

## TERMS OF REFERENCE

### Detailed Engineering Design Phase 2 (DED 2) and Tender Packages for Advanced Work concerning Kbal Hong Irrigation Scheme in Pursat province and Kanghot irrigation scheme in Battambang province plus two flood mitigation subprojects (Svay At in Pursat and Ou Sralau in Battambang province)

#### A. Project Background

1. The Ministry of Water Resources and Meteorology (MOWRAM) is preparing an Integrated Water Resources Management Project (IWRMP) to be co-financed by Asian Development Bank (ADB) and Asian Infrastructure Investment Bank (AIIB). The IWRMP will support the strengthening of the integrated water resources management (IWRM) to foster socioeconomic development in the project area in the river basin groups in Pursat and Battambang provinces covering rivers Pursat, Svay Daun Keo, MOUNG Russei, Sangker which are located in the southwest of the Tonle Sap Great Lake (TSL). The project will be aligned to impact: Cambodia's Water Resources Management (WRM) to adapt to the changing climate in sustainable ways to support social and economic growth whilst protecting the environment and enhancing ecosystems in the river basin groups covering Pursat, Svay Daunkeo, MOUNG Russei, and Sangker<sup>1</sup>. These river basin groups were assessed as highly vulnerable to climate change impacts. In the target basin groups, expected changes to precipitation and temperature patterns will result in more frequent short dry periods, which will increase water demands in various sectors in dry season. Substantial increases in wet season rainfalls are also expected, increasing the risk of both riverine and lowland flash flooding events. The potential for increased peak water levels at the TSL further exacerbates this risk.

2. The project is expected to have the following outcome: livelihoods in the target river basin groups made climate and disaster resilient through climate adaptive integrated water resources management (IWRM). The project target river basin groups and location are shown in Figure 1.

3. The IWRMP covers 3 project outputs as follows:

**Output 1: Planning, coordination, and climate change adaptation capacities of water resources management strengthened.** The project will help the two provinces (i) strengthen existing river basin committees (RBCs), (ii) develop effective and climate-adaptive river basin management plans, (iii) develop climate-adaptive reservoir operation plans for flood and dry season operation; and (iv) update river flow management plans with water allocation rules for various water users. These plans will be updated or developed in consultation with key water user stakeholders. The project will help the National River Basin Management Committee provide RBCs with necessary support, particularly on the climate change adaptation aspects. The project will also (v) upgrade existing and install additional hydrometeorological monitoring stations with remote monitoring and data transmission systems; and (iv) develop and operate drought and flood forecasting and warning systems with drought and flood risk maps. Output 1 will also provide training to RBCs to increase their climate-adaptive WRM capacities and enable them to perform their duties. The project will also help MOWRAM and two provinces develop sustainable WRM operation and management strategies to ensure sustainable operation of the developed plans and sustainable operation and maintenance (O&M) for developed/upgraded WRM infrastructure under outputs 2 and 3.

**Output 2: Water supply capacity increased.** The project will modernize two irrigation systems and efficiently provide reliable irrigation water increasing resilience to climate change risks for 17,020 ha command areas in Battambang Province and 13,500 ha command areas in Pursat Province. This will enable farmers to crop (i) rice in 32,330 ha during wet season, and rice and other crops in 7,190 ha during dry season in Battambang Province; and (ii) rice in 22,100 ha during wet season, and rice and other crops in 3,890 ha during dry season in Pursat Province, with expected increase in the crop yields. The

