rehabilitated under component one in addition to other public service delivery buildings & spaces, and social cohesion through the provision of Grants to local CSOs/NGOs.

1.4 Specific Information – SIMA Street Network (SN) Sub-Project:

1.4.1 The Concept

In line with the 3RF Pillars 3 & 4, that entail improving social protection, inclusion and culture, and improving services and infrastructure, respectively, UNOPS selected several streets, roads and infrastructure, within Beirut and Bourj Hammoud (BH), to receive a retrofitting that would be conceptualized and designed along two main frameworks:

- The Resilience, Adaptation and Transformation Framework

This concept relies on the theory of resilience: "The capacity of a system to absorb disturbance and re-organize so as to retain essentially the same function, structure and feedback – to have the same identity." Resilience concepts underpin the emerging Sustainable Development Goals (SDGs), and are embedded in the SDG framework linking social, economic and environmental aspects to address the root causes of poverty and environmental degradation

- Urban Resilience Framework

This framework is based on four basic pillars: resisting, recovering, adapting and transforming. Urban resilience can also be divided into five dimensions: natural, economic, social, physical and institutional. Additionally, its evaluation models integrate eleven characteristics: redundancy, robustness, connectivity, independence, efficiency, resources, diversity, adaptation, innovation, inclusion and integration

Mainstreaming Peace Building, Gender Responsiveness and Sustainability is crucial in the design to be developed, whilst underlining two themes within this Framework: Ecological and Evolutionary.

1.4.2 The Selection

Streets and sidewalks form the largest contiguous spaces of the public domain, and are the only space left that, if planned properly, can become an entry into reclaiming and reconnecting the urban fabric of the city. As such, they pose an unexploited potential: to act as the connective tissue that stitches the city neighbourhoods together and connects people to services and each other.

Along those lines, UNOPS selected several infrastructure elements based on the Integrative Rehabilitation Plan to receive investments in physical improvement to encourage pedestrianization by enhancing pedestrian safety , greening, and reclaiming the streets as spaces of public activities in addition to their role in facilitating mobility. Some of the considered streets were already subject to previous studies .I

Beside the spatial and qualitative criteria of the streets themselves, the street network has been further analyzed on the potential of the streets to improve the quality of life of the vulnerable urban populations.

The selection primarily led to the following Sections to be retrofitted[1]:

a- Section 1: Underside of Yerevan Flyover

b- Section 2: BH Historic Center Trail

c- Section 3: BH Green Corridor

d- Section 4: Jesuit Neighborhood Corridors and Stairs

e- Section 5: Saeb Salam Boulevard

f- Section 6: Liaison Douce Trail

g- Section 7: Cola Roundabout

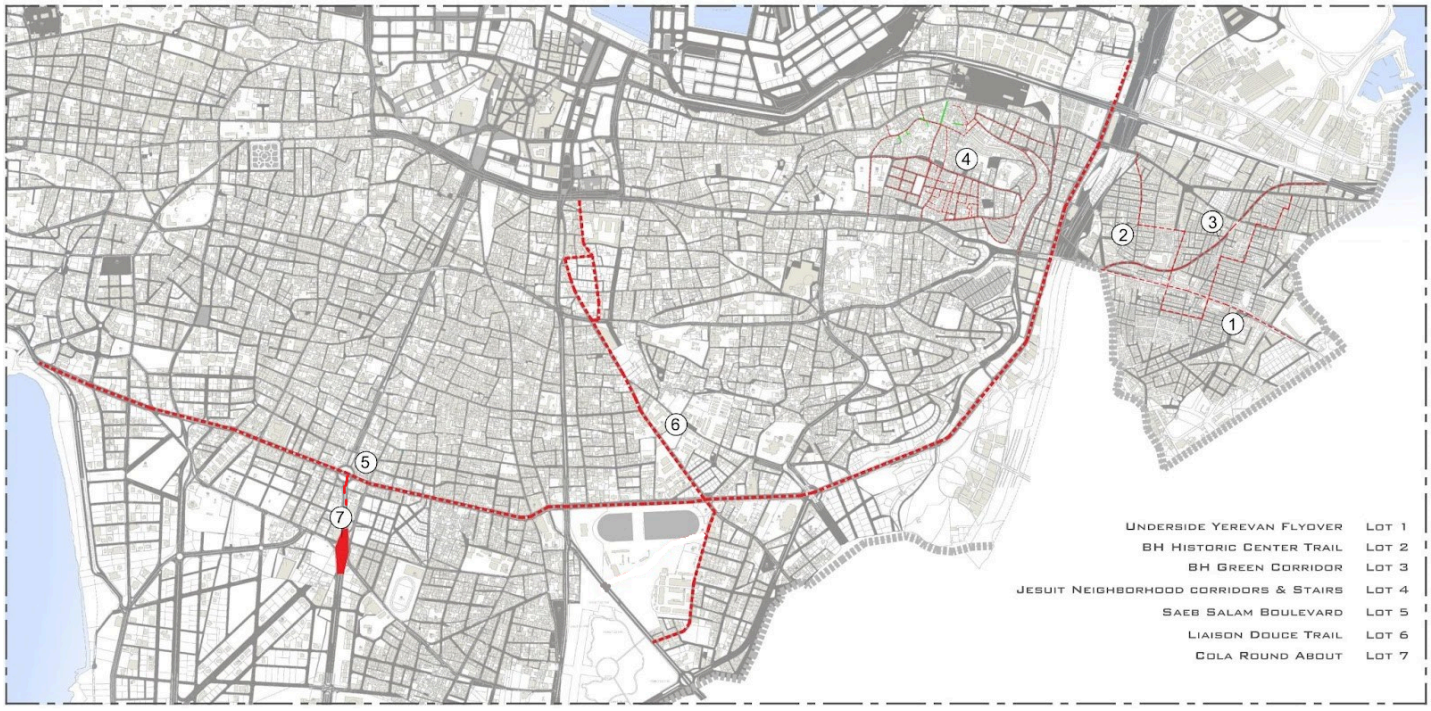

Figure 1: Map of all Sections

[1] The approximate length of these sections combined is 22km. This is merely an indicative approximation. The Consulting Firm is responsible of estimating the exact number of kms shown in the maps above in the design

1.4.3 The Scope

The Consultancy Service is concerned with the "Design Works of Rehabilitation and Upgrading SIMA Street Network - Beirut and Bourj Hammoud sub-project which is part of **"SIMA"** project. The Rehabilitation and Upgrading of the Street Network works[2] include, inter alia, the following:

1. Pedestrian safety enhancement through the introduction of pedestrian crossings (zebra, pelican. Pedestrian refugee where applicable etc…), rehabilitation of sidewalks, provision of accessibility elements on sidewalks (curb cuts or ramps, tactile surface indicators, etc…)
2. Retrofitting works on the streets (rehabilitation of pavement where needed, vehicular safety enhancements(marking, signage, cat eyes)etc…), as well as the rehabilitation of the drainage system (gutters, ditches etc…) where needed.
3. Provision of SPV lighting where applicable, replacement of sodium lights, Provision of traffic lights and solarization of the existing ones where possible.
4. Beautification and landscaping of streets including medians, islands, and the sides of the streets.
5. Provision of urban furniture (benches, waste bins, etc…) where possible
6. Increasing water infiltration through the provision of green gutters and porous pavements where possible[3]

Additional, section-specific rehabilitation scope is detailed under section 1.4.6. The scope above is not exhaustive. The Consulting Firms is responsible of proposing the needed scope based on the results of the assessment.

1.4.4 Design Goals

The design of each Section, should focus at minimum on the below goals:

a- Pedestrian Safety, Traffic Safety, Accessibility and ease of mobility

b- Social Cohesion, Peace building and Inclusivity

c- Environmental, social and economical sustainability

1.4.5 Physical criteria to be considered in the Design solution per Section

Below are some crucial criteria to be considered in the Design solutions to be developed:

a- Sidewalks on one or two sides

b- Narrow sidewalks (< 60 cm)

c- Pavement's condition

d- Obstacles erected within the sidewalk (permanent and temporary)

[2] Refer to OBJECTIVES/OUTCOMES OF THE ASSIGNMENT and SCOPE OF SERVICES sections for the assignments of the Consulting Firm

[3] The focus will be on sections 1,2, & 3, and can be extended to other sections if deemed necessary. The Consulting Firms shall assess the feasibility of providing such option.

e- Street Crossing Lines

f- Visibility at corners and intersections

g- Traffic calming measures

h- Urban furniture, Housekeeping elements and Signage

i- Dropped curbs and sidewalk ramps

j- Traffic lights

k- Urban lighting

l- No substantial modification to the vehicular route width (<40cm) (No impact on traffic flow)

m- Sensory wayfinding materials

n- Median refuge islands

o- Green gutters to take in the overflow of rainwater (where possible)

p- Landscaping (where possible)

q- Ground surface porosity for rainwater infiltration

1.4.6 Description of each Section

1. **Section 1: Underside of Yerevan Flyover**

Cutting through the middle section of Bourj Hammoud, Yerevan flyover crosses a) an eastern part of BH which is a densely built and populated predominantly residential area, constituted of four to six floors high individual juxtaposed buildings facing narrow streets, with scattered commercial activities at street level, mainly serving local residences, and b) a western part which constitutes a rather homogeneous area displaying a small grain urban tissue, low rise buildings and a mesh of narrow streets in grid iron pattern. This part has developed into a commercial hub including the main personalized shopping streets (souks) of rather popular nature, along characterized handicraft workshops[4].

