Government of The People's Republic of Bangladesh

Ministry of Local Government, Rural Development and Co-operatives

Local Government Engineering Department (LGED)

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)

Project ID: P167762 **IDA Credit No. 5561-BD**

ENVIRONMENTAL SCREENING REPORT

Of the Sub-project:

Supply and Installation of Solar PV Nano Grid in Ukhiya and Teknaf Upazila of Cox's Bazar District.

Under the Package No. EMCRP/AF/G-19

Component Name: Supply and Installation of Solar PV Nano Grid

Upazila: Ukhiya and Teknaf

District: Cox's Bazar

Funded by:

THE WORLD BANK
IBRD • IDA

Government of the People's Republic of Bangladesh & World Bank

Design and Supervision Consultancy:

Development Design Consultants Ltd.

March 2024

Contents

ACRONYMS

DoE	Department of Environment
DRP	Displaced Rohingya people
EA	Environmental Assessment
EC	Electrical Conductivity
EMCRP	Emergency Multi-Sector Rohingya Crisis Response Project
ESMP	Environmental and Social Management Plan
ERP	Emergency Response Plan
FDMN	Forcibly Displaced Myanmar National
FGD	Focus Group Discussion
FSM	Faecal Sludge Management
GBV	Gender Based violence
GPS	Government Primary School
IEFs	Important Environmental Features
ISCG	Inter Sector Coordination Group
IUCN	International Union for Conservation of Nature
IWM	Institute of Water Modeling
PIA	Project Influence Area
PPE	Personal Protective Equipment
PSC	Project Steering Committee
SPM	Suspended Particulate Matter
SWM	Solid Waste Management
UNHCR	The United Nations High Commissioner for Refugees
UNFPA	United Nations Population Fund
WB	World Bank

Executive Summary

The Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP) has been designed in order to reduce the vulnerability of Forcibly Displaced Myanmar National (FDMN) along with people from the host communities in Teknaf and Ukhiya Upazila under Cox's Bazar District, to different disasters and improve the social service delivery system and disaster resilience to both the communities. This project will follow a sustainable development pathway that is resilient to disaster and climate change.

The project is jointly being implemented by Local Government Engineering Department (LGED), Department of Public Health Engineering (DPHE) and Ministry of Disaster Management and Relief (MoDMR) under their respective mandate and scope of works. Under the project purview of LGED, 35 nos. Solar PV Nano grid will be supplied and installed under the package of EMCRP/AF/G-19 in the Rohingya camps of Ukhiya and Teknaf Upazila of Cox's Bazar district in Bangladesh to address the severe energy crisis that has plagued these camps for years. The locations of the facilities where the electric connection to be provided are selected based on geographical priority and requirement of services to different facilities in different camp areas. Therefore, the installation of a solar PV Nano grid system will provide a reliable and sustainable source of electricity, improving the living conditions of the affected population and minimizing the carbon footprint during operations. It is anticipated that the installation works of the Nano grid may trigger some social and environmental risks and impacts along with some great opportunities, may it be trivial or insignificant. However, an assessment is required to identify those issues and address duly by the contractor during the installation period, and some responsibilities may lie on the receiving authority of those facilities afterwards (O&M period). This screening work thus has been undertaken before the mobilization of contractor in the field.

This package involves supplying and installation of 8KW capacity nano grid system with a control room having dimension of 10ft*8ft*8.5ft and a thickness of 2.3mm. The control room will be made of a steel container that includes thermal insulation, and ventilation operated by a temperature sensor, and will serve as the central hub for the distribution of electricity to the target facilities. None of the sections, equipment or operating parts of the control room contain asbestos or similar type of hazardous compound or chemicals. Construction of RCC footing is also required, where the container will be placed on. The nano grid will consist of approximately 14 poles, which will be installed to distribute electricity to various facilities. Each pole will have an electricity line drawn from the nano grid, with a solar panel to be installed on top of each pole. Additionally, each pole will have a 10-watt security light installed on top, providing additional safety and security for the surrounding areas.

The proposed facilities also include the installation of 65 energy-efficient fans and lights in various service centers, each with a capacity of 35 watts and 10 watts respectively. These fans will help to keep the facilities cool during hot temperatures, ensuring a comfortable working environment for the facilitators. Two fire extinguishers will also be installed in the nano grid room, ensuring the safety of the equipment and personnel operating in the facility.

The installation of the Nano grids is expected to cause minimal environmental damage, though there may be temporary impacts on air and soil due to construction activities. Environmental disturbances during the construction phase may primarily result from noise and dust generation. The installation of containers and poles may generate noise and vibrations that could potentially disrupt the surrounding environment. Dust particles might be released into the air during excavation and construction work. Additionally, several health and safety issues need to be considered due to the use of cranes and heavy equipment, battery storage, electric wires, welding machines, and other tools. The installation of poles and electrical lines involves working with heavy machinery and welding equipment, presenting significant risks of electrical shocks and burns. Chemicals such as paints, solvents, adhesives, and insulation materials may contain hazardous substances like volatile organic compounds (VOCs) and heavy metals. Construction activities may also involve manual lifting, carrying, and moving of heavy equipment and materials, where improper lifting techniques and overexertion can lead to musculoskeletal injuries. Working at heights, particularly during the installation of poles and overhead lines, poses a significant risk of falls. However, appropriate mitigation and management measures are detailed in the relevant section of this document.

Given the small scale of construction and the use of local labor for these minimal tasks, there is no need for a labor shed. Consequently, there will be minimal waste generation, primarily consisting of construction debris such as leftover brick chips, cement, wood, bamboo, plastics, wires, etc. The absence of a labor shed will reduce the likelihood of generating organic waste, fecal waste, and kitchen waste during the construction phase. Additionally, no damage will be caused to existing vegetation or garden plants, as the sites are vacant open spaces without vegetation, with only some shrubs present in certain areas.

On the positive side, each of the Nano-grid facilities, equipped with a solar-powered electricity supply system with a capacity of 8 kW, would help reduce CO2 emissions by 8.76 tons per year, based on a conservative estimation (Ref. CO2 Emission Reduction: Results - Solar Mango – #1 guide for solar; considering 250 days of sunshine per year).

A key concern for this facility is the production of significant amounts of e-waste after the solar PV Nano grid and lead-acid batteries reach the end of their life cycle. Since Bangladesh currently lacks formal facilities to recycle or upcycle these wastes, the project has developed a plan to manage all waste produced by the solar system (street lights, Nano-grid, etc.) after the associated products, equipment, and batteries reach the end of their life. One of the vendors supplying and installing these solar systems has agreed to take back all waste (non-functioning products, equipment, batteries, spare parts, etc.) at their own cost and will manage it in cooperation with the manufacturing company they represent. The project will finalize an agreement (MoU) with this vendor by the end of the project or the end of the warranty period of their services, whichever comes first.

None of the proposed Solar PV Nano grid sites are located in or near environmentally sensitive areas, nor will they cause any significant detrimental impacts during the construction period. The Nano grid will power educational facilities in the camp area, such as schools and learning centers, benefiting children in the community. The availability of electricity in healthcare facilities in the camp area, supported by the Nano grid, will improve access to quality healthcare services for women and children. By harnessing clean and renewable solar energy, the Nano grid will

significantly reduce reliance on fossil fuel-based power sources, leading to a reduction in carbon emissions, which helps mitigate climate change and improve air quality in the local environment. However, the short-term negative impacts on air quality, noise, solid waste, and occupational health and safety during the construction period need to be minimized through the implementation of the provided management plan.

1. INTRODUCTION

1.1 Project background

An estimated 730,000[1] people of Rohingya community has fled to neighboring Cox's Bazar district of Bangladesh since August 25, 2017 to escape extreme violence in Rakhine State of Myanmar, which caused the total number of Forcibly Displaced Myanmar National (FDMN) in the district to be about 923,033[2]. This huge number of displaced population account for about one-third of the total population of Cox's bazar, a district which was already facing many development challenges and suffering from resource-constrained social service delivery system even before the crisis evolved and the mass exodus of FDMN has worsened the situation further. Almost all of these displaced people are hosted in Ukhiya and Teknaf Upazila of Cox's Bazar, in extremely congested settlements in areas having very minimal access to basic infrastructure and services and is prone to natural disasters. The Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP) has been designed in order to reduce the vulnerability of Forcibly Displaced Myanmar National (FDMN) along with people from the host communities in Teknaf and Ukhiya Upazila under Cox's Bazar District, to different disasters and improve the social service delivery system and disaster resilience to both the communities. This project will follow a sustainable development pathway that is resilient to disaster and climate change.

The objective of the Project is to provide greater protection for the FDMN and host communities through:

- Reducing the vulnerability to natural disasters
- Improving social service delivery system
- Improving water and sanitation facilities
- Reducing vulnerability to accidental fire
- Provisioning better educational facilities and
- Strengthening and scaling up of GBV prevention services to the FDMN

The project is jointly being implemented by Local Government Engineering Department (LGED), Department of Public Health Engineering (DPHE) and Ministry of Disaster Management and Relief (MoDMR) under their respective mandate and scope of works. Apart from the interventions in addressing Gender and Social Inclusiveness and Preventing Gender Based Violence with the Support from UNFPA and building Communication and Awareness among all affected parties through an effective engagement of BCCP (Bangladesh Center for Communication Programs) in the areas, LGED is implementing a good number of infrastructural facilities, namely improvement of hat bazars, roads (both inside and outside of the camps), bridges, culverts, construction of School cum multi-purpose disaster shelters, Satellite Fire Stations, Relief Distribution Center, Community Service Center and many other different types of facilities. - Given the project interventions, sensitivity of the areas and volume of people in or around the sites, the project is more likely to trigger certain Operational Policies and Bank Procedures, namely Environmental Assessment (OP/BP 4.01), Natural Habitat (OP/BP 4.04), Forest (OP/BP 4.36) and Physical Cultural Resources (OP /BP 4.11).

[1] ISCG: Situation Report Rohingya Refugee Crisis, (September 27, 2018)
[2] IOM Needs and Population Monitoring round 12 as of October 10, 2018

1.2 Rationale of Site Selection for Solar PV Nano Grid under the project

Increase in number of DRP from the last wave migration in 2017 has brought increased demand for space and services. Utilization of the land capacity offered by Rohingya camp locations of Ukhiya and Teknaf Upazila is a crucial subject of demand base analysis through which facilities should be introduced.

Solar PV nano grid installation is needed in the Rohingya camps of Ukhiya and Teknaf Upazila of Cox's Bazar district in Bangladesh to address the severe energy crisis that has plagued these camps for years. The area experiences high levels of solar radiation, making it an ideal location for the installation of a solar PV system. Secondly, the camps are located in remote areas with limited access to the national power grid, and the population living in these camps has limited access to basic energy services. Therefore, the installation of a solar PV Nano grid system will provide a reliable and sustainable source of electricity, improving the living conditions of the affected population and minimizing the carbon footprint during operations.

Moreover, the project aims to support renewable energy systems using Solar PV Nano Grid schemes to increase access to clean electricity, with a focus on health centers, female safe spaces, distribution points, learning centers, offices, and urgent Health, Sanitation and Hygiene (WASH) needs of Rohingya people. This subproject will implement a sustainable approach to generating energy to improve environmental sustainability, resource efficiency, and quality management across the camps.

In addition, the project aims to support the government agencies in strengthening institutional systems and capacities to plan, coordinate, and respond to crisis and emergencies. This subproject will also help the facilities and staff to transition to cleaner fuel sources, ensuring a better and more sustainable future for Rohingya communities and locals.

These Solar PV Nano Grids in Rohingya camps in Bangladesh can significantly improve the living conditions of the Rohingya population and provide them with access to basic energy services that are essential for their health and well-being. Every camp location which are identified for this intervention will establish benefit from it. Camp in Charge authority will steer the operation of these structures and will judge the best fit practice for them.

1.3 Elementary information of Supply and Installation of Solar PV Nano grid

The catchment area of these components falls within the area where mostly Displaced Rohingya Community lives. Under the package of EMCRP/AF/G-19, 35 nos. Supply and Installation of Solar PV Nano grid will be constructed in various camps of Ukhiya and teknaf Upazila under Cox’s bazar district. These facilities are selected on the basis of geographical priority and needs for developed camp areas locations. Moreover, these interventions are also selected considering different social and environmental aspects.

The objective of this Environmental Screening Report is to screen out the major environmental features of the proposed components site and surrounding areas of Supply and Installation of Solar PV Nano grid assessing the potential impacts in respect to the planned interventions on the site and

also suggest intervention items specific management plan including appropriate mitigation options, if any or required.

It is imperative to recognize proposed components of Supply and Installation of Solar PV Nano grid in Ukhiya and Teknaf Upazilas in order to assess and verify its interventions according to UNFPA regards. Acknowledging this matter, such details are accounted for as given below in Table 1.3.1 along with visual presentation (General Upazila Map) given in Figure 1.3.1.

Table-1.3.1: Basic Geolocation Information and current condition of Supply and Installation of Solar PV Nano grids proposed location

Sl	Camp	Location	Block	Sub Block	Latitude	Longitude	Upazila	Union	Connecting road	Distance from the upazila HQ. Km	Current land condition sq. ft.
1	Camp 18	Majhi section- H50. Closed to CiC office	Block A	A4	21.193359	92.149612	Ukhiya	Palongkhali	Camp 18 Connecting road	12	400 (Open Space)
2	Camp 18	Majhi section -M17 Beside of the SMEP road	Block B	B1	21.189745	92.143323	Ukhiya	Palongkhali	camp 18 SMEP road	13	300 (Open Space)
3	Camp 18	Majhi section- L 12 Near by L 12 Mosque	Block C	C6	21.18800433	92.14830022	Ukhiya	Palongkhali	camp 18 SMEP road	12	300 (Open Space)
4	Camp 18	Majhi section F 30 Adjoining with BDRCS Distribution point in	Block C	C03	21.188859	92.151646	Ukhiya	Palongkhali	camp 18 SMEP road	8	300 (Open Space)
5	Camp 12	Near by pulse Bangladesh PHC	A	A5	21.180209	92.153284	Ukhiya	Palongkhali	Camp 12 connecting road	12	144 (open space)
6	Camp 12	Near by IOM warehouse SD	D	D3	21.184581	92.150178	Ukhiya	Palongkhali	Camp 12 connecting road	12	180(Open Space)
7	Camp 12	near by CIC office	D	D1	21.183593	92.151146	Ukhiya	Palongkhali	Camp 12 connecting road	12	180(Open Space)
8	Camp 10	Inside of CIC office boundary, Beside the flag stand	C	C3	21.189078	92.1535063	Ukhiya	Palongkhali	camp 10 connecting	10	144 (open space)
9	Camp 10	F-13 Community Watch Tower	D	D2	21.188083	92.154509	Ukhiya	Palongkhali	camp 10 connecting	11	300 (Open Space)

Sl	Camp	Location	Block	Sub Block	Latitude	Longitude	Upazila	Union	Connecting road	Distance from the upazila HQ. Km	Current land condition sq. ft.
		Opposite ward to Play Ground									
10	Camp 10	F-13 Community Watch Tower Opposite ward to Play Ground	D	D2	21.188084	92.15452	Ukhiya	Palongkhali	camp 10 connecting	11	144 (open space)
11	Camp 11	Behind SMS Hub and beside Cox's Bazar to Teknaf main road	C	C2	21.1798912	92.15724	Ukhiya	Palongkhali	camp 11 connecting road/ Arakan Road	12	144 (open space)
12	Camp 11	Inside of ware house	C	C2	21.1778372	92.1560417	Ukhiya	Palongkhali	camp 11 connecting	12	225 (Open Space)
13	Camp 11	Near by Temporary Nutrition Center	A	A1	21.183013	92.158064	Ukhiya	Palongkhali	Army Road	12	400 (Open Space)
14	Camp 13	Inside of IOM emergency Container point	A	A1	21.1747081	92.1408682	Ukhiya	Palongkhali	camp 13 connecting road	15	144 (open space)
15	Camp 13	Inside of World Vision CFS	G	G5	21.1789602	92.1365052	Ukhiya	Palongkhali	camp 13 connecting road	24	400 (Open Space)
16	Camp 13	Inside of SHED wash office	B	B4	21.1786845	92.1416812	Ukhiya	Palongkhali	camp 13 connecting road	13.5	144 (Open Space)
17	Camp 2W	Near by CiC Office	B	B3	21.209314	92.159838	Ukhiya	Rajapalong	Camp 2W connecting road	4	225 (Open Space)
18	Camp 5	CiC office, BRAC-	E	E6	21.201734	92.146675	Ukhiya	Rajapalong	camp 5	16	180(Open

Sl	Camp	Location	Block	Sub Block	Latitude	Longitude	Upazila	Union	Connecting road	Distance from the upazila HQ. Km	Current land condition sq. ft.
		SMS Office & Blast							and 6 connecting road		Space)
19	Camp 5	FH-MHPSS, JCF-LC, TDH, NGOF-Protection, Mukti-LC&BDRCS Distribution Point	E	E2	21.200735	92.151417	Ukhiya	Rajapalong	camp 5 and 6 connecting road	15	300 (Open Space)
20	Camp 5	Police camp, RTMI-PHC, JCF-LC & NGOF	E	E1	21.201204	92.148165	Ukhiya	Rajapalong	camp 5 connecting road near APBN office	16	180(Open Space)
21	Camp 5	BRAC UN Wamen Market, SARPV, IRC, FH-HP, Mukti-LC & JCF-LC	B	B5	21.204441	92.148163	Ukhiya	Rajapalong	Moricha Bazar camp connecting road/Army road	15	144 (open space)
22	Camp 6	PHC BDRCS	A	A3	21.208591	92.156921	Ukhiya	Rajapalong	Pitkhola Bazar Road	7.5	144 (open space)
23	Camp 6	CIC OFFICE	D	D7	21.202227	92.156103	Ukhiya	Rajapalong	camp 6 connecting road	7	144 (open space)
24	Camp 20EXT	NGO From Center	S3	B1	21.195231	92.133284	Ukhiya	Palongkhali	Camp 20 Ext. connecting road	9	196 (Open Space)

Sl	Camp	Location	Block	Sub Block	Latitude	Longitude	Upazila	Union	Connecting road	Distance from the upazila HQ. Km	Current land condition sq. ft.
25	Camp 20EXT	Beside the learning center	S1	B8	21.191379	92.136331	Ukhiya	Palongkhali	Camp 20 Ext. connecting road	9	225 (Open Space)
26	Camp 20EXT	Beside the Turkish clinic	S4	B3	21.197592	92.131893	Ukhiya	Palongkhali	Camp 20 Ext. connecting road	9.5	225 (Open Space)
27	Camp 20EXT	Health and Nutrition	S3	B4	21.193375	92.133512	Ukhiya	Palongkhali	Camp 20 Ext. connecting road	9	196 (Open Space)
28	Kutupalong RC	Near by Shed-64-room -1	F		21.21114	92.16347	Ukhiya	Rajapalong	camp connecting road	5	180(Open Space)
29	Camp 14	beside WFP DP	A	A 01	21.167397	92.148894	Ukhiya	Palongkhali	camp 14 connecting road	10	144 (open space)
30	Camp 14	Beside SD Warehouse	C	C01	21.167833	92.148116	Ukhiya	Palongkhali	camp 14 connecting road	10.5	156 (Open Space)
31	Camp 14	Near A Block FIC Hub	A	A05	21.166643	92.146064	Ukhiya	Palongkhali	camp 14 connecting road	10.5	169 (Open Space)
32	Camp 14	Inside of CIC Office & Beside Water Tank	Hakimpara CIC Office		21.167578	92.151104	Ukhiya	Palongkhali	camp 14 connecting road	10.5	210 (Open Space)
33	Camp 9	Opposite of CIC	G	G20	21.1878168	92.1596041	Ukhiya	Palongkhali	camp 9	11	180(Open

Sl	Camp	Location	Block	Sub Block	Latitude	Longitude	Upazila	Union	Connecting road	Distance from the upazila HQ. Km	Current land condition sq. ft.
		office boundary, Beside Turkish hospital							connecting road		Space)
34	Camp 9	Inside of APBN office, Beside the watch tower	D	D2	21.19106	92.160566	Ukhiya	Palongkhali	camp 9 connecting road	11	300 (Open Space)
35	Camp 22	Inside of Madrasa	B	B2	21.086378	92.197215	Teknaf	Whykong	Camp 22 connecting road	30	324 (Open Space)

[Sources of data: Field survey, 2023: DDC]

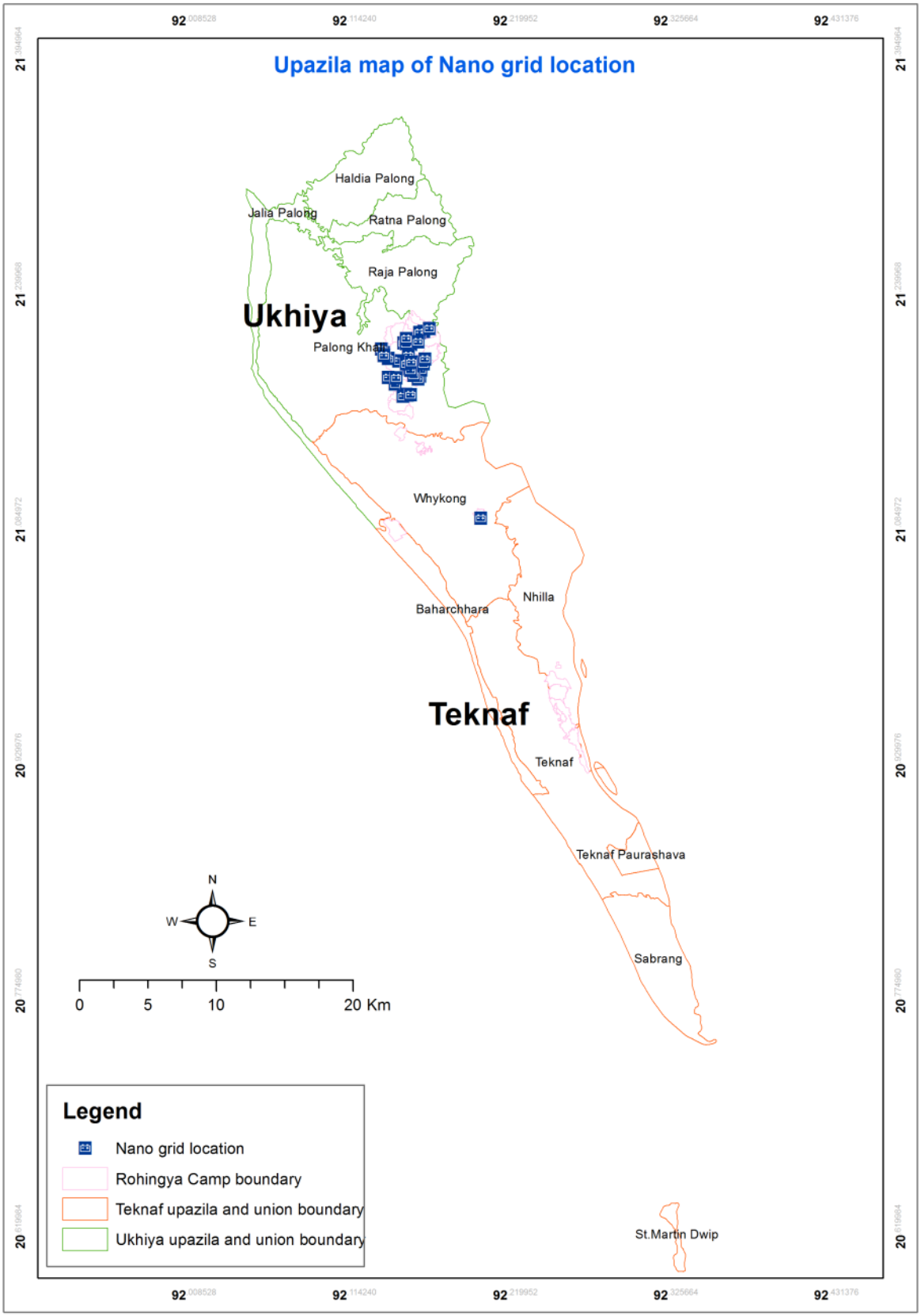


Figure 1.3.1: Location of Solar PV Nano Grid (Ukhiya & Teknaf Upazila)

1.4 Proposed Facilities in Solar PV Nano Grid

The proposed facilities for the Solar PV Nano Grid are exclusively designed to provide electricity to the service centers and facilities that engage the Rohingya people. These facilities include health centers, female safe spaces, distribution points, learning centers and urgent Health, Sanitation and Hygiene (WASH) needs centers.

The 8KW capacity nano grid control room, which is 10ft*8ft*8.5ft in size and has a thickness of 2.3mm, will serve as the central hub for the distribution of electricity to these facilities. The control room will be made of a steel container that includes the construction of RCC footing, thermal insulation, and ventilation operated by a temperature sensor. This will ensure that the equipment is protected from extreme weather conditions and operates at optimal performance. None of the sections, equipment or operating parts of the control room contain asbestos or similar type of hazardous compound or chemicals.

The nano grid will consist of approximately 14 poles, which will be installed to distribute electricity to the various facilities. Each pole will have an electricity line drawn from the nano grid, with 14 panels installed on top of each pole. Additionally, each pole will have a 10 watt security light installed on top, providing additional safety and security for the surrounding area.

The proposed facilities also include the installation of 65 energy-efficient fans and lights in various service centers, each with a capacity of 35 watts and 10 watts respectively. These fans will help to keep the facilities cool during hot temperatures, ensuring a comfortable working environment for the facilitators.

Two fire extinguishers will also be installed in the Nano grid room, ensuring the safety of the equipment and personnel operating in the area.

In summary, the Solar PV Nano Grid is designed to provide reliable and sustainable electricity to the service centers and facilities that engage the Rohingya people. The proposed facilities include a robust control room, poles with electricity lines and panels, security lights, energy-efficient fans and lights in service centers, and fire extinguishers for safety measures. These facilities will ensure the efficient and safe operation of the Solar PV Nano Grid and provide the necessary support for the various service centers in the Rohingya camps.

Table 1.4.1: Detailed Technical Specification for each Solar PV Nano Grid constructions and proposed facilities

Name of Goods	Detailed Technical Specification	Quantity	Capacity
Control Room	10ft*8ft*8.5ft and thickness is 2.3mm made of steel container inclusive of construction of RCC footing, thermal inclusion and ventilation fan operated by temperature sensor	1 no.	8KW

Solar PV module	450 Wp, PV Module, Mono Crystalline type, 72 Cell or higher/ Module in conformity with international standard &code.	18 nos.	18*450w= 8KW
Vented Lead Acid Battery	2V, 900Ah @ 10Hr or Higher capacity solar battery having tubular positive plate, pasted flat negative plate and Dilute Sulfuric Acid Electrolyte in conformity with international standard &code.	24 nos.	2V, 900Ah
Overhead Distribution Line pole	7.6 m SPC or 6.0m Steel pole including erection of the pole with RCC base, Number Plate and earthing with all others fittings and accessories etc.	14 nos.	Height 7.6 m SPC or 6.0m Steel pole
Led Light	10 Watt capacity LED Lights for Public facilities etc.	65 nos.	10 Watt
Security Light	10 Watt capacity LED bulb for Security Light with outdoor installation fixtures and Day Light & Motion Sensor etc.	15 nos.	10 Watt
Energy Saving BLDC saving fan	35 Watt capacity 56 inch BLDC Ceiling fan with 5 Step Capacitive Compatible Wall Regulator for Public facilities complete with canopies and required length of rods, ceiling roses, switches and required length of flexible wire etc.	65 nos.	35 Watt capacity 56 inch
Switch, Socket and Fuse board	Public Facilities Internal wiring for lights and fans including Switches, Sockets, PVC Switch Boxes and PVC insulated Cables with all other fittings and Accessories etc.	20 nos.	-

2. PUBLIC CONSULTATION, PARTICIPATION AND SURVEY FINDINGS

2.1 Methodology

Public participation and community consultation has been taken up as an integral part of environmental assessment process of the project. Field visits have been carried out around the Sub-project sites. As part of the impact assessment, 35 nos. participatory public consultation were conducted in that area by the field level staffs, and consultants from PIU and D&SC, with active participation from the Rohingya community. These meetings were crucial in gathering insights and perspectives from the affected population, as well as engaging with various stakeholders.

The consultation meetings were organized in different blocks and sub-blocks within the Rohingya camp, where the proposed nano grids were to be installed. The participants included

representatives from various facilities, such as team members, doctors and nurses from different hospitals located in camp inside, site management personnel, and teachers from learning centers that would benefit from the electricity provided by the nano grids. To ensure inclusivity, the participants were selected from different age groups, representing a diverse range of stakeholders. The meetings were conducted in an informed, expressive, and unbiased manner, allowing different views and concerns to be raised. These valuable inputs were given due consideration during the site selection and will be properly taken care of during the construction phases of the project. To address any confusion or worries regarding the proposed intervention, relevant information was shared with the audience, and discussions were held to clarify any issues.

Additionally, specific consultation meetings were held with the Camp in Charge (CiC), where detailed discussions took place regarding the various environmentally friendly facilities that would be integrated into the nano grid system. This ensured that the project aligned with sustainable practices and prioritized environmental considerations. The consultation meetings played a significant role in fostering transparency, accountability, and community engagement. By involving the Rohingya community and other relevant stakeholders throughout the decision-making process, the project aimed to ensure that their perspectives will be considered and integrated into the implementation and operation of the nano grids. Their concerns and comments were very important for this intervention development also for the safeguard screening as well, since all of the nano grids are selected in side camp locations. These locations in particular have no major complications and are in relevance with the CiC office authority currently. Most of the present Camp in Charges have suggested starting the development works as early as possible.

To help with the screening process, we shared relevant information with the audience and addressed any confusing or concerning issues related to the proposed project. We discussed the potential impacts on the environment and socio-economic aspects during the pre-construction, construction, and post-construction phases. By doing so, we aimed to provide transparency and ensure that the community was well-informed about the project's potential effects. The consultation meetings ensured the inclusion of diverse perspectives and allowed for the identification of potential challenges and opportunities related to the environment and socio-economic aspects. The findings will be taken into account to inform the project's design, construction, and operation, with the aim of mitigating any adverse impacts and promoting sustainable development.

2.2 Important features/establishments within the PIA

To understand the surrounding features and potential impacts, a screening process was carried out for each Nano Grid, considering a Project Influence Area (PIA) with a radius of 10 meters. A solar PV nano grid comprises 14 poles that will be installed within a half-kilometer radius of the project site. To identify and document the existing features in this area, an initial screening process for each nano grid was conducted through field surveys and active involvement of stakeholders residing in the influence area of the proposed component.

Combining the insights gained from field walk-throughs and the inputs provided by the audience, a comprehensive register of existing features was created. The table 2.2.1 below highlights these elements across all Solar PV Nano Grid installations.

The table is consist of a list of important features and establishments found within the PIAs, which may include existing infrastructure, community facilities, health centers, educational institutions, distribution points, or any other significant elements present in the vicinity of the solar PV nano grids. At many sites, there are no significant establishments or infrastructure or settlements or environmental/cultural objects within 100 meters in one or more directions, with 'No structures within 100 meters' mentioned in following table, therefore, in relation to those directions.

Table 2.2.1: Important features under Project Influence Area

Sl. No.	Component's name	Direction	Important features/ establishment (approx. distance from the proposed site)
1	Camp 18, Block A, Sub block A4 Majhi section- H50. Closed to CiC office	East	No establishment in 100 meters
		West	CiC office (62m)
		North	No establishment in 100 meters
		South	Child protection facilities (75m, 81m)
2	Camp 18, Block B, Sub block B1, Majhi section - M17 Beside of the SMEP road	East	No establishment in 100 meters
		West	No establishment in 100 meters
		North	No establishment in 100 meters
		South	Child protection facilities (37m, 53m), Learning center (50m, 57m, 77m, 86m)
3	Camp 18, Block C, Sub block C6, Majhi section- L 12 Near by L 12 Mosque	East	Learning center (82m)
		West	No establishment in 100 meters
		North	Learning center (36m, 46m, 86m)
		South	Learning center (42m)
4	Camp 18, Block C, Sub block C03, Majhi section F 30 Adjoining with BDRCS Distribution point in	East	No establishment in 100 meters
		West	Child protection facility (24m), Graveyard (93m)
		North	Primary health center (71m)
		South	Multipurpose protection center (37m)
5	Camp 12, Block A, Sub block A5, Near by pulse Bangladesh PHC	East	Health post (47m), learning center (68m)
		West	Learning center (64m)
		North	CiC office (30m), learning center (45m)
		South	No establishment in 100 meters
6	Camp 12 Block D Sub block D3 Near by IOM warehouse SD	East	Learning center (73m)
		West	No establishment in 100 meters
		North	Learning center (46m)
		South	Child protection facility (21m), learning center (75m)
7	Camp 12 Block D Sub block D1 near by CIC office	East	Health post (51m)
		West	No establishment in 100 meters
		North	CiC office (49m), Learning center (73m, 81m)
		South	Learning center (91m, 93m)
8	Camp 10 Block C, Sub block C3 Inside of CIC office boundary, Beside the flag stand	East	Learning center (77m), Religious facility (63m)
		West	Learning center (97m), Religious facility (82m, 92m)
		North	CiC office (25m), Graveyard (71m), Child protection facility (72m), Religious facility (100m)
		South	No establishment in 100 meters
9	Camp 10, Block D, Sub block D2, F-13 Community	East	Religious facility (92m), health post (60m), Child protection facility (50m)

	Watch Tower Opposite ward to Play Ground	West	Religious facility (43m, 45m, 64m, 74m)
		North	Child protection facility (51m), learning center (85m), Religious facility (100m)
		South	Learning center (38m, 76m), Religious facility (69m, 81m, 91m), Child protection facility (97m, 100m)
10	Camp 10, Block D, Sub block D2, F-13 Community Watch Tower Opposite ward to Play Ground	East	Religious facility (92m), health post (60m), Child protection facility (50m)
		West	Religious facility (43m, 45m, 64m, 74m)
		North	Child protection facility (51m), learning center (85m), Religious facility (100m)
		South	Learning center (38m, 76m), Religious facility (69m, 81m, 91m), Child protection facility (97m, 100m)
11	Camp 11, Block C, Sub block C2, Behind SMS Hub and beside Cox's Bazar to Teknaf main road	East	No establishment in 100 meters
		West	Religious facility (30m, 44m)
		North	CiC office (56m, 65m), Learning center (94m, 97m)
		South	Learning center (65m, 73m), religious facility (61m, 63m)
12	Camp 11, Block C, Sub block C2, Inside of ware house	East	No establishment in 100 meters
		West	No establishment in 100 meters
		North	Learning center (78m)
		South	No establishment in 100 meters
13	Camp 11, Block A, Sub block A1, nearby Temporary Nutrition Center	East	No establishment in 100 meters
		West	Learning center (80m, 94m), health post (92m), child protection facility (95m)
		North	Religious facility (41m, 44m), child protection facility (50m)
		South	Learning center (68m), religious facility (53m), primary health center (34m)
14	Camp 13, Block A, Sub block A1, Inside of IOM emergency Container point	East	No establishment in 100 meters
		West	No establishment in 100 meters
		North	child protection facility (73m)
		South	Learning center 939m, 40m, 42m, 44m), child protection facility (37m), health post (57m)
15	Camp 13 Block G Sub block G5 Inside of World Vision CFS	East	No establishment in 100 meters
		West	Learning center 953m, 73m)
		North	No establishment in 100 meters
		South	child protection facility (69m), learning center (97m), health post (7m)
16	Camp 13 Block B Sub block B4 Inside of SHED wash office	East	----
		West	child protection facility (94m)
		North	child protection facility (92m, 98m), health post (77m), Age friendly space (79m)
		South	child protection facility (91m)
17	Camp 2W Block B Sub block B3 Near by CiC Office	East	No establishment in 100 meters
		West	Learning center (55m)
		North	Learning center (20m)
		South	CiC office (31m), Primary health center (24m)
18	Camp 5, Block E, Sub block E6, CiC office, BRAC-SMS Office & Blast	East	Religious facility (26m, 33m)
		West	No establishment in 100 meters
		North	No establishment in 100 meters

		South	CiC office (31m), Primary health center (24m)
19	Camp 5, Block E, Sub block E2, FH-MHPSS, JCF-LC, TDH, NGOF-Protection, Mukti-LC&BDRCS Distribution Point	East	Learning center (20m)
		West	No establishment in 100 meters
		North	Learning center (72m, 87m), religious center (100m)
		South	No establishment in 100 meters
20	Camp 5, Block E, Sub block E1, Police camp, RTMI-PHC, JCF-LC & NGOF	East	Learning center (77m)
		West	No establishment in 100 meters
		North	Religious facility (85m, 86m)
		North east	Primary health center (85m)
		South	No establishment in 100 meters
21	Camp 5, Block B, Sub block B5, BRAC UN Wamen Market, SARPV, IRC, FH-HP, Mukti-LC & JCF-LC	East	Learning center (90m, 93m), religious facility (97m, 100m)
		West	No establishment in 100 meters
		North	Religious facility (67m, 75m)
		South	Religious facility (24m, 32m)
22	Camp 6 Block A Sub block A3 PHC BDRCS	East	No establishment in 100 meters
		West	Religious facility (78m, 80m)
		North	No establishment in 100 meters
		South	No establishment in 100 meters
23	Camp 6 Block D Sub block D7 CIC OFFICE	East	Learning center (29m, 39m, 96m)
		West	Learning center (93m, 96m), Religious facility (98m), Home based learning center (87m)
		North	Religious facility (70m, 81m)
		South	Religious facility (16m, 29m, 74m, 67m, 92m)
24	Camp 20EXT Block S3 Sub block B1 NGO From Center	East	No establishment in 100 meters
		West	No establishment in 100 meters
		North	Religious facility (10m)
		South	No establishment in 100 meters
25	Camp 20EXT Block S1 Sub block B8 Beside the learning center	East	No establishment in 100 meters
		West	No establishment in 100 meters
		North	CiC office (100m)
		South	No establishment in 100 meters
26	Camp 20EXT Block S4 Sub block B3 Beside the Turkish clinic	East	Religious facility (97m)
		West	No establishment in 100 meters
		North	No establishment in 100 meters
		South	No establishment in 100 meters
27	Camp 20EXT Block S3 Sub block B4 Health and Nutrition	East	No establishment in 100 meters
		West	No establishment in 100 meters
		North	No establishment in 100 meters
		South	Learning center (97m)
28	Kutupalong RC Block F Near by Shed-64-room -1	East	No establishment in 100 meters
		West	No establishment in 100 meters
		North	Religious facility (68m, 86m), Learning center (94m), child protection facility (95m)
		South	Learning center (58m, 61m), Religious facility (83m, 92m)
29	Camp 14 Block A	East	No establishment in 100 meters
		West	Learning center (87m)

	Sub block A 01 beside WFP DP	North	No establishment in 100 meters
		South	Religious facility (52m, 57m), learning center (59m, 60m, 63m)
30	Camp 14 Block C Sub block C01 Beside SD Warehouse	East	No establishment in 100 meters
		West	No establishment in 100 meters
		North	Learning center (50m)
		South	Learning center (50m, 78m)
31	Camp 14 Block A Sub block A05 Near A Block FIC Hub	East	Learning center (14m, 21m, 30m, 80m, 88m, 91m)
		West	Learning center (82m, 91m)
		North	Religious facility (18m, 28m, 34m)
		South	Learning center (2m), religious facility (51m, 56m)
32	Camp 14, Hakimpara CIC Office, Inside of CIC Office & Beside Water Tank	East	No establishment in 100 meters
		West	CiC office (29m, 44m)
		North	No establishment in 100 meters
		South	No establishment in 100 meters
33	Camp 9, Block G, Sub block G20, Opposite of CIC office boundary, Beside Turkish hospital	East	No establishment in 100 meters
		West	No establishment in 100 meters
		North	Religious facility (29m, 34m)
		South	Lwarning center (99m), child protection facility (68m), CiC office (29m, 31m)
34	Camp 9, Block D, Sub block D2, Inside of APBN office, Beside the watch tower	East	----
		West	Religious facility (25m, 40m, 43m)
		North	child protection facility (68m), Learning center (76m, 83m)
		South	Learning center (65m)
35	Camp 22 Block B Sub block B2 Inside of Madrasa	East	Learning center (11m, 12m, 32m, 34m, 46m, 48m, 54m, 56m), Multipurpose protection center 960m)
		West	Religious facility (7m, 16m, 19m)
		North	Learning center (98m)
		South	Learning center (70m, 81m, 87m, 99m, 100m), CiC office (92m)

2.3 Issues and Recommendations raised by the Participants in regards to component interventions

In the consultation meetings conducted for the Solar PV Nano Grid project in the various blocks and sub-blocks of Rohingya camps in Ukhiya and Teknaf Upazila, the participants discussed environmental issues and their impacts on the proposed interventions. The advantages and disadvantages of the development activities were also revealed during these discussions. The successful execution of a public consultation program requires three key elements: (i) dissemination of information to stakeholders, (ii) solicitation of views and information from affected parties and residents on social and environmental issues, and (iii) consultation with interest groups and the public.

D&S Consultants and PIU Consultant from EMCRP-LGED facilitated the consultation meetings with the Rohingya communities, specifically addressing the work activities related to the Solar PV Nano Grid project. All the consultation meetings took place in the conference rooms of CiC offices under different or respective camps. Stakeholders from 35 sites gathered in 13 consultation events; 3

events took place in the conference room of CiC office for Camp-11, while 2 events took place in the conference room of CiC office for Camp-10. Single event took place in all other venues. Total number of participants was 155, among them 28 were female participants. The participants, overall, expressed their enthusiasm for the sub-project's potential benefits and interest in receiving the services and advantages it would provide. During the meetings, it was assured to the participants that the impact, particularly from the construction of 35 nos. Nano Grid structures in open spaces would be very low and negligible. They were reassured that the interventions would have minimal adverse effects on the environment.

Please follow the table 2.3.1 given below to recognize participants' inputs arranged in relevance with separate component. Consultation meeting summary and attendance sheets along with pictures of location with separate meetings for proposed location of each Solar PV Nano Grid can be found in Table 2.3.2 and Appendix-01 and Appendix-02 respectively. These meetings ensured the well-represented participation of both women and men from the Rohingya community, allowing their voices and perspectives to be heard. Additionally, specific consultation meetings were organized with the Camp in Charges (CiC) to discuss the implementation of the nano grid project. These inclusive and participatory meetings helped gather valuable insights and recommendations, ensuring that the Solar PV Nano Grid project reflects the needs and aspirations of the Rohingya community and the various facilities within the camp area.

Table 2.3.1: Issues and Recommendations raised by the Participants

TOPIC DISCUSSED	ISSUES INTRODUCED	PARTICIPANTS' FEEDBACK /ACKNOWLEDGEMENT
Ideology of Solar PV Nano Grid	Solar PV Nano Grids are rooted in sustainability, accessibility, and community empowerment. These systems harness solar energy to provide clean and reliable electricity to specific areas within the Rohingya camps. By promoting environmental sustainability, embracing renewable energy, improving access to electricity, improving access to essential services, and actively involving the community in decision-making, Solar PV nano grids create a more sustainable and inclusive and resilient environment for the Rohingya community.	Participants have expressed their appreciation for the use of renewable energy sources and the positive impact they have on the environment. They have recognized the importance of promoting clean and sustainable energy solutions. Participants have noted that the construction of the Solar PV Nano Grid has heightened their awareness and understanding of the benefits of solar energy, highlighting its potential to meet energy needs in a sustainable way. They have provided feedback on how the implementation of the Solar PV Nano Grid can enhance their living conditions, particularly through improved access to clean electricity, better lighting, and enhanced services in facilities such as health centers, learning centers,

		distribution points, and medical centers. Participants have reported feeling empowered and engaged through their involvement in the consultation and decision-making processes related to the Solar PV Nano Grid and also acknowledged the social benefits that the Solar PV Nano Grid can bring, such as improved livelihood opportunities and increased access to essential services. They have recognized the long-term sustainability of the Solar PV Nano Grid and its potential to contribute to a greener and more sustainable future. They have appreciated the emphasis on reducing carbon footprints and dependence on fossil fuels.
Construction and positioning of Solar PV Nano grid	Construction and positioning of Solar PV nano grids involve site selection, design and engineering, installation, positioning of panels for maximum sunlight exposure, infrastructure development, pole and electric line installation and grid integration. It aims to create a reliable and sustainable source of electricity for designated facilities in the Rohingya camps.	Participants have acknowledged the efficient construction process of the Solar PV Nano Grid, highlighting the timely completion and effective coordination of construction activities. Participants have expressed appreciation for the well-planned positioning of the Solar PV Nano Grid. They have recognized the efforts made to identify suitable locations within the camp areas that maximize solar exposure and minimize shading. Participants have provided feedback on the minimal disruption cause during the construction phase of the Solar PV Nano Grid. They have acknowledged the efforts made to minimize noise, dust, and inconvenience to the surrounding community. Participants have emphasized the need for stringent safety measures during the construction of the Solar PV Nano Grid. They have highlighted the importance of

		implementing necessary safety protocols to ensure the protection of workers and the community. Participants have praised the Solar PV Nano Grid and its accompanying infrastructure, including pole installations, electrical lines, and panel setups. They have discussed the improved infrastructure for electricity distribution within the camp and ensuring the accessibility of various amenities. They emphasized the importance of considering the ease with which everyone can benefit from the advantages of this Nano Grid. Participants have provided positive feedback regarding the aesthetic aspect of the Solar PV Nano Grid. They have emphasized the importance of completing the integrated infrastructure properly, which will play a crucial role in maintaining the camp environment.
Environmental Concerns	Solar PV Nano Grid panels require space for installation, which may involve clearing or repurposing land or open space. The presence of solar PV panels and associated infrastructure may alter the visual landscape. Proper disposal and recycling of solar PV panels at the end of their lifespan is essential to minimize environmental impacts. The installation and operation of solar PV systems may temporarily disrupt local environment, such as air and water particularly during the construction phase. Mitigation measures should be in place to minimize disturbances, and restore affected areas after construction.	Participants have expressed appreciation for the adoption of Solar PV Nano Grid as a renewable energy solution. They have emphasized the positive environmental impact of reducing dependence on fossil fuels and minimizing greenhouse gas emissions. The participants have appreciated the focus on environmental sustainability shown through the use of the Solar PV Nano Grid. They have recognized the efforts made to utilize clean and renewable energy sources, which help create a greener and more sustainable future. Participants have highlighted the positive impact of Solar PV Nano Grid in reducing air pollution. They have acknowledged that the use of solar energy eliminates the emissions of harmful pollutants associated with traditional energy sources, leading to

		improved air quality within the camp. Participants have expressed the conservation of natural resources facilitated by Solar PV Nano Grid. They have acknowledged that solar energy harnesses the power of the sun, a virtually limitless resource, thereby reducing the strain on finite resources like fossil fuels. Participants have expressed appreciation when they heard that the Solar PV Nano Grid will operate quietly and without causing vibrations. They are happy with how the solar energy system will not create noise or disturbances, making the environment peaceful and enjoyable.
Safety at work site	Safety at the work site for solar PV nano grids involves ensuring equipment safety, implementing electrical safety measures. The installation of poles and electrical lines involves working with live electricity. The risk of electrical shocks, burns, and electrocution is a significant concern. Prioritizing safety minimizes risks and ensures worker well-being. Safety of children and adults at the sites during construction works. Fencing will have to be maintained while construction so that local habitants are not disturbed for any reason.	They have appreciated this motif and stated they will arrange fencing if necessary, for their own safety from their part of effort.

Table 2.3.2: Particulars of Consultation Meetings

Sl	Camp/ Block/ Sub block/ Location	Date of meeting	Meeting Place*	Number of participants		Total
				Male	Female	
1	Camp 18 Block A, Sub block A4, Majhi section- H50. Closed to CiC office	13/11/2023	Rohingya Camp 18 CiC office Conference room	15	1	16
2	Camp 18, Block B, Sub block B1, Majhi section -M17 Beside of the					

Sl	Camp/ Block/ Sub block/ Location	Date of meeting	Meeting Place*	Number of participants		Total
				Male	Female	
	SMEP road					
3	Camp 18, Block C, Sub block C6, Majhi section- L 12 Near by L 12 Mosque					
4	Camp 18, Block C, Sub block C03, Majhi section F 30 Adjoining with BDRCS Distribution point in					
5	Camp 12, Block A, Sub block A5, Nearby pulse Bangladesh PHC	15/11/2023	Rohingya Camp 11 CiC office Conference room	8	0	8
6	Camp 12, Block D, Sub block D3, Nearby IOM warehouse SD					
7	Camp 12, Block D, Sub block D1, nearby CIC office					
8	Camp 10, Block C, Sub block C3, Inside of CIC office boundary, Beside the flag stand	16/11/2023	Rohingya Camp 10 CiC office Conference room	7	3	10
9	Camp 10, Block D, Sub block D2, F-13 Community Watch Tower Opposite ward to Play Ground					
10	Camp 10, Block D, Sub block D2, F-13 Community Watch Tower Opposite ward to Play Ground					
11	Camp 11, Block C, Sub block C2, Behind SMS Hub and beside Cox's Bazar to Teknaf main road	15/11/2023	Rohingya Camp 11 CiC office Conference room	8	0	8
12	Camp 11, Block C, Sub block C2, Inside of ware house					
13	Camp 11, Block A, Sub block A1, Nearby Temporary Nutrition Center					
14	Camp 13, Block A, Sub block A1, Inside of IOM emergency Container point	20/11/2023	Rohingya Camp 13 CiC office Conference room	17	7	24
15	Camp 13, Block G, Sub block G5, Inside of World Vision CFS					
16	Camp 13, Block B, Sub block B4, Inside of SHED wash office					
17	Camp 2W, Block B, Sub block B3, Nearby CiC Office	14/11/2023	Rohingya Camp 2W CiC office Conference room	3	0	3
18	Camp 5, Block E, Sub block E6, CiC office, BRAC-SMS Office & Blast	20/11/2023	Rohingya Camp 5 CiC office Conference room	14	3	17
19	Camp 5, Block E, Sub block E2, FH-MHPSS, JCF-LC, TDH, NGOF-Protection, Mukti-LC&BDRCS Distribution Point					
20	Camp 5, Block E, Sub block E1,m Police camp, RTMI-PHC, JCF-LC &					

Sl	Camp/ Block/ Sub block/ Location	Date of meeting	Meeting Place*	Number of participants		Total
				Male	Female	
	NGOF					
21	Camp 5, Block B, Sub block B5, BRAC UN Wamen Market, SARPV, IRC, FH-HP, Mukti-LC & JCF-LC					
22	Camp 6, Block A, Sub block A3, PHC BDRCS	13/11/2023	Rohingya Camp 6 CiC office Conference room	12	0	12
23	Camp 6, Block D, Sub block D7, CIC OFFICE					
24	Camp 20EXT, Block S3, Sub block B1, NGO From Center	15/11/2023	Rohingya Camp 20 CiC office Conference room	13	5	18
25	Camp 20EXT, Block S1, Sub block B8, Beside the learning center					
26	Camp 20EXT, Block S4, Sub block B3, Beside the Turkish clinic					
27	Camp 20EXT, Block S3, Sub block B4, Health and Nutrition					
28	Kutupalong RC, Block F, Nearby Shed-64-room -1	14/11/2023	Rohingya Camp 2W CiC office Conference room	3	0	3
29	Camp 14, Block A, Sub bloc, A 01 beside WFP DP	15/11/2023	Rohingya Camp 11 CiC office Conference room	8	0	8
30	Camp 14, Block C, Sub block C01 Beside SD Warehouse					
31	Camp 14, Block A, Sub block A05 Near A Block FIC Hub					
32	Camp 14, Hakimpara CIC Office, Inside of CIC Office & Beside Water Tank					
33	Camp 9, Block G, Sub block G20 Opposite of CIC office boundary, Beside Turkish hospital	16/11/2023	Rohingya Camp 10 CiC office Conference room	7	3	10
34	Camp 9, Block D, Sub block D2 Inside of APBN office, Beside the watch tower					
35	Camp 22, Block B, Sub block B2 Inside of Madrasa	15/11/2023	Rohingya Camp 20 CiC office Conference room	13	5	18

* Due to the responsibilities of the same Camp in Charge (CiC) across multiple camps, a consultation meeting was convened at a central location to discuss the implementation of one or more Nano grids across different locations.

3. ENVIRONMENTAL SCREENING

3.1 General

This section identifies the potential impacts (if any) that the various elements of the proposed Solar PV Nano grid may have on the physical, biological and socio-economic environment within 10 meters of the radial distance around the selected site. Environmental Assessment (EA) based on this

screening study for the Sub-project has been conducted to identify and determine which potential Project impacts may be significant and therefore require the application of reasonable and effective management and/or mitigation measures.

In order to realize the exact physical, biological, socio-economic and environmental impacts of the proposed sub-project sites and the influence area in regards to the implementation measures, an extensive field visit was carried out in each proposed area.

The screening data and information for each Solar PV Nano Grid is illustrated in safeguard questionnaire summary form shown in tables under section 3.2 where project impacts in construction phases have been considered. Each component has been brought to questioning in order to understand the characteristics of each way impacts these developments may have with circumambient features.

3.2 Major Findings

We have gathered information about the current environmental conditions in specific locations and analyzed how different interventions may impact them. It's interesting to note that most sub-projects are related to their surroundings and have similar effects. However, the degree of impact can vary as each component is not equally scaled. This is where different mitigation measures come into play. We have also considered unique circumstances during the environmental screening process, which is important to address. The significant issues observed in camp wise sub-projects are enlisted in following Table 3.2.1 with pertaining impacts. Additionally, we have included any unexpected impacts to promote best practices. For more details, please refer to the detailed Environmental Screening form provided in Appendix-03.

Table 3.2.1: Concerning environmental issues relating to Camp wise proposed Solar PV Nano Grids

Environmental Screening Summary	
Project Name	**Supply and Installation of Solar PV Nano Grid**
Camp wise subprojects location (Camp 18)	There are 4 Solar PV Nano grids will be constructed within the Camp 18. These are- 1. Camp 18, Block C, Sub block C03, Majhi section F 30, Adjoining with BDRCS Distribution point in 2. Camp 18, Block B, Sub block B1, Majhi section -M17, beside of the SMEP road 3. Camp 18, Block C, Sub block C6, Majhi section- L 12, Near by L 12 Mosque 4. Camp 18, Block A, Sub block A4 Majhi section- H50, Closed to CiC office
Are the subprojects located in any environmentally sensitive locations?	
No. The proposed locations for the Solar PV Nano Grids are not situated in any critical areas. These sites do not pose any risks or impact on sensitive habitats, major forest covers, or water bodies. Currently, the designated sites are observed to have open spaces without any environmental concerns. Therefore, the implementation of the Nano Grids in these locations is expected to have no adverse effects on the surrounding environment.	

Are the subprojects located in elephant migration route?
No. These have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).
Will the construction of these components induce land degradation or landslide?
The construction of the Solar PV Nano Grids component, which involves installing a steel container structure supported by four RCC pillars, is not expected to induce land degradation or trigger landslides. The selected locations for the Nano Grids are situated on plain land with moderate vegetation cover, and these areas do not have any significant inclinations or steep slopes. The use of the steel container structure eliminates the need for extensive excavation or heavy piling work. While minimal ground preparation and pillar installation may be required, the overall impact on the land is expected to be minimal. Therefore, the construction activities associated with the Nano Grids, utilizing the steel container structure and pillar installation, are unlikely to cause land degradation or pose landslide risks in the designated areas.
Will the construction obstruct water cycle of the local area or pollute near water body and groundwater?
No. The construction of the Solar PV Nano Grids will not obstruct the water cycle of the local area or cause pollution near water bodies and groundwater. The construction activities will be confined to the selected sites, which are not in close proximity to any significant water bodies that could be negatively impacted. Furthermore, the construction process does not involve heavy earth removal or cutting, minimizing the risk of disrupting the natural flow of water or causing sedimentation. Moreover, since the Nano Grids primarily rely on solar energy, there will be no direct discharge of pollutants into water bodies or groundwater. The construction and operation of the Solar PV Nano Grid aim to prioritize environmental sustainability and minimize any potential adverse effects on the water cycle and local water resources.
Chances of Waste generation?
The construction process involves the installation of a steel container control room which will be constructed on RCC footings. So minimal ground preparation and RCC pillar installation may be required. Due to the small scale of construction, there will be a little waste generation, primarily consisting of construction debris. This may include leftover brick chips, cement, wood, bamboo, plastics, wires etc. There will be no need for a labor shed, resulting in a reduced likelihood of generating organic waste, faecal waste, and kitchen waste during this phase. The container structure will be transported to the site using a truck and then installed on the pillars with the assistance of a crane. As a result, the construction process is expected to have minimal waste generation. However, it is important to ensure proper waste management practices are in place to handle any potential waste materials that may arise during transportation and installation.
Any damage to existing vegetation or garden plants?
The construction of the Solar PV Nano Grids will take places in open spaces, ensuring that there will be no damage caused to the existing vegetation or garden plants. The construction process involves the installation of a steel container control room, which measures 10ft*8ft*8.5ft and has a thickness of 2.3mm. The control room will be constructed on RCC footings. The positioning of the control room and the construction of the RCC footings will be carried out in a manner that avoids unnecessary disturbance to nearby plants and garden areas. If there are any plants or vegetation that need to be cleared or uprooted to accommodate the installation of the control room and RCC footings, efforts

will be made to minimize the impact.
Will the project cause socio-economic disturbance?
The implementation of the Solar PV Nano Grid subproject is not anticipated to cause any significant socio-economic disturbances. The Nano grids site, which is located in open spaces, is identified as Government land. While the intervention may challenge existing socio-economic practices to some extent, arrangements have been made ensuring a mutually beneficial agreement. Clear communication and collaboration with the community will be maintained to address any concerns or issues that may arise. The project team will prioritize respectful engagement with local stakeholders to ensure their acceptance and participation in the process.
Violation of Environment, Health and Safety?
The construction of the Nano grids is expected to cause minimal environmental damage; there may still be some impacts on air and soil due to the construction activities. Environmental damage during the construction phase can occur primarily from noise and dust generation. Construction activities such as carrying container, cutting, heavy machinery, installation of poles, and wiring may generate noise and vibration that could potentially disturb the surrounding environment. Dust particles may be released into the air during excavation and construction, affecting air quality in the vicinity. There are several health and safety issues that need to be considered due to the presence of electricity and potential hazards during the construction phase. The installation of poles and electrical lines involves working with live electricity. The risk of electrical shocks, burns, and electrocution is a significant concern. Construction materials, such as paints, solvents, adhesives, and insulation materials, may contain hazardous substances. Construction activities may involve manual lifting, carrying, and moving of heavy equipment and materials. Improper lifting techniques and overexertion can lead to musculoskeletal injuries. Construction activities may require working at heights, such as during the installation of poles and overhead lines. Falls from heights pose a significant risk.
Availability of Labor camp and material storage Space?
The construction process involves the installation of a steel container control room which will be constructed on RCC footings. So minimal ground preparation and RCC pillar installation may be required. Due to the small scale of construction, hence there is no need for labor shed. The materials, including the poles, for the Nano grids will be stored either on the side of the road or in designated vacant spaces near each Nano grid. The site management or the Camp-in-Charge (CIC) will grant permission to store the required materials for the Nano grid within the camp premises. To ensure security during nighttime, there may be provisions for having night guards in place.
Availability of Utility Services?
Electricity is not available. Alternative measures such as solar power or generators will be considered. Due to the small scale of construction, hence there is no need for labor shed. As a result, there is no necessity for a tube well in the proposed locations. Instead, during the construction phase, the contractor will arrange for a mobile water supply system to ensure a sufficient water source for the construction work. Additionally, the contractor will be responsible for providing temporary sanitation facilities. A portable or temporary sanitary system will be set up to cater to the basic hygiene needs of the workers during the construction period.
Availability of access road?
There are two main roads facilitating transportation for the Nano grids in Camp 18. The first one is

the Camp 18 Connecting road, which will be utilized for transporting materials to the first Nano grid of Camp 18. The second road, called the Camp 18 SMEP road, will be used for transporting materials to the remaining three Nano grids within Camp 18. These roads play a crucial role in providing access for vehicles and ensuring a smooth route for transporting goods and supplies to the designated locations.

Whether e-waste will be produced during the O&M period and if yes, how will be managed?

Solar PV nano-grid and lead acid batteries will produce significant amount of e-wastes at the end of those products' defunct/ end-of-life stage. Except the nonreactive silica from the defunct solar panel, all other objects or substances, e.g., heavy metals, acid, electric parts and wires, etc. can pose serious threat to the environment as well as to human health. Yet, we don't have any formal facilities in Bangladesh to recycle or upcycle these wastes.

However, the project has made a plan to manage all the wastes produced from solar system (street light, nano-grid, etc.) after the end-life of associated products, equipment, batteries, etc. One of the working vendors supplying and installing these solar systems is willing to take back all the wastes (non-functioning products, equipment, batteries, spare-parts, etc.) on its own cost and will manage those in cooperation with the manufacturing company which it is representing for. The project, hence, will come to an agreement (MoU) with that vendor by the end of this project or the end of the warranty period of their services, whichever comes first, in this regard.

Environmental Components (Physical/ Biological)	***Impact during the project life span***		
	PC	**OM**	**DE**
Noise	Low	Low	None
Air Pollution	Low	None	None
Soils	Low	None	None
Vibrations	Low	None	None
Surface Water	None	None	None
Groundwater	None	None	None
Flora	None	None	None
Fauna	None	None	None

Note: PC = Pre-construction and construction stages; OM = Operation and Maintenance Stage; DE = decommissioning stage. High = Likely to cause long-term impacts or over large area (>0.5sqkm); Medium = Likely to cause temporary damage or over moderate area (0.25 to 0.5sqkm); Low = Likely to cause little, short-term damage and over small area (<0.25sqkm)

Environmental Screening Summary	
Project Name	**Supply and Installation of Solar PV Nano Grid**
Camp wise subprojects location (Camp 12)	There are 3 Solar PV Nano grids will be constructed within the Camp 12. These are- 1. Camp 12, Block A, Sub block A5, Near by pulse Bangladesh PHC 2. Camp 12, Block D, Sub block D3, Near by IOM warehouse SD

	3. Camp 12, Block D, Sub block D1, near by CIC office
Are the subprojects located in any environmentally sensitive locations?	
No. The proposed locations for the Solar PV Nano Grids are not situated in any critical areas. These sites do not pose any risks or impact on sensitive habitats, major forest covers, or water bodies. Currently, the designated sites are observed to have open spaces without any environmental concerns. Therefore, the implementation of the Nano Grids in these locations is expected to have no adverse effects on the surrounding environment.	
Are the subprojects located in elephant migration route?	
No. These have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).	
Will the construction of these components induce land degradation or landslide?	
The construction of the Solar PV Nano Grids component, which involves installing a steel container structure supported by four RCC pillars, is not expected to induce land degradation or trigger landslides. The selected locations for the Nano Grids are situated on plain land with moderate vegetation cover, and these areas do not have any significant inclinations or steep slopes. The use of the steel container structure eliminates the need for extensive excavation or heavy piling work. While minimal ground preparation and pillar installation may be required, the overall impact on the land is expected to be minimal. Therefore, the construction activities associated with the Nano Grids, utilizing the steel container structure and pillar installation, are unlikely to cause land degradation or pose landslide risks in the designated areas.	
Will the construction obstruct water cycle of the local area or pollute near water body and groundwater?	
No. The construction of the Solar PV Nano Grids will not obstruct the water cycle of the local area or cause pollution near water bodies and groundwater. The construction activities will be confined to the selected sites, which are not in close proximity to any significant water bodies that could be negatively impacted. Furthermore, the construction process does not involve heavy earth removal or cutting, minimizing the risk of disrupting the natural flow of water or causing sedimentation. Moreover, since the Nano Grids primarily rely on solar energy, there will be no direct discharge of pollutants into water bodies or groundwater. The construction and operation of the Solar PV Nano Grid aim to prioritize environmental sustainability and minimize any potential adverse effects on the water cycle and local water resources.	
Chances of Waste generation?	
The construction process involves the installation of a steel container control room which will be constructed on RCC footings. So minimal ground preparation and RCC pillar installation may be required. Due to the small scale of construction, there will be a little waste generation, primarily consisting of construction debris. This may include leftover brick chips, cement, wood, bamboo, plastics, wires etc. There will be no need for a labor shed, resulting in a reduced likelihood of generating organic waste, faecal waste, and kitchen waste during this phase. The container structure will be transported to the site using a truck and then installed on the pillars with the assistance of a crane. As a result, the construction process is expected to have minimal waste generation. However, it is important to ensure proper waste management practices are in place to handle any potential waste materials that may arise during transportation and installation.	

Any damage to existing vegetation or garden plants?
The construction of the Solar PV Nano Grids will take places in open spaces, ensuring that there will be no damage caused to the existing vegetation or garden plants. The construction process involves the installation of a steel container control room, which measures 10ft*8ft*8.5ft and has a thickness of 2.3mm. The control room will be constructed on RCC footings. The positioning of the control room and the construction of the RCC footings will be carried out in a manner that avoids unnecessary disturbance to nearby plants and garden areas. If there are any plants or vegetation that need to be cleared or uprooted to accommodate the installation of the control room and RCC footings, efforts will be made to minimize the impact.
Will the project cause socio-economic disturbance?
The implementation of the Solar PV Nano Grid subproject is not anticipated to cause any significant socio-economic disturbances. The Nano grids site, which is located in open spaces, is identified as Government land. While the intervention may challenge existing socio-economic practices to some extent, arrangements have been made ensuring a mutually beneficial agreement. Clear communication and collaboration with the community will be maintained to address any concerns or issues that may arise. The project team will prioritize respectful engagement with local stakeholders to ensure their acceptance and participation in the process.
Violation of Environment, Health and Safety?
The construction of the Nano grids is expected to cause minimal environmental damage; there may still be some impacts on air and soil due to the construction activities. Environmental damage during the construction phase can occur primarily from noise and dust generation. Construction activities such as carrying container, cutting, heavy machinery, installation of poles, and wiring may generate noise and vibration that could potentially disturb the surrounding environment. Dust particles may be released into the air during excavation and construction, affecting air quality in the vicinity. There are several health and safety issues that need to be considered due to the presence of electricity and potential hazards during the construction phase. The installation of poles and electrical lines involves working with live electricity. The risk of electrical shocks, burns, and electrocution is a significant concern. Construction materials, such as paints, solvents, adhesives, and insulation materials, may contain hazardous substances. Construction activities may involve manual lifting, carrying, and moving of heavy equipment and materials. Improper lifting techniques and overexertion can lead to musculoskeletal injuries. Construction activities may require working at heights, such as during the installation of poles and overhead lines. Falls from heights pose a significant risk.
Availability of Labor camp and material storage Space?
The construction process involves the installation of a steel container control room which will be constructed on RCC footings. So minimal ground preparation and RCC pillar installation may be required. Due to the small scale of construction, hence there is no need for labor shed. The materials, including the poles, for the Nano grids will be stored either on the side of the road or in designated vacant spaces near each Nano grid. The site management or the Camp-in-Charge (CIC) will grant permission to store the required materials for the Nano grid within the camp premises. To ensure security during nighttime, there may be provisions for having night guards in place.
Availability of Utility Services?

Electricity is not available. Alternative measures such as solar power or generators will be considered. Due to the small scale of construction, hence there is no need for labor shed. As a result, there is no necessity for a tube well in the proposed locations. Instead, during the construction phase, the contractor will arrange for a mobile water supply system to ensure a sufficient water source for the construction work. Additionally, the contractor will be responsible for providing temporary sanitation facilities. A portable or temporary sanitary system will be set up to cater to the basic hygiene needs of the workers during the construction period.

