Ministry of Finance
Republic of Maldives

TERMS OF REFERNCE (TOR)

for

CONSULTING SERVICES FOR PREPERATION OF DETAIL DESIGN AND CONSTRUCTION SUPERVISION OF NATIONAL EMERGENCY OPERATION COORDINATION CENTER (EOCC)

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CONSULTING SERVICES FOR PREPERATION OF DETAIL DESIGN AND CONSTRUCTION SUPERVISION OF NATIONAL EMERGENCY OPERATION COORDINATION CENTER (EOCC)

MALDIVES URBAN DEVELOPMENT AND RESILIENCE PROJECT

1. Project Background

The Republic of Maldives (Maldives) is an archipelagic nation made up of a collection of 26 atolls of 1,190 small coral islands. Of these, 188 are inhabited and home to about 407,000 people[1], who are spread out over more than 600 miles. Despite its uniquely challenging geography, remote location, and widely dispersed population, Maldives has become an upper-middle-income country by capitalizing on its extraordinary natural marine and coastal assets to promote growth and socio-economic development. The country has benefited from rich marine fisheries and high-end tourism.

Maldives is highly exposed to natural hazards and climate variability. With sea levels expected to rise and extreme weather events likely to increase in frequency and intensity, the low-lying Maldives is considered one of the world's most vulnerable countries. The country's maximum elevation is 2.4m above sea level[2]. The consequences of high frequency events such as monsoonal flooding, coastal erosion, saltwater intrusion, sea swells and sea level rise, combined with the potential of thunderstorms, flash floods, prolonged dry periods, and coral reef destruction, pose a real threat to lives, livelihoods and the economy of Maldives. As coastal erosion and pressure on inhabitable land resources increase, the physical vulnerabilities of island populations, infrastructure, and livelihood assets will increase as well. The effects of climate change, if poorly managed, could cause annual economic losses of more than 12 percent of Maldives' GDP by 2100.

[1] Projection based on Ministry of Finance and Treasury, National Bureau of Statistics (2014), 2014 Maldives Census.

[2] The World Bank Group, 2017. Climate Risk and Adaptation Country Profiles.

The Maldives Urban Development and Resilience Project (MUDRP) supported by the World Bank (WB) seeks to enhance urban services in selected cities in Maldives and strengthen the Government's capacity to provide effective response to disasters. The project has four components which are implemented by the Ministry of National Planning, Housing and Infrastructure (MNPHI), Housing Development Corporation (HDC) and the National Disaster Management Authority (NDMA).

The Subcomponent 1.2 ***Strengthening Emergency Response Systems*** will aim to enhance the Government of the Maldives' (GoM) capacity in Emergency Preparedness and Response (EP&R) by supporting the establishment and operationalization of the National Emergency Operations Plan (NEOP) through the establishment of an Emergency Operations Coordination Center (EOCC) within the National Disaster Management Authority (NDMA). When activated, the center will be used to perform the following functions: (a) Information and communication management including public information and media management; (b) Coordination with stakeholders to ensure efficient and effective response; (c) Resource Management and Coordination; and d) Liaison with external organizations including UN and other international and national non-governmental organizations and private sector entities. To efficiently coordinate disaster and emergency response, the EOCC will consist of, among other things: a community incident reporting system; a GIS system with data and information essential for efficient emergency response coordination; a call center function; and a coordination system based on Standard Operating Procedures (SOPs). The Center will be connected to all the key agencies involved in EP&R at national, atoll and island levels, including but not limited to the Maldives National Defense Force (MNDF), the Coast Guards, the Fire and Rescue Service, the Maldives Meteorological Service (MMS), the Health Emergency Operations Center (HEOC) at the Ministry of Health and local government bodies.

The establishment of functional Emergency Operation Coordination Center (EOCC) is a core element in any national effort to respond to disasters that affect the country. A close relationship with the MMS and other ministries with hazard-specific expertise will be required to ensure 24/7 situational awareness and early warnings of potential events. This project will provide support for the establishment of a fully operational EOCC through the following three phases:

I. **Design phase**: The primary outputs of this phase are: a) design of the Emergency Operation Coordination ICT System that includes a community incident reporting system, a GIS system with data and information essential for efficient emergency response coordination, a call center function, and a coordination system based on Standard Operating Procedures (SOPs); and b) technical specifications of the equipment to be purchased. The EOCC will be housed within the NDMA and the design of the EOCC has to take into account the space availability

and the availability of staff to man the center. This has to be carried out in close consultation with the Chief Executive and the other senior staff of the NDMA.

II. **Build phase:** The primary output of this phase should be the design input and supervision of the NDMA office space during the construction phase. This is to ensure the safety and integrity of both the site and the structure to be able to host all necessary equipment to be able to perform the intended functions. The structure should be able to withstand the known hazards (e.g. windstorm, fire, floods, etc.) and should be capable of 24/7 operation for an extended period even during major disasters affecting the immediate area.