Generally, a major pollution source along the Yerevan flyover is the traffic congestion under the viaduct, with the encumbrances of the scattered parking spaces which adversely affects the accessibility of the area, mainly its commercial functions. The viaduct constitutes a physical barrier and its interface with its surrounding is intricate, cutting through dense residential areas and elevated at the residential units' level, some of them being distanced only about one meter from the viaduct[5].

Its location, on the border of the southern Nabaa district, will enable it to act as a connector between the various neighborhoods of Bourj Hammoud as well as with Greater Beirut.

This Section's intervention is focused on physical rehabilitation and retrofitting works for the underside of the Yerevan bridge (Section 1) as shown in Figure 1 above. The design works for the retrofitting of this Section shall target the criteria entailed in the afore-mentioned section 1.4.5, in addition to the provision of spaces that can be temporarily dedicated to culture, arts

[4] http://www.bourjhammoud.gov.lb/sites/default/files/public/SBH-REPORT-F-shrinked.pdf
[5] http://www.bourjhammoud.gov.lb/sites/default/files/public/SBH-REPORT-F-shrinked.pdf

and craft, and the circular economy; i.e. festivals, exhibitions, flea markets, craft markets, installation arts, etc… With other potential SIMA interventions along the same axis of Yerevan, ranging from sport courts, public gardens, arts and crafts hub, community center, etc., the design of this Section shall be well coordinated with those other potential interventions, providing an integrative rehabilitation for a street that presents an opportunity to physically stitch back what once was ruptured by the viaduct.

2. **Section 2: BH Historic Center Trail**

In a country predominantly focused on the tertiary sector, Bourj Hammoud had a major role to play as a productive territory.[6]

This Section's intervention is focused on physical rehabilitation and retrofitting works for the Historic Center Trail (Section 2) as shown in Figure 1 above. The design works for the retrofitting of this Section shall target the criteria entailed in the afore-mentioned section 1.4.5, in addition to reinforcing the identity of the economic clusters of specialized markets in Bourj Hammoud. Passing through the historic heart of Bourj Hammoud, through a concentration of boutiques, cultural venues and craftsmen's workshops, this historic path once retrofitted, shall serve as a connecting spine between the different market pockets and the fragmented spatial districts of BH/Nabaa, thus also creating a touristic attractive souk with competitive local products.

3. **Section 3: BH Green Corridor**

This Section's intervention is focused on physical rehabilitation and retrofitting works for the Green Corridor (Section 3) as shown in Figure 1 above. The design works for the retrofitting of this Section shall target the criteria entailed in the afore-mentioned section 1.4.5, with a focus on to the provision of renaturation solutions and filter gardens where applicable.

4. **Section 4: Jesuit Neighborhood Corridors and Stairs**

The Jesuite neighborhood is a popular and primarily residential area surrounding the Jesuite Garden which acts as the neighborhood plaza.[7].

Bordered by Rue Nassif Er Rayess, rue Rmeil, rue Chekri Choukair, rue Iskandar Farah, rue hôpital Orthodox, UNOPS decided to increase the boundary of this Section's intervention to include public stairs, alleyways, neighborhood corridors, to be part of this integrative multiscalar soft mobility network.

This Section's intervention is focused on physical rehabilitation and retrofitting works for the streets, alleys, stairs and public leftover spaces along those pathways (Section 4) as shown in Figure 1 above. The design works for the retrofitting of this Section shall target the criteria entailed in the concept design section, with a focus on PWD accessibility and inclusive design namely near the abundant schools, hospices and hospitals in the area.

5. **Section 5: Saeb Salam Boulevard (PDD)**

Proposed as an itinerary within the PDD, Saeb Salam Boulevard has a big potential and favorable topography to encourage and promote soft mobility (generating poles, low slope, and a high pedestrian frequency). This Section includes Avenue Abdallah El yafi, Boulevard Saeb Salem and Corniche Pierre El Gemayel as shown in figure 1 above. This Section plays the

[6] AVITEM - Arts & Crafts Hub project paper
[7] PDD Phase 1

role of a backbone for SIMA street network, connecting through Beirut's fragmented areas and integrating the different Interventions under SIMA.

While this section ’s intervention aims to stitch back the city, We suggest to focus, within these main streets, on the transversal extensions - especially those ones that connect towards vulnerable neighbourhoods.

This Section’s intervention is focused on physical rehabilitation and retrofitting works for the Saed Salam Boulevard (Section 3) as shown in Figure 1 above. The design works for the retrofitting of this Section shall target the criteria entailed in the afore-mentioned section 1.4.5, with a focus Pedestrian Safety and crossing, and transversal extensions.

6. Section 6: Liaison Douce Trail

The 'Liaison Douce' project, initiated in 2011, was a collaborative effort between the Ile-de-France region and the municipality of Beirut, focusing on rehabilitating and transforming Rue de Damas into a more pedestrian-friendly and socially cohesive space. The key objectives included improving urban mobility, enhancing the safety of cars, cyclists, and pedestrians, and creating a pleasant communal area that connects Achrafieh and Ras el Nabeh.

This Section’s intervention goes in line with the main goals of Liaison Douce, and is focused on physical rehabilitation and retrofitting works for the same Trail underlined in Liaison Douce (Section 6) as shown in Figure 1 above, however without any narrowing to the streets nor any implementation of underground parking. The design works for the retrofitting of this Section shall target the criteria entailed in the afore-mentioned section 1.4.5, with a focus on the introduction of alternative soft mobility means without any substantial impact on vehicular traffic flow.

7. Section 7: Cola Roundabout

The Cola roundabout is located in an area that lacks open public spaces and greenery. It serves as a junction between several neighborhoods and communities, along which several small buses park waiting for commuters entering the capital or exiting it towards the southern cities and villages. During the day, the roundabout is used by a large number of commuters and pedestrians, increasing the existing traffic congestion in the total absence of safety measures.Moreover, the area becomes insecure at night, mainly for women and children with illicit activities taking place during late hours.

Reorganizing the space under the Cola Bridge and turning it into a large public space with high quality landscape, urban lighting and furniture, usage of renewable energy sources, safe pedestrian crossings and rainwater drainage (where feasible) aims at increasing the quality of life and safety of the neighboring community as well as other users. It aims at enhancing social and gender inclusivity and shifting the image of the area towards a more positive perception that can contribute actively to the re-dynamization of the whole area. Among the specific activities to be considered: kids' open air playground, open public space in front of existing universities and schools for students to gather, meet and exchange as well as in front of the existing Mosque for believers to gather before and after praying time.

Please Refer to Sample Pictures-Attachment #10. For more sample pictures of some of the proposed works in the projects[8].

1.5 General Objectives of the Project

The Street Network (SN) sub-project lies under Component 1 of SIMA Project. SIMA SN aims to foster interactions among different communities and within the same community by establishing a shared public space that is accessible, free, and secure for all. The collective social impact of this endeavor will contribute to improving the daily lives of residents, as activities will alleviate tensions and create a common space for diverse communities to coexist and preserve shared interests. This will significantly contribute to enhancing social cohesion at the local level, considering the neighborhood's diverse socio-economic backgrounds. Moreover, securing pedestrian mobility in the city will enhance citizen's quality of life and will impact on reducing traffic congestion in specific areas.

2. OBJECTIVES/OUTCOMES OF THE ASSIGNMENT

In order to enhance safety and security for pedestrians in Bourj Hammoud and Beirut, particularly for women and children, and to facilitate access to other interventions, the street network interventions will act as an interlinkage web connecting the different projects and providing a unified experience throughout different urban fabrics.

Under SIMA Street Network (SN), the current Assignment is concerned with the provision of Engineering/Consulting Services needed for the Retrofitting and Refurbishment of the streets while effectively utilizing the limited space available to meet the diverse needs of the community.

The assignment is divided into the following section s:

1. Section 1: Underside of Yerevan Flyover
2. Section 2: BH Historic Center Trail
3. Section 3: BH Green Corridor
4. Section 4: Jesuit Neighborhood Corridors and Stairs
5. Section 5: Saeb Salam Boulevard
6. Section 6: Liaison Douce Trail
7. Section 7: Cola Roundabout

The primary objectives of the services are to:

A. **Task # 1: Site Inspection, Survey and Assessment :** Conducting geotechnical investigation, topographic survey, traffic survey, hydrological assessment as well as conducting of Environmental & Social Assessment and preparation of required reports and Environmental and Social Management Plan, ESMP and any other required surveys and assessments required for the development of detailed design.

[8] These Pictures are for indicative purposes only. The Consulting Firm shall propose their own enhancements and interventions in line with the scope of work defined in the TORs

B. **Task #2– Preparation of Detailed Design and Technical Support** Conducting technical studies, analysis and design, generating related reports and preparing detailed design/construction drawings, calculations, technical specifications, construction methodology and the works implementation work program required for construction. In addition to providing Technical Support during the Solicitation of Construction Proposals, Construction Implementation Stage, and the Defects Notification Period- DNP.

This TOR is limited to the Scope of Services detailed below [9] for the 7 sections mentioned above. The design of the sections is to be awarded to the same Consulting Firm (CF).