Availability of access road?

There is a road called the Camp 12 connecting road that will be used for transportation and delivering materials to the 3 Nano grids in Camp 12. It provides access for vehicles and ensures a route for transporting goods and supplies.

Whether e-waste will be produced during the O&M period and if yes, how will be managed?

Solar PV nano-grid and lead acid batteries will produce significant amount of e-wastes at the end of those products' defunct/ end-of-life stage. Except the nonreactive silica from the defunct solar panel, all other objects or substances, e.g., heavy metals, acid, electric parts and wires, etc. can pose serious threat to the environment as well as to human health. Yet, we don't have any formal facilities in Bangladesh to recycle or upcycle these wastes.

However, the project has made a plan to manage all the wastes produced from solar system (street light, nano-grid, etc.) after the end-life of associated products, equipment, batteries, etc. One of the working vendors supplying and installing these solar systems is willing to take back all the wastes (non-functioning products, equipment, batteries, spare-parts, etc.) on its own cost and will manage those in cooperation with the manufacturing company which it is representing for. The project, hence, will come to an agreement (MoU) with that vendor by the end of this project or the end of the warranty period of their services, whichever comes first, in this regard.

\Environmental Components (Physical/ Biological)	***Impact during the project life span***		
	PC	**OM**	**DE**
Noise	Low	Low	None
Air Pollution	Low	None	None
Soils	Low	None	None
Vibrations	Low	None	None
Surface Water	None	None	None
Groundwater	None	None	None
Flora	None	None	None
Fauna	None	None	None

Note: PC = Pre-construction and construction stages; OM = Operation and Maintenance Stage; DE = decommissioning stage. High = Likely to cause long-term impacts or over large area (>0.5sqkm); Medium = Likely to cause temporary damage or over moderate area (0.25 to 0.5sqkm); Low = Likely to cause little, short-term damage and over small area (<0.25sqkm)

Environmental Screening Summary	
Project Name	**Supply and Installation of Solar PV Nano Grid**
Camp wise	There are 3 Solar PV Nano grids will be constructed within the Camp 10. These

subprojects location (Camp 10)	are- 1. Camp 10, Block C, Sub block C3, Inside of CIC office boundary, Beside the flag stand 2. Camp 10, Block D, Sub block D2, F-13 Community Watch Tower Opposite ward to Play Ground 3. Camp 10, Block D, Sub block D2, F-13 Community Watch Tower Opposite ward to Play Ground
Are the subprojects located in any environmentally sensitive locations?	
No. The proposed locations for the Solar PV Nano Grids are not situated in any critical areas. These sites do not pose any risks or impact on sensitive habitats, major forest covers, or water bodies. Currently, the designated sites are observed to have open spaces without any environmental concerns. Therefore, the implementation of the Nano Grids in these locations is expected to have no adverse effects on the surrounding environment.	
Are the subprojects located in elephant migration route?	
No. These have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).	
Will the construction of these components induce land degradation or landslide?	
The construction of the Solar PV Nano Grids component, which involves installing a steel container structure supported by four RCC pillars, is not expected to induce land degradation or trigger landslides. The selected locations for the Nano Grids are situated on plain land with moderate vegetation cover, and these areas do not have any significant inclinations or steep slopes. The use of the steel container structure eliminates the need for extensive excavation or heavy piling work. While minimal ground preparation and pillar installation may be required, the overall impact on the land is expected to be minimal. Therefore, the construction activities associated with the Nano Grids, utilizing the steel container structure and pillar installation, are unlikely to cause land degradation or pose landslide risks in the designated areas.	
Will the construction obstruct water cycle of the local area or pollute near water body and groundwater?	
No. The construction of the Solar PV Nano Grids will not obstruct the water cycle of the local area or cause pollution near water bodies and groundwater. The construction activities will be confined to the selected sites, which are not in close proximity to any significant water bodies that could be negatively impacted. Furthermore, the construction process does not involve heavy earth removal or cutting, minimizing the risk of disrupting the natural flow of water or causing sedimentation. Moreover, since the Nano Grids primarily rely on solar energy, there will be no direct discharge of pollutants into water bodies or groundwater. The construction and operation of the Solar PV Nano Grid aim to prioritize environmental sustainability and minimize any potential adverse effects on the water cycle and local water resources.	
Chances of Waste generation?	
The construction process involves the installation of a steel container control room which will be constructed on RCC footings. So minimal ground preparation and RCC pillar installation may be required. Due to the small scale of construction, there will be a little waste generation, primarily consisting of construction debris. This may include leftover brick chips, cement, wood, bamboo, plastics, wires etc. There will be no need for a labor shed, resulting in a reduced likelihood of	

generating organic waste, faecal waste, and kitchen waste during this phase.

The container structure will be transported to the site using a truck and then installed on the pillars with the assistance of a crane. As a result, the construction process is expected to have minimal waste generation. However, it is important to ensure proper waste management practices are in place to handle any potential waste materials that may arise during transportation and installation.

Any damage to existing vegetation or garden plants?

The construction of the Solar PV Nano Grids will take places in open spaces, ensuring that there will be no damage caused to the existing vegetation or garden plants. The construction process involves the installation of a steel container control room, which measures 10ft*8ft*8.5ft and has a thickness of 2.3mm. The control room will be constructed on RCC footings. The positioning of the control room and the construction of the RCC footings will be carried out in a manner that avoids unnecessary disturbance to nearby plants and garden areas. If there are any plants or vegetation that need to be cleared or uprooted to accommodate the installation of the control room and RCC footings, efforts will be made to minimize the impact.

Will the project cause socio-economic disturbance?

The implementation of the Solar PV Nano Grid subproject is not anticipated to cause any significant socio-economic disturbances. The Nano grids site, which is located in open spaces, is identified as Government land. While the intervention may challenge existing socio-economic practices to some extent, arrangements have been made ensuring a mutually beneficial agreement.

Clear communication and collaboration with the community will be maintained to address any concerns or issues that may arise. The project team will prioritize respectful engagement with local stakeholders to ensure their acceptance and participation in the process.

Violation of Environment, Health and Safety?

The construction of the Nano grids is expected to cause minimal environmental damage; there may still be some impacts on air and soil due to the construction activities. Environmental damage during the construction phase can occur primarily from noise and dust generation. Construction activities such as carrying container, cutting, heavy machinery, installation of poles, and wiring may generate noise and vibration that could potentially disturb the surrounding environment. Dust particles may be released into the air during excavation and construction, affecting air quality in the vicinity.

There are several health and safety issues that need to be considered due to the presence of electricity and potential hazards during the construction phase. The installation of poles and electrical lines involves working with live electricity. The risk of electrical shocks, burns, and electrocution is a significant concern. Construction materials, such as paints, solvents, adhesives, and insulation materials, may contain hazardous substances. Construction activities may involve manual lifting, carrying, and moving of heavy equipment and materials. Improper lifting techniques and overexertion can lead to musculoskeletal injuries. Construction activities may require working at heights, such as during the installation of poles and overhead lines. Falls from heights pose a significant risk.

Availability of Labor camp and material storage Space?

The construction process involves the installation of a steel container control room which will be constructed on RCC footings. So minimal ground preparation and RCC pillar installation may be

required. Due to the small scale of construction, hence there is no need for labor shed.

The materials, including the poles, for the Nano grids will be stored either on the side of the road or in designated vacant spaces near each Nano grid. The site management or the Camp-in-Charge (CIC) will grant permission to store the required materials for the Nano grid within the camp premises. To ensure security during nighttime, there may be provisions for having night guards in place.

Availability of Utility Services?

Electricity is not available. Alternative measures such as solar power or generators will be considered. Due to the small scale of construction, hence there is no need for labor shed. As a result, there is no necessity for a tube well in the proposed locations. Instead, during the construction phase, the contractor will arrange for a mobile water supply system to ensure a sufficient water source for the construction work. Additionally, the contractor will be responsible for providing temporary sanitation facilities. A portable or temporary sanitary system will be set up to cater to the basic hygiene needs of the workers during the construction period.

Availability of access road?

There is a road called the camp 10 connecting road that will be used for transportation and delivering materials to the 3 Nano grids in Camp 10. It provides access for vehicles and ensures a route for transporting goods and supplies.

Whether e-waste will be produced during the O&M period and if yes, how will be managed?

Solar PV nano-grid and lead acid batteries will produce significant amount of e-wastes at the end of those products' defunct/ end-of-life stage. Except the nonreactive silica from the defunct solar panel, all other objects or substances, e.g., heavy metals, acid, electric parts and wires, etc. can pose serious threat to the environment as well as to human health. Yet, we don't have any formal facilities in Bangladesh to recycle or upcycle these wastes.

However, the project has made a plan to manage all the wastes produced from solar system (street light, nano-grid, etc.) after the end-life of associated products, equipment, batteries, etc. One of the working vendors supplying and installing these solar systems is willing to take back all the wastes (non-functioning products, equipment, batteries, spare-parts, etc.) on its own cost and will manage those in cooperation with the manufacturing company which it is representing for. The project, hence, will come to an agreement (MoU) with that vendor by the end of this project or the end of the warranty period of their services, whichever comes first, in this regard.

Environmental Components (Physical/ Biological)	***Impact during the project life span***		
	PC	**OM**	**DE**
Noise	Low	Low	None
Air Pollution	Low	None	None
Soils	Low	None	None
Vibrations	Low	None	None
Surface Water	None	None	None
Groundwater	None	None	None
Flora	None	None	None
Fauna	None	None	None

Note: PC = Pre-construction and construction stages; OM = Operation and Maintenance Stage; DE = decommissioning stage. High = Likely to cause long-term impacts or over large area (>0.5sqkm); Medium =

Likely to cause temporary damage or over moderate area (0.25 to 0.5sqkm); Low = Likely to cause little, short-term damage and over small area (<0.25sqkm)

Environmental Screening Summary	
Project Name	**Supply and Installation of Solar PV Nano Grid**
Camp wise subprojects location (Camp 11)	There are 3 Solar PV Nano grids will be constructed within the Camp 11. These are- 1. Camp 11, Block C, Sub block C2, Behind SMS Hub and beside Cox's Bazar to Teknaf main road 2. Camp 11, Block C, Sub block C2, Inside of ware house 3. Camp 11, Block A, Sub block A1, Near by Temporary Nutrition Center
Are the subprojects located in any environmentally sensitive locations?	
No. The proposed locations for the Solar PV Nano Grids are not situated in any critical areas. These sites do not pose any risks or impact on sensitive habitats, major forest covers, or water bodies. Currently, the designated sites are observed to have open spaces without any environmental concerns. Therefore, the implementation of the Nano Grids in these locations is expected to have no adverse effects on the surrounding environment.	
Are the subprojects located in elephant migration route?	
No. These have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).	
Will the construction of these components induce land degradation or landslide?	
The construction of the Solar PV Nano Grids component, which involves installing a steel container structure supported by four RCC pillars, is not expected to induce land degradation or trigger landslides. The selected locations for the Nano Grids are situated on plain land with moderate vegetation cover, and these areas do not have any significant inclinations or steep slopes. The use of the steel container structure eliminates the need for extensive excavation or heavy piling work. While minimal ground preparation and pillar installation may be required, the overall impact on the land is expected to be minimal. Therefore, the construction activities associated with the Nano Grids, utilizing the steel container structure and pillar installation, are unlikely to cause land degradation or pose landslide risks in the designated areas.	
Will the construction obstruct water cycle of the local area or pollute near water body and groundwater?	
No. The construction of the Solar PV Nano Grids will not obstruct the water cycle of the local area or cause pollution near water bodies and groundwater. The construction activities will be confined to the selected sites, which are not in close proximity to any significant water bodies that could be negatively impacted. Furthermore, the construction process does not involve heavy earth removal or cutting, minimizing the risk of disrupting the natural flow of water or causing sedimentation. Moreover, since the Nano Grids primarily rely on solar energy, there will be no direct discharge of pollutants into water bodies or groundwater. The construction and operation of the Solar PV Nano Grid aim to prioritize environmental sustainability and minimize any potential adverse effects on the water cycle and local water resources.	
Chances of Waste generation?	
The construction process involves the installation of a steel container control room which will be	

constructed on RCC footings. So minimal ground preparation and RCC pillar installation may be required. Due to the small scale of construction, there will be a little waste generation, primarily consisting of construction debris. This may include leftover brick chips, cement, wood, bamboo, plastics, wires etc. There will be no need for a labor shed, resulting in a reduced likelihood of generating organic waste, faecal waste, and kitchen waste during this phase. The container structure will be transported to the site using a truck and then installed on the pillars with the assistance of a crane. As a result, the construction process is expected to have minimal waste generation. However, it is important to ensure proper waste management practices are in place to handle any potential waste materials that may arise during transportation and installation.
Any damage to existing vegetation or garden plants?
The construction of the Solar PV Nano Grids will take places in open spaces, ensuring that there will be no damage caused to the existing vegetation or garden plants. The construction process involves the installation of a steel container control room, which measures 10ft*8ft*8.5ft and has a thickness of 2.3mm. The control room will be constructed on RCC footings. The positioning of the control room and the construction of the RCC footings will be carried out in a manner that avoids unnecessary disturbance to nearby plants and garden areas. If there are any plants or vegetation that need to be cleared or uprooted to accommodate the installation of the control room and RCC footings, efforts will be made to minimize the impact.
Will the project cause socio-economic disturbance?
The implementation of the Solar PV Nano Grid subproject is not anticipated to cause any significant socio-economic disturbances. The Nano grids site, which is located in open spaces, is identified as Government land. While the intervention may challenge existing socio-economic practices to some extent, arrangements have been made ensuring a mutually beneficial agreement. Clear communication and collaboration with the community will be maintained to address any concerns or issues that may arise. The project team will prioritize respectful engagement with local stakeholders to ensure their acceptance and participation in the process.
Violation of Environment, Health and Safety?
The construction of the Nano grids is expected to cause minimal environmental damage; there may still be some impacts on air and soil due to the construction activities. Environmental damage during the construction phase can occur primarily from noise and dust generation. Construction activities such as carrying container, cutting, heavy machinery, installation of poles, and wiring may generate noise and vibration that could potentially disturb the surrounding environment. Dust particles may be released into the air during excavation and construction, affecting air quality in the vicinity. There are several health and safety issues that need to be considered due to the presence of electricity and potential hazards during the construction phase. The installation of poles and electrical lines involves working with live electricity. The risk of electrical shocks, burns, and electrocution is a significant concern. Construction materials, such as paints, solvents, adhesives, and insulation materials, may contain hazardous substances. Construction activities may involve manual lifting, carrying, and moving of heavy equipment and materials. Improper lifting techniques and overexertion can lead to musculoskeletal injuries. Construction activities may require working at heights, such as during the installation of poles and overhead lines. Falls from heights pose a significant risk.
Availability of Labor camp and material storage Space?

The construction process involves the installation of a steel container control room which will be constructed on RCC footings. So minimal ground preparation and RCC pillar installation may be required. Due to the small scale of construction, hence there is no need for labor shed.

The materials, including the poles, for the Nano grids will be stored either on the side of the road or in designated vacant spaces near each Nano grid. The site management or the Camp-in-Charge (CIC) will grant permission to store the required materials for the Nano grid within the camp premises. To ensure security during nighttime, there may be provisions for having night guards in place.

Availability of Utility Services?

Electricity is not available. Alternative measures such as solar power or generators will be considered. Due to the small scale of construction, hence there is no need for labor shed. As a result, there is no necessity for a tube well in the proposed locations. Instead, during the construction phase, the contractor will arrange for a mobile water supply system to ensure a sufficient water source for the construction work. Additionally, the contractor will be responsible for providing temporary sanitation facilities. A portable or temporary sanitary system will be set up to cater to the basic hygiene needs of the workers during the construction period.

Availability of access road?

There is a road called the camp 11 connecting road/ Arakan Road that will be used for transportation and delivering materials to the 3 Nano grids in Camp 11. It provides access for vehicles and ensures a route for transporting goods and supplies.

Whether e-waste will be produced during the O&M period and if yes, how will be managed?

Solar PV nano-grid and lead acid batteries will produce significant amount of e-wastes at the end of those products' defunct/ end-of-life stage. Except the nonreactive silica from the defunct solar panel, all other objects or substances, e.g., heavy metals, acid, electric parts and wires, etc. can pose serious threat to the environment as well as to human health. Yet, we don't have any formal facilities in Bangladesh to recycle or upcycle these wastes.

However, the project has made a plan to manage all the wastes produced from solar system (street light, nano-grid, etc.) after the end-life of associated products, equipment, batteries, etc. One of the working vendors supplying and installing these solar systems is willing to take back all the wastes (non-functioning products, equipment, batteries, spare-parts, etc.) on its own cost and will manage those in cooperation with the manufacturing company which it is representing for. The project, hence, will come to an agreement (MoU) with that vendor by the end of this project or the end of the warranty period of their services, whichever comes first, in this regard.

Environmental Components (Physical/ Biological)	***Impact during the project life span***		
	PC	**OM**	**DE**
Noise	Low	Low	None
Air Pollution	Low	None	None
Soils	Low	None	None
Vibrations	Low	None	None
Surface Water	None	None	None
Groundwater	None	None	None
Flora	None	None	None

Fauna	None	None	None

Note: PC = Pre-construction and construction stages; OM = Operation and Maintenance Stage; DE = decommissioning stage. High = Likely to cause long-term impacts or over large area (>0.5sqkm); Medium = Likely to cause temporary damage or over moderate area (0.25 to 0.5sqkm); Low = Likely to cause little, short-term damage and over small area (<0.25sqkm)

Environmental Screening Summary	
Project Name	**Supply and Installation of Solar PV Nano Grid**
Camp wise subprojects location (Camp 13)	There are 3 Solar PV Nano grids will be constructed within the Camp 13. These are- 1. Camp 13, Block A, Sub block A1, Inside of IOM emergency Container point 2. Camp 13, Block B, Sub block B4, Inside of SHED wash office 3. Camp 13, Block G, Sub block G5, Inside of World Vision CFS
Are the subprojects located in any environmentally sensitive locations?	
No. The proposed locations for the Solar PV Nano Grids are not situated in any critical areas. These sites do not pose any risks or impact on sensitive habitats, major forest covers, or water bodies. Currently, the designated sites are observed to have open spaces without any environmental concerns. Therefore, the implementation of the Nano Grids in these locations is expected to have no adverse effects on the surrounding environment.	
Are the subprojects located in elephant migration route?	
No. These have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).	
Will the construction of these components induce land degradation or landslide?	
The construction of the Solar PV Nano Grids component, which involves installing a steel container structure supported by four RCC pillars, is not expected to induce land degradation or trigger landslides. The selected locations for the Nano Grids are situated on plain land with moderate vegetation cover, and these areas do not have any significant inclinations or steep slopes. The use of the steel container structure eliminates the need for extensive excavation or heavy piling work. While minimal ground preparation and pillar installation may be required, the overall impact on the land is expected to be minimal. Therefore, the construction activities associated with the Nano Grids, utilizing the steel container structure and pillar installation, are unlikely to cause land degradation or pose landslide risks in the designated areas.	
Will the construction obstruct water cycle of the local area or pollute near water body and groundwater?	
No. The construction of the Solar PV Nano Grids will not obstruct the water cycle of the local area or cause pollution near water bodies and groundwater. The construction activities will be confined to the selected sites, which are not in close proximity to any significant water bodies that could be negatively impacted. Furthermore, the construction process does not involve heavy earth removal or cutting, minimizing the risk of disrupting the natural flow of water or causing sedimentation. Moreover, since the Nano Grids primarily rely on solar energy, there will be no direct discharge of pollutants into water bodies or groundwater. The construction and operation of the Solar PV Nano Grid aim to prioritize environmental sustainability and minimize any potential adverse effects on the water cycle and local water resources.	
Chances of Waste generation?	

The construction process involves the installation of a steel container control room which will be constructed on RCC footings. So minimal ground preparation and RCC pillar installation may be required. Due to the small scale of construction, there will be a little waste generation, primarily consisting of construction debris. This may include leftover brick chips, cement, wood, bamboo, plastics, wires etc. There will be no need for a labor shed, resulting in a reduced likelihood of generating organic waste, faecal waste, and kitchen waste during this phase.

The container structure will be transported to the site using a truck and then installed on the pillars with the assistance of a crane. As a result, the construction process is expected to have minimal waste generation. However, it is important to ensure proper waste management practices are in place to handle any potential waste materials that may arise during transportation and installation.

Any damage to existing vegetation or garden plants?

The construction of the Solar PV Nano Grids will take places in open spaces, ensuring that there will be no damage caused to the existing vegetation or garden plants. The construction process involves the installation of a steel container control room, which measures 10ft*8ft*8.5ft and has a thickness of 2.3mm. The control room will be constructed on RCC footings. The positioning of the control room and the construction of the RCC footings will be carried out in a manner that avoids unnecessary disturbance to nearby plants and garden areas. If there are any plants or vegetation that need to be cleared or uprooted to accommodate the installation of the control room and RCC footings, efforts will be made to minimize the impact.

Will the project cause socio-economic disturbance?

The implementation of the Solar PV Nano Grid subproject is not anticipated to cause any significant socio-economic disturbances. The Nano grids site, which is located in open spaces, is identified as Government land. While the intervention may challenge existing socio-economic practices to some extent, arrangements have been made ensuring a mutually beneficial agreement.

Clear communication and collaboration with the community will be maintained to address any concerns or issues that may arise. The project team will prioritize respectful engagement with local stakeholders to ensure their acceptance and participation in the process.

Violation of Environment, Health and Safety?

The constructions of the Nano grids are expected to cause minimal environmental damage; there may still be some impacts on air and soil due to the construction activities. Environmental damage during the construction phase can occur primarily from noise and dust generation. Construction activities such as carrying container, cutting, heavy machinery, installation of poles, and wiring may generate noise and vibration that could potentially disturb the surrounding environment. Dust particles may be released into the air during excavation and construction, affecting air quality in the vicinity.

There are several health and safety issues that need to be considered due to the presence of electricity and potential hazards during the construction phase. The installation of poles and electrical lines involves working with live electricity. The risk of electrical shocks, burns, and electrocution is a significant concern. Construction materials, such as paints, solvents, adhesives, and insulation materials, may contain hazardous substances. Construction activities may involve manual lifting, carrying, and moving of heavy equipment and materials. Improper lifting techniques and overexertion can lead to musculoskeletal injuries. Construction activities may require working at heights, such as during the installation of poles and overhead lines. Falls from heights pose a significant risk.

Availability of Labor camp and material storage Space?
The construction process involves the installation of a steel container control room which will be constructed on RCC footings. So minimal ground preparation and RCC pillar installation may be required. Due to the small scale of construction, hence there is no need for labor shed. The materials, including the poles, for the Nano grids will be stored either on the side of the road or in designated vacant spaces near each Nano grid. The site management or the Camp-in-Charge (CIC) will grant permission to store the required materials for the Nano grid within the camp premises. To ensure security during nighttime, there may be provisions for having night guards in place.
Availability of Utility Services?
Electricity is not available. Alternative measures such as solar power or generators will be considered. Due to the small scale of construction, hence there is no need for labor shed. As a result, there is no necessity for a tube well in the proposed locations. Instead, during the construction phase, the contractor will arrange for a mobile water supply system to ensure a sufficient water source for the construction work. Additionally, the contractor will be responsible for providing temporary sanitation facilities. A portable or temporary sanitary system will be set up to cater to the basic hygiene needs of the workers during the construction period.
Availability of access road?
There is a road called the camp 13 connecting road that will be used for transportation and delivering materials to the 3 Nano grids in Camp 13. It provides access for vehicles and ensures a route for transporting goods and supplies.
Whether e-waste will be produced during the O&M period and if yes, how will be managed?
Solar PV nano-grid and lead acid batteries will produce significant amount of e-wastes at the end of those products' defunct/ end-of-life stage. Except the nonreactive silica from the defunct solar panel, all other objects or substances, e.g., heavy metals, acid, electric parts and wires, etc. can pose serious threat to the environment as well as to human health. Yet, we don't have any formal facilities in Bangladesh to recycle or upcycle these wastes. However, the project has made a plan to manage all the wastes produced from solar system (street light, nano-grid, etc.) after the end-life of associated products, equipment, batteries, etc. One of the working vendors supplying and installing these solar systems is willing to take back all the wastes (non-functioning products, equipment, batteries, spare-parts, etc.) on its own cost and will manage those in cooperation with the manufacturing company which it is representing for. The project, hence, will come to an agreement (MoU) with that vendor by the end of this project or the end of the warranty period of their services, whichever comes first, in this regard.

Environmental Components (Physical/ Biological)	***Impact during the project life span***		
	PC	**OM**	**DE**
Noise	Low	Low	None
Air Pollution	Low	None	None
Soils	Low	None	None
Vibrations	Low	None	None
Surface Water	None	None	None
Groundwater	None	None	None

Flora	None	None	None
Fauna	None	None	None

Note: PC = Pre-construction and construction stages; OM = Operation and Maintenance Stage; DE = decommissioning stage. High = Likely to cause long-term impacts or over large area (>0.5sqkm); Medium = Likely to cause temporary damage or over moderate area (0.25 to 0.5sqkm); Low = Likely to cause little, short-term damage and over small area (<0.25sqkm)

Environmental Screening Summary	
Project Name	**Supply and Installation of Solar PV Nano Grid**
Camp wise subprojects location (Camp 2W)	There is a Solar PV Nano grid will be constructed within the Camp 2W. These are- 1. Camp 2W, Block B, Sub block B3, Nearby CiC Office
Are the subprojects located in any environmentally sensitive locations?	
No. The proposed location for the Solar PV Nano Grid is not situated in any critical areas. These sites do not pose any risks or impact on sensitive habitats, major forest covers, or water bodies. Currently, the designated sites are observed to have open space without any environmental concerns. Therefore, the implementation of the Nano Grid in this location is expected to have no adverse effects on the surrounding environment.	
Are the subprojects located in elephant migration route?	
No. These have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).	
Will the construction of these components induce land degradation or landslide?	
The construction of the Solar PV Nano Grid component, which involves installing a steel container structure supported by four RCC pillars, is not expected to induce land degradation or trigger landslides. The selected location for the Nano Grid is situated on plain land with moderate vegetation cover, and this area does not have any significant inclinations or steep slopes. The use of the steel container structure eliminates the need for extensive excavation or heavy piling work. While minimal ground preparation and pillar installation may be required, the overall impact on the land is expected to be minimal. Therefore, the construction activities associated with the Nano Grid, utilizing the steel container structure and pillar installation, are unlikely to cause land degradation or pose landslide risks in the designated areas.	
Will the construction obstruct water cycle of the local area or pollute near water body and groundwater?	
No. The construction of the Solar PV Nano Grid will not obstruct the water cycle of the local area or cause pollution near water bodies and groundwater. The construction activities will be confined to the selected sites, which are not in close proximity to any significant water bodies that could be negatively impacted. Furthermore, the construction process does not involve heavy earth removal or cutting, minimizing the risk of disrupting the natural flow of water or causing sedimentation. Moreover, since the Nano Grid primarily rely on solar energy, there will be no direct discharge of pollutants into water bodies or groundwater. The construction and operation of the Solar PV Nano Grid aim to prioritize environmental sustainability and minimize any potential adverse effects on the water cycle and local water resources.	

Chances of Waste generation?
The construction process involves the installation of a steel container control room which will be constructed on RCC footings. So minimal ground preparation and RCC pillar installation may be required. Due to the small scale of construction, there will be a little waste generation, primarily consisting of construction debris. This may include leftover brick chips, cement, wood, bamboo, plastics, wires etc. There will be no need for a labor shed, resulting in a reduced likelihood of generating organic waste, faecal waste, and kitchen waste during this phase. The container structure will be transported to the site using a truck and then installed on the pillars with the assistance of a crane. As a result, the construction process is expected to have minimal waste generation. However, it is important to ensure proper waste management practices are in place to handle any potential waste materials that may arise during transportation and installation.
Any damage to existing vegetation or garden plants?
The construction of the Solar PV Nano Grid will take place in open space, ensuring that there will be no damage caused to the existing vegetation or garden plants. The construction process involves the installation of a steel container control room, which measures 10ft*8ft*8.5ft and has a thickness of 2.3mm. The control room will be constructed on RCC footings. The positioning of the control room and the construction of the RCC footings will be carried out in a manner that avoids unnecessary disturbance to nearby plants and garden areas. If there are any plants or vegetation that need to be cleared or uprooted to accommodate the installation of the control room and RCC footings, efforts will be made to minimize the impact.
Will the project cause socio-economic disturbance?
The implementation of the Solar PV Nano Grid subproject is not anticipated to cause any significant socio-economic disturbances. The Nano grid site, which is located in open space, is identified as Government land. While the intervention may challenge existing socio-economic practices to some extent, arrangements have been made ensuring a mutually beneficial agreement. Clear communication and collaboration with the community will be maintained to address any concerns or issues that may arise. The project team will prioritize respectful engagement with local stakeholders to ensure their acceptance and participation in the process.
Violation of Environment, Health and Safety?
The construction of the Nano grid is expected to cause minimal environmental damage; there may still be some impacts on air and soil due to the construction activities. Environmental damage during the construction phase can occur primarily from noise and dust generation. Construction activities such as carrying container, cutting, heavy machinery, installation of poles, and wiring may generate noise and vibration that could potentially disturb the surrounding environment. Dust particles may be released into the air during excavation and construction, affecting air quality in the vicinity. There are several health and safety issues that need to be considered due to the presence of electricity and potential hazards during the construction phase. The installation of poles and electrical lines involves working with live electricity. The risk of electrical shocks, burns, and

electrocution is a significant concern. Construction materials, such as paints, solvents, adhesives, and insulation materials, may contain hazardous substances. Construction activities may involve manual lifting, carrying, and moving of heavy equipment and materials. Improper lifting techniques and overexertion can lead to musculoskeletal injuries. Construction activities may require working at heights, such as during the installation of poles and overhead lines. Falls from heights pose a significant risk.
Availability of Labor camp and material storage Space?
The construction process involves the installation of a steel container control room which will be constructed on RCC footings. So minimal ground preparation and RCC pillar installation may be required. Due to the small scale of construction, hence there is no need for labor shed. The materials, including the poles, for the Nano grids will be stored either on the side of the road or in designated vacant spaces near each Nano grid. The site management or the Camp-in-Charge (CIC) will grant permission to store the required materials for the Nano grid within the camp premises. To ensure security during nighttime, there may be provisions for having night guards in place.
Availability of Utility Services?
Electricity is not available. Alternative measures such as solar power or generators will be considered. Due to the small scale of construction, hence there is no need for labor shed. As a result, there is no necessity for a tube well in the proposed locations. Instead, during the construction phase, the contractor will arrange for a mobile water supply system to ensure a sufficient water source for the construction work. Additionally, the contractor will be responsible for providing temporary sanitation facilities. A portable or temporary sanitary system will be set up to cater to the basic hygiene needs of the workers during the construction period.
Availability of access road?
There is a road called the Camp 2W connecting road that will be used for transportation and delivering materials to the Nano grid in Camp 2W. It provides access for vehicles and ensures a route for transporting goods and supplies.
Whether e-waste will be produced during the O&M period and if yes, how will be managed?
Solar PV nano-grid and lead acid batteries will produce significant amount of e-wastes at the end of those products' defunct/ end-of-life stage. Except the nonreactive silica from the defunct solar panel, all other objects or substances, e.g., heavy metals, acid, electric parts and wires, etc. can pose serious threat to the environment as well as to human health. Yet, we don't have any formal facilities in Bangladesh to recycle or upcycle these wastes. However, the project has made a plan to manage all the wastes produced from solar system (street light, nano-grid, etc.) after the end-life of associated products, equipment, batteries, etc. One of the working vendors supplying and installing these solar systems is willing to take back all the wastes (non-functioning products, equipment, batteries, spare-parts, etc.) on its own cost and will manage those in cooperation with the manufacturing company which it is representing for. The project, hence, will come to an agreement (MoU) with that vendor by the end of this project or the end of the warranty period of their services, whichever comes first, in this regard.

Environmental Components (Physical/ Biological)	***Impact during the project life span***

	PC	OM	DE
Noise	Low	Low	None
Air Pollution	Low	None	None
Soils	Low	None	None
Vibrations	Low	None	None
Surface Water	None	None	None
Groundwater	None	None	None
Flora	None	None	None
Fauna	None	None	None

Note: PC = Pre-construction and construction stages; OM = Operation and Maintenance Stage; DE = decommissioning stage. High = Likely to cause long-term impacts or over large area (>0.5sqkm); Medium = Likely to cause temporary damage or over moderate area (0.25 to 0.5sqkm); Low = Likely to cause little, short-term damage and over small area (<0.25sqkm)

Environmental Screening Summary	
Project Name	**Supply and Installation of Solar PV Nano Grid**
Camp wise subprojects location (Camp 05)	There are 4 Solar PV Nano grids will be constructed within the Camp 05. These are- 1. Camp 5, Block E, Sub block E6, CiC office, BRAC-SMS Office & Blast 2. Camp 5, Block E, Sub block E2, FH-MHPSS, JCF-LC, TDH, NGOF-Protection, Mukti-LC & BDRCS Distribution Point 3. Camp 5, Block E, Sub block E1, Police camp, RTMI-PHC, JCF-LC & NGOF 4. Camp 5, Block B, Sub block B5, BRAC UN Wamen Market, SARPV, IRC, FH-HP, Mukti-LC & JCF-LC
Are the subprojects located in any environmentally sensitive locations?	
No. The proposed locations for the Solar PV Nano Grids are not situated in any critical areas. These sites do not pose any risks or impact on sensitive habitats, major forest covers, or water bodies. Currently, the designated sites are observed to have open spaces without any environmental concerns. Therefore, the implementation of the Nano Grids in these locations is expected to have no adverse effects on the surrounding environment.	
Are the subprojects located in elephant migration route?	
No. These have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).	
Will the construction of these components induce land degradation or landslide?	
The construction of the Solar PV Nano Grids component, which involves installing a steel container structure supported by four RCC pillars, is not expected to induce land degradation or trigger landslides. The selected locations for the Nano Grids are situated on plain land with moderate vegetation cover, and these areas do not have any significant inclinations or steep slopes. The use of the steel container structure eliminates the need for extensive excavation or heavy piling work. While minimal ground preparation and pillar installation may be required, the overall impact on the land is expected to be minimal. Therefore, the construction activities associated with the Nano Grids, utilizing the steel container structure and pillar installation, are unlikely to cause land degradation or pose landslide risks in the designated areas.	

Will the construction obstruct water cycle of the local area or pollute near water body and groundwater?
No. The construction of the Solar PV Nano Grids will not obstruct the water cycle of the local area or cause pollution near water bodies and groundwater. The construction activities will be confined to the selected sites, which are not in close proximity to any significant water bodies that could be negatively impacted. Furthermore, the construction process does not involve heavy earth removal or cutting, minimizing the risk of disrupting the natural flow of water or causing sedimentation. Moreover, since the Nano Grids primarily rely on solar energy, there will be no direct discharge of pollutants into water bodies or groundwater. The construction and operation of the Solar PV Nano Grid aim to prioritize environmental sustainability and minimize any potential adverse effects on the water cycle and local water resources.
Chances of Waste generation?
The construction process involves the installation of a steel container control room which will be constructed on RCC footings. So minimal ground preparation and RCC pillar installation may be required. Due to the small scale of construction, there will be a little waste generation, primarily consisting of construction debris. This may include leftover brick chips, cement, wood, bamboo, plastics, wires etc. There will be no need for a labor shed, resulting in a reduced likelihood of generating organic waste, faecal waste, and kitchen waste during this phase. The container structure will be transported to the site using a truck and then installed on the pillars with the assistance of a crane. As a result, the construction process is expected to have minimal waste generation. However, it is important to ensure proper waste management practices are in place to handle any potential waste materials that may arise during transportation and installation.
Any damage to existing vegetation or garden plants?
The construction of the Solar PV Nano Grids will take places in open spaces, ensuring that there will be no damage caused to the existing vegetation or garden plants. The construction process involves the installation of a steel container control room, which measures 10ft*8ft*8.5ft and has a thickness of 2.3mm. The control room will be constructed on RCC footings. The positioning of the control room and the construction of the RCC footings will be carried out in a manner that avoids unnecessary disturbance to nearby plants and garden areas. If there are any plants or vegetation that need to be cleared or uprooted to accommodate the installation of the control room and RCC footings, efforts will be made to minimize the impact.
Will the project cause socio-economic disturbance?
The implementation of the Solar PV Nano Grid subproject is not anticipated to cause any significant socio-economic disturbances. The Nano grids site, which is located in open spaces, is identified as Government land. While the intervention may challenge existing socio-economic practices to some extent, arrangements have been made ensuring a mutually beneficial agreement. Clear communication and collaboration with the community will be maintained to address any concerns or issues that may arise. The project team will prioritize respectful engagement with local stakeholders to ensure their acceptance and participation in the process.
Violation of Environment, Health and Safety?
The constructions of the Nano grids are expected to cause minimal environmental damage; there may

still be some impacts on air and soil due to the construction activities. Environmental damage during the construction phase can occur primarily from noise and dust generation. Construction activities such as carrying container, cutting, heavy machinery, installation of poles, and wiring may generate noise and vibration that could potentially disturb the surrounding environment. Dust particles may be released into the air during excavation and construction, affecting air quality in the vicinity.

There are several health and safety issues that need to be considered due to the presence of electricity and potential hazards during the construction phase. The installation of poles and electrical lines involves working with live electricity. The risk of electrical shocks, burns, and electrocution is a significant concern. Construction materials, such as paints, solvents, adhesives, and insulation materials, may contain hazardous substances. Construction activities may involve manual lifting, carrying, and moving of heavy equipment and materials. Improper lifting techniques and overexertion can lead to musculoskeletal injuries. Construction activities may require working at heights, such as during the installation of poles and overhead lines. Falls from heights pose a significant risk.

Availability of Labor camp and material storage Space?

The construction process involves the installation of a steel container control room which will be constructed on RCC footings. So minimal ground preparation and RCC pillar installation may be required. Due to the small scale of construction, hence there is no need for labor shed.

The materials, including the poles, for the Nano grids will be stored either on the side of the road or in designated vacant spaces near each Nano grid. The site management or the Camp-in-Charge (CIC) will grant permission to store the required materials for the Nano grid within the camp premises. To ensure security during nighttime, there may be provisions for having night guards in place.

Availability of Utility Services?

Electricity is not available. Alternative measures such as solar power or generators will be considered. Due to the small scale of construction, hence there is no need for labor shed. As a result, there is no necessity for a tube well in the proposed locations. Instead, during the construction phase, the contractor will arrange for a mobile water supply system to ensure a sufficient water source for the construction work. Additionally, the contractor will be responsible for providing temporary sanitation facilities. A portable or temporary sanitary system will be set up to cater to the basic hygiene needs of the workers during the construction period.

Availability of access road?

Three roads will be utilized in the area: the Camp 5 and 6 connecting road, the Camp 5 connecting road near the APBN office, and the Moricha Bazar Camp connecting road, also known as the Army road. These roads will facilitate the transportation of materials to various Nano grid sites within the camp. The Camp 5 and 6 connecting road will be used to deliver materials to the first two Nano grids in Camp 05. The Camp 5 connecting road near the APBN office will serve transportation needs for Camp 5, Block E, Sub block E1, Police camp, RTMI-PHC, JCF-LC, and NGOF Nano grid site. Additionally, the Moricha Bazar Camp connecting road, or Army road, will enable the transportation of materials to Camp 5, Block B, Sub block B5, BRAC UN Women Market, SARPV, IRC, FH-HP, Mukti-LC, and JCF-LC Nano grid site. These roads will provide access for vehicles and ensure a route for transporting goods and supplies to the designated Nano grid locations within the camps.

Whether e-waste will be produced during the O&M period and if yes, how will be managed?

Solar PV nano-grid and lead acid batteries will produce significant amount of e-wastes at the end of those products' defunct/ end-of-life stage. Except the nonreactive silica from the defunct solar panel, all other objects or substances, e.g., heavy metals, acid, electric parts and wires, etc. can pose serious threat to the environment as well as to human health. Yet, we don't have any formal facilities in Bangladesh to recycle or upcycle these wastes.

However, the project has made a plan to manage all the wastes produced from solar system (street light, nano-grid, etc.) after the end-life of associated products, equipment, batteries, etc. One of the working vendors supplying and installing these solar systems is willing to take back all the wastes (non-functioning products, equipment, batteries, spare-parts, etc.) on its own cost and will manage those in cooperation with the manufacturing company which it is representing for. The project, hence, will come to an agreement (MoU) with that vendor by the end of this project or the end of the warranty period of their services, whichever comes first, in this regard.

Environmental Components (Physical/ Biological)	***Impact during the project life span***		
	PC	**OM**	**DE**
Noise	Low	Low	None
Air Pollution	Low	None	None
Soils	Low	None	None
Vibrations	Low	None	None
Surface Water	None	None	None
Groundwater	None	None	None
Flora	None	None	None
Fauna	None	None	None

Note: PC = Pre-construction and construction stages; OM = Operation and Maintenance Stage; DE = decommissioning stage. High = Likely to cause long-term impacts or over large area (>0.5sqkm); Medium = Likely to cause temporary damage or over moderate area (0.25 to 0.5sqkm); Low = Likely to cause little, short-term damage and over small area (<0.25sqkm)

Environmental Screening Summary	
Project Name	**Supply and Installation of Solar PV Nano Grid**
Camp wise subprojects location (Camp 06)	There are 2 Solar PV Nano grids will be constructed within the Camp 06. These are- 1. Camp 6, Block D, Sub block D7, CIC OFFICE 2. Camp 6, Block A, Sub block A3, PHC BDRCS
Are the subprojects located in any environmentally sensitive locations?	
No. The proposed locations for the Solar PV Nano Grids are not situated in any critical areas. These sites do not pose any risks or impact on sensitive habitats, major forest covers, or water bodies. Currently, the designated sites are observed to have open spaces without any environmental concerns. Therefore, the implementation of the Nano Grids in these locations is expected to have no adverse effects on the surrounding environment.	
Are the subprojects located in elephant migration route?	
No. These have been checked on the basis of elephant migration route map established by	

UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).
Will the construction of these components induce land degradation or landslide?
The construction of the Solar PV Nano Grids component, which involves installing a steel container structure supported by four RCC pillars, is not expected to induce land degradation or trigger landslides. The selected locations for the Nano Grids are situated on plain land with moderate vegetation cover, and these areas do not have any significant inclinations or steep slopes. The use of the steel container structure eliminates the need for extensive excavation or heavy piling work. While minimal ground preparation and pillar installation may be required, the overall impact on the land is expected to be minimal. Therefore, the construction activities associated with the Nano Grids, utilizing the steel container structure and pillar installation, are unlikely to cause land degradation or pose landslide risks in the designated areas.
Will the construction obstruct water cycle of the local area or pollute near water body and groundwater?
No. The construction of the Solar PV Nano Grids will not obstruct the water cycle of the local area or cause pollution near water bodies and groundwater. The construction activities will be confined to the selected sites, which are not in close proximity to any significant water bodies that could be negatively impacted. Furthermore, the construction process does not involve heavy earth removal or cutting, minimizing the risk of disrupting the natural flow of water or causing sedimentation. Moreover, since the Nano Grids primarily rely on solar energy, there will be no direct discharge of pollutants into water bodies or groundwater. The construction and operation of the Solar PV Nano Grid aim to prioritize environmental sustainability and minimize any potential adverse effects on the water cycle and local water resources.
Chances of Waste generation?
The construction process involves the installation of a steel container control room which will be constructed on RCC footings. So minimal ground preparation and RCC pillar installation may be required. Due to the small scale of construction, there will be a little waste generation, primarily consisting of construction debris. This may include leftover brick chips, cement, wood, bamboo, plastics, wires etc. There will be no need for a labor shed, resulting in a reduced likelihood of generating organic waste, faecal waste, and kitchen waste during this phase. The container structure will be transported to the site using a truck and then installed on the pillars with the assistance of a crane. As a result, the construction process is expected to have minimal waste generation. However, it is important to ensure proper waste management practices are in place to handle any potential waste materials that may arise during transportation and installation.
Any damage to existing vegetation or garden plants?
The construction of the Solar PV Nano Grids will take places in open spaces, ensuring that there will be no damage caused to the existing vegetation or garden plants. The construction process involves the installation of a steel container control room, which measures 10ft*8ft*8.5ft and has a thickness of 2.3mm. The control room will be constructed on RCC footings. The positioning of the control room and the construction of the RCC footings will be carried out in a manner that avoids unnecessary disturbance to nearby plants and garden areas. If there are any plants or vegetation that need to be cleared or uprooted to accommodate the installation of the control room and RCC footings, efforts will be made to minimize the impact.
Will the project cause socio-economic disturbance?

The implementation of the Solar PV Nano Grid subproject is not anticipated to cause any significant socio-economic disturbances. The Nano grids site, which is located in open spaces, is identified as Government land. While the intervention may challenge existing socio-economic practices to some extent, arrangements have been made ensuring a mutually beneficial agreement. Clear communication and collaboration with the community will be maintained to address any concerns or issues that may arise. The project team will prioritize respectful engagement with local stakeholders to ensure their acceptance and participation in the process.
Violation of Environment, Health and Safety?
The constructions of the Nano grids are expected to cause minimal environmental damage; there may still be some impacts on air and soil due to the construction activities. Environmental damage during the construction phase can occur primarily from noise and dust generation. Construction activities such as carrying container, cutting, heavy machinery, installation of poles, and wiring may generate noise and vibration that could potentially disturb the surrounding environment. Dust particles may be released into the air during excavation and construction, affecting air quality in the vicinity. There are several health and safety issues that need to be considered due to the presence of electricity and potential hazards during the construction phase. The installation of poles and electrical lines involves working with live electricity. The risk of electrical shocks, burns, and electrocution is a significant concern. Construction materials, such as paints, solvents, adhesives, and insulation materials, may contain hazardous substances. Construction activities may involve manual lifting, carrying, and moving of heavy equipment and materials. Improper lifting techniques and overexertion can lead to musculoskeletal injuries. Construction activities may require working at heights, such as during the installation of poles and overhead lines. Falls from heights pose a significant risk.
Availability of Labor camp and material storage Space?
The construction process involves the installation of a steel container control room which will be constructed on RCC footings. So minimal ground preparation and RCC pillar installation may be required. Due to the small scale of construction, hence there is no need for labor shed. The materials, including the poles, for the Nano grids will be stored either on the side of the road or in designated vacant spaces near each Nano grid. The site management or the Camp-in-Charge (CIC) will grant permission to store the required materials for the Nano grid within the camp premises. To ensure security during nighttime, there may be provisions for having night guards in place.
Availability of Utility Services?
Electricity is not available. Alternative measures such as solar power or generators will be considered. Due to the small scale of construction, hence there is no need for labor shed. As a result, there is no necessity for a tube well in the proposed locations. Instead, during the construction phase, the contractor will arrange for a mobile water supply system to ensure a sufficient water source for the construction work. Additionally, the contractor will be responsible for providing temporary sanitation facilities. A portable or temporary sanitary system will be set up to cater to the basic hygiene needs of the workers during the construction period.
Availability of access road?
There is a road called the Pitkhola Bazar Road which will be used to Camp 6, Block D, Sub block D7, CIC OFFICE Nano grid for transportation and another road named camp 6 connecting road which will be used for transportation and delivering materials to Camp 6, Block A, Sub block A3, PHC BDRCS

Nano grid. These two roads provide access for vehicles and ensure a route for transporting goods and supplies.

Whether e-waste will be produced during the O&M period and if yes, how will be managed?

Solar PV nano-grid and lead acid batteries will produce significant amount of e-wastes at the end of those products' defunct/ end-of-life stage. Except the nonreactive silica from the defunct solar panel, all other objects or substances, e.g., heavy metals, acid, electric parts and wires, etc. can pose serious threat to the environment as well as to human health. Yet, we don't have any formal facilities in Bangladesh to recycle or upcycle these wastes.

However, the project has made a plan to manage all the wastes produced from solar system (street light, nano-grid, etc.) after the end-life of associated products, equipment, batteries, etc. One of the working vendors supplying and installing these solar systems is willing to take back all the wastes (non-functioning products, equipment, batteries, spare-parts, etc.) on its own cost and will manage those in cooperation with the manufacturing company which it is representing for. The project, hence, will come to an agreement (MoU) with that vendor by the end of this project or the end of the warranty period of their services, whichever comes first, in this regard.

Environmental Components (Physical/ Biological)	***Impact during the project life span***		
	PC	**OM**	**DE**
Noise	Low	Low	None
Air Pollution	Low	None	None
Soils	Low	None	None
Vibrations	Low	None	None
Surface Water	None	None	None
Groundwater	None	None	None
Flora	None	None	None
Fauna	None	None	None

Note: PC = Pre-construction and construction stages; OM = Operation and Maintenance Stage; DE = decommissioning stage. High = Likely to cause long-term impacts or over large area (>0.5sqkm); Medium = Likely to cause temporary damage or over moderate area (0.25 to 0.5sqkm); Low = Likely to cause little, short-term damage and over small area (<0.25sqkm)

Environmental Screening Summary	
Project Name	**Supply and Installation of Solar PV Nano Grid**
Camp wise subprojects location (Camp 20Ext.)	There are 4 Solar PV Nano grids will be constructed within the Camp 20Ext. These are- 1. Camp 20EXT, Block S3, Sub block B1, NGO From Center 2. Camp 20EXT, Block S1, Sub block B8, Beside the learning center 3. Camp 20EXT, Block S4, Sub block B3, Beside the Turkish clinic 4. Camp 20EXT, Block S3, Sub block B4, Health and Nutrition
Are the subprojects located in any environmentally sensitive locations?	
No. The proposed locations for the Solar PV Nano Grids are not situated in any critical areas. These	

sites do not pose any risks or impact on sensitive habitats, major forest covers, or water bodies. Currently, the designated sites are observed to have open spaces without any environmental concerns. Therefore, the implementation of the Nano Grids in these locations is expected to have no adverse effects on the surrounding environment.
Are the subprojects located in elephant migration route?
No. These have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).
Will the construction of these components induce land degradation or landslide?
The construction of the Solar PV Nano Grids component, which involves installing a steel container structure supported by four RCC pillars, is not expected to induce land degradation or trigger landslides. The selected locations for the Nano Grids are situated on plain land with moderate vegetation cover, and these areas do not have any significant inclinations or steep slopes. The use of the steel container structure eliminates the need for extensive excavation or heavy piling work. While minimal ground preparation and pillar installation may be required, the overall impact on the land is expected to be minimal. Therefore, the construction activities associated with the Nano Grids, utilizing the steel container structure and pillar installation, are unlikely to cause land degradation or pose landslide risks in the designated areas.
Will the construction obstruct water cycle of the local area or pollute near water body and groundwater?
No. The construction of the Solar PV Nano Grids will not obstruct the water cycle of the local area or cause pollution near water bodies and groundwater. The construction activities will be confined to the selected sites, which are not in close proximity to any significant water bodies that could be negatively impacted. Furthermore, the construction process does not involve heavy earth removal or cutting, minimizing the risk of disrupting the natural flow of water or causing sedimentation. Moreover, since the Nano Grids primarily rely on solar energy, there will be no direct discharge of pollutants into water bodies or groundwater. The construction and operation of the Solar PV Nano Grid aim to prioritize environmental sustainability and minimize any potential adverse effects on the water cycle and local water resources.
Chances of Waste generation?
The construction process involves the installation of a steel container control room which will be constructed on RCC footings. So minimal ground preparation and RCC pillar installation may be required. Due to the small scale of construction, there will be a little waste generation, primarily consisting of construction debris. This may include leftover brick chips, cement, wood, bamboo, plastics, wires etc. There will be no need for a labor shed, resulting in a reduced likelihood of generating organic waste, faecal waste, and kitchen waste during this phase. The container structure will be transported to the site using a truck and then installed on the pillars with the assistance of a crane. As a result, the construction process is expected to have minimal waste generation. However, it is important to ensure proper waste management practices are in place to handle any potential waste materials that may arise during transportation and installation.
Any damage to existing vegetation or garden plants?
The construction of the Solar PV Nano Grids will take places in open spaces, ensuring that there will be no damage caused to the existing vegetation or garden plants. The construction process involves

the installation of a steel container control room, which measures 10ft*8ft*8.5ft and has a thickness of 2.3mm. The control room will be constructed on RCC footings. The positioning of the control room and the construction of the RCC footings will be carried out in a manner that avoids unnecessary disturbance to nearby plants and garden areas. If there are any plants or vegetation that need to be cleared or uprooted to accommodate the installation of the control room and RCC footings, efforts will be made to minimize the impact.
Will the project cause socio-economic disturbance?
The implementation of the Solar PV Nano Grid subproject is not anticipated to cause any significant socio-economic disturbances. The Nano grids site, which is located in open spaces, is identified as Government land. While the intervention may challenge existing socio-economic practices to some extent, arrangements have been made ensuring a mutually beneficial agreement. Clear communication and collaboration with the community will be maintained to address any concerns or issues that may arise. The project team will prioritize respectful engagement with local stakeholders to ensure their acceptance and participation in the process.
Violation of Environment, Health and Safety?
The constructions of the Nano grids are expected to cause minimal environmental damage; there may still be some impacts on air and soil due to the construction activities. Environmental damage during the construction phase can occur primarily from noise and dust generation. Construction activities such as carrying container, cutting, heavy machinery, installation of poles, and wiring may generate noise and vibration that could potentially disturb the surrounding environment. Dust particles may be released into the air during excavation and construction, affecting air quality in the vicinity. There are several health and safety issues that need to be considered due to the presence of electricity and potential hazards during the construction phase. The installation of poles and electrical lines involves working with live electricity. The risk of electrical shocks, burns, and electrocution is a significant concern. Construction materials, such as paints, solvents, adhesives, and insulation materials, may contain hazardous substances. Construction activities may involve manual lifting, carrying, and moving of heavy equipment and materials. Improper lifting techniques and overexertion can lead to musculoskeletal injuries. Construction activities may require working at heights, such as during the installation of poles and overhead lines. Falls from heights pose a significant risk.
Availability of Labor camp and material storage Space?
The construction process involves the installation of a steel container control room which will be constructed on RCC footings. So minimal ground preparation and RCC pillar installation may be required. Due to the small scale of construction, hence there is no need for labor shed. The materials, including the poles, for the Nano grids will be stored either on the side of the road or in designated vacant spaces near each Nano grid. The site management or the Camp-in-Charge (CIC) will grant permission to store the required materials for the Nano grid within the camp premises. To ensure security during nighttime, there may be provisions for having night guards in place.
Availability of Utility Services?
Electricity is not available. Alternative measures such as solar power or generators will be considered. Due to the small scale of construction, hence there is no need for labor shed. As a result, there is no necessity for a tube well in the proposed locations. Instead, during the construction phase, the

contractor will arrange for a mobile water supply system to ensure a sufficient water source for the construction work. Additionally, the contractor will be responsible for providing temporary sanitation facilities. A portable or temporary sanitary system will be set up to cater to the basic hygiene needs of the workers during the construction period.

Availability of access road?

There is a road called the Camp 20 Ext. connecting road that will be used for transportation and delivering materials to the 4 Nano grids in Camp 20 Ext. It provides access for vehicles and ensures a route for transporting goods and supplies.

Whether e-waste will be produced during the O&M period and if yes, how will be managed?

Solar PV nano-grid and lead acid batteries will produce significant amount of e-wastes at the end of those products' defunct/ end-of-life stage. Except the nonreactive silica from the defunct solar panel, all other objects or substances, e.g., heavy metals, acid, electric parts and wires, etc. can pose serious threat to the environment as well as to human health. Yet, we don't have any formal facilities in Bangladesh to recycle or upcycle these wastes.

However, the project has made a plan to manage all the wastes produced from solar system (street light, nano-grid, etc.) after the end-life of associated products, equipment, batteries, etc. One of the working vendors supplying and installing these solar systems is willing to take back all the wastes (non-functioning products, equipment, batteries, spare-parts, etc.) on its own cost and will manage those in cooperation with the manufacturing company which it is representing for. The project, hence, will come to an agreement (MoU) with that vendor by the end of this project or the end of the warranty period of their services, whichever comes first, in this regard.

Environmental Components (Physical/ Biological)	***Impact during the project life span***		
	PC	**OM**	**DE**
Noise	Low	Low	None
Air Pollution	Low	None	None
Soils	Low	None	None
Vibrations	Low	None	None
Surface Water	None	None	None
Groundwater	None	None	None
Flora	None	None	None
Fauna	None	None	None

Note: PC = Pre-construction and construction stages; OM = Operation and Maintenance Stage; DE = decommissioning stage. High = Likely to cause long-term impacts or over large area (>0.5sqkm); Medium = Likely to cause temporary damage or over moderate area (0.25 to 0.5sqkm); Low = Likely to cause little, short-term damage and over small area (<0.25sqkm)

Environmental Screening Summary	
Project Name	**Supply and Installation of Solar PV Nano Grid**
Camp wise subprojects location (Camp KRC)	There is a Solar PV Nano grid will be constructed within the Camp KRC. These are-

	1. Kutupalong RC, Block F, Nearby Shed-64-room -1
Are the subprojects located in any environmentally sensitive locations?	
No. The proposed location for the Solar PV Nano Grid is not situated in any critical areas. These sites do not pose any risks or impact on sensitive habitats, major forest covers, or water bodies. Currently, the designated sites are observed to have open space without any environmental concerns. Therefore, the implementation of the Nano Grid in this location is expected to have no adverse effects on the surrounding environment.	
Are the subprojects located in elephant migration route?	
No. These have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).	
Will the construction of these components induce land degradation or landslide?	
The construction of the Solar PV Nano Grid component, which involves installing a steel container structure supported by four RCC pillars, is not expected to induce land degradation or trigger landslides. The selected location for the Nano Grid is situated on plain land with moderate vegetation cover, and this area does not have any significant inclinations or steep slopes. The use of the steel container structure eliminates the need for extensive excavation or heavy piling work. While minimal ground preparation and pillar installation may be required, the overall impact on the land is expected to be minimal. Therefore, the construction activities associated with the Nano Grid, utilizing the steel container structure and pillar installation, are unlikely to cause land degradation or pose landslide risks in the designated areas.	
Will the construction obstruct water cycle of the local area or pollute near water body and groundwater?	
No. The construction of the Solar PV Nano Grid will not obstruct the water cycle of the local area or cause pollution near water bodies and groundwater. The construction activities will be confined to the selected sites, which are not in close proximity to any significant water bodies that could be negatively impacted. Furthermore, the construction process does not involve heavy earth removal or cutting, minimizing the risk of disrupting the natural flow of water or causing sedimentation. Moreover, since the Nano Grid primarily rely on solar energy, there will be no direct discharge of pollutants into water bodies or groundwater. The construction and operation of the Solar PV Nano Grid aim to prioritize environmental sustainability and minimize any potential adverse effects on the water cycle and local water resources.	
Chances of Waste generation?	
The construction process involves the installation of a steel container control room which will be constructed on RCC footings. So minimal ground preparation and RCC pillar installation may be required. Due to the small scale of construction, there will be a little waste generation, primarily consisting of construction debris. This may include leftover brick chips, cement, wood, bamboo, plastics, wires etc. There will be no need for a labor shed, resulting in a reduced likelihood of generating organic waste, faecal waste, and kitchen waste during this phase. The container structure will be transported to the site using a truck and then installed on the pillars with the assistance of a crane. As a result, the construction process is expected to have minimal waste generation. However, it is important to ensure proper waste management practices are in place to handle any potential waste materials that may arise during transportation and installation.	
Any damage to existing vegetation or garden plants?	

The construction of the Solar PV Nano Grid will take place in open space, ensuring that there will be no damage caused to the existing vegetation or garden plants. The construction process involves the installation of a steel container control room, which measures 10ft*8ft*8.5ft and has a thickness of 2.3mm. The control room will be constructed on RCC footings. The positioning of the control room and the construction of the RCC footings will be carried out in a manner that avoids unnecessary disturbance to nearby plants and garden areas. If there are any plants or vegetation that need to be cleared or uprooted to accommodate the installation of the control room and RCC footings, efforts will be made to minimize the impact.
Will the project cause socio-economic disturbance?
The implementation of the Solar PV Nano Grid subproject is not anticipated to cause any significant socio-economic disturbances. The Nano grid site, which is located in open space, is identified as Government land. While the intervention may challenge existing socio-economic practices to some extent, arrangements have been made ensuring a mutually beneficial agreement. Clear communication and collaboration with the community will be maintained to address any concerns or issues that may arise. The project team will prioritize respectful engagement with local stakeholders to ensure their acceptance and participation in the process.
Violation of Environment, Health and Safety?
The construction of the Nano grid is expected to cause minimal environmental damage; there may still be some impacts on air and soil due to the construction activities. Environmental damage during the construction phase can occur primarily from noise and dust generation. Construction activities such as carrying container, cutting, heavy machinery, installation of poles, and wiring may generate noise and vibration that could potentially disturb the surrounding environment. Dust particles may be released into the air during excavation and construction, affecting air quality in the vicinity. There are several health and safety issues that need to be considered due to the presence of electricity and potential hazards during the construction phase. The installation of poles and electrical lines involves working with live electricity. The risk of electrical shocks, burns, and electrocution is a significant concern. Construction materials, such as paints, solvents, adhesives, and insulation materials, may contain hazardous substances. Construction activities may involve manual lifting, carrying, and moving of heavy equipment and materials. Improper lifting techniques and overexertion can lead to musculoskeletal injuries. Construction activities may require working at heights, such as during the installation of poles and overhead lines. Falls from heights pose a significant risk.
Availability of Labor camp and material storage Space?
The construction process involves the installation of a steel container control room which will be constructed on RCC footings. So minimal ground preparation and RCC pillar installation may be required. Due to the small scale of construction, hence there is no need for labor shed. The materials, including the poles, for the Nano grids will be stored either on the side of the road or in designated vacant spaces near each Nano grid. The site management or the Camp-in-Charge (CIC) will grant permission to store the required materials for the Nano grid within the camp premises. To ensure security during nighttime, there may be provisions for having night guards in place.
Availability of Utility Services?
Electricity is not available. Alternative measures such as solar power or generators will be considered. Due to the small scale of construction, hence there is no need for labor shed. As a result, there is no

necessity for a tube well in the proposed locations. Instead, during the construction phase, the contractor will arrange for a mobile water supply system to ensure a sufficient water source for the construction work. Additionally, the contractor will be responsible for providing temporary sanitation facilities. A portable or temporary sanitary system will be set up to cater to the basic hygiene needs of the workers during the construction period.
Availability of access road?
There is a road called the camp connecting road that will be used for transportation and delivering materials to the Nano grid in Camp KRC. It provides access for vehicles and ensures a route for transporting goods and supplies.
Whether e-waste will be produced during the O&M period and if yes, how will be managed?
Solar PV nano-grid and lead acid batteries will produce significant amount of e-wastes at the end of those products' defunct/ end-of-life stage. Except the nonreactive silica from the defunct solar panel, all other objects or substances, e.g., heavy metals, acid, electric parts and wires, etc. can pose serious threat to the environment as well as to human health. Yet, we don't have any formal facilities in Bangladesh to recycle or upcycle these wastes. However, the project has made a plan to manage all the wastes produced from solar system (street light, nano-grid, etc.) after the end-life of associated products, equipment, batteries, etc. One of the working vendors supplying and installing these solar systems is willing to take back all the wastes (non-functioning products, equipment, batteries, spare-parts, etc.) on its own cost and will manage those in cooperation with the manufacturing company which it is representing for. The project, hence, will come to an agreement (MoU) with that vendor by the end of this project or the end of the warranty period of their services, whichever comes first, in this regard.

Environmental Components (Physical/ Biological)	***Impact during the project life span***		
	PC	**OM**	**DE**
Noise	Low	Low	None
Air Pollution	Low	None	None
Soils	Low	None	None
Vibrations	Low	None	None
Surface Water	None	None	None
Groundwater	None	None	None
Flora	None	None	None
Fauna	None	None	None

Note: PC = Pre-construction and construction stages; OM = Operation and Maintenance Stage; DE = decommissioning stage. High = Likely to cause long-term impacts or over large area (>0.5sqkm); Medium = Likely to cause temporary damage or over moderate area (0.25 to 0.5sqkm); Low = Likely to cause little, short-term damage and over small area (<0.25sqkm)

Environmental Screening Summary	
Project Name	**Supply and Installation of Solar PV Nano Grid**
Camp wise subprojects location	There are 4 Solar PV Nano grids will be constructed within the Camp 14. These are-

(Camp 14)	1. Camp 14, Block A, Sub block A 01, beside WFP DP 2. Camp 14, Hakimpara CIC Office, Inside of CIC Office & Beside Water Tank 3. Camp 14, Block A, Sub block A05, Near A Block FIC Hub 4. Camp 14, Block C, Sub block C01, Beside SD Warehouse

Are the subprojects located in any environmentally sensitive locations?

No. The proposed locations for the Solar PV Nano Grids are not situated in any critical areas. These sites do not pose any risks or impact on sensitive habitats, major forest covers, or water bodies. Currently, the designated sites are observed to have open spaces without any environmental concerns. Therefore, the implementation of the Nano Grids in these locations is expected to have no adverse effects on the surrounding environment.

Are the subprojects located in elephant migration route?

No. These have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

Will the construction of these components induce land degradation or landslide?

The construction of the Solar PV Nano Grids component, which involves installing a steel container structure supported by four RCC pillars, is not expected to induce land degradation or trigger landslides. The selected locations for the Nano Grids are situated on plain land with moderate vegetation cover, and these areas do not have any significant inclinations or steep slopes. The use of the steel container structure eliminates the need for extensive excavation or heavy piling work. While minimal ground preparation and pillar installation may be required, the overall impact on the land is expected to be minimal. Therefore, the construction activities associated with the Nano Grids, utilizing the steel container structure and pillar installation, are unlikely to cause land degradation or pose landslide risks in the designated areas.

Will the construction obstruct water cycle of the local area or pollute near water body and groundwater?

No. The construction of the Solar PV Nano Grids will not obstruct the water cycle of the local area or cause pollution near water bodies and groundwater. The construction activities will be confined to the selected sites, which are not in close proximity to any significant water bodies that could be negatively impacted. Furthermore, the construction process does not involve heavy earth removal or cutting, minimizing the risk of disrupting the natural flow of water or causing sedimentation. Moreover, since the Nano Grids primarily rely on solar energy, there will be no direct discharge of pollutants into water bodies or groundwater. The construction and operation of the Solar PV Nano Grid aim to prioritize environmental sustainability and minimize any potential adverse effects on the water cycle and local water resources.

Chances of Waste generation?

The construction process involves the installation of a steel container control room which will be constructed on RCC footings. So minimal ground preparation and RCC pillar installation may be required. Due to the small scale of construction, there will be a little waste generation, primarily consisting of construction debris. This may include leftover brick chips, cement, wood, bamboo, plastics, wires etc. There will be no need for a labor shed, resulting in a reduced likelihood of generating organic waste, faecal waste, and kitchen waste during this phase.

The container structure will be transported to the site using a truck and then installed on the pillars

with the assistance of a crane. As a result, the construction process is expected to have minimal waste generation. However, it is important to ensure proper waste management practices are in place to handle any potential waste materials that may arise during transportation and installation.

Any damage to existing vegetation or garden plants?