III. **Equip phase:** The building should be supplied with the appropriate equipment and install the developed EOCC system to enable the full functionality required for disaster response coordination, even during times when the immediate area is directly affected. This may include monitor and projection systems, map displays, multi-layered telecommunications equipment (landline, mobile, satellite, radio etc, depending on the affordability for NDMA to maintain), power back-up systems, security systems, etc.

In this context, the PMU and MNPHI envisages to hire a qualified consultant firm with proven expertise and background in the design and implementation of EOCCs to support NDMA in implementing the design, supervision and equip phases as will be described in the TOR.

2. Objective of the consultancy

The objective of this consultancy is to design an Emergency Operation Coordination Center (EOCC) for the Maldives NDMA and supervise the implementation of the design during construction, equipping and installation phases. The overall expected outcome of this activity is to establish a fully functional EOCC.

The success of the activity will be measured with the following three indicators:

a. **Completion of the EOCC design (following consultation with NDMA and key stakeholders):** Produce and present a complete design for the facility (based on available space). The design and associated documentation should be comprehensive and sufficient to enable construction of new building. It should also account for the necessary Information Communication and Technology (ICT) and electrical systems, call center function, hardware, and resilient infrastructure that will ensure all equipment will be functional once installed and that the facility will operate despite catastrophic events. In addition to the physical design of

the EOCC space, it also involves the design of the EOCC ICT system as detailed in below sections and prepare technical specifications of the equipment for the EOCC.

b. **Supervision of the EOCC new building :** Supervise the works for quality assurance and quality control, including approval of the materials and workmanship of the works in cooperation and in consultation with NDMA to ensure timely completion of the project. Provide technical support to ensure work aligns fully with the approved design.

c. **Equipping of the EOCC:** Provide technical support to ensure equipping of the EOCC aligns fully with the approved design and develop SOPs and supervise the installation process for quality assurance.

3. Scope of Work

The scope of work consists of the four phases below.

The Consultants are expected to provide detailed technical proposals to further elaborate the basic scope of the work defined below by demonstrating the past relevant experience in other countries and knowledge on global best practices.

Phase 1: Project Initiation

Project Initiation

The Consultant shall conduct a review of existing ICT systems (including Spatial Data System, Citizen Reporting Mechanism, Communications Mechanism, and IT SOP System), Call Center Function, Coordination Mechanism, and Hardware (Displays, Computers, phones etc.). The Consultant shall: 1) explore the background of the Maldives' EP&R system, including the NEOP and the SOPs, DRM Act and the EP&R legal and policy framework; 2) identify recent natural hazard events that impacted the country; and 3) will consider how the EOCC design can be optimized to help manage these events.

The consultant shall engage NDMA and other key stakeholders to discuss the concept of the EOCC and its role and functions in coordinating incidents (pre, during and post emergency), EOCC facilities and operating procedures, and different considerations and processes for building a resilient EOCC. The consultant shall review information and communications technology for the EOCC and the role of emerging technology in maintaining information sharing, planning, and resource coordination. Finally, the consultant shall review the need for appropriate Human Resources functions and their capacity building (capacity and needs assessment).

Output: Inception Report. The report shall describe the understanding of the objectives and tasks, the design and supervision approach, a conceptual framework of the system design, detailed project schedule including critical path, staffing plan, project management approach, and the quality control method to ensure the project reaches its goals.

More specifically the report shall describe: data collection schedule, list of interviews (provide details for each interview, including the participant's name, a proposed location and time, and focus and guiding questions for the interview), the draft work plan and detailed work schedule, provide a brief review of academic literature to explore the background of Maldives's EP&R system, study of the National Strategy for Disaster Risk Reduction and Disaster Recovery Framework, the EP&R legal and policy framework, existing emergency/contingency plans and standard operating procedures. The report will also look at the current IT systems with focus on: Communication Requirements; Information Requirements; Information Technology Requirements; Information and Data Management Tools; and Infrastructure for Communications, Information and Data Management.

Phase 2: Development of the Detailed EOCC Design

The EOCC will be established inside the new NDMA building that will be developed by the Government of Maldives. The new building will be established in Hulhumale. The construction of the new building will be undertaken in collaboration with the Hulhumale Development Cooperation (HDC). The main role of construction will be carried out by contractors hired through HDC and the consultant is required to provide requirements for the two floors dedicated for the NDMA to house the EOCC. Also the consultant is required to outline the quality standards that is required for the building space and supervise the same during construction. NDMA will be housed in a 5 story building with floor area of minimum 3,500 square feet each and will consist of two floors dedicated for NDMA. The EOCC and the system has to be designed considering the capacity issues, especially staffing and space that the NDMA is facing. However, the consultant may propose the minimum requirements to run an EOCC in consultation with the NDMA and other stakeholders. This will include following tasks.