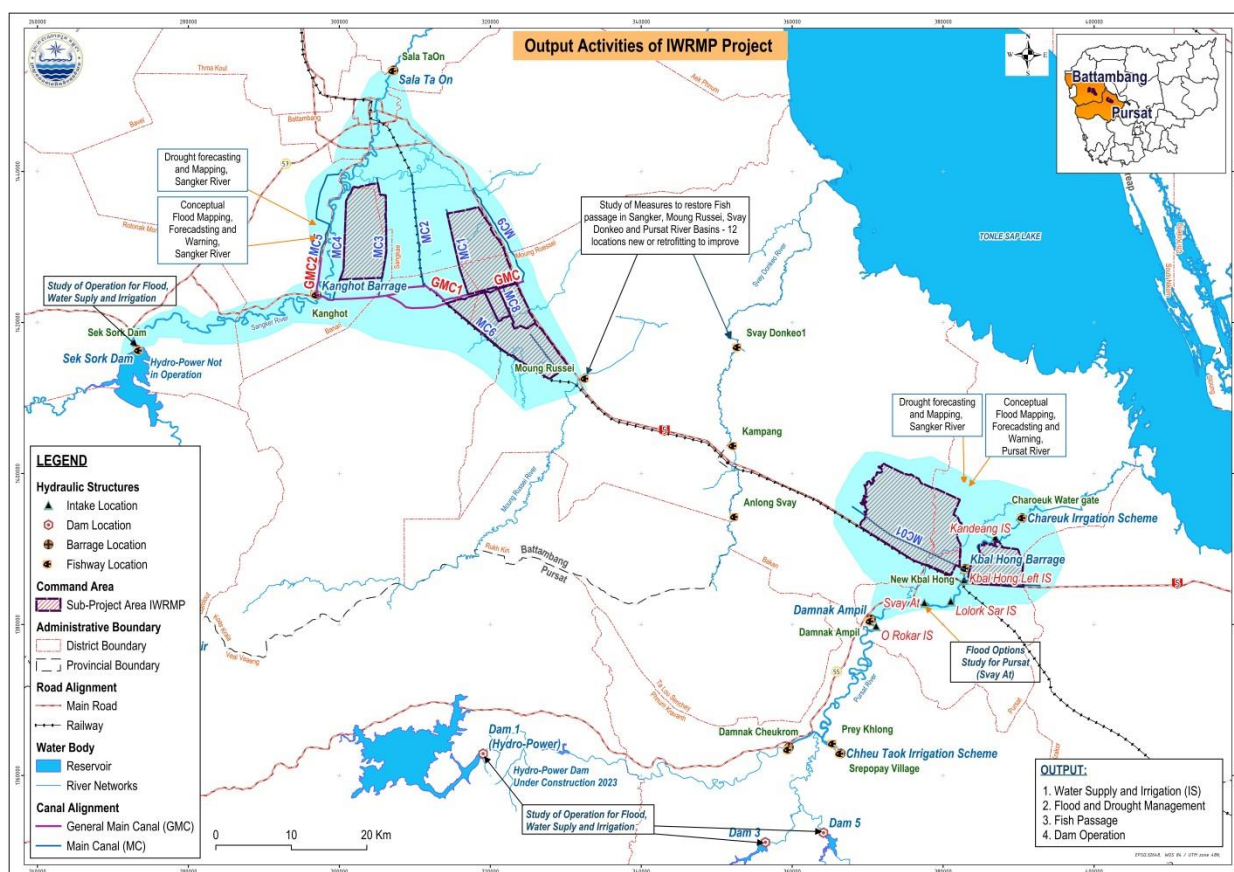
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<sup>1</sup> Beneficiaries are within Pursat and Battambang Provinces.

modernizations will include main, secondary, and tertiary canals, with flood discharge drainage structures, gates and other regulated structures, including farm turnouts. An existing barrage in the irrigation system in Pursat Province will also be remodeled for stable water intake. The project will train farmers in the target irrigation systems to (a) form and train 4 new Farmer Water User Communities (FWUCs) and strengthen 3 existing FWUCs for efficient water use and sustainable O&M of the tertiary canals, (b) crop non-paddy rice in 4,800 ha and manage their farming, and (c) demonstrate the alternate wetting and drying method (AWD) in 2,350 ha to grow paddy rice to reduce the methane emission while maintaining crop yield.<sup>2</sup> The project will also install 14 fish passages in existing and new river crossing structures for fish friendly river management. The project will help reduce the climate-induced drought risks for the population of 37,170 in Battambang Province and 35,060 in Pursat Province.

**Output 3: Flood risk during wet season reduced.** The project will (i) update operation rules of existing reservoirs with the increase in flood protection capacity during the wet season to adapt to the climate-induced flood risks as well as the increase in storage capacity during the dry season for more available water for irrigation; (ii) modernize old river channels in Battambang and Pursat provinces to divert the flood flow from the Sangkar River in the Battambang Province and Pursat River in the Pursat Province; and (iii) develop flood risk maps and operate gender-responsive community flood preparedness plans.