The construction of the Solar PV Nano Grids will take places in open spaces, ensuring that there will be no damage caused to the existing vegetation or garden plants. The construction process involves the installation of a steel container control room, which measures 10ft*8ft*8.5ft and has a thickness of 2.3mm. The control room will be constructed on RCC footings. The positioning of the control room and the construction of the RCC footings will be carried out in a manner that avoids unnecessary disturbance to nearby plants and garden areas. If there are any plants or vegetation that need to be cleared or uprooted to accommodate the installation of the control room and RCC footings, efforts will be made to minimize the impact.

Will the project cause socio-economic disturbance?

The implementation of the Solar PV Nano Grid subproject is not anticipated to cause any significant socio-economic disturbances. The Nano grids site, which is located in open spaces, is identified as Government land. While the intervention may challenge existing socio-economic practices to some extent, arrangements have been made ensuring a mutually beneficial agreement.

Clear communication and collaboration with the community will be maintained to address any concerns or issues that may arise. The project team will prioritize respectful engagement with local stakeholders to ensure their acceptance and participation in the process.

Violation of Environment, Health and Safety?

The constructions of the Nano grids are expected to cause minimal environmental damage; there may still be some impacts on air and soil due to the construction activities. Environmental damage during the construction phase can occur primarily from noise and dust generation. Construction activities such as carrying container, cutting, heavy machinery, installation of poles, and wiring may generate noise and vibration that could potentially disturb the surrounding environment. Dust particles may be released into the air during excavation and construction, affecting air quality in the vicinity.

There are several health and safety issues that need to be considered due to the presence of electricity and potential hazards during the construction phase. The installation of poles and electrical lines involves working with live electricity. The risk of electrical shocks, burns, and electrocution is a significant concern. Construction materials, such as paints, solvents, adhesives, and insulation materials, may contain hazardous substances. Construction activities may involve manual lifting, carrying, and moving of heavy equipment and materials. Improper lifting techniques and overexertion can lead to musculoskeletal injuries. Construction activities may require working at heights, such as during the installation of poles and overhead lines. Falls from heights pose a significant risk.

Availability of Labor camp and material storage Space?

The construction process involves the installation of a steel container control room which will be constructed on RCC footings. So minimal ground preparation and RCC pillar installation may be required. Due to the small scale of construction, hence there is no need for labor shed.

The materials, including the poles, for the Nano grids will be stored either on the side of the road or in

designated vacant spaces near each Nano grid. The site management or the Camp-in-Charge (CIC) will grant permission to store the required materials for the Nano grid within the camp premises. To ensure security during nighttime, there may be provisions for having night guards in place.
Availability of Utility Services?
Electricity is not available. Alternative measures such as solar power or generators will be considered. Due to the small scale of construction, hence there is no need for labor shed. As a result, there is no necessity for a tube well in the proposed locations. Instead, during the construction phase, the contractor will arrange for a mobile water supply system to ensure a sufficient water source for the construction work. Additionally, the contractor will be responsible for providing temporary sanitation facilities. A portable or temporary sanitary system will be set up to cater to the basic hygiene needs of the workers during the construction period.
Availability of access road?
There is a road called the camp 14 connecting road that will be used for transportation and delivering materials to the 4 Nano grids in Camp 14. It provides access for vehicles and ensures a route for transporting goods and supplies.
Whether e-waste will be produced during the O&M period and if yes, how will be managed?
Solar PV nano-grid and lead acid batteries will produce significant amount of e-wastes at the end of those products' defunct/ end-of-life stage. Except the nonreactive silica from the defunct solar panel, all other objects or substances, e.g., heavy metals, acid, electric parts and wires, etc. can pose serious threat to the environment as well as to human health. Yet, we don't have any formal facilities in Bangladesh to recycle or upcycle these wastes. However, the project has made a plan to manage all the wastes produced from solar system (street light, nano-grid, etc.) after the end-life of associated products, equipment, batteries, etc. One of the working vendors supplying and installing these solar systems is willing to take back all the wastes (non-functioning products, equipment, batteries, spare-parts, etc.) on its own cost and will manage those in cooperation with the manufacturing company which it is representing for. The project, hence, will come to an agreement (MoU) with that vendor by the end of this project or the end of the warranty period of their services, whichever comes first, in this regard.

Environmental Components (Physical/ Biological)	***Impact during the project life span***		
	PC	**OM**	**DE**
Noise	Low	Low	None
Air Pollution	Low	None	None
Soils	Low	None	None
Vibrations	Low	None	None
Surface Water	None	None	None
Groundwater	None	None	None
Flora	None	None	None
Fauna	None	None	None

Note: PC = Pre-construction and construction stages; OM = Operation and Maintenance Stage; DE = decommissioning stage. High = Likely to cause long-term impacts or over large area (>0.5sqkm); Medium = Likely to cause temporary damage or over moderate area (0.25 to 0.5sqkm); Low = Likely to cause little, short-term damage and over small area (<0.25sqkm)

Environmental Screening Summary	
Project Name	**Supply and Installation of Solar PV Nano Grid**
Camp wise subprojects location (Camp 09)	There are 2 Solar PV Nano grids will be constructed within the Camp 09. These are- 1. Camp 9, Block G, Sub block G20, Opposite of CIC office boundary, Beside Turkish hospital 2. Camp 9, Block D, Sub block D2, Inside of APBN office, Beside the watch tower
Are the subprojects located in any environmentally sensitive locations?	
No. The proposed locations for the Solar PV Nano Grids are not situated in any critical areas. These sites do not pose any risks or impact on sensitive habitats, major forest covers, or water bodies. Currently, the designated sites are observed to have open spaces without any environmental concerns. Therefore, the implementation of the Nano Grids in these locations is expected to have no adverse effects on the surrounding environment.	
Are the subprojects located in elephant migration route?	
No. These have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).	
Will the construction of these components induce land degradation or landslide?	
The construction of the Solar PV Nano Grids component, which involves installing a steel container structure supported by four RCC pillars, is not expected to induce land degradation or trigger landslides. The selected locations for the Nano Grids are situated on plain land with moderate vegetation cover, and these areas do not have any significant inclinations or steep slopes. The use of the steel container structure eliminates the need for extensive excavation or heavy piling work. While minimal ground preparation and pillar installation may be required, the overall impact on the land is expected to be minimal. Therefore, the construction activities associated with the Nano Grids, utilizing the steel container structure and pillar installation, are unlikely to cause land degradation or pose landslide risks in the designated areas.	
Will the construction obstruct water cycle of the local area or pollute near water body and groundwater?	
No. The construction of the Solar PV Nano Grids will not obstruct the water cycle of the local area or cause pollution near water bodies and groundwater. The construction activities will be confined to the selected sites, which are not in close proximity to any significant water bodies that could be negatively impacted. Furthermore, the construction process does not involve heavy earth removal or cutting, minimizing the risk of disrupting the natural flow of water or causing sedimentation. Moreover, since the Nano Grids primarily rely on solar energy, there will be no direct discharge of pollutants into water bodies or groundwater. The construction and operation of the Solar PV Nano Grid aim to prioritize environmental sustainability and minimize any potential adverse effects on the water cycle and local water resources.	
Chances of Waste generation?	
The construction process involves the installation of a steel container control room which will be constructed on RCC footings. So minimal ground preparation and RCC pillar installation may be	

required. Due to the small scale of construction, there will be a little waste generation, primarily consisting of construction debris. This may include leftover brick chips, cement, wood, bamboo, plastics, wires etc. There will be no need for a labor shed, resulting in a reduced likelihood of generating organic waste, faecal waste, and kitchen waste during this phase.

The container structure will be transported to the site using a truck and then installed on the pillars with the assistance of a crane. As a result, the construction process is expected to have minimal waste generation. However, it is important to ensure proper waste management practices are in place to handle any potential waste materials that may arise during transportation and installation.

Any damage to existing vegetation or garden plants?

The construction of the Solar PV Nano Grids will take places in open spaces, ensuring that there will be no damage caused to the existing vegetation or garden plants. The construction process involves the installation of a steel container control room, which measures 10ft*8ft*8.5ft and has a thickness of 2.3mm. The control room will be constructed on RCC footings. The positioning of the control room and the construction of the RCC footings will be carried out in a manner that avoids unnecessary disturbance to nearby plants and garden areas. If there are any plants or vegetation that need to be cleared or uprooted to accommodate the installation of the control room and RCC footings, efforts will be made to minimize the impact.

Will the project cause socio-economic disturbance?

The implementation of the Solar PV Nano Grid subproject is not anticipated to cause any significant socio-economic disturbances. The Nano grids site, which is located in open spaces, is identified as Government land. While the intervention may challenge existing socio-economic practices to some extent, arrangements have been made ensuring a mutually beneficial agreement.

Clear communication and collaboration with the community will be maintained to address any concerns or issues that may arise. The project team will prioritize respectful engagement with local stakeholders to ensure their acceptance and participation in the process.

Violation of Environment, Health and Safety?

The constructions of the Nano grids are expected to cause minimal environmental damage; there may still be some impacts on air and soil due to the construction activities. Environmental damage during the construction phase can occur primarily from noise and dust generation. Construction activities such as carrying container, cutting, heavy machinery, installation of poles, and wiring may generate noise and vibration that could potentially disturb the surrounding environment. Dust particles may be released into the air during excavation and construction, affecting air quality in the vicinity.

There are several health and safety issues that need to be considered due to the presence of electricity and potential hazards during the construction phase. The installation of poles and electrical lines involves working with live electricity. The risk of electrical shocks, burns, and electrocution is a significant concern. Construction materials, such as paints, solvents, adhesives, and insulation materials, may contain hazardous substances. Construction activities may involve manual lifting, carrying, and moving of heavy equipment and materials. Improper lifting techniques and overexertion can lead to musculoskeletal injuries. Construction activities may require working at heights, such as during the installation of poles and overhead lines. Falls from heights pose a significant risk.

Availability of Labor camp and material storage Space?

The construction process involves the installation of a steel container control room which will be constructed on RCC footings. So minimal ground preparation and RCC pillar installation may be required. Due to the small scale of construction, hence there is no need for labor shed.

The materials, including the poles, for the Nano grids will be stored either on the side of the road or in designated vacant spaces near each Nano grid. The site management or the Camp-in-Charge (CIC) will grant permission to store the required materials for the Nano grid within the camp premises. To ensure security during nighttime, there may be provisions for having night guards in place.

Availability of Utility Services?

Electricity is not available. Alternative measures such as solar power or generators will be considered. Due to the small scale of construction, hence there is no need for labor shed. As a result, there is no necessity for a tube well in the proposed locations. Instead, during the construction phase, the contractor will arrange for a mobile water supply system to ensure a sufficient water source for the construction work. Additionally, the contractor will be responsible for providing temporary sanitation facilities. A portable or temporary sanitary system will be set up to cater to the basic hygiene needs of the workers during the construction period.

Availability of access road?

There is a road called the camp 9 connecting road that will be used for transportation and delivering materials to the 2 Nano grids in Camp 09. It provides access for vehicles and ensures a route for transporting goods and supplies.

Whether e-waste will be produced during the O&M period and if yes, how will be managed?

Solar PV nano-grid and lead acid batteries will produce significant amount of e-wastes at the end of those products' defunct/ end-of-life stage. Except the nonreactive silica from the defunct solar panel, all other objects or substances, e.g., heavy metals, acid, electric parts and wires, etc. can pose serious threat to the environment as well as to human health. Yet, we don't have any formal facilities in Bangladesh to recycle or upcycle these wastes.

However, the project has made a plan to manage all the wastes produced from solar system (street light, nano-grid, etc.) after the end-life of associated products, equipment, batteries, etc. One of the working vendors supplying and installing these solar systems is willing to take back all the wastes (non-functioning products, equipment, batteries, spare-parts, etc.) on its own cost and will manage those in cooperation with the manufacturing company which it is representing for. The project, hence, will come to an agreement (MoU) with that vendor by the end of this project or the end of the warranty period of their services, whichever comes first, in this regard.

Environmental Components (Physical/ Biological)	***Impact during the project life span***		
	PC	**OM**	**DE**
Noise	Low	Low	None
Air Pollution	Low	None	None
Soils	Low	None	None
Vibrations	Low	None	None
Surface Water	None	None	None
Groundwater	None	None	None
Flora	None	None	None

Fauna	None	None	None

Note: PC = Pre-construction and construction stages; OM = Operation and Maintenance Stage; DE = decommissioning stage. High = Likely to cause long-term impacts or over large area (>0.5sqkm); Medium = Likely to cause temporary damage or over moderate area (0.25 to 0.5sqkm); Low = Likely to cause little, short-term damage and over small area (<0.25sqkm)

Environmental Screening Summary	
Project Name	**Supply and Installation of Solar PV Nano Grid**
Camp wise subprojects location (Camp 22)	There is a Solar PV Nano grid will be constructed within the Camp KRC. These are- 1. Camp 22, Block B, Sub block B2, Inside of Madrasa
Are the subprojects located in any environmentally sensitive locations?	
No. The proposed location for the Solar PV Nano Grid is not situated in any critical areas. These sites do not pose any risks or impact on sensitive habitats, major forest covers, or water bodies. Currently, the designated sites are observed to have open space without any environmental concerns. Therefore, the implementation of the Nano Grid in this location is expected to have no adverse effects on the surrounding environment.	
Are the subprojects located in elephant migration route?	
No. These have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).	
Will the construction of these components induce land degradation or landslide?	
The construction of the Solar PV Nano Grid component, which involves installing a steel container structure supported by four RCC pillars, is not expected to induce land degradation or trigger landslides. The selected location for the Nano Grid is situated on plain land with moderate vegetation cover, and this area does not have any significant inclinations or steep slopes. The use of the steel container structure eliminates the need for extensive excavation or heavy piling work. While minimal ground preparation and pillar installation may be required, the overall impact on the land is expected to be minimal. Therefore, the construction activities associated with the Nano Grid, utilizing the steel container structure and pillar installation, are unlikely to cause land degradation or pose landslide risks in the designated areas.	
Will the construction obstruct water cycle of the local area or pollute near water body and groundwater?	
No. The construction of the Solar PV Nano Grid will not obstruct the water cycle of the local area or cause pollution near water bodies and groundwater. The construction activities will be confined to the selected sites, which are not in close proximity to any significant water bodies that could be negatively impacted. Furthermore, the construction process does not involve heavy earth removal or cutting, minimizing the risk of disrupting the natural flow of water or causing sedimentation. Moreover, since the Nano Grid primarily rely on solar energy, there will be no direct discharge of pollutants into water bodies or groundwater. The construction and operation of the Solar PV Nano Grid aim to prioritize environmental sustainability and minimize any potential adverse effects on the water cycle and local water resources.	
Chances of Waste generation?	

The construction process involves the installation of a steel container control room which will be constructed on RCC footings. So minimal ground preparation and RCC pillar installation may be required. Due to the small scale of construction, there will be a little waste generation, primarily consisting of construction debris. This may include leftover brick chips, cement, wood, bamboo, plastics, wires etc. There will be no need for a labor shed, resulting in a reduced likelihood of generating organic waste, faecal waste, and kitchen waste during this phase.

The container structure will be transported to the site using a truck and then installed on the pillars with the assistance of a crane. As a result, the construction process is expected to have minimal waste generation. However, it is important to ensure proper waste management practices are in place to handle any potential waste materials that may arise during transportation and installation.

Any damage to existing vegetation or garden plants?

The construction of the Solar PV Nano Grid will take place in open space, ensuring that there will be no damage caused to the existing vegetation or garden plants. The construction process involves the installation of a steel container control room, which measures 10ft*8ft*8.5ft and has a thickness of 2.3mm. The control room will be constructed on RCC footings. The positioning of the control room and the construction of the RCC footings will be carried out in a manner that avoids unnecessary disturbance to nearby plants and garden areas. If there are any plants or vegetation that need to be cleared or uprooted to accommodate the installation of the control room and RCC footings, efforts will be made to minimize the impact.

Will the project cause socio-economic disturbance?

The implementation of the Solar PV Nano Grid subproject is not anticipated to cause any significant socio-economic disturbances. The Nano grid site, which is located in open space, is identified as Government land. While the intervention may challenge existing socio-economic practices to some extent, arrangements have been made ensuring a mutually beneficial agreement.

Clear communication and collaboration with the community will be maintained to address any concerns or issues that may arise. The project team will prioritize respectful engagement with local stakeholders to ensure their acceptance and participation in the process.

Violation of Environment, Health and Safety?

The construction of the Nano grid is expected to cause minimal environmental damage; there may still be some impacts on air and soil due to the construction activities. Environmental damage during the construction phase can occur primarily from noise and dust generation. Construction activities such as carrying container, cutting, heavy machinery, installation of poles, and wiring may generate noise and vibration that could potentially disturb the surrounding environment. Dust particles may be released into the air during excavation and construction, affecting air quality in the vicinity.

There are several health and safety issues that need to be considered due to the presence of electricity and potential hazards during the construction phase. The installation of poles and electrical lines involves working with live electricity. The risk of electrical shocks, burns, and electrocution is a significant concern. Construction materials, such as paints, solvents, adhesives, and insulation materials, may contain hazardous substances. Construction activities may involve manual lifting, carrying, and moving of heavy equipment and materials. Improper lifting techniques and overexertion can lead to musculoskeletal injuries. Construction activities may require working at heights, such as

during the installation of poles and overhead lines. Falls from heights pose a significant risk.

Availability of Labor camp and material storage Space?

The construction process involves the installation of a steel container control room which will be constructed on RCC footings. So minimal ground preparation and RCC pillar installation may be required. Due to the small scale of construction, hence there is no need for labor shed.

The materials, including the poles, for the Nano grids will be stored either on the side of the road or in designated vacant spaces near each Nano grid. The site management or the Camp-in-Charge (CIC) will grant permission to store the required materials for the Nano grid within the camp premises. To ensure security during nighttime, there may be provisions for having night guards in place.

Availability of Utility Services?

Electricity is not available. Alternative measures such as solar power or generators will be considered. Due to the small scale of construction, hence there is no need for labor shed. As a result, there is no necessity for a tube well in the proposed locations. Instead, during the construction phase, the contractor will arrange for a mobile water supply system to ensure a sufficient water source for the construction work. Additionally, the contractor will be responsible for providing temporary sanitation facilities. A portable or temporary sanitary system will be set up to cater to the basic hygiene needs of the workers during the construction period.

Availability of access road?

There is a road called the camp 22 connecting road that will be used for transportation and delivering materials to the Nano grid in Camp 22. It provides access for vehicles and ensures a route for transporting goods and supplies.

Whether e-waste will be produced during the O&M period and if yes, how will be managed?

Solar PV nano-grid and lead acid batteries will produce significant amount of e-wastes at the end of those products' defunct/ end-of-life stage. Except the nonreactive silica from the defunct solar panel, all other objects or substances, e.g., heavy metals, acid, electric parts and wires, etc. can pose serious threat to the environment as well as to human health. Yet, we don't have any formal facilities in Bangladesh to recycle or upcycle these wastes.

However, the project has made a plan to manage all the wastes produced from solar system (street light, nano-grid, etc.) after the end-life of associated products, equipment, batteries, etc. One of the working vendors supplying and installing these solar systems is willing to take back all the wastes (non-functioning products, equipment, batteries, spare-parts, etc.) on its own cost and will manage those in cooperation with the manufacturing company which it is representing for. The project, hence, will come to an agreement (MoU) with that vendor by the end of this project or the end of the warranty period of their services, whichever comes first, in this regard.

Environmental Components (Physical/ Biological)	***Impact during the project life span***		
	PC	**OM**	**DE**
Noise	Low	Low	None
Air Pollution	Low	None	None
Soils	Low	None	None
Vibrations	Low	None	None
Surface Water	None	None	None

Groundwater	None	None	None
Flora	None	None	None
Fauna	None	None	None

Note: PC = Pre-construction and construction stages; OM = Operation and Maintenance Stage; DE = decommissioning stage. High = Likely to cause long-term impacts or over large area (>0.5sqkm); Medium = Likely to cause temporary damage or over moderate area (0.25 to 0.5sqkm); Low = Likely to cause little, short-term damage and over small area (<0.25sqkm)

There is no evidence of presence of elephants in the subproject area. A few incidents of human elephant conflict were reported in 2018. The IUCN has conducted a study on such conflict. With the support from UNHCR, IUCN has been marking elephant routs and corridors and informing local communities and stakeholders of avoiding the marked areas. As part of the mitigation options, different initiatives have been undertaken, such as formation and capacity development of Elephant Response Teams (ERTs); providing equipment to ERTs to divert in-coming elephants; and setting up elephant deterrent tools (e.g., trip alarms and watch-towers). Though the current chances of occurrence of conflicting incidence are becoming narrow, any recurrence would be managed by the ERTs and they will be called if there appears any minute possibility to recur. Appendix-4 presents a map of elephant routes of Ukhiya and Teknaf Upazila which is prepared by the IUCN.

In order to offset the loss or attenuating the environmental degradation, a set of mitigation measures will be adopted, on top of general practice of standard construction procedure or following the relevant codes of practices.

3.3 Climate Change Impact Screening

3.3.1 General Overview of the area

Cox's Bazar is one of the coastal districts of Bangladesh and is prone to the effects of climate change due to its geomorphological siting and climate induced effects. The hilly tracts of Cox's Bazar could foster further environmental crisis brought on by indiscriminate deforestation and diminishing groundwater reservoirs, which have been taken place in recent months as the Rohingya crisis evolved. A recent study conducted by World Bank[3] has found that Cox's Bazar will be the worst-hit district in South Asia as average temperatures rise and rainfall patterns become disruptive, by 2050, if greenhouse gas emissions continue unabated.

The hilly region of the country, especially the part in Cox's Bazar is characteristically of muddy soil structure, not of any rocky formation and the stability comes from the roots of the trees. Also rainfall, proximity to the sea, elevation, and land cover are very important factors for analyzing the risk of cyclone. Denudation of trees from hilltops in order for the huge settlement of Rohingya people has already increased the vulnerability to the risk of hill collapse by destabilizing the terrain. Also deforestation at a rapid speed uncovers the land and raise the risk of occurrence of cyclones, as forests protect land from high wind and storm surges where demolishing the trees would make the area vulnerable.

Together with the above-mentioned hazardous situation, again due to sudden extraction of huge amount of groundwater, availability of potable water from shallow tube wells that pump water up

[3] https://openknowledge.worldbank.org/bitstream/handle/10986/28723/9781464811555.pdf

from about 150 feet has already reached to a critical level. Averting the problem requires new tube wells to be plumbing deeper into the poorly mapped aquifer, but going deeper than 700 feet in some places may cause salt water to contaminate freshwater resources.

3.3.2 Site Specific Screening and outcome

Climate Change impact on a particular subproject is tough to deduce as the highest resolution of climate model simulation done over Bangladesh is 50km. Depending on the simulation ensemble of Cox's Bazar district, the temperature and precipitation are likely to increase with time.

The impact of cyclone and precipitation has higher impact in this area, Intensity of precipitation has increased according to the participants and number of cyclones has been seen to have increased in the past few years. Salinity has not been found in the vicinity of the target locations. Cyclonic storm surge has medium impact in the proposed areas. Temperature has increased and thus has medium impact on the area and Thunder storm has been seen to have increase and is found to have highest impact in the area. Water stagnation has not been found. Drainage channel has not been found in the target areas.

As compared to the entire district area or a 50km resolution for model simulation, the proposed sites are trivial point for impact generation, having minor footprints in respect to climate change effects. Yet, to avoid the devastation caused by the growing thunderstorm events, conventional lightning protection system (copper rod to be used as a lightning arrester) should be employed to the proposed facilities. Solar power as energy sources is suggested to be incorporated in the design and to be implemented as part of the construction of these Solar PV Nano Grids. As there is very low impact of cyclonic storm surge in the area the mitigation measures for flooding potential are not provided here.

4. ENVIRONMENTAL AND SOCIAL PROTECTION/SAFEGUARDS

It is important to address the environmental and social aspects to ensure effective safeguarding. The potential impacts associated with this project are primarily construction-related and can be mitigated through the implementation of good engineering practices, proper material management, and adherence to health and safety protocols.

The construction process involves the installation of a steel container control room which will be constructed on RCC footings. Hence, minimal ground preparation and RCC pillar installation may be required. Due to the small scale of construction, a very little amount of dust will be generated during the construction phases. The contractor will be responsible for adopting the best practices in debris management and implementing regular dust control measures, such as spraying water, to minimize any potential adverse effects. Construction activities involving equipment, such as drilling, cutting, and heavy machinery, can generate high levels of noise and vibrations. To minimize noise and vibration associated with the construction activities of the Nano grid, the contractor will be responsible for adopting the best practices in line with regulations. Regular maintenance and calibration of construction equipment, including cutting tools, cranes, and trucks, are crucial to ensuring they operate efficiently and produce minimal noise and vibration. Proper lubrication, alignment, and inspection of machinery can help mitigate any excessive noise or vibration generation. Close attention will be given to activities that may have an impact on the surrounding

environment, and appropriate mitigation measures will be applied with careful consideration and vigilance.

To prioritize the safety of workers and the local community, the contractor will provide thorough training to their staff and workers. This training will cover best practices in construction, health and safety protocols, and efficient site management. Additionally, awareness sessions will be conducted to promote understanding of the project's environmental goals and the importance of safeguarding measures. Records of these training sessions will be kept on-site for effective monitoring and management.

The sub-project includes an environmental management plan, outlined in Appendix-5, which contains specific guidelines and measures for each phase of the Nano grid project. This plan ensures that environmental concerns are addressed proactively, and a monitoring program is in place to assess the effectiveness of the mitigation measures.

By following these measures and implementing the environmental management plan, the project aims to minimize and control any potential environmental impacts associated with the construction and operation of the Nano grid. This approach contributes to the sustainable development of the area and fosters acceptance from the local community.

On the bright side, each of the Nano-grid facilities equipped with Solar Powered electricity supply system with a capacity of 8 KW, would help reducing the CO2 emission to 8.76 Tons per year, considering a conservative estimation of reduction (Ref. CO2 Emission Reduction : Results - Solar Mango – #1 guide for solar; considering 250 days of sunshine each year).

5. CONCLUSION AND RECOMMENDATIONS

The overall conclusion is that if the mitigation, compensation and enhancement measures are implemented in full, there will be no significant negative environmental impacts in regards to the selection of location, design, construction, and/or operation procedure of the proposed Sub-project. There will in fact be tremendous benefits from recommended mitigation and enhancement measures and major improvements in quality of life and ensuring social safety and security for adjacent community will be achieved once the scheme is in operation.

The conclusions of the screening study can be summarized as follows:

- None of the proposed Solar PV Nano grid sites are located in or near to any environmentally sensitive sites/areas, nor will cause any significant detrimental impacts during the construction period.
- The Nano grid will enhance safety and security measures in the community. This will provide a safer environment for women and children, especially during nighttime hours. This will contribute to their overall well-being and peace of mind.
- The Nano grid will power educational facilities in the camp area, such as schools and learning centers benefiting children in the community. With electricity, these educational

institutions can provide better lighting, and extend study hours. This will improve access to quality education and empower children with knowledge and skills for their future.

- The availability of electricity in healthcare facilities in the camp area supported by the Nano grid will improve access to quality healthcare services for women and children. Powered medical equipment and lighting will enhance the provision of healthcare, leading to improved maternal and child health outcomes.
- The Nano grid utilizes solar photovoltaic (PV) technology to generate electricity. By harnessing clean and renewable solar energy, the Nano grid will significantly reduce reliance on fossil fuel-based power sources. This leads to a reduction in carbon emissions, helping to mitigate climate change and improve air quality in the local environment.
- The short-term negative impacts that may come by the way of air quality, noise, solid waste, occupational health & safety during the construction period, that need to be minimized through management plan. Management problems are common and should be taken into consideration.
- The project will create employment for those who live in the vicinity of the construction site and will provide them a short-term economic gain.
- A comprehensive Environmental and social Management Plan (ESMP) has been prepared to mitigate and reduce the adverse impacts that will come out from the project activities.

Appendix-01: List of Participants in the Consultation Meetings

Supply and Installation of Solar PV Nano Grid

Consultation of Camp 18

Package Number : EMCRP/AF/G-19

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)

জরুরী ভিত্তিতে রোহিঙ্গা সংকট মোকাবেলায় মাল্টি সেক্টর প্রকল্প

Local Government Engineering Department (LGED)

Public Consultation Participants List

Focus Group Discussion

Upazila: Ukhiya
Time: 1:30 pm.
District: Cox's Bazar
Dated: 13.11.2023
Purpose of consultation: Supply and Installation of Solar PV Nano Grid.
Place of meeting: CIC office, Conference Room, Camp-18.

Sl. No.	Name	Designation	Signature
01	S.M. Ishtiaque Shahriar	C;C	
02	Anam Md. Sharif.	CMO	
03	Ahmed Yusuf Jamil	FA	
04	Kaisar Uddin	+ L (IOM)	
05	Md. Ekramul Hasan Moridha	camp officer. PMO BDRCS	
06.	Zahidul Islam Bepul	Asst. WaSH officer	
07	Md. Sakhawat Hossain	officer case work	
08	Nurul Islam	T.A	
09	Abdul Momin Mamun	O. CM (SCI)	
10	Md. Riayel	C.O.O	
11	ATM Mamunul Arif	PO (BITA)	
12	Dr. Anuthu Sarker	Medical Officer PHD - UNICEF	
13	Md. Ahsan Habib	CHS - PHD - SCI	
14	Md. Abdur Rahman	Team Leader PCUSEP&D.	

Figure: Attendance of consultation meeting for Camp No. 18 (Part 1)

Supply and Installation of Solar PV Nano Grid
Consultation of Camp 18
Package Number : EMCRP/AF/G-19

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)
জরুরী ভিত্তিতে রোহিঙ্গা সংকট মোকাবেলায় বহুখাতে সেক্টর প্রকল্প
Local Government Engineering Department (LGED)
Public Consultation Participants List

Focus Group Discussion

Upazila: Ukhiya
Time: 1:30 pm
Purpose of consultation: Supply and Installation of Solar PV Nano Grid.
Place of meeting: CIC Office, Conference Room, Camp-18

District: Cox's Bazar
Dated: 13.11.2023

Sl. No.	Name	Designation	Signature
15	Md. Mostakim	Project Officer	
16	Afruza Sultana	Manager-ALPWE	

Figure: Attendance of consultation meeting for Camp No. 18 (Part 2)

Supply and Installation of Solar PV Nano Grid

Consultation of Camp 11, Camp 12 & Camp 14

Package Number : EMCRP/AF/G-19

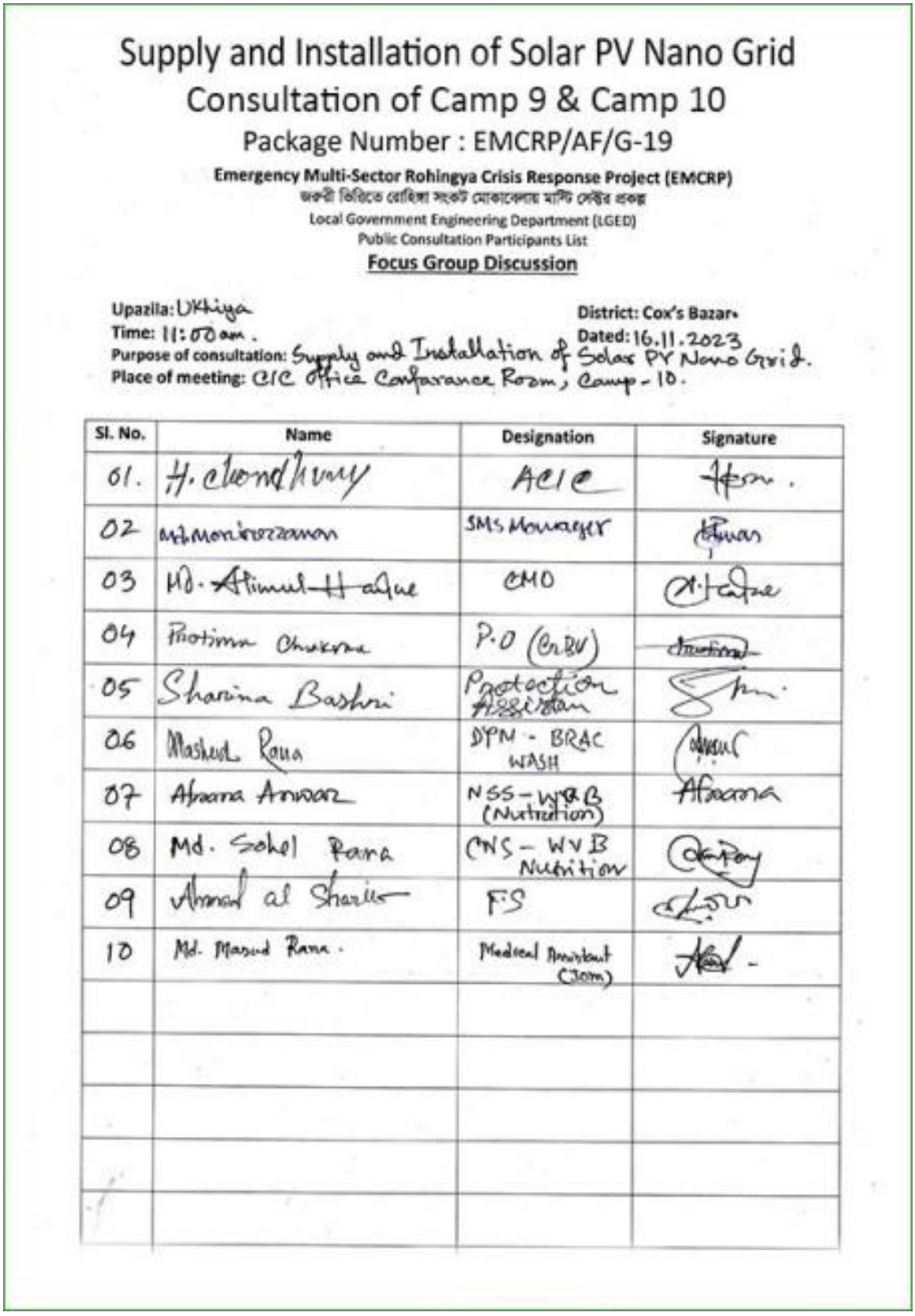
Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)
জরুরী ভিত্তিতে রোহিঙ্গা সংকট মোকাবেলায় মাল্টি সেক্টর প্রকল্প
Local Government Engineering Department (LGED)
Public Consultation Participants List

Focus Group Discussion

Upazila: Ukhiya — District: Cox's Bazar
Time: 1:45 pm — Dated: 15.11.2023
Purpose of consultation: Supply and Installation of Solar PV Nano Grid.
Place of meeting: Conference Room, Camp-11, CIC Office.

Sl. No.	Name	Designation	Signature
01.	MD. Al-Imran	Camp-In-charge Camp 11, 12, 14	15.11.2023
02.	Mohammad Monir Hossain	ACiC, Camp 11, 12 & 14.	Monir 15.11.2023
03.	Md. Sohel Rana	CMO Camp-14	Rana
04.	Md. Amran Hossain	Sub-Assistant Engineer Camp-11.	
05	Touhidul Islam	CMO Camp-12	15.11.2023
06	Syed Abul Bashar	PM-CCCM C-12-DRC	
07.	Md. Sirajus Salekin	SFOA(SMS), IOM Camp 14	
08.	NOOR	SFOA(SMS) C11	

Figure: Attendance of consultation meeting for Camp 11, 12 & 14



Supply and Installation of Solar PV Nano Grid
Consultation of Camp 9 & Camp 10
Package Number : EMCRP/AF/G-19

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)
জরুরী ভিত্তিতে রোহিঙ্গা সংকট মোকাবেলায় মাল্টি সেক্টর প্রকল্প
Local Government Engineering Department (LGED)
Public Consultation Participants List
Focus Group Discussion

Upazila: Ukhiya
Time: 11:00 am.
Purpose of consultation: Supply and Installation of Solar PV Nano Grid.
Place of meeting: CIC Office Conference Room, Camp-10.
District: Cox's Bazar.
Dated: 16.11.2023

Sl. No.	Name	Designation	Signature
01.	H. Chowdhury	ACIC	
02	Md. Monirozzaman	SMS Manager	
03	Md. Atimul Haque	CMO	
04	Protima Chakma	P.O (CwBV)	
05	Sharina Bashir	Protection Assistant	
06	Mashud Rana	DPM - BRAC WASH	
07	Afsana Anwar	NSS - WVB (Nutrition)	
08	Md. Sohel Rana	CNS - WVB Nutrition	
09	Ahmad al Sharif	FS	
10	Md. Masud Rana.	Medical Assistant (Com)	

Figure: Attendance of consultation meeting for Camp No.9 & 10

Supply and Installation of Solar PV Nano Grid

Consultation of Camp 2W & Kutupalong RC

Package Number : EMCRP/AF/G-19

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)
জরুরী ভিত্তিতে রোহিঙ্গা সংকট মোকাবেলায় মাল্টি সেক্টর প্রকল্প
Local Government Engineering Department (LGED)
Public Consultation Participants List

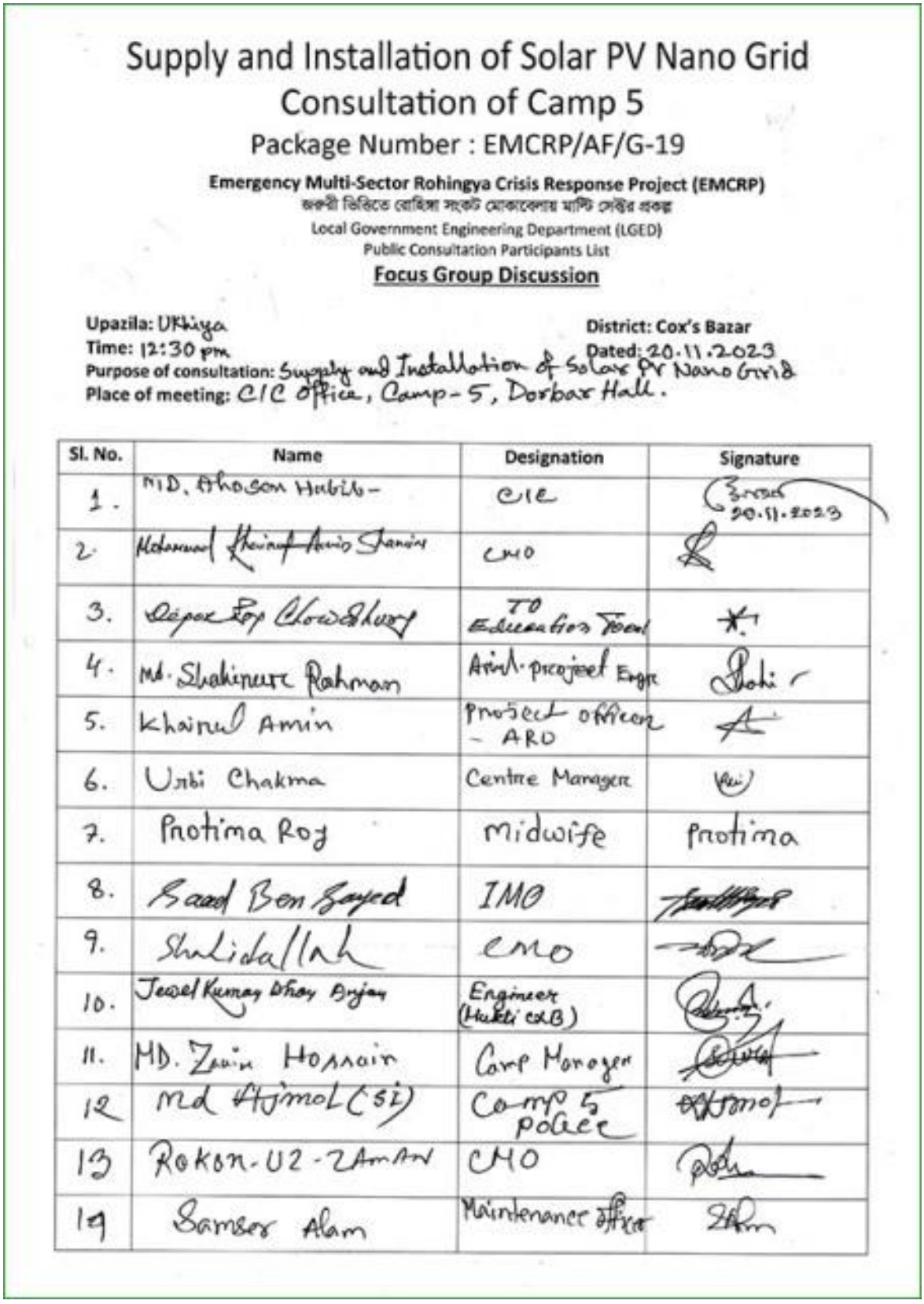
Focus Group Discussion

Upazila: Ukhiya
Time: 11:00 am
Purpose of consultation: Supply and Installation of Solar PV Nano Grid.
Place of meeting: CIC office Room, Camp-2W.

District: Cox's Bazar
Dated: 14.11.2023

Sl. No.	Name	Designation	Signature
01.	Md. Shaed Iqbal	CiC	
02.	Md. Rayhan Ali	AsiC	
03.	Md. Shah Johar	CMO	

Figure: Attendance of consultation meeting for Camp 2W & KRC



Supply and Installation of Solar PV Nano Grid
Consultation of Camp 5
Package Number : EMCRP/AF/G-19

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)
জরুরী ভিত্তিতে রোহিঙ্গা সংকট মোকাবেলায় বহুখাতভিত্তিক প্রকল্প
Local Government Engineering Department (LGED)
Public Consultation Participants List

Focus Group Discussion

Upazila: Ukhiya
Time: 12:30 pm
District: Cox's Bazar
Dated: 20.11.2023
Purpose of consultation: Supply and Installation of Solar PV Nano Grid
Place of meeting: CIC office, Camp-5, Darbar Hall.

Sl. No.	Name	Designation	Signature
1.	MD. Ahasan Habib	CIC	20.11.2023
2.	Mohammad Khairul Amin Jahan	CMO	
3.	Dipak Roy Chowdhury	TO Education Focal	
4.	Md. Shahinure Rahman	Asst. project Engr	
5.	Khairul Amin	Project officer - ARD	
6.	Urbi Chakma	Centre Manager	
7.	Protima Roy	Midwife	Protima
8.	Saad Bin Sayed	IMO	
9.	Shalida Akh	CMO	
10.	Jewel Kumar Dhar Arjan	Engineer (Hakki CxB)	
11.	MD. Zakir Hossain	Camp Manager	
12	md Hajmol (SI)	Camp 5 police	
13	Rokon-U2-Zaman	CHO	
14	Samser Alam	Maintenance officer	

Figure: Attendance of consultation meeting for Camp No. 5 (part 1)

Supply and Installation of Solar PV Nano Grid
Consultation of Camp 5
Package Number : EMCRP/AF/G-19

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)
জরুরী ভিত্তিতে রোহিঙ্গা সংকট মোকাবেলায় বহুমুখী সেক্টর প্রকল্প
Local Government Engineering Department (LGED)
Public Consultation Participants List

Focus Group Discussion

Upazila: Ukhiya
Time: 12:30 pm
District: Cox's Bazar
Dated: 20.11.2023.
Purpose of consultation: Supply and Installation of Solar PV Nano Grid.
Place of meeting: C/C Office, Camp-5. Darbar Hall.

Sl. No.	Name	Designation	Signature
15	Manik Hasan	SPO-III	
16.	Dr. Tasrin Tasnim	Clinic In Charge	
17	Adv. Tawfiqul Alam	Legal officer-BLAST	

Figure: Attendance of consultation meeting for Camp No. 5 (Part 2)

Supply and Installation of Solar PV Nano Grid
Consultation of Camp 6
Package Number : EMCRP/AF/G-19

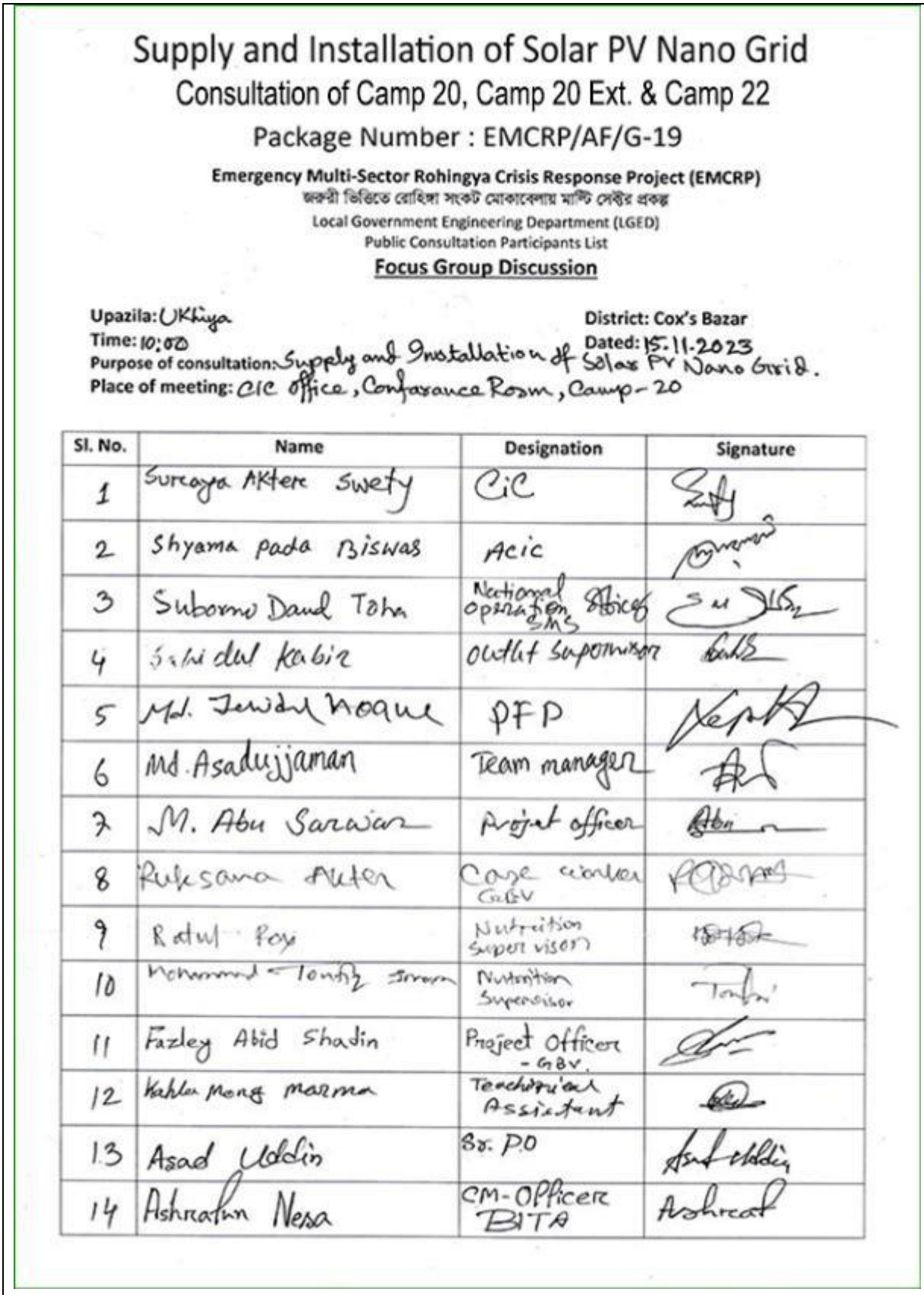
Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)
জরুরী ভিত্তিতে রোহিঙ্গা সংকট মোকাবেলায় মাল্টি সেক্টর প্রকল্প
Local Government Engineering Department (LGED)
Public Consultation Participants List

Focus Group Discussion

Upazila: Ukhiya **District:** Cox's Bazar
Time: 11:50 **Dated:** 13.11.2023
Purpose of consultation: Supply and Installation of Solar PV Nano Grid.
Place of meeting: CIC office Room, Camp-06.

Sl. No.	Name	Designation	Signature
01.	H.M. Khadadat Hossen	Camp in-Charge Camp-06	
02	Tokidel Golam	CMO camp-06	26/11/26
03	Md. Nazmul Golam	CMA Camp-06	26.11.26
04.	Md. Rasel Uddin	Team manager Camp-06	26/11/26
05	U Hla Thein	General Protection officer - DRC	
06	MD. Maruf Hossain	Centre manager CODEC	26/11/23
07	Kazi Mahmudul Hasan	International Rescue Committee	13/11/23
08	Faysal Saleh	Senior Field Assis.	
09	MD. Abdulla Al Jobaer	medical Doctor BDRC/IRC-PHCC camp-06	
10	Muhammad Sozib	Medical Assistant BDRCS/IRC-PHCC Camp-6	
11	Abu Noman Md Tanvir	CSS / BDRCS PHC camp-6	
12	Hillel Amin	Camp Manager	

Figure: Attendance of consultation meeting for Camp No.6



Supply and Installation of Solar PV Nano Grid

Consultation of Camp 20, Camp 20 Ext. & Camp 22

Package Number : EMCRP/AF/G-19

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)
জরুরী ভিত্তিতে রোহিঙ্গা সংকট মোকাবেলায় মাল্টি সেক্টর প্রকল্প
Local Government Engineering Department (LGED)
Public Consultation Participants List

Focus Group Discussion

Upazila: Ukhiya
Time: 10:00
Purpose of consultation: Supply and Installation of Solar PV Nano Grid.
Place of meeting: CIC office, Conference Room, Camp-20
District: Cox's Bazar
Dated: 15.11.2023

Sl. No.	Name	Designation	Signature
1	Sureaya Akter Swety	CiC	
2	Shyama pada Biswas	Acic	
3	Subarna Daud Taha	National operation officer SMS	
4	Sahidul Kabir	Outlet Supervisor	
5	Md. Jahidul Hoque	PFP	
6	Md. Asadujjaman	Team manager	
7	M. Abu Sarwar	Project officer	
8	Ruksana Akter	Case worker GBV	
9	Ratul Roy	Nutrition Supervisor	
10	Mohammad Tonfiq Imran	Nutrition Supervisor	
11	Fazley Abid Shadin	Project Officer - GBV.	
12	Kahlen Mong marma	Technical Assistant	
13	Asad Uddin	Sr. PO	
14	Ashratun Nesa	CM-Officer BITA	

Figure: Attendance of consultation meeting for Camp No.20, 20Ext. & 22 (Part 1)

Supply and Installation of Solar PV Nano Grid

Consultation of Camp 20, Camp 20 Ext. & Camp 22

Package Number : EMCRP/AF/G-19

Emergency Multi-Sector Rohingya Crisis Response Project (EMCRP)
জরুরী ভিত্তিতে রোহিঙ্গা সংকট মোকাবেলায় মাল্টি সেক্টর প্রকল্প
Local Government Engineering Department (LGED)
Public Consultation Participants List

Focus Group Discussion

Upazila: Ukhiya
Time: 10:30
Purpose of consultation: Supply and Installation of Solar PV Nano Grid.
Place of meeting: CIC office conferance Room – Camp- 20 ext.
District: Cox's Bazar
Dated: 15.11.2023

Sl. No.	Name	Designation	Signature
15.	Kazi Didar	SSDE	
16.	Mahar Ali	SMA	
17.	Rumi Akter	T.A	
18.	Nurul Kabir	S-COMs	

Figure: Attendance of consultation meeting for Camp No.20, 20Ext. & 22 (Part 2)

Appendix-02: Pictorial View of the sites and consultation meetings

Present Condition of the selected 35 Nano grid sites


Present condition of the Nano grid site of Camp No.18, Block A, Sub-block A4


Present condition of the Nano grid site of Camp No.18, Block B, Sub-block B1


Present condition of the Nano grid site of Camp No.18, Block C, Sub-block C6


Present condition of the Nano grid site of Camp No.18, Block C, Sub-block C3


Present condition of the Nano grid site of Camp No.12, Block A, Sub-block A5


Present condition of the Nano grid site of Camp No.12, Block D, Sub-block D3


Present condition of the Nano grid site of Camp No.12, Block D, Sub-block D1


Present condition of the Nano grid site of Camp No.10, Block C, Sub-block C3


Present condition of the Nano grid site of Camp No.10, Block D, Sub-block D2


Present condition of the Nano grid site of Camp No.10, Block D, Sub-block D2


Present condition of the Nano grid site of Camp No.11, Block C, Sub-block C2


Present condition of the Nano grid site of Camp No.11, Block C, Sub-block C2


Present condition of the Nano grid site of Camp No.11, Block A, Sub-block A1


Present condition of the Nano grid site of Camp No.13, Block A, Sub-block A1


Present condition of the Nano grid site of Camp No.13, Block G, Sub-block G5


Present condition of the Nano grid site of Camp No.13, Block B, Sub-block B4


Present condition of the Nano grid site of Camp No.2W, Block B, Sub-block B3


Present condition of the Nano grid site of Camp No.5, Block E, Sub-block E6


Present condition of the Nano grid site of Camp No.5, Block E, Sub-block E2


Present condition of the Nano grid site of Camp No.5, Block E, Sub-block E1


Present condition of the Nano grid site of Camp No.5, Block B, Sub-block B5


Present condition of the Nano grid site of Camp No.6, Block A, Sub-block A3


Present condition of the Nano grid site of Camp No.6, Block D, Sub-block D7


Present condition of the Nano grid site of Camp No.20EXT, Block S3, Sub-block B1


Present condition of the Nano grid site of Camp No.20EXT, Block S1, Sub-block B8


Present condition of the Nano grid site of Camp No.20EXT, Block S4, Sub-block B3


Present condition of the Nano grid site of Camp No.20EXT, Block S3, Sub-block B4


Present condition of the Nano grid site of Camp No. Kutupalong RC, Block F


Present condition of the Nano grid site of Camp No.14, Block A, Sub-block A1


Present condition of the Nano grid site of Camp No.14, Block C, Sub-block C1


Present condition of the Nano grid site of Camp No.14, Block A, Sub-block A5


Present condition of the Nano grid site of Camp No.14, Block E, Sub-block E3


Present condition of the Nano grid site of Camp No.9, Block G, Sub-block G**2**0


Present condition of the Nano grid site of Camp No.9, Block D, Sub-block D2


Present condition of the Nano grid site of Camp No.22, Block B, Sub-block B2

Consultation meeting for the Selected 35 nos. Nano grid Sites



Consultation meeting for the Nano grids of Camp 18




Consultation meeting for the Nano grids of Camp No. 11, Camp No. 12 & Camp No. 14


Consultation meeting for the Nano grids of Camp No. 9 & Camp No. 10




Consultation meeting for the Nano grids of Camp No. 13


Consultation meeting for the Nano grids of Camp No. 5


Consultation meeting for the Nano grids of Camp No. 6


Consultation meeting for the Nano grids of Camp No. 20 EXT & 22


Consultation meeting for the Nano grids of Camp No. Kutupalong RC & Camp No. 2W

Appendix-03: Filled in Environmental Screening Forms for examining Solar PV Nano Grids

Environmental Screening Form for Solar PV Nano Grid (Camp 18)

Name of Sub-Project: Supply and Installation of Solar PV Nano grid (Camp 18: There are 4 nos. of Nano Grid will be installed in Camp 18)

Sl	Camp	Location	Block	Sub Block	Upazila	Union
1	Camp 18	Majhi section- H50. Closed to CiC office	Block A	A4	Ukhiya	Palongkhali
2	Camp 18	Majhi section -M17 Beside of the SMEP road	Block B	B1	Ukhiya	Palongkhali
3	Camp 18	Majhi section- L 12 Near by L 12 Mosque	Block C	C6	Ukhiya	Palongkhali
4	Camp 18	Majhi section F 30 Adjoining with BDRCS Distribution point in	Block C	C03	Ukhiya	Palongkhali

Implementing Agency/Agencies: Local Government Engineering Department (LGED)

Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):
The proposed sub-project activities for the Nano grid include various components and equipment that are essential for its functioning. The control room is a steel container with dimensions of 10ft**8ft**8.5ft and a thickness of 2.3mm. It includes the construction of reinforced concrete footing, thermal insulation, and a ventilation fan operated by a temperature sensor. One control room with a capacity of 8KW will be installed.

The sub-project will require 18 solar PV modules, each with a capacity of 450 Wp (watt peak). These modules are of the mono crystalline type and consist of 72 cells or more, conforming to international standards and codes. The total capacity of the solar PV modules will be 8KW.

A total of 24 vented lead acid batteries will be used, each having a capacity of 2V and 900Ah (ampere-hour) or higher. These batteries are specifically designed for solar applications and comply with international standards and codes.

14 overhead distribution line poles will be erected, either with a height of 7.6 meters (SPC) or 6.0 meters (steel). The installation includes the use of reinforced concrete base, number plate, earthing, and all necessary fittings and accessories.

A total of 65 LED lights with a capacity of 10 watts will be installed for public facilities. These energy efficient lights will provide illumination while consuming minimal power.

Fifteen security lights with a capacity of 10 watts, equipped with outdoor installation fixtures, day light, and motion sensors, will be installed to ensure safety and security in the area.

Sixty-five energy-saving BLDC (Brushless Direct Current) ceiling fans with a capacity of 35 watts and a size of 56 inches will be installed in public facilities. These fans come with a 5-step capacitive compatible wall regulator and all necessary accessories for installation.

Twenty sets of switch, socket, and fuse board will be installed for the internal wiring of lights and fans in public facilities. This includes switches, sockets, PVC switch boxes, PVC insulated cables, and all other necessary fittings and accessories.

Estimated footprint / land area is 100 sq. feet for each Nano grid

Brief description of sub-project site: (e.g., present land use, Important Environmental Features (IEFs) near site, etc.:

There are four nano grids located in Camp 18. The first nano grid planned for Camp 18 will be in Block A, sub block A4, near the Majhi section - H50, close to the CiC office. This location is on the east side of the CiC office, within a secure area reachable via the Camp 18 CiC office approach road. It's enclosed by a chain-linked fence and currently has no notable features except for three trees that need to be removed.

The second Nano grid, proposed for Camp 18 Block B, sub block B1, near the Majhi section - M17, is located beside the SMEP road. It's easily accessible and has an open space without any existing fencing. Although it's near the 'Save the Children Multi-purpose child and adolescent center', which adds extra security. Nearby, there are fields to the west and some banana trees to the north.

Next, the third Nano grid, planned for Camp 18, Block C, subblock C6, near the Majhi section - L12 Mosque, is currently fenced with bamboo and has a few small trees. It's situated among DRP settlements and close to a U drain and SMEP BFS road.

Finally, the fourth Nano grid is in Camp 18 Block C, sub block C3, near the Majhi section F30, connects with the BDRCS Distribution point. It's located on lower ground and separated by a protection wall. Despite potential security risks due to its lower elevation, the site offers plenty of space and only needs the removal of a few small seedlings. Several large trees are located adjacent to the subproject site but not at risk.

Overall Comments

The proposed Solar PV Nano grids will have minimal environmental impact and are not located in environmentally sensitive areas. The project activities will not pose a significant threat to the natural surroundings and will not cause drainage congestion or water logging issues. Moreover, there will be no utilization of productive agricultural soil for the project, ensuring the preservation of fertile land.
The construction materials and equipment required for the Nano grids will be limited to the project boundary, minimizing any potential impact on the surrounding environment. The project follows environmentally responsible practices and aims to reduce any negative effects on the ecosystem.

The rohingya community has shown a positive attitude towards the project and expressed their enthusiasm to actively participate in its activities. The project is considered environmentally sustainable and socially acceptable by the adjacent community and representatives from various facilities. The participatory public consultation meeting provided an opportunity for community

members to voice their opinions, and no objections were raised regarding the construction of the Nano grids at the proposed site. On the contrary, the community expressed appreciation for the infrastructure as it will enhance safety and security for the community.

During the consultation, the community highlighted the benefits that the Solar PV Nano grids will bring, particularly in terms of socio-security for female communities. The project is seen as a means to improve the quality of life, reduce vulnerability to social aggression and mistreatment, and enhance access to education and healthcare services. In addition, the establishment of the Solar PV Nano grids is expected to contribute to the overall development and well-being of the adjacent community. It will provide reliable electricity to various facilities such as learning centers, health posts, and food distribution centers, creating a conducive environment for education, healthcare, and community activities. The Solar PV Nano grids will not only provide electricity but also empower the community, ensuring a brighter and more secure future for all.

Types of waste to be generated during construction and operation phase:
The construction of the Nano grid involves installing a control room made of a steel container, which will be placed on RCC foundations. This process may require minimal ground preparation and the installation of RCC foundations. Additionally, during the construction phase, 14 poles will be installed near the project site.

During the installation of the poles and RCC foundations, there is a possibility of generating waste materials. These may include soil and debris that are excavated while digging holes for pole installation. The waste generated from the pole installation and RCC foundation is relatively small and mainly consists of construction debris. This debris can include materials like concrete, cement, bricks, and other building materials that are used during the installation process. If wooden or bamboo components or supports are used during the pole installation, there may be waste generated from cutting or shaping the wood or bamboo to fit the desired specifications.

Due to the small scale of construction, there will be no need for a labor shed, resulting in a reduced likelihood of generating organic waste, faecal waste, and kitchen waste during this phase.

The container structure will be transported to the site using a truck and then installed on the pillars with the assistance of a crane. As a result, the construction process is expected to have minimal waste generation. However, it is important to ensure proper waste management practices are in place to handle any potential waste materials that may arise during transportation and installation.

Sensitive environmental, cultural, archaeological, religious sites near (within 100m) of site including elephant migration routes and remaining forests:
4 nos. of Nano grids will be installed in Camp 18. Within the influence area of the subproject no historical sites were identified. The proposed locations for the Nano grids have been considered for their proximity to sensitive environmental, cultural, archaeological, religious sites, as well as elephant migration routes and remaining forests within a 100-meter radius. Several sensitive features have been identified near the Nano grid locations, as described below:

In Camp 18, Block A, Sub block A4, located near the Majhi section - H50 and adjacent to the CiC office, the proposed site has no notable features in the east or north directions. A CiC office located at 62m west from the subproject site. On the other hand, child protection facilities situated approximately 75 meters to the south and 81 meters to the south.

Moving to Camp 18, Block B, Sub block B1, near the Majhi section - M17, beside the SMEP road, the proposed site has no notable features in the east or west directions. However, child protection facilities and learning centers are located approximately 37 meters and 53 meters, respectively, to the south.

In Camp 18, Block C, Sub block C6, adjacent to the Majhi section - L12 Mosque, A learning center is situated approximately 82 meters to the east. Nearby, there are other learning centers situated approximately 36 meters, 46 meters, and 86 meters to the north, and approximately 42 meters to the south.

Finally, in Camp 18, Block C, Sub block C03, near the Majhi section F30, adjoining the BDRCS Distribution point, the proposed site is without notable features in the east direction. However, a child protection facility is located at 24m west and a graveyard located at 93m west of the subproject site. A primary health center lies approximately 71 meters to the north, and a multipurpose protection center, along with other facilities, is situated approximately 37 meters to the south.

Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists. Mostly Rohingya settlements are found around the proposed area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project area, no elephant migration routes exist (ref. IUCN). No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below

Section A: Sub-Project Overview

Description of sub-project/component interventions:

The 8KW capacity Nano grid control room, which is 10ft*8ft*8.5ft in size and has a thickness of 2.3mm, will serve as the central hub for the distribution of electricity to these facilities. The control room will be made of a steel container that includes the construction of RCC footing, thermal insulation, and ventilation operated by a temperature sensor. This will ensure that the equipment is protected from extreme weather conditions and operates at optimal performance.

The Nano grid will consist of approximately 14 poles, which will be installed to distribute electricity to the various facilities. Each pole will have an electricity line drawn from the Nano grid, with 14 panels installed on top of each pole. Additionally, each pole will have a 10 watt security light installed on top, providing additional safety and security for the surrounding area.

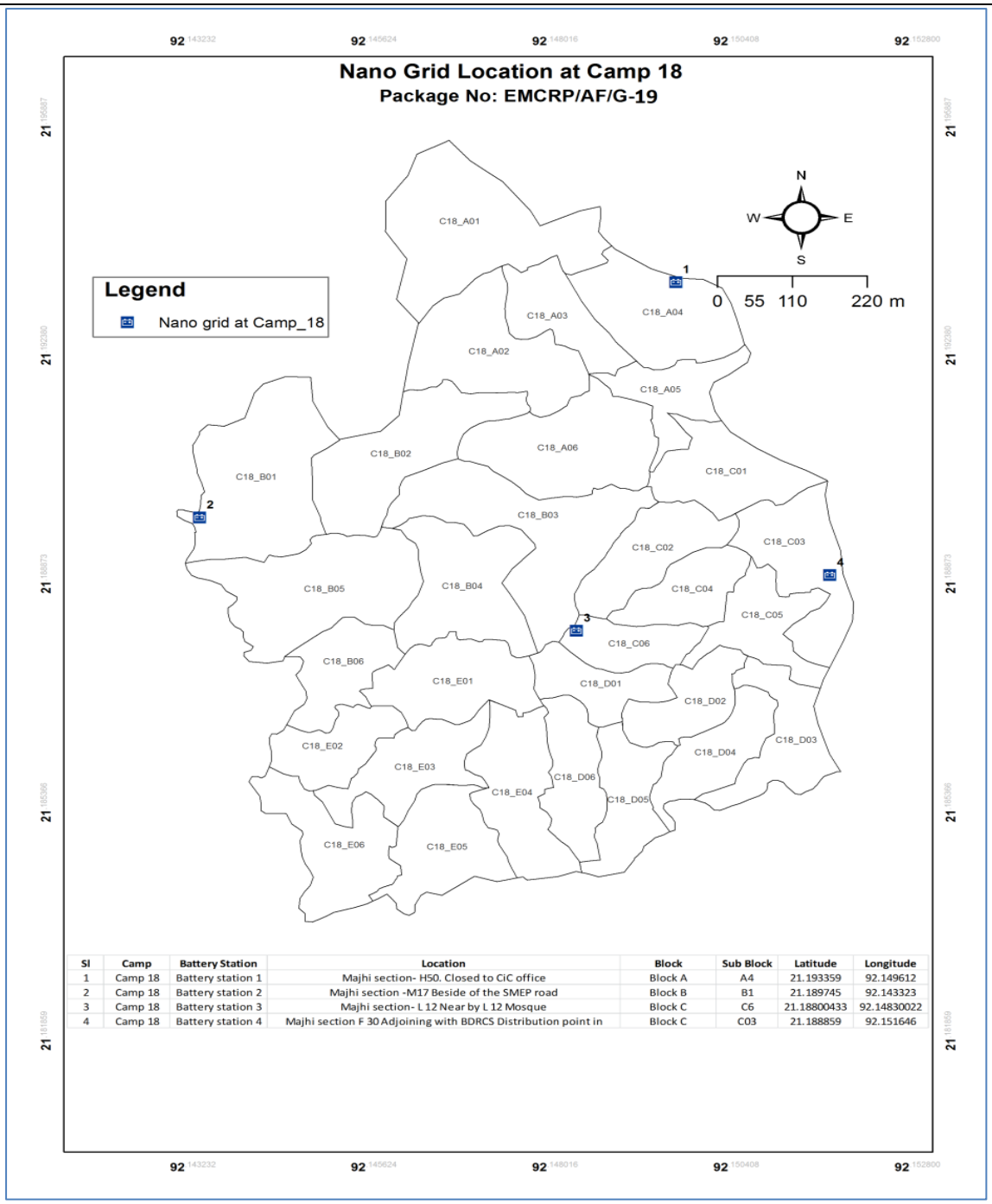
The proposed facilities also include the installation of 65 energy-efficient fans and lights in various service centers, each with a capacity of 35 watts and 10 watts respectively. These fans will help to keep the facilities cool during hot temperatures, ensuring a comfortable working environment for the facilitators.

Two fire extinguishers will also be installed in the Nano grid room, ensuring the safety of the equipment and personnel operating in the area.