Development of the detailed design and drawings for the EOCC (based on available space):

The Consultant shall prepare the detailed design (if needed) and drawings work of the EOCC layout, including but not limited (as applicable to the context) to thermal and sound insulation, heating and cooling systems, water supply, internal and external drainage system, sewerage system, electrical system, IT and communication networking, audio/visual system, room layouts, furniture and fixtures, flooring, security system, fire security and safety system, internal and

external lighting, water proofing, parking, landscaping, compound boundary walls, and any other features as required by NDMA for the purpose of tenders/bids/quotations to be called whenever required.

The Consultant shall complete the conceptual EOCC design. This task will consist of the following inputs among other things:

- Prepare and submit conceptual design, 3D views from all directions and drawings with reference to the requirements given and in accordance with the standards of the concerned building, rough cost estimate, report giving details of useful area, circulation area, plinth area, ground coverage, floor area ratio, services and broad specification, etc.
- The design and drawings should be in compliance with (i) rules and regulations of approving authorities (ii) World Bank safeguards (iii) necessary hazard risk mitigation. Building design should consider access for people with special needs.

Output: Preliminary Design Report. The output of this task will be a complete set of drawings, design and any other necessary documents both in hard and soft copy to (i) acquire necessary approvals from appropriate statutory authorities and (ii) enable tenders/bids/quotations to be called for the equipping of the EOCC.

The report shall include, but not be limited to, the following:

a. Executive summary, including project background, consultant role, identification of GoM contact, etc.
b. Summary of advice, and anonymized minutes from, the Technical Working group meetings.
c. Recommendations on resilient layout and systems and how the preliminary design addresses those considerations.
d. Summary of expected EOCC services.
e. Detailed note of how all design considerations have been addressed.
f. Time and Cost Analysis
g. Analysis and summary of materials to be used in major items.
h. Summary briefs on architectural design, structural design, utility systems design, landscape and parking design, etc.
i. All preliminary drawings, master plan and 3D views.
j. Schedule of project with detailed analysis and risk management plan to ensure project completion within the identified timeframe.
k.

The report shall be accompanied by a presentation.

Revised documents based on NDMA's feedback

The Consultant shall be responsible for making changes to the design, drawings and other related documents that are required by the review and approval process of the statutory authorities.

Output: Revised Design Report. Revised documents addressing issues raised during approval process as well as at any stage of the project. Revise the concept drawings and associated reports based on feedback from NDMA and the technical working group led by NDMA. The revised design shall be considered as the preliminary design until the necessary approvals are received from the appropriate statutory authorities.

Phase 3: Design of the EOCC ICT System

The EOCC ICT System will include the following key components: a) a community incident reporting system; b) a GIS system with data and information essential for efficient emergency response coordination; c) a call center function with required minimum infrastructure; and d) an inter-agency coordination and communication system based on Standard Operating Procedures (SOPs). The consultant may propose additional features for this integrated ICT system based on the needs identified during stakeholder consultations. One key thing to keep in mind is the sustainability aspects, especially the ability of the Government/ NDMA to man and maintain the system. At all possible times, open source software tools to be customized and used in developing this system.

Community Incident Reporting System

The integrated ICT system of EOCC should have a system that allows public and other first respondents at different levels to report hazard incidents with the location. It should be received at the EOCC with the location and recorded on a map (probably connected to the GIS System). Both web and mobile applications should be developed to allow this function (depending on the requirements, the consultant may develop a suite of applications of which the reporting application can be a component). An open source platform is preferred. It should be designed to allow maximum potential users to use it during an event. The system should allow downloading of data in GIS compatible formats for later detailed analysis.

GIS System

The GIS system should preferably be built using an open source software platform and should be included with the best available GIS layers for Maldives (hazard, exposure and vulnerability

data, different response resources for response both human and physical etc), that will allow the NDMA to efficiently coordinate emergencies. The system should have the provisions to include the better data layers when they become available and the consultant should prepare a program to acquire/ generate the data layers that can best serve the NDMA's purpose and carry out necessary training in acquisition and incorporation of new, better data layers in the system.

Call center function

The EOCC should have a call center function with the ability to scale up if required. It has to be designed considering the NDMA's staff capacity, but the minimum requirements to be met. The call center should be equipped with the necessary equipment and the call center staff to be trained on their duty. Details of this system should be given in the inception report.

Coordination system based on the SOPs

This system should allow NDMA to coordinate response efforts with its stakeholders before, during and after a disaster event. It will include, but not limited to: a) receive information from technical agencies related to impending or current hazards; b) analyze the potential impact of the hazard on communities, different sectors etc; c) disseminate alerts and warning to stakeholders and alert them on the actions needed; and d) disseminate the early warning messages to the public. When designing this system, potential impact of hazard on the communication systems to be taken into account, thus setup redundant channels.