3. General Assignment Considerations

3.1 General Considerations

In performing the Assignment, the Consulting Firm MUST:

1. Acknowledge that The UNOPS Senior Project Manager will be the focal person for official communications and the delegated UNOPS Project Team will supervise the Consulting Firm's activities.
2. The Consulting Firm shall ensure full coordination and cooperation with the UNOPS Project Team.
3. The Consulting Firm shall proceed with the implementation of the Assignment as per the Methodology submitted in the Consulting Firm Proposal subject to amendments that might be requested by UNOPS.
4. Take into consideration in preparing the Detailed Design, that UNOPS infrastructure projects request fit-for-purpose design solutions that are appropriate for the Donor, Beneficiary and end users, and to be in line with the UNOPS Policy for Sustainable Infrastructure, as well as UNSDGs indicated in Article 1.3;
5. Take into consideration the Design Planning Manual for Transport Infrastructure issued by UNOPS (Attachment #3.a), as well as the UNOPS Guidelines for Inclusive Infrastructure . The Consulting firm shall fully abide by the minimum requirements and stipulations of these documents and these are considered integral parts of these Terms of Reference. The Consulting Firm shall fully abide by the National and International codes and standards approved by UNOPS ;
6. Prepare the design to have meaningful inclusion of gender and social considerations, accessibility for People With Disabilities- PWD, and include mitigation measures for GBV/SEA matters to ensure a social and gender-responsive design;
7. Take into consideration the results/recommendations of the gender and social specific needs assessment study previously conducted and those to be conducted by UNOPS.
8. Participate in all the meetings to be organized by UNOPS as and when requested by UNOPS, consult and coordinate closely with the Project stakeholders, including community members,

[9]

and provide reports and deliver presentations during such meetings as would be deemed necessary and requested by UNOPS;

9. Coordinate its work with all stakeholders in order to identify risks, challenges and opportunities;
10. Prepare the Detailed Design to be cost effective in line with the available Project budget and conducive to practical implementation considering the specific circumstances of SIMA SN location;
11. Take into consideration sustainable procurement best practices and maximize the use of locally available goods and materials in the design to increase the design's sustainability while ensuring the utilization of cutting-edge concepts and technologies;
12. Take into consideration climate change matters, including energy and water savings, to the highest extent possible, such as, but not limited to: use of porous pavements to increasing water infiltration where applicable , passive lighting, solar energy systems (e.g. Solar PV Hybrid Energy Systems,, etc..), etc..;
13. Take into consideration pertinent national and international environmental standards, legislation, treaties, and conventions that may have significant impacts, and highlight any uncertainties concerning any impacts;
14. Provide all the necessary technical documentations that would be needed to be submitted to the local authorities (Order of Engineers and Architects, Civic Planning, Ministry of Public Works etc..) and official bodies in Lebanon to obtain all required approvals for retrofitting/rehabilitation permits, Environmental license. Furthermore, the Consulting Firm shall be responsible for applying to the above mentioned authorities and bodies and to obtain all the pertaining permits and licenses, the cost of these services shall be deemed included in the prices schedule of this assignment;
15. Review and become familiar with UNOPS Procurement Manual and standard tender documents and prepare all the deliverables (e.g. detailed design, Technical Requirements and Specifications, warranty requirements, Bills of Quantities, etc..) to be in full compliance with the UNOPS Procurement Manual and standard Tender Documents;
16. The UNOPS Project Team will review the Consulting Firm’s submissions, provide comments to the Consulting Firm and request further inputs/actions/clarifications to be provided where needed. If any revisions are deemed necessary by the UNOPS Senior Project Manager, the Consulting Firm shall revise the submissions and resubmit the same to the UNOPS Senior Project Manager.

3.2 Health and Safety, Social and Environment Requirements

UNOPS endeavors to design and implement infrastructure projects in a manner that ensures that reasonable measures are taken to prevent personal injuries, illnesses and damage to property in accordance with the best international practices.

Throughout the execution of the services and activities under this assignment, the Consulting Firm shall :

A. Abide by UNOPS Health Safety Security and Environment- HSSE (Attachment #4), this document is an integral part of these Terms of Reference and the Consulting Firm shall fully abide by its requirements and stipulations, and Prevention of Sexual Harassment and Abuse- PSEA Requirements, especially when performing site activities (Inspection, coring, testing, etc..). Furthermore, the Detailed Design must eliminate hazards and reduce risks associated with the rehabilitation works and shall be prepared to incorporate the UNOPS minimum HSSE requirements.
B. Consider foreseeable risks in relation to Health, Safety, Social and Environment- HSSE and shall provide adequate information about such risks, and ensure that health and safety risks arising from the design during construction are eliminated or minimized.
C. Take into consideration pertinent national and international environmental standards, legislation, treaties, and conventions that may have significant impacts, and highlight any uncertainties concerning any impacts;
D. Take the health and safety of any workers/staff on their site as of the highest priority. All operatives shall be site inducted and expected to comply with all site safety rules and guidelines. This includes the wearing of full Personal Protective Equipment (PPE) all all times during the investigation works (site assessment, geotechnical investigation, structural integrity assessment, etc…), which as a minimum will include hard hats, safety boots, hi-vi vests, gloves, safety glasses, and ear protection.
E. The Consulting Firm is required to install safety barriers at each workstation of each and every respective site, (Jersey barriers, safety tape, etc.) for public safety mitigation measures.
F. The Consulting Firm shall consider all potential Environmental and Social hazards as well as presence of archaeological ruins, and determine suitable work methods and any controls required to manage potential hazards.
G. The Consulting Firm shall be responsible to ensure how the design will affect the health and safety of those who will interact with the infrastructure throughout its lifecycle, from the construction stage and through the operations and maintenance on completion and handover of the infrastructure from UNOPS to end users.
H. The Consulting Firm shall support UNOPS project team in performing environmental and social screening of the project, including reviewing the existing topographic maps of the site, conducting an environmental and social impact assessment, describing legal framework and social and environmental impact, addressing health and safety aspects for workers and for the nearby communities, especially as regards access across work zones, traffic safety, and safety near excavations, trenches, and slopes, and developing Environmental and social management plan[10] (ESMPs).

The Consulting Firm must ensure that the design solution addresses all aspects of the UNOPS policy for Sustainable infrastructure, wherein UNOPS has committed to design and implement infrastructure projects in a manner that respect the principle of social and environmental responsibility, including preventing or mitigating adverse impacts on the environment and identifying opportunities for improved environmental performance.

4. SCOPE OF SERVICES

[10] ESMP template to be shared with winning bidder upon contract signature

The Scope of Services to be rendered by the CF under the current Assignment, comprises the following Tasks:

1. Task # 1 - Survey and Assessment Activities for the 7 Sections
2. Task #2 - Preparation of Detailed Design and Technical Support

1. Task # 1: Site Inspection, Survey and Assessment

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

1.1. Task # 1.1: Site Inspection and Data collection

A. Conduct site visits and site inspections to assess the current street conditions.

B. Perform Data Collection:

The preliminary data may be focused around the below items which is a non-conclusive:

a. Collecting previous designs (By the Municipality of Beirut, Beirut Arab University, Plan Vert, PDD etc…), As- Built drawings, notes of materials, existing design data, and all pertinent data) from the Municipality of Beirut, CDR, etc.. in coordination with UNOPS team;

b. Topographic, Geotechnical data and reports

c. Meteorological/Hydrological data (where available):

1. Rainfall Data recorded within the project areas - Historical to Present;
2. Stream flow data where applicable;
3. Any anecdotal data related to flash flooding at the crossings will be helpful;
4. Latest IDF Curves developed for the area;
5. Reports/studies on flood assessment inclusive of flood maps generated for the area, if any;
6. Road construction, maintenance and rehabilitation history
7. Hydrogeological Map of the area;

C. Review the existing designs (Beirut Arab University design of Cola, PDD, Liaison Douce, etc…) and check if any of the ideas in the concepts indicated therein can be reflected in the new detailed design if deemed suitable.

D. Conduct a comprehensive inspection and survey of the streets,underbridges, and roads within SIMA SN, assessing its current condition. The survey will involve a detailed

assessment of the targeted areas(streets,stairs,roads, underbridges), taking into account its physical features, structural elements, hardscape and landscape elements, environmental aspects and overall layout. Pavements and walkways current condition will be assessed , mainly in relation with various modes of occupation that impact pedestrian mobility and accessibility. Security for pedestrians to cross will be assessed as well, with a specific attention to users with temporary or permanent disabilities.

E. Perform a survey of the lighting poles , including an assessment of their conditions. The assessment shall determine the type of poles in these streets, need of repair or replacement, and type of lighting fixtures used.The Consulting Firm shall perform Data Collection (as built drawings, maps, etc…) of the existing Mechanical, Electrical and Plumbing- MEP drainage installations (Including those connected to utilities, e.g. clean water, sewage, electricity, telephone, etc..) , mainly in the street sections where existing utilities might be affected by the proposed design (where excavations are expected, connection to existing utilities and installations , or rehabilitation of existing utilities is proposed in the design). Prepare a detailed survey and list of the demolition, dismantling, scrubbing, reinstatement, and rehabilitation works that might be needed based on the results of the assessment

1.2. Task #1.2: Geotechnical Assessment and Topographic Surveys:

The Consulting Firm shall provide its expertise as required to manage, coordinate and execute all the required services related to the Survey, Assessment and Preparation of Roads/streets Integrity Assessment, Geotechnical Assessment and Topographic Surveys. The Consulting Firm shall conduct a comprehensive investigation based on existing records, site inspections and tests.