Sub-project Location:

4 nos. of Nano grids will be installed in Camp 18. The location details are given below.

Sl	Camp	Location	Block	Sub Block	Upazila	Union	Latitude	Longitude
1	Camp 18	Majhi section- H50. Closed to CiC office	Block A	A4	Ukhiya	Palongkhali	21.193359	92.149612
2	Camp 18	Majhi section -M17 Beside of the SMEP road	Block B	B1	Ukhiya	Palongkhali	21.189745	92.143323
3	Camp 18	Majhi section- L 12 Near by L 12 Mosque	Block C	C6	Ukhiya	Palongkhali	21.18800433	92.14830022
4	Camp 18	Majhi section F 30 Adjoining with BDRCS Distribution point in	Block C	C03	Ukhiya	Palongkhali	21.188859	92.151646



Sl	Camp	Battery Station	Location	Block	Sub Block	Latitude	Longitude
1	Camp 18	Battery station 1	Majhi section- H50. Closed to CiC office	Block A	A4	21.193359	92.149612
2	Camp 18	Battery station 2	Majhi section -M17 Beside of the SMEP road	Block B	B1	21.189745	92.143323
3	Camp 18	Battery station 3	Majhi section- L 12 Near by L 12 Mosque	Block C	C6	21.18800433	92.14830022
4	Camp 18	Battery station 4	Majhi section F 30 Adjoining with BDRCS Distribution point in	Block C	C03	21.188859	92.151646

Proposed Nano grid location at Camp 18

Land ownership

Govt. land

Expected construction period: 6 months

Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive environmental areas such as elephant corridors, water bodies, etc. and historical or socio-cultural assets): Please also explain any analysis on alternative location was conducted:

There are 4 nos. of Nano grid in Camp 18. In Camp 18, Block A, Sub block A4, located near the Majhi section - H50 and adjacent to the CiC office, the proposed site has no notable features in the east or

north directions. A CiC office located at 62m west from the subproject site. On the other hand, child protection facilities situated approximately 75 meters to the south and 81 meters to the south.

Moving to Camp 18, Block B, Sub block B1, near the Majhi section - M17, beside the SMEP road, the proposed site has no notable features in the east or west directions. However, child protection facilities and learning centers are located approximately 37 meters and 53 meters, respectively, to the south.

In Camp 18, Block C, Sub block C6, adjacent to the Majhi section - L12 Mosque, A learning center is situated approximately 82 meters to the east. Nearby, there are other learning centers situated approximately 36 meters, 46 meters, and 86 meters to the north, and approximately 42 meters to the south.

Finally, in Camp 18, Block C, Sub block C03, near the Majhi section F30, adjoining the BDRCS Distribution point, the proposed site is without notable features in the east direction. However, a child protection facility is located at 24m west and a graveyard located at 93m west of the subproject site. A primary health center lies approximately 71 meters to the north, and a multipurpose protection center, along with other facilities, is situated approximately 37 meters to the south.

Within the influence area of the proposed location no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (confirmed by the participants in the consultation meeting).

Section B: Environmental Screening

***B.1*: Environmental feature of sub-project location**

Description of cultural properties (if applicable, including distance from site): Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests:

There are 4 nos. of Nano grid in Camp 18. In Camp 18, Block A, Sub block A4, located near the Majhi section - H50 and adjacent to the CiC office, the proposed site has no notable features in the east or north directions. A CiC office located at 62m west from the subproject site. On the other hand, child protection facilities situated approximately 75 meters to the south and 81 meters to the south.

Moving to Camp 18, Block B, Sub block B1, near the Majhi section - M17, beside the SMEP road, the proposed site has no notable features in the east or west directions. However, child protection facilities and learning centers are located approximately 37 meters and 53 meters, respectively, to the south.

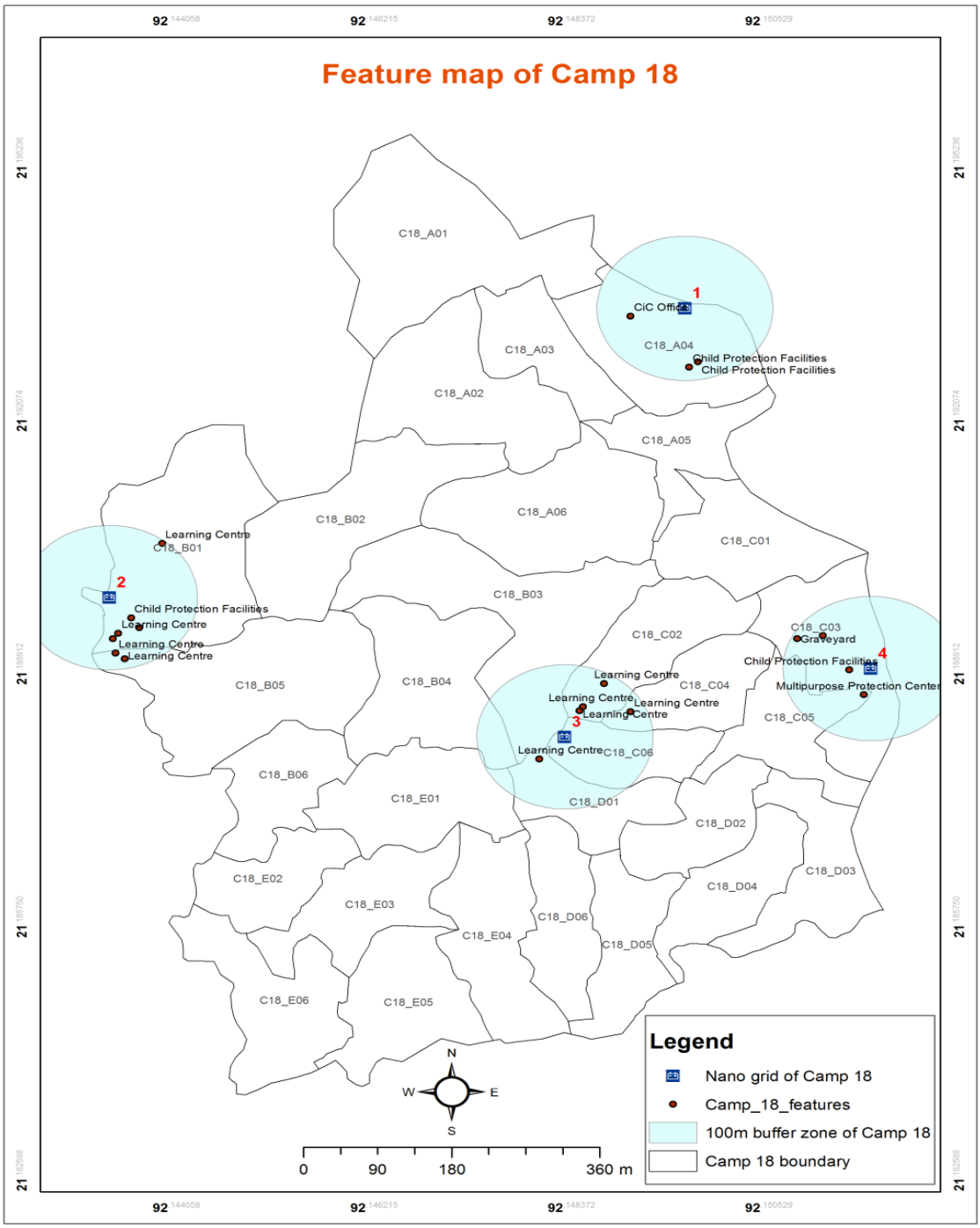
In Camp 18, Block C, Sub block C6, adjacent to the Majhi section - L12 Mosque, A learning center is situated approximately 82 meters to the east. Nearby, there are other learning centers situated approximately 36 meters, 46 meters, and 86 meters to the north, and approximately 42 meters to the south.

Finally, in Camp 18, Block C, Sub block C03, near the Majhi section F30, adjoining the BDRCS Distribution point, the proposed site is without notable features in the east direction. However, a child protection facility is located at 24m west and a graveyard located at 93m west of the subproject site. A primary health center lies approximately 71 meters to the north, and a

multipurpose protection center, along with other facilities, is situated approximately 37 meters to the south.

There are no other sensitive environmental, cultural, archaeological sites within the catchment area of this sub-project.

A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas are shown below.



Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive features found in the footprint area. Several learning center, rohingya settlements, multipurpose protection facilities and religious facilities were found during the survey. It will not be affected by the construction works, as the activities will be carried out within the existing proposed area boundary and necessary preventive and mitigation measures will be followed during the entire construction period.

(1) Within/near Elephant Migration Routes Yes/No*

No. These have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

(2) potential impacts on remaining forests in/around camps Yes/No

N/A (This activity will be confined within the proposed location)

(3) Other issues: N/A

*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:

Dust:

Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, trailer, mini truck, etc. move on roads adjacent to proposed location throughout the day generating noise but within tolerable limit in most cases.

Baseline soil quality:

The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.

Landslide potential (high/medium/low, with explanation):

The nominated location is found to be on fairly plane land. There is no condition found around the selected site which might give reasons for landslides.

Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH):

Groundwater is the main source of potable water in the Sub-project area. The shallow depth is about 100 feet to 120 feet and deep tube well depth is 700 to 850 feet. In the sub-project area, deep groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains medium concentration of iron. Deep groundwater table (drinkable) varies from 600-800ft (Field survey, 2021). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer.

Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to 681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)

Status of wildlife movement: **N/A** (None of the information was found about the wildlife movement in or across the area)
State of forestation: Patches of vegetation containing small trees found in target location and in surrounding area of the proposed location which are within 200m radial distance.
Summary of water balance analysis (For water supply scheme only): **N/A**

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g., status of access road or any other facility required for sub-project to be viable): There are two main roads facilitating transportation for the Nano grids in Camp 18. The first one is the Camp 18 Connecting road, which will be utilized for transporting materials to the first Nano grid of Camp 18. The second road, called the Camp 18 SMEP road, will be used for transporting materials to the remaining three Nano grids within Camp 18. These roads play a crucial role in providing access for vehicles and ensuring a smooth route for transporting goods and supplies to the designated locations.
Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction: Due to the small scale of construction, hence there is no need for labor shed. As a result, there is no necessity for a tube well in the proposed locations. Instead, during the construction phase, the contractor will arrange for a mobile water supply system to ensure a sufficient water source for the construction work. Additionally, the contractor will be responsible for providing temporary sanitation facilities. A portable or temporary sanitary system will be set up to cater to the basic hygiene needs of the workers during the construction period in the vicinity of the construction area for all the components of the project. Electricity is not available in the area. Generator or Solar lamp will need installation.
Possible location of labor camps: Due to the small scale of construction, hence there is no need for labor shed.
Requirement and type of raw materials (e.g., sand, stone, wood, etc.): i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials
Identification of access road for transportation (Yes/No): Yes. There are two main roads facilitating transportation for the Nano grids in Camp 18. The first one is the Camp 18 Connecting road, which will be utilized for transporting materials to the first Nano grid of Camp 18. The second road, called the Camp 18 SMEP road, will be used for transporting materials to the remaining three Nano grids within Camp 18. These roads play a crucial role in providing access for vehicles and ensuring a smooth route for transporting goods and supplies to the designated locations.
Location identification for raw material storage: The materials, including the poles, for the Nano grids will be stored either on the side of the road or

in designated vacant spaces near each Nano grid. The site management or the Camp-in-Charge (CIC) will grant permission to store the required materials for the Nano grid within the camp premises. To ensure security during nighttime, there may be provisions for having night guards in place
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.): There is no pre-existing structure which will face demolition. Here, demolition waste will not have to be accounted for. Few leftovers from soil clearing, plastics or residual clearing and site clearing may be generated.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g., Solids wastes, liquid wastes, etc.): **Solid waste:** Iron, concrete, metal, drywall, wood, plastic, rubber, copper wires, excavated soils etc. **Quantity:** It is difficult to give exact figures of construction waste produced on a typical construction site. However, in order to approximate the quantity, it is estimated that nearly 2 kg of waste would be generated each working day, which are mainly RCC foundation construction and poles installation wastes. Some plastic, paper and organic waste will be generated from the use of workers, though a very negligible amount- half a kilogram a day maximum. **Liquid waste**: Paint chemicals as paint thinners which contain Volatile Organic Compounds (VOCs) will come out as leftovers. Due to the small scale of construction, hence there is no need for labor shed. So, fecal sludge will not be generated from the labor camp during the construction period. Leftover oils or spills from machinery can be a high probability generating liquid waste.
Type and quantity of raw materials used (wood, bricks, cement, water, etc.): **Type:** i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction. **Quantity**: It is difficult to give exact figures of construction waste produced on a typical construction site.
Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards: Around 100 sq. feet area is needed for this project. No vegetation is present in the targeted footprint area. Specific soil amount is not needed for the sub-project component. The current condition explains that there is no aggregated soil on the right of way. On the other hand, vegetation was found around the proposed area. The vegetation will not be affected by construction work since scope of works is confined within planned area.
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) Low. No borrow pit or quarries will be required to dig out during the construction period in or around/ adjacent to the proposed area.

Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description). No pre-existing water body or drainage is present
Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) **Low.** The site is free from any aquatic ecosystems or habitats of endangered species. There are some terrestrial flora species around the project site, which will slightly be affected by the works. Life cycle or movement of some terrestrial living species (fauna) (i.e. Insects - ant, bees, earthworm, reptiles, birds etc.) might be disturbed for the time being, but with very less impact indeed. So, overall potential effect is very low or absent for this specific sub project.
Activities that can lead to landslides, slumps, slips and other mass movements in road cuts: The soil in the proposed site is largely flat, so there is almost no chance to trigger the landslide or any type of mass movement of soil for the said construction works.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description) N/A
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: N/A
Chance of long-term or semi-permanent destruction of soils: (High/Medium/Low with description) There is no chance of activities during the operation period, which can lead to any long-term or semi-permanent destruction of soils.
Possibility of odor and water, soil quality impacts from SWM and FSM disposal system: (High/Medium/Low with description) N/A
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) There is no possibility for creating borrow-pits, quarries, etc. during the operation phase.
Likely direct and indirect impacts on economic development in the project areas by the sub-project: During the operation phase of the sub-project, there are likely to be both direct and indirect impacts on economic development in the project areas. Direct impacts refer to the immediate effects that result directly from the sub-project activities. For example, the establishment and operation of the Nano grid can create employment opportunities for the adjacent workforce. This can include job opportunities in the construction phase as well as maintenance and operation of the infrastructure.

Indirect impacts, on the other hand, are the ripple effects that arise from the sub-project activities. Access to electricity provided by the Nano grid can enhance the quality and efficiency of various services such as healthcare, education, and communication. Healthcare facilities can operate more effectively with reliable power supply, ensuring better medical services for the community. Educational institutions can improve their teaching and learning environments through the availability of electricity, enabling students to access modern technology and educational resources.
Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No existing drainage channels or surface water bodies found in the project area; therefore, no such effect can be anticipated
Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. There are no protected areas in or around project sites, and no known areas of ecological interest which can be affected by the daily activity of this facility.
Activities leading to landslides, slumps, slips and other mass movements in road cuts: N/A
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation) N/A
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: N/A

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

Environmental Screening Form for Solar PV Nano Grid (Camp 12)

Name of Sub-Project: Supply and Installation of Solar PV Nano grid (Camp 12: There are 3 nos. of Nano Grid will be installed in Camp 12)

Sl	Camp	Location	Block	Sub Block	Upazila	Union
1	Camp 12	Near by pulse Bangladesh PHC	A	A5	Ukhiya	Palongkhali
2	Camp 12	Near by IOM warehouse SD	D	D3	Ukhiya	Palongkhali
3	Camp 12	near by CIC office	D	D1	Ukhiya	Palongkhali

Implementing Agency/Agencies: Local Government Engineering Department (LGED)

Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):
The proposed sub-project activities for the Nano grid include various components and equipment that are essential for its functioning. The control room is a steel container with dimensions of 10ft**8ft**8.5ft and a thickness of 2.3mm. It includes the construction of reinforced concrete footing, thermal insulation, and a ventilation fan operated by a temperature sensor. One control room with a capacity of 8KW will be installed.

The sub-project will require 18 solar PV modules, each with a capacity of 450 Wp (watt peak). These modules are of the mono crystalline type and consist of 72 cells or more, conforming to international standards and codes. The total capacity of the solar PV modules will be 8KW.

A total of 24 vented lead acid batteries will be used, each having a capacity of 2V and 900Ah (ampere-hour) or higher. These batteries are specifically designed for solar applications and comply with international standards and codes.

14 overhead distribution line poles will be erected, either with a height of 7.6 meters (SPC) or 6.0 meters (steel). The installation includes the use of reinforced concrete base, number plate, earthing, and all necessary fittings and accessories.

A total of 65 LED lights with a capacity of 10 watts will be installed for public facilities. These energy efficient lights will provide illumination while consuming minimal power.

Fifteen security lights with a capacity of 10 watts, equipped with outdoor installation fixtures, day light, and motion sensors, will be installed to ensure safety and security in the area.

Sixty-five energy-saving BLDC (Brushless Direct Current) ceiling fans with a capacity of 35 watts and a size of 56 inches will be installed in public facilities. These fans come with a 5-step capacitive compatible wall regulator and all necessary accessories for installation.

Twenty sets of switch, socket, and fuse board will be installed for the internal wiring of lights and fans in public facilities. This includes switches, sockets, PVC switch boxes, PVC insulated cables, and all other necessary fittings and accessories.

Estimated footprint / land area is 100 sq. feet for each Nano grid

Brief description of sub-project site: (e.g., present land use, Important Environmental Features (IEFs) near site, etc.:

In Camp 12, there are plans for three Nano grids. The first Nano grid will be in Block A, sub block A5, close to the Pulse Bangladesh PHC. It's just in front of the PHC waiting room towards the west. There's enough space there for the Nano grid. The area has only DRP settlements around it. Also, there's a road nearby to bring in equipment.

The second Nano grid is in Block D, sub block D3, near the IOM warehouse SD. It is north of the Shushilan Water supply facility. There's a road near the Shushilan facility to bring in containers. There's an old bamboo settlement nearby, but it won't cause any problems for the project.

The third Nano grid, in Block D, sub block D1, is near the CiC office. It's inside a firefighting unit facility. The area is empty and suitable for the Nano grid. A road nearby will help with bringing in equipment. There are only DRP settlements around this area too.

Overall Comments

The proposed Solar PV Nano grids will have minimal environmental impact and are not located in environmentally sensitive areas. The project activities will not pose a significant threat to the natural surroundings and will not cause drainage congestion or water logging issues. Moreover, there will be no utilization of productive agricultural soil for the project, ensuring the preservation of fertile land. The construction materials and equipment required for the Nano grids will be limited to the project boundary, minimizing any potential impact on the surrounding environment. The project follows environmentally responsible practices and aims to reduce any negative effects on the ecosystem.

The rohingya community has shown a positive attitude towards the project and expressed their enthusiasm to actively participate in its activities. The project is considered environmentally sustainable and socially acceptable by the adjacent community and representatives from various facilities. The participatory public consultation meeting provided an opportunity for community members to voice their opinions, and no objections were raised regarding the construction of the Nano grids at the proposed site. On the contrary, the community expressed appreciation for the infrastructure as it will enhance safety and security for the community.

During the consultation, the community highlighted the benefits that the Solar PV Nano grids will bring, particularly in terms of socio-security for female communities. The project is seen as a means to improve the quality of life, reduce vulnerability to social aggression and mistreatment, and enhance access to education and healthcare services. In addition, the establishment of the Solar PV Nano grids is expected to contribute to the overall development and well-being of the adjacent community. It will provide reliable electricity to various facilities such as learning centers, health

posts, and food distribution centers, creating a conducive environment for education, healthcare, and community activities. The Solar PV Nano grids will not only provide electricity but also empower the community, ensuring a brighter and more secure future for all.

Types of waste to be generated during construction and operation phase:

The construction of the Nano grid involves installing a control room made of a steel container, which will be placed on RCC foundations. This process may require minimal ground preparation and the installation of RCC foundations. Additionally, during the construction phase, 14 poles will be installed near the project site.

During the installation of the poles and RCC foundations, there is a possibility of generating waste materials. These may include soil and debris that are excavated while digging holes for pole installation. The waste generated from the pole installation and RCC foundation is relatively small and mainly consists of construction debris. This debris can include materials like concrete, cement, bricks, and other building materials that are used during the installation process. If wooden or bamboo components or supports are used during the pole installation, there may be waste generated from cutting or shaping the wood or bamboo to fit the desired specifications.

Due to the small scale of construction, there will be no need for a labor shed, resulting in a reduced likelihood of generating organic waste, faecal waste, and kitchen waste during this phase.

The container structure will be transported to the site using a truck and then installed on the pillars with the assistance of a crane. As a result, the construction process is expected to have minimal waste generation. However, it is important to ensure proper waste management practices are in place to handle any potential waste materials that may arise during transportation and installation.

Sensitive environmental, cultural, archaeological, religious sites near (within 100m) of site including elephant migration routes and remaining forests:

3 nos. of Nano grids will be installed in Camp 12. Within the influence area of the subproject no historical sites were identified. The proposed locations for the Nano grids have been considered for their proximity to sensitive environmental, cultural, archaeological, religious sites, as well as elephant migration routes and remaining forests within a 100-meter radius. Several sensitive features have been identified near the Nano grid locations, as described below:

3 nos. of Nano grids will be installed in Camp 12. In Camp 12, Block A, Sub block A5, near Pulse Bangladesh PHC, the proposed site is surrounded by several important features. To the east lies a health post approximately 47 meters away and learning center about 68 meters away. On the west side, there's another learning center situated approximately 64 meters from the site. To the north, the site is close to the CiC office, around 30 meters away, and another learning center about 45 meters away. There are no existing features to the south of the proposed site.

Moving to Camp 12, Block D, Sub block D3, near the IOM warehouse SD, the proposed site is situated east of a learning center, approximately 73 meters away. There are no existing features on the west side of the site. To the north, there's another learning center located approximately 46

meters away. To the south, the site is close to a child protection facility, around 21 meters away, and another learning center about 75 meters away.

In Camp 12, Block D, Sub block D1, near the CiC office, the proposed site is surrounded by various features. To the east, there's a health post located approximately 51 meters away. There are no existing features on the west side of the site. To the north, the site is close to the CiC office, around 49 meters away, and a learning center situated approximately 73 meters and 81 meters away respectively. To the south, there are two learning centers located approximately 91 meters and 93 meters away from the proposed site.

Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists. Mostly Rohingya settlements are found around the proposed area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project area, no elephant migration routes exist (ref. IUCN). No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below

Section A: Sub-Project Overview

Description of sub-project/component interventions:

The 8KW capacity Nano grid control room, which is 10ft*8ft*8.5ft in size and has a thickness of 2.3mm, will serve as the central hub for the distribution of electricity to these facilities. The control room will be made of a steel container that includes the construction of RCC footing, thermal insulation, and ventilation operated by a temperature sensor. This will ensure that the equipment is protected from extreme weather conditions and operates at optimal performance.

The Nano grid will consist of approximately 14 poles, which will be installed to distribute electricity to the various facilities. Each pole will have an electricity line drawn from the Nano grid, with 14 panels installed on top of each pole. Additionally, each pole will have a 10 watt security light installed on top, providing additional safety and security for the surrounding area.

The proposed facilities also include the installation of 65 energy-efficient fans and lights in various service centers, each with a capacity of 35 watts and 10 watts respectively. These fans will help to keep the facilities cool during hot temperatures, ensuring a comfortable working environment for the facilitators.

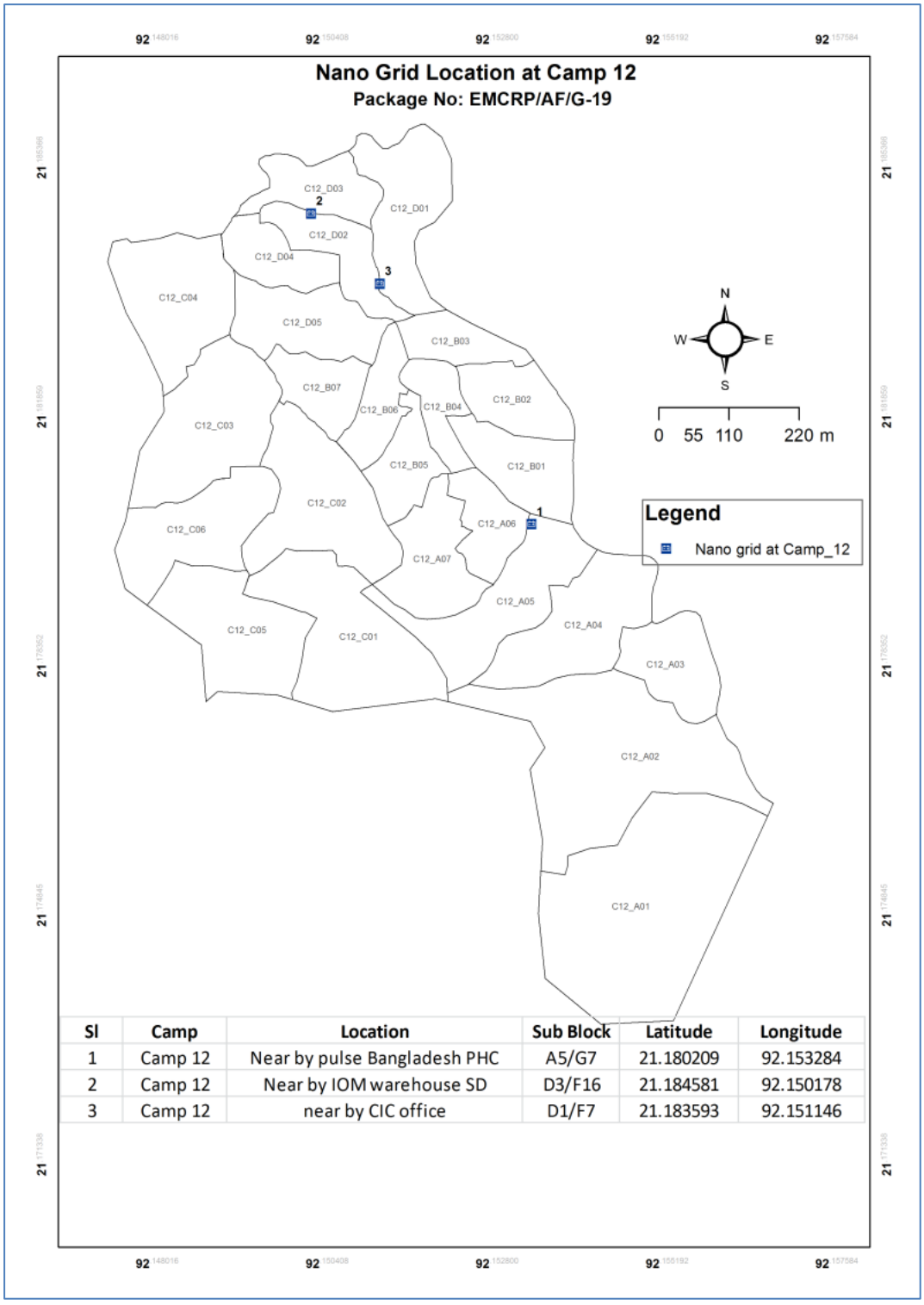
Two fire extinguishers will also be installed in the Nano grid room, ensuring the safety of the equipment and personnel operating in the area.

Sub-project Location:

3 nos. of Nano grids will be installed in Camp 12. The location details are given below.

Sl	Camp	Location	Block	Sub Block	Upazila	Union	Latitude	Longitude
1	Camp 12	Near by pulse Bangladesh PHC	A	A5	Ukhiya	Palongkhali	21.180209	92.153284
2	Camp 12	Near by IOM warehouse SD	D	D3	Ukhiya	Palongkhali	21.184581	92.150178

3	Camp 12	nearby CIC office	D	D1	Ukhiya	Palongkhali	21.183593	92.151146



Sl	Camp	Location	Sub Block	Latitude	Longitude
1	Camp 12	Near by pulse Bangladesh PHC	A5/G7	21.180209	92.153284
2	Camp 12	Near by IOM warehouse SD	D3/F16	21.184581	92.150178
3	Camp 12	near by CIC office	D1/F7	21.183593	92.151146

Proposed Nano grid location at Camp 12

Land ownership

Govt. Land

Expected construction period: 6 months

Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive environmental areas such as elephant corridors, water

bodies, etc. and historical or socio-cultural assets): Please also explain any analysis on alternative location was conducted:

3 nos. of Nano grids will be installed in Camp 12. In Camp 12, Block A, Sub block A5, near Pulse Bangladesh PHC, the proposed site is surrounded by several important features. To the east lies a health post approximately 47 meters away and learning center about 68 meters away. On the west side, there's another learning center situated approximately 64 meters from the site. To the north, the site is close to the CiC office, around 30 meters away, and another learning center about 45 meters away. There are no existing features to the south of the proposed site.

Moving to Camp 12, Block D, Sub block D3, near the IOM warehouse SD, the proposed site is situated east of a learning center, approximately 73 meters away. There are no existing features on the west side of the site. To the north, there's another learning center located approximately 46 meters away. To the south, the site is close to a child protection facility, around 21 meters away, and another learning center about 75 meters away.

In Camp 12, Block D, Sub block D1, near the CiC office, the proposed site is surrounded by various features. To the east, there's a health post located approximately 51 meters away. There are no existing features on the west side of the site. To the north, the site is close to the CiC office, around 49 meters away, and a learning center situated approximately 73 meters and 81 meters away respectively. To the south, there are two learning centers located approximately 91 meters and 93 meters away from the proposed site.

Within the influence area of the proposed location no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (confirmed by the participants in the consultation meeting).

Section B: Environmental Screening

***B.1*: Environmental feature of sub-project location**

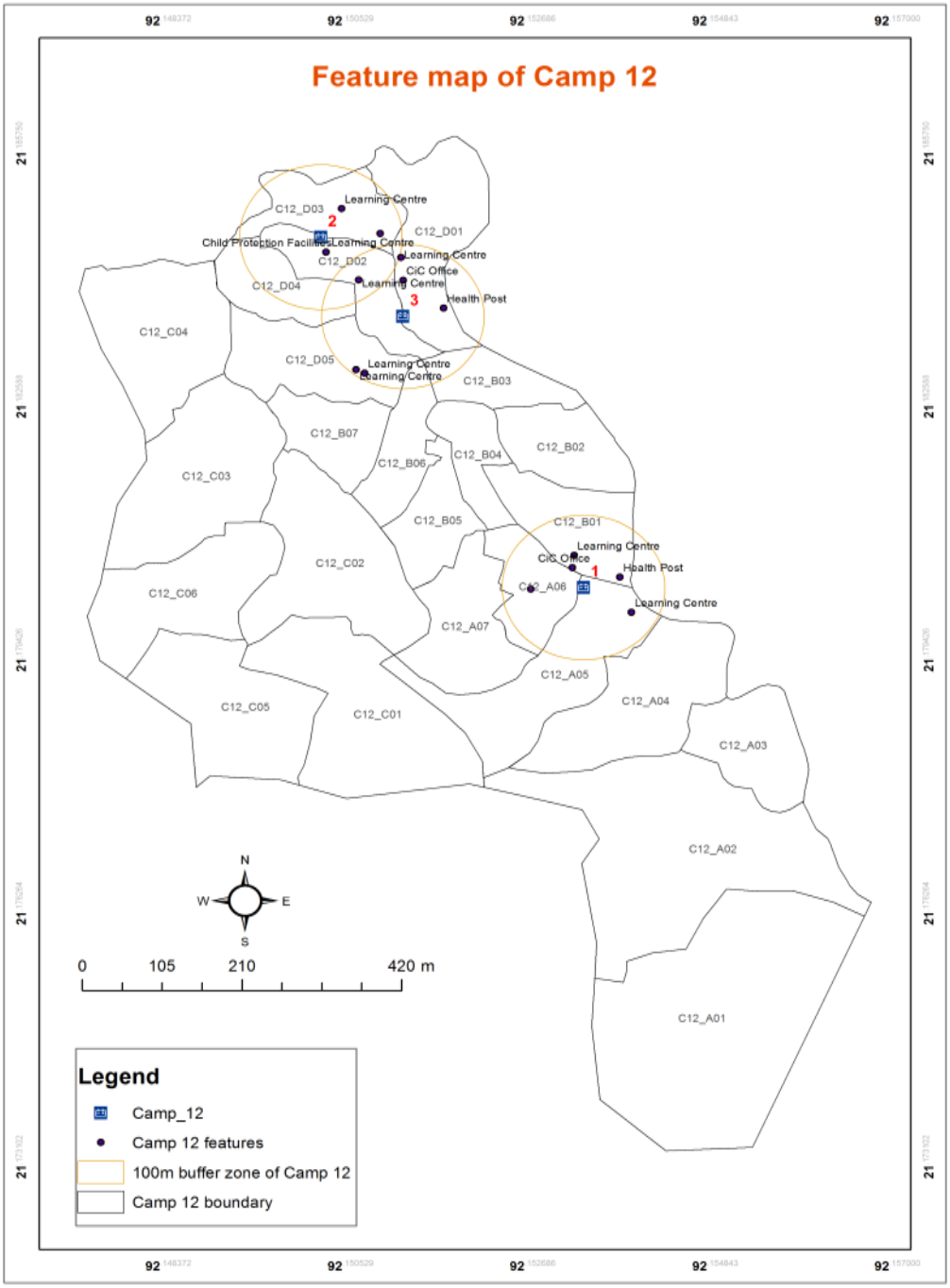
Description of cultural properties (if applicable, including distance from site): Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests:

3 nos. of Nano grids will be installed in Camp 12. In Camp 12, Block A, Sub block A5, near Pulse Bangladesh PHC, the proposed site is surrounded by several important features. To the east lies a health post approximately 47 meters away and learning center about 68 meters away. On the west side, there's another learning center situated approximately 64 meters from the site. To the north, the site is close to the CiC office, around 30 meters away, and another learning center about 45 meters away. There are no existing features to the south of the proposed site.

Moving to Camp 12, Block D, Sub block D3, near the IOM warehouse SD, the proposed site is situated east of a learning center, approximately 73 meters away. There are no existing features on the west side of the site. To the north, there's another learning center located approximately 46 meters away. To the south, the site is close to a child protection facility, around 21 meters away, and another learning center about 75 meters away.

In Camp 12, Block D, Sub block D1, near the CiC office, the proposed site is surrounded by various features. To the east, there's a health post located approximately 51 meters away. There are no existing features on the west side of the site. To the north, the site is close to the CiC office, around 49 meters away, and a learning center situated approximately 73 meters and 81 meters away respectively. To the south, there are two learning centers located approximately 91 meters and 93 meters away from the proposed site. There are no other sensitive environmental, cultural, archaeological sites within the catchment area of this sub-project.

0**A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas are shown below.**



Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive features found in the footprint area. Several learning center, child protection facilities, health post, rohingya settlements and religious facilities were found during the survey. It will not be affected by the construction works, as the activities will be carried out within the existing proposed area boundary and necessary preventive and mitigation measures will be followed during the entire construction period.

(1) Within/near Elephant Migration Routes Yes/No*

No. These have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

(2) potential impacts on remaining forests in/around camps Yes/No

N/A (This activity will be confined within the proposed location)

(3) Other issues: N/A

*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:

Dust:

Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, trailer, mini truck, etc. move on roads adjacent to proposed location throughout the day generating noise but within tolerable limit in most cases.

Baseline soil quality:

The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.

Landslide potential (high/medium/low, with explanation):

The nominated location is found to be on fairly plane land. There is no condition found around the selected site which might give reasons for landslides.

Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH):

Groundwater is the main source of potable water in the Sub-project area. The shallow depth is about 100 feet to 120 feet and deep tube well depth is 700 to 850 feet. In the sub-project area, deep groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains medium concentration of iron. Deep groundwater table (drinkable) varies from 600-800ft (Field survey, 2021). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer.

Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to 681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)

Status of wildlife movement: **N/A** (None of the information was found about the wildlife movement in or across the area)
State of forestation: Patches of vegetation containing small trees found in target location and in surrounding area of the proposed location which are within 200m radial distance.
Summary of water balance analysis (For water supply scheme only): **N/A**

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g., status of access road or any other facility required for sub-project to be viable): There is a road called the Camp 12 connecting road that will be used for transportation and delivering materials to the 3 Nano grids in Camp 12. It provides access for vehicles and ensures a route for transporting goods and supplies.
Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction: Due to the small scale of construction, hence there is no need for labor shed. As a result, there is no necessity for a tube well in the proposed locations. Instead, during the construction phase, the contractor will arrange for a mobile water supply system to ensure a sufficient water source for the construction work. Additionally, the contractor will be responsible for providing temporary sanitation facilities. A portable or temporary sanitary system will be set up to cater to the basic hygiene needs of the workers during the construction period in the vicinity of the construction area for all the components of the project. Electricity is not available in the area. Generator or Solar lamp will need installation.
Possible location of labor camps: Due to the small scale of construction, hence there is no need for labor shed.
Requirement and type of raw materials (e.g., sand, stone, wood, etc.): i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials
Identification of access road for transportation (Yes/No): Yes. There is a road called the Camp 12 connecting road that will be used for transportation and delivering materials to the 3 Nano grids in Camp 12. It provides access for vehicles and ensures a route for transporting goods and supplies.
Location identification for raw material storage: The materials, including the poles, for the Nano grids will be stored either on the side of the road or in designated vacant spaces near each Nano grid. The site management or the Camp-in-Charge (CIC) will grant permission to store the required materials for the Nano grid within the camp premises. To ensure security during nighttime, there may be provisions for having night guards in place
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.):

There is no pre-existing structure which will face demolition. Here, demolition waste will not have to be accounted for. Few leftovers from soil clearing, plastics or residual clearing and site clearing may be generated.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g., Solids wastes, liquid wastes, etc.): **Solid waste:** Iron, concrete, metal, drywall, wood, plastic, rubber, copper wires, excavated soils etc. **Quantity:** It is difficult to give exact figures of construction waste produced on a typical construction site. However, in order to approximate the quantity, it is estimated that nearly 2 kg of waste would be generated each working day, which are mainly RCC foundation construction and poles installation wastes. Some plastic, paper and organic waste will be generated from the use of workers, though a very negligible amount- half a kilogram a day maximum. **Liquid waste**: Paint chemicals as paint thinners which contain Volatile Organic Compounds (VOCs) will come out as leftovers. Due to the small scale of construction, hence there is no need for labor shed. So, fecal sludge will not be generated from the labor camp during the construction period. Leftover oils or spills from machinery can be a high probability generating liquid waste.
Type and quantity of raw materials used (wood, bricks, cement, water, etc.): **Type:** i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction. **Quantity**: It is difficult to give exact figures of construction waste produced on a typical construction site.
Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards: Around 100 sq. feet area is needed for this project. No vegetation is present in the targeted footprint area. Specific soil amount is not needed for the sub-project component. The current condition explains that there is no aggregated soil on the right of way. On the other hand, vegetation was found around the proposed area. The vegetation will not be affected by construction work since scope of works is confined within planned area.
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) Low. No borrow pit or quarries will be required to dig out during the construction period in or around/ adjacent to the proposed area.
Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description). No pre-existing water body or drainage is present
Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description)

Low. The site is free from any aquatic ecosystems or habitats of endangered species. There are some terrestrial flora species around the project site, which will slightly be affected by the works. Life cycle or movement of some terrestrial living species (fauna) (i.e. Insects - ant, bees, earthworm, reptiles, birds etc.) might be disturbed for the time being, but with very less impact indeed. So, overall potential effect is very low or absent for this specific sub project.
Activities that can lead to landslides, slumps, slips and other mass movements in road cuts: The soil in the proposed site is largely flat, so there is almost no chance to trigger the landslide or any type of mass movement of soil for the said construction works.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description) N/A
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: N/A
Chance of long-term or semi-permanent destruction of soils: (High/Medium/Low with description) There is no chance of activities during the operation period, which can lead to any long-term or semi-permanent destruction of soils.
Possibility of odor and water, soil quality impacts from SWM and FSM disposal system: (High/Medium/Low with description) N/A
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) There is no possibility for creating borrow-pits, quarries, etc. during the operation phase.
Likely direct and indirect impacts on economic development in the project areas by the sub-project: During the operation phase of the sub-project, there are likely to be both direct and indirect impacts on economic development in the project areas. Direct impacts refer to the immediate effects that result directly from the sub-project activities. For example, the establishment and operation of the Nano grid can create employment opportunities for the adjacent workforce. This can include job opportunities in the construction phase as well as maintenance and operation of the infrastructure. Indirect impacts, on the other hand, are the ripple effects that arise from the sub-project activities. Access to electricity provided by the Nano grid can enhance the quality and efficiency of various services such as healthcare, education, and communication. Healthcare facilities can operate more effectively with reliable power supply, ensuring better medical services for the community.

Educational institutions can improve their teaching and learning environments through the availability of electricity, enabling students to access modern technology and educational resources.
Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No existing drainage channels or surface water bodies found in the project area; therefore, no such effect can be anticipated
Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. There are no protected areas in or around project sites, and no known areas of ecological interest which can be affected by the daily activity of this facility.
Activities leading to landslides, slumps, slips and other mass movements in road cuts: N/A
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation) N/A
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: N/A

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

Environmental Screening Form for Solar PV Nano Grid (Camp 10)

Name of Sub-Project: Supply and Installation of Solar PV Nano grid (Camp 10: 3 nos. of Nano Grid will be installed in Camp 10)

Sl	Camp	Location	Block	Sub Block	Upazila	Union
1	Camp 10	Inside of CIC office boundary, Beside the flag stand	C	C3	Ukhiya	Palongkhali
2	Camp 10	F-13 Community Watch Tower Opposite ward to Play Ground	D	D2	Ukhiya	Palongkhali
3	Camp 10	F-13 Community Watch Tower Opposite ward to Play Ground	D	D2	Ukhiya	Palongkhali

Implementing Agency/Agencies: Local Government Engineering Department (LGED)

Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):
The proposed sub-project activities for the Nano grid include various components and equipment that are essential for its functioning. The control room is a steel container with dimensions of 10ft**8ft**8.5ft and a thickness of 2.3mm. It includes the construction of reinforced concrete footing, thermal insulation, and a ventilation fan operated by a temperature sensor. One control room with a capacity of 8KW will be installed.

The sub-project will require 18 solar PV modules, each with a capacity of 450 Wp (watt peak). These modules are of the mono crystalline type and consist of 72 cells or more, conforming to international standards and codes. The total capacity of the solar PV modules will be 8KW.

A total of 24 vented lead acid batteries will be used, each having a capacity of 2V and 900Ah (ampere-hour) or higher. These batteries are specifically designed for solar applications and comply with international standards and codes.

14 overhead distribution line poles will be erected, either with a height of 7.6 meters (SPC) or 6.0 meters (steel). The installation includes the use of reinforced concrete base, number plate, earthing, and all necessary fittings and accessories.

A total of 65 LED lights with a capacity of 10 watts will be installed for public facilities. These energy efficient lights will provide illumination while consuming minimal power.

Fifteen security lights with a capacity of 10 watts, equipped with outdoor installation fixtures, day light, and motion sensors, will be installed to ensure safety and security in the area.

Sixty-five energy-saving BLDC (Brushless Direct Current) ceiling fans with a capacity of 35 watts and a size of 56 inches will be installed in public facilities. These fans come with a 5-step capacitive compatible wall regulator and all necessary accessories for installation.

Twenty sets of switch, socket, and fuse board will be installed for the internal wiring of lights and fans in public facilities. This includes switches, sockets, PVC switch boxes, PVC insulated cables, and all other necessary fittings and accessories.

Estimated footprint / land area is 100 sq. feet for each Nano grid

Brief description of sub-project site: (e.g., present land use, Important Environmental Features (IEFs) near site, etc.:
In Camp 10, Block C, sub block C3, inside the CiC office boundary next to the flag stand, the nano grid site is safe and clear. It's placed between the CiC office and a flagpole, with only a few small plants that need removing. Being within the CiC office fencing makes it even more secure.

Moving to Camp 10, Block D, sub block D2, near the F-13 Community Watch Tower and opposite the playground ward, the site sits on the south side of Camp 10 BFS road, close to the CiC office. It's suitable but needs filling for stability. Also, a temporary bamboo structure used by DRP Majhi groups needs clearing. Despite being near settlements and mosques, it won't affect the playground nearby.

Lastly, in Camp 10, Block D, sub block D2, near the F-13 Community Watch Tower, the site is in a fenced backyard next to a DRP settlement. A few plants need cutting for the installation. This site is flat and good for installation.

Overall Comments
The proposed Solar PV Nano grids will have minimal environmental impact and are not located in environmentally sensitive areas. The project activities will not pose a significant threat to the natural surroundings and will not cause drainage congestion or water logging issues. Moreover, there will be no utilization of productive agricultural soil for the project, ensuring the preservation of fertile land.
The construction materials and equipment required for the Nano grids will be limited to the project boundary, minimizing any potential impact on the surrounding environment. The project follows environmentally responsible practices and aims to reduce any negative effects on the ecosystem.

The rohingya community has shown a positive attitude towards the project and expressed their enthusiasm to actively participate in its activities. The project is considered environmentally sustainable and socially acceptable by the adjacent community and representatives from various facilities. The participatory public consultation meeting provided an opportunity for community members to voice their opinions, and no objections were raised regarding the construction of the Nano grids at the proposed site. On the contrary, the community expressed appreciation for the infrastructure as it will enhance safety and security for the community.

During the consultation, the community highlighted the benefits that the Solar PV Nano grids will bring, particularly in terms of socio-security for female communities. The project is seen as a means to improve the quality of life, reduce vulnerability to social aggression and mistreatment, and enhance access to education and healthcare services. In addition, the establishment of the Solar PV Nano grids is expected to contribute to the overall development and well-being of the adjacent community. It will provide reliable electricity to various facilities such as learning centers, health posts, and food distribution centers, creating a conducive environment for education, healthcare,

and community activities. The Solar PV Nano grids will not only provide electricity but also empower the community, ensuring a brighter and more secure future for all.

Types of waste to be generated during construction and operation phase:

The construction of the Nano grid involves installing a control room made of a steel container, which will be placed on RCC foundations. This process may require minimal ground preparation and the installation of RCC foundations. Additionally, during the construction phase, 14 poles will be installed near the project site.

During the installation of the poles and RCC foundations, there is a possibility of generating waste materials. These may include soil and debris that are excavated while digging holes for pole installation. The waste generated from the pole installation and RCC foundation is relatively small and mainly consists of construction debris. This debris can include materials like concrete, cement, bricks, and other building materials that are used during the installation process. If wooden or bamboo components or supports are used during the pole installation, there may be waste generated from cutting or shaping the wood or bamboo to fit the desired specifications.

Due to the small scale of construction, there will be no need for a labor shed, resulting in a reduced likelihood of generating organic waste, faecal waste, and kitchen waste during this phase.

The container structure will be transported to the site using a truck and then installed on the pillars with the assistance of a crane. As a result, the construction process is expected to have minimal waste generation. However, it is important to ensure proper waste management practices are in place to handle any potential waste materials that may arise during transportation and installation.

Sensitive environmental, cultural, archaeological, religious sites near (within 100m) of site including elephant migration routes and remaining forests:

3 nos. of Nano grids will be installed in Camp 10. Within the influence area of the subproject no historical sites were identified. The proposed locations for the Nano grids have been considered for their proximity to sensitive environmental, cultural, archaeological, religious sites, as well as elephant migration routes and remaining forests within a 100-meter radius. Several sensitive features have been identified near the Nano grid locations, as described below:

In Camp 10, there are 3 Nano grids proposed in different locations.

In Camp 10, Block C, Sub block C3, located inside the CiC office boundary next to the flag stand, the proposed site for the Nano grid is surrounded by various facilities. Learning centers are situated approximately 77 meters to the east, while religious facilities are approximately 63 meters away. To the west, learning centers are found at a distance of about 97 meters, and religious facilities range from approximately 82 to 92 meters. Moving northwards, the CiC office is approximately 25 meters away, followed by a graveyard at about 71 meters, a child protection facility at 72 meters, and religious facilities at around 100 meters. Fortunately, no sensitive sites were found to the south.

2 Nano grids will be installed in block D, sub block D2. Both are installed near the F-13 Community Watch Tower and opposite the playground yard. Near the F-13 Community Watch Tower and

opposite the playground yard, the proposed site is also surrounded by several facilities. Religious facilities, a health post, and a child protection facility are situated approximately 92, 60, and 50 meters to the east respectively. To the west, religious facilities are situated at distances of around 43m, 45m, 64m and 74 meters. Moving northwards, a child protection facility is approximately 51 meters away, followed by a learning center at around 85 meters, and religious facilities at approximately 100 meters. To the south, learning centers are situated approximately 38 and 76 meters away, while religious facilities are situated at distances of around 69m, 81m and 91 meters.

Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists. Mostly Rohingya settlements are found around the proposed area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project area, no elephant migration routes exist (ref. IUCN). No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below

Section A: Sub-Project Overview

Description of sub-project/component interventions:

The 8KW capacity Nano grid control room, which is 10ft*8ft*8.5ft in size and has a thickness of 2.3mm, will serve as the central hub for the distribution of electricity to these facilities. The control room will be made of a steel container that includes the construction of RCC footing, thermal insulation, and ventilation operated by a temperature sensor. This will ensure that the equipment is protected from extreme weather conditions and operates at optimal performance.

The Nano grid will consist of approximately 14 poles, which will be installed to distribute electricity to the various facilities. Each pole will have an electricity line drawn from the Nano grid, with 14 panels installed on top of each pole. Additionally, each pole will have a 10 watt security light installed on top, providing additional safety and security for the surrounding area.

The proposed facilities also include the installation of 65 energy-efficient fans and lights in various service centers, each with a capacity of 35 watts and 10 watts respectively. These fans will help to keep the facilities cool during hot temperatures, ensuring a comfortable working environment for the facilitators.

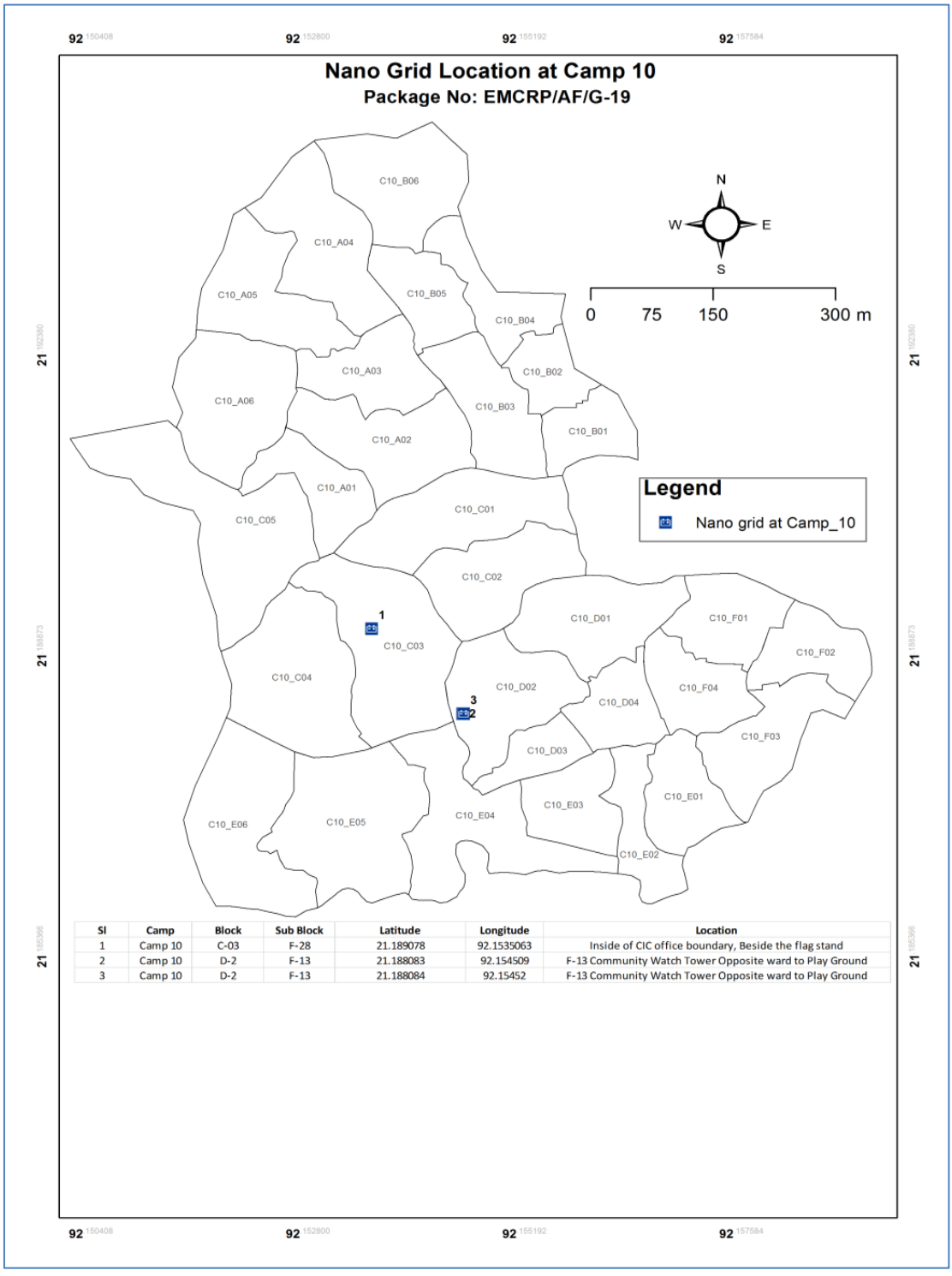
Two fire extinguishers will also be installed in the Nano grid room, ensuring the safety of the equipment and personnel oprating in the area.

Sub-project Location:

3 nos. of Nano grid will be installed in Camp 10. The location details are given below.

Sl	Camp	Location	Block	Sub Block	Upazila	Union	Latitude	Longitude
1	Camp 10	Inside of CIC office boundary, Beside the flag stand	C	C3	Ukhiya	Palongkhali	21.189078	92.1535063

2	Camp 10	F-13 Community Watch Tower Opposite ward to Play Ground	D	D2	Ukhiya	Palongkhali	21.188083	92.154509
3	Camp 10	F-13 Community Watch Tower Opposite ward to Play Ground	D	D2	Ukhiya	Palongkhali	21.188084	92.15452



Sl	Camp	Block	Sub Block	Latitude	Longitude	Location
1	Camp 10	C-03	F-28	21.189078	92.1535063	Inside of CIC office boundary, Beside the flag stand
2	Camp 10	D-2	F-13	21.188083	92.154509	F-13 Community Watch Tower Opposite ward to Play Ground
3	Camp 10	D-2	F-13	21.188084	92.15452	F-13 Community Watch Tower Opposite ward to Play Ground

Proposed Nano grid location at Camp 10

Land ownership Govt. Land
Expected construction period: 6 months
Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive environmental areas such as elephant corridors, water bodies, etc. and historical or socio-cultural assets): Please also explain any analysis on alternative location was conducted: There are 3 nos. of Nano grid in camp 10. In Camp 10, Block C, Sub block C3, located inside the CiC office boundary next to the flag stand, the proposed site for the Nano grid is surrounded by various facilities. Learning centers are situated approximately 77 meters to the east, while religious facilities are approximately 63 meters away. To the west, learning centers are found at a distance of about 97 meters, and religious facilities range from approximately 82 to 92 meters. Moving northwards, the CiC office is approximately 25 meters away, followed by a graveyard at about 71 meters, a child protection facility at 72 meters, and religious facilities at around 100 meters. Fortunately, no sensitive sites were found to the south. 2 Nano grids will be installed in block D, sub block D2. Both are installed near the F-13 Community Watch Tower and opposite the playground yard. Near the F-13 Community Watch Tower and opposite the playground yard, the proposed site is also surrounded by several facilities. Religious facilities, a health post, and a child protection facility are situated approximately 92, 60, and 50 meters to the east respectively. To the west, religious facilities are situated at distances of around 43m, 45m, 64m and 74 meters. Moving northwards, a child protection facility is approximately 51 meters away, followed by a learning center at around 85 meters, and religious facilities at approximately 100 meters. To the south, learning centers are situated approximately 38 and 76 meters away, while religious facilities are situated at distances of around 69m, 81m and 91 meters. Within the influence area of the proposed location no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (confirmed by the participants in the consultation meeting).

Section B: Environmental Screening

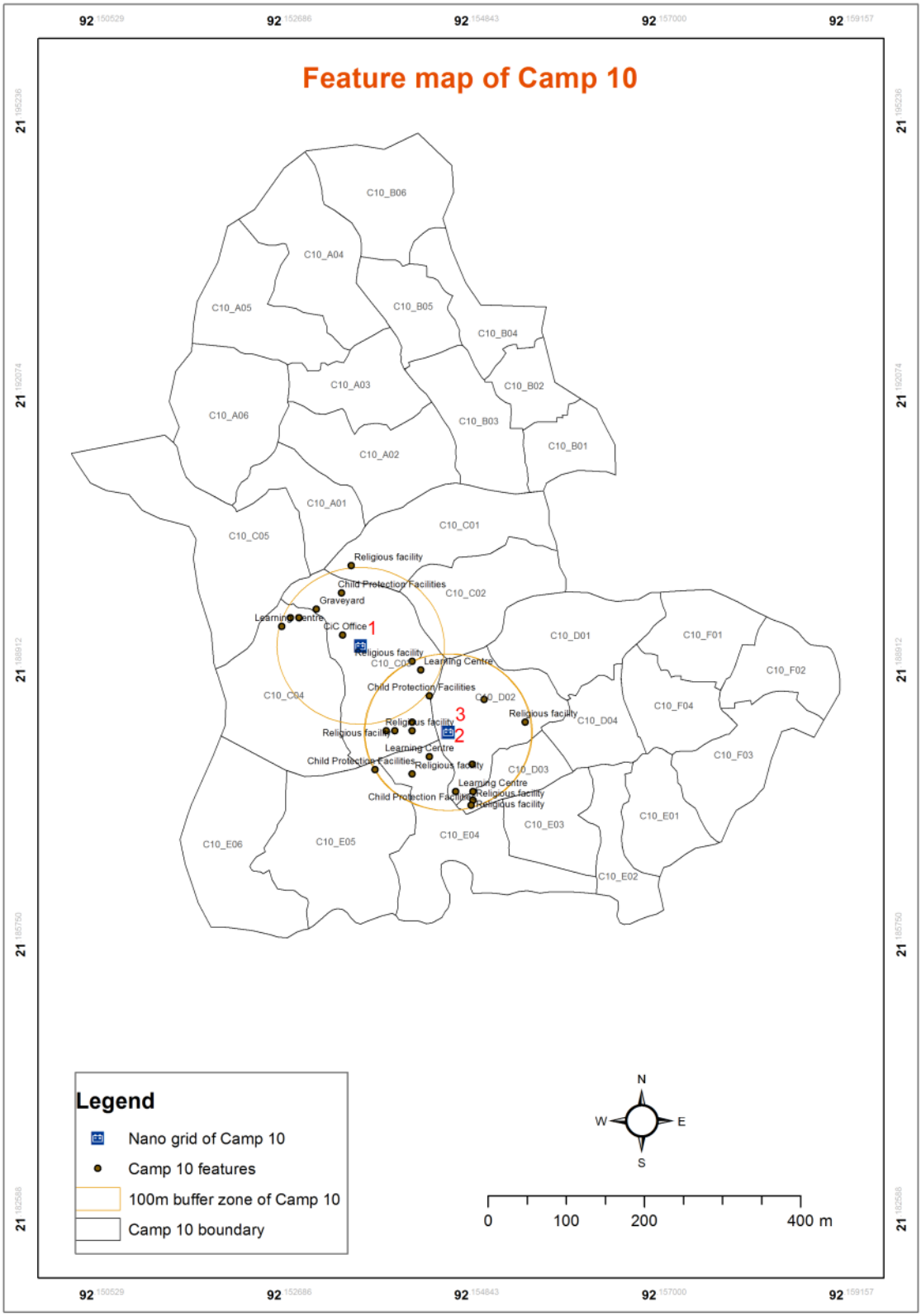
***B.1*: Environmental feature of sub-project location**

Description of cultural properties (if applicable, including distance from site): Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests: There are 3 nos. of Nano grid in camp 10. In Camp 10, Block C, Sub block C3, located inside the CiC office boundary next to the flag stand, the proposed site for the Nano grid is surrounded by various facilities. Learning centers are situated approximately 77 meters to the east, while religious facilities are approximately 63 meters away. To the west, learning centers are found at a distance of about 97 meters, and religious facilities range from approximately 82 to 92 meters. Moving northwards, the CiC office is approximately 25 meters away, followed by a graveyard at about 71 meters, a child protection facility at 72 meters, and religious facilities at around 100 meters. Fortunately, no sensitive sites were found to the south.

2 Nano grids will be installed in block D, sub block D2. Both are installed near the F-13 Community Watch Tower and opposite the playground yard. Near the F-13 Community Watch Tower and opposite the playground yard, the proposed site is also surrounded by several facilities. Religious facilities, a health post, and a child protection facility are situated approximately 92, 60, and 50 meters to the east respectively. To the west, religious facilities are situated at distances of around 43m, 45m, 64m and 74 meters. Moving northwards, a child protection facility is approximately 51 meters away, followed by a learning center at around 85 meters, and religious facilities at approximately 100 meters. To the south, learning centers are situated approximately 38 and 76 meters away, while religious facilities are situated at distances of around 69m, 81m and 91 meters.

Within the influence area of the proposed location no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (confirmed by the participants in the consultation meeting). There are no other sensitive environmental, cultural, archaeological sites within the catchment area of this sub-project.

A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas are shown below.



Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive features found in the footprint area. Several

learning center, child protection facility, rohingya settlements and religious facilities were found during the survey. It will not be affected by the construction works, as the activities will be carried out within the existing proposed area boundary and necessary preventive and mitigation measures will be followed during the entire construction period.

(1) Within/near Elephant Migration Routes Yes/No*

No. These have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

(2) potential impacts on remaining forests in/around camps Yes/No

N/A (This activity will be confined within the proposed location)

(3) Other issues: N/A

*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:

Dust:

Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, trailer, mini truck, etc. move on roads adjacent to proposed location throughout the day generating noise but within tolerable limit in most cases.

Baseline soil quality:

The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.

Landslide potential (high/medium/low, with explanation):

The nominated location is found to be on fairly plane land. There is no condition found around the selected site which might give reasons for landslides.

Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH):

Groundwater is the main source of potable water in the Sub-project area. The shallow depth is about 100 feet to 120 feet and deep tube well depth is 700 to 850 feet. In the sub-project area, deep groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains medium concentration of iron. Deep groundwater table (drinkable) varies from 600-800ft (Field survey, 2021). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer.

Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to 681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)

Status of wildlife movement:

N/A (None of the information was found about the wildlife movement in or across the area)

State of forestation: Patches of vegetation containing small trees found in target location and in surrounding area of the proposed location which are within 200m radial distance.
Summary of water balance analysis (For water supply scheme only): **N/A**

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g., status of access road or any other facility required for sub-project to be viable): There is a road called the camp 10 connecting road that will be used for transportation and delivering materials to the 3 Nano grids in Camp 10. It provides access for vehicles and ensures a route for transporting goods and supplies.
Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction: Due to the small scale of construction, hence there is no need for labor shed. As a result, there is no necessity for a tube well in the proposed locations. Instead, during the construction phase, the contractor will arrange for a mobile water supply system to ensure a sufficient water source for the construction work. Additionally, the contractor will be responsible for providing temporary sanitation facilities. A portable or temporary sanitary system will be set up to cater to the basic hygiene needs of the workers during the construction period in the vicinity of the construction area for all the components of the project. Electricity is not available in the area. Generator or Solar lamp will need installation.
Possible location of labor camps: Due to the small scale of construction, hence there is no need for labor shed.
Requirement and type of raw materials (e.g., sand, stone, wood, etc.): i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials
Identification of access road for transportation (Yes/No): Yes. There is a road called the camp 10 connecting road that will be used for transportation and delivering materials to the 3 Nano grids in Camp 10. It provides access for vehicles and ensures a route for transporting goods and supplies.
Location identification for raw material storage: The materials, including the poles, for the Nano grids will be stored either on the side of the road or in designated vacant spaces near each Nano grid. The site management or the Camp-in-Charge (CIC) will grant permission to store the required materials for the Nano grid within the camp premises. To ensure security during nighttime, there may be provisions for having night guards in place
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.): There is no pre-existing structure which will face demolition. Here, demolition waste will not have to be accounted for. Few leftovers from soil clearing, plastics or residual clearing and site clearing may be generated.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g., Solids wastes, liquid wastes, etc.): **Solid waste:** Iron, concrete, metal, drywall, wood, plastic, rubber, copper wires, excavated soils etc. **Quantity:** It is difficult to give exact figures of construction waste produced on a typical construction site. However, in order to approximate the quantity, it is estimated that nearly 2 kg of waste would be generated each working day, which are mainly RCC foundation construction and poles installation wastes. Some plastic, paper and organic waste will be generated from the use of workers, though a very negligible amount- half a kilogram a day maximum. **Liquid waste**: Paint chemicals as paint thinners which contain Volatile Organic Compounds (VOCs) will come out as leftovers. Due to the small scale of construction, hence there is no need for labor shed. So, fecal sludge will not be generated from the labor camp during the construction period. Leftover oils or spills from machinery can be a high probability generating liquid waste.
Type and quantity of raw materials used (wood, bricks, cement, water, etc.): **Type:** i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction. **Quantity**: It is difficult to give exact figures of construction waste produced on a typical construction site.
Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards: Around 100 sq. feet area is needed for this project. No vegetation is present in the targeted footprint area. Specific soil amount is not needed for the sub-project component. The current condition explains that there is no aggregated soil on the right of way. On the other hand, vegetation was found around the proposed area. The vegetation will not be affected by construction work since scope of works is confined within planned area.
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) Low. No borrow pit or quarries will be required to dig out during the construction period in or around/ adjacent to the proposed area.
Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description). No pre-existing water body or drainage is present
Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) **Low.** The site is free from any aquatic ecosystems or habitats of endangered species. There are some terrestrial flora species around the project site, which will slightly be affected by the works. Life cycle or movement of some terrestrial living species (fauna) (i.e. Insects - ant, bees, earthworm, reptiles, birds etc.) might be disturbed for the time being, but with very less impact indeed. So, overall

potential effect is very low or absent for this specific sub project.
Activities that can lead to landslides, slumps, slips and other mass movements in road cuts: The soil in the proposed site is largely flat, so there is almost no chance to trigger the landslide or any type of mass movement of soil for the said construction works.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description) N/A
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: N/A
Chance of long-term or semi-permanent destruction of soils: (High/Medium/Low with description) There is no chance of activities during the operation period, which can lead to any long-term or semi-permanent destruction of soils.
Possibility of odor and water, soil quality impacts from SWM and FSM disposal system: (High/Medium/Low with description) N/A
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) There is no possibility for creating borrow-pits, quarries, etc. during the operation phase.
Likely direct and indirect impacts on economic development in the project areas by the sub-project: During the operation phase of the sub-project, there are likely to be both direct and indirect impacts on economic development in the project areas. Direct impacts refer to the immediate effects that result directly from the sub-project activities. For example, the establishment and operation of the Nano grid can create employment opportunities for the adjacent workforce. This can include job opportunities in the construction phase as well as maintenance and operation of the infrastructure. Indirect impacts, on the other hand, are the ripple effects that arise from the sub-project activities. Access to electricity provided by the Nano grid can enhance the quality and efficiency of various services such as healthcare, education, and communication. Healthcare facilities can operate more effectively with reliable power supply, ensuring better medical services for the community. Educational institutions can improve their teaching and learning environments through the availability of electricity, enabling students to access modern technology and educational resources.
Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description)

No existing drainage channels or surface water bodies found in the project area; therefore, no such effect can be anticipated
Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. There are no protected areas in or around project sites, and no known areas of ecological interest which can be affected by the daily activity of this facility.
Activities leading to landslides, slumps, slips and other mass movements in road cuts: N/A
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation) N/A
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: N/A

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

Environmental Screening Form for Solar PV Nano Grid (Camp 11)

Name of Sub-Project: Supply and Installation of Solar PV Nano grid (Camp 11: There are 3 nos. of Nano Grid will be installed in Camp 11)

Sl	Camp	Location	Block	Sub Block	Upazila	Union
1	Camp 11	Behind SMS Hub and beside Cox's Bazar to Teknaf main road	C	C2	Ukhiya	Palongkhali
2	Camp 11	Inside of ware house	C	C2	Ukhiya	Palongkhali
3	Camp 11	Near by Temporary Nutrition Center	A	A1	Ukhiya	Palongkhali

Implementing Agency/Agencies: Local Government Engineering Department (LGED)

Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):
The proposed sub-project activities for the Nano grid include various components and equipment that are essential for its functioning. The control room is a steel container with dimensions of 10ft**8ft**8.5ft and a thickness of 2.3mm. It includes the construction of reinforced concrete footing, thermal insulation, and a ventilation fan operated by a temperature sensor. One control room with a capacity of 8KW will be installed.