*Figure 1: Project Target River Basin and Location*



<sup>2</sup> The AWD will be implemented under the Attached Technical Assistance. The total emission of methane from rice field in Cambodia is estimated at approximately 0.376 million ton. The alternate wetting and drying method has been recommended by the International Rice Research Institute.

4. A summary of the scope to be procured under the project is shown in the following Table 1.

<p><b>Output 1 Planning, coordination, and climate change adaptation capacities of water resources management strengthened</b></p> <p><u>Goods</u></p> <ul style="list-style-type: none"> <li>Hydro-meteorology station improvement in the Sangker and Pursat River Basin</li> </ul> <p><u>Consulting</u></p> <ul style="list-style-type: none"> <li>Support to the Pursat and Sangker RBCs and capacity building for flood forecasting system, including development/upgrading and operation of (i) climate-adaptive river basin management plans, (ii) climate-adaptive reservoir operation plans with operation rules; (iii) update river flow management plans with water allocation rules.</li> </ul> <p><b>Output 2 – Water supply capacity increased</b></p> <p><u>Works</u></p> <ul style="list-style-type: none"> <li>Rehabilitation of Kbal Hong irrigation scheme, 15,000 ha, including a new barrage, 2 main canals, secondary canal intakes, and secondary, tertiary canals and structures</li> <li>Development and upgrading of Kanghot MC1, MC4, MC6, MC7 and MC8 irrigation scheme, 20,800 ha, including secondary, tertiary canals and structures, canal-side roads</li> <li>Construction of the fish pass structures at 12 locations in the Moung Russey, Svay Donkeo, Pursat and Sangker River Basins</li> </ul> <p><u>Consulting</u></p> <ul style="list-style-type: none"> <li>Project Management and Implementation Consultant (PMIC) including project management and coordination supports and construction supervision</li> <li>Establish the Farmers Water User Community and strengthening for Kbal Hong irrigation scheme</li> <li>Strengthening the Farmers Water User Community for Kanghot MC1, MC4, MC6, MC7 and MC8</li> <li>Agriculture support service for Kbal Hong and Kanghot irrigation schemes</li> <li>Training farmers to demonstrate the alternative wetting and drying (AWD) to grow paddy rice and reduce the methane emission (This services will be implemented under the attached technical assistance, separately from the consulting services for the IWRMP) for Kbal Hong and Kanghot irrigation schemes</li> </ul> <p><b>Output 3: Flood risks during the wet season reduced</b></p> <p><u>Works</u></p> <ul style="list-style-type: none"> <li>Svay At offtake channel including associated structures for flood risk mitigation</li> <li>Ou Sralau channel improvement including associated structures for flood risk mitigation</li> </ul> <p><u>Consulting (The below services will be integrated into the consulting services for output 1)</u></p> <ul style="list-style-type: none"> <li>Update operation rules of existing reservoirs</li> <li>Development of flood risk maps</li> <li>Community-based disaster risk management (CBDRM) including preparation of flood / drought preparedness plans for Kanghot and Kbal Hong sub-projects</li> </ul>
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5. The activities preparing physical intervention during project preparation stage included the following: (i) A consulting firm engaged by ADB for preparation of feasibility studies for: Kbal Hong and Kanghot irrigation systems, including the Pursat barrage, and flood risk mitigation schemes on Svay At and Ou Sralau, and outline design of fishways. A consulting firm financed by AIIB will be engaged by MOWRAM during the 2nd quarter of 2024 for detailed design, procurement assistance, and preparing resettlement plan for the Pursat barrage, including its intakes to MC1 and MC2, and its fishway. Further, the consulting services for the detailed engineering design, bid documents preparation, and preparation of the resettlement plans, detailed resettlement plans, social safeguard due diligence reports and community participation plan (CPP) for other works than the Pursat barrage, including its intakes to MC1 and MC2, and its fishway is currently under the recruitment separately under AIIB's financing through Project Preparation Special Fund (PPSF).

## **B. Purpose of Assignment**

6. The purpose of the Consultant's assignment is to undertake detailed engineering design, support the preparation and implementation of social safeguards documents and procurement assistance for all civil works packages except for the Pursat barrage, its intakes to MC1 and MC2, and its fishway.