Phase 4: Supervision of the EOCC building

Supervision of the EOCC building and progress tracking

The Consultant shall begin supervising the construction of the EOCC building/ space to make sure that it gets completed as per the identified timeline. The consultant shall conduct regular inspections of the works and materials to ensure structural integrity and design elements are being met according to design and engineering requirements. The Consultant shall work with the Project Management Unit (PMU) under NDMA to ensure an agreed-to minimum number of joint inspections with NDMA. In addition, NDMA may participate in any inspection being conducted by the Consultant with minimal notice.

Output: The Consultant shall provide a brief monthly report on the progress of the EOCC building space in relation to the project plan identified. In the event of forecast delays and/or cost overruns, the Consultant shall provide a detail plan on how these will be mitigated to ensure successful completion of the project. The Consultant shall be available to discuss these

reports with NDMA upon request. The reports shall continue to be submitted quarterly until the EOCC building and equipping stages are completed.

The progress tracking will consist of but not limited to:

a. On-site briefings to demonstrate project advancement, discuss any deviations from the timeline and mitigating actions required, work site safety and ensure general situational awareness. These briefings and associated short report shall occur monthly.
b. Quarterly Progress Reports will provide a detailed, written account of work completed over the last quarter and work forecasted to be completed in the following quarter. An explanation will be provided by the Consultant for any deviation from the identified project timeline. These briefings and associated report shall occur every three months.
c. Ad-hoc meetings as requested by either NDMA or the Consultant to address critical issues as they arise such that the overall project timeline is not compromised

Output: Supervision Reports. The consultant shall produce monthly progress briefs and quarterly progress reports.

The Supervision Manual:

The Consultant shall prepare a Supervision Manual that outlines routines and procedures to be applied in contract management, site supervision, and quality assurance metrics to be tracked weekly and general administration. This has to be prepared in parallel to phase 2 above and should be ready by the time the contractor comes on board.

The manual shall also include, but not be limited to, the following:

a. The quality standards that apply to the project, with reference to the technical specifications and relevant codes and guidance.
b. Quality control, quality assurance and process improvement approach for the project.
c. Quality control tools and techniques that will be applied.
d. An accountability matrix that clearly demonstrates accountability and responsibility assignments, including who will be involved in managing quality, when and what their specific duties will be.
e. The metrics that shall be used to measure quality and how this data will be collected, analyzed, stored and shared.
f. Check lists for inspection of material and processes.
g. Flow chart of processes to detect potential quality problems.
h. Scope for periodic quality audits completed by the Consultant in collaboration with the NDMA project focal person and NDMA supervision consultant.

Completion of the EOCC Building/ Space

The Consultant shall oversee and ensure completion of the EOCC building/ space. This will include installation of necessary accessories/ equipment, any required site modifications and access provisions prior to closure of the project.

Phase 5: Facilitate Equipping of the EOCC

Facilitate equipping of the EOCC

Parallel to the Phase 2 and Phase 3 activities, the Consultant shall prepare technical documentation required for EOCC operations including detailed technical specifications, drawings where required and estimated costs associated with each equipment item to the satisfaction of NDMA (including but not limited to: Communication Requirements; Information Requirements; Information Technology Requirements; Information and Data Management Tools; and Infrastructure for Communications, visualization equipment, Information and Data Management etc).

Note: Phase 2 and 3 activities should be carried out simultaneously to save time. Thus, the phases will have overlapping activities.

Output: Procurement Plan. Procurement Plan will include all the goods that are required to equip the EOCC. Together with the procurement plan, consultant should submit detailed technical specifications for all these items. The list of equipment should be provided with details on its priority and function. These goods will be procured by the client (PMU at MNPHI)

Technical support

The Consultant shall provide technical support during NDMA-led equipment procurement as well as supervision of equipment installation to ensure quality control and alignment with the EOCC design.

Develop EOCC Building Maintenance Guide and Schedule

To ensure that the EOCC building is maintained at a high state of resilience, the Consultant shall develop a technical guide for DRDM building maintenance staff. This Guide shall minimally include details on the utility and resilient systems included in the EOCC building. Within the building envelope this may include systems such as HVAC, primary and secondary electrical, plumbing, etc. and externally this may include painting requirements to ensure

concrete maintains its integrity, clearance of any rain water drainage systems, landscaping maintenance, etc.

Output: Building Maintenance Guide. The Guide will also include technical specifications for the systems equipment used in the building, such as HVAC, generators, etc. as well as the model number, parts and services supplier and the warranty information associated with the equipment.

Installation of Equipment, Software, Operation and Handover of the EOCC

The consultant will install the procured equipment in the EOCC, install the EOCC ICT software system developed, operate and hand the center over to the NDMA. At least three simulation exercises should be conducted within a month after the completion of the system, and the NDMA should provide a completion certificate indicating the successful completion of the project.