The sub-project will require 18 solar PV modules, each with a capacity of 450 Wp (watt peak). These modules are of the mono crystalline type and consist of 72 cells or more, conforming to international standards and codes. The total capacity of the solar PV modules will be 8KW.

A total of 24 vented lead acid batteries will be used, each having a capacity of 2V and 900Ah (ampere-hour) or higher. These batteries are specifically designed for solar applications and comply with international standards and codes.

14 overhead distribution line poles will be erected, either with a height of 7.6 meters (SPC) or 6.0 meters (steel). The installation includes the use of reinforced concrete base, number plate, earthing, and all necessary fittings and accessories.

A total of 65 LED lights with a capacity of 10 watts will be installed for public facilities. These energy efficient lights will provide illumination while consuming minimal power.

Fifteen security lights with a capacity of 10 watts, equipped with outdoor installation fixtures, day light, and motion sensors, will be installed to ensure safety and security in the area.

Sixty-five energy-saving BLDC (Brushless Direct Current) ceiling fans with a capacity of 35 watts and a size of 56 inches will be installed in public facilities. These fans come with a 5-step capacitive compatible wall regulator and all necessary accessories for installation.

Twenty sets of switch, socket, and fuse board will be installed for the internal wiring of lights and fans in public facilities. This includes switches, sockets, PVC switch boxes, PVC insulated cables, and all other necessary fittings and accessories.

Estimated footprint / land area is 100 sq. feet for each Nano grid

Brief description of sub-project site: (e.g., present land use, Important Environmental Features (IEFs) near site, etc.:
In Camp 11, there are three proposed Nano grid sites.

Camp 11, Block C, Sub block C2, Behind SMS Hub and beside Cox's Bazar to Teknaf main road: This site is within camp 11, behind the SMS Hub and next to the Cox's Bazar to Teknaf main road. Currently, it's used for storing materials and as a scrap yard. Before installing the Nano grid, this site is need to be clear a few small plants and shrubs. Camp 11 connecting road located nearby the site, making it easy to transport containers and materials for installation.

Camp 11, Block C, sub block C2, inside of IOM Warehouse: Located on the east side of the Arakan camp road inside the IOM warehouse facility, this site has limited space for the nano grid. It's mainly used for storing scrap materials and debris because it's a warehouse. The area is fenced for security, and there's a wash block to the north and a mosque located nearby it.

Camp 11, Block A, sub block A1, Nearby Temporary Nutrition Center: Found on the west side of a Friendship Learning Center, this site offers plenty of space for the nano grid without any obstacles. It's close to the camp 11 connecting road, making it convenient for transporting materials. Nearby, there are two mosques to the east and a few DRP settlements.

Overall Comments
The proposed Solar PV Nano grids will have minimal environmental impact and are not located in environmentally sensitive areas. The project activities will not pose a significant threat to the natural surroundings and will not cause drainage congestion or water logging issues. Moreover, there will be no utilization of productive agricultural soil for the project, ensuring the preservation of fertile land.
The construction materials and equipment required for the Nano grids will be limited to the project boundary, minimizing any potential impact on the surrounding environment. The project follows environmentally responsible practices and aims to reduce any negative effects on the ecosystem.

The rohingya community has shown a positive attitude towards the project and expressed their enthusiasm to actively participate in its activities. The project is considered environmentally sustainable and socially acceptable by the adjacent community and representatives from various facilities. The participatory public consultation meeting provided an opportunity for community members to voice their opinions, and no objections were raised regarding the construction of the Nano grids at the proposed site. On the contrary, the community expressed appreciation for the infrastructure as it will enhance safety and security for the community.

During the consultation, the community highlighted the benefits that the Solar PV Nano grids will bring, particularly in terms of socio-security for female communities. The project is seen as a means

to improve the quality of life, reduce vulnerability to social aggression and mistreatment, and enhance access to education and healthcare services. In addition, the establishment of the Solar PV Nano grids is expected to contribute to the overall development and well-being of the adjacent community. It will provide reliable electricity to various facilities such as learning centers, child protection facilities, health posts, and food distribution centers, creating a conducive environment for education, healthcare, and community activities. The Solar PV Nano grids will not only provide electricity but also empower the community, ensuring a brighter and more secure future for all.

Types of waste to be generated during construction and operation phase:

The construction of the Nano grid involves installing a control room made of a steel container, which will be placed on RCC foundations. This process may require minimal ground preparation and the installation of RCC foundations. Additionally, during the construction phase, 14 poles will be installed near the project site.

During the installation of the poles and RCC foundations, there is a possibility of generating waste materials. These may include soil and debris that are excavated while digging holes for pole installation. The waste generated from the pole installation and RCC foundation is relatively small and mainly consists of construction debris. This debris can include materials like concrete, cement, bricks, and other building materials that are used during the installation process. If wooden or bamboo components or supports are used during the pole installation, there may be waste generated from cutting or shaping the wood or bamboo to fit the desired specifications.

Due to the small scale of construction, there will be no need for a labor shed, resulting in a reduced likelihood of generating organic waste, faecal waste, and kitchen waste during this phase.

The container structure will be transported to the site using a truck and then installed on the pillars with the assistance of a crane. As a result, the construction process is expected to have minimal waste generation. However, it is important to ensure proper waste management practices are in place to handle any potential waste materials that may arise during transportation and installation.

Sensitive environmental, cultural, archaeological, religious sites near (within 100m) of site including elephant migration routes and remaining forests:

3 nos. of Nano grids will be installed in Camp 11. Within the influence area of the subproject no historical sites were identified. The proposed locations for the Nano grids have been considered for their proximity to sensitive environmental, cultural, archaeological, religious sites, as well as elephant migration routes and remaining forests within a 100-meter radius. Several sensitive features have been identified near the Nano grid locations, as described below:

Within Camp No.11, where 3 Nano grids are planned for construction, several sensitive features are present in different blocks and sub-blocks.

The first Nano grid, located in Block C, Sub block C2, behind the SMS Hub and adjacent to the Cox's Bazar to Teknaf main road, is surrounded by several sensitive sites. To the west, there are religious facilities situated at distances of 30 meters and 44 meters. To the north, the CiC office and a learning center are present at distances of 56 meters, 65 meters, 94 meters, and 97 meters respectively. To

the south, there are learning centers and religious facilities at distances of 65 meters, 73 meters, 61 meters, and 63 meters respectively.

Moving to the second nano grid, also in Block C, Sub block C2, located inside a warehouse, there are no sensitive features found in the immediate vicinity. To the north, there is a learning center located at a distance of 78 meters.

Lastly, the third nano grid, situated in Block A, Sub block A1, near the Temporary Nutrition Center, has no sensitive features to the east and south. To the west, there are learning centers, a health post, and a child protection facility at distances of 80 meters, 94 meters, 92 meters, and 95 meters respectively. To the north, there are religious facilities and a child protection facility located at distances of 41 meters, 44 meters, and 50 meters respectively. To the south, there are learning centers, religious facilities, and a primary health center at distances of 68 meters, 53 meters, and 34 meters respectively.

Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists. Mostly Rohingya settlements are found around the proposed area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project area, no elephant migration routes exist (ref. IUCN). No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below

Section A: Sub-Project Overview

Description of sub-project/component interventions:

The 8KW capacity Nano grid control room, which is 10ft*8ft*8.5ft in size and has a thickness of 2.3mm, will serve as the central hub for the distribution of electricity to these facilities. The control room will be made of a steel container that includes the construction of RCC footing, thermal insulation, and ventilation operated by a temperature sensor. This will ensure that the equipment is protected from extreme weather conditions and operates at optimal performance.

The Nano grid will consist of approximately 14 poles, which will be installed to distribute electricity to the various facilities. Each pole will have an electricity line drawn from the Nano grid, with 14 panels installed on top of each pole. Additionally, each pole will have a 10 watt security light installed on top, providing additional safety and security for the surrounding area.

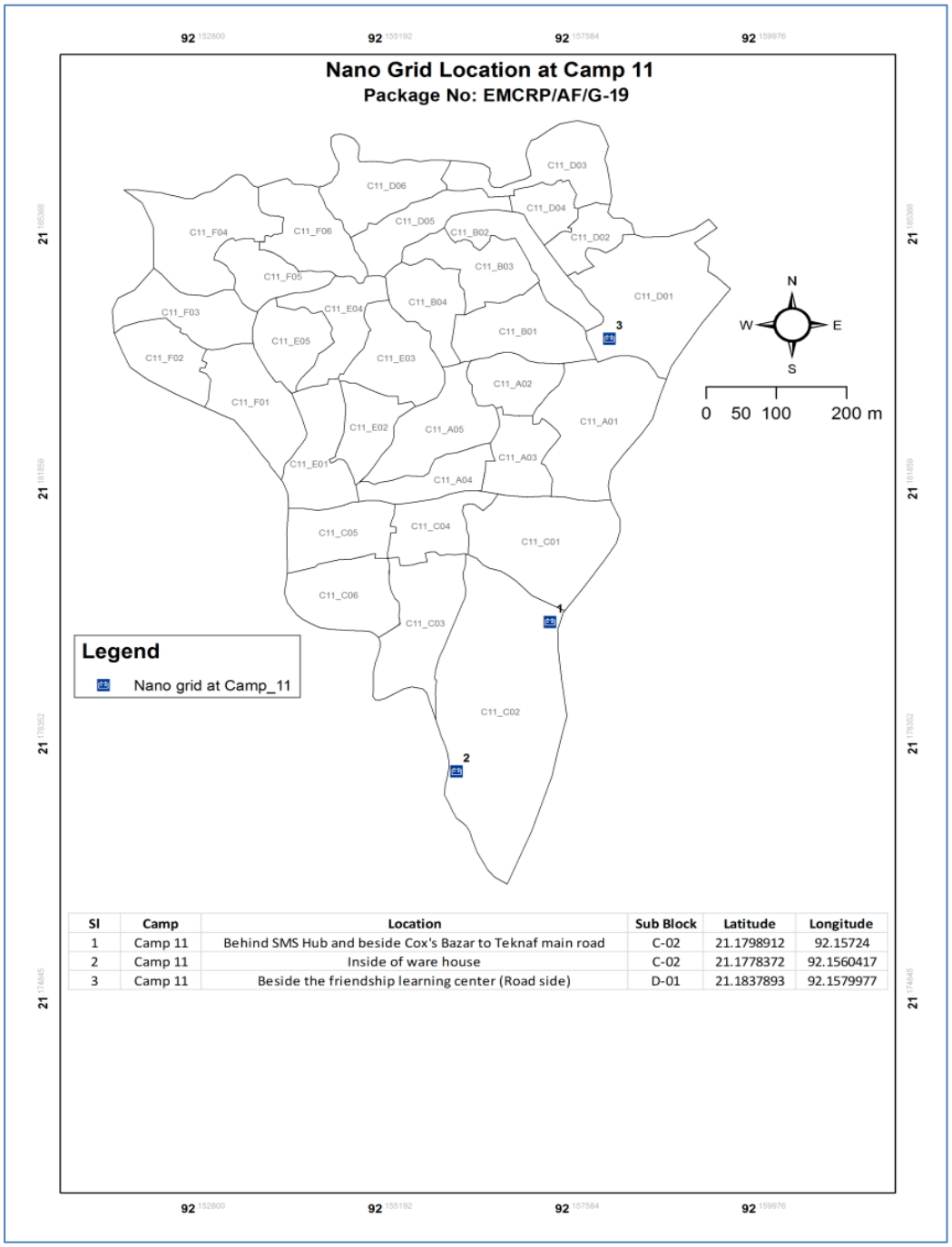
The proposed facilities also include the installation of 65 energy-efficient fans and lights in various service centers, each with a capacity of 35 watts and 10 watts respectively. These fans will help to keep the facilities cool during hot temperatures, ensuring a comfortable working environment for the facilitators.

Two fire extinguishers will also be installed in the Nano grid room, ensuring the safety of the equipment and personnel operating in the area.

Sub-project Location:

3 nos. of Nano grids will be installed in Camp 11. The location details are given below.

Sl	Camp	Location	Block	Sub Block	Upazila	Union	Latitude	Longitude
1	Camp 11	Behind SMS Hub and beside Cox's Bazar to Teknaf main road	C	C2	Ukhiya	Palongkhali	21.1798912	92.15724
2	Camp 11	Inside of ware house	C	C2	Ukhiya	Palongkhali	21.1778372	92.1560417
3	Camp 11	Near by Temporary Nutrition Center	A	A1	Ukhiya	Palongkhali	21.183013	92.158064



Sl	Camp	Location	Sub Block	Latitude	Longitude
1	Camp 11	Behind SMS Hub and beside Cox's Bazar to Teknaf main road	C-02	21.1798912	92.15724
2	Camp 11	Inside of ware house	C-02	21.1778372	92.1560417
3	Camp 11	Beside the friendship learning center (Road side)	D-01	21.1837893	92.1579977

Proposed Nano grid location at Camp 11

Land ownership Govt. Land
Expected construction period: 6 months
Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive environmental areas such as elephant corridors, water bodies, etc. and historical or socio-cultural assets): Please also explain any analysis on alternative location was conducted: There are 3 nos. of Nano grid in camp 11. The first Nano grid, located in Block C, Sub block C2, behind the SMS Hub and adjacent to the Cox's Bazar to Teknaf main road, is surrounded by several sensitive sites. To the west, there are religious facilities situated at distances of 30 meters and 44 meters. To the north, the CiC office and a learning center are present at distances of 56 meters, 65 meters, 94 meters, and 97 meters respectively. To the south, there are learning centers and religious facilities at distances of 65 meters, 73 meters, 61 meters, and 63 meters respectively. Moving to the second Nano grid, also in Block C, Sub block C2, located inside a warehouse, there are no sensitive features found in the immediate vicinity. To the north, there is a learning center located at a distance of 78 meters. Lastly, the third Nano grid, situated in Block A, Sub block A1, near the Temporary Nutrition Center, has no sensitive features to the east and south. To the west, there are learning centers, a health post, and a child protection facility at distances of 80 meters, 94 meters, 92 meters, and 95 meters respectively. To the north, there are religious facilities and a child protection facility located at distances of 41 meters, 44 meters, and 50 meters respectively. To the south, there are learning centers, religious facilities, and a primary health center at distances of 68 meters, 53 meters, and 34 meters respectively. Within the influence area of the proposed location no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (confirmed by the participants in the consultation meeting).

Section B: Environmental Screening

***B.1*: Environmental feature of sub-project location**

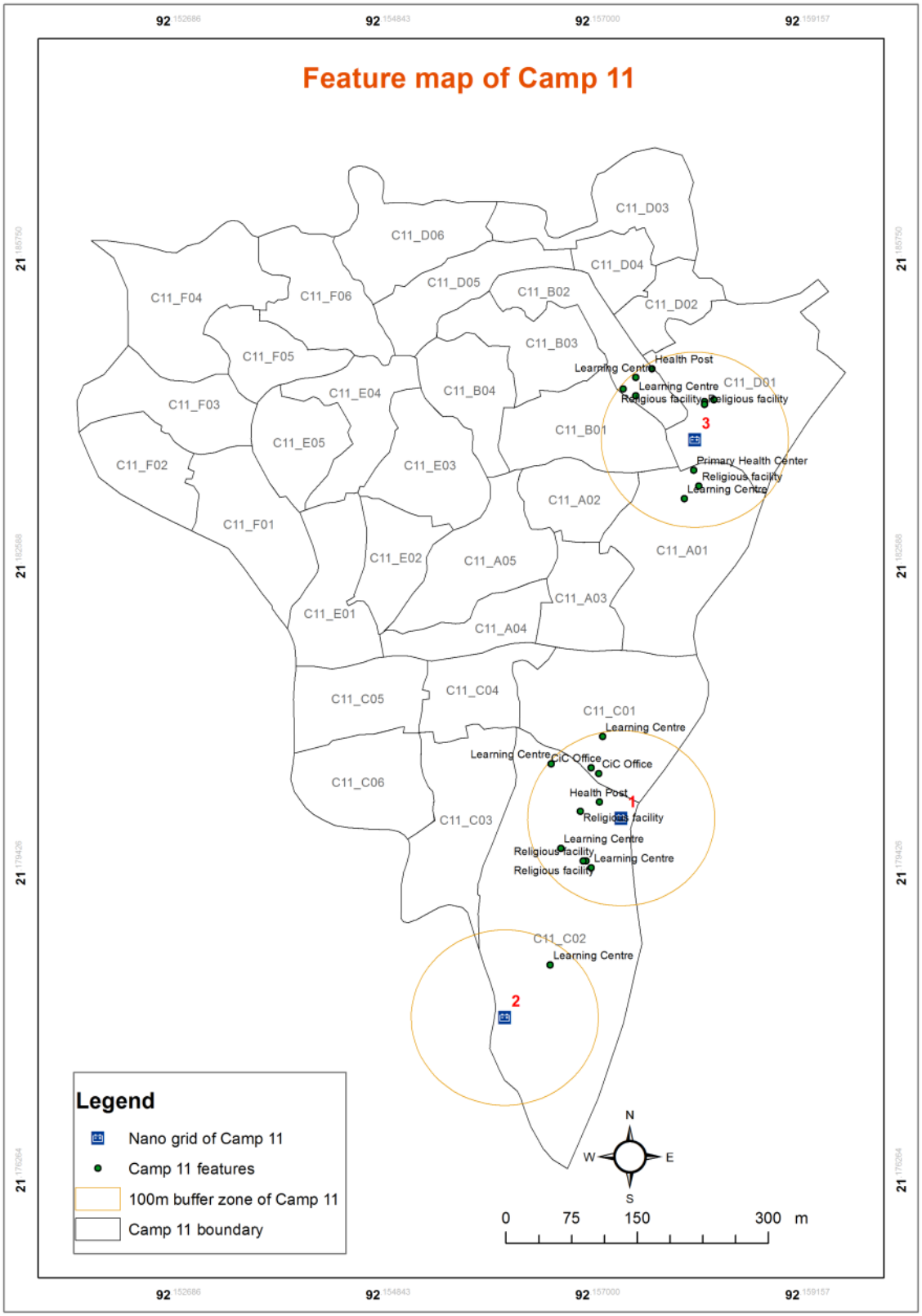
Description of cultural properties (if applicable, including distance from site): Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests: There are 3 nos. of Nano grid in camp 11. The first Nano grid, located in Block C, Sub block C2, behind the SMS Hub and adjacent to the Cox's Bazar to Teknaf main road, is surrounded by several sensitive sites. To the west, there are religious facilities situated at distances of 30 meters and 44 meters. To the north, the CiC office and a learning center are present at distances of 56 meters, 65 meters, 94 meters, and 97 meters respectively. To the south, there are learning centers and religious facilities at distances of 65 meters, 73 meters, 61 meters, and 63 meters respectively. Moving to the second Nano grid, also in Block C, Sub block C2, located inside a warehouse, there are no sensitive features found in the immediate vicinity. To the north, there is a learning center located

at a distance of 78 meters.

Lastly, the third Nano grid, situated in Block A, Sub block A1, near the Temporary Nutrition Center, has no sensitive features to the east and south. To the west, there are learning centers, a health post, and a child protection facility at distances of 80 meters, 94 meters, 92 meters, and 95 meters respectively. To the north, there are religious facilities and a child protection facility located at distances of 41 meters, 44 meters, and 50 meters respectively. To the south, there are learning centers, religious facilities, and a primary health center at distances of 68 meters, 53 meters, and 34 meters respectively.

Within the influence area of the proposed location no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (confirmed by the participants in the consultation meeting). There are no other sensitive environmental, cultural, archaeological sites within the catchment area of this sub-project.

A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas are shown below.



Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive features found in the footprint area. Several

learning center, health post, rohingya settlements and religious facilities were found during the survey. It will not be affected by the construction works, as the activities will be carried out within the existing proposed area boundary and necessary preventive and mitigation measures will be followed during the entire construction period.

(1) Within/near Elephant Migration Routes Yes/No*

No. These have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

(2) potential impacts on remaining forests in/around camps Yes/No

N/A (This activity will be confined within the proposed location)

(3) Other issues: N/A

*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:

Dust:

Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, trailer, mini truck, etc. move on roads adjacent to proposed location throughout the day generating noise but within tolerable limit in most cases.

Baseline soil quality:

The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.

Landslide potential (high/medium/low, with explanation):

The nominated location is found to be on fairly plane land. There is no condition found around the selected site which might give reasons for landslides.

Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH):

Groundwater is the main source of potable water in the Sub-project area. The shallow depth is about 100 feet to 120 feet and deep tube well depth is 700 to 850 feet. In the sub-project area, deep groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains medium concentration of iron. Deep groundwater table (drinkable) varies from 600-800ft (Field survey, 2021). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer.

Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to 681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)

Status of wildlife movement:

N/A (None of the information was found about the wildlife movement in or across the area)

State of forestation: Patches of vegetation containing small trees found in target location and in surrounding area of the proposed location which are within 200m radial distance.
Summary of water balance analysis (For water supply scheme only): **N/A**

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g., status of access road or any other facility required for sub-project to be viable): There is a road called the camp 11 connecting road/ Arakan Road that will be used for transportation and delivering materials to the 3 Nano grids in Camp 11. It provides access for vehicles and ensures a route for transporting goods and supplies.
Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction: Due to the small scale of construction, hence there is no need for labor shed. As a result, there is no necessity for a tube well in the proposed locations. Instead, during the construction phase, the contractor will arrange for a mobile water supply system to ensure a sufficient water source for the construction work. Additionally, the contractor will be responsible for providing temporary sanitation facilities. A portable or temporary sanitary system will be set up to cater to the basic hygiene needs of the workers during the construction period in the vicinity of the construction area for all the components of the project. Electricity is not available in the area. Generator or Solar lamp will need installation.
Possible location of labor camps: Due to the small scale of construction, hence there is no need for labor shed.
Requirement and type of raw materials (e.g., sand, stone, wood, etc.): i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials
Identification of access road for transportation (Yes/No): Yes. There is a road called the camp 11 connecting road/ Arakan Road that will be used for transportation and delivering materials to the 3 Nano grids in Camp 11. It provides access for vehicles and ensures a route for transporting goods and supplies.
Location identification for raw material storage: The materials, including the poles, for the Nano grids will be stored either on the side of the road or in designated vacant spaces near each Nano grid. The site management or the Camp-in-Charge (CIC) will grant permission to store the required materials for the Nano grid within the camp premises. To ensure security during nighttime, there may be provisions for having night guards in place
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.): There is no pre-existing structure which will face demolition. Here, demolition waste will not have to be accounted for. Few leftovers from soil clearing, plastics or residual clearing and site clearing may be generated.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g., Solids wastes, liquid wastes, etc.): **Solid waste:** Iron, concrete, metal, drywall, wood, plastic, rubber, copper wires, excavated soils etc. **Quantity:** It is difficult to give exact figures of construction waste produced on a typical construction site. However, in order to approximate the quantity, it is estimated that nearly 2 kg of waste would be generated each working day, which are mainly RCC foundation construction and poles installation wastes. Some plastic, paper and organic waste will be generated from the use of workers, though a very negligible amount- half a kilogram a day maximum. **Liquid waste**: Paint chemicals as paint thinners which contain Volatile Organic Compounds (VOCs) will come out as leftovers. Due to the small scale of construction, hence there is no need for labor shed. So, fecal sludge will not be generated from the labor camp during the construction period. Leftover oils or spills from machinery can be a high probability generating liquid waste.
Type and quantity of raw materials used (wood, bricks, cement, water, etc.): **Type:** i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction. **Quantity**: It is difficult to give exact figures of construction waste produced on a typical construction site.
Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards: Around 100 sq. feet area is needed for this project. No vegetation is present in the targeted footprint area. Specific soil amount is not needed for the sub-project component. The current condition explains that there is no aggregated soil on the right of way. On the other hand, vegetation was found around the proposed area. The vegetation will not be affected by construction work since scope of works is confined within planned area.
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) Low. No borrow pit or quarries will be required to dig out during the construction period in or around/ adjacent to the proposed area.
Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description). No pre-existing water body or drainage is present
Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) **Low.** The site is free from any aquatic ecosystems or habitats of endangered species. There are some terrestrial flora species around the project site, which will slightly be affected by the works. Life cycle or movement of some terrestrial living species (fauna) (i.e. Insects - ant, bees, earthworm, reptiles,

birds etc.) might be disturbed for the time being, but with very less impact indeed. So, overall potential effect is very low or absent for this specific sub project.
Activities that can lead to landslides, slumps, slips and other mass movements in road cuts: The soil in the proposed site is largely flat, so there is almost no chance to trigger the landslide or any type of mass movement of soil for the said construction works.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description) N/A
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: N/A
Chance of long-term or semi-permanent destruction of soils: (High/Medium/Low with description) There is no chance of activities during the operation period, which can lead to any long-term or semi-permanent destruction of soils.
Possibility of odor and water, soil quality impacts from SWM and FSM disposal system: (High/Medium/Low with description) N/A
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) There is no possibility for creating borrow-pits, quarries, etc. during the operation phase.
Likely direct and indirect impacts on economic development in the project areas by the sub-project: During the operation phase of the sub-project, there are likely to be both direct and indirect impacts on economic development in the project areas. Direct impacts refer to the immediate effects that result directly from the sub-project activities. For example, the establishment and operation of the Nano grid can create employment opportunities for the adjacent workforce. This can include job opportunities in the construction phase as well as maintenance and operation of the infrastructure. Indirect impacts, on the other hand, are the ripple effects that arise from the sub-project activities. Access to electricity provided by the Nano grid can enhance the quality and efficiency of various services such as healthcare, education, and communication. Healthcare facilities can operate more effectively with reliable power supply, ensuring better medical services for the community. Educational institutions can improve their teaching and learning environments through the availability of electricity, enabling students to access modern technology and educational resources.
Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface

water bodies (wetlands, marshes): (High/Medium/Low with description) No existing drainage channels or surface water bodies found in the project area; therefore, no such effect can be anticipated
Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. There are no protected areas in or around project sites, and no known areas of ecological interest which can be affected by the daily activity of this facility.
Activities leading to landslides, slumps, slips and other mass movements in road cuts: N/A
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation) N/A
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: N/A

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

Environmental Screening Form for Solar PV Nano Grid (Camp 13)

Name of Sub-Project: Supply and Installation of Solar PV Nano grid (Camp 13: There are 3 nos. of Nano Grid will be installed in Camp 13)

Sl	Camp	Location	Block	Sub Block	Upazila	Union
1	Camp 13	Inside of IOM emergency Container point	A	A1	Ukhiya	Palongkhali
2	Camp 13	Inside of World Vision CFS	G	G5	Ukhiya	Palongkhali
3	Camp 13	Inside of SHED wash office	B	B4	Ukhiya	Palongkhali

Implementing Agency/Agencies: Local Government Engineering Department (LGED)

Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):
The proposed sub-project activities for the Nano grid include various components and equipment that are essential for its functioning. The control room is a steel container with dimensions of 10ft**8ft**8.5ft and a thickness of 2.3mm. It includes the construction of reinforced concrete footing, thermal insulation, and a ventilation fan operated by a temperature sensor. One control room with a capacity of 8KW will be installed.

The sub-project will require 18 solar PV modules, each with a capacity of 450 Wp (watt peak). These modules are of the mono crystalline type and consist of 72 cells or more, conforming to international standards and codes. The total capacity of the solar PV modules will be 8KW.

A total of 24 vented lead acid batteries will be used, each having a capacity of 2V and 900Ah (ampere-hour) or higher. These batteries are specifically designed for solar applications and comply with international standards and codes.

14 overhead distribution line poles will be erected, either with a height of 7.6 meters (SPC) or 6.0 meters (steel). The installation includes the use of reinforced concrete base, number plate, earthing, and all necessary fittings and accessories.

A total of 65 LED lights with a capacity of 10 watts will be installed for public facilities. These energy efficient lights will provide illumination while consuming minimal power.

Fifteen security lights with a capacity of 10 watts, equipped with outdoor installation fixtures, day light, and motion sensors, will be installed to ensure safety and security in the area.

Sixty-five energy-saving BLDC (Brushless Direct Current) ceiling fans with a capacity of 35 watts and a size of 56 inches will be installed in public facilities. These fans come with a 5-step capacitive compatible wall regulator and all necessary accessories for installation.

Twenty sets of switch, socket, and fuse board will be installed for the internal wiring of lights and fans in public facilities. This includes switches, sockets, PVC switch boxes, PVC insulated cables, and all other necessary fittings and accessories.

Estimated footprint / land area is 100 sq. feet for each Nano grid

Brief description of sub-project site: (e.g., present land use, Important Environmental Features (IEFs) near site, etc.:

In Camp 13, there are 3 Nano grids.

For the first one in Block A, sub block A1, it's placed inside the IOM emergency Container point. It's next to the Thainkhali-Telkhola road, with a small bamboo fence around a vegetable garden nearby. There are a few DRP settlements around, but no major features other than that. Also, there's a U-drain nearby, but it won't be affected by the installation.

Moving on to Block G, sub block G5, the second Nano grid is inside the World Vision CFS. It's located beside the camp road, south of the facility. This area is shared with a fenced World Vision Learning Center, ensuring security. Nearby, there's a Multi-purpose Child Adolescent Center and an IRC WFS to the west, and a hand tube well to the north, which won't be disturbed by the installation.

Lastly, in Block B, sub block B4, the third Nano grid is inside the SHED wash office. This location is within the IOM wash facility warehouse, which is cluttered with debris and garbage. However, the surface is flat enough for mounting the container. Clearing works will be needed, and there is a camp road for material transportation. Other nearby facilities includes the Caritas warehouse to the north, the WFP Food and Nutrition center to the south, and the IOM hospital to the north.

Overall Comments

The proposed Solar PV Nano grids will have minimal environmental impact and are not located in environmentally sensitive areas. The project activities will not pose a significant threat to the natural surroundings and will not cause drainage congestion or water logging issues. Moreover, there will be no utilization of productive agricultural soil for the project, ensuring the preservation of fertile land. The construction materials and equipment required for the Nano grids will be limited to the project boundary, minimizing any potential impact on the surrounding environment. The project follows environmentally responsible practices and aims to reduce any negative effects on the ecosystem.

The rohingya community has shown a positive attitude towards the project and expressed their enthusiasm to actively participate in its activities. The project is considered environmentally sustainable and socially acceptable by the adjacent community and representatives from various facilities. The participatory public consultation meeting provided an opportunity for community members to voice their opinions, and no objections were raised regarding the construction of the Nano grids at the proposed site. On the contrary, the community expressed appreciation for the infrastructure as it will enhance safety and security for the community.

During the consultation, the community highlighted the benefits that the Solar PV Nano grids will bring, particularly in terms of socio-security for female communities. The project is seen as a means

to improve the quality of life, reduce vulnerability to social aggression and mistreatment, and enhance access to education and healthcare services. In addition, the establishment of the Solar PV Nano grids is expected to contribute to the overall development and well-being of the adjacent community. It will provide reliable electricity to various facilities such as learning centers, health posts, and food distribution centers, creating a conducive environment for education, healthcare, and community activities. The Solar PV Nano grids will not only provide electricity but also empower the community, ensuring a brighter and more secure future for all.

Types of waste to be generated during construction and operation phase:

The construction of the Nano grid involves installing a control room made of a steel container, which will be placed on RCC foundations. This process may require minimal ground preparation and the installation of RCC foundations. Additionally, during the construction phase, 14 poles will be installed near the project site.

During the installation of the poles and RCC foundations, there is a possibility of generating waste materials. These may include soil and debris that are excavated while digging holes for pole installation. The waste generated from the pole installation and RCC foundation is relatively small and mainly consists of construction debris. This debris can include materials like concrete, cement, bricks, and other building materials that are used during the installation process. If wooden or bamboo components or supports are used during the pole installation, there may be waste generated from cutting or shaping the wood or bamboo to fit the desired specifications.

Due to the small scale of construction, there will be no need for a labor shed, resulting in a reduced likelihood of generating organic waste, faecal waste, and kitchen waste during this phase.

The container structure will be transported to the site using a truck and then installed on the pillars with the assistance of a crane. As a result, the construction process is expected to have minimal waste generation. However, it is important to ensure proper waste management practices are in place to handle any potential waste materials that may arise during transportation and installation.

Sensitive environmental, cultural, archaeological, religious sites near (within 100m) of site including elephant migration routes and remaining forests:

3 nos. of Nano grids will be installed in Camp 13. Within the influence area of the subproject no historical sites were identified. The proposed locations for the Nano grids have been considered for their proximity to sensitive environmental, cultural, archaeological, religious sites, as well as elephant migration routes and remaining forests within a 100-meter radius. Several sensitive features have been identified near the Nano grid locations, as described below:

Within Camp No.13, where 3 Nano grids are planned for construction, several sensitive features are present in different blocks and sub-blocks.

The first Nano grid, situated in Block A, Sub block A1, inside the IOM emergency Container point, doesn't have any features to the east or west. However, to the north, there's a child protection facility located at 73 meters away. To the south, there's a Learning center located at 39 meters away, another Learning center situated at 40 meters away, yet another Learning center found at 42

meters away, a child protection facility located at 37 meters away, and a health post located at 57 meters away.

Moving on to the second Nano grid, positioned in Block G, Sub block G5, inside the World Vision CFS, there are no features to the east or north. However, to the west, there's a Learning center located at 53 meters away and another Learning center located at 73 meters away. To the south, there's a child protection facility situated at 69 meters away, a Learning center located at 97 meters away, and a health post located at 7 meters away.

Lastly, in Block B, Sub block B4, inside the SHED wash office, there are no features to the east. To the west, there's a child protection facility situated 94 meters away. To the north, there are child protection facilities located 92 meters and 98 meters away, a health post located at 77 meters away, and an Age-friendly space situated at 79 meters away. To the south, there's a child protection facility located at 91 meters away.

Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists. Mostly Rohingya settlements are found around the proposed area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project area, no elephant migration routes exist (ref. IUCN). No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below

Section A: Sub-Project Overview

Description of sub-project/component interventions:

The 8KW capacity Nano grid control room, which is 10ft*8ft*8.5ft in size and has a thickness of 2.3mm, will serve as the central hub for the distribution of electricity to these facilities. The control room will be made of a steel container that includes the construction of RCC footing, thermal insulation, and ventilation operated by a temperature sensor. This will ensure that the equipment is protected from extreme weather conditions and operates at optimal performance.

The Nano grid will consist of approximately 14 poles, which will be installed to distribute electricity to the various facilities. Each pole will have an electricity line drawn from the Nano grid, with 14 panels installed on top of each pole. Additionally, each pole will have a 10 watt security light installed on top, providing additional safety and security for the surrounding area.

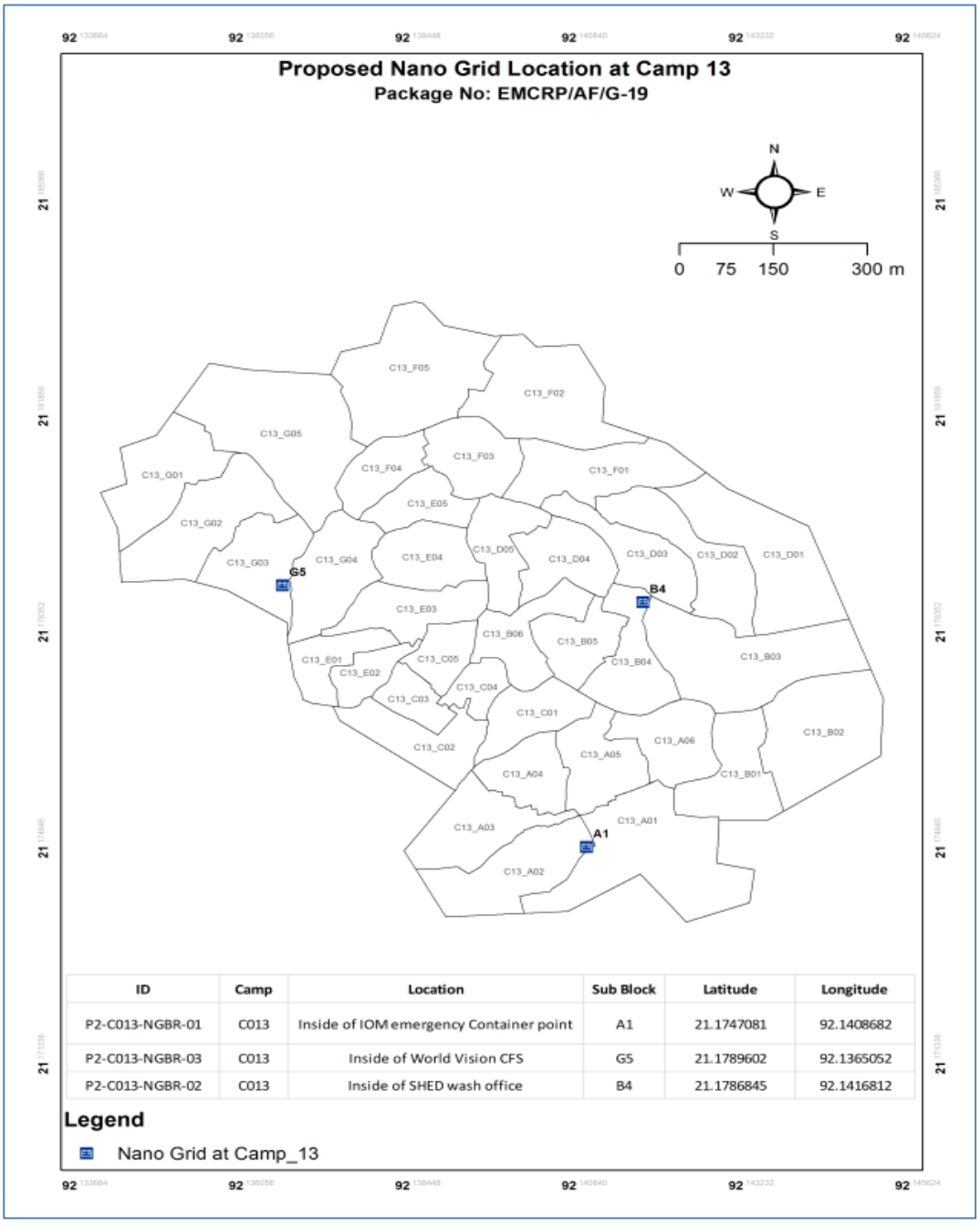
The proposed facilities also include the installation of 65 energy-efficient fans and lights in various service centers, each with a capacity of 35 watts and 10 watts respectively. These fans will help to keep the facilities cool during hot temperatures, ensuring a comfortable working environment for the facilitators.

Two fire extinguishers will also be installed in the Nano grid room, ensuring the safety of the equipment and personnel operating in the area.

Sub-project Location:

3 nos. of Nano grids will be installed in Camp 13. The location details are given below.

Sl	Camp	Location	Block	Sub Block	Upazila	Union	Latitude	Longitude
1	Camp 13	Inside of IOM emergency Container point	A	A1	Ukhiya	Palongkhali	21.1747081	92.1408682
2	Camp 13	Inside of World Vision CFS	G	G5	Ukhiya	Palongkhali	21.1789602	92.1365052
3	Camp 13	Inside of SHED wash office	B	B4	Ukhiya	Palongkhali	21.1786845	92.1416812



Proposed Nano grid location at Camp 13

Land ownership Govt. Land
Expected construction period: 6 months
Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive environmental areas such as elephant corridors, water bodies, etc. and historical or socio-cultural assets): Please also explain any analysis on alternative location was conducted: In Camp 13, there are three Nano grids. The first Nano grid, situated in Block A, Sub block A1, inside the IOM emergency Container point, doesn't have any features to the east or west. However, to the north, there's a child protection facility located at 73 meters away. To the south, there's a Learning center located at 39 meters away, another Learning center situated at 40 meters away, yet another Learning center found at 42 meters away, a child protection facility located at 37 meters away, and a health post located at 57 meters away. Moving on to the second Nano grid, positioned in Block G, Sub block G5, inside the World Vision CFS, there are no features to the east or north. However, to the west, there's a Learning center located at 53 meters away and another Learning center located at 73 meters away. To the south, there's a child protection facility situated at 69 meters away, a Learning center located at 97 meters away, and a health post located at 7 meters away. Lastly, in Block B, Sub block B4, inside the SHED wash office, there are no features to the east. To the west, there's a child protection facility situated 94 meters away. To the north, there are child protection facilities located 92 meters and 98 meters away, a health post located at 77 meters away, and an Age-friendly space situated at 79 meters away. To the south, there's a child protection facility located at 91 meters away. Within the influence area of the proposed location no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (confirmed by the participants in the consultation meeting).

Section B: Environmental Screening

***B.1*: Environmental feature of sub-project location**

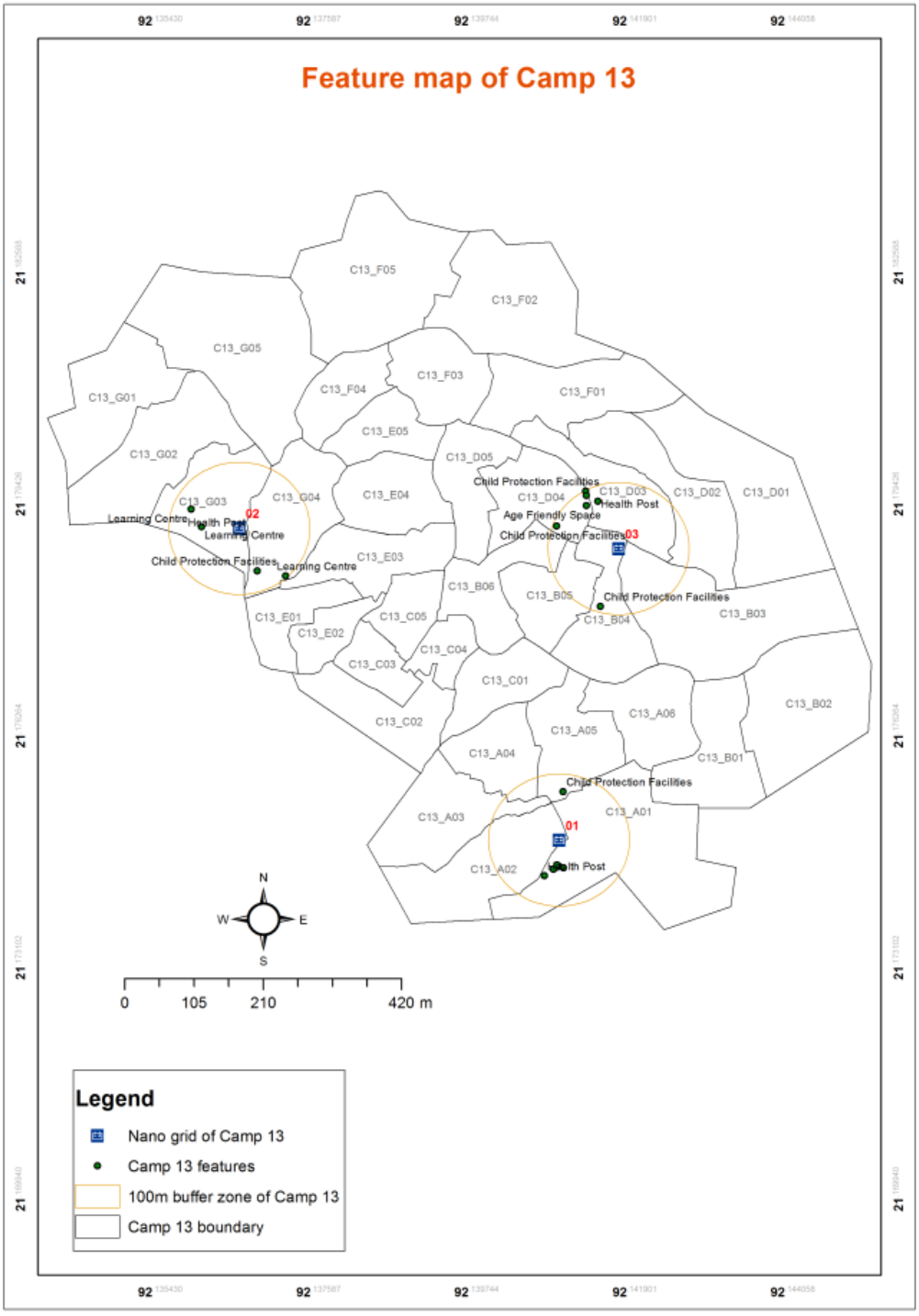
Description of cultural properties (if applicable, including distance from site): Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests: In Camp 13, there are three Nano grids. The first Nano grid, situated in Block A, Sub block A1, inside the IOM emergency Container point, doesn't have any sensitive features to the east or west. However, to the north, there's a child protection facility located at 73 meters away. To the south, there's a Learning center located at 39 meters away, another Learning center situated at 40 meters away, yet another Learning center found at 42 meters away, a child protection facility located at 37 meters away, and a health post located at 57 meters away. Moving on to the second Nano grid, positioned in Block G, Sub block G5, inside the World Vision CFS,

there are no sensitive features to the east or north. However, to the west, there's a Learning center located at 53 meters away and another Learning center located at 73 meters away. To the south, there's a child protection facility situated at 69 meters away, a Learning center located at 97 meters away, and a health post located at 7 meters away.

Lastly, in Block B, Sub block B4, inside the SHED wash office, there are no features to the east. To the west, there's a child protection facility situated 94 meters away. To the north, there are child protection facilities located 92 meters and 98 meters away, a health post located at 77 meters away, and an Age-friendly space situated at 79 meters away. To the south, there's a child protection facility located at 91 meters away.

Within the influence area of the proposed location no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (confirmed by the participants in the consultation meeting). There are no other sensitive environmental, cultural, archaeological sites within the catchment area of this sub-project.

A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas are shown below.



Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive features found in the footprint area. Several learning center, rohingya settlements and religious facilities were found during the survey. It will not be affected by the construction works, as the activities will be carried out within the existing proposed area boundary and necessary preventive and mitigation measures will be followed during the entire construction period.

(1) Within/near Elephant Migration Routes Yes/No*

No. These have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

(2) potential impacts on remaining forests in/around camps Yes/No
N/A (This activity will be confined within the proposed location)
(3) Other issues: N/A
*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:
Dust:
Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, trailer, mini truck, etc. move on roads adjacent to proposed location throughout the day generating noise but within tolerable limit in most cases.

Baseline soil quality:
The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.
Landslide potential (high/medium/low, with explanation):
The nominated location is found to be on fairly plane land. There is no condition found around the selected site which might give reasons for landslides.

Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH):
Groundwater is the main source of potable water in the Sub-project area. The shallow depth is about 100 feet to 120 feet and deep tube well depth is 700 to 850 feet. In the sub-project area, deep groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains medium concentration of iron. Deep groundwater table (drinkable) varies from 600-800ft (Field survey, 2021). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer.
Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to 681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)

Status of wildlife movement:
N/A (None of the information was found about the wildlife movement in or across the area)

State of forestation:
Patches of vegetation containing small trees found in target location and in surrounding area of the proposed location which are within 200m radial distance.

Summary of water balance analysis (For water supply scheme only):
N/A

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g., status of access road or any other facility required for sub-project to be viable): There is a road called the camp 13 connecting road that will be used for transportation and delivering materials to the 3 Nano grids in Camp 13. It provides access for vehicles and ensures a route for transporting goods and supplies.
Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction: Due to the small scale of construction, hence there is no need for labor shed. As a result, there is no necessity for a tube well in the proposed locations. Instead, during the construction phase, the contractor will arrange for a mobile water supply system to ensure a sufficient water source for the construction work. Additionally, the contractor will be responsible for providing temporary sanitation facilities. A portable or temporary sanitary system will be set up to cater to the basic hygiene needs of the workers during the construction period in the vicinity of the construction area for all the components of the project. Electricity is not available in the area. Generator or Solar lamp will need installation.
Possible location of labor camps: Due to the small scale of construction, hence there is no need for labor shed.
Requirement and type of raw materials (e.g., sand, stone, wood, etc.): i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials
Identification of access road for transportation (Yes/No): There is a road called the camp 13 connecting road that will be used for transportation and delivering materials to the 3 Nano grids in Camp 13. It provides access for vehicles and ensures a route for transporting goods and supplies.
Location identification for raw material storage: The materials, including the poles, for the Nano grids will be stored either on the side of the road or in designated vacant spaces near each Nano grid. The site management or the Camp-in-Charge (CIC) will grant permission to store the required materials for the Nano grid within the camp premises. To ensure security during nighttime, there may be provisions for having night guards in place
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.): There is no pre-existing structure which will face demolition. Here, demolition waste will not have to be accounted for. Few leftovers from soil clearing, plastics or residual clearing and site clearing may be generated.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g., Solids wastes, liquid wastes, etc.): **Solid waste:** Iron, concrete, metal, drywall, wood, plastic, rubber, copper wires, excavated soils etc. **Quantity:** It is difficult to give exact figures of construction waste produced on a typical construction

site. However, in order to approximate the quantity, it is estimated that nearly 2 kg of waste would be generated each working day, which are mainly RCC foundation construction and poles installation wastes. Some plastic, paper and organic waste will be generated from the use of workers, though a very negligible amount- half a kilogram a day maximum.

Liquid waste: Paint chemicals as paint thinners which contain Volatile Organic Compounds (VOCs) will come out as leftovers. Due to the small scale of construction, hence there is no need for labor shed. So, fecal sludge will not be generated from the labor camp during the construction period. Leftover oils or spills from machinery can be a high probability generating liquid waste.

Type and quantity of raw materials used (wood, bricks, cement, water, etc.):
Type: i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction.

Quantity: It is difficult to give exact figures of construction waste produced on a typical construction site.

Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards:
Around 100 sq. feet area is needed for this project.

No vegetation is present in the targeted footprint area. Specific soil amount is not needed for the sub-project component. The current condition explains that there is no aggregated soil on the right of way. On the other hand, vegetation was found around the proposed area. The vegetation will not be affected by construction work since scope of works is confined within planned area.

Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation)
Low. No borrow pit or quarries will be required to dig out during the construction period in or around/ adjacent to the proposed area.

Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description).
No pre-existing water body or drainage is present

Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description)
Low. The site is free from any aquatic ecosystems or habitats of endangered species. There are some terrestrial flora species around the project site, which will slightly be affected by the works. Life cycle or movement of some terrestrial living species (fauna) (i.e. Insects - ant, bees, earthworm, reptiles, birds etc.) might be disturbed for the time being, but with very less impact indeed. So, overall potential effect is very low or absent for this specific sub project.

Activities that can lead to landslides, slumps, slips and other mass movements in road cuts:
The soil in the proposed site is largely flat, so there is almost no chance to trigger the landslide or any type of mass movement of soil for the said construction works.

Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description)

N/A
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: N/A
Chance of long-term or semi-permanent destruction of soils: (High/Medium/Low with description) There is no chance of activities during the operation period, which can lead to any long-term or semi-permanent destruction of soils.
Possibility of odor and water, soil quality impacts from SWM and FSM disposal system: (High/Medium/Low with description) N/A
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) There is no possibility for creating borrow-pits, quarries, etc. during the operation phase.
Likely direct and indirect impacts on economic development in the project areas by the sub-project: During the operation phase of the sub-project, there are likely to be both direct and indirect impacts on economic development in the project areas. Direct impacts refer to the immediate effects that result directly from the sub-project activities. For example, the establishment and operation of the Nano grid can create employment opportunities for the adjacent workforce. This can include job opportunities in the construction phase as well as maintenance and operation of the infrastructure. Indirect impacts, on the other hand, are the ripple effects that arise from the sub-project activities. Access to electricity provided by the Nano grid can enhance the quality and efficiency of various services such as healthcare, education, and communication. Healthcare facilities can operate more effectively with reliable power supply, ensuring better medical services for the community. Educational institutions can improve their teaching and learning environments through the availability of electricity, enabling students to access modern technology and educational resources.
Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No existing drainage channels or surface water bodies found in the project area; therefore, no such effect can be anticipated
Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. There are no protected areas in or around project sites, and no known areas of ecological interest which can be affected by the daily activity of this facility.

Activities leading to landslides, slumps, slips and other mass movements in road cuts: N/A
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation) N/A
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: N/A

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

Environmental Screening Form for Solar PV Nano Grid (Camp 2W)

Name of Sub-Project: Supply and Installation of Solar PV Nano grid (Camp 2W: There is one Nano Grid will be installed in Camp 2W)

Sl	Camp	Location	Block	Sub Block	Upazila	Union
1	Camp 2W	Near by CiC Office	B	B3	Ukhiya	Rajapalong

Implementing Agency/Agencies: Local Government Engineering Department (LGED)

Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):
The proposed sub-project activities for the Nano grid include various components and equipment that are essential for its functioning. The control room is a steel container with dimensions of 10ft**8ft**8.5ft and a thickness of 2.3mm. It includes the construction of reinforced concrete footing, thermal insulation, and a ventilation fan operated by a temperature sensor. One control room with a capacity of 8KW will be installed.

The sub-project will require 18 solar PV modules, each with a capacity of 450 Wp (watt peak). These modules are of the mono crystalline type and consist of 72 cells or more, conforming to international standards and codes. The total capacity of the solar PV modules will be 8KW.

A total of 24 vented lead acid batteries will be used, each having a capacity of 2V and 900Ah (ampere-hour) or higher. These batteries are specifically designed for solar applications and comply with international standards and codes.

14 overhead distribution line poles will be erected, either with a height of 7.6 meters (SPC) or 6.0 meters (steel). The installation includes the use of reinforced concrete base, number plate, earthing, and all necessary fittings and accessories.

A total of 65 LED lights with a capacity of 10 watts will be installed for public facilities. These energy efficient lights will provide illumination while consuming minimal power.

Fifteen security lights with a capacity of 10 watts, equipped with outdoor installation fixtures, day light, and motion sensors, will be installed to ensure safety and security in the area.

Sixty-five energy-saving BLDC (Brushless Direct Current) ceiling fans with a capacity of 35 watts and a size of 56 inches will be installed in public facilities. These fans come with a 5-step capacitive compatible wall regulator and all necessary accessories for installation.

Twenty sets of switch, socket, and fuse board will be installed for the internal wiring of lights and fans in public facilities. This includes switches, sockets, PVC switch boxes, PVC insulated cables, and all other necessary fittings and accessories.

Estimated footprint / land area is 100 sq. feet for each Nano grid

Brief description of sub-project site: (e.g., present land use, Important Environmental Features (IEFs) near site, etc.:

There is a Nano grid planned for Camp 2W.

In Block B, Sub block B3, it's positioned near the CiC Office. The site is located to the south of the camp 2W connecting road, adjacent to the Shapla child learning center. It's an open space without significant features that could obstruct installation. Access is available from the 2W camp road, allowing for the transportation of containers and materials. Adjacent to the site are social service facilities such as the WFP Food distribution center to the south, the UNHCR primary health center to the north, and the CiC office to the northeast.

Overall Comments

The proposed Solar PV Nano grid will have minimal environmental impact and are not located in environmentally sensitive areas. The project activities will not pose a significant threat to the natural surroundings and will not cause drainage congestion or water logging issues. Moreover, there will be no utilization of productive agricultural soil for the project, ensuring the preservation of fertile land.
The construction materials and equipment required for the Nano grid will be limited to the project boundary, minimizing any potential impact on the surrounding environment. The project follows environmentally responsible practices and aims to reduce any negative effects on the ecosystem.

The rohingya community has shown a positive attitude towards the project and expressed their enthusiasm to actively participate in its activities. The project is considered environmentally sustainable and socially acceptable by the adjacent community and representatives from various facilities. The participatory public consultation meeting provided an opportunity for community members to voice their opinions, and no objections were raised regarding the construction of the Nano grid at the proposed site. On the contrary, the community expressed appreciation for the infrastructure as it will enhance safety and security for the community.

During the consultation, the community highlighted the benefits that the Solar PV Nano grid will bring, particularly in terms of socio-security for female communities. The project is seen as a means to improve the quality of life, reduce vulnerability to social aggression and mistreatment, and enhance access to education and healthcare services. In addition, the establishment of the Solar PV Nano grid is expected to contribute to the overall development and well-being of the adjacent community. It will provide reliable electricity to various facilities such as learning centers, health posts, and food distribution centers, creating a conducive environment for education, healthcare, and community activities. The Solar PV Nano grids will not only provide electricity but also empower the community, ensuring a brighter and more secure future for all.

Types of waste to be generated during construction and operation phase:

The construction of the Nano grid involves installing a control room made of a steel container, which will be placed on RCC foundations. This process may require minimal ground preparation and the installation of RCC foundations. Additionally, during the construction phase, 14 poles will be installed near the project site.

During the installation of the poles and RCC foundations, there is a possibility of generating waste materials. These may include soil and debris that are excavated while digging holes for pole installation. The waste generated from the pole installation and RCC foundation is relatively small and mainly consists of construction debris. This debris can include materials like concrete, cement, bricks, and other building materials that are used during the installation process. If wooden or bamboo components or supports are used during the pole installation, there may be waste generated from cutting or shaping the wood or bamboo to fit the desired specifications.

Due to the small scale of construction, there will be no need for a labor shed, resulting in a reduced likelihood of generating organic waste, faecal waste, and kitchen waste during this phase.

The container structure will be transported to the site using a truck and then installed on the pillars with the assistance of a crane. As a result, the construction process is expected to have minimal waste generation. However, it is important to ensure proper waste management practices are in place to handle any potential waste materials that may arise during transportation and installation.

Sensitive environmental, cultural, archaeological, religious sites near (within 100m) of site including elephant migration routes and remaining forests:
One Nano grid will be installed in Camp 2W. Within the influence area of the subproject no historical sites were identified. The proposed location for the Nano grid has been considered for their proximity to sensitive environmental, cultural, archaeological, religious sites, as well as elephant migration routes and remaining forests within a 100-meter radius. Several sensitive features have been identified near the Nano grid locations, as described below:

In Camp 2W, a Nano grid is designated near the CiC Office in Block B, Sub block B3. To the west lies a learning center at a distance of 55 meters, while to the north, another learning center is situated just 20 meters away. In the southern direction, the CiC office stands at proximity of 31 meters, accompanied by a primary health center positioned 24 meters away.

Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists. Mostly Rohingya settlements are found around the proposed area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project area, no elephant migration routes exist (ref. IUCN). No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below
Section A: Sub-Project Overview

Description of sub-project/component interventions:

The 8KW capacity Nano grid control room, which is 10ft*8ft*8.5ft in size and has a thickness of 2.3mm, will serve as the central hub for the distribution of electricity to these facilities. The control room will be made of a steel container that includes the construction of RCC footing, thermal insulation, and ventilation operated by a temperature sensor. This will ensure that the equipment is protected from extreme weather conditions and operates at optimal performance.

The Nano grid will consist of approximately 14 poles, which will be installed to distribute electricity to the various facilities. Each pole will have an electricity line drawn from the Nano grid, with 14 panels installed on top of each pole. Additionally, each pole will have a 10 watt security light installed on top, providing additional safety and security for the surrounding area.

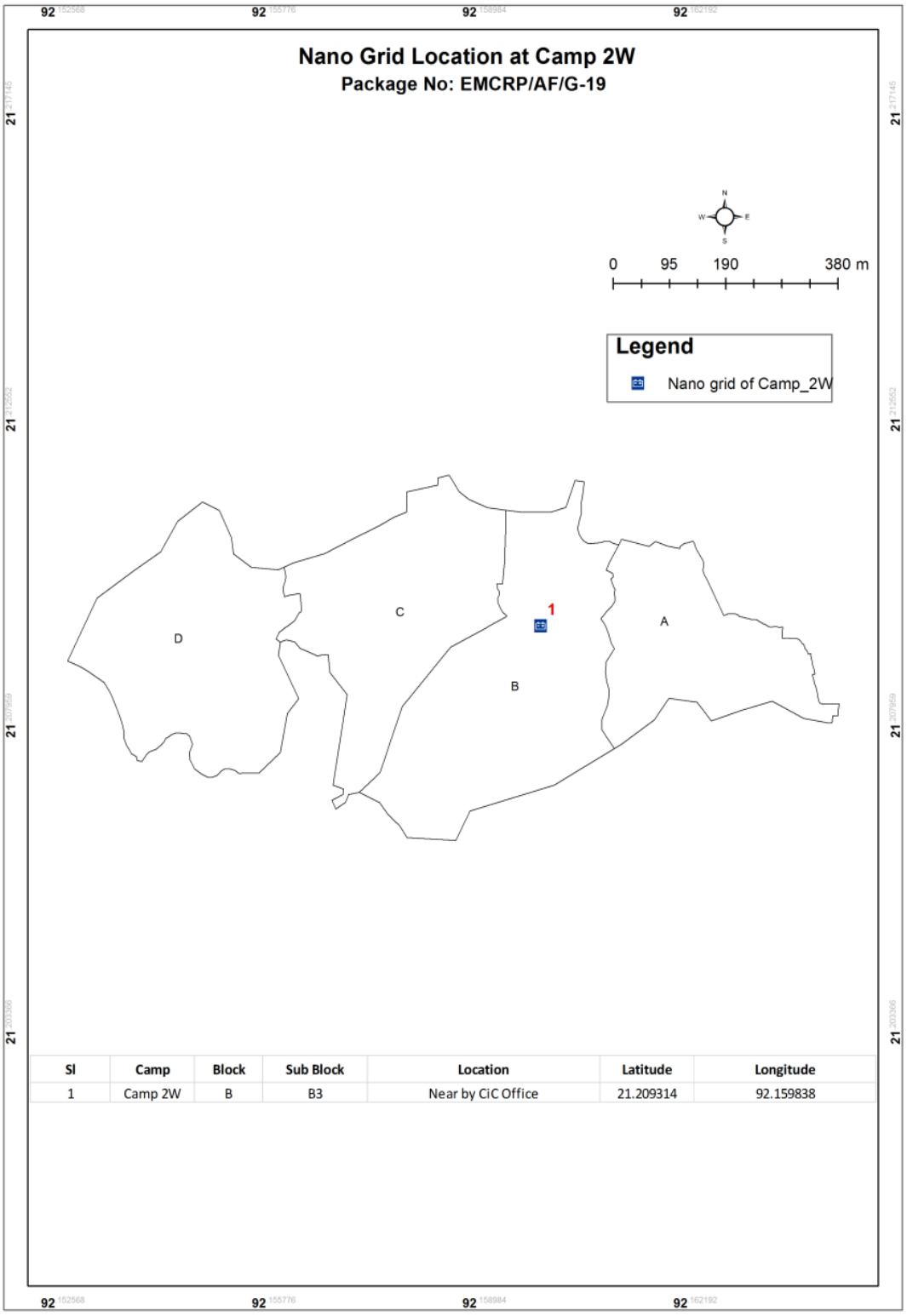
The proposed facilities also include the installation of 65 energy-efficient fans and lights in various service centers, each with a capacity of 35 watts and 10 watts respectively. These fans will help to keep the facilities cool during hot temperatures, ensuring a comfortable working environment for the facilitators.

Two fire extinguishers will also be installed in the Nano grid room, ensuring the safety of the equipment and personnel operating in the area.

Sub-project Location:

One Nano grid will be installed in Camp 2W. The location details are given below.

Sl	Camp	Location	Block	Sub Block	Upazila	Union	Latitude	Longitude
1	Camp 2W	Near by CiC Office	B	B3	Ukhiya	Rajapalong	21.209314	92.159838



Sl	Camp	Block	Sub Block	Location	Latitude	Longitude
1	Camp 2W	B	B3	Near by CiC Office	21.209314	92.159838

Proposed Nano grid location at Camp 2W

Land ownership

Govt. Land

Expected construction period: 6 months

Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive environmental areas such as elephant corridors, water bodies, etc. and historical or socio-cultural assets): Please also explain any analysis on alternative location was conducted:

In Camp 2W, a Nano grid is designated near the CiC Office in Block B, Sub block B3. To the west lies a learning center at a distance of 55 meters, while to the north, another learning center is situated just 20 meters away. In the southern direction, the CiC office stands at proximity of 31 meters, accompanied by a primary health center positioned 24 meters away.

Within the influence area of the proposed location no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (confirmed by the participants in the consultation meeting).

Section B: Environmental Screening

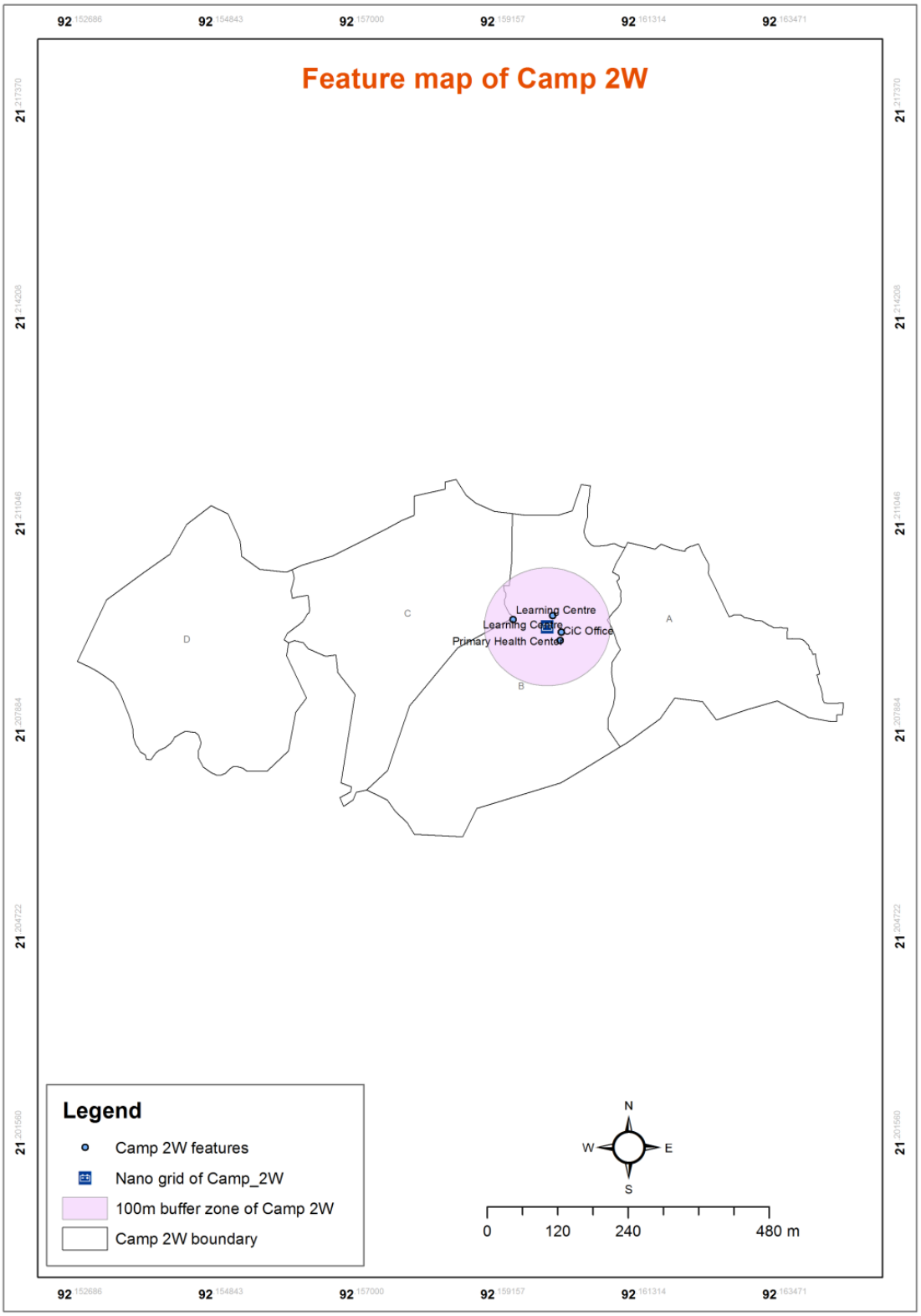
***B.1*: Environmental feature of sub-project location**

Description of cultural properties (if applicable, including distance from site): Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests:

In Camp 2W, a Nano grid is designated near the CiC Office in Block B, Sub block B3. To the west lies a learning center at a distance of 55 meters, while to the north, another learning center is situated just 20 meters away. In the southern direction, the CiC office stands at proximity of 31 meters, accompanied by a primary health center positioned 24 meters away.