In performing these tasks, the Consulting Firm shall follow UNOPS Geotechnical Investigations Guidelines (Attachment #3). 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:

a. Perform data collection (General notes of material, topographical and geological maps, any recent geological studies within the project areas, results of percolation tests and methodology employed by the Ministry of Transport and Roads Development etc…)

b. Conduct visual survey and inspection of the site and its facilities; and Other activities needed to perform Geotechnical Testing and Topographic Survey.

c. 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 in SIMA SN.

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

i. contour lines, elevation data and slopes (i.e. elevations and other landforms) with 30mm minimum equidistance;

ii. Road boundaries, sidewalk boundaries, land boundaries, location of reference marks etc…;

iii. natural and manmade features within the land (e.g. natural features and structures, canals, trees with diameter above 15 centimeters, stream, fences, buildings, etc.);

iv. Cross-sectional drawings showing a vertical slice of the road, detailing the existing ground surface,road levels, pavement layers, sidewalks, utilities, and any other relevant features.

v. Alignment and Profile Drawings showing the horizontal and vertical alignment of the road (road's curvature, grades, and elevations, and any other pertaining details aiding in the design of road improvements or rehabilitation.

vi. secondary roads and street level; and,

vii. such other information relevant to or important to take note of for road rehabilitation projects, such as, drainage, existing utilities, etc.

viii. The trial pits or boreholes from the geotechnical investigation (being carried out concurrently) shall be clearly identified in the topo survey.

The CF shall utilize any suitable topographical survey method as a means for conducting the topographical survey.

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

a. **<u>Field and lab tests- Section 7-Cola Roundabout:</u>** 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:

i. Conduct drilling and sampling of at least two (2) boreholes and three tests pits within the Cola Roundabout[11];

ii. Conduct all necessary field tests including but not limited Standard Penetration Test (SPT), CPT etc… through the soil at 1.5m depth intervals;

[11] Boreholes Number and Location are based on the location and number of foundations to be excuted within the Cola Roundabout project

iii. Determine the compactness of the soil strata at field at different elevations;

iv. Explore the subsurface conditions at various locations underneath the proposed foundation locations and conduct the required in- situ tests; and

v. Conduct the necessary laboratory testing on the representative samples obtained during field investigation and drilling and evaluate relevant engineering parameters of the subsurface soils.

vi. The field and laboratory testing shall be in accordance with the following standards:

1. BS EN 1997-2:2007, Eurocode 7 – Geotechnical design – Part 2: Ground investigation and testing.
2. NA to BS EN 1997-2:2007.
3. BS 5930:1999+A1.
4. BS 1377 – Parts 1 to 9.
5. EN ISO 14688.
6. AASHTO.
7. ASTM.
8. Records and results of field and laboratory work shall be reported using Standard International System (SI) units.

b. **Field and lab tests- Sections 1, 2,3,4,5,&6:** 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:

i. Determine the sub-soil condition through pitting to reach subgrade levels. The number and spacing of test pits shall be sufficient to determine the sub-soil characteristics needed (CBR value, K value etc…) for the design and assessment purposes of the interventions proposed. A minimum of 1 pit every 300 m of the road strip to be rehabilitated alternating on both sides of the road is required; however, more test pits might be deemed necessary based on the initial inspection of the road conditions (structural damages, potholes, continuous failure of asphalt pavement etc…).

ii. Determine the sub-soil condition through Dynamic Cone Penetration (DCP) tests at a minimum interval of every 100 meters.

iii. Determine the engineering strength properties of the sub-soil conditions through geotechnical investigations and laboratory tests and/or with empirical correlations from the above test required for design of the interventions proposed along the selected roads.

iv. Test pits need to be properly filled and restored, with suitable material(clearing debris, restoring subbase layers, compaction, reinstating asphalt pavement)

c. **Desk assessment:** The Consulting Firm shall perform the following tasks:

After the field reconnaissance mission to the road, the Consultant will draft a precise geotechnical investigation specification which will outline the scope of the field geotechnical investigation campaign to be performed. The desk assessment shall include, inter alia, the following:

i. Drilling Methods.

ii. Sampling and Field Testing

iii. Laboratory Testing – carry out the required laboratory test on soil and rock samples at the laboratory.

iv. Prepare engineering analysis of field and laboratory findings;

v. Assess the relevant engineering parameters of the surface and subsurface soils; and

vi. 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 Areas of intervention (all sections) The information provided shall be adequately detailed to enable an informed decision by UNOPS, and shall include the following:

a. Brief Project background;

b. Methodology followed for the Geotechnical Surveys;

c. Outline of the activities undertaken;

d. A plot showing the location of test borings and/or excavations;

e. Existing geotechnical (e.g. surface and subsurface, Soil condition findings) conditions and assessment;

f. Location of subsurface exploration logs on the site plan;

g. Exploration point;

h. Subsurface stratigraphy;

i. Earthquake seismicity parameters;

j. Climatic and environmental condition of project sites;

k. Documentation on tests undertaken and test results / reports, data analysis;

l. Method statements for any remedial or retrofitting procedure that shall be executed where needed along with calculation sheets;

m. California Bearing Ratio (CBR) of the soil, settlement, compaction requirements, ground-water levels, construction materials, and others; and

n. 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 all items under topographic survey (A.c)

1.3. Task #1.3: Pavement Assessment

Under this Task the Consulting Firm shall conduct a pavement assessment of the targeted streets. It is important that the data collected during each inspection can be compared with previous pavement inspections. The consulting Firm shall use the most appropriate for visual inspection of the roads under the intervention. A properly executed visual evaluation is one of the most reliable and efficient forms of pavement evaluation available.

The consulting Firm shall conduct ,inter alia, the following:

A. Visual Condition Survey - a detailed visual condition survey will be undertaken for all lanes in each direction of the road. The survey will be generally done in accordance with ASTM D 6433, “Standard Practice for Roads and Parking Sections Pavement Condition Index Surveys” or any other relevant international or national code and standard.

B. A PCR (Pavement condition rating) of the inspected inspection units in the section are then used to represent the condition of the entire section. The rating method provides a procedure for uniformly identifying and describing, in terms of severity and extent, pavement distress. The mathematical expression for pavement condition rating (PCR) provides an index reflecting the composite effects of varying distress types, severity, and extent upon the overall condition of the pavement.

C. Relevant testing methods to assess structural adequacy where applicable (FWD testing, plate testing, etc…) and Subsurface investigation, if applicable.

D. **Narrative Report-**Submission of Pavement Assessment Report (PAR) on Findings and Recommendations– - the Consulting Firm shall produce a pavement assessment narrative report for the Selected Areas of intervention (all section s) The information provided shall be adequately detailed to enable an informed decision by UNOPS, and shall include the following:

- Brief Project background;
- Methodology followed for the Pavement Assessment;
- Outline of the activities undertaken;
- PCR
- Any tests conducted if applicable
- Results of Pavement Assessment (plots , narrative etc…)
- Figures,maps etc… as needed

1.4. Task #1.4: Drainage Assessment

The methodology for achieving the objectives envisaged by the study is outlined as follows:

A. Data Collection including topographic, cadastral, geologic and precipitation data
B. Review all existing data/documentation that relate to hydrology/drainage including:
    a. Topographic data of the various catchments;
    b. Previous hydrological studies of the various catchments;
    c. Studies relating to soil characteristics including infiltration properties;
    d. Hydraulic studies relating to the provision of adequate drainage infrastructure for carriageways and interconnecting communities.
C. Visual inspection of existing drainage infrastructure based on site visits;
D. Catchment Delineation using topographic surveys/DTM models;
E. Sub-catchment delineation based on the location of existing drainage infrastructure and the establishment of hydrological points of interest;
F. Determine peak incoming runoff flows;
G. Calculate hydraulic capacities of the existing drainage elements, inclusive of open drains, pipes and culverts;
H. Culverts which fail in hydraulic capacity would be re-sized hydraulically. The consulting Firm to advise on actions to be taken.
I. Proposed new or refurbished Culverts would be structurally designed to comply with the International codes.
J. Determination of infiltration rates within the various catchments to facilitate percolation of surface runoff;

Based on the recommendations made following the hydrologic/hydraulic assessments, the consulting Firms shall produce a Drainage Assessment Report- (DAR) entailing the assessment findings with the recommended interventions .

1.5. Task #1.5 : Traffic Survey

The CF shall collect any existing data (previous studies, data from relevant public authorities and ministries etc…) and conduct a basic traffic survey and projections of future traffic and utilize it in the proposed design.

The Consulting Firms shall use the most applicable methods of traffic data collection to obtain an estimate of the Annual Average Daily Traffic (AADT) using the roads under the intervention, disaggregated by vehicle type.

The Traffic survey shall give consideration to seasonal variations, incidence of delays and other constraints set by the present roads, different types of vehicles, existing traffic volume data, axle loadings and the projected traffic growth on which the pavement design is to be based.The analysis will also constitute a baseline against which the project may be evaluated in the future; the findings should therefore be presented in a manner, which facilitates comparison with an ex-post survey.

The main components of the survey shall include inter alia, the following:

A. Traffic Volume & Composition Count: This involves an estimation of the number of vehicles passing through the road during different times of the day, as well as utilizing existing traffic volume data, axle loadings and the projected traffic growth on which the pavement design is to be based. It helps in understanding the average traffic flow and peak hours and in determining the Annual Average Daily Traffic (AADT).

B. Speed Measurements: Conducting speed checks to determine the average speed of vehicles on the road.

C. Pedestrian Count: Observing and estimating the number of pedestrians using the road, especially at crosswalks or areas with high pedestrian activity.