Final report

This Report will represent the final project output. It should cover, but not limited to: a) operation manual for the EOCC (how the system should be operated); b) technical specifications of all the equipment used, and their maintenance requirements; c) source codes of all the software developed for the EOCC ICT system; d) standard operating procedures for the operation of the EOCC; and e) plan for simulation exercises/ mock drills.

Support and Maintenance

The firm is expected to provide support to maintain the system to ensure smooth operation including trouble shooting during operation for at least one year. The firm may consider this in the preparation of the technical and financial proposals (since this is a simple system one ICT expert allocated on part-time basis would be sufficient), The firm may involve the NDMA ICT focal point and provide necessary training for him/ her in system maintenance, so that once the system is fully handed over, he/she could attend to the routine maintenance/ troubleshooting.

4. Deliverables Schedule

Description of the expected outputs was provided in section **2.0 Scope of Work** above. All outputs shall be submitted to MNPHI and NDMA in soft and hard copy.

	ToR phase	Output Number	Output Title	Due Date (From the date of contract signature)	No. of Hard Copies
1	Project Initiation	1	Inception Report	Within 3 weeks	2
2	Development of the detailed EOCC design & drawings for the of the EOCC space	2.1	Conceptual Design Report	Within 3 months	1
		2.2	Preliminary Design Report	Within 5 months	1
		2.3	Revised Design Report	Within 6 months	1
		2.4	Final Design Report Including floor plans	Within 7 months	3
3	Design of the EOCC ICT System	3.1	A Beta version of the EOCC Software Platform	8 months from Inception	
		3.2	Final-ready to install version of the EOCC Software Platform	12 months from Inception	
		3.3	User guides and source codes document	12 months from Inception	
4	Supervision of EOCC Building/space	4.1	Progress Tracking Report	Within 9 months	1
		4.2	Work Plan for Supervision (Supervision Manual)	Within 9months	3
		4.3	Quarterly Progress Report	Every three months until end of project	1
5	Facilitate equipping of the EOCC	5.1	Procurement Plan and Technical documentation for equipping the EOCC	Within 8 months from Inception	2
		5.2	Hand over fully operational EOCC	Within 18 months of Inception	
		5.3	Develop EOCC Building Maintenance Guide and Schedule	Within 18 months	2
		5.4	EOCC Final Report	Within 18 months	2

5. Specific Inputs to be provided by the NDMA

NDMA shall provide the following documents to the consultant:

i. The site plan
ii. National Emergency Operations Plan (NEOP)

6. Implementation Arrangements

The Consultant shall work closely with the MUDRP PMU and NDMA. Reports generated as per this ToR will be submitted to NDMA for review. The Consultant is expected to join meetings and other occasions as and when needed and coordinated by the PMU and NDMA. During the supervision and equipping phases, the Consultant will report to, and seek prior permission from NDMA before taking any of the following actions:

a. Consenting to the subcontracting of any part of the works.
b. Certifying additional cost determined necessary for continuity of equipping works.
c. Ordering suspension of work.
d. Issuing the notice to commence the work.
e. Approving an extension of time.
f. Issuing a variation except if such variation would be within the limits as indicated in the civil contract document.
g. Approving new rates either for existing items of work, which arises from variation quantities beyond the limit, defined in the contract or fixing rates of non-priced works involving any extra item and certifying any additional cost determined under the provisions of contract.
h. Issuing the order for special tests not provided for in the contract and determining the cost of such tests, which shall be added to the contract price.
i. Potential/ required collaboration with the private sector, especially the telecom service providers

7. Duration of Assignment

Duration of the contract is as follows (Full period is 18 Months):

a. Designing and drawings for the EOCC building space – 7 months
b. Supervision: until the completion of the building space and equipping phases (including technical support)
c. Provide technical specifications for equipping –within the 8 months of design period

8. Staffing Requirements

The Consultant is free to propose a staffing plan and skill mix necessary to meet the objectives and scope of the services. The skill sets expected for this project include architectural design, civil/structural engineering, EOCC specialist, GIS and ICT. If all the required skills are not available within the firm, the Consultant is encouraged to form partnership or hire experts from national or international firms.

As part of the proposal, the Consultant Firms should identify the members of the project team noted in the following table, including where these roles are intended to be filled full-time throughout the project or engaged on an as-needed basis. For each role, the Consultant shall identify the expected person-months required from each role, including which project phase involvement is expected and whether the involvement will be full-time or intermittent and the expected monthly rate for each position.

The following table provides an indicative list of personnel that the Consulting Firm should propose, including suggested months required for each position. Note that given the nature of the project, each position may be continuous or intermittent as the Consulting Firm deems appropriate to the project tasks. In consultant's proposal, a clear and detailed plan illustrating the involvement of these experts to be provided.