There are no other sensitive environmental, cultural, archaeological sites within the catchment area of this sub-project.

A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas are shown below.



Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive features found in the footprint area. Several learning center, rohingya settlements and religious facilities were found during the survey. It will not

be affected by the construction works, as the activities will be carried out within the existing proposed area boundary and necessary preventive and mitigation measures will be followed during the entire construction period.

(1) Within/near Elephant Migration Routes Yes/No*

No. These have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

(2) potential impacts on remaining forests in/around camps Yes/No

N/A (This activity will be confined within the proposed location)

(3) Other issues: N/A

*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:

Dust:

Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, trailer, mini truck, etc. move on roads adjacent to proposed location throughout the day generating noise but within tolerable limit in most cases.

Baseline soil quality:

The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.

Landslide potential (high/medium/low, with explanation):

The nominated location is found to be on fairly plane land. There is no condition found around the selected site which might give reasons for landslides.

Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH):

Groundwater is the main source of potable water in the Sub-project area. The shallow depth is about 100 feet to 120 feet and deep tube well depth is 700 to 850 feet. In the sub-project area, deep groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains medium concentration of iron. Deep groundwater table (drinkable) varies from 600-800ft (Field survey, 2021). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer.

Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to 681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)

Status of wildlife movement:

N/A (None of the information was found about the wildlife movement in or across the area)

State of forestation:

Patches of vegetation containing small trees found in target location and in surrounding area of the proposed location which are within 200m radial distance.
Summary of water balance analysis (For water supply scheme only): **N/A**

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g., status of access road or any other facility required for sub-project to be viable): There is a road called the Camp 2W connecting road that will be used for transportation and delivering materials to the Nano grid in Camp 2W. It provides access for vehicles and ensures a route for transporting goods and supplies.
Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction: Due to the small scale of construction, hence there is no need for labor shed. As a result, there is no necessity for a tube well in the proposed locations. Instead, during the construction phase, the contractor will arrange for a mobile water supply system to ensure a sufficient water source for the construction work. Additionally, the contractor will be responsible for providing temporary sanitation facilities. A portable or temporary sanitary system will be set up to cater to the basic hygiene needs of the workers during the construction period in the vicinity of the construction area for all the components of the project. Electricity is not available in the area. Generator or Solar lamp will need installation.
Possible location of labor camps: Due to the small scale of construction, hence there is no need for labor shed.
Requirement and type of raw materials (e.g., sand, stone, wood, etc.): i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials
Identification of access road for transportation (Yes/No): There is a road called the Camp 2W connecting road that will be used for transportation and delivering materials to the Nano grid in Camp 2W. It provides access for vehicles and ensures a route for transporting goods and supplies.
Location identification for raw material storage: The materials, including the poles, for the Nano grids will be stored either on the side of the road or in designated vacant spaces near each Nano grid. The site management or the Camp-in-Charge (CIC) will grant permission to store the required materials for the Nano grid within the camp premises. To ensure security during nighttime, there may be provisions for having night guards in place
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.): There is no pre-existing structure which will face demolition. Here, demolition waste will not have to be accounted for. Few leftovers from soil clearing, plastics or residual clearing and site clearing may be generated.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g., Solids wastes, liquid wastes, etc.): **Solid waste:** Iron, concrete, metal, drywall, wood, plastic, rubber, copper wires, excavated soils etc. **Quantity:** It is difficult to give exact figures of construction waste produced on a typical construction site. However, in order to approximate the quantity, it is estimated that nearly 2 kg of waste would be generated each working day, which are mainly RCC foundation construction and poles installation wastes. Some plastic, paper and organic waste will be generated from the use of workers, though a very negligible amount- half a kilogram a day maximum. **Liquid waste**: Paint chemicals as paint thinners which contain Volatile Organic Compounds (VOCs) will come out as leftovers. Due to the small scale of construction, hence there is no need for labor shed. So, fecal sludge will not be generated from the labor camp during the construction period. Leftover oils or spills from machinery can be a high probability generating liquid waste.
Type and quantity of raw materials used (wood, bricks, cement, water, etc.): **Type:** i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction. **Quantity**: It is difficult to give exact figures of construction waste produced on a typical construction site.
Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards: Around 100 sq. feet area is needed for this project. No vegetation is present in the targeted footprint area. Specific soil amount is not needed for the sub-project component. The current condition explains that there is no aggregated soil on the right of way. On the other hand, vegetation was found around the proposed area. The vegetation will not be affected by construction work since scope of works is confined within planned area.
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) Low. No borrow pit or quarries will be required to dig out during the construction period in or around/ adjacent to the proposed area.
Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description). No pre-existing water body or drainage is present
Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) **Low.** The site is free from any aquatic ecosystems or habitats of endangered species. There are some terrestrial flora species around the project site, which will slightly be affected by the works. Life cycle or movement of some terrestrial living species (fauna) (i.e. Insects - ant, bees, earthworm, reptiles, birds etc.) might be disturbed for the time being, but with very less impact indeed. So, overall potential effect is very low or absent for this specific sub project.

Activities that can lead to landslides, slumps, slips and other mass movements in road cuts: The soil in the proposed site is largely flat, so there is almost no chance to trigger the landslide or any type of mass movement of soil for the said construction works.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description) N/A
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: N/A
Chance of long-term or semi-permanent destruction of soils: (High/Medium/Low with description) There is no chance of activities during the operation period, which can lead to any long-term or semi-permanent destruction of soils.
Possibility of odor and water, soil quality impacts from SWM and FSM disposal system: (High/Medium/Low with description) N/A
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) There is no possibility for creating borrow-pits, quarries, etc. during the operation phase.
Likely direct and indirect impacts on economic development in the project areas by the sub-project: During the operation phase of the sub-project, there are likely to be both direct and indirect impacts on economic development in the project areas. Direct impacts refer to the immediate effects that result directly from the sub-project activities. For example, the establishment and operation of the Nano grid can create employment opportunities for the adjacent workforce. This can include job opportunities in the construction phase as well as maintenance and operation of the infrastructure. Indirect impacts, on the other hand, are the ripple effects that arise from the sub-project activities. Access to electricity provided by the Nano grid can enhance the quality and efficiency of various services such as healthcare, education, and communication. Healthcare facilities can operate more effectively with reliable power supply, ensuring better medical services for the community. Educational institutions can improve their teaching and learning environments through the availability of electricity, enabling students to access modern technology and educational resources.
Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No existing drainage channels or surface water bodies found in the project area; therefore, no such

effect can be anticipated
Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. There are no protected areas in or around project sites, and no known areas of ecological interest which can be affected by the daily activity of this facility.
Activities leading to landslides, slumps, slips and other mass movements in road cuts: N/A
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation) N/A
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: N/A

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

Environmental Screening Form for Solar PV Nano Grid (Camp 5)

Name of Sub-Project: Supply and Installation of Solar PV Nano grid (Camp 5: There will be 4 Nano Grids installed in Camp 5.)

Sl	Camp	Location	Block	Sub Block	Upazila	Union
1	Camp 5	CiC office, BRAC-SMS Office & Blast	E	E6	Ukhiya	Rajapalong
2	Camp 5	FH-MHPSS, JCF-LC, TDH, NGOF-Protection, Mukti-LC&BDRCS Distribution Point	E	E2	Ukhiya	Rajapalong
3	Camp 5	Police camp, RTMI-PHC, JCF-LC & NGOF	E	E1	Ukhiya	Rajapalong
4	Camp 5	BRAC UN Wamen Market, SARPV, IRC, FH-HP, Mukti-LC & JCF-LC	B	B5	Ukhiya	Rajapalong

Implementing Agency/Agencies: Local Government Engineering Department (LGED)

Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):
The proposed sub-project activities for the Nano grid include various components and equipment that are essential for its functioning. The control room is a steel container with dimensions of 10ft**8ft**8.5ft and a thickness of 2.3mm. It includes the construction of reinforced concrete footing, thermal insulation, and a ventilation fan operated by a temperature sensor. One control room with a capacity of 8KW will be installed.

The sub-project will require 18 solar PV modules, each with a capacity of 450 Wp (watt peak). These modules are of the mono crystalline type and consist of 72 cells or more, conforming to international standards and codes. The total capacity of the solar PV modules will be 8KW.

A total of 24 vented lead acid batteries will be used, each having a capacity of 2V and 900Ah (ampere-hour) or higher. These batteries are specifically designed for solar applications and comply with international standards and codes.

14 overhead distribution line poles will be erected, either with a height of 7.6 meters (SPC) or 6.0 meters (steel). The installation includes the use of reinforced concrete base, number plate, earthing, and all necessary fittings and accessories.

A total of 65 LED lights with a capacity of 10 watts will be installed for public facilities. These energy efficient lights will provide illumination while consuming minimal power.

Fifteen security lights with a capacity of 10 watts, equipped with outdoor installation fixtures, day light, and motion sensors, will be installed to ensure safety and security in the area.

Sixty-five energy-saving BLDC (Brushless Direct Current) ceiling fans with a capacity of 35 watts and a size of 56 inches will be installed in public facilities. These fans come with a 5-step capacitive compatible wall regulator and all necessary accessories for installation.

Twenty sets of switch, socket, and fuse board will be installed for the internal wiring of lights and fans in public facilities. This includes switches, sockets, PVC switch boxes, PVC insulated cables, and all other necessary fittings and accessories.

Estimated footprint / land area is 100 sq. feet for each Nano grid

Brief description of sub-project site: (e.g., present land use, Important Environmental Features (IEFs) near site, etc.:
In Camp 5, there are plans to install 4 Nano Grids, each situated in different locations within the camp.

The first Nano Grid site, located in Block E, sub block E6, is positioned east of the camp 5 CiC office. It is an open space adjacent to the camp road, currently occupied by a few small trees surrounded by bamboo straws. These trees will need to be cleared to accommodate the Nano Grid installation. However, the site's proximity to the CiC office ensures security, and there is enough space for the installation process.

Moving on to the second site in Block E, sub block E2, this area is also an open space with no significant features present. It sits beside an elevated area, but this elevation does not pose a problem for the installation. Although there are a few bamboo structures nearby, no relocation or adjustments are required.

The third site, located in Block E, sub block E1, is within the Irani Pahar Police camp, enclosed by fencing. Currently serving as a debris collection yard, the site will be cleared for the Nano Grid installation. Despite the terrain sloping down to the south, the ground structure is compact and suitable for installation.

Finally, the fourth site, situated in Block B, sub block B5, is an open and flat space located beside the BFS road to the east of the camp road. This location lacks any major features, making it suitable for the installation of the Nano Grid.

Overall Comments
The proposed Solar PV Nano grids will have minimal environmental impact and are not located in environmentally sensitive areas. The project activities will not pose a significant threat to the natural surroundings and will not cause drainage congestion or water logging issues. Moreover, there will be no utilization of productive agricultural soil for the project, ensuring the preservation of fertile land.
The construction materials and equipment required for the Nano grids will be limited to the project boundary, minimizing any potential impact on the surrounding environment. The project follows environmentally responsible practices and aims to reduce any negative effects on the ecosystem.

The rohingya community has shown a positive attitude towards the project and expressed their enthusiasm to actively participate in its activities. The project is considered environmentally sustainable and socially acceptable by the adjacent community and representatives from various facilities. The participatory public consultation meeting provided an opportunity for community members to voice their opinions, and no objections were raised regarding the construction of the Nano grids at the proposed site. On the contrary, the community expressed appreciation for the infrastructure as it will enhance safety and security for the community.

During the consultation, the community highlighted the benefits that the Solar PV Nano grids will bring, particularly in terms of socio-security for female communities. The project is seen as a means to improve the quality of life, reduce vulnerability to social aggression and mistreatment, and enhance access to education and healthcare services. In addition, the establishment of the Solar PV Nano grids is expected to contribute to the overall development and well-being of the adjacent community. It will provide reliable electricity to various facilities such as learning centers, health posts, and food distribution centers, creating a conducive environment for education, healthcare, and community activities. The Solar PV Nano grids will not only provide electricity but also empower the community, ensuring a brighter and more secure future for all.

Types of waste to be generated during construction and operation phase:
The construction of the Nano grid involves installing a control room made of a steel container, which will be placed on RCC foundations. This process may require minimal ground preparation and the installation of RCC foundations. Additionally, during the construction phase, 14 poles will be installed near the project site.

During the installation of the poles and RCC foundations, there is a possibility of generating waste materials. These may include soil and debris that are excavated while digging holes for pole installation. The waste generated from the pole installation and RCC foundation is relatively small and mainly consists of construction debris. This debris can include materials like concrete, cement, bricks, and other building materials that are used during the installation process. If wooden or bamboo components or supports are used during the pole installation, there may be waste generated from cutting or shaping the wood or bamboo to fit the desired specifications.

Due to the small scale of construction, there will be no need for a labor shed, resulting in a reduced likelihood of generating organic waste, faecal waste, and kitchen waste during this phase.

The container structure will be transported to the site using a truck and then installed on the pillars with the assistance of a crane. As a result, the construction process is expected to have minimal waste generation. However, it is important to ensure proper waste management practices are in place to handle any potential waste materials that may arise during transportation and installation.

Sensitive environmental, cultural, archaeological, religious sites near (within 100m) of site including elephant migration routes and remaining forests:
4 nos. of Nano grids will be installed in Camp 5. Within the influence area of the subproject no historical sites were identified. The proposed locations for the Nano grids have been considered for their proximity to sensitive environmental, cultural, archaeological, religious sites, as well as

elephant migration routes and remaining forests within a 100-meter radius. Several sensitive features have been identified near the Nano grid locations, as described below:

Within Camp No.5, where 4 Nano grids are planned for construction, several sensitive features are present in different blocks and sub-blocks.

In Block E, sub block E6, near the CiC office, BRAC-SMS Office & Blast, there is a religious facility to the east, with distances of 26m and 33m. To the south of this location are the CiC office at 31m distance and the Primary Health Center at 24m distance.

Moving to Block E, sub block E2, near FH-MHPSS, JCF-LC, TDH, NGOF-Protection, Mukti-LC&BDRCS Distribution Point, there's a learning center to the east at 20m. To the north are a learning center at 72m and 87m, and a religious center at 100m.

In Block E, sub block E1, near the Police camp, RTMI-PHC, JCF-LC & NGOF, there's a learning center to the east at 77m. Towards the north, there's a religious facility at 85m and 86m, and to the northeast, a Primary Health Center at 85m.

Finally, in Block B, sub block B5, near BRAC UN Women Market, SARPV, IRC, FH-HP, Mukti-LC & JCF-LC, there are learning centers to the east at 90m and 93m, and religious facilities at 97m and 100m. To the north, there are religious facilities at 67m and 75m, and to the south, religious facilities at 24m and 32m.

Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists. Mostly Rohingya settlements are found around the proposed area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project area, no elephant migration routes exist (ref. IUCN). No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below

Section A: Sub-Project Overview

Description of sub-project/component interventions:

The 8KW capacity Nano grid control room, which is 10ft*8ft*8.5ft in size and has a thickness of 2.3mm, will serve as the central hub for the distribution of electricity to these facilities. The control room will be made of a steel container that includes the construction of RCC footing, thermal insulation, and ventilation operated by a temperature sensor. This will ensure that the equipment is protected from extreme weather conditions and operates at optimal performance.

The Nano grid will consist of approximately 14 poles, which will be installed to distribute electricity to the various facilities. Each pole will have an electricity line drawn from the Nano grid, with 14 panels installed on top of each pole. Additionally, each pole will have a 10 watt security light installed on top, providing additional safety and security for the surrounding area.

The proposed facilities also include the installation of 65 energy-efficient fans and lights in various service centers, each with a capacity of 35 watts and 10 watts respectively. These fans will help to

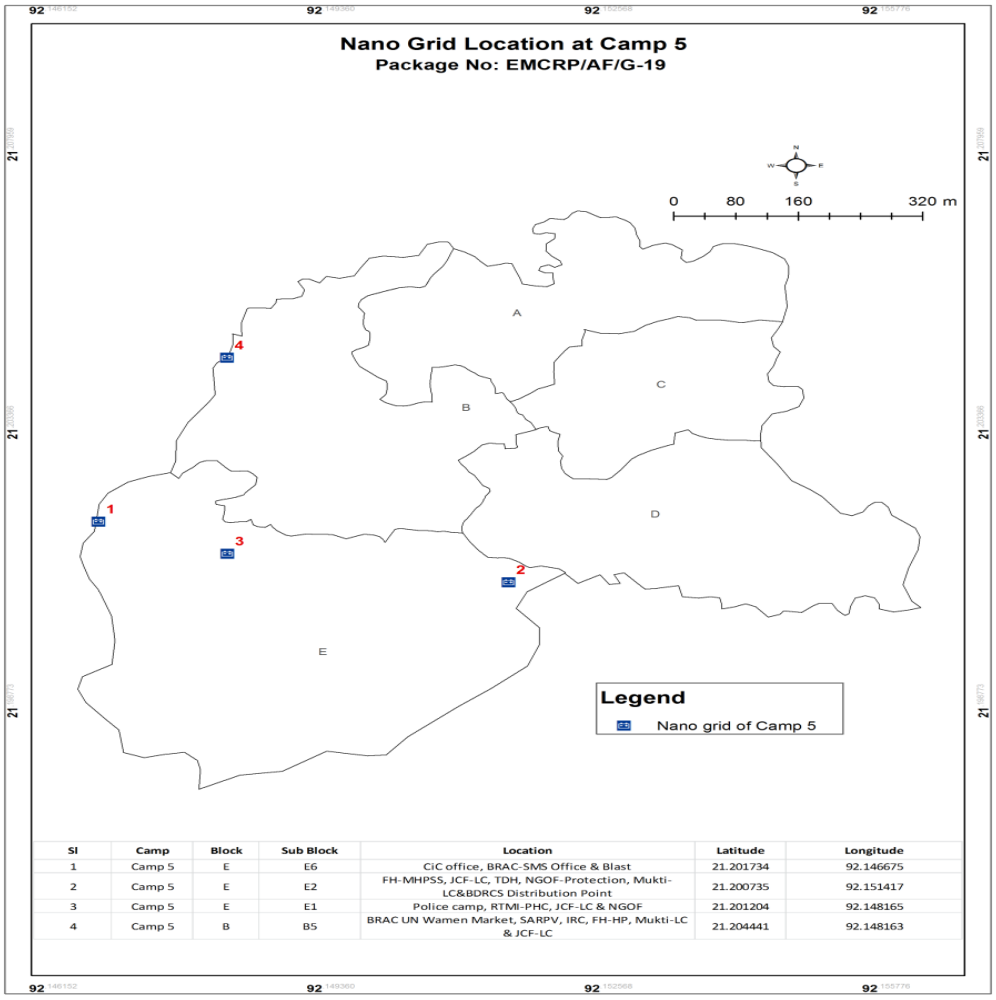
keep the facilities cool during hot temperatures, ensuring a comfortable working environment for the facilitators.

Two fire extinguishers will also be installed in the Nano grid room, ensuring the safety of the equipment and personnel operating in the area.

Sub-project Location:

4 nos. of Nano grids will be installed in Camp 5. The location details are given below.

Sl	Camp	Location	Block	Sub Block	Upazila	Union	Latitude	Longitude
1	Camp 5	CiC office, BRAC-SMS Office & Blast	E	E6	Ukhiya	Rajapalong	21.201734	92.146675
2	Camp 5	FH-MHPSS, JCF-LC, TDH, NGOF-Protection, Mukti-LC&BDRCS Distribution Point	E	E2	Ukhiya	Rajapalong	21.200735	92.151417
3	Camp 5	Police camp, RTMI-PHC, JCF-LC & NGOF	E	E1	Ukhiya	Rajapalong	21.201204	92.148165
4	Camp 5	BRAC UN Wamen Market, SARPV, IRC, FH-HP, Mukti-LC & JCF-LC	B	B5	Ukhiya	Rajapalong	21.204441	92.148163



Proposed Nano grid location at Camp 05

Land ownership Govt. Land
Expected construction period: 6 months
Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive environmental areas such as elephant corridors, water bodies, etc. and historical or socio-cultural assets): Please also explain any analysis on alternative location was conducted: There are 4 nos. of Nano grid in camp 5. In Block E, sub block E6, near the CiC office, BRAC-SMS Office & Blast, there is a religious facility to the east, with distances of 26m and 33m. To the south of this location are the CiC office at 31m distance and the Primary Health Center at 24m distance. Moving to Block E, sub block E2, near FH-MHPSS, JCF-LC, TDH, NGOF-Protection, Mukti-LC&BDRCS Distribution Point, there's a learning center to the east at 20m. To the north are a learning center at 72m and 87m, and a religious center at 100m. In Block E, sub block E1, near the Police camp, RTMI-PHC, JCF-LC & NGOF, there's a learning center to the east at 77m. Towards the north, there's a religious facility at 85m and 86m, and to the northeast, a Primary Health Center at 85m. Finally, in Block B, sub block B5, near BRAC UN Women Market, SARPV, IRC, FH-HP, Mukti-LC & JCF-LC, there are learning centers to the east at 90m and 93m, and religious facilities at 97m and 100m. To the north, there are religious facilities at 67m and 75m, and to the south, religious facilities at 24m and 32m. Within the influence area of the proposed location no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (confirmed by the participants in the consultation meeting).

Section B: Environmental Screening

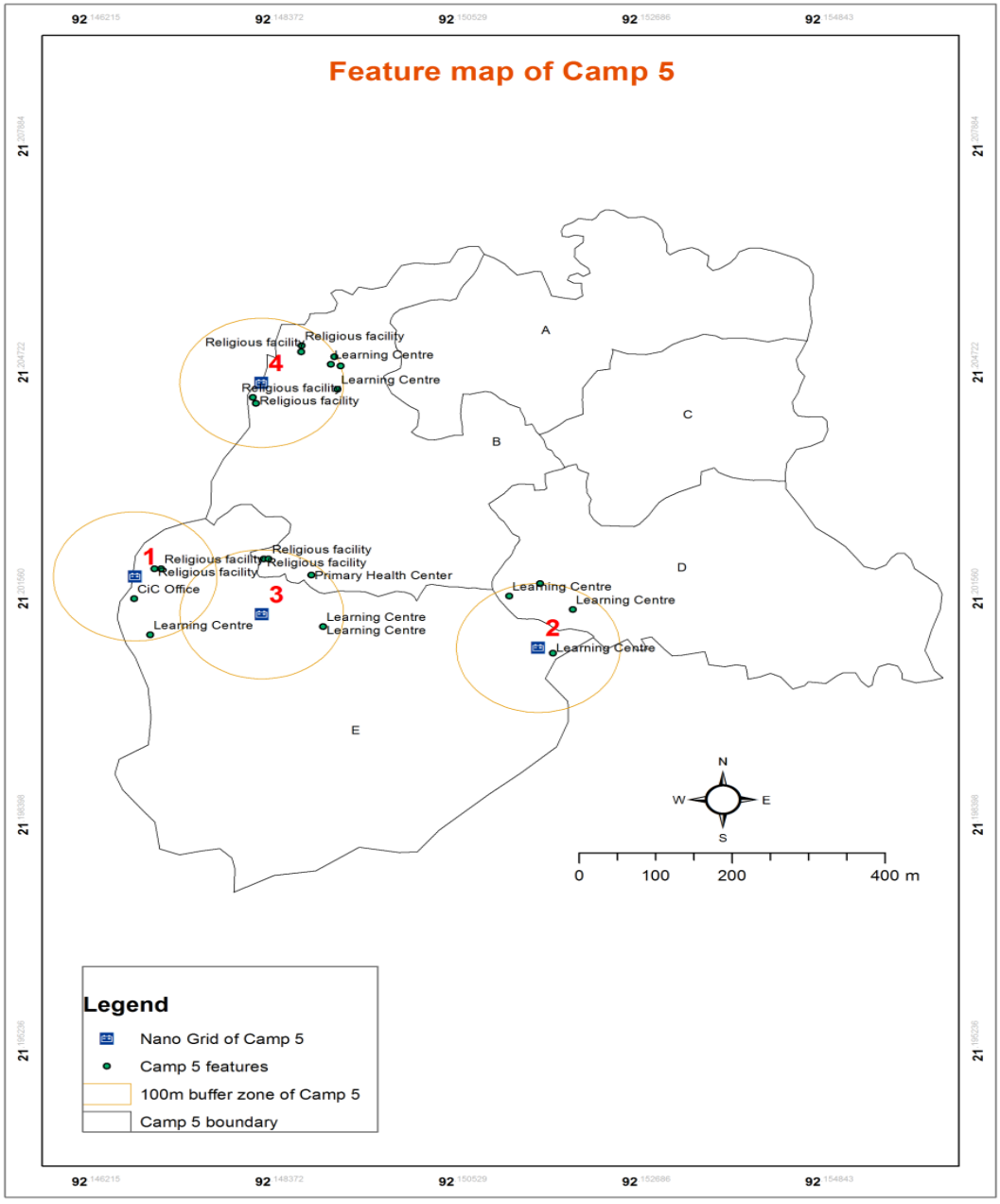
***B.1*: Environmental feature of sub-project location**

Description of cultural properties (if applicable, including distance from site): Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests: There are 4 nos. of Nano grid in camp 5. In Block E, sub block E6, near the CiC office, BRAC-SMS Office & Blast, there is a religious facility to the east, with distances of 26m and 33m. To the south of this location are the CiC office at 31m distance and the Primary Health Center at 24m distance. Moving to Block E, sub block E2, near FH-MHPSS, JCF-LC, TDH, NGOF-Protection, Mukti-LC&BDRCS Distribution Point, there's a learning center to the east at 20m. To the north are a learning center at 72m and 87m, and a religious center at 100m. In Block E, sub block E1, near the Police camp, RTMI-PHC, JCF-LC & NGOF, there's a learning center to the east at 77m. Towards the north, there's a religious facility at 85m and 86m, and to the northeast, a Primary Health Center at 85m. Finally, in Block B, sub block B5, near BRAC UN Women Market, SARPV, IRC, FH-HP, Mukti-LC & JCF-

LC, there are learning centers to the east at 90m and 93m, and religious facilities at 97m and 100m. To the north, there are religious facilities at 67m and 75m, and to the south, religious facilities at 24m and 32m.

Within the influence area of the proposed location no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (confirmed by the participants in the consultation meeting). There are no other sensitive environmental, cultural, archaeological sites within the catchment area of this sub-project.

A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas are shown below



Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive features found in the footprint area. Several

learning center, rohingya settlements and religious facilities were found during the survey. It will not be affected by the construction works, as the activities will be carried out within the existing proposed area boundary and necessary preventive and mitigation measures will be followed during the entire construction period.

(1) Within/near Elephant Migration Routes Yes/No*

No. These have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

(2) potential impacts on remaining forests in/around camps Yes/No

N/A (This activity will be confined within the proposed location)

(3) Other issues: N/A

*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:

Dust:

Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, trailer, mini truck, etc. move on roads adjacent to proposed location throughout the day generating noise but within tolerable limit in most cases.

Baseline soil quality:

The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.

Landslide potential (high/medium/low, with explanation):

The nominated location is found to be on fairly plane land. There is no condition found around the selected site which might give reasons for landslides.

Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH):

Groundwater is the main source of potable water in the Sub-project area. The shallow depth is about 100 feet to 120 feet and deep tube well depth is 700 to 850 feet. In the sub-project area, deep groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains medium concentration of iron. Deep groundwater table (drinkable) varies from 600-800ft (Field survey, 2021). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer.

Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to 681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)

Status of wildlife movement:

N/A (None of the information was found about the wildlife movement in or across the area)

State of forestation: Patches of vegetation containing small trees found in target location and in surrounding area of the proposed location which are within 200m radial distance.
Summary of water balance analysis (For water supply scheme only): **N/A**

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g., status of access road or any other facility required for sub-project to be viable): Three roads will be utilized in the area: the Camp 5 and 6 connecting road, the Camp 5 connecting road near the APBN office, and the Moricha Bazar Camp connecting road, also known as the Army road. These roads will facilitate the transportation of materials to various nano grid sites within the camp. The Camp 5 and 6 connecting road will be used to deliver materials to the first two nano grids in Camp 05. The Camp 5 connecting road near the APBN office will serve transportation needs for Camp 5, Block E, Sub block E1, Police camp, RTMI-PHC, JCF-LC, and NGOF nano grid site. Additionally, the Moricha Bazar Camp connecting road, or Army road, will enable the transportation of materials to Camp 5, Block B, Sub block B5, BRAC UN Women Market, SARPV, IRC, FH-HP, Mukti-LC, and JCF-LC nano grid site.These roads will provide access for vehicles and ensure a route for transporting goods and supplies to the designated nano grid locations within the camps.
Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction: Due to the small scale of construction, hence there is no need for labor shed. As a result, there is no necessity for a tube well in the proposed locations. Instead, during the construction phase, the contractor will arrange for a mobile water supply system to ensure a sufficient water source for the construction work. Additionally, the contractor will be responsible for providing temporary sanitation facilities. A portable or temporary sanitary system will be set up to cater to the basic hygiene needs of the workers during the construction period in the vicinity of the construction area for all the components of the project. Electricity is not available in the area. Generator or Solar lamp will need installation.
Possible location of labor camps: Due to the small scale of construction, hence there is no need for labor shed.
Requirement and type of raw materials (e.g., sand, stone, wood, etc.): i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials
Identification of access road for transportation (Yes/No): Yes. Three roads will be utilized in the area: the Camp 5 and 6 connecting road, the Camp 5 connecting road near the APBN office, and the Moricha Bazar Camp connecting road, also known as the Army road. These roads will facilitate the transportation of materials to various Nano grid sites within the camp.

The Camp 5 and 6 connecting road will be used to deliver materials to the first two nano grids in Camp 05. The Camp 5 connecting road near the APBN office will serve transportation needs for Camp 5, Block E, Sub block E1, Police camp, RTMI-PHC, JCF-LC, and NGOF nano grid site. Additionally, the Moricha Bazar Camp connecting road, or Army road, will enable the transportation of materials to Camp 5, Block B, Sub block B5, BRAC UN Women Market, SARPV, IRC, FH-HP, Mukti-LC, and JCF-LC nano grid site.These roads will provide access for vehicles and ensure a route for transporting goods and supplies to the designated nano grid locations within the camps.
Location identification for raw material storage: The materials, including the poles, for the Nano grids will be stored either on the side of the road or in designated vacant spaces near each Nano grid. The site management or the Camp-in-Charge (CIC) will grant permission to store the required materials for the Nano grid within the camp premises. To ensure security during nighttime, there may be provisions for having night guards in place
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.): There is no pre-existing structure which will face demolition. Here, demolition waste will not have to be accounted for. Few leftovers from soil clearing, plastics or residual clearing and site clearing may be generated.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g., Solids wastes, liquid wastes, etc.): **Solid waste:** Iron, concrete, metal, drywall, wood, plastic, rubber, copper wires, excavated soils etc. **Quantity:** It is difficult to give exact figures of construction waste produced on a typical construction site. However, in order to approximate the quantity, it is estimated that nearly 2 kg of waste would be generated each working day, which are mainly RCC foundation construction and poles installation wastes. Some plastic, paper and organic waste will be generated from the use of workers, though a very negligible amount- half a kilogram a day maximum. **Liquid waste**: Paint chemicals as paint thinners which contain Volatile Organic Compounds (VOCs) will come out as leftovers. Due to the small scale of construction, hence there is no need for labor shed. So, fecal sludge will not be generated from the labor camp during the construction period. Leftover oils or spills from machinery can be a high probability generating liquid waste.
Type and quantity of raw materials used (wood, bricks, cement, water, etc.): **Type:** i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction. **Quantity**: It is difficult to give exact figures of construction waste produced on a typical construction site.
Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards: Around 100 sq. feet area is needed for this project.

No vegetation is present in the targeted footprint area. Specific soil amount is not needed for the sub-project component. The current condition explains that there is no aggregated soil on the right of way. On the other hand, vegetation was found around the proposed area. The vegetation will not be affected by construction work since scope of works is confined within planned area.
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) Low. No borrow pit or quarries will be required to dig out during the construction period in or around/ adjacent to the proposed area.
Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description). No pre-existing water body or drainage is present
Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) **Low.** The site is free from any aquatic ecosystems or habitats of endangered species. There are some terrestrial flora species around the project site, which will slightly be affected by the works. Life cycle or movement of some terrestrial living species (fauna) (i.e. Insects - ant, bees, earthworm, reptiles, birds etc.) might be disturbed for the time being, but with very less impact indeed. So, overall potential effect is very low or absent for this specific sub project.
Activities that can lead to landslides, slumps, slips and other mass movements in road cuts: The soil in the proposed site is largely flat, so there is almost no chance to trigger the landslide or any type of mass movement of soil for the said construction works.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description) N/A
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: N/A
Chance of long-term or semi-permanent destruction of soils: (High/Medium/Low with description) There is no chance of activities during the operation period, which can lead to any long-term or semi-permanent destruction of soils.
Possibility of odor and water, soil quality impacts from SWM and FSM disposal system: (High/Medium/Low with description) N/A
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito

breeding and other disease vectors: (High/Medium/Low with explanation) There is no possibility for creating borrow-pits, quarries, etc. during the operation phase.
Likely direct and indirect impacts on economic development in the project areas by the sub-project: During the operation phase of the sub-project, there are likely to be both direct and indirect impacts on economic development in the project areas. Direct impacts refer to the immediate effects that result directly from the sub-project activities. For example, the establishment and operation of the Nano grid can create employment opportunities for the adjacent workforce. This can include job opportunities in the construction phase as well as maintenance and operation of the infrastructure. Indirect impacts, on the other hand, are the ripple effects that arise from the sub-project activities. Access to electricity provided by the Nano grid can enhance the quality and efficiency of various services such as healthcare, education, and communication. Healthcare facilities can operate more effectively with reliable power supply, ensuring better medical services for the community. Educational institutions can improve their teaching and learning environments through the availability of electricity, enabling students to access modern technology and educational resources.
Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No existing drainage channels or surface water bodies found in the project area; therefore, no such effect can be anticipated
Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. There are no protected areas in or around project sites, and no known areas of ecological interest which can be affected by the daily activity of this facility.
Activities leading to landslides, slumps, slips and other mass movements in road cuts: N/A
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation) N/A
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: N/A

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

Environmental Screening Form for Solar PV Nano Grid (Camp 6)

Name of Sub-Project: Supply and Installation of Solar PV Nano grid (Camp 6: There are 2 nos. of Nano Grid will be installed in Camp 6)

Sl	Camp	Location	Block	Sub Block	Upazila	Union
1	Camp 6	PHC BDRCS	A	A3	Ukhiya	Rajapalong
2	Camp 6	CIC OFFICE	D	D7	Ukhiya	Rajapalong

Implementing Agency/Agencies: Local Government Engineering Department (LGED)

Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):
The proposed sub-project activities for the Nano grid include various components and equipment that are essential for its functioning. The control room is a steel container with dimensions of 10ft**8ft**8.5ft and a thickness of 2.3mm. It includes the construction of reinforced concrete footing, thermal insulation, and a ventilation fan operated by a temperature sensor. One control room with a capacity of 8KW will be installed.

The sub-project will require 18 solar PV modules, each with a capacity of 450 Wp (watt peak). These modules are of the mono crystalline type and consist of 72 cells or more, conforming to international standards and codes. The total capacity of the solar PV modules will be 8KW.

A total of 24 vented lead acid batteries will be used, each having a capacity of 2V and 900Ah (ampere-hour) or higher. These batteries are specifically designed for solar applications and comply with international standards and codes.

14 overhead distribution line poles will be erected, either with a height of 7.6 meters (SPC) or 6.0 meters (steel). The installation includes the use of reinforced concrete base, number plate, earthing, and all necessary fittings and accessories.

A total of 65 LED lights with a capacity of 10 watts will be installed for public facilities. These energy efficient lights will provide illumination while consuming minimal power.

Fifteen security lights with a capacity of 10 watts, equipped with outdoor installation fixtures, day light, and motion sensors, will be installed to ensure safety and security in the area.

Sixty-five energy-saving BLDC (Brushless Direct Current) ceiling fans with a capacity of 35 watts and a size of 56 inches will be installed in public facilities. These fans come with a 5-step capacitive compatible wall regulator and all necessary accessories for installation.

Twenty sets of switch, socket, and fuse board will be installed for the internal wiring of lights and fans in public facilities. This includes switches, sockets, PVC switch boxes, PVC insulated cables, and all other necessary fittings and accessories.

Estimated footprint / land area is 100 sq. feet for each Nano grid

Brief description of sub-project site: (e.g., present land use, Important Environmental Features (IEFs) near site, etc.:

In Camp 6, there are 2 Nano grids planned.

In Block A, sub block A3, near PHC BDRCS, the site is located next to the camp 6 BFS road, adjacent to a few DRP structures. There are no significant features that would require relocation for the installation. The site offers enough space for the Nano grid.

Moving to Block D, sub block D7, near the CiC office, the location is situated behind the camp 6 CiC office. It provides a plain land with sufficient space for installation. However, there are some small trees and shrubs nearby that may need clearing. The site benefits from security due to its proximity to the CiC office facility.

Overall Comments

The proposed Solar PV Nano grids will have minimal environmental impact and are not located in environmentally sensitive areas. The project activities will not pose a significant threat to the natural surroundings and will not cause drainage congestion or water logging issues. Moreover, there will be no utilization of productive agricultural soil for the project, ensuring the preservation of fertile land. The construction materials and equipment required for the Nano grids will be limited to the project boundary, minimizing any potential impact on the surrounding environment. The project follows environmentally responsible practices and aims to reduce any negative effects on the ecosystem.

The rohingya community has shown a positive attitude towards the project and expressed their enthusiasm to actively participate in its activities. The project is considered environmentally sustainable and socially acceptable by the adjacent community and representatives from various facilities. The participatory public consultation meeting provided an opportunity for community members to voice their opinions, and no objections were raised regarding the construction of the Nano grids at the proposed site. On the contrary, the community expressed appreciation for the infrastructure as it will enhance safety and security for the community.

During the consultation, the community highlighted the benefits that the Solar PV Nano grids will bring, particularly in terms of socio-security for female communities. The project is seen as a means to improve the quality of life, reduce vulnerability to social aggression and mistreatment, and enhance access to education and healthcare services. In addition, the establishment of the Solar PV Nano grids is expected to contribute to the overall development and well-being of the adjacent community. It will provide reliable electricity to various facilities such as learning centers, health posts, and food distribution centers, creating a conducive environment for education, healthcare, and community activities. The Solar PV Nano grids will not only provide electricity but also empower the community, ensuring a brighter and more secure future for all.

Types of waste to be generated during construction and operation phase:

The construction of the Nano grid involves installing a control room made of a steel container, which will be placed on RCC foundations. This process may require minimal ground preparation and the installation of RCC foundations. Additionally, during the construction phase, 14 poles will be installed near the project site.

During the installation of the poles and RCC foundations, there is a possibility of generating waste materials. These may include soil and debris that are excavated while digging holes for pole installation. The waste generated from the pole installation and RCC foundation is relatively small and mainly consists of construction debris. This debris can include materials like concrete, cement, bricks, and other building materials that are used during the installation process. If wooden or bamboo components or supports are used during the pole installation, there may be waste generated from cutting or shaping the wood or bamboo to fit the desired specifications.

Due to the small scale of construction, there will be no need for a labor shed, resulting in a reduced likelihood of generating organic waste, faecal waste, and kitchen waste during this phase.

The container structure will be transported to the site using a truck and then installed on the pillars with the assistance of a crane. As a result, the construction process is expected to have minimal waste generation. However, it is important to ensure proper waste management practices are in place to handle any potential waste materials that may arise during transportation and installation.

Sensitive environmental, cultural, archaeological, religious sites near (within 100m) of site including elephant migration routes and remaining forests:

2 nos. of Nano grids will be installed in Camp 6. Within the influence area of the subproject no historical sites were identified. The proposed locations for the Nano grids have been considered for their proximity to sensitive environmental, cultural, archaeological, religious sites, as well as elephant migration routes and remaining forests within a 100-meter radius. Several sensitive features have been identified near the Nano grid locations, as described below:

For the Nano grid situated in Block A, Sub block A3, close to PHC BDRCS, there are no significant features to the east or north. However, to the west, there is a religious facility approximately 78 meters away. No sensitive features are present to the south.

Regarding the Nano grid located in Block D, Sub block D7, near the CiC office, there are learning centers to the east at distances of 29m, 39m, and 96m. On the west side, there are learning centers and a religious facility located at distances of 93m, 96m, and 98m respectively. Towards the north, religious facilities are situated approximately 70m and 81m away. To the south, there are religious facilities at distances of 16m, 29m, 74m, 67m, and 92m.

Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists. Mostly Rohingya settlements are found around the proposed area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project area, no elephant migration routes exist (ref. IUCN). No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below

Section A: Sub-Project Overview

Description of sub-project/component interventions:

The 8KW capacity Nano grid control room, which is 10ft*8ft*8.5ft in size and has a thickness of 2.3mm, will serve as the central hub for the distribution of electricity to these facilities. The control room will be made of a steel container that includes the construction of RCC footing, thermal insulation, and ventilation operated by a temperature sensor. This will ensure that the equipment is protected from extreme weather conditions and operates at optimal performance.

The Nano grid will consist of approximately 14 poles, which will be installed to distribute electricity to the various facilities. Each pole will have an electricity line drawn from the Nano grid, with 14 panels installed on top of each pole. Additionally, each pole will have a 10 watt security light installed on top, providing additional safety and security for the surrounding area.

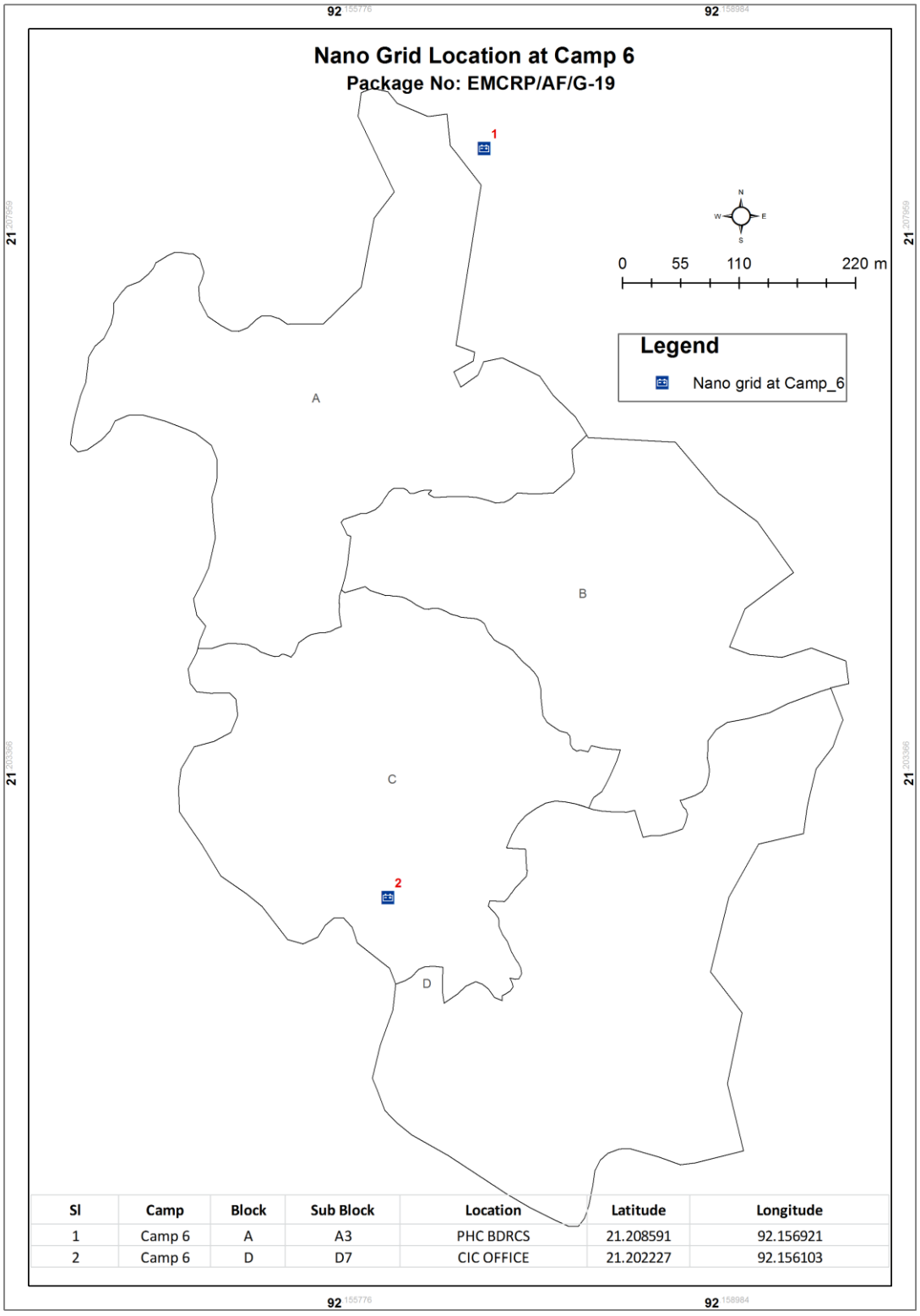
The proposed facilities also include the installation of 65 energy-efficient fans and lights in various service centers, each with a capacity of 35 watts and 10 watts respectively. These fans will help to keep the facilities cool during hot temperatures, ensuring a comfortable working environment for the facilitators.

Two fire extinguishers will also be installed in the Nano grid room, ensuring the safety of the equipment and personnel operating in the area.

Sub-project Location:

2 nos. of Nano grids will be installed in Camp 6. The location details are given below.

Sl	Camp	Location	Block	Sub Block	Upazila	Union	Latitude	Longitude
1	Camp 6	PHC BDRCS	A	A3	Ukhiya	Rajapalong	21.208591	92.156921
2	Camp 6	CIC OFFICE	D	D7	Ukhiya	Rajapalong	21.202227	92.156103



Sl	Camp	Block	Sub Block	Location	Latitude	Longitude
1	Camp 6	A	A3	PHC BDRCS	21.208591	92.156921
2	Camp 6	D	D7	CIC OFFICE	21.202227	92.156103

Proposed Nano grid location at Camp 6

Land ownership

Govt. Land

Expected construction period: 6 months

Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive environmental areas such as elephant corridors, water bodies, etc. and historical or socio-cultural assets): Please also explain any analysis on alternative location was conducted:

There are 2 nos. of Nano grid in camp 6.

For the Nano grid situated in Block A, Sub block A3, close to PHC BDRCS, there are no significant features to the east or north. However, to the west, there is a religious facility approximately 78 meters away. No sensitive features are present to the south.

Regarding the Nano grid located in Block D, Sub block D7, near the CiC office, there are learning centers to the east at distances of 29m, 39m, and 96m. On the west side, there are learning centers and a religious facility located at distances of 93m, 96m, and 98m respectively. Towards the north, religious facilities are situated approximately 70m and 81m away. To the south, there are religious facilities at distances of 16m, 29m, 74m, 67m, and 92m.

Within the influence area of the proposed location no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (confirmed by the participants in the consultation meeting).

Section B: Environmental Screening

***B.1*: Environmental feature of sub-project location**

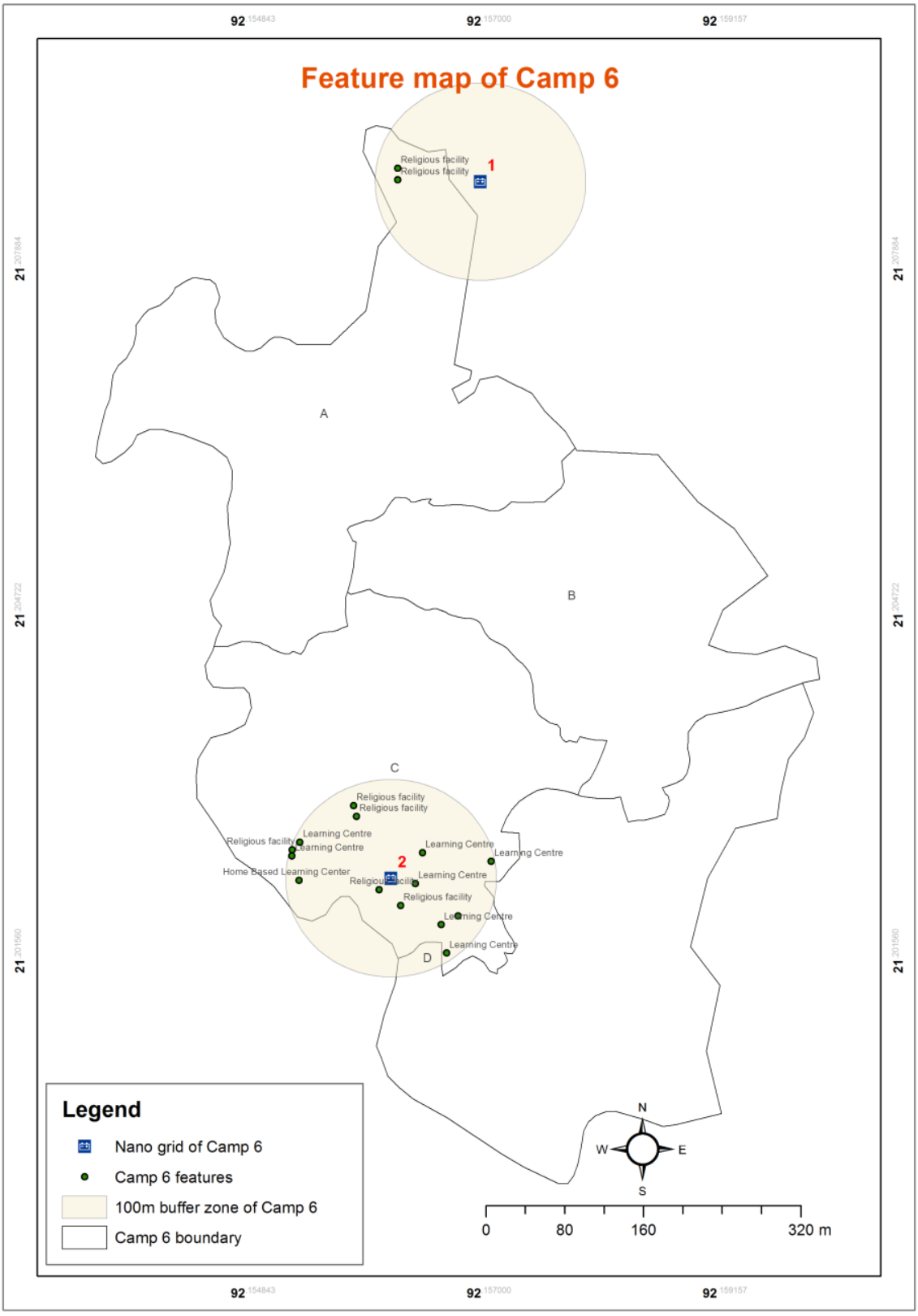
Description of cultural properties (if applicable, including distance from site): Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests:

There are 2 nos. of Nano grid in camp 6.

For the Nano grid situated in Block A, Sub block A3, close to PHC BDRCS, there are no significant features to the east or north. However, to the west, there is a religious facility approximately 78 meters away. No sensitive features are present to the south.

Regarding the Nano grid located in Block D, Sub block D7, near the CiC office, there are learning centers to the east at distances of 29m, 39m, and 96m. On the west side, there are learning centers and a religious facility located at distances of 93m, 96m, and 98m respectively. Towards the north, religious facilities are situated approximately 70m and 81m away. To the south, there are religious facilities at distances of 16m, 29m, 74m, 67m, and 92m.

A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas are shown below.



Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive features found in the footprint area. Several

learning center, rohingya settlements and religious facilities were found during the survey. It will not be affected by the construction works, as the activities will be carried out within the existing proposed area boundary and necessary preventive and mitigation measures will be followed during the entire construction period.

(1) Within/near Elephant Migration Routes Yes/No*

No. These have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

(2) potential impacts on remaining forests in/around camps Yes/No

N/A (This activity will be confined within the proposed location)

(3) Other issues: N/A

*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:

Dust:

Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, trailer, mini truck, etc. move on roads adjacent to proposed location throughout the day generating noise but within tolerable limit in most cases.

Baseline soil quality:

The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.

Landslide potential (high/medium/low, with explanation):

The nominated location is found to be on fairly plane land. There is no condition found around the selected site which might give reasons for landslides.

Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH):

Groundwater is the main source of potable water in the Sub-project area. The shallow depth is about 100 feet to 120 feet and deep tube well depth is 700 to 850 feet. In the sub-project area, deep groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains medium concentration of iron. Deep groundwater table (drinkable) varies from 600-800ft (Field survey, 2021). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer.

Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to 681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)

Status of wildlife movement:

N/A (None of the information was found about the wildlife movement in or across the area)

State of forestation: Patches of vegetation containing small trees found in target location and in surrounding area of the proposed location which are within 200m radial distance.
Summary of water balance analysis (For water supply scheme only): **N/A**

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g., status of access road or any other facility required for sub-project to be viable): There is a road called the Pitkhola Bazar Road which will be used to Camp 6, Block D, Sub block D7, CIC OFFICE Nano grid for transportation and another road named camp 6 connecting road which will be used for transportation and delivering materials to Camp 6, Block A, Sub block A3, PHC BDRCS Nano grid. These two roads provide access for vehicles and ensure a route for transporting goods and supplies.
Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction: Due to the small scale of construction, hence there is no need for labor shed. As a result, there is no necessity for a tube well in the proposed locations. Instead, during the construction phase, the contractor will arrange for a mobile water supply system to ensure a sufficient water source for the construction work. Additionally, the contractor will be responsible for providing temporary sanitation facilities. A portable or temporary sanitary system will be set up to cater to the basic hygiene needs of the workers during the construction period in the vicinity of the construction area for all the components of the project. Electricity is not available in the area. Generator or Solar lamp will need installation.
Possible location of labor camps: Due to the small scale of construction, hence there is no need for labor shed.
Requirement and type of raw materials (e.g., sand, stone, wood, etc.): i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials
Identification of access road for transportation (Yes/No): Yes. There is a road called the Pitkhola Bazar Road which will be used to Camp 6, Block D, Sub block D7, CiC office Nano grid for transportation and another road named camp 6 connecting road which will be used for transportation and delivering materials to Camp 6, Block A, Sub block A3, PHC BDRCS Nano grid. These two roads provide access for vehicles and ensure a route for transporting goods and supplies.
Location identification for raw material storage: The materials, including the poles, for the Nano grids will be stored either on the side of the road or in designated vacant spaces near each Nano grid. The site management or the Camp-in-Charge (CIC) will grant permission to store the required materials for the Nano grid within the camp premises. To ensure security during nighttime, there may be provisions for having night guards in place
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from

old latrines, etc.): There is no pre-existing structure which will face demolition. Here, demolition waste will not have to be accounted for. Few leftovers from soil clearing, plastics or residual clearing and site clearing may be generated.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g., Solids wastes, liquid wastes, etc.): **Solid waste:** Iron, concrete, metal, drywall, wood, plastic, rubber, copper wires, excavated soils etc. **Quantity:** It is difficult to give exact figures of construction waste produced on a typical construction site. However, in order to approximate the quantity, it is estimated that nearly 2 kg of waste would be generated each working day, which are mainly RCC foundation construction and poles installation wastes. Some plastic, paper and organic waste will be generated from the use of workers, though a very negligible amount- half a kilogram a day maximum. **Liquid waste**: Paint chemicals as paint thinners which contain Volatile Organic Compounds (VOCs) will come out as leftovers. Due to the small scale of construction, hence there is no need for labor shed. So, fecal sludge will not be generated from the labor camp during the construction period. Leftover oils or spills from machinery can be a high probability generating liquid waste.
Type and quantity of raw materials used (wood, bricks, cement, water, etc.): **Type:** i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction. **Quantity**: It is difficult to give exact figures of construction waste produced on a typical construction site.
Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards: Around 100 sq. feet area is needed for this project. No vegetation is present in the targeted footprint area. Specific soil amount is not needed for the sub-project component. The current condition explains that there is no aggregated soil on the right of way. On the other hand, vegetation was found around the proposed area. The vegetation will not be affected by construction work since scope of works is confined within planned area.
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) Low. No borrow pit or quarries will be required to dig out during the construction period in or around/ adjacent to the proposed area.
Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description). No pre-existing water body or drainage is present
Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by

induced development: (High/Medium/Low with description) **Low.** The site is free from any aquatic ecosystems or habitats of endangered species. There are some terrestrial flora species around the project site, which will slightly be affected by the works. Life cycle or movement of some terrestrial living species (fauna) (i.e. Insects - ant, bees, earthworm, reptiles, birds etc.) might be disturbed for the time being, but with very less impact indeed. So, overall potential effect is very low or absent for this specific sub project.
Activities that can lead to landslides, slumps, slips and other mass movements in road cuts: The soil in the proposed site is largely flat, so there is almost no chance to trigger the landslide or any type of mass movement of soil for the said construction works.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description) N/A
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: N/A
Chance of long-term or semi-permanent destruction of soils: (High/Medium/Low with description) There is no chance of activities during the operation period, which can lead to any long-term or semi-permanent destruction of soils.
Possibility of odor and water, soil quality impacts from SWM and FSM disposal system: (High/Medium/Low with description) N/A
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) There is no possibility for creating borrow-pits, quarries, etc. during the operation phase.
Likely direct and indirect impacts on economic development in the project areas by the sub-project: During the operation phase of the sub-project, there are likely to be both direct and indirect impacts on economic development in the project areas. Direct impacts refer to the immediate effects that result directly from the sub-project activities. For example, the establishment and operation of the Nano grid can create employment opportunities for the adjacent workforce. This can include job opportunities in the construction phase as well as maintenance and operation of the infrastructure. Indirect impacts, on the other hand, are the ripple effects that arise from the sub-project activities. Access to electricity provided by the Nano grid can enhance the quality and efficiency of various services such as healthcare, education, and communication. Healthcare facilities can operate more

effectively with reliable power supply, ensuring better medical services for the community. Educational institutions can improve their teaching and learning environments through the availability of electricity, enabling students to access modern technology and educational resources.
Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No existing drainage channels or surface water bodies found in the project area; therefore, no such effect can be anticipated
Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. There are no protected areas in or around project sites, and no known areas of ecological interest which can be affected by the daily activity of this facility.
Activities leading to landslides, slumps, slips and other mass movements in road cuts: N/A
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation) N/A
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: N/A

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

Environmental Screening Form for Solar PV Nano Grid (Camp 20 Ext.)

Name of Sub-Project: Supply and Installation of Solar PV Nano grid (Camp 20 Ext.: There will be 4 Nano Grids installed in Camp 20 Ext.)

Sl	Camp	Location	Block	Sub Block	Upazila	Union
1	Camp 20EXT	NGO From Center	S3	B1	Ukhiya	Palongkhali
2	Camp 20EXT	Beside the learning center	S1	B8	Ukhiya	Palongkhali
3	Camp 20EXT	Beside the Turkish clinic	S4	B3	Ukhiya	Palongkhali
4	Camp 20EXT	Health and Nutrition	S3	B4	Ukhiya	Palongkhali

Implementing Agency/Agencies: Local Government Engineering Department (LGED)

Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):
The proposed sub-project activities for the Nano grid include various components and equipment that are essential for its functioning. The control room is a steel container with dimensions of 10ft**8ft**8.5ft and a thickness of 2.3mm. It includes the construction of reinforced concrete footing, thermal insulation, and a ventilation fan operated by a temperature sensor. One control room with a capacity of 8KW will be installed.

The sub-project will require 18 solar PV modules, each with a capacity of 450 Wp (watt peak). These modules are of the mono crystalline type and consist of 72 cells or more, conforming to international standards and codes. The total capacity of the solar PV modules will be 8KW.

A total of 24 vented lead acid batteries will be used, each having a capacity of 2V and 900Ah (ampere-hour) or higher. These batteries are specifically designed for solar applications and comply with international standards and codes.

14 overhead distribution line poles will be erected, either with a height of 7.6 meters (SPC) or 6.0 meters (steel). The installation includes the use of reinforced concrete base, number plate, earthing, and all necessary fittings and accessories.

A total of 65 LED lights with a capacity of 10 watts will be installed for public facilities. These energy efficient lights will provide illumination while consuming minimal power.

Fifteen security lights with a capacity of 10 watts, equipped with outdoor installation fixtures, day light, and motion sensors, will be installed to ensure safety and security in the area.

Sixty-five energy-saving BLDC (Brushless Direct Current) ceiling fans with a capacity of 35 watts and a size of 56 inches will be installed in public facilities. These fans come with a 5-step capacitive compatible wall regulator and all necessary accessories for installation.

Twenty sets of switch, socket, and fuse board will be installed for the internal wiring of lights and fans in public facilities. This includes switches, sockets, PVC switch boxes, PVC insulated cables, and all other necessary fittings and accessories.

Estimated footprint / land area is 100 sq. feet for each Nano grid

Brief description of sub-project site: (e.g., present land use, Important Environmental Features (IEFs) near site, etc.:
In Camp 20 Ext., there are four Nano grids planned for installation, each situated in different sub-blocks.

The first Nano grid, located in Block S3, Sub-block B1, is positioned on the east side of the existing connecting road. It sits on higher ground and is adjacent to a mosque, with DRP settlements nearby. However, these features won't interfere with the installation process.

The second Nano grid, in Block S1, Sub-block B8, is next to the camp's connecting road. Although there's a drainage canal to the south, it's not a major concern as long as there's proper planning for material transportation. Learning and WFS centers to the west won't be affected during the installation.

The third Nano grid, in Block S4, Sub-block B3, is also by the camp's BFS road. Aside from DRP settlements around 80 meters away, there are no significant concerns, and there's enough space for installation.

Lastly, the fourth Nano grid, in Block S3, Sub-block B4, is situated on the east side of the connecting road. It's an open space with only a water tank and collection point nearby, but they won't be impacted by the installation process due to sufficient space.

Overall Comments
The proposed Solar PV Nano grids will have minimal environmental impact and are not located in environmentally sensitive areas. The project activities will not pose a significant threat to the natural surroundings and will not cause drainage congestion or water logging issues. Moreover, there will be no utilization of productive agricultural soil for the project, ensuring the preservation of fertile land.
The construction materials and equipment required for the Nano grids will be limited to the project boundary, minimizing any potential impact on the surrounding environment. The project follows environmentally responsible practices and aims to reduce any negative effects on the ecosystem.

The rohingya community has shown a positive attitude towards the project and expressed their enthusiasm to actively participate in its activities. The project is considered environmentally sustainable and socially acceptable by the adjacent community and representatives from various facilities. The participatory public consultation meeting provided an opportunity for community members to voice their opinions, and no objections were raised regarding the construction of the Nano grids at the proposed site. On the contrary, the community expressed appreciation for the infrastructure as it will enhance safety and security for the community.

During the consultation, the community highlighted the benefits that the Solar PV Nano grids will bring, particularly in terms of socio-security for female communities. The project is seen as a means to improve the quality of life, reduce vulnerability to social aggression and mistreatment, and enhance access to education and healthcare services. In addition, the establishment of the Solar PV Nano grids is expected to contribute to the overall development and well-being of the adjacent community. It will provide reliable electricity to various facilities such as learning centers, health posts, and food distribution centers, creating a conducive environment for education, healthcare, and community activities. The Solar PV Nano grids will not only provide electricity but also empower the community, ensuring a brighter and more secure future for all.

Types of waste to be generated during construction and operation phase:
The construction of the Nano grid involves installing a control room made of a steel container, which will be placed on RCC foundations. This process may require minimal ground preparation and the installation of RCC foundations. Additionally, during the construction phase, 14 poles will be installed near the project site.

During the installation of the poles and RCC foundations, there is a possibility of generating waste materials. These may include soil and debris that are excavated while digging holes for pole installation. The waste generated from the pole installation and RCC foundation is relatively small and mainly consists of construction debris. This debris can include materials like concrete, cement, bricks, and other building materials that are used during the installation process. If wooden or bamboo components or supports are used during the pole installation, there may be waste generated from cutting or shaping the wood or bamboo to fit the desired specifications.

Due to the small scale of construction, there will be no need for a labor shed, resulting in a reduced likelihood of generating organic waste, faecal waste, and kitchen waste during this phase.

The container structure will be transported to the site using a truck and then installed on the pillars with the assistance of a crane. As a result, the construction process is expected to have minimal waste generation. However, it is important to ensure proper waste management practices are in place to handle any potential waste materials that may arise during transportation and installation.

Sensitive environmental, cultural, archaeological, religious sites near (within 100m) of site including elephant migration routes and remaining forests:
4 nos. of Nano grids will be installed in Camp 20 Ext. Within the influence area of the subproject no historical sites were identified. The proposed locations for the Nano grids have been considered for their proximity to sensitive environmental, cultural, archaeological, religious sites, as well as elephant migration routes and remaining forests within a 100-meter radius. Several sensitive features have been identified near the Nano grid locations, as described below:

In Block S3, Sub-block B1, inside the NGO Forum Center, there are no sensitive features to the east or west. However, there is a religious facility just 10 meters to the north.

In Block S1, Sub-block B8, adjacent to the learning center, there are no sensitive features to the east or west. However, the CiC office is located 100 meters to the north.

In Block S4, Sub-block B3, beside the Turkish clinic, there is a religious facility 97 meters to the east.

In Block S3, Sub-block B4, where the Health and Nutrition facility is positioned, there are no sensitive features to the east or west, but there's a learning center 97 meters to the south.

Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists. Mostly Rohingya settlements are found around the proposed area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project area, no elephant migration routes exist (ref. IUCN). No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below

Section A: Sub-Project Overview

Description of sub-project/component interventions:

The 8KW capacity Nano grid control room, which is 10ft*8ft*8.5ft in size and has a thickness of 2.3mm, will serve as the central hub for the distribution of electricity to these facilities. The control room will be made of a steel container that includes the construction of RCC footing, thermal insulation, and ventilation operated by a temperature sensor. This will ensure that the equipment is protected from extreme weather conditions and operates at optimal performance.

The Nano grid will consist of approximately 14 poles, which will be installed to distribute electricity to the various facilities. Each pole will have an electricity line drawn from the Nano grid, with 14 panels installed on top of each pole. Additionally, each pole will have a 10 watt security light installed on top, providing additional safety and security for the surrounding area.

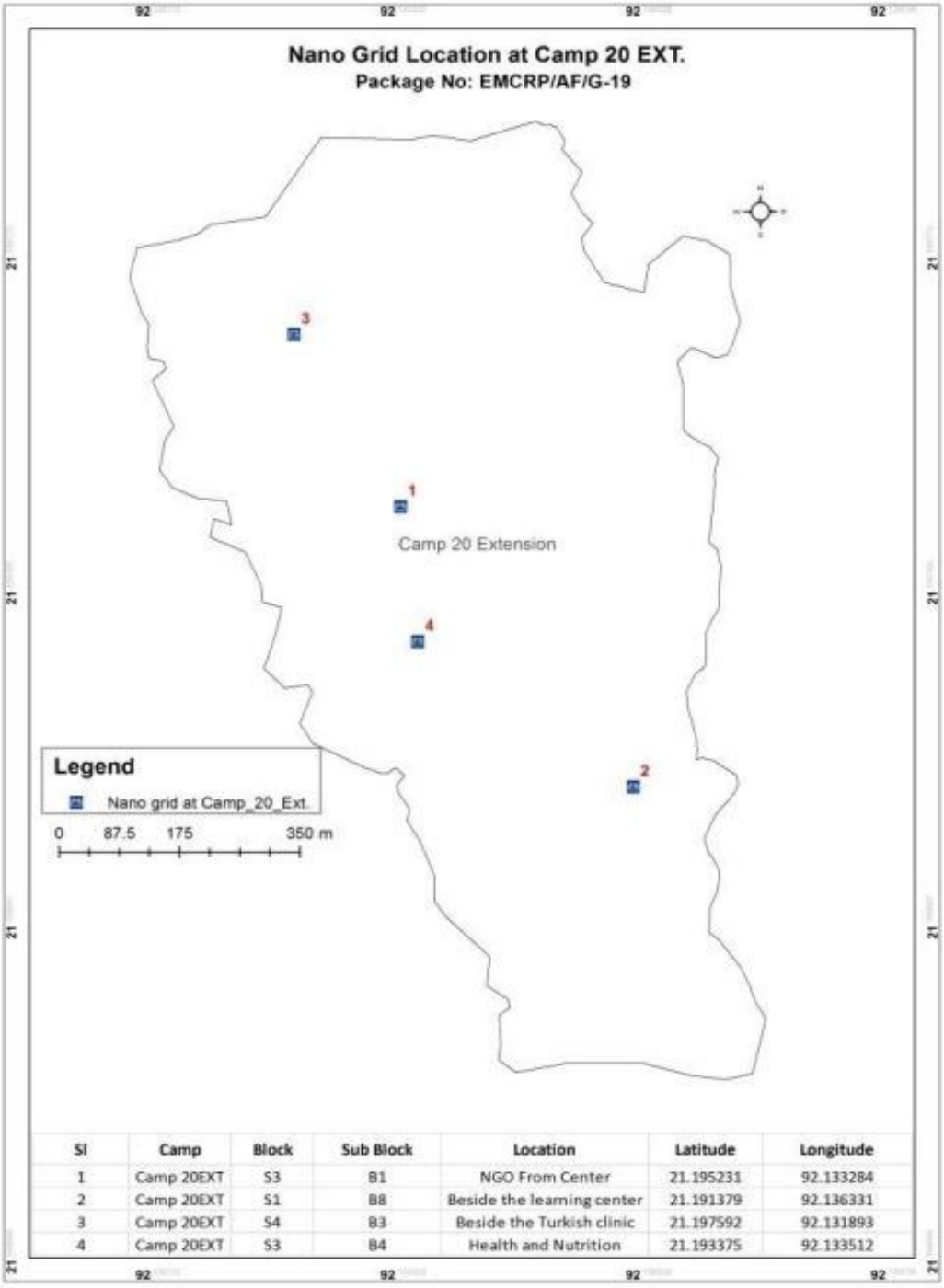
The proposed facilities also include the installation of 65 energy-efficient fans and lights in various service centers, each with a capacity of 35 watts and 10 watts respectively. These fans will help to keep the facilities cool during hot temperatures, ensuring a comfortable working environment for the facilitators.

Two fire extinguishers will also be installed in the Nano grid room, ensuring the safety of the equipment and personnel operating in the area.

Sub-project Location:

4 nos. of Nano grids will be installed in Camp 20 Ext. The location details are given below.

Sl	Camp	Location	Block	Sub Block	Upazila	Union	Latitude	Longitude
1	Camp 20EXT	NGO From Center	S3	B1	Ukhiya	Palongkhali	21.195231	92.133284
2	Camp 20EXT	Beside the learning center	S1	B8	Ukhiya	Palongkhali	21.191379	92.136331
3	Camp 20EXT	Beside the Turkish clinic	S4	B3	Ukhiya	Palongkhali	21.197592	92.131893
4	Camp 20EXT	Health and Nutrition	S3	B4	Ukhiya	Palongkhali	21.193375	92.133512



Sl	Camp	Block	Sub Block	Location	Latitude	Longitude
1	Camp 20EXT	S3	B1	NGO From Center	21.195231	92.133284
2	Camp 20EXT	S1	B8	Beside the learning center	21.191379	92.136331
3	Camp 20EXT	S4	B3	Beside the Turkish clinic	21.197592	92.131893
4	Camp 20EXT	S3	B4	Health and Nutrition	21.193375	92.133512

Proposed Nano grid location of Camp 20 Ext.

Land ownership
Govt. Land

Expected construction period: 6 months

Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive environmental areas such as elephant corridors, water

bodies, etc. and historical or socio-cultural assets): Please also explain any analysis on alternative location was conducted:

4 nos. of Nano grids will be installed in Camp 20 Ext.
In Block S3, Sub-block B1, inside the NGO Forum Center, there are no sensitive features to the east or west. However, there is a religious facility just 10 meters to the north.

In Block S1, Sub-block B8, adjacent to the learning center, there are no sensitive features to the east or west. However, the CiC office is located 100 meters to the north.

In Block S4, Sub-block B3, beside the Turkish clinic, there is a religious facility 97 meters to the east.

In Block S3, Sub-block B4, where the Health and Nutrition facility is positioned, there are no sensitive features to the east or west, but there's a learning center 97 meters to the south.

Within the influence area of the proposed location no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (confirmed by the participants in the consultation meeting).

Section B: Environmental Screening

***B.1*: Environmental feature of sub-project location**

Description of cultural properties (if applicable, including distance from site): Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests:

4 nos. of Nano grids will be installed in Camp 20 Ext.
In Block S3, Sub-block B1, inside the NGO Forum Center, there are no sensitive features to the east or west. However, there is a religious facility just 10 meters to the north.

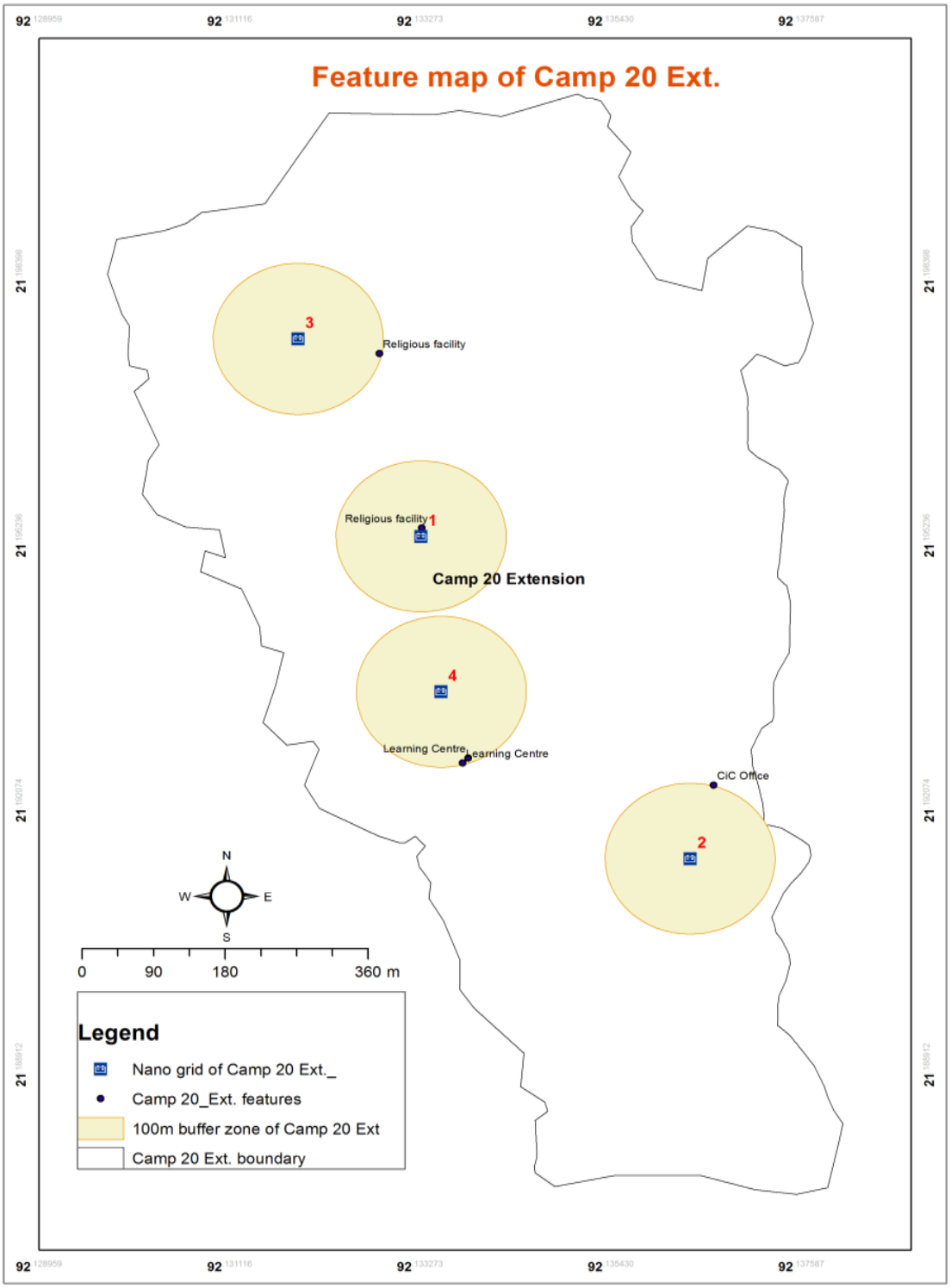
In Block S1, Sub-block B8, adjacent to the learning center, there are no sensitive features to the east or west. However, the CiC office is located 100 meters to the north.

In Block S4, Sub-block B3, beside the Turkish clinic, there is a religious facility 97 meters to the east.

In Block S3, Sub-block B4, where the Health and Nutrition facility is positioned, there are no sensitive features to the east or west, but there's a learning center 97 meters to the south.

There are no other sensitive environmental, cultural, archaeological sites within the catchment area of this sub-project.

A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas are shown below.



Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive features found in the footprint area. Several learning center, child protection center, rohingya settlements and religious facilities were found during the survey. It will not be affected by the construction works, as the activities will be carried out within the existing proposed area boundary and necessary preventive and mitigation measures

will be followed during the entire construction period.

(1) Within/near Elephant Migration Routes Yes/No*

No. These have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

(2) potential impacts on remaining forests in/around camps Yes/No

N/A (This activity will be confined within the proposed location)

(3) Other issues: N/A

*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:

Dust:

Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, trailer, mini truck, etc. move on roads adjacent to proposed location throughout the day generating noise but within tolerable limit in most cases.

Baseline soil quality:

The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.

Landslide potential (high/medium/low, with explanation):

The nominated location is found to be on fairly plane land. There is no condition found around the selected site which might give reasons for landslides.

Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH):

Groundwater is the main source of potable water in the Sub-project area. The shallow depth is about 100 feet to 120 feet and deep tube well depth is 700 to 850 feet. In the sub-project area, deep groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains medium concentration of iron. Deep groundwater table (drinkable) varies from 600-800ft (Field survey, 2021). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer.

Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to 681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)

Status of wildlife movement:

N/A (None of the information was found about the wildlife movement in or across the area)

State of forestation:

Patches of vegetation containing small trees found in target location and in surrounding area of the proposed location which are within 200m radial distance.

Summary of water balance analysis (For water supply scheme only):

N/A

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g., status of access road or any other facility required for sub-project to be viable): There is a road called the Camp 20 Ext. connecting road that will be used for transportation and delivering materials to the 4 Nano grids in Camp 20 Ext. It provides access for vehicles and ensures a route for transporting goods and supplies.
Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction: Due to the small scale of construction, hence there is no need for labor shed. As a result, there is no necessity for a tube well in the proposed locations. Instead, during the construction phase, the contractor will arrange for a mobile water supply system to ensure a sufficient water source for the construction work. Additionally, the contractor will be responsible for providing temporary sanitation facilities. A portable or temporary sanitary system will be set up to cater to the basic hygiene needs of the workers during the construction period in the vicinity of the construction area for all the components of the project. Electricity is not available in the area. Generator or Solar lamp will need installation.
Possible location of labor camps: Due to the small scale of construction, hence there is no need for labor shed.
Requirement and type of raw materials (e.g., sand, stone, wood, etc.): i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials
Identification of access road for transportation (Yes/No): Yes. There is a road called the Camp 20 Ext. connecting road that will be used for transportation and delivering materials to the 4 Nano grids in Camp 20 Ext. It provides access for vehicles and ensures a route for transporting goods and supplies.
Location identification for raw material storage: The materials, including the poles, for the Nano grids will be stored either on the side of the road or in designated vacant spaces near each Nano grid. The site management or the Camp-in-Charge (CIC) will grant permission to store the required materials for the Nano grid within the camp premises. To ensure security during nighttime, there may be provisions for having night guards in place
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.): There is no pre-existing structure which will face demolition. Here, demolition waste will not have to be accounted for. Few leftovers from soil clearing, plastics or residual clearing and site clearing may be generated.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g., Solids wastes, liquid wastes, etc.): **Solid waste:** Iron, concrete, metal, drywall, wood, plastic, rubber, copper wires, excavated soils etc.

Quantity: It is difficult to give exact figures of construction waste produced on a typical construction site. However, in order to approximate the quantity, it is estimated that nearly 2 kg of waste would be generated each working day, which are mainly RCC foundation construction and poles installation wastes. Some plastic, paper and organic waste will be generated from the use of workers, though a very negligible amount- half a kilogram a day maximum.

Liquid waste: Paint chemicals as paint thinners which contain Volatile Organic Compounds (VOCs) will come out as leftovers. Due to the small scale of construction, hence there is no need for labor shed. So, fecal sludge will not be generated from the labor camp during the construction period. Leftover oils or spills from machinery can be a high probability generating liquid waste.

Type and quantity of raw materials used (wood, bricks, cement, water, etc.):

Type: i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction.

Quantity: It is difficult to give exact figures of construction waste produced on a typical construction site.

Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards:

Around 100 sq. feet area is needed for this project.

No vegetation is present in the targeted footprint area. Specific soil amount is not needed for the sub-project component. The current condition explains that there is no aggregated soil on the right of way. On the other hand, vegetation was found around the proposed area. The vegetation will not be affected by construction work since scope of works is confined within planned area.

Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation)

Low. No borrow pit or quarries will be required to dig out during the construction period in or around/ adjacent to the proposed area.

Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description).

No pre-existing water body or drainage is present

Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description)

Low. The site is free from any aquatic ecosystems or habitats of endangered species. There are some terrestrial flora species around the project site, which will slightly be affected by the works. Life cycle or movement of some terrestrial living species (fauna) (i.e. Insects - ant, bees, earthworm, reptiles, birds etc.) might be disturbed for the time being, but with very less impact indeed. So, overall potential effect is very low or absent for this specific sub project.

Activities that can lead to landslides, slumps, slips and other mass movements in road cuts:

The soil in the proposed site is largely flat, so there is almost no chance to trigger the landslide or any type of mass movement of soil for the said construction works.

Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description)

N/A
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: N/A
Chance of long-term or semi-permanent destruction of soils: (High/Medium/Low with description) There is no chance of activities during the operation period, which can lead to any long-term or semi-permanent destruction of soils.
Possibility of odor and water, soil quality impacts from SWM and FSM disposal system: (High/Medium/Low with description) N/A
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) There is no possibility for creating borrow-pits, quarries, etc. during the operation phase.
Likely direct and indirect impacts on economic development in the project areas by the sub-project: During the operation phase of the sub-project, there are likely to be both direct and indirect impacts on economic development in the project areas. Direct impacts refer to the immediate effects that result directly from the sub-project activities. For example, the establishment and operation of the Nano grid can create employment opportunities for the adjacent workforce. This can include job opportunities in the construction phase as well as maintenance and operation of the infrastructure. Indirect impacts, on the other hand, are the ripple effects that arise from the sub-project activities. Access to electricity provided by the Nano grid can enhance the quality and efficiency of various services such as healthcare, education, and communication. Healthcare facilities can operate more effectively with reliable power supply, ensuring better medical services for the community. Educational institutions can improve their teaching and learning environments through the availability of electricity, enabling students to access modern technology and educational resources.
Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No existing drainage channels or surface water bodies found in the project area; therefore, no such effect can be anticipated
Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. There are no protected areas in or around project sites, and no known areas of ecological interest which can be affected by the daily activity of this facility.

Activities leading to landslides, slumps, slips and other mass movements in road cuts: N/A
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation) N/A
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: N/A

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

Environmental Screening Form for Solar PV Nano Grid (Camp KRC)

Name of Sub-Project: Supply and Installation of Solar PV Nano grid (Camp KRC: One Nano Grid will be installed in Camp KRC)

Sl	Camp	Location	Block	Upazila	Union
1	Kutupalong RC	Near by Shed-64-room -1	F	Ukhiya	Rajapalong

Implementing Agency/Agencies: Local Government Engineering Department (LGED)

Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):
The proposed sub-project activities for the Nano grid include various components and equipment that are essential for its functioning. The control room is a steel container with dimensions of 10ft**8ft**8.5ft and a thickness of 2.3mm. It includes the construction of reinforced concrete footing, thermal insulation, and a ventilation fan operated by a temperature sensor. One control room with a capacity of 8KW will be installed.

The sub-project will require 18 solar PV modules, each with a capacity of 450 Wp (watt peak). These modules are of the mono crystalline type and consist of 72 cells or more, conforming to international standards and codes. The total capacity of the solar PV modules will be 8KW.

A total of 24 vented lead acid batteries will be used, each having a capacity of 2V and 900Ah (ampere-hour) or higher. These batteries are specifically designed for solar applications and comply with international standards and codes.

14 overhead distribution line poles will be erected, either with a height of 7.6 meters (SPC) or 6.0 meters (steel). The installation includes the use of reinforced concrete base, number plate, earthing, and all necessary fittings and accessories.

A total of 65 LED lights with a capacity of 10 watts will be installed for public facilities. These energy efficient lights will provide illumination while consuming minimal power.

Fifteen security lights with a capacity of 10 watts, equipped with outdoor installation fixtures, day light, and motion sensors, will be installed to ensure safety and security in the area.

Sixty-five energy-saving BLDC (Brushless Direct Current) ceiling fans with a capacity of 35 watts and a size of 56 inches will be installed in public facilities. These fans come with a 5-step capacitive compatible wall regulator and all necessary accessories for installation.

Twenty sets of switch, socket, and fuse board will be installed for the internal wiring of lights and fans in public facilities. This includes switches, sockets, PVC switch boxes, PVC insulated cables, and all other necessary fittings and accessories.

Estimated footprint / land area is 100 sq. feet for each Nano grid

Brief description of sub-project site: (e.g., present land use, Important Environmental Features (IEFs) near site, etc.:

There is a Nano grid in Camp Kutupalong RC, Block F, nearby shed 64 block-1. The site is an open space with a barren surface, and the only feature present is a concrete drain located on one side of the location. Installing the Nano grid will not interfere with any existing facilities or objects in the area.

Overall Comments

The proposed Solar PV Nano grid will have minimal environmental impact and are not located in environmentally sensitive areas. The project activities will not pose a significant threat to the natural surroundings and will not cause drainage congestion or water logging issues. Moreover, there will be no utilization of productive agricultural soil for the project, ensuring the preservation of fertile land. The construction materials and equipment required for the Nano grid will be limited to the project boundary, minimizing any potential impact on the surrounding environment. The project follows environmentally responsible practices and aims to reduce any negative effects on the ecosystem.

The rohingya community has shown a positive attitude towards the project and expressed their enthusiasm to actively participate in its activities. The project is considered environmentally sustainable and socially acceptable by the adjacent community and representatives from various facilities. The participatory public consultation meeting provided an opportunity for community members to voice their opinions, and no objections were raised regarding the construction of the Nano grid at the proposed site. On the contrary, the community expressed appreciation for the infrastructure as it will enhance safety and security for the community.

During the consultation, the community highlighted the benefits that the Solar PV Nano grid will bring, particularly in terms of socio-security for female communities. The project is seen as a means to improve the quality of life, reduce vulnerability to social aggression and mistreatment, and enhance access to education and healthcare services. In addition, the establishment of the Solar PV Nano grid is expected to contribute to the overall development and well-being of the adjacent community. It will provide reliable electricity to various facilities such as learning centers, health posts, and food distribution centers, creating a conducive environment for education, healthcare, and community activities. The Solar PV Nano grids will not only provide electricity but also empower the community, ensuring a brighter and more secure future for all.

Types of waste to be generated during construction and operation phase:

The construction of the Nano grid involves installing a control room made of a steel container, which will be placed on RCC foundations. This process may require minimal ground preparation and the installation of RCC foundations. Additionally, during the construction phase, 14 poles will be installed near the project site.

During the installation of the poles and RCC foundations, there is a possibility of generating waste materials. These may include soil and debris that are excavated while digging holes for pole installation. The waste generated from the pole installation and RCC foundation is relatively small and mainly consists of construction debris. This debris can include materials like concrete, cement,

bricks, and other building materials that are used during the installation process. If wooden or bamboo components or supports are used during the pole installation, there may be waste generated from cutting or shaping the wood or bamboo to fit the desired specifications.

Due to the small scale of construction, there will be no need for a labor shed, resulting in a reduced likelihood of generating organic waste, faecal waste, and kitchen waste during this phase.

The container structure will be transported to the site using a truck and then installed on the pillars with the assistance of a crane. As a result, the construction process is expected to have minimal waste generation. However, it is important to ensure proper waste management practices are in place to handle any potential waste materials that may arise during transportation and installation.

Sensitive environmental, cultural, archaeological, religious sites near (within 100m) of site including elephant migration routes and remaining forests:

One Nano grid will be installed in Camp KRC. Within the influence area of the subproject no historical sites were identified. The proposed location for the Nano grid has been considered for their proximity to sensitive environmental, cultural, archaeological, religious sites, as well as elephant migration routes and remaining forests within a 100-meter radius. Several sensitive features have been identified near the Nano grid locations, as described below:

There is a Nano grid in Camp Kutupalong RC, Block F, near Shed-64-room -1. The surrounding area has some sensitive sites within 100 meters. To the east and west, no features were found. To the north, there is a religious facility located 68 meters away, a learning center at 94 meters, and a child protection facility at 95 meters. To the south, there are a learning center at 58 meters, another learning center at 61 meters, a religious facility at 83 meters, and another religious facility at 92 meters.

Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists. Mostly Rohingya settlements are found around the proposed area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project area, no elephant migration routes exist (ref. IUCN). No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below

Section A: Sub-Project Overview

Description of sub-project/component interventions:

The 8KW capacity Nano grid control room, which is 10ft*8ft*8.5ft in size and has a thickness of 2.3mm, will serve as the central hub for the distribution of electricity to these facilities. The control room will be made of a steel container that includes the construction of RCC footing, thermal insulation, and ventilation operated by a temperature sensor. This will ensure that the equipment is protected from extreme weather conditions and operates at optimal performance.

The Nano grid will consist of approximately 14 poles, which will be installed to distribute electricity to the various facilities. Each pole will have an electricity line drawn from the Nano grid, with 14 panels installed on top of each pole. Additionally, each pole will have a 10 watt security light installed on top, providing additional safety and security for the surrounding area.

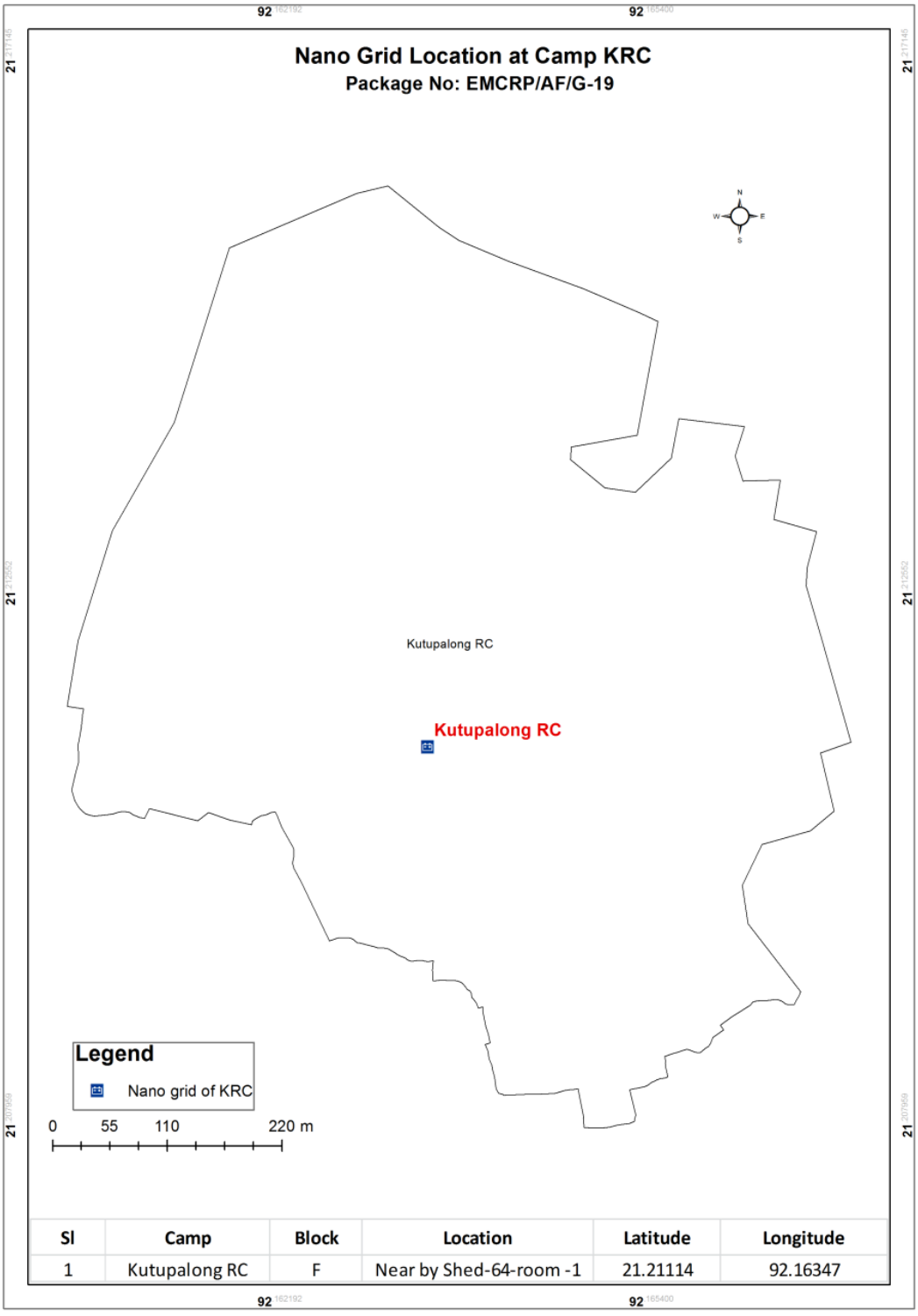
The proposed facilities also include the installation of 65 energy-efficient fans and lights in various service centers, each with a capacity of 35 watts and 10 watts respectively. These fans will help to keep the facilities cool during hot temperatures, ensuring a comfortable working environment for the facilitators.

Two fire extinguishers will also be installed in the Nano grid room, ensuring the safety of the equipment and personnel operating in the area.

Sub-project Location:

One Nano grid will be installed in Camp KRC. The location details are given below.

Sl	Camp	Location	Block	Upazila	Union	Latitude	Longitude
1	Kutupalong RC	Nearby Shed-64-room -1	F	Ukhiya	Rajapalong	21.21114	92.16347



Sl	Camp	Block	Location	Latitude	Longitude
1	Kutupalong RC	F	Near by Shed-64-room -1	21.21114	92.16347

Proposed Nano grid location of Camp KRC

Land ownership
Govt. Land

Expected construction period: 6 months

Description of project intervention area and project influence area with schematic diagram (where

relevant, indicate distance to sensitive environmental areas such as elephant corridors, water bodies, etc. and historical or socio-cultural assets): Please also explain any analysis on alternative location was conducted:

There is a Nano grid in Camp Kutupalong RC, Block F, near Shed-64-room -1. The surrounding area has some sensitive sites within 100 meters. To the east and west, no features were found. To the north, there is a religious facility located 68 meters away, a learning center at 94 meters, and a child protection facility at 95 meters. To the south, there are a learning center at 58 meters, another learning center at 61 meters, a religious facility at 83 meters, and another religious facility at 92 meters.

Within the influence area of the proposed location no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (confirmed by the participants in the consultation meeting).

Section B: Environmental Screening

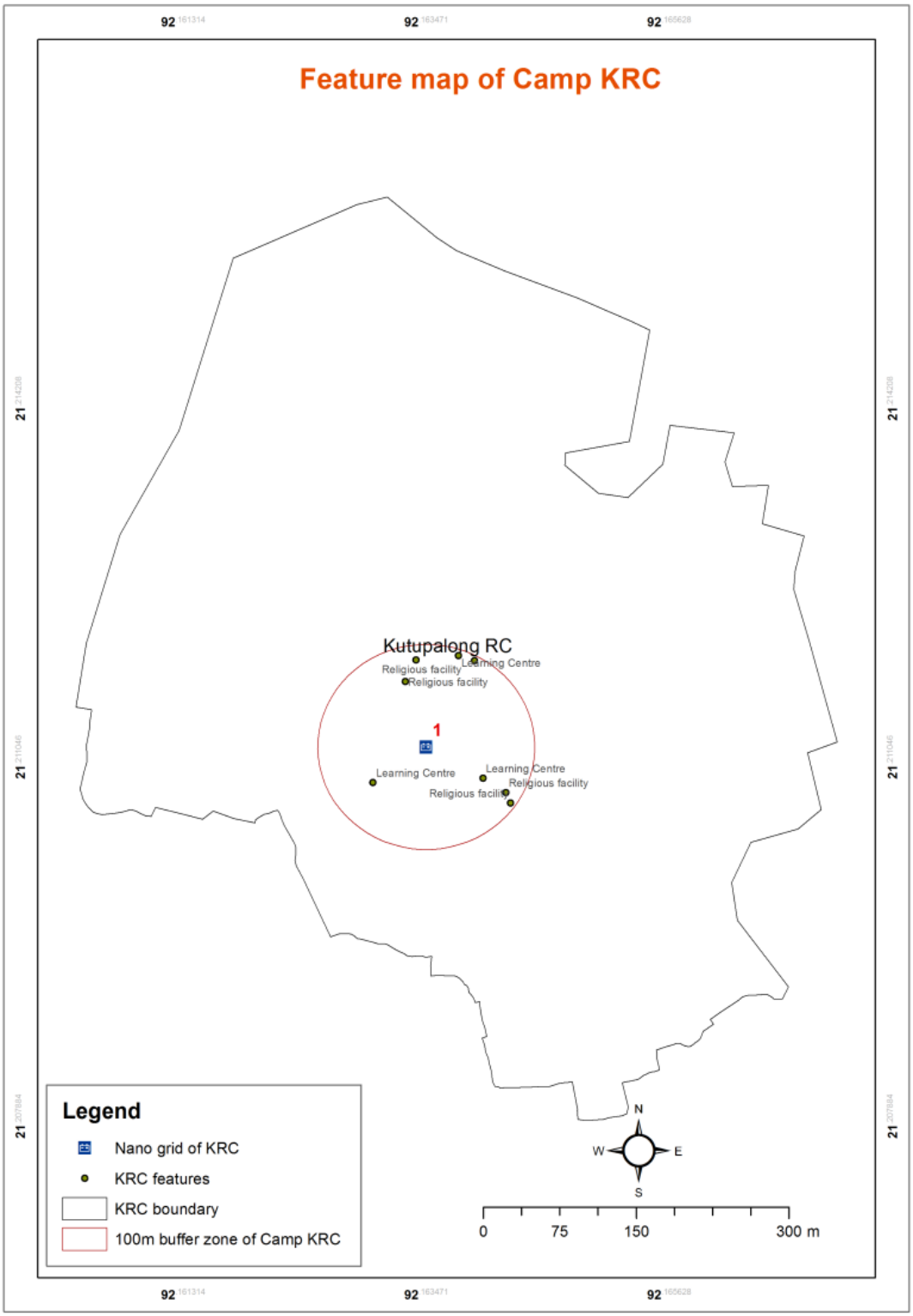
***B.1*: Environmental feature of sub-project location**

Description of cultural properties (if applicable, including distance from site): Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests:

There is a Nano grid in Camp Kutupalong RC, Block F, near Shed-64-room -1. The surrounding area has some sensitive sites within 100 meters. To the east and west, no features were found. To the north, there is a religious facility located 68 meters away, a learning center at 94 meters, and a child protection facility at 95 meters. To the south, there are a learning center at 58 meters, another learning center at 61 meters, a religious facility at 83 meters, and another religious facility at 92 meters.

There are no other sensitive environmental, cultural, archaeological sites within the catchment area of this sub-project.

A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas are shown below.



Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive features found in the footprint area. Several learning center, rohingya settlements and religious facilities were found during the survey. It will not be affected by the construction works, as the activities will be carried out within the existing

proposed area boundary and necessary preventive and mitigation measures will be followed during the entire construction period.

(1) Within/near Elephant Migration Routes Yes/No*

No. These have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

(2) potential impacts on remaining forests in/around camps Yes/No

N/A (This activity will be confined within the proposed location)

(3) Other issues: N/A

*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:

Dust:

Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, trailer, mini truck, etc. move on roads adjacent to proposed location throughout the day generating noise but within tolerable limit in most cases.

Baseline soil quality:

The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.

Landslide potential (high/medium/low, with explanation):

The nominated location is found to be on fairly plane land. There is no condition found around the selected site which might give reasons for landslides.

Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH):

Groundwater is the main source of potable water in the Sub-project area. The shallow depth is about 100 feet to 120 feet and deep tube well depth is 700 to 850 feet. In the sub-project area, deep groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains medium concentration of iron. Deep groundwater table (drinkable) varies from 600-800ft (Field survey, 2021). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer.

Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to 681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)

Status of wildlife movement:

N/A (None of the information was found about the wildlife movement in or across the area)

State of forestation:

Patches of vegetation containing small trees found in target location and in surrounding area of the

proposed location which are within 200m radial distance.
Summary of water balance analysis (For water supply scheme only): **N/A**

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g., status of access road or any other facility required for sub-project to be viable): There is a road called the camp connecting road that will be used for transportation and delivering materials to the Nano grid in Camp KRC. It provides access for vehicles and ensures a route for transporting goods and supplies.
Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction: Due to the small scale of construction, hence there is no need for labor shed. As a result, there is no necessity for a tube well in the proposed locations. Instead, during the construction phase, the contractor will arrange for a mobile water supply system to ensure a sufficient water source for the construction work. Additionally, the contractor will be responsible for providing temporary sanitation facilities. A portable or temporary sanitary system will be set up to cater to the basic hygiene needs of the workers during the construction period in the vicinity of the construction area for all the components of the project. Electricity is not available in the area. Generator or Solar lamp will need installation.
Possible location of labor camps: Due to the small scale of construction, hence there is no need for labor shed.
Requirement and type of raw materials (e.g., sand, stone, wood, etc.): i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials
Identification of access road for transportation (Yes/No): There is a road called the camp connecting road that will be used for transportation and delivering materials to the Nano grid in Camp KRC. It provides access for vehicles and ensures a route for transporting goods and supplies.
Location identification for raw material storage: The materials, including the poles, for the Nano grids will be stored either on the side of the road or in designated vacant spaces near each Nano grid. The site management or the Camp-in-Charge (CIC) will grant permission to store the required materials for the Nano grid within the camp premises. To ensure security during nighttime, there may be provisions for having night guards in place
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.): There is no pre-existing structure which will face demolition. Here, demolition waste will not have to be accounted for. Few leftovers from soil clearing, plastics or residual clearing and site clearing may be generated.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g., Solids wastes, liquid wastes, etc.): **Solid waste:** Iron, concrete, metal, drywall, wood, plastic, rubber, copper wires, excavated soils etc. **Quantity:** It is difficult to give exact figures of construction waste produced on a typical construction site. However, in order to approximate the quantity, it is estimated that nearly 2 kg of waste would be generated each working day, which are mainly RCC foundation construction and poles installation wastes. Some plastic, paper and organic waste will be generated from the use of workers, though a very negligible amount- half a kilogram a day maximum. **Liquid waste**: Paint chemicals as paint thinners which contain Volatile Organic Compounds (VOCs) will come out as leftovers. Due to the small scale of construction, hence there is no need for labor shed. So, fecal sludge will not be generated from the labor camp during the construction period. Leftover oils or spills from machinery can be a high probability generating liquid waste.
Type and quantity of raw materials used (wood, bricks, cement, water, etc.): **Type:** i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction. **Quantity**: It is difficult to give exact figures of construction waste produced on a typical construction site.
Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards: Around 100 sq. feet area is needed for this project. No vegetation is present in the targeted footprint area. Specific soil amount is not needed for the sub-project component. The current condition explains that there is no aggregated soil on the right of way. On the other hand, vegetation was found around the proposed area. The vegetation will not be affected by construction work since scope of works is confined within planned area.
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) Low. No borrow pit or quarries will be required to dig out during the construction period in or around/ adjacent to the proposed area.
Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description). No pre-existing water body or drainage is present
Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) **Low.** The site is free from any aquatic ecosystems or habitats of endangered species. There are some terrestrial flora species around the project site, which will slightly be affected by the works. Life cycle or movement of some terrestrial living species (fauna) (i.e. Insects - ant, bees, earthworm, reptiles, birds etc.) might be disturbed for the time being, but with very less impact indeed. So, overall potential effect is very low or absent for this specific sub project.

Activities that can lead to landslides, slumps, slips and other mass movements in road cuts: The soil in the proposed site is largely flat, so there is almost no chance to trigger the landslide or any type of mass movement of soil for the said construction works.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description) N/A
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: N/A
Chance of long-term or semi-permanent destruction of soils: (High/Medium/Low with description) There is no chance of activities during the operation period, which can lead to any long-term or semi-permanent destruction of soils.
Possibility of odor and water, soil quality impacts from SWM and FSM disposal system: (High/Medium/Low with description) N/A
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) There is no possibility for creating borrow-pits, quarries, etc. during the operation phase.
Likely direct and indirect impacts on economic development in the project areas by the sub-project: During the operation phase of the sub-project, there are likely to be both direct and indirect impacts on economic development in the project areas. Direct impacts refer to the immediate effects that result directly from the sub-project activities. For example, the establishment and operation of the Nano grid can create employment opportunities for the adjacent workforce. This can include job opportunities in the construction phase as well as maintenance and operation of the infrastructure. Indirect impacts, on the other hand, are the ripple effects that arise from the sub-project activities. Access to electricity provided by the Nano grid can enhance the quality and efficiency of various services such as healthcare, education, and communication. Healthcare facilities can operate more effectively with reliable power supply, ensuring better medical services for the community. Educational institutions can improve their teaching and learning environments through the availability of electricity, enabling students to access modern technology and educational resources.
Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No existing drainage channels or surface water bodies found in the project area; therefore, no such

effect can be anticipated
Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. There are no protected areas in or around project sites, and no known areas of ecological interest which can be affected by the daily activity of this facility.
Activities leading to landslides, slumps, slips and other mass movements in road cuts: N/A
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation) N/A
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: N/A

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

Environmental Screening Form for Solar PV Nano Grid (Camp 14)

Name of Sub-Project: Supply and Installation of Solar PV Nano grid (Camp 14: 4 nos. of Nano Grid will be installed in Camp 14)

Sl	Camp	Location	Block	Sub Block	Upazila	Union
1	Camp 14	beside WFP DP	A	A 01	Ukhiya	Palongkhali
2	Camp 14	Beside SD Warehouse	C	C01	Ukhiya	Palongkhali
3	Camp 14	Near A Block FIC Hub	A	A05	Ukhiya	Palongkhali
4	Camp 14	Inside of CIC Office & Beside Water Tank	Hakimpara CIC Office		Ukhiya	Palongkhali

Implementing Agency/Agencies: Local Government Engineering Department (LGED)

Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):
The proposed sub-project activities for the Nano grid include various components and equipment that are essential for its functioning. The control room is a steel container with dimensions of 10ft**8ft**8.5ft and a thickness of 2.3mm. It includes the construction of reinforced concrete footing, thermal insulation, and a ventilation fan operated by a temperature sensor. One control room with a capacity of 8KW will be installed.

The sub-project will require 18 solar PV modules, each with a capacity of 450 Wp (watt peak). These modules are of the mono crystalline type and consist of 72 cells or more, conforming to international standards and codes. The total capacity of the solar PV modules will be 8KW.

A total of 24 vented lead acid batteries will be used, each having a capacity of 2V and 900Ah (ampere-hour) or higher. These batteries are specifically designed for solar applications and comply with international standards and codes.

14 overhead distribution line poles will be erected, either with a height of 7.6 meters (SPC) or 6.0 meters (steel). The installation includes the use of reinforced concrete base, number plate, earthing, and all necessary fittings and accessories.

A total of 65 LED lights with a capacity of 10 watts will be installed for public facilities. These energy efficient lights will provide illumination while consuming minimal power.

Fifteen security lights with a capacity of 10 watts, equipped with outdoor installation fixtures, day light, and motion sensors, will be installed to ensure safety and security in the area.

Sixty-five energy-saving BLDC (Brushless Direct Current) ceiling fans with a capacity of 35 watts and a size of 56 inches will be installed in public facilities. These fans come with a 5-step capacitive compatible wall regulator and all necessary accessories for installation.

Twenty sets of switch, socket, and fuse board will be installed for the internal wiring of lights and fans in public facilities. This includes switches, sockets, PVC switch boxes, PVC insulated cables, and all other necessary fittings and accessories.

Estimated footprint / land area is 100 sq. feet for each Nano grid

Brief description of sub-project site: (e.g., present land use, Important Environmental Features (IEFs) near site, etc.:

There are 4 Nano grids planned for installation in Camp 14.

In Camp No.14, Block A, Sub-block A1, beside WFP DP, this site is situated on the north side of the camp 14 BFS road. It's an empty space surrounded by service provider offices. However, these offices won't interfere with the installation process. Large trees are present nearby, but they are at a safe distance from the installation site.

In Camp No.14, Block C, Sub-block C1, Beside SD Warehouse, located on lower ground from the camp road, this site is surrounded by a protection wall. It's an open space with no significant obstacles for installation. Nearby, there are other DRP settlements and facility provider facilities.

In Camp No.14, Block A, Sub-block A5, Near A Block FIC Hub, positioned northwest of the camp 14 connecting road, this open space has no existing structures. There are a few trees on the west side, but they won't pose any issues during installation. Access to the site is available via the camp 14 connecting road.

In Camp No.14, Block E, Sub-block E3, inside of CIC Office & beside Water Tank, this site is located on higher ground, secured by a protection wall perpendicular to the road. There are a few trees on the site. Some service provider facilities are present to the south.

Overall Comments

The proposed Solar PV Nano grids will have minimal environmental impact and are not located in environmentally sensitive areas. The project activities will not pose a significant threat to the natural surroundings and will not cause drainage congestion or water logging issues. Moreover, there will be no utilization of productive agricultural soil for the project, ensuring the preservation of fertile land. The construction materials and equipment required for the Nano grids will be limited to the project boundary, minimizing any potential impact on the surrounding environment. The project follows environmentally responsible practices and aims to reduce any negative effects on the ecosystem.

The rohingya community has shown a positive attitude towards the project and expressed their enthusiasm to actively participate in its activities. The project is considered environmentally sustainable and socially acceptable by the adjacent community and representatives from various facilities. The participatory public consultation meeting provided an opportunity for community members to voice their opinions, and no objections were raised regarding the construction of the Nano grids at the proposed site. On the contrary, the community expressed appreciation for the infrastructure as it will enhance safety and security for the community.

During the consultation, the community highlighted the benefits that the Solar PV Nano grids will bring, particularly in terms of socio-security for female communities. The project is seen as a means to improve the quality of life, reduce vulnerability to social aggression and mistreatment, and enhance access to education and healthcare services. In addition, the establishment of the Solar PV Nano grids is expected to contribute to the overall development and well-being of the adjacent community. It will provide reliable electricity to various facilities such as learning centers, health posts, and food distribution centers, creating a conducive environment for education, healthcare, and community activities. The Solar PV Nano grids will not only provide electricity but also empower the community, ensuring a brighter and more secure future for all.

Types of waste to be generated during construction and operation phase:
The construction of the Nano grid involves installing a control room made of a steel container, which will be placed on RCC foundations. This process may require minimal ground preparation and the installation of RCC foundations. Additionally, during the construction phase, 14 poles will be installed near the project site.

During the installation of the poles and RCC foundations, there is a possibility of generating waste materials. These may include soil and debris that are excavated while digging holes for pole installation. The waste generated from the pole installation and RCC foundation is relatively small and mainly consists of construction debris. This debris can include materials like concrete, cement, bricks, and other building materials that are used during the installation process. If wooden or bamboo components or supports are used during the pole installation, there may be waste generated from cutting or shaping the wood or bamboo to fit the desired specifications.

Due to the small scale of construction, there will be no need for a labor shed, resulting in a reduced likelihood of generating organic waste, faecal waste, and kitchen waste during this phase.

The container structure will be transported to the site using a truck and then installed on the pillars with the assistance of a crane. As a result, the construction process is expected to have minimal waste generation. However, it is important to ensure proper waste management practices are in place to handle any potential waste materials that may arise during transportation and installation.

Sensitive environmental, cultural, archaeological, religious sites near (within 100m) of site including elephant migration routes and remaining forests:
4 nos. of Nano grids will be installed in Camp 14. Within the influence area of the subproject no historical sites were identified. The proposed locations for the Nano grids have been considered for their proximity to sensitive environmental, cultural, archaeological, religious sites, as well as elephant migration routes and remaining forests within a 100-meter radius. Several sensitive features have been identified near the Nano grid locations, as described below:

In Camp 14, Block A, Sub block A01, beside WFP DP, there are no significant features to the east or north. To the west, there's a learning center located 87 meters away. To the south, there's a religious facility at 52 meters and another learning center at various distances: 59m, 60m, and 63m.

In Camp 14, Block C, Sub block C01, Beside SD Warehouse, there is no features to the east or west. To the north, there's a learning center situated 50 meters away. To the south, there's a learning center at 50 meters and another one at 78 meters.

In Camp 14, Block A, Sub block A05, Near A Block FIC Hub, to the east, there are multiple learning centers located at 14m, 21m, 30m, 80m, 88m, and 91m. To the west, there are learning centers situated at 82m and 91m. To the north, there's a religious facility at 18m, 28m, and 34m. To the south, there's a learning center at 2 meters, and a religious facility at 51m and 56m.

In Camp 14, Hakimpara CIC Office, Inside of CIC Office & Beside Water Tank, there are no significant features to the east or north. To the west, the CiC office is located 29m and 44m away. There are no features to the south.

Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists. Mostly Rohingya settlements are found around the proposed area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project area, no elephant migration routes exist (ref. IUCN). No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below

Section A: Sub-Project Overview

Description of sub-project/component interventions:

The 8KW capacity Nano grid control room, which is 10ft*8ft*8.5ft in size and has a thickness of 2.3mm, will serve as the central hub for the distribution of electricity to these facilities. The control room will be made of a steel container that includes the construction of RCC footing, thermal insulation, and ventilation operated by a temperature sensor. This will ensure that the equipment is protected from extreme weather conditions and operates at optimal performance.

The Nano grid will consist of approximately 14 poles, which will be installed to distribute electricity to the various facilities. Each pole will have an electricity line drawn from the Nano grid, with 14 panels installed on top of each pole. Additionally, each pole will have a 10 watt security light installed on top, providing additional safety and security for the surrounding area.

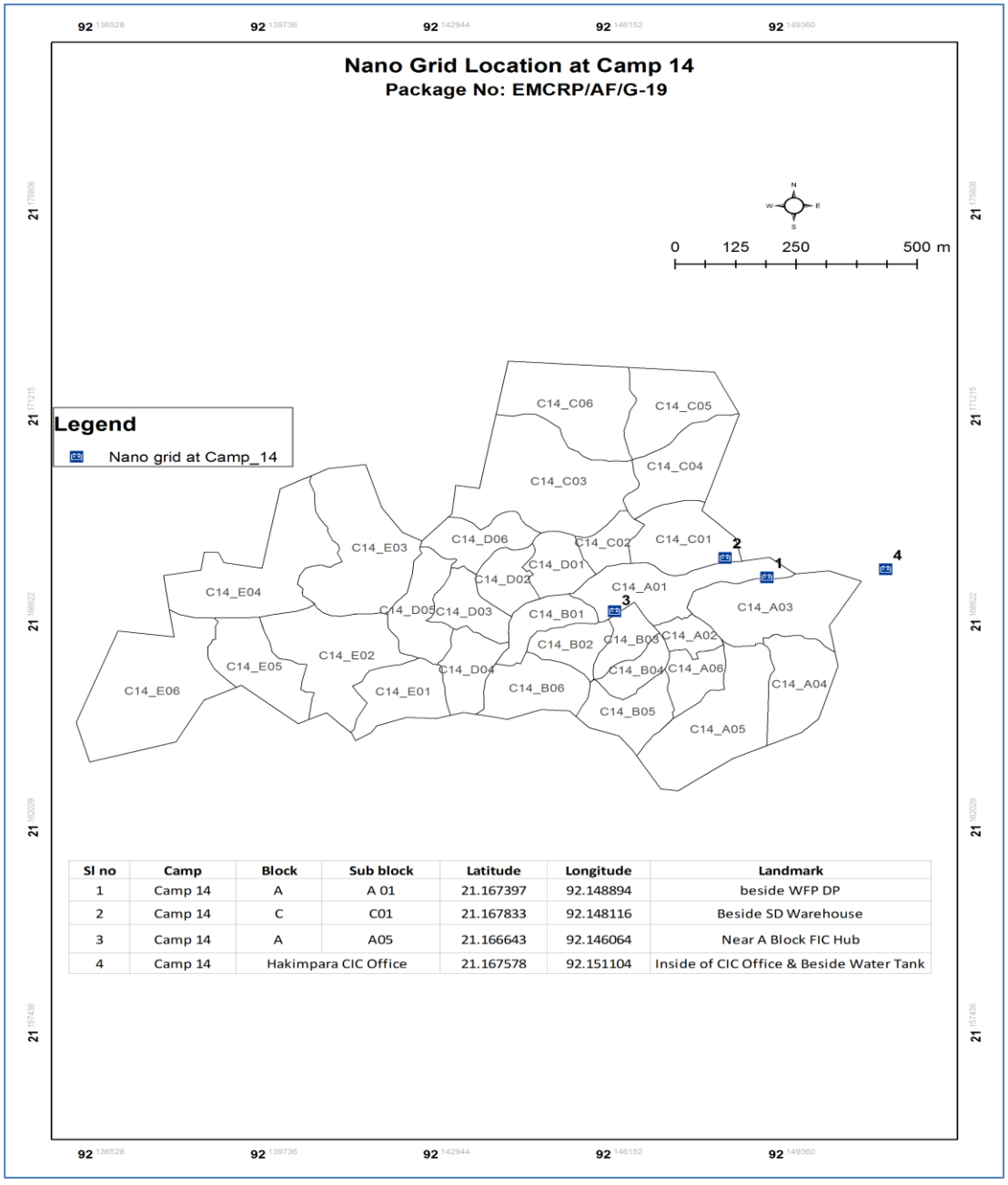
The proposed facilities also include the installation of 65 energy-efficient fans and lights in various service centers, each with a capacity of 35 watts and 10 watts respectively. These fans will help to keep the facilities cool during hot temperatures, ensuring a comfortable working environment for the facilitators.

Two fire extinguishers will also be installed in the Nano grid room, ensuring the safety of the equipment and personnel operating in the area.

Sub-project Location:

4 nos. of Nano grids will be installed in Camp 14. The location details are given below.

Sl	Camp	Location	Block	Sub Block	Upazila	Union	Latitude	Longitude
1	Camp 14	beside WFP DP	A	A 01	Ukhiya	Palongkhali	21.167397	92.148894
2	Camp 14	Beside SD Warehouse	C	C01	Ukhiya	Palongkhali	21.167833	92.148116
3	Camp 14	Near A Block FIC Hub	A	A05	Ukhiya	Palongkhali	21.166643	92.146064
4	Camp 14	Inside of CIC Office & Beside Water Tank	Hakimpara CIC Office		Ukhiya	Palongkhali	21.167578	92.151104



Proposed Nano Grid location At Camp 14

Land ownership

Govt. Land

Expected construction period: 6 months

Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive environmental areas such as elephant corridors, water bodies, etc. and historical or socio-cultural assets): Please also explain any analysis on alternative location was conducted:

In Camp No.14, a total of 4 Nano grids will be constructed out of the planned 35 Nano grids.

In Camp 14, Block A, Sub block A01, beside WFP DP, there are no significant features to the east or north. To the west, there's a learning center located 87 meters away. To the south, there's a religious facility at 52 meters and another learning center at various distances: 59m, 60m, and 63m.

In Camp 14, Block C, Sub block C01, Beside SD Warehouse, there is no features to the east or west. To the north, there's a learning center situated 50 meters away. To the south, there's a learning center at 50 meters and another one at 78 meters.

In Camp 14, Block A, Sub block A05, Near A Block FIC Hub, to the east, there are multiple learning centers located at 14m, 21m, 30m, 80m, 88m, and 91m. To the west, there are learning centers situated at 82m and 91m. To the north, there's a religious facility at 18m, 28m, and 34m. To the south, there's a learning center at 2 meters, and a religious facility at 51m and 56m.

In Camp 14, Hakimpara CIC Office, Inside of CIC Office & Beside Water Tank, there are no significant features to the east or north. To the west, the CiC office is located 29m and 44m away. There are no features to the south.

Within the influence area of the proposed location no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (confirmed by the participants in the consultation meeting).

Section B: Environmental Screening

***B.1*: Environmental feature of sub-project location**

Description of cultural properties (if applicable, including distance from site): Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests:

There are 4 nos. of Nano grid in camp 14.

In Camp 14, Block A, Sub block A01, beside WFP DP, there are no significant features to the east or north. To the west, there's a learning center located 87 meters away. To the south, there's a religious facility at 52 meters and another learning center at various distances: 59m, 60m, and 63m.

In Camp 14, Block C, Sub block C01, Beside SD Warehouse, there is no features to the east or west. To the north, there's a learning center situated 50 meters away. To the south, there's a learning center at 50 meters and another one at 78 meters.

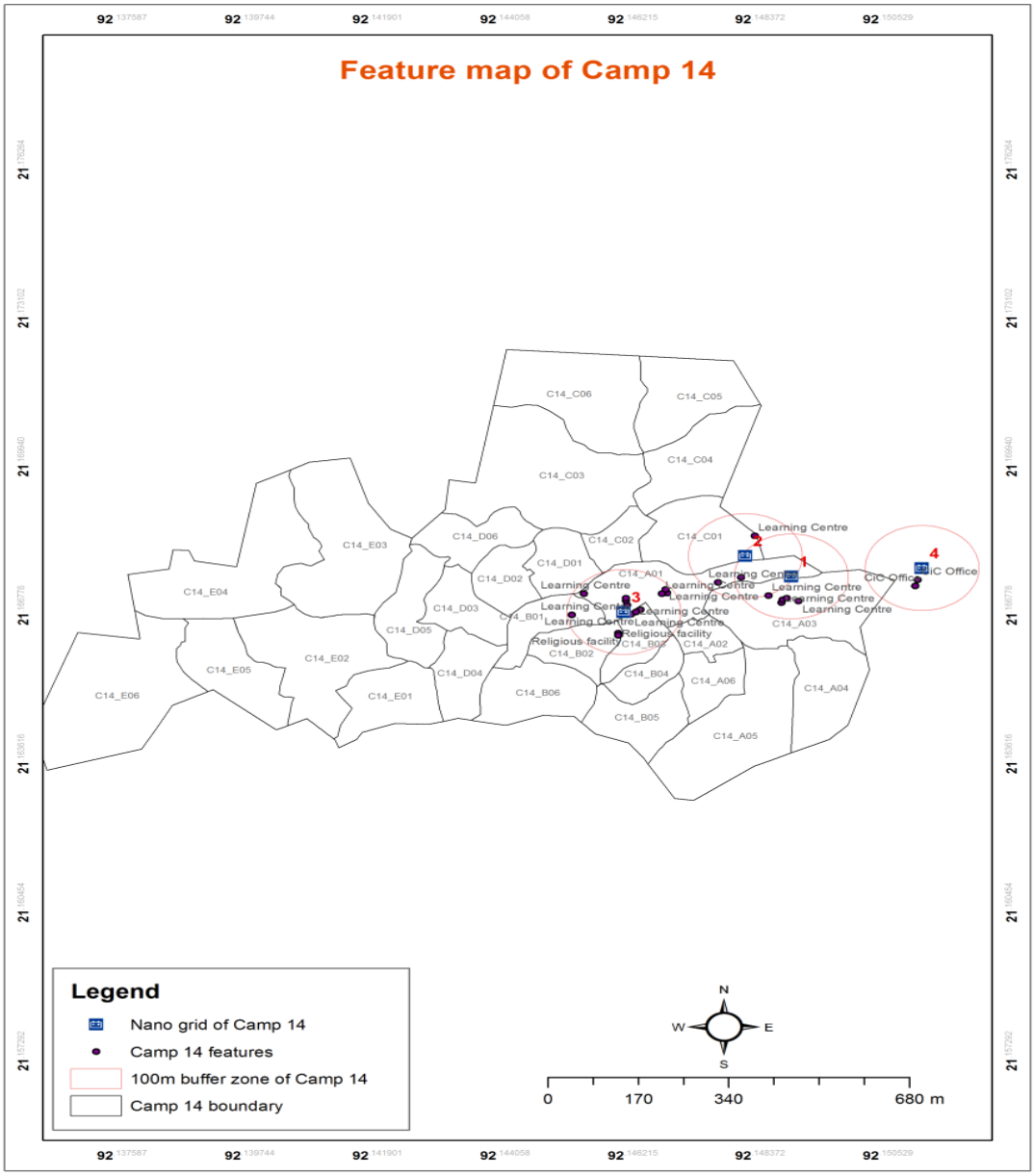
In Camp 14, Block A, Sub block A05, Near A Block FIC Hub, to the east, there are multiple learning

centers located at 14m, 21m, 30m, 80m, 88m, and 91m. To the west, there are learning centers situated at 82m and 91m. To the north, there's a religious facility at 18m, 28m, and 34m. To the south, there's a learning center at 2 meters, and a religious facility at 51m and 56m.

In Camp 14, Hakimpara CIC Office, Inside of CIC Office & Beside Water Tank, there are no significant features to the east or north. To the west, the CiC office is located 29m and 44m away. There are no features to the south.

There are no other sensitive environmental, cultural, archaeological sites within the catchment area of this sub-project.

A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas are shown below.



Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive features found in the footprint area. Several learning center, rohingya settlements and religious facilities were found during the survey. It will not be affected by the construction works, as the activities will be carried out within the existing proposed area boundary and necessary preventive and mitigation measures will be followed during the entire construction period.

(1) Within/near Elephant Migration Routes Yes/No*

No. These have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

(2) potential impacts on remaining forests in/around camps Yes/No

N/A (This activity will be confined within the proposed location)

(3) Other issues: N/A

*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:

Dust:

Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, trailer, mini truck, etc. move on roads adjacent to proposed location throughout the day generating noise but within tolerable limit in most cases.

Baseline soil quality:

The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.

Landslide potential (high/medium/low, with explanation):

The nominated location is found to be on fairly plane land. There is no condition found around the selected site which might give reasons for landslides.

Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH):

Groundwater is the main source of potable water in the Sub-project area. The shallow depth is about 100 feet to 120 feet and deep tube well depth is 700 to 850 feet. In the sub-project area, deep groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains medium concentration of iron. Deep groundwater table (drinkable) varies from 600-800ft (Field survey, 2021). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer.

Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to 681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)

Status of wildlife movement:

N/A (None of the information was found about the wildlife movement in or across the area)

State of forestation: Patches of vegetation containing small trees found in target location and in surrounding area of the proposed location which are within 200m radial distance.
Summary of water balance analysis (For water supply scheme only): **N/A**

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g., status of access road or any other facility required for sub-project to be viable): There is a road called the camp 14 connecting road that will be used for transportation and delivering materials to the 4 Nano grids in Camp 14. It provides access for vehicles and ensures a route for transporting goods and supplies.
Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction: Due to the small scale of construction, hence there is no need for labor shed. As a result, there is no necessity for a tube well in the proposed locations. Instead, during the construction phase, the contractor will arrange for a mobile water supply system to ensure a sufficient water source for the construction work. Additionally, the contractor will be responsible for providing temporary sanitation facilities. A portable or temporary sanitary system will be set up to cater to the basic hygiene needs of the workers during the construction period in the vicinity of the construction area for all the components of the project. Electricity is not available in the area. Generator or Solar lamp will need installation.
Possible location of labor camps: Due to the small scale of construction, hence there is no need for labor shed.
Requirement and type of raw materials (e.g., sand, stone, wood, etc.): i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials
Identification of access road for transportation (Yes/No): Yes. There is a road called the camp 14 connecting road that will be used for transportation and delivering materials to the 4 Nano grids in Camp 14. It provides access for vehicles and ensures a route for transporting goods and supplies.
Location identification for raw material storage: The materials, including the poles, for the Nano grids will be stored either on the side of the road or in designated vacant spaces near each Nano grid. The site management or the Camp-in-Charge (CIC) will grant permission to store the required materials for the Nano grid within the camp premises. To ensure security during nighttime, there may be provisions for having night guards in place
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.): There is no pre-existing structure which will face demolition. Here, demolition waste will not have to be accounted for. Few leftovers from soil clearing, plastics or residual clearing and site clearing may be generated.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g., Solids wastes, liquid wastes, etc.): **Solid waste:** Iron, concrete, metal, drywall, wood, plastic, rubber, copper wires, excavated soils etc. **Quantity:** It is difficult to give exact figures of construction waste produced on a typical construction site. However, in order to approximate the quantity, it is estimated that nearly 2 kg of waste would be generated each working day, which are mainly RCC foundation construction and poles installation wastes. Some plastic, paper and organic waste will be generated from the use of workers, though a very negligible amount- half a kilogram a day maximum. **Liquid waste**: Paint chemicals as paint thinners which contain Volatile Organic Compounds (VOCs) will come out as leftovers. Due to the small scale of construction, hence there is no need for labor shed. So, fecal sludge will not be generated from the labor camp during the construction period. Leftover oils or spills from machinery can be a high probability generating liquid waste.
Type and quantity of raw materials used (wood, bricks, cement, water, etc.): **Type:** i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction. **Quantity**: It is difficult to give exact figures of construction waste produced on a typical construction site.
Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards: Around 100 sq. feet area is needed for this project. No vegetation is present in the targeted footprint area. Specific soil amount is not needed for the sub-project component. The current condition explains that there is no aggregated soil on the right of way. On the other hand, vegetation was found around the proposed area. The vegetation will not be affected by construction work since scope of works is confined within planned area.
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) Low. No borrow pit or quarries will be required to dig out during the construction period in or around/ adjacent to the proposed area.
Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description). No pre-existing water body or drainage is present
Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) **Low.** The site is free from any aquatic ecosystems or habitats of endangered species. There are some terrestrial flora species around the project site, which will slightly be affected by the works. Life cycle or movement of some terrestrial living species (fauna) (i.e. Insects - ant, bees, earthworm, reptiles,

birds etc.) might be disturbed for the time being, but with very less impact indeed. So, overall potential effect is very low or absent for this specific sub project.
Activities that can lead to landslides, slumps, slips and other mass movements in road cuts: The soil in the proposed site is largely flat, so there is almost no chance to trigger the landslide or any type of mass movement of soil for the said construction works.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description) N/A
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: N/A
Chance of long-term or semi-permanent destruction of soils: (High/Medium/Low with description) There is no chance of activities during the operation period, which can lead to any long-term or semi-permanent destruction of soils.
Possibility of odor and water, soil quality impacts from SWM and FSM disposal system: (High/Medium/Low with description) N/A
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) There is no possibility for creating borrow-pits, quarries, etc. during the operation phase.
Likely direct and indirect impacts on economic development in the project areas by the sub-project: During the operation phase of the sub-project, there are likely to be both direct and indirect impacts on economic development in the project areas. Direct impacts refer to the immediate effects that result directly from the sub-project activities. For example, the establishment and operation of the Nano grid can create employment opportunities for the adjacent workforce. This can include job opportunities in the construction phase as well as maintenance and operation of the infrastructure. Indirect impacts, on the other hand, are the ripple effects that arise from the sub-project activities. Access to electricity provided by the Nano grid can enhance the quality and efficiency of various services such as healthcare, education, and communication. Healthcare facilities can operate more effectively with reliable power supply, ensuring better medical services for the community. Educational institutions can improve their teaching and learning environments through the availability of electricity, enabling students to access modern technology and educational resources.
Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface

water bodies (wetlands, marshes): (High/Medium/Low with description) No existing drainage channels or surface water bodies found in the project area; therefore, no such effect can be anticipated
Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. There are no protected areas in or around project sites, and no known areas of ecological interest which can be affected by the daily activity of this facility.
Activities leading to landslides, slumps, slips and other mass movements in road cuts: N/A
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation) N/A
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: N/A

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

Environmental Screening Form for Solar PV Nano Grid (Camp 09)

Name of Sub-Project: Supply and Installation of Solar PV Nano grid (Camp 09: 2 nos. of Nano Grid will be installed in Camp 09)

Sl	Camp	Location	Block	Sub Block	Upazila	Union
1	Camp 9	Opposite of CIC office boundary, Beside Turkish hospital	G	G20	Ukhiya	Palongkhali
2	Camp 9	Inside of APBN office, Beside the watch tower	D	D2	Ukhiya	Palongkhali

Implementing Agency/Agencies: Local Government Engineering Department (LGED)

Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):
The proposed sub-project activities for the Nano grid include various components and equipment that are essential for its functioning. The control room is a steel container with dimensions of 10ft**8ft**8.5ft and a thickness of 2.3mm. It includes the construction of reinforced concrete footing, thermal insulation, and a ventilation fan operated by a temperature sensor. One control room with a capacity of 8KW will be installed.