Based on the traffic survey, the consulting Firms shall produce a final traffic survey report, entailing the findings and recommendations.

The results of the survey shall be utilized by the Consulting Firm to

i. Identify specific locations where interventions like pedestrian crossings or speed-reducing measures are most needed.

ii. Determine the appropriate types and placements of traffic calming measures based on traffic flow, speeds, and pedestrian activity.

iii. Assess the effectiveness of implemented changes by comparing pre- and post-implementation data.

1.6. Task #1.6: 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 SIAR and its annexes;

C. The GTTR and its annexes; and

D. The Pavement Assessment, Drainage Assessment, traffic survey and their annexes;

E. Clear description of the Findings and outcomes of Task #1 along with clear recommendations that need to be taken into account and feed into the completion of the following Tasks.

Upon the submission of the SR and the approval of the same by UNOPS, The Consulting Firm shall proceed to prepare the Detailed Design, nevertheless, subject to the approval of the UNOPS SPM, subtasks under Task #2 can be started prior to the completion of Task #1 in coordination with the UNOPS Project Team and the Beneficiaries, in a manner that would respect the timeliness of the Project and the quality of the deliverables.

2. Task #2– Preparation of Detailed Design and Technical Support

2.1. 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, Solar Powered Systems, Landscaping, etc..) needed to rehabilitate/ construct all the facilities of SIMA SN.

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

- Task# 2.1.1 Design Brief
- Task# 2.1.2 Concept Design
- Task# 2.1.3 Detailed Design
- Task# 2.1.4 Design Review

A. 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 utilizing the topographic survey data.
b. Utilize the Narrative Reports on Findings & Recommendations related to the SR prepared under Task #1, and to prepare the detailed design in a manner that would maintain the integrity of structural elements in the site (pavement, lighting poles etc…) and take into consideration the site conditions, traffic data, hydrological assessment, soil data and the method statements indicated in the said Narrative Reports.
c. Be responsible for producing a detailed design taking into consideration the actual situation on the ground, the social assessments prepared by UNOPS, 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 UNOPS design planning manuals/requirements/guidances, ability to meet the diverse needs and preferences of the roads/streets end users, and shall respond to the comments by and comply with requirements of the UNOPS Project Team and the UNOPS Infrastructure Project Management Group- IPMG Design Review- DR- Team.
d. Prepare the Detailed Design in a manner that ensures meeting minimum requirements for safety and functionality as per UNOPS Minimum Health and Safety Requirements for Contractors. (Attachment #4).
e. Optimize the design in a manner that would highly meet value for money and designed to adequately comply with and meet international standards and UNOPS requirements.

B. Detailed Design Considerations

a. Access and egress- Circulation space:

The design must take into account the following:

i) Allow movement into and out of the area (s) and in unobstructed manner during normal use, especially taking into consideration women, girl, elderly and PWSN needs. The access plan must include a strategy to solve the obstacles and hazards to pedestrian safety in the immediate neighborhood of the gardens.

ii) The primary point of access MUST be clearly defined to enable simple access with signage or non-written visual means depending on the design circumstances;

iii) Have sufficient circulation space within the area to enable its intended function in an efficient and smooth manner; and

iv) Allow equipment access for service, repair and replacement if necessary.

b. Services Design and Future Maintenance

The Consulting Firm is responsible for examining the possible alternatives, future maintenance implications and provision of recommendations for a design solution. The solution must meet the design criteria and partner and end user requirements in accordance with the local context. The Consulting Firm is requested to provision selected spare parts that would be included in the contractor's scope of work for future maintenance process

c. Services Infrastructure on Site

The Consulting Firm must demonstrate that the design solution is appropriate for the services infrastructure available or planned for the site. The design should cover the connection of the Roads to the public electrical grid, water network, drainage network, and telecommunications network. The design should also consider maintenance implications for services to maximize the potential design horizon and functionality of the infrastructure.

d. Structural Integrity

The Consulting Firm shall take into account that the design shall maintain the structural integrity of the elements within the targeted Sites.

e. Designer Duty of Care

As an UN organization, UNOPS has a duty to provide competent professional services to donors and beneficiaries. With regard to Consulting Firm, Designer Duty of Care is interpreted by UNOPS as follows:

i) Duty to beneficiaries (end users of infrastructure); and

ii) Duty to personal safety (and that of colleagues) within UN offices and on Project sites.

f. UNOPS and UNOPS Personnel Duty to Beneficiaries

All external consultants and personnel involved in the design of infrastructure should have the knowledge, skills and experience to comply with the pertinent sections of the UNOPS Design Planning Manual for Buildings and Transport Infrastructure.

The use of professional judgment is expected from all those working on the design of infrastructure. These personnel should be competent and have the necessary resources to complete their job satisfactorily (resources include time, equipment etc., as needed). It is UNOPS duty, as the employer, to request that personnel engaged to undertake design tasks have the necessary competence to do so.

The Consulting Firm is duty bound not to endanger the safety of others, as such the Consulting Firm be bound to assume additional duties with relation to:

i) Duty of care to the public as stipulated by the Lebanese pertinent laws;

ii) Duty of care to the occupants of the building and associated site work;

iii) Professional organizations (e.g. membership to recognized Architectural or Engineering Bodies); and

iv) Terms of contract either with UNOPS or UNOPS direct partners.

g. Fitness for Purpose

The choice of elements and materials needs to take into consideration that the materials fit the below requirements:

i) Local sources: All selection of elements and materials MUST be carried out on the basis that a balanced choice is made between locally available systems and materials, and systems that require either import or the establishment or enhancement of a manufacturing facility.

ii) Life cycle: Other than services and equipment, system elements MUST be envisaged to have the required lifetime for the infrastructure project, an acceptable life cycle cost, and which can be recycled safely at the end of their useful life, where feasible.

iii) Neighboring buildings- The Consulting Firm MUST investigate the potential for neighboring buildings and structures, including through consultations with the affected residents/to be affected by the infrastructure works and any negative effects MUST be eliminated.

iv) Inspection, Testing and Commissioning, and Training- In the design documentation, the Consulting Firm needs to clearly identify:

1) The items of equipment to be inspected, tested and commissioned along with full details of such procedures;

2) The need for maintenance manuals for such equipment; and

3) Any necessary training of Beneficiary designated persons/ staff in the use of the equipment.The above issues shall be detailed in full compliance with UNOPS requirements. These activities/services shall be performed by the prospective Contractor prior to the handing over of the Systems to the end users.

h. Codes

The Consulting Firm detailed design needs to:

i) be based on and comply with national and/or international design codes appropriate to the country in which the structure is built. As a rule, codes are prescriptive and must be researched carefully. The Consulting Firm shall assess the international, national and UNOPS requirements and apply the stricter standard.

ii) determine the international applicable codes for all the disciplines of the Project, including equipment, materials, manufacturing, painting, welding, and installation works and provide a full list of all the codes and standards that the Consulting Firm has based its detailed design on; and

iii) Consider existing standards in Lebanon and ensure that any design solution identified matches or exceeds the existing country standard.

iv) Design Codes/Standards;

(a) List of standard details related to road and drainage structures adopted by the Ministry of Transport and Road Development;

(b) Specifications for the road marking and road signs;

(c) Specifications for the road curbs, fences and etc.;

(d) Local practices and cost for road maintenance;

i. Life Safety

UNOPS priority for building and road design is life safety. Special factors are to be considered in the design, in order to ensure that the Systems to be constructed are constructed to withstand the impact of hazards and remain functional in emergency situations.

The Final Design must consider the combination of many critical elements that impact the installations' life and safety.

j. CAD Drawings

The Consulting Firm shall give due consideration to the pertinent sections of the UNOPS' CAD Drawings Guidelines (Attachment #6) and shall prepare the Drawings in accordance with the same.

k. Sustainability Dimension

The Consulting Firm shall give due consideration to:

i) Sustainability;

ii) Gender Equality and Empowerment; and

iii) Environmental Impact.

l. Veracity, Accuracy, Clarification of the Design

The Consulting Firm shall be responsible for:

i) the veracity, details and accuracy of the Design;

ii) not allowing for variations in the Construction Contracts and conflicting interpretations; and

iii) for clarifying/ modifying/ correcting/ altering the Design as might be deemed necessary.

C. Detailed Design Components

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

I. Task #2.1.1 Design Brief

The Consulting Firm shall build on the SR and set out the Technical Objectives, Functional Statements and Performance Requirements, as well as spatial requirements (p.78 Design Manual) for SIMA SN Project, and shall prepare the Design Brief. The design brief shall indicate the current SN conditions, including its location, length, width and current conditions and an explanation of the need of enhancemnets to the existing streets in accordance with the scope of rehabilitation mentioned earlier. The design brief shall also and the potential design options or Alternatives (Design of pavements, Landscaping,...). In addition, Preparing an analysis of the existing layout, traffic patterns, surrounding environment, and factors to be considered such as soil conditions, pavement condition, drainage system and environmental impact. The Design Brief to tackle/include, inter alia, the following:

A. Site information and surveys, as well as all other technical surveys conducted/collected under the scope of this consultancy (SR etc…). All documents related to the land plot subject to the project: Official Surveys (Geotechnical and Topographic Surveys, Right of Way, etc…)

B. Physical Condition Assessment that will combine the new topographic survey, existing utilities mapping and indication of any future utility to be installed based on revised documents. It shall also include soil testing and assessment.