S.N	Required key staff	No.	Estimated input (in man months)
1	Project Manager (with expertise in Emergency Operations, ICT, Disaster Management, Communications Systems)	1	Consultant may propose
2	Architect	1	Just for the design phase
3	Structural Engineer	1	If needed – during design phase
4	Civil Engineer	1	supervision of works
5	EOCC specialist	1	To be proposed by the consultant as per the requirement within the design period
6	Electrical Engineer	1	Limited inputs during
7	GIS Expert	1	Part time inputs during system design stage
8	IT Engineer/ Software Architect	1	To be proposed by the consultant as per the requirement within the design period
9	Software engineer	1	To be proposed by the consultant as per the requirement within the design period

Note: Above is for the development phase. The firms may propose the staffing requirement for the one-year maintenance period (since this is a simple system one ICT expert allocated on part-time basis would be sufficient – but the firms can propose the required staff and time inputs needed).

Description for each position:

1) Project Manager:

The Project Manager needs to have minimum of master's qualification preferably in ICT, Engineering, Disaster Management, Planning and other related disciplines with at least 10 years of experience in planning, designing and establishment of emergency solutions or ICT Solutions. The Project Manager will have a broad knowledge of all the components of the consultancy and should have deep expertise in at least one of the required specializations. The person will assume leadership and responsibility for delivery of all project outputs and results. The Project Manager will have direct and regular communication with the PMU and NDMA Focal Person, so strong written and verbal communication skills in English are required.

2) Architect:

The Architect should have a minimum of bachelor's degree in Architecture and 10 years of experience in architectural planning, designing and ensuring interior workplace functionality that promotes barrier-free access and accommodates safe and healthy extended use in high-stress situations. To ensure compliance and understanding of local design standards, a licensed architect will be required.

3) Structural/ Civil Engineer:

Structural/ civil Engineer should have minimum of degree in civil engineering and 10 years of experience in structural designing and supervision of construction projects. The experience in small island states will be advantageous. The expert should have significant experience with resilient building construction (including physical incursion, seismic, erosion, high winds, heavy rainfall, extreme wild land/structural fire, severe air quality degradation, etc.)

4) EOCC Specialist

The EOCC Specialist should possess and have a clear understanding of EOCC functions especially of the communication function, issues and challenges related to interoperability of different communication systems. Prior experience of installing telecommunication systems for EOCC and working on EOCC planning and designs would be desirable. A good understanding

and knowledge in Disaster Management/EOCC management with more than 10 years of experience and related field will be preferred.

5) Electrical Engineer

The Electrical Engineer should have a degree in electrical engineering. The expert should have significant experience with electrification of public buildings, energy efficiency and backup power options and installation. The Electrical Engineer will have a minimum 10 years of experience and demonstrated experience with similar projects.

6) IT Engineer

The IT Engineer will require a degree in ICT/ computer science and have minimum 10 years of experience with the design, layout and future compatibility of ICT systems with particular focus on emergency response services and EOCC systems, especially with ensuring redundancy and system resilience. The expert will hold appropriate education and professional certifications in this field.

9. Reporting and Project Management

The consultant will work with the core team in NDMA and will coordinate with the PMU at MNPHI.

10. Payment conditions and schedule

The proposed payment conditions are as follows;

Description	Payment %
Upon submission of the Inception report (Output 1) and acceptance of the same by the Client	15%
Upon submission of the detailed EOCC design & drawings for the of the EOCC space (output 2.4) and acceptance of the same by the Client	25%
Upon submission of the EOCC ICT System (output 3.1) and acceptance of the same by the Client	15%
Upon submission of the EOCC ICT System (output 3.2 and3.3) and acceptance of the same by the Client	20%
Upon submission of the Quarterly Progress reports (output 4.3) and acceptance of the same by the Client	15%
Upon submission of the EOCC Final report (output 5.4) and acceptance of the same by the Client	10%

11. Consideration of COVID-19 impacts

Due to the ongoing COVID-19 pandemic, the firm may not be able to physically travel to the Maldives to conduct this work in initial months or entire assignment duration. The Consultants are expected to propose a feasible operational modality under such circumstance (e.g. partner with local firms or personnel) in the technical proposal.

ANNEXURES

Annex 1: General Requirements

I. Preparation of designing and drawings for the EOCC

1. Requirement of the EOCC structure

a. The preliminary design for the EOCC building should consider the diagrams in Annex 2 of this ToR.

b. This structure should include EOCC focused elements as well as office spaces with priority for EOCC requirement.