The sub-project will require 18 solar PV modules, each with a capacity of 450 Wp (watt peak). These modules are of the mono crystalline type and consist of 72 cells or more, conforming to international standards and codes. The total capacity of the solar PV modules will be 8KW.

A total of 24 vented lead acid batteries will be used, each having a capacity of 2V and 900Ah (ampere-hour) or higher. These batteries are specifically designed for solar applications and comply with international standards and codes.

14 overhead distribution line poles will be erected, either with a height of 7.6 meters (SPC) or 6.0 meters (steel). The installation includes the use of reinforced concrete base, number plate, earthing, and all necessary fittings and accessories.

A total of 65 LED lights with a capacity of 10 watts will be installed for public facilities. These energy efficient lights will provide illumination while consuming minimal power.

Fifteen security lights with a capacity of 10 watts, equipped with outdoor installation fixtures, day light, and motion sensors, will be installed to ensure safety and security in the area.

Sixty-five energy-saving BLDC (Brushless Direct Current) ceiling fans with a capacity of 35 watts and a size of 56 inches will be installed in public facilities. These fans come with a 5-step capacitive compatible wall regulator and all necessary accessories for installation.

Twenty sets of switch, socket, and fuse board will be installed for the internal wiring of lights and fans in public facilities. This includes switches, sockets, PVC switch boxes, PVC insulated cables, and all other necessary fittings and accessories.

Estimated footprint / land area is 100 sq. feet for each Nano grid

Brief description of sub-project site: (e.g., present land use, Important Environmental Features (IEFs) near site, etc.:

There are 2 Nano grids in Camp 9.

In Camp No.9, Block G, Sub-block G20, the site is situated on the south-west side of the camp road, within the vicinity of the CiC office. It's positioned east of the CiC office and is surrounded by a fence with numerous trees. The location offers enough space for installing the nano grid.

In Camp No.9, Block D, Sub-block D2, the site is within the camp 9 APBN facility. It provides sufficient space for installation and is enclosed by a brick wall. Additionally, there is a watch tower situated nearby.

Overall Comments

The proposed Solar PV Nano grids will have minimal environmental impact and are not located in environmentally sensitive areas. The project activities will not pose a significant threat to the natural surroundings and will not cause drainage congestion or water logging issues. Moreover, there will be no utilization of productive agricultural soil for the project, ensuring the preservation of fertile land. The construction materials and equipment required for the Nano grids will be limited to the project boundary, minimizing any potential impact on the surrounding environment. The project follows environmentally responsible practices and aims to reduce any negative effects on the ecosystem.

The rohingya community has shown a positive attitude towards the project and expressed their enthusiasm to actively participate in its activities. The project is considered environmentally sustainable and socially acceptable by the adjacent community and representatives from various facilities. The participatory public consultation meeting provided an opportunity for community members to voice their opinions, and no objections were raised regarding the construction of the Nano grids at the proposed site. On the contrary, the community expressed appreciation for the infrastructure as it will enhance safety and security for the community.

During the consultation, the community highlighted the benefits that the Solar PV Nano grids will bring, particularly in terms of socio-security for female communities. The project is seen as a means to improve the quality of life, reduce vulnerability to social aggression and mistreatment, and enhance access to education and healthcare services. In addition, the establishment of the Solar PV Nano grids is expected to contribute to the overall development and well-being of the adjacent community. It will provide reliable electricity to various facilities such as learning centers, health posts, and food distribution centers, creating a conducive environment for education, healthcare, and community activities. The Solar PV Nano grids will not only provide electricity but also empower the community, ensuring a brighter and more secure future for all.

Types of waste to be generated during construction and operation phase:

The construction of the Nano grid involves installing a control room made of a steel container, which will be placed on RCC foundations. This process may require minimal ground preparation and the installation of RCC foundations. Additionally, during the construction phase, 14 poles will be installed near the project site.

During the installation of the poles and RCC foundations, there is a possibility of generating waste materials. These may include soil and debris that are excavated while digging holes for pole installation. The waste generated from the pole installation and RCC foundation is relatively small and mainly consists of construction debris. This debris can include materials like concrete, cement, bricks, and other building materials that are used during the installation process. If wooden or bamboo components or supports are used during the pole installation, there may be waste generated from cutting or shaping the wood or bamboo to fit the desired specifications.

Due to the small scale of construction, there will be no need for a labor shed, resulting in a reduced likelihood of generating organic waste, faecal waste, and kitchen waste during this phase.

The container structure will be transported to the site using a truck and then installed on the pillars with the assistance of a crane. As a result, the construction process is expected to have minimal waste generation. However, it is important to ensure proper waste management practices are in place to handle any potential waste materials that may arise during transportation and installation.

Sensitive environmental, cultural, archaeological, religious sites near (within 100m) of site including elephant migration routes and remaining forests:

2 nos. of Nano grids will be installed in Camp 9. Within the influence area of the subproject no historical sites were identified. The proposed locations for the Nano grids have been considered for their proximity to sensitive environmental, cultural, archaeological, religious sites, as well as elephant migration routes and remaining forests within a 100-meter radius. Several sensitive features have been identified near the Nano grid locations, as described below:

In Camp 9, Block G, Sub block G20, situated opposite the CIC office boundary and adjacent to the Turkish hospital, no significant features are found within 100 meters to the east or west. To the north, a religious facility is located at distances of 29 meters and 34 meters. To the south, a learning center located at 99 meters distance, a child protection facility at 68 meters, and the CIC office at 29 meters and 31 meters.

In Camp 9, Block D, Sub block D2, within the APBN office compound, adjacent to the watchtower, there are no significant features within 100 meters to the east or west. To the north, a child protection facility and learning center are situated at distances of 68 meters, 76 meters, and 83 meters, respectively. To the west, a religious facility is found at distances of 25 meters, 40 meters, and 43 meters. Furthermore, to the south, a learning center is located 65 meters away.

Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists. Mostly Rohingya settlements are found around the proposed area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project

area, no elephant migration routes exist (ref. IUCN). No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below

Section A: Sub-Project Overview

Description of sub-project/component interventions:

The 8KW capacity Nano grid control room, which is 10ft*8ft*8.5ft in size and has a thickness of 2.3mm, will serve as the central hub for the distribution of electricity to these facilities. The control room will be made of a steel container that includes the construction of RCC footing, thermal insulation, and ventilation operated by a temperature sensor. This will ensure that the equipment is protected from extreme weather conditions and operates at optimal performance.

The Nano grid will consist of approximately 14 poles, which will be installed to distribute electricity to the various facilities. Each pole will have an electricity line drawn from the Nano grid, with 14 panels installed on top of each pole. Additionally, each pole will have a 10 watt security light installed on top, providing additional safety and security for the surrounding area.

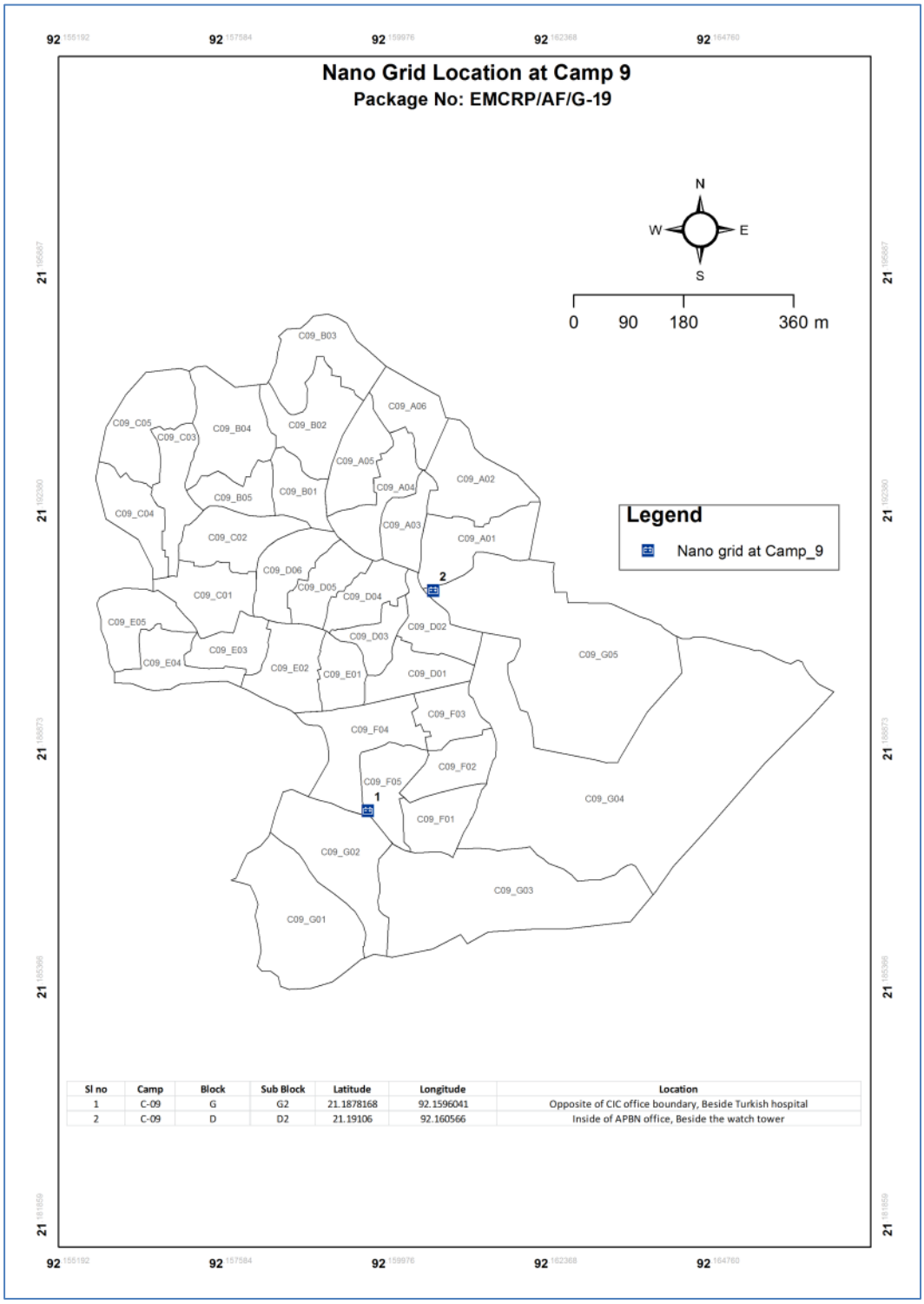
The proposed facilities also include the installation of 65 energy-efficient fans and lights in various service centers, each with a capacity of 35 watts and 10 watts respectively. These fans will help to keep the facilities cool during hot temperatures, ensuring a comfortable working environment for the facilitators.

Two fire extinguishers will also be installed in the Nano grid room, ensuring the safety of the equipment and personnel operating in the area.

Sub-project Location:

2 nos. of Nano grids will be installed in Camp 9. The location details are given below.

Sl	Camp	Location	Block	Sub Block	Upazila	Union	Latitude	Longitude
1	Camp 9	Opposite of CIC office boundary, Beside Turkish hospital	G	G20	Ukhiya	Palongkhali	21.1878168	92.1596041
2	Camp 9	Inside of APBN office, Beside the watch tower	D	D2	Ukhiya	Palongkhali	21.19106	92.160566



Sl no	Camp	Block	Sub Block	Latitude	Longitude	Location
1	C-09	G	G2	21.1878168	92.1596041	Opposite of CIC office boundary, Beside Turkish hospital
2	C-09	D	D2	21.19106	92.160566	Inside of APBN office, Beside the watch tower

Proposed Nano grid location at Camp 9

Land ownership
Govt. Land

Expected construction period: 6 months

Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive environmental areas such as elephant corridors, water

bodies, etc. and historical or socio-cultural assets): Please also explain any analysis on alternative location was conducted:

There are 2 nos. of Nano grid in camp 9. In Camp 9, Block G, Sub block G20, situated opposite the CIC office boundary and adjacent to the Turkish hospital, no significant features are found within 100 meters to the east or west. To the north, a religious facility is located at distances of 29 meters and 34 meters. To the south, a learning center located at 99 meters distance, a child protection facility at 68 meters, and the CIC office at 29 meters and 31 meters.

In Camp 9, Block D, Sub block D2, within the APBN office compound, adjacent to the watchtower, there are no significant features within 100 meters to the east or west. To the north, a child protection facility and learning center are situated at distances of 68 meters, 76 meters, and 83 meters, respectively. To the west, a religious facility is found at distances of 25 meters, 40 meters, and 43 meters. Furthermore, to the south, a learning center is located 65 meters away.

Within the influence area of the proposed location no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (confirmed by the participants in the consultation meeting).

Section B: Environmental Screening

***B.1*: Environmental feature of sub-project location**

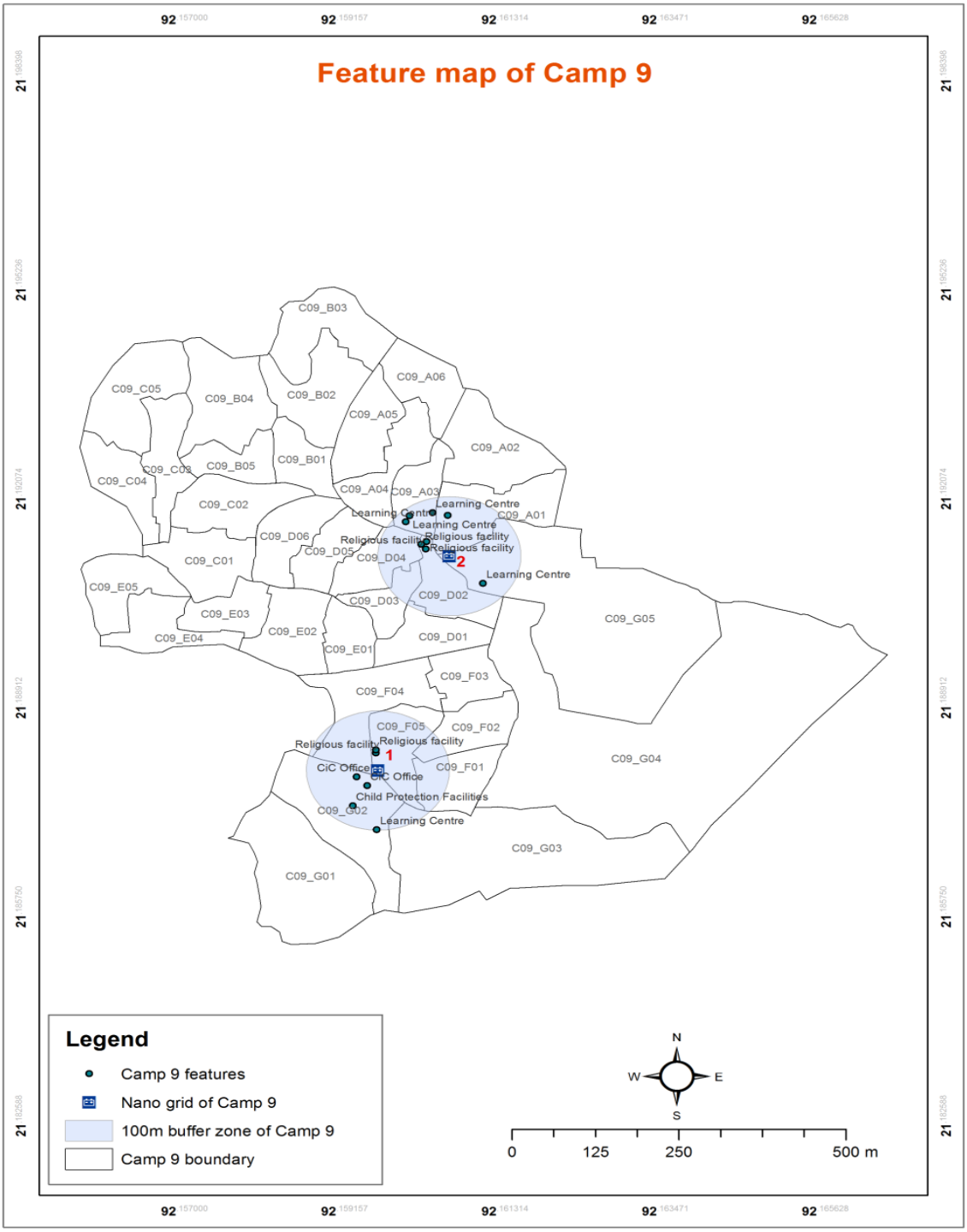
Description of cultural properties (if applicable, including distance from site): Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests:

There are 2 nos. of Nano grid in camp 9. In Camp 9, Block G, Sub block G20, situated opposite the CIC office boundary and adjacent to the Turkish hospital, no significant features are found within 100 meters to the east or west. To the north, a religious facility is located at distances of 29 meters and 34 meters. To the south, a learning center located at 99 meters distance, a child protection facility at 68 meters, and the CIC office at 29 meters and 31 meters.

In Camp 9, Block D, Sub block D2, within the APBN office compound, adjacent to the watchtower, there are no significant features within 100 meters to the east or west. To the north, a child protection facility and learning center are situated at distances of 68 meters, 76 meters, and 83 meters, respectively. To the west, a religious facility is found at distances of 25 meters, 40 meters, and 43 meters. Furthermore, to the south, a learning center is located 65 meters away.

There are no other sensitive environmental, cultural, archaeological sites within the catchment area of this sub-project.

A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas are shown below.



Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive features found in the footprint area. Several learning center, rohingya settlements and religious facilities were found during the survey. It will not be affected by the construction works, as the activities will be carried out within the existing proposed area boundary and necessary preventive and mitigation measures will be followed during the entire construction period.

(1) Within/near Elephant Migration Routes Yes/No*

No. These have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

(2) potential impacts on remaining forests in/around camps Yes/No

N/A (This activity will be confined within the proposed location)

(3) Other issues: N/A

*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:

Dust:

Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, trailer, mini truck, etc. move on roads adjacent to proposed location throughout the day generating noise but within tolerable limit in most cases.

Baseline soil quality:

The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.

Landslide potential (high/medium/low, with explanation):

The nominated location is found to be on fairly plane land. There is no condition found around the selected site which might give reasons for landslides.

Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH):

Groundwater is the main source of potable water in the Sub-project area. The shallow depth is about 100 feet to 120 feet and deep tube well depth is 700 to 850 feet. In the sub-project area, deep groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains medium concentration of iron. Deep groundwater table (drinkable) varies from 600-800ft (Field survey, 2021). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer.

Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to 681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)

Status of wildlife movement:

N/A (None of the information was found about the wildlife movement in or across the area)

State of forestation:

Patches of vegetation containing small trees found in target location and in surrounding area of the proposed location which are within 200m radial distance.

Summary of water balance analysis (For water supply scheme only):

N/A

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g., status of access road or any other facility required for sub-project to be viable): There is a road called the camp 9 connecting road that will be used for transportation and delivering materials to the 2 Nano grids in Camp 09. It provides access for vehicles and ensures a route for transporting goods and supplies.
Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction: Due to the small scale of construction, hence there is no need for labor shed. As a result, there is no necessity for a tube well in the proposed locations. Instead, during the construction phase, the contractor will arrange for a mobile water supply system to ensure a sufficient water source for the construction work. Additionally, the contractor will be responsible for providing temporary sanitation facilities. A portable or temporary sanitary system will be set up to cater to the basic hygiene needs of the workers during the construction period in the vicinity of the construction area for all the components of the project. Electricity is not available in the area. Generator or Solar lamp will need installation.
Possible location of labor camps: Due to the small scale of construction, hence there is no need for labor shed.
Requirement and type of raw materials (e.g., sand, stone, wood, etc.): i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials
Identification of access road for transportation (Yes/No): Yes. There is a road called the camp 9 connecting road that will be used for transportation and delivering materials to the 2 Nano grids in Camp 09. It provides access for vehicles and ensures a route for transporting goods and supplies.
Location identification for raw material storage: The materials, including the poles, for the Nano grids will be stored either on the side of the road or in designated vacant spaces near each Nano grid. The site management or the Camp-in-Charge (CIC) will grant permission to store the required materials for the Nano grid within the camp premises. To ensure security during nighttime, there may be provisions for having night guards in place
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.): There is no pre-existing structure which will face demolition. Here, demolition waste will not have to be accounted for. Few leftovers from soil clearing, plastics or residual clearing and site clearing may be generated.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g., Solids wastes, liquid wastes, etc.): **Solid waste:** Iron, concrete, metal, drywall, wood, plastic, rubber, copper wires, excavated soils etc. **Quantity:** It is difficult to give exact figures of construction waste produced on a typical construction site. However, in order to approximate the quantity, it is estimated that nearly 2 kg of waste would be generated each working day, which are mainly RCC foundation construction and poles installation wastes. Some plastic, paper and organic waste will be generated from the use of workers, though a very negligible amount- half a kilogram a day maximum. **Liquid waste**: Paint chemicals as paint thinners which contain Volatile Organic Compounds (VOCs) will come out as leftovers. Due to the small scale of construction, hence there is no need for labor shed. So, fecal sludge will not be generated from the labor camp during the construction period. Leftover oils or spills from machinery can be a high probability generating liquid waste.
Type and quantity of raw materials used (wood, bricks, cement, water, etc.): **Type:** i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction. **Quantity**: It is difficult to give exact figures of construction waste produced on a typical construction site.
Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards: Around 100 sq. feet area is needed for this project. No vegetation is present in the targeted footprint area. Specific soil amount is not needed for the sub-project component. The current condition explains that there is no aggregated soil on the right of way. On the other hand, vegetation was found around the proposed area. The vegetation will not be affected by construction work since scope of works is confined within planned area.
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) Low. No borrow pit or quarries will be required to dig out during the construction period in or around/ adjacent to the proposed area.
Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description). No pre-existing water body or drainage is present
Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) **Low.** The site is free from any aquatic ecosystems or habitats of endangered species. There are some terrestrial flora species around the project site, which will slightly be affected by the works. Life cycle or movement of some terrestrial living species (fauna) (i.e. Insects - ant, bees, earthworm, reptiles, birds etc.) might be disturbed for the time being, but with very less impact indeed. So, overall potential effect is very low or absent for this specific sub project.

Activities that can lead to landslides, slumps, slips and other mass movements in road cuts: The soil in the proposed site is largely flat, so there is almost no chance to trigger the landslide or any type of mass movement of soil for the said construction works.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description) N/A
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: N/A
Chance of long-term or semi-permanent destruction of soils: (High/Medium/Low with description) There is no chance of activities during the operation period, which can lead to any long-term or semi-permanent destruction of soils.
Possibility of odor and water, soil quality impacts from SWM and FSM disposal system: (High/Medium/Low with description) N/A
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) There is no possibility for creating borrow-pits, quarries, etc. during the operation phase.
Likely direct and indirect impacts on economic development in the project areas by the sub-project: During the operation phase of the sub-project, there are likely to be both direct and indirect impacts on economic development in the project areas. Direct impacts refer to the immediate effects that result directly from the sub-project activities. For example, the establishment and operation of the Nano grid can create employment opportunities for the adjacent workforce. This can include job opportunities in the construction phase as well as maintenance and operation of the infrastructure. Indirect impacts, on the other hand, are the ripple effects that arise from the sub-project activities. Access to electricity provided by the Nano grid can enhance the quality and efficiency of various services such as healthcare, education, and communication. Healthcare facilities can operate more effectively with reliable power supply, ensuring better medical services for the community. Educational institutions can improve their teaching and learning environments through the availability of electricity, enabling students to access modern technology and educational resources.
Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description) No existing drainage channels or surface water bodies found in the project area; therefore, no such

effect can be anticipated
Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. There are no protected areas in or around project sites, and no known areas of ecological interest which can be affected by the daily activity of this facility.
Activities leading to landslides, slumps, slips and other mass movements in road cuts: N/A
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation) N/A
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: N/A

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

Environmental Screening Form for Solar PV Nano Grid (Camp 22)

Name of Sub-Project: Supply and Installation of Solar PV Nano grid (Camp 22: One Nano Grid will be installed in Camp 22)

Sl	Camp	Location	Block	Sub Block	Upazila	Union
1	Camp 22	Inside of Madrasa	B	B2	Teknaf	Whykong

Implementing Agency/Agencies: Local Government Engineering Department (LGED)
Description of proposed sub-project activities (incl. type of activities, footprint area, natural resources required, etc.):
The proposed sub-project activities for the Nano grid include various components and equipment that are essential for its functioning. The control room is a steel container with dimensions of 10ft**8ft**8.5ft and a thickness of 2.3mm. It includes the construction of reinforced concrete footing, thermal insulation, and a ventilation fan operated by a temperature sensor. One control room with a capacity of 8KW will be installed.

The sub-project will require 18 solar PV modules, each with a capacity of 450 Wp (watt peak). These modules are of the mono crystalline type and consist of 72 cells or more, conforming to international standards and codes. The total capacity of the solar PV modules will be 8KW.

A total of 24 vented lead acid batteries will be used, each having a capacity of 2V and 900Ah (ampere-hour) or higher. These batteries are specifically designed for solar applications and comply with international standards and codes.

14 overhead distribution line poles will be erected, either with a height of 7.6 meters (SPC) or 6.0 meters (steel). The installation includes the use of reinforced concrete base, number plate, earthing, and all necessary fittings and accessories.

A total of 65 LED lights with a capacity of 10 watts will be installed for public facilities. These energy efficient lights will provide illumination while consuming minimal power.

Fifteen security lights with a capacity of 10 watts, equipped with outdoor installation fixtures, day light, and motion sensors, will be installed to ensure safety and security in the area.

Sixty-five energy-saving BLDC (Brushless Direct Current) ceiling fans with a capacity of 35 watts and a size of 56 inches will be installed in public facilities. These fans come with a 5-step capacitive compatible wall regulator and all necessary accessories for installation.

Twenty sets of switch, socket, and fuse board will be installed for the internal wiring of lights and fans in public facilities. This includes switches, sockets, PVC switch boxes, PVC insulated cables, and all other necessary fittings and accessories.

Estimated footprint / land area is 100 sq. feet for each Nano grid

Brief description of sub-project site: (e.g., present land use, Important Environmental Features (IEFs) near site, etc.:

There is a Nano grid in Camp 22, specifically in Block B, Sub-block B2. The site is positioned to the north of the camp's connecting road and is characterized by an open space with no significant features that might interfere with the installation process. Additionally, there are a few trees located nearby, but they are at a safe distance from the installation area and will not be affected by the works.

Overall Comments

The proposed Solar PV Nano grid will have minimal environmental impact and are not located in environmentally sensitive areas. The project activities will not pose a significant threat to the natural surroundings and will not cause drainage congestion or water logging issues. Moreover, there will be no utilization of productive agricultural soil for the project, ensuring the preservation of fertile land.
The construction materials and equipment required for the Nano grid will be limited to the project boundary, minimizing any potential impact on the surrounding environment. The project follows environmentally responsible practices and aims to reduce any negative effects on the ecosystem.

The rohingya community has shown a positive attitude towards the project and expressed their enthusiasm to actively participate in its activities. The project is considered environmentally sustainable and socially acceptable by the adjacent community and representatives from various facilities. The participatory public consultation meeting provided an opportunity for community members to voice their opinions, and no objections were raised regarding the construction of the Nano grid at the proposed site. On the contrary, the community expressed appreciation for the infrastructure as it will enhance safety and security for the community.

During the consultation, the community highlighted the benefits that the Solar PV Nano grid will bring, particularly in terms of socio-security for female communities. The project is seen as a means to improve the quality of life, reduce vulnerability to social aggression and mistreatment, and enhance access to education and healthcare services. In addition, the establishment of the Solar PV Nano grid is expected to contribute to the overall development and well-being of the adjacent community. It will provide reliable electricity to various facilities such as learning centers, health posts, and food distribution centers, creating a conducive environment for education, healthcare, and community activities. The Solar PV Nano grids will not only provide electricity but also empower the community, ensuring a brighter and more secure future for all.

Types of waste to be generated during construction and operation phase:

The construction of the Nano grid involves installing a control room made of a steel container, which will be placed on RCC foundations. This process may require minimal ground preparation and the installation of RCC foundations. Additionally, during the construction phase, 14 poles will be installed near the project site.

During the installation of the poles and RCC foundations, there is a possibility of generating waste materials. These may include soil and debris that are excavated while digging holes for pole installation. The waste generated from the pole installation and RCC foundation is relatively small

and mainly consists of construction debris. This debris can include materials like concrete, cement, bricks, and other building materials that are used during the installation process. If wooden or bamboo components or supports are used during the pole installation, there may be waste generated from cutting or shaping the wood or bamboo to fit the desired specifications.

Due to the small scale of construction, there will be no need for a labor shed, resulting in a reduced likelihood of generating organic waste, faecal waste, and kitchen waste during this phase.

The container structure will be transported to the site using a truck and then installed on the pillars with the assistance of a crane. As a result, the construction process is expected to have minimal waste generation. However, it is important to ensure proper waste management practices are in place to handle any potential waste materials that may arise during transportation and installation.

Sensitive environmental, cultural, archaeological, religious sites near (within 100m) of site including elephant migration routes and remaining forests:

One Nano grid will be installed in Camp KRC. Within the influence area of the subproject no historical sites were identified. The proposed location for the Nano grid has been considered for their proximity to sensitive environmental, cultural, archaeological, religious sites, as well as elephant migration routes and remaining forests within a 100-meter radius. Several sensitive features have been identified near the Nano grid location, as described below:

There is a Nano grid in Camp Kutupalong RC, Block F, near Shed-64-room -1. The surrounding area has some sensitive sites within 100 meters. To the east and west, no features were found. To the north, there is a religious facility located 68 meters away, a learning center at 94 meters, and a child protection facility at 95 meters. To the south, there are a learning center at 58 meters, another learning center at 61 meters, a religious facility at 83 meters, and another religious facility at 92 meters.

Apart from these structures no other sensitive environmental, cultural, archaeological, religious sites exists. Mostly Rohingya settlements are found around the proposed area. No disturbance is anticipated due to construction activities to those environmental components. In this sub-project area, no elephant migration routes exist (ref. IUCN). No disturbance is anticipated due to construction activities to those social and environmental components.

Completed environmental and social screening forms are given below

Section A: Sub-Project Overview

Description of sub-project/component interventions:

The 8KW capacity Nano grid control room, which is 10ft*8ft*8.5ft in size and has a thickness of 2.3mm, will serve as the central hub for the distribution of electricity to these facilities. The control room will be made of a steel container that includes the construction of RCC footing, thermal insulation, and ventilation operated by a temperature sensor. This will ensure that the equipment is protected from extreme weather conditions and operates at optimal performance.

The Nano grid will consist of approximately 14 poles, which will be installed to distribute electricity to the various facilities. Each pole will have an electricity line drawn from the Nano grid, with 14 panels installed on top of each pole. Additionally, each pole will have a 10 watt security light installed on top, providing additional safety and security for the surrounding area.

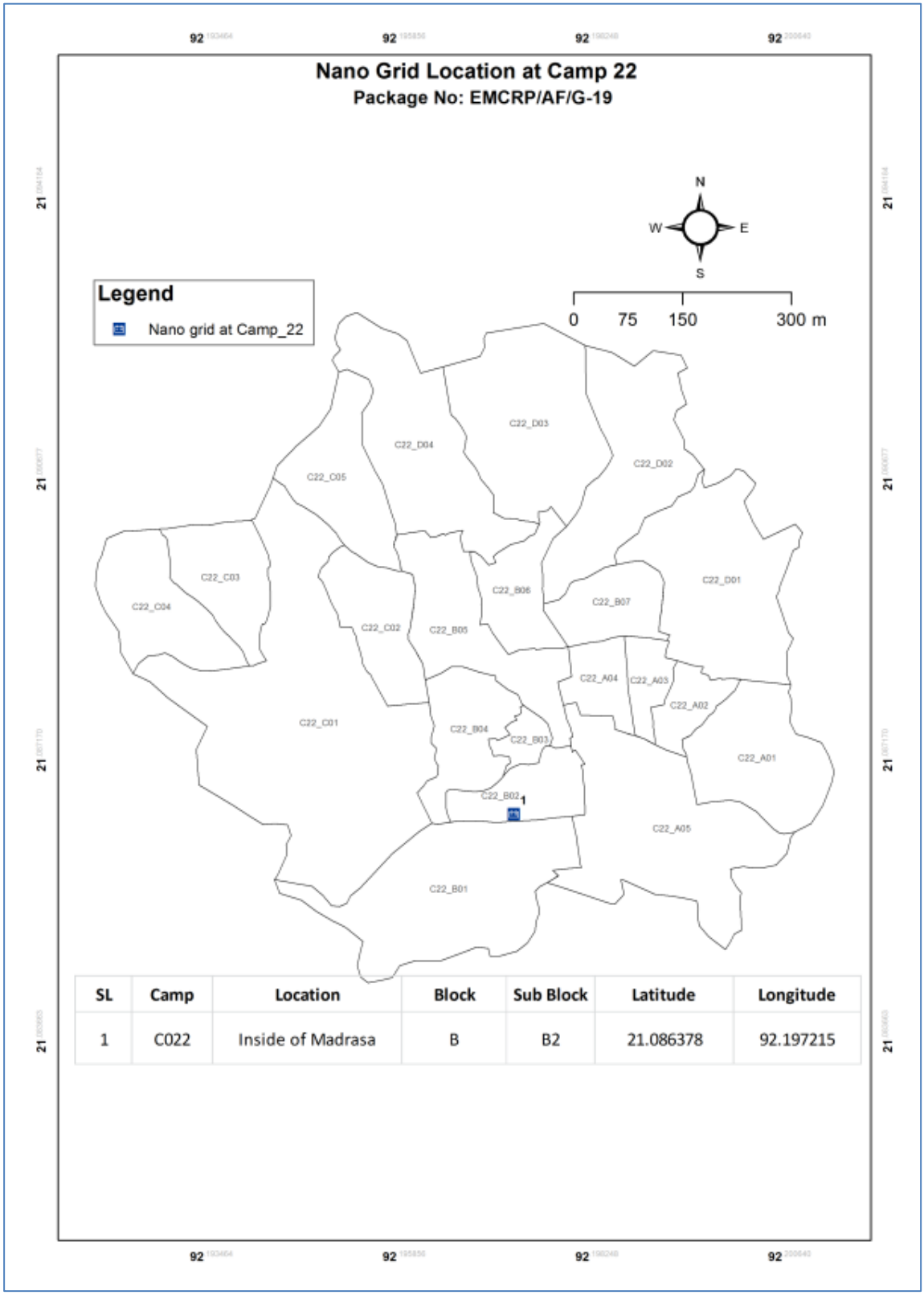
The proposed facilities also include the installation of 65 energy-efficient fans and lights in various service centers, each with a capacity of 35 watts and 10 watts respectively. These fans will help to keep the facilities cool during hot temperatures, ensuring a comfortable working environment for the facilitators.

Two fire extinguishers will also be installed in the Nano grid room, ensuring the safety of the equipment and personnel operating in the area.

Sub-project Location:

One Nano grid will be installed in Camp 22. The location details are given below.

Sl	Camp	Location	Block	Sub Block	Upazila	Union	Latitude	Longitude
1	Camp 22	Inside of Madrasa	B	B2	Teknaf	Whykong	21.086378	92.197215



SL	Camp	Location	Block	Sub Block	Latitude	Longitude
1	C022	Inside of Madrasa	B	B2	21.086378	92.197215

Proposed Nano grid location at Camp 22

Land ownership

Govt. Land

Expected construction period: 6 months

Description of project intervention area and project influence area with schematic diagram (where relevant, indicate distance to sensitive environmental areas such as elephant corridors, water bodies, etc. and historical or socio-cultural assets): Please also explain any analysis on alternative location was conducted:

There is a Nano grid in Camp 22. To the east, there are multiple learning centers at distances ranging from 11m to 56m, along with a Multipurpose Protection Center located at 960m. On the west side, there are multiple religious facilities located at distances of 7m, 16m, and 19m. Towards the north, there is a learning center situated at a distance of 98m. To the south, there are several learning centers located at distances of 70m, 81m, 87m, 99m, and 100m, along with the CiC office at a distance of 92m.

Within the influence area of the proposed location no historical sites were identified. Also, there is no evidence of elephant movement close to subproject location (confirmed by the participants in the consultation meeting).

Section B: Environmental Screening

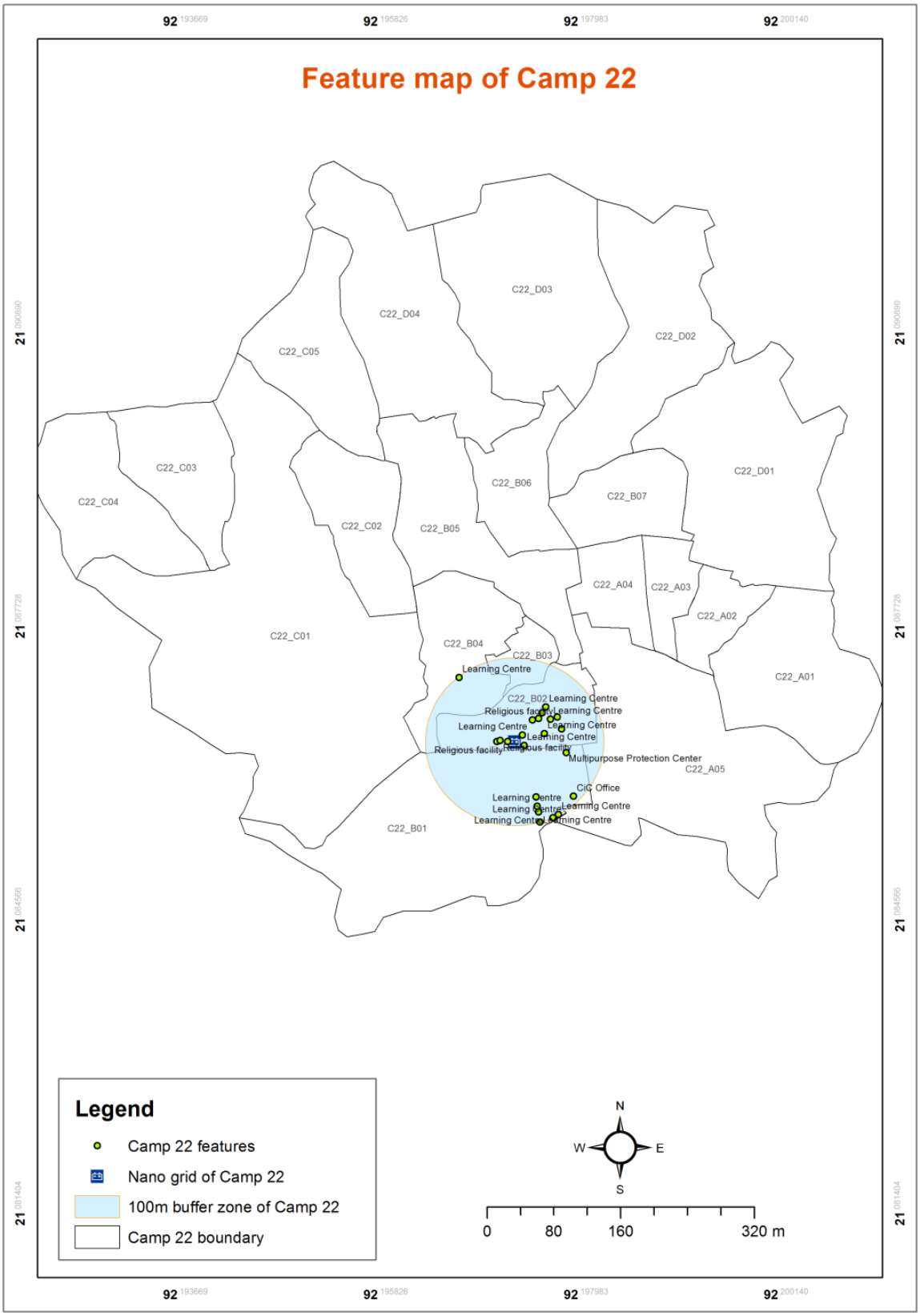
***B.1*: Environmental feature of sub-project location**

Description of cultural properties (if applicable, including distance from site): Sensitive environmental, cultural, archaeological, religious sites near (within the catchment area) of site including elephant migration routes and remaining forests:

There is a Nano grid in Camp 22. To the east, there are multiple learning centers at distances ranging from 11m to 56m, along with a Multipurpose Protection Center located at 960m. On the west side, there are multiple religious facilities located at distances of 7m, 16m, and 19m. Towards the north, there is a learning center situated at a distance of 98m. To the south, there are several learning centers located at distances of 70m, 81m, 87m, 99m, and 100m, along with the CiC office at a distance of 92m.

There are no other sensitive environmental, cultural, archaeological sites within the catchment area of this sub-project.

A sketch of the project surrounding area with several features at relatively distant places and locations of sensitive institutions in the project surrounding areas are shown below.



Location of environmentally important and sensitive areas:

There are no environmentally important or sensitive features found in the footprint area. Several learning center, rohingya settlements and religious facilities were found during the survey. It will not be affected by the construction works, as the activities will be carried out within the existing proposed area boundary and necessary preventive and mitigation measures will be followed during the entire construction period.

(1) Within/near Elephant Migration Routes Yes/No*

No. These have been checked on the basis of elephant migration route map established by UNHCR/IUCN (latest updated maps as of 22 February 2018 and later June 05, 2018).

(2) potential impacts on remaining forests in/around camps Yes/No

N/A (This activity will be confined within the proposed location)

(3) Other issues: N/A

*This question needs to be answered by checking the elephant migration route map established by UNHCR/IUCN

Baseline air quality and noise levels:

Dust:

Ambient air quality data was not readily available, but quality is apparently good due to the appearance of rural vegetative settings around. Dust is slightly generated through movement of pedestrians. Natural air action, over the road surface which causes dust circulation.

Noise:

Noise in the Sub-project area is not a major concern because noise level is within the tolerance limit. Vehicles such as tempo, auto rickshaw, trailer, mini truck, etc. move on roads adjacent to proposed location throughout the day generating noise but within tolerable limit in most cases.

Baseline soil quality:

The Sub-project area is located mainly on red, alluvial, muddy and sandy soil. The soil developing from the weathered sandstones tend to be sandy to clay loams. Presence of Organic matter content in the soil is moderate.

Landslide potential (high/medium/low, with explanation):

The nominated location is found to be on fairly plane land. There is no condition found around the selected site which might give reasons for landslides.

Baseline surface water and groundwater quality (FE, TDS, fecal coliform, pH):

Groundwater is the main source of potable water in the Sub-project area. The shallow depth is about 100 feet to 120 feet and deep tube well depth is 700 to 850 feet. In the sub-project area, deep groundwater is fresh and potable, and arsenic free. Water from the shallower aquifers contains medium concentration of iron. Deep groundwater table (drinkable) varies from 600-800ft (Field survey, 2021). Local people usually use deep tube-well water for drinking and other domestic purposes. There should have been deep tube well which pump water from the confined aquifer.

Groundwater quality: pH-5.17 to 8.51, DO-2.26 to 8.14mg/l, TDS-23.40 to 320 mg/l, EC -25.7 to 681µs/cm, Fe-0.5 to 7.0 mg/l and As-Nil (IWM Study Report, 2019)

Status of wildlife movement:

N/A (None of the information was found about the wildlife movement in or across the area)

State of forestation:

Patches of vegetation containing small trees found in target location and in surrounding area of the proposed location which are within 200m radial distance.
Summary of water balance analysis (For water supply scheme only): **N/A**

B.2: Pre construction Phase

Information on Ancillary Facilities (e.g., status of access road or any other facility required for sub-project to be viable): There is a road called the camp 22 connecting road that will be used for transportation and delivering materials to the Nano grid in Camp 22. It provides access for vehicles and ensures a route for transporting goods and supplies.
Requirement of accommodation or service amenities (toilet, water supply, electricity) to support the workforce during construction: Due to the small scale of construction, hence there is no need for labor shed. As a result, there is no necessity for a tube well in the proposed locations. Instead, during the construction phase, the contractor will arrange for a mobile water supply system to ensure a sufficient water source for the construction work. Additionally, the contractor will be responsible for providing temporary sanitation facilities. A portable or temporary sanitary system will be set up to cater to the basic hygiene needs of the workers during the construction period in the vicinity of the construction area for all the components of the project. Electricity is not available in the area. Generator or Solar lamp will need installation.
Possible location of labor camps: Due to the small scale of construction, hence there is no need for labor shed.
Requirement and type of raw materials (e.g., sand, stone, wood, etc.): i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials
Identification of access road for transportation (Yes/No): There is a road called the camp 22 connecting road that will be used for transportation and delivering materials to the Nano grid in Camp 22. It provides access for vehicles and ensures a route for transporting goods and supplies.
Location identification for raw material storage: The materials, including the poles, for the Nano grids will be stored either on the side of the road or in designated vacant spaces near each Nano grid. The site management or the Camp-in-Charge (CIC) will grant permission to store the required materials for the Nano grid within the camp premises. To ensure security during nighttime, there may be provisions for having night guards in place
Possible composition and quantities of wastes (Solids wastes, demolition materials, sludge from old latrines, etc.): There is no pre-existing structure which will face demolition. Here, demolition waste will not have to be accounted for. Few leftovers from soil clearing, plastics or residual clearing and site clearing may be generated.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.3: Construction Phase

Type and quantity of waste generated (e.g., Solids wastes, liquid wastes, etc.): **Solid waste:** Iron, concrete, metal, drywall, wood, plastic, rubber, copper wires, excavated soils etc. **Quantity:** It is difficult to give exact figures of construction waste produced on a typical construction site. However, in order to approximate the quantity, it is estimated that nearly 2 kg of waste would be generated each working day, which are mainly RCC foundation construction and poles installation wastes. Some plastic, paper and organic waste will be generated from the use of workers, though a very negligible amount- half a kilogram a day maximum. **Liquid waste**: Paint chemicals as paint thinners which contain Volatile Organic Compounds (VOCs) will come out as leftovers. Due to the small scale of construction, hence there is no need for labor shed. So, fecal sludge will not be generated from the labor camp during the construction period. Leftover oils or spills from machinery can be a high probability generating liquid waste.
Type and quantity of raw materials used (wood, bricks, cement, water, etc.): **Type:** i) Bricks, ii) Sand iii) cement iv) aggregates v) metals vi) water vii) concretes vii) Bamboo & wood from mobilized materials viii) clay are the most common type of building material used in construction. **Quantity**: It is difficult to give exact figures of construction waste produced on a typical construction site.
Approx. area (in square meters) of vegetation and soil in the right-of-way, borrow pits, waste dumps, and equipment yards: Around 100 sq. feet area is needed for this project. No vegetation is present in the targeted footprint area. Specific soil amount is not needed for the sub-project component. The current condition explains that there is no aggregated soil on the right of way. On the other hand, vegetation was found around the proposed area. The vegetation will not be affected by construction work since scope of works is confined within planned area.
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) Low. No borrow pit or quarries will be required to dig out during the construction period in or around/ adjacent to the proposed area.
Disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description). No pre-existing water body or drainage is present
Destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) **Low.** The site is free from any aquatic ecosystems or habitats of endangered species. There are some terrestrial flora species around the project site, which will slightly be affected by the works. Life cycle or movement of some terrestrial living species (fauna) (i.e. Insects - ant, bees, earthworm, reptiles, birds etc.) might be disturbed for the time being, but with very less impact indeed. So, overall

potential effect is very low or absent for this specific sub project.
Activities that can lead to landslides, slumps, slips and other mass movements in road cuts: The soil in the proposed site is largely flat, so there is almost no chance to trigger the landslide or any type of mass movement of soil for the said construction works.
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with description) N/A
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: No traffic movement impact on light is anticipated, but low effects of noise and air pollution may appear resulting from the movement of vehicles carrying construction materials.

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

B.4: Operation Phase

Activities leading to health hazards and interference of plant growth adjacent to roads by dust raised and blown by vehicles: N/A
Chance of long-term or semi-permanent destruction of soils: (High/Medium/Low with description) There is no chance of activities during the operation period, which can lead to any long-term or semi-permanent destruction of soils.
Possibility of odor and water, soil quality impacts from SWM and FSM disposal system: (High/Medium/Low with description) N/A
Possibility of stagnant water bodies in borrow pits, quarries, etc., encouraging for mosquito breeding and other disease vectors: (High/Medium/Low with explanation) There is no possibility for creating borrow-pits, quarries, etc. during the operation phase.
Likely direct and indirect impacts on economic development in the project areas by the sub-project: During the operation phase of the sub-project, there are likely to be both direct and indirect impacts on economic development in the project areas. Direct impacts refer to the immediate effects that result directly from the sub-project activities. For example, the establishment and operation of the Nano grid can create employment opportunities for the adjacent workforce. This can include job opportunities in the construction phase as well as maintenance and operation of the infrastructure. Indirect impacts, on the other hand, are the ripple effects that arise from the sub-project activities. Access to electricity provided by the Nano grid can enhance the quality and efficiency of various services such as healthcare, education, and communication. Healthcare facilities can operate more effectively with reliable power supply, ensuring better medical services for the community. Educational institutions can improve their teaching and learning environments through the availability of electricity, enabling students to access modern technology and educational resources.
Extent of disturbance or modification of existing drainage channels (rivers, canals) or surface water bodies (wetlands, marshes): (High/Medium/Low with description)

No existing drainage channels or surface water bodies found in the project area; therefore, no such effect can be anticipated
Extent of destruction or damage of terrestrial or aquatic ecosystems or endangered species directly or by induced development: (High/Medium/Low with description) Low. There are no protected areas in or around project sites, and no known areas of ecological interest which can be affected by the daily activity of this facility.
Activities leading to landslides, slumps, slips and other mass movements in road cuts: N/A
Erosion of lands below the roadbed receiving concentrated outflow carried by covered or open drains: (High/Medium/Low with explanation) N/A
Describe possible traffic movement impacts on (unwanted) light, noise and air pollution: N/A

High = Likely to cause long-term impacts or over large area (>1sqkm); Medium = Likely to cause temporary damage or over moderate area (0.5 to 1sqkm); Low = Likely to cause little, short-term damage and over small area (<0.5sqkm)

Appendix-04: Elephant Presence Map

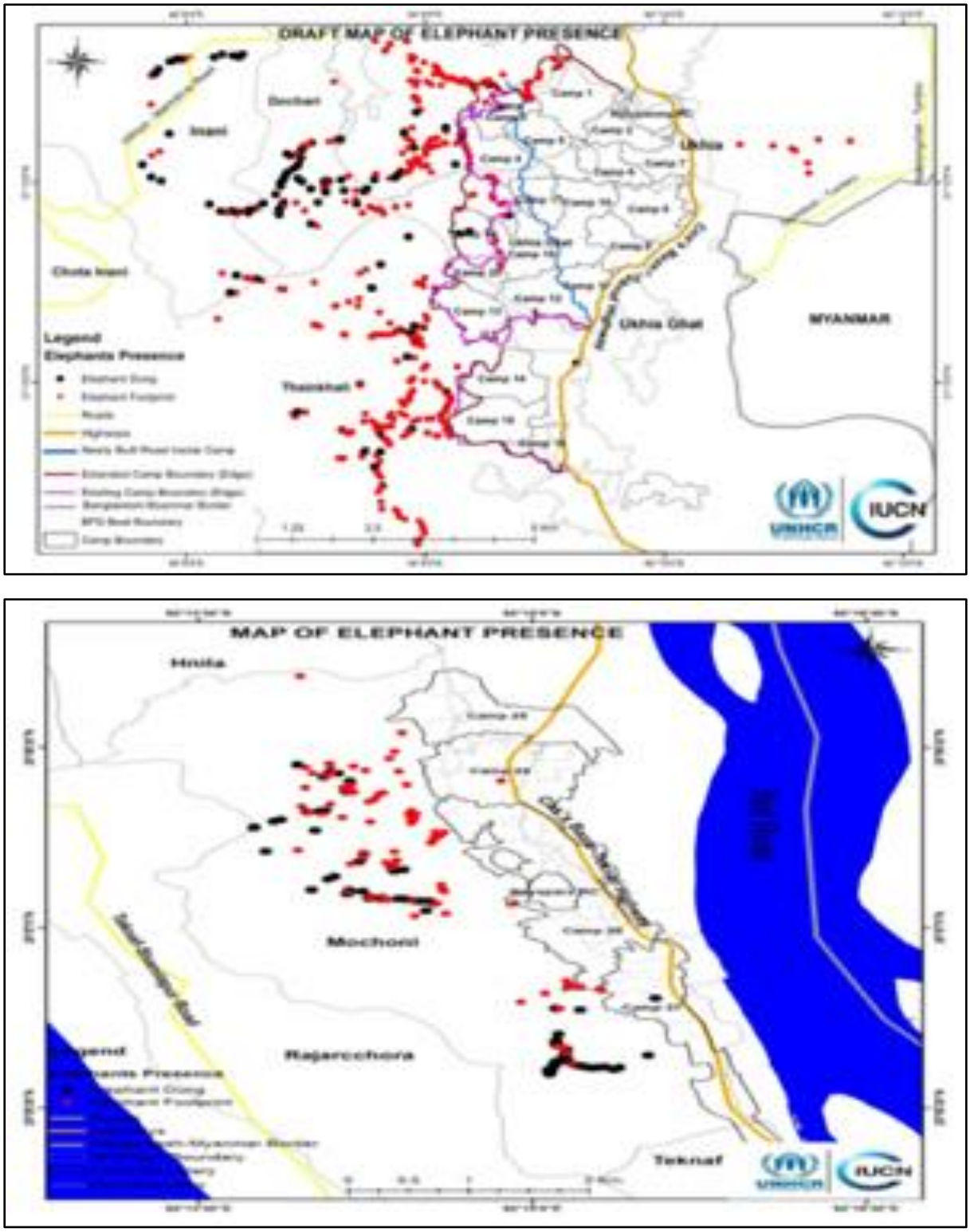


Figure: Elephant presence map (latest information published on 24 May 2018)

Appendix-05: Environmental Screening Summary of the Installation of Solar PV Nano grid works
Section D: Environmental Screening Summary

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/ Institution Responsible	Monitoring Suggestions	
					Indicators	Frequency
1. Sub-project Interventions	**Construction** of Solar PV Nano Grids (degradation of air, water and soil quality, and local hydrology)	Under the sub-project intervention, the overall score is low	• Limiting earthworks; • Watering of dry exposed surfaces and stockpiles of aggregates at least twice daily, as necessary; • Requiring trucks delivering aggregates or bricks, poles, container and cement to have tarpaulin cover and Limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph. • The earthwork sites where exposed land surface is vulnerable to runoff shall be consolidated and/or covered. • The material stockpile sites shall be far away from surface water bodies and areas prone to surface run-off. Loose materials shall be bagged and covered. • Channels, earth bunds, netting, tarpaulin and or sand bag barriers shall be used on site to manage surface water runoff and minimize erosion. • All precautions to store chemicals/oil/fuel properly so that no chance of spill.	Contractor, environmental specialist of D&SC	Visual monitoring result of air quality condition, Results of water test parameters, blockage of water flow with soil, debris or stack materials at site.	Throughout the time during the construction period.

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/ Institution Responsible	Monitoring Suggestions	
					Indicators	Frequency
			• Workers must specify waste dump locations to avoid littering which in turn might negatively affect surface and ground water.			
2.Pre-construction Phase	**Site planning** (i.e. ~~Labor camp,~~ construction of material storage area etc.)	Under the sub-project intervention, the overall score is low.	• The construction area is on a plain land. The entire construction area within the camp boundary needs to be well fenced so that children, people and others could be protected from any accidental events/injuries. • Construction camp and material storage area should be located at the site & approved by the Environmental Specialist of D&SC.	Contractor, environmental specialist of D&SC	Location of stockpiles	Prior to the start of Construction works.
	Transportation	Under the subproject intervention the overall score is **low.**	• Contractor should verify vehicles for the suitability of carrying, loading and unloading of materials.	Contractor, environmental specialist of D&SC	• Record of regular inspection. Record of accidents/incidents	Monthly monitoring.
	Storage of construction materials	Under the subproject intervention the overall score is **low**.	• Train concerned person and team assigned for the construction work to ensure items are stored properly and away from steep slopes.	Contractor, environmental specialist of D&SC	• List of materials and sources of materials;	During Design Stage
3. Construction	**Noise Impacts**	Under the sub-project intervention, the	• Avoid high noise making activities during active hours. One very effective method is to discuss with the CiC authority and settle for a	Contractor, environmental specialist of	Number of complaints from	Daily

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/ Institution Responsible	Monitoring Suggestions	
					Indicators	Frequency
Phase		overall score is low.	time for heavy machinery usage. • Involve the community in planning the work program so that any particularly noisy or otherwise invasive activities can be scheduled to avoid sensitive times. • Avoid using of construction equipment producing excessive noise at day working time & at night. • Ear protection devices for the workers & site staffs should be available in site during construction period.	D&SC	stakeholders, Use of silencers in noise producing equipment and sound barriers, Noise Level following decibel meter (dB)	
	Air pollution	Under the subproject intervention the overall score is **low.**	• Water spraying for dust control; construction materials with potential for significant dust generation shall be covered; no smoke emitting equipment; and limiting speed of construction vehicles in access roads and work sites to maximum of 20 kph.	Contractor, environmental specialist of D&SC	Location of stockpiles; Number of complaints from stakeholders; Records of air quality inspection, if any.	Visual observation and monitoring of air quality during construction period.
	Workers' health and safety	Under the sub-project intervention, the overall score is	• Prevent excessive noise; • Construction staff are to make use of the facilities provided for them (e.g., fires for cooking);	Contractor, environmental specialist of D&SC	Numbers of complaints from sensitive receptors;	Monthly

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/ Institution Responsible	Monitoring Suggestions	
					Indicators	Frequency
		low.	• No fires permitted on site except if needed for the construction works; • Staff must be trained up for operating equipment, • Availability and access to first-aid equipment and medical supplies. • Ensure the presence and use of safety gear at site: Ear protection devices, Goggles, Illuminating jackets, Masks, Gloves, Helmets, Uniforms etc., • Paint containing low VOC shall be used, and workers must use nose-mask during the painting works. • Ensure adequate portable supply of drinking water. • Mobile Sanitation facilities for male & female workers separately.		Number of walkways signage, and metal sheets placed at project location;	
4. **Post-Construction Phase**	Safety/Location signage	Under the issue the overall score is **low**.	• The contractor shall provide, erect and maintain informatory/safety signs written in local language, wherever required.	Construction Contractor.	Location signage and safety instruments at suitable locations and chainage.	Immediately after the construction work is over.
	Construction clean-up (Damage due to debris,	Under the sub-project	• Remove all spoils wreckage, rubbish; wires, plastic etc.	Contractor	Worksite is restored to	After the completion

Section	Main Environmental Impacts	Impact Significance*	Suggested Mitigation Measures	Person/ Institution Responsible	Monitoring Suggestions	
					Indicators	Frequency
	spoils, wire, plastic, excess construction materials)	intervention, the overall score is low.	• All affected structures rehabilitated/compensated; • All imported materials are to be removed; • The contractor must arrange the cancellation of all temporary services;		original conditions; worksite cleanup is satisfactory; camp has been restored to pre project conditions.	of Works

	Produced e-wastes management	Under the sub-project intervention, the overall score is medium.	• Contracting with vendors/suppliers to take back all the wastes (non-functioning products, equipment, batteries, spare-parts, etc.) on its own cost and will manage those in cooperation with the manufacturing company which it is representing for.	PIU	Defunct products and removal of those	Throughout the O&M period

* Overall Impact Score: High = Likely to cause long-term E&S impacts; Medium = Likely to cause temporary impacts; Low = Likely to cause little, short-term impacts

**Post-construction phase denotes the time period contractor use to clear and clean up the sites after the construction work is ended, perform tree plantation, grass turfing, and minor rectification till the official handing over the site to LGED, or owner of the site.

Recommendation for further environmental and social assessment and/or site specific environmental and social management plan: Yes

**If yes, please specify what assessments/plans would be required.* Mention some recommendation on E&S assessment …. ESMP

If site specific environmental and social management plan (ESMP) is followed the impacts can be mitigated and monitored. ESMP is attached.

Appendix-06: Environmental and Social Management Plan (ESMP) of this Sub project (site specific)

ESMP for Construction of Supply and Installation of 35 Solar PV Nano grid (LGED/EMCRP/AF/G-19)

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
Pre-Construction Stage	Loss of land / and other physical assets	• No land acquisition is allowed inside the camp so, there is no mitigation measures according to this impact.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of livelihood	• Under this subproject, there is no scope of negative impact on livelihoods of the people of catchment area. • Avoid activities that will have adverse impacts on the host communities • Awareness generation, disaster risk resilience or mitigation, implementation of renewable energy.	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Stakeholders Engagement	• All the project stakeholders will be consulted • Consultation meeting with nearby residents about the project objectives and scope of works • People living in nearby community will be involved with the GRM • All the stakeholders will be informed about the GRM	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Loss of right to access	• In case of unavoidable circumstances, alternative access will be provided. • Access road shall be well demarcated and accessibly paved.	PIU	Social Development Specialist and Gender Specialist of PIU, PSC
Pre-Construction Stage	Site Selection & implementing interventions: Human-elephant conflict	• Selection of sub-project sites and all implementing interventions must take place outside of the elephant corridor/influence area.	PIU	Environmental Consultant of PIU, PSC
Pre-Construction Stage	Site Preparation: Soil Erosion; Alteration of	• Selected site will be far away from any water bodies or	PIU & Contractor	Environmental Consultant of PIU,

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
	natural drainage	natural flow path to avoid the flash flood or any kind or surface runoff. • Minimize cut & fill operations, the site clearing and grubbing operations should be limited to specific locations only. • The existing slope and natural drainage pattern on the site should not be significantly altered. • The contractor shall ensure that site preparation activities do not lead to disruption of activities of the local residents.		PSC
Construction Activity	Noise from construction works	• Construction activities will be finished at day time within 05 PM. Proper measures will be taken to avoid any disturbances. • All Personal Protective Equipment (PPE) will be available in site before starting any kind of construction works.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Dust	• Construction machinery shall be properly maintained to minimize exhaust emissions of CO, particulate matter (SPM, PM2.5, PM 10) and Hydrocarbons. • Provision of using water sprinklers to dust control. • Construction materials should be covered properly while carrying in vehicles to the site. • Vehicle movement will be controlled on haul roads/access roads for limiting dust generation.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Safety Issues	• Unauthorized entry to the site area is completely prohibited and the site will be properly fenced with a single entry, for this purpose. • It will be ensured that proper training and guidance are	Contractor	Environmental Consultant of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		provided on general and occupational health and safety to Contractors' personnel and labors forces, and records of training sessions are to be kept on site. • All kinds of Child labor will be completely prohibited.		
Construction Activity	Traffic Management	• Contractors will discuss with traffic management authorities and take site specific traffic management measures to avoid traffic jam and any unwanted incidents or accidents.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Conflicts with existing users due to the scarcity of resource base.	• A detailed assessment of the available resources and consent of the local representative for withdrawal of water from existing surface water sources shall be taken. • If ground water is withdrawn, adequate approvals from the appropriate department need to be undertaken before setting up bore wells. • Camp in Charge must be consulted before any construction work starts.	PIU & Contractor	Social Development Specialist and Gender Specialist of PIU, PSC
Construction Activity	Increase in road accidents	• Maintain safety measures during the movement and operation of heavy machineries and equipment. • Adjacent community will be trained up about traffic management and awareness.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Conflicts with the local residents	• Awareness building session will be undertaken about prevention of child abuse, child marriage, GBV, sexual harassment, trafficking of women and children as well as illegal drug trade. Written records of this awareness building session shall be kept on site. • Work force should be prohibited from disturbing the flora, fauna including hunting of animals, wildlife hunting, poaching and tree felling.	Contractor	Social Development Specialist and Gender Specialist of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• Treated water will be made available at site for drinking purpose. • Labor code of conduct is to be disclosed through consultation.		
Construction Activity	Waste Management: Improper management and handling of hazardous and non-hazardous waste during construction.	Preparation of a waste management plan covering the following aspects: • Working areas are kept clean and tidy at all times. • The waste from equipment maintenance or vehicles on-site is managed responsibly. • Construction site is to be checked for spills of substances i.e., chemical, oil, paint, wire, debris, etc. • Bins and/ or skips should be emptied regularly and waste/ debris should be disposed of at waste disposal areas and/ or at the site. • Hazardous waste viz. waste oil etc. will be collected and stored in the paved and bounded area and subsequently sold to authorized recyclers. • The Hazardous Waste Management Rules are applicable and followed.	Contractor	Environmental Consultant of PIU, PSC
Construction Activity	Health & Safety Risks: • The potential for exposure to safety events such as tripping, working at height activities, fire from hot works, smoking, failure in electrical installation,	• All construction equipment will be properly inspected timely. • The risk assessment will be prepared time to time for all types of work activities on site. • Proper walkways will be prepared for adjacent people in existing boundary. • Proper Signpost at any slippery areas will be ensured in construction site.	PIU & Contractor	Environmental Consultant as well as Social Development and Gender Specialists of PIU, PSC

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
	mobile plant and vehicles, and electrical shocks. • Exposure to health events during construction activities such as manual handling and musculoskeletal disorders, hand-arm vibration, temporary or permanent hearing loss, heat stress, and dermatitis.	• Fire extinguishers will be located at identified fire points around the site. The extinguishers must be appropriate to the nature of the potential fire. • Electrical equipment will be ensured to be safe and properly maintained, and works will not be carried out on live systems. • Maintenance on electrical equipment will be carried out only by competent authorized persons. Adequate Personal Protective Equipment (PPE) for electrical works will be provided to all personnel involved in the tasks. • Provision to first aid box in sub-project areas will be ensured. • Proper Emergency evacuation response plan will exist in sub-project area. • All safety equipment will be available in sub-project site (safety, size, power, efficiency, ergonomics, cost, user acceptability etc.), the lowest vibration tools will be provided that are suitable and can do the works. • Paint containing low VOC shall be used, and workers must use nose-mask during the painting works. • Awareness training will be given to all personnel involved during the construction phase in order to highlight/make aware of the heat related illnesses of working in hot conditions such as heat cramps, heat exhaustion, heat stroke, and dehydration. • Adequate quantities of drinking water will be available at all Sites, on different locations within the site.		

Project Stage	Potential Environmental & Social Impacts/Issues	Proposed Mitigation Measures	Institutional Responsibilities	Supervision Responsibility
		• Provision to maintain proper PPE wherever necessary and to ensure that there are satisfactory washing and changing facilities. • Provision to ensure all workers exposed to a risk are aware of the possible dangers and also given thorough training on how to protect themselves and there should be effective supervision to ensure that the correct methods are being used.		
Operation & Maintenance	Noise disturbances to fauna	• Provision to maintain noise from the operation and maintenance of machinery and equipment by proper monitoring and measures. • Provision to take necessary lighting, caution for the works and necessary maintenance should be done in day light.	PIU/Contractor	Environmental Consultant of PIU, PSC, Union Member
Decommissioning during the project implementation period (including site clearance after the construction)	The impacts are similar to those listed in construction stage: • Pollution from waste materials • Health & Safety risks to workers and local community/DRPs	• Provision to proper measure of mitigation and monitoring to minimize or reduce the environmental and social impacts during decommissioning are anticipated to be similar to those identified for the construction phase.	Contractor	Environmental Consultant of PIU/D&SC, XEN, Cox's Bazar, PSC.

Prepared by: Harogopal Kabiraj, Environmental Focal Person, +8801714980171
Tanvir Ahsan Haque, Environmental Specialist, +8801688117059
Reviewed by: Md. Saiful Islam, Environmental Specialist, +8801913442006