## **C. Duration and Location of Services**

7. The duration of the assignment is 24 months. The PMU will provide office space for the Consultant in its PMU building at the MOWRAM, Phnom Penh, Cambodia, and the PIUs will provide office space for the PMIC field staff in the Provincial Department of Water Resources and Meteorology (PDWRAM) offices in Battambang, and Pursat provinces where the subprojects are located.

## **Scope of Services**

8. The scope of work will include but is not limited to the following:
- (i) Prepare the detailed engineering design (DED) of Kbal Hong Irrigation Scheme and Kanghot Irrigation Scheme subprojects and detailed engineering design of Pursat and Sangker flood subprojects, and detailed engineering design of fish ways.
  - (ii) Prepare detailed cost estimations and bidding documents following ADB's relevant standard bid documents, and support the PMU for advertisement of above works for the project.
  - (iii) Ensure compliance with ADB's Safeguard Policy Statement (SPS), 2009;
  - (iv) Support the Ministry of Economy and Finance-General Department of Resettlement (MEF-GDR) in planning, updating, and preparing the implementation of the contract package wise detailed resettlement plans (DRPs) for Kbal Hong Barrage and intake structures, Kbang Hong irrigation system and Kanghot irrigation system, as well as Output 3 subprojects (i.e. Sway At offtake channel including associated structures, and Ou Sralau channel improvement);
  - (v) Assist PMU and MEF GDR in dissemination of information and posting of safeguards documents in accessible public places;
  - (vi) Support PMU in monitoring and preparing of social safeguard due diligence reports (DDRs) and community participation plan (CPP) for activities under output 2 and 3 for submission to ADB;
  - (vii) Support and coordinate with the PMU/PMIC in conducting meaningful public consultations with affected communities.
  - (viii) Ensure technology and transfer of know-how from this consulting services to their counterparts in the PMU; and
  - (ix) Prepare quarterly progress reports (QPRs), annual reports, and a consultant completion report (CCR).

## **Detailed Outputs of the Assignment**

### **Key Timelines or Milestones**

9. The services are anticipated to commence around mid Feb 2025, with a duration of 24 months. However, detailed design and procurement of the first batch of packages are to be completed within 12 months of commencement.<sup>3</sup>

10. Services for the detailed design and procurement will be reimbursed under a lump sum form of contract, based on the deliverables submitted and subject to approvals from PMU-MOWRAM.

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<sup>3</sup> The detailed design and bid document will be prepared by another consulting services.

### Team Composition and Qualification Requirements for the Key Experts

11. An estimated total of 385 person-months (p-m) consisting of 52 p-m of international, and 333 p-m of national experts and non-key experts is required. The required positions and inputs are summarized below:

12. **Table 2. Summary of Required Positions and Inputs**

No	Position	Input (person-month)	
		International Qualification	National Qualification
Key Expert Positions			
1	Team Leader / Water Resources Specialist	10	
2	Deputy Team Leader / Irrigation and Drainage Engineer		12
3	Irrigation and Hydraulic Structure Design Engineer	20	
4	Irrigation and Hydraulic Structure Design Engineer		34
5	Hydro-mechanical and Electrical Engineer	4	
6	Hydro-mechanical and Electrical Engineer		6
7	Mechanical/Pump Engineer	2	
8	Mechanical/Pump Engineer		3
9	Fishery Specialist	3	
10	Fishery Specialist		5
11	Procurement/ Contract Management Specialist	7	
12	Procurement/ Contract Management Specialist		29
13	Social Safeguards/ Resettlement Specialist	6	
14	Social Safeguards/ Resettlement Specialist – 1		60
15	Social Safeguards/ Resettlement Specialist – 2		
16	Social Safeguards/ Resettlement Specialist – 3		
	Sub-Total 1	52	149
Non-Key Expert Positions			
1	Topo-Survey Engineer and Assistant Survey Engineers x 3		43
2	AutoCAD/ Civil 3D x 3		41
3	Field surveyor/enumerators (for DDR/CPP/DRP preparation) – Coordinators x 10		80
4	Data processor/analysts x 4		20
5	Gender Specialist		Consultant will need to plan non-key expert inputs for position 5-15 according to its own arrangements
6	Construction manager		
7	Construction Management Engineers x 3		
8	Materials/Quality Control Engineers		
9	Field Supervisors x 5		
10	Community Development Specialist/ FWUC Specialist		
11	Agriculture Development Specialist		
12	Operation & Maintenance Specialists		
13	Monitoring and Evaluation Specialist		
14	Financial Management Specialist		
15	Project Management Assistant		
	Sub-Total 2		184
	TOTAL	52	333