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

D. Spatial requirements of the Project and proposed enhancements on the streets, etc..;

E. Detailed list of stakeholders and their roles, and communication strategy to continually correspond with and involve all stakeholders;

F. Identification of Donor and Stakeholders' requirements, including End- User needs, such as women and girls, PWD and other groups;

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

H. Requirements for urban integration: analysis for the routes for pedestrians, and a mapping of the needs for improvements in the accessibility and pedestrian safety for various population groups and levels of personal mobility;

I. Description of the various utilities, installations, equipment (e.g. architectural, civil, electrical, Solar,, drainage, storm water, water treatment and storage, etc….) to be incorporated in SIMA SN along with schedules and locations;

J. In case where a solar powered voltaic systems (SPVS) is utilized, Describe SIMA SN's prospective energy Supply sources, taking into consideration load growth forecasts;

K. Design sketches;

L. Setting Out Technical Objectives, Functional Statements and Performance Requirements for SIMA SN Project components and facilities;

M. Suitability of SIMA SN to have solar powered voltaic systems (SPVS)supplies (e.g on traffic lights, solar panels etc…) and provision of SPVS simulation report utilizing specialized software, determine the optimum system orientation and tilt angle taking into consideration shading, available area, distance from interconnection point, financial feasibility, etc..;

N. Codes and standards (Local and International) pertaining to all disciplines, that will be adopted, noting that the applicable codes and standards suggested by the Consulting Firm shall be subject to the approval of UNOPS as part of accepting the Design Brief;

O. The Consulting Firm shall collect List of standard details related to road and drainage structures adopted by the Ministry of Transport and Road Development;Specifications for the road marking and road signs;Specifications for the road curbs, fences and etc and Local practices and cost for road maintenance;

P. Environmental risk assessment to evaluate the potential effect of the project design on the environment by identifying, assessing and managing arising/ existing environmental risks to prevent or minimize their negative impacts of the project;

Q. Forecast about the waste, types, proposed waste management system, size, operation and maintenance protocols and Standards of Procedure-SOPs;Description of the required operation, maintenance, and management strategies to guarantee the sustainability of SIMA SN;

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

S. 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..); andAnnexes (e.g. SR, etc..)

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

The Consulting Firm shall respond to the comments that would be provided by UNOPS PT and amend the Design Brief accordingly.

II. 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, UNOPS requirements, best practices, Stakeholders' requirements, and the particular situation of SIMA SN.

As a general recommendation, it is essential that the design introduces no substantial changes in the existing circulation flow (mainly the number of existing lanes) nor in the direction of circulation. Fluidity of circulation should as well be addressed and bottlenecks being avoided. No dedicated lane (for bicycle or others) to be introduced in case it leads to any of the above-mentioned issues.

The Consulting Firm shall:

A. Perform any additional, necessary site assessments and surveys that emerge as a result of the design brief preparation;

B. Conduct meetings with the various stakeholders as might be needed and requested by UNOPS in addition to the participatory consultations (At least 5) with the stakeholders/community that would be planned and conducted by UNOPS;

C. Prepare and submit a Draft Concept Design after due consultation with UNOPS and the Stakeholders;

D. Present the Draft Concept Design to the various stakeholders (The Municipality of Beirut, the community, etc..). 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 during Key Informant Interviews (KIIs), Focus Group Discussions (FGDs) with segregated population groups including, women, children, youth, Persons with Disability (PWD) and more, as would be requested by UNOPS.

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

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

b. Deliberations with, recommendations and requests from the stakeholders,

c. analysis and assessment 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;

F. Amend the Draft Concept Design building on the findings from stakeholders engagement activities, resonate with the stakeholders' input and incorporating 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

G. Submit the amended Draft Concept Design to UNOPS PT for its review, comments and approval/disapproval.

H. The Consulting Firm shall respond to the comments that would be provided by UNOPS PT and amend the Draft Concept Design accordingly and submit the Final Concept Design to UNOPS PT.

I. The Concept Design shall be subject to the review of the UNOPS PT. Upon approval of the same by the UNOPS PM and the Beneficiary and upon receipt of instructions from the UNOPS PM, the Consulting Firm may proceed with the execution of the tasks under the Detailed Design, noting that the final approval is vested with the UNOPS' IPMG- DR Team.

The Concept Design (Draft and Final) must address/include, inter alia, the following:

a. Environmentally Conscious Urban Masterplan, that entails the proposed interventions along SIMA SN ;

b. Setting out and leveling;

c. Basic plans, road profiles and relevant sections;

d. Basic plans, circulation, softscape and hardscape layouts, and relevant sections;

e. Drawings of the existing streets showing the surrounding sites/buildings according to the surveys and site assessments (e.g existing road (plans, cross sections, levels, pavement layers, landscape elements etc…) existing building(s) existing utilities (electrical, water supply drainage,manholes, stormwater discharge into municipality networks, etc.);

f. Structural Concept and Approach indicating structural elements locations if any.

g. Design and recommendations for the cola bridge waterproofing works;including the process of applying specialized materials/membrane and treatments to the surface of the bridge deck to prevent water and moisture infiltration,these protective measures ensure the underlying structure remains intact by preventing corrosion ,deterioration and freeze-thaw damage.A detailed map showing the layout of the interventions along SIMA SN, including major features such as proposed pedestrian safety enhancement elements, landscape elements, urban furniture, ,and proposed utilities such as water,lighting, electricity, waste water, storm water etc..;

h. Recommendations on implementation approach especially in case existing utilities might overlap with proposed road treatment;

i. Sketches or any other visual reference that may be necessary;

j. A circulation plan indicating Layout of pathways, roads, and traffic calming measures and traffic management and accessibility features to ensure smooth flow of pedestrians, bikes, and vehicles, etc..; a list of figures representing various measures to enhance and secure pedestrian's crossings should be

submitted for review and selection. These measures should include - and not limited to- dedicated lighting fixtures for pedestrians' crossings, sensory and tactile measures, new 3D visuals , etc… reference of suggested measures should be made to existing booklets published by the Order of Engineers of Beirut and the Beirut Urban Lab - American University of Beirut for accessibility and walkability in the city for citizens facing temporary or permanent disabilities.

k. Outline technical specifications and scope of work of the rehabilitation/ construction works;

l. Design plans including 2D layouts, 3D modeling and renderings, and conceptual calculations pertaining to the various trades/divisions i.e. landscape, architectural, civil, structural, mechanical, and electrical

m. Preliminary design plans for the building(s)\ structures, landscape elements, and outdoor facilities on a scale of 1:200 or 1:100 where suitable;

n. Considerations for Construction and sustainability strategies, operation and maintenance implications for services as well as functionality and health and safety considerations as per UNOPS requirements;

o. Setting out Quality Expectations; determination of Codes and standards (Local and International) pertaining to all disciplines, that will be adopted;

p. More accurate 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..);

q. Preliminary Implementation schedule (For the Rehabilitation/Construction works); and

r. Design Report including any other relevant matters that may affect the completion of the design process, describing the findings, conclusions, and recommendations. All condition assessments, surveys, relevant correspondence, and studies shall be attached to the data collection report;

s. Preliminary Cost estimate:The Consultant shall prepare, compile, and present to the preliminary cost estimate for the project. The Consultant shall make sure that the total price estimate does not exceed the proposed estimated budget

t. Physical criteria to be considered in the Design solution per Section

Refer to section 1.4.4 above

III. Task #2.1.3 Detailed Design

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 roads design packages (leveling, milling and filling, drainage, traffic lights, pedestrian crossing, signs, PV street lighting,bridge waterproofing(for cola bridge),...) , calculations, details, Bills of Quantities and Specifications, whilst abiding by the defined standards, codes and guidelines and acquiring the UNOPS Design Review Certificate/Approval[12].

The Consulting Firm shall revise the Detailed design package to incorporate and comply with the comments to be received from the UNOPS Design Review, and prepare Construction Tender Package; i.e. compilation of the specifications with technical preface, BOQs, Guidelines, contractor's qualification criteria, etc.

The Detailed Design must include, inter alia, the following:

A. Detailed Design Drawing Set:

a. Architectural \ Setting out Drawings:

A complete set of ready for construction detailed drawings. Below is an indicative list of the architectural drawings that shall be provided by the Consulting Firm:

i) Layout out plans, showing levels, and locations of suggested walls, sidewalks, fences, drains and relevant site features including urban furniture.
i) Sections where needed, showing all denivelations.
ii) Details specific to the project as needed.
iii) Sections showing all connections and proper details.
iv) Topographic Details and Sections showing all the site drops and landform elevations.
v) Layout plans for Hardscape elements and types, including curbs, pavements, edging, etc…
vi) Layout for Softscape elements including trees and shrubs and groundcover spaces.
vii) Layout for circulation paths.
viii) Fire escape plans
ix) Signage plans
x) Layouts related to waste management handling.
xi) Other required drawings as would be deemed necessary by UNOPS SPM

b. Structural drawings :

Complete sets of detailed full ready for construction drawings, plans, details, sections, schedules,and any other drawings and plans needed for the proper

[12] UNOPS Design Planning Manual enclosed in Attachment # 3. This manual is considered an integral part of this TOR

execution of the design, all on an appropriate scale. Refer to Attachment #8 for sample drawings.
Below is an indicative list of the structural drawings that shall be provided by the Consulting Firm:

i) Structural Plans and relevant sections showing all structural elements placement and sizes.
ii) Connection details where necessary.
iii) Foundation details and leveling.
iv) Soil reports, or any specific structural report that may be needed.

c. Civil Works & Infrastructural 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.