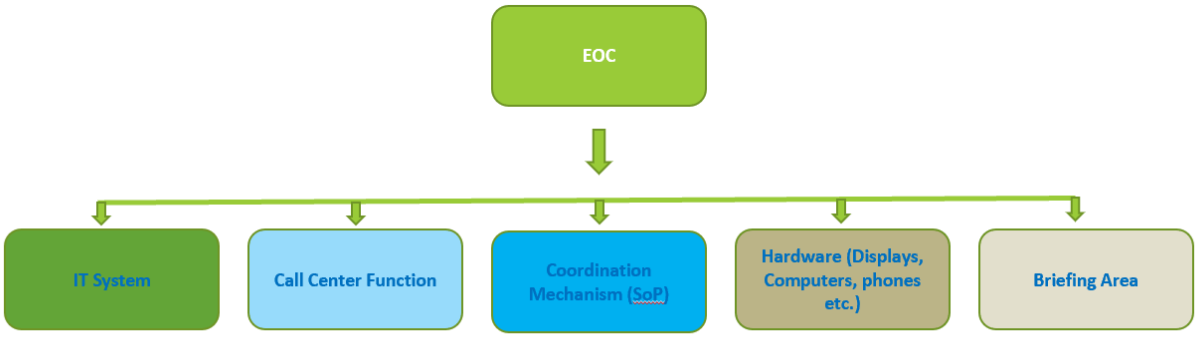
2. Coordination

a. During the project period (all phases), the Consultant shall arrange a minimum of one meeting per two weeks with the MNPHI PMU and NDMA for coordination and planning purpose starting from the project initiation date. The Consultant's Project Manager, along with other necessary Team Members, shall attend these meetings. The Project Manager, or designate, will take the note of the meeting and issue minutes for review and approval by the NDMA.

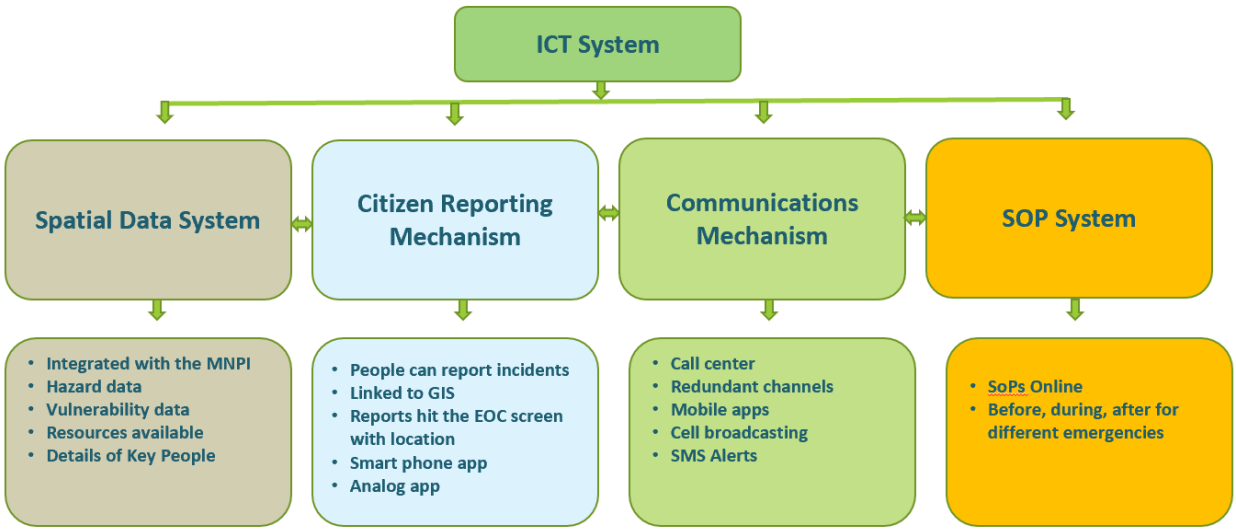
b. During all phases, the consultant should be available as and when needed.

Annex 2: Documents made available to the consultant

1. Suggested EOCC Components



2. Suggested Conceptual Design of the EOC



Annex 3: Principal Responsibilities for Supervision Phase and Equip Phase

In addition to the deliverables identified in Section 2, the principal responsibilities will be generally to carry out all the duties of the Consultant as specified in the supervision and equipping contract documents, within the limitations specified therein, but not limited to the following. Given that this does not involve construction of an EOCC building, some of the below responsibilities may not apply. However, all applicable for a rehabilitation of an existing office space to set up and EOC, develop necessary software, specifications for hardware and installation of all necessary hardware and software will be applicable.