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

i) Topographic Survey Plan.
ii) Site plan sheet showing the proposed levels (pavement, sidewalks etc…), storm water discharge features (ditches, Underground pipes, Surface trenches, gutters etc..).
iii) Demolition and Excavation plans.
iv) Typical Details of civil works (manholes, gutters, trenches, road sections, pavement sections etc…).
v) Infrastructure Plans and relevant sections showing all built-up areas including buildings, walls, fences, terraces,manholes, etc.
vi) Site Hydraulics Plan, and stormwater management (to be coordinated with the mechanical drawings)
vii) Ensure Utilities are well coordinated.
viii) Full coordination with architectural and structural drawings.
ix) Connections to utilities.
x) Infrastructural details as needed.
xi) Cola bridge waterproofing drawings details
xii) Calculations as needed.
xiii) Power tables and necessary diagrams as needed.

d. Landscape drawings

i) General landscape masterplan with coding and references.

ii) Rendered Landscape masterplan.

iii) Softscape detailed plans and sections, labeling plant species and quantities.

iv) Hardscape detailed plans and sections, labeling material types and quantities/areas.

v) Site urban furniture plans and sections.

vi) Site directional signage plan and details.

vii) Typical softscape and planting detailed drawings and sections.

viii) Typical hardscape and installation detail drawings and sections.

ix) Typical furniture construction details where applicable

e. Mechanical Package:

Complete sets of detailed Mechanical (Drainage , 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:

i) Site plans for main water, drainage, irrigation, rain water works
ii) Rain water, sewage, domestic cold & hot water, firefighting, central heating, HVAC, LPG, Steam layouts, etc where applicable
iii) R.O. Water Treatment Plant to supply critical Equipment
iv) Risers for all mechanical and plumbing works
v) Mechanical & Plumbing details
vi) Detailed layouts for Mechanical plant room
vii) Septic tanks, wastewater network where applicable
viii) Interconnection with utilities installations (Potable Water, waste water, etc..)
ix) Mechanical equipment schedules and Calculations
x) Other required drawings as would be deemed necessary by UNOPS SPM

f. Solar PV and Electrical Systems design and drawings:

Solar PV Systems(traffic lights, street lighting etc…) 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 road 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 UNOPS decides to increase/decrease the capacities
5) In case existing poles were utilized, the consulting firm shall assess the suitability of these poles to sustain such additional loads. 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) 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, traffic lights,/ PV modules/ mounting structures/ communication cables/ Monitoring and Data Acquisition System- Data Logger- including hardware and software (Screen for Remote monitoring,cctv cameras ,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.

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

i) External Electrical works and area lighting
ii) Lighting and Power Electrical details
iii) UPS System
iv) Solar PV Hybrid System (PV Panels, Inverters, Combiners, Connectors, etc..)
v) Earthing Layouts
vi) Lightning Protection layouts
vii) Electrical Risers and Single Line Diagrams
viii) Electrical schedules of equipment and calculations
ix) Other required drawings as would be deemed necessary by UNOPS SPM

Fully coordinated plans showing the multi-disciplinary layers of the different engineering systems.

Other required works, related to the specific functions of SIMA SN

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

B. Construction details:

The detailed design MUST provide extensive construction details and schedules that can be executed without compromising the design intent and can be supervised on site by the UNOPS Project Team.

The Design shall provide full details, dimensions, sizes, distances, elevations, weights where applicable (e.g. milling and filling,drainage systems,sidewalks,manholes etc..) of structural elements and works to be implemented and all the stand-alone solar PV lighting poles system, in addition to schedules of equipment,, connections as well as the specifications of the materials,waterproofing, protection, painting, etc. where applicable.

C. Supporting Calculations Notes:

The Consulting Firms shall prepare all calculation notes(Civil, environmental, drainage, lighting, solar PV system, 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. Detailed Technical Specifications:

Technical and Functional Requirements and Technical Warranties of all the components and equipment. 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.

E. Detailed Scope of Work :

The consulting Firm shall prepare the detailed scope of work of the construction contractors in addition to general obligations (e.g. Abiding by UNOPS 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..);

F. 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.

G. **Standards, codes and guidelines;** International and local standards, codes and codes of practice as adopted by UNOPS and its partners in the Design Brief;

H. **Visibility:** Provide high quality photos capturing the components and the impact of the project. UNOPS will provide the Consulting Firm with photography and branding guidelines to adhere to

I. **Training requirements**,operation and maintenance and management services, and SOPs for the waste management system

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

K. **Detailed Bill of Quantities and Detailed Cost Estimates** including recommended Spare Parts list, cost of operation and maintenance and management of SIMA SN.

L. **Other reports** as might be deemed necessary to comply with UNOPS Requirements.

IV. Task #2.1.4 Design Review

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 UNOPS Infrastructure Project Management Group- IPMG- Design Review Team.

Under this task the Consulting shall provide clarifications or further documentations, assessments or investigations to the clarification requests raised by the IPMG Design Review Team.

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 IPMG Design Review Team.

The Consulting Firm shall provide the final full Detailed Design on the set deadline complete without omissions in order to be submitted to the IPMG Design Review Team.

The deliverables shall not be considered Final until the IPMG Design Review Team deems that the Design Documents substantially and fully meet the UNOPS requirements, upon which the Design Review Certificate would be issued by the IPMG Design Review Team.

The design liability shall rest with the Consulting Firm. 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.

A. Duration of The Design Review Process:

The Design Review process starts when the complete design package is submitted to the IPMG Design Review Team by the UNOPS PM. The duration of review from first submission to the signature of the Design Review Certificate depends on the complexity of the works, the quality and detail of the design package.

The review process may require multiple review cycles and clarifications might be raised by the IPMG-DR as well as further design development/amendment by the Consulting Firm.

B. Total Duration of the Design Review Process:

Because design review can only be completed once the design meets the requirements of UNOPS, the total duration of design review depends on the time that it takes the Consulting Firm to meet these requirements. The quality and detailing of the design package is the most significant driver of total time for design review. In order to be efficient, the Consulting Firm shall deliver complete information to demonstrate compliance with the applicable codes.

It is the sole responsibility of the Consulting Firm to submit on the assigned deadline a complete detailed design with full information, incomplete submissions are not permissible.

The final approval of the detailed design will be the design review approval from IPMG. The Consulting Firm should make all modifications as per the IPMG comments without any additional costs.

2.2 Task #2.2: Technical Support

The Consulting Firm shall provide Technical Support during the Solicitation of Construction Proposals, Construction Implementation Stage, and the Defects Notification Period- DNP.

A. Task #2.2.1- Support during Solicitation and Evaluation of Construction Proposals:

As soon as the Design Review Certificate is issued, UNOPS will launch the bidding process for the solicitation of proposals for the certified works.

During this period, the Consulting Firm shall provide UNOPS with complete responses (e.g. technical answers, corrections to the designs, etc..) to the clarification requests that might be issued by the prospective bidders.

The evaluation of the construction proposals shall be performed solely by UNOPS. However, the Consulting Firm shall respond to queries that might be raised by UNOPS.

Upon completion of the evaluation, the evaluation report would be sent to the UNOPS Headquarters Contracts and Property Committee- HQCPC for the final review.

The Consulting Firm shall provide clarifications that might be requested by the HQCPC.

B. Task #2.2.2- Technical Support During the Construction/ Implementation Stage:

During this period, the Consulting Firm shall review any design variations that might arise during the implementation phase and reflect those changes in the design drawing package, in addition to the inspection of some critical works as defined and seen necessary by the SPM.

In this context, the Consulting Firm shall:

- Submit detailed substantiated responses to technical queries issued by UNOPS, related to the Detailed Design;
- Conduct on-site survey[13] and coordinate requested site visits, testing, sampling, etc. with the UNOPS Project Team and the concerned parties at the Municipality of Beirut as defined and seen necessary by the SPM.
- Review/comment/disapprove/approve shop drawings issued by the contractor;
- Issue Documents (Calculation Sheets, specifications, drawings, BOQ, Cost Estimates,etc..) in case there is a need to remedy any defects discovered in the Detailed Design, as well as reviewing variations/changes requests by the Contractors, if needed; and
- Issue reports pertaining to the attendance of Project meetings (Physically or virtually), site visits, etc.. and any other document as might be requested by UNOPS SPM to clarify matters related to the Consulting Firm's Detailed Design.

C. Task 2.2.3- Technical Support During Defects Notification Period-DNP:

During this period (One year after the completion of the construction of the Works), the Consulting Firm shall ensure that technical support services are available as might be required by UNOPS.

[13] Inspection of some critical works as defined and seen necessary by the SPM.

5. TIMELINES, DELIVERABLES, DELIVERABLES AND REPORTING REQUIREMENTS

5.1. Commencement Date and Period of Implementation

The Commencement Date is the date of signature of the Contract. The duration of this assignment is 4 months[14].

The Consulting Firm shall complete the assignment and provide the deliverables within the deadlines/durations indicated in the Preliminary Detailed Implementation Schedule (Annex 4.)in Call-off Order documents.

5.2. Deliverables

The Consulting Firm shall submit to UNOPS the below indicated Deliverables as per the Detailed Implementation Schedule; the Deliverables, include, inter alia, the following:

1. Task #1- Site Inspection, Survey and Assessment

Upon the completion of Task #1, the Consulting Firm shall submit the following Deliverables:

1.1. Site Inspection and Data Collection

1.2. Geotechnical Assessment and Topographic Survey Report (GTTR)- Draft & Final

1.3. Pavement Assessment Report (PAR)- Draft & Final

1.4. Drainage Assessment Report (DAR)- Draft & Final

1.5. Traffic Survey Report (TSR) - Draft & Final

1.6. Detailed Survey Report- SR- Draft and Final

2. Task #2- Preparation of Detailed Design and Technical Support

2.1. Task #2.1- Preparation of Detailed Design

Throughout the execution of Task #2.1, the Consulting Firm shall submit the following Deliverables:

2.1.1. Design Brief Report- Draft and Final
2.1.2. Concept Design- Draft and Final
2.1.3. Final Detailed Design Complete Package- Draft and Final
2.1.4. Design Review-Providing clarifications/further documentations/etc.. to the clarification requests raised by the IPMG Design Review Team.

[14] This duration includes the time needed by the Consulting Firm to accomplish Task # 1 & Task #2.1 (Task # 2.1.1 , Task # 2.1.2,Task # 2.1.3 excluding Task # 2.1.4 Design Review). UNOPS Project Team might submit the approved Design brief and Concept design before the commencement of the detailed design for initial feedback from the Design Review Team. Please Refer to Annex 4 for additional details.

2.2. Task #2.2- Technical Support

Throughout the execution of Task #2.2, the Consulting Firm shall submit the following Deliverables:

2.2.1. Task #2.2.1- Support during Solicitation and Evaluation of Construction Proposals

Throughout the execution of Task #2.2.1, the Consulting Firm shall submit the following Deliverables:

i. Providing UNOPS SPM with answers to the Clarifications Requests raised by the Prospective Bidders as might be requested.
ii. Providing UNOPS SPM with answers to the Clarifications Requests raised by the HQCPC as might be requested.

2.2.2. Task #2.2.2- Technical Support During the Construction/ Implementation Stage

Throughout the execution of Task #3.2, the Consulting Firm shall submit the following Deliverables:

i. Detailed substantiated responses to technical queries issued by UNOPS, related to the Detailed Design;

ii. Approval of shop drawings issued by contractor;
iii. Documents (Calculation Sheets, specifications, drawings, BOQ, etc..) in case there is a need to remedy any defects discovered in the Detailed Design and providing complete related details and cost estimate, if needed; and
iv. Reports pertaining to the attendance of Project meetings (Physically or virtually) as might be requested by UNOPS SPM to clarify matters related to the Consulting Firm's Detailed Design.

2.2.3. Task 2.2.3- Technical Support During Defects Notification Period- DNP:

Reports shall be submitted by the Consulting Firm as would be requested by UNOPS.

The Consulting Firm shall submit the Deliverables in both electronic and hard copy forms.

After UNOPS approval of DRAFT and FINAL Deliverables, the Consulting Firm shall provide three (3) signed hard copies and one soft copy of the approved documents.

UNOPS shall become the sole owner of all the documents/deliverables produced by the Consulting Firm under this Assignment, UNOPs has the full rights to utilize the same at its sole discretion without any restrictions.

5.3. Meetings and Reporting

The Consulting Firm and UNOPS will hold weekly site progress meetings and other ad-hoc meetings as might be requested by UNOPS.

The Consulting Firm shall prepare Bi-weekly progress reports and other technical reports and/or presentations as might be deemed necessary by UNOPS.

The Consulting Firm shall attend all meetings (Including those with Stakeholders, and other entities) that the UNOPS SPM requests the Consulting Firm to attend with the proper representation as would be determined by the UNOPS SPM.

Furthermore, the Consulting Firm shall prepare regular updates of the implementation schedule and methodology.

6. TERMS OF PAYMENT

UNOPS will process the payments to the Consulting Firm in accordance with Annex 2. PRICES SCHEDULE in the COO documents and indicated in the Contract for Consultant Services for Works.

7. TEAM COMPOSITION, REQUIREMENTS & QUALIFICATION FOR THE KEY EXPERTS

7.1. General Requirements

The Consulting Firm shall:

- Provide highly experienced staff (Landscape Architects, Architects, Solar Energy experts, Electrical, Civil Infrastructure and Mechanical Engineers, Quality Controller, Quantity Assessors, 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 organogram illustrating the reporting lines together with a description of such organization of the team structure.
- Provide the curriculum vitae of all proposed 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. Team Composition

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

1- **Team Leader** – she/he shall:

- have a minimum 15 years experience in the design of infrastructure Projects with experience in the design of streets/ Roads Design
- Have previous experience in technical coordination between different trades of a project;
- Haveprevious experience in project and/or design management:
- have a Bachelor degree in Civil Engineering.;
- be responsible for coordination and overseeing the activities of the Assignment;
- act as Key focal person to liaion and to communicate with UNOPS; and
- be a registered member of a Lebanese Order of Engineers (Beirut or Tripoli).

2- **Two Landscape Architects- or Architects Specialized in Public Space Design -** She/he shall:

- have a minimum 8 years experience in architecture with previous experience in gardens, public spaces and landscape design projects;
- have a Bachelor degree in landscape architecture or architecture;

3- **Two Urban Specialists/ Urban Designer** – she/he shall:

- have a minimum 8 years experience, with previous experience in public space design and/or urban design projects;
- have a Bachelor degree in Urbanism or architecture; and

4- **One Structural Engineer- Specialized in Steel Structure Design** – she/he shall:

- Have a minimum 8 years' experience in Civil/Structural engineering design projects, with experience in Steel Structure Design, Preferably pertaining to Solar PV Systems;

- ➢ Have a Bachelor degree in science/civil engineering;

5- Two Civil Engineers- Specialized in Road Design - she/he shall:

- ➢ have a minimum 8 years experience in infrastructure design projects, mainly experience in road design projects;
- ➢ have a Bachelor degree in Civil engineering;
- ➢ Support the team leader in undertaking Roads assessment and retrofitting design , Geotechnical Survey, design of roads drainage, pavement, traffic etc… ; and
- ➢ One of the engineers shall be a registered member of a Lebanese Order of Engineers (Beirut or Tripoli).

6- One Solar /Eelectrical Engineer- Specialized in Solar PV Systems Design - she/he shall:

- ➢ have a minimum 8 years experience in Electrical/Energy engineering, with previous experience in Solar PV Systems Design, preferably pertaining to Utility Grade Solar PV Hybrid Systems (On-Grid/ Off-Grid);
- ➢ have a Bachelor degree in Electrical/ Energy/Industrial engineering or other relevant engineering field;

7- One Electrical Engineer- Specialized in Medium Voltage/Low Voltage Systems Design - she/he shall:

- ➢ have a minimum 8 years experience in Electrical engineering, with experience in Medium Voltage/Low Voltage Systems Design, preferably pertaining to Utility Grade Systems and/or Solar PV Hybrid systems;
- ➢ have a Bachelor degree in Electrical engineering or other relevant engineering field;

8- One Mechanical Engineer- Specialized in Infrastructure Water, Irrigation and Drainage Systems Design - she/he shall:

- ➢ have a minimum 8 years experience in Mechanical engineering, with experience in infrastructure water, irrigation and drainage Systems Design;
- ➢ have a Bachelor degree in Mechanical engineering or other relevant engineering field;

9- Two Traffic or Transportation Engineer Specialized in Road Safety - she/he shall:

- ➢ have a minimum 8 years experience in Traffic engineering studies, surveys, road design road and safety
- ➢ Support the team leader in undertaking traffic surveys, road design and road safety enhancements etc… ; and

- ➢ have a Bachelor degree in Civil engineering \ Traffic Engineering or other relevant engineering field;

10- One Environmental Expert- s- she/he shall:

- ➢ have a minimum 8 years experience in Environmental engineering and; ,
- ➢ have a Bachelor degree in Environmental engineering or other relevant engineering field;

10- Other Supporting highly competent staff that are needed to conduct and deliver high quality Engineering Services and communication tasks (e.g. Quality Controller,Geotechnical engineer, Water Engineer, Quantity/Cost Assessor, Draftsperson, Surveyor, Communications Officers, Enumerators etc..)

8. INPUTS

8.1. Input from UNOPS

- UNOPS will request the relevant Municipalities to provide the CF with As- Built plans, old designs, existing assessment reports where available;
- Review draft and final deliverables submitted by the Consulting Firm
- Participate in weekly, bi-weekly and ad hoc meetings to assess the progress of the assigned work

8.2. Inputs from Municipalities

- UNOPS will request the relevant Municipalities to provide the CF with As- Built plans, old designs, existing assessment reports where available;
- Provide access to all sites and facilities;
- Provide pertinent available As- Built plans, documents, and existing designs if available;

8.3. Input from the Consulting Firm - CF

- Key personnel; and
- All equipment, instruments, measuring devices, and tools to carry out the services satisfactorily.

9. ATTACHMENTS

- UNOPS Design Planning Manual for Buildings & UNOPS Design Planning Manual for Transport Infrastructure, UNOPS Geotechnical Investigation Guidelines- Attachments #3.a & #3.b # 3.c
- UNOPS Minimum Health and Safety Requirements for Contractors- Attachment #4.
- UNOPS Guidance on minimum requirements for works contractors on PSEAH #5

- UNOPS CAD Drawings Guidelines- Attachment #6.
- Sample Structural Design Drawings- Attachment #8
- Design Brief Template- Attachment #9
- Sample Pictures-Attachment #10