1. Ensure that the works are in accordance with the technical specifications.
2. To verify and if necessary, order correction of the drawings submitted by the Contractor.
3. To issue a working drawing or modify the existing drawing (preferably within one month on request of the Contractor) or to supply a new/supplementary drawing which is not included in the contract, wherever required and to give appropriate associated instructions to the Contractor.
4. To approve setting out of the works.
5. To verify and if necessary, order correction of the drawings submitted by the Contractor.
6. Ensure a system of Quality Assurance of works, approve materials, sampling and testing procedure and Quality Control measures to ensure required standard and consistency in quality, at the commencement of item.
7. Check the laboratory and field tests carried out by the Contractor and develop a mechanism in consultation with NDMA to carry out an adequate number of independent tests other than the regular testing done by Contractor laboratory personnel.
8. Order special tests of materials and/or completed works, order removal and substitution of improper materials and/or works as required.
9. To make independent measurements and check all quantity measurements and calculations required for payment purpose and ensure that all measurements and calculations are carried out in a manner and at the frequencies specified in the contact documents.
10. To control and appraise the progress of the works, to order suspension of works and to authorize with NDMA's approval, extensions of the period of completion of works.
11. To monitor and check the day-to-day quality control and quantity measurements of the works carried out under the contract, keep all measurement records (in measurement

books- MB's) as per the directions of NDMA and issue payment certificates per agreed-to payment schedules, as identified in contract documents, when the quality of the works is satisfactory, and the quantities are correct.

12. To direct the Contractor in all matters concerning safety and care of the works and if required, to request the Contractor to provide any necessary lights, guards, fencing and watchmen, etc. to ensure a safe environment.
13. To direct the Contractor to carry out all such works or to do such things as may be necessary in his opinion to avoid or to reduce the risk in any emergency affecting the safety of life or of adjoining property.
14. To direct the Contractor to take all necessary steps including those mentioned in the contract to protect the environment on and off the site which arise due to operations.
15. To verify and correct the as-built drawings supplied by the Contractor.
16. To direct the Contractor to take all necessary steps to maintain the rate of progress of works as per the approved program of the Contractor on monthly basis.
17. To provide adequate supervision of the Contractor's work carried out in more than one shift thus matching the working hours to be the same as that of the Contractor(s).
18. To ensure timely completion of the project without diluting the quality standards envisaged and be fully accountable to NDMA in this regard.
19. Provide assistance to NDMA in respect of contract implementation, claims and other matters.
20. Advise and assist the Client/Employer with respect to arbitration, litigation related with this project, if so required, during contract period or after the contract period.
21. Review and ensure continuity of the Contractor's services in approved formats.
22. Assist/advise NDMA on advance actions required to be taken for handing over of site and in achieving different milestones for completion of projects as per schedule.
23. Assist NDMA in proper monitoring/progress of works and implementation of project through computer aided project management technique and management information systems.
24. To write a day-by-day project log which shall record all events pertaining to the admission of the contract, requests from and orders given to the Contractor, any other information which may at a later date be of assistance in resolving queries which may arise concerning execution of the works.

Annex 4: EOCC key characteristics

The key to developing a good disaster management system in the State is also to establish a functional EOC. A well-established EOCC (coupled with decision support system and trained human resources) is essential for the effective direction, control, and coordination of emergency response and recovery efforts. EOCC serves as an effective facility for coordinating all emergency response efforts and optimize the emergency communication and information management. Following characteristics should be considered for the development of the EOC:

I. Flexibility

Scale operations and adapt operational space to the all hazards event; e.g., operational space, furniture, communication network, administrative supplies, computer support and computing capability, decision making tools, etc., available to satisfy mission requirements.

II. Sustainability

Support operations for extended duration; e.g., be able to sustain operations 24 hours a day/seven days a week during all emergency situations without interruption; to the extent practical, be located in a place that is not a high-risk area for known hazards such as flood zone, liquefaction zone, other natural hazard, easy access to decision making authority, etc.

III. Interoperability

Share common principles of operations and exchange routine and time-sensitive information with key national and state level agencies, response agencies at the state and other EOCs, e.g., be able to communicate with state and district level administration and disaster affected site,

IV. Survivability

Sustain the effects of a realized potential risk and continue operations from the EOCC or a fully-capable alternate location (Disaster Recovery Centre), e.g., have an alternate EOCC that can be activated and used if the primary is damaged, or not accessible due to failure in communication or electricity network.

V. Data security

Protect operations from the unauthorized access and disclosure of sensitive information.

VI. Premises Safety

Ensure structural integrity of the facility to various threats and hazards, provisions for fire safety in the building, back-up mechanisms for continuity of operations (communications, power), safety of the occupants and security of premises from any unauthorized entry.

Abbreviations and Acronyms

BoQ	Bill of Quantities
EP&R	Emergency Preparedness and Response
GoM	Government of Maldives
HDC	Housing Development Corporation
MoF	Ministry of Finance
MNPHI	Ministry of National Planning, Housing and Infrastructure
MoD	Ministry of Defense
MMS	Maldives Meteorological Service
NDMA	National Disaster Management Authority
NEOP	National Emergency Operations Plan
PMU	Project Management Unit
HVAC	Heating Ventilation and Air Conditioning
ICT	Information Communication Technology
EOCC	Emergency Operation Coordination Center
ToR	Terms of Reference
WB	World Bank