### 13. Responsibilities and Qualifications of Key Consultants.

#### 1. Team Leader/Water Resources Specialist – International

##### Responsibilities:

- (i) provide overall responsibility for supports during implementation, including preparation

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- and implementation of work plans;
- (ii) coordinate financial management;
- (iii) monitor progress against design implementation schedule and coordinate preparation and submission of periodic progress reports and technical reports;
- (iv) work closely with the PMU and advise the PMU Project Director;
- (v) coordinate with ADB, PMU, and others stakeholders and key institutions such as the Ministry of Mines and Energy (MME), Ministry of Agriculture, Forestry and Fisheries (MAFF), Fisheries Administration, Ministry of Economy and Finance (MEF), Ministry of Environment (MoE), and local authorities;
- (vi) provide guidance and directions to all experts of the team to ensure that the quality of works including designs meet a required standard;
- (vii) monitor the environment, work health and safety, quality assurance and control, resettlement and social safeguards aspects to bring minimum delays to the design works;
- (viii) be mainly responsible for the preparation of the QPRs, annual reports, and
- (ix) other reports that may be required by PMU and ADB.

Qualifications:

Having a Bachelor's degree in water resources engineering or management, preferably with a post graduate qualification, and at least 15 years of professional experience. Having experience in design, implementation and management for water resources management projects including major hydraulic structures such as dams, barrages and irrigations systems. Having experience of leading project teams, preferably for projects financed by ADB or the World Bank.

## **2. Deputy Team Leader/Irrigation Management Specialist – National**

Responsibilities:

In the absence of the Team Leader, the Deputy Team Leader will assume the overall management of the project. Duties are to support the Team Leader.

Qualifications:

Having a Master's degree or equivalent in water resources/irrigation engineering and 10 years of experience in the design and management of irrigation development projects. Preferably having experience of projects financed by donor agencies including ADB. Excellent communication skills in spoken and written English.

## **3. Irrigation and Hydraulic Structural Engineer – International**

Responsibilities:

- (i) investigate the structural conditions of existing irrigation and water management facilities, such as canals, concrete structures, pumps, and gates in the project area;
- (ii) assess the durability, usability, and suitability of those facilities for future water management and incorporate the assessment findings into the design of proposed facilities, including the appropriate use of dredge spoil depending upon contamination analysis as specified in the safeguards documents; finalizing layout of canals and drains with land owners in the right of way (ROW) of the Kbal Hong and Kanghot irrigation schemes, and other two subprojects under the Output 3;
- (iii) lead the preparation of detailed engineering design of facilities intended to improve irrigation efficiency and water productivity, ensuring the incorporation of climate proofing features,
- (iv) Hydraulic and structural design for the canal/ drain syphon, cross regulators on the MC1, MC2, and hydraulic design for the canals and drains in the command area, and
- (v) lead the preparation of cost estimates, technical specifications, bill of quantities for various irrigation facilities and, with the Procurement/Contract Management Specialists, prepare the tender documents for the construction of the systems.

Qualifications:

Having a Master's degree or equivalent in structural/civil engineering/hydraulics with at least 10 years of professional experience. Having experience in the design of water

management facilities, including irrigation canals and associated structures.

#### **4. Irrigation and Hydraulic Structural Engineer – National**

Responsibilities:

Duties are to support the international specialist.

Qualifications:

Having a Bachelor's degree in irrigation and drainage or hydraulic engineering or relevant subject and 10 years of professional experience in design and construction of irrigation or hydraulic structures such as dams, weirs, and irrigation systems. Experience of donor financed projects would be an advantage. Proficiency in spoken and written English.

#### **5. Hydro-Mechanical and Electrical Engineer - International**

Responsibilities:

He/she will be responsible for detailed designs of the gates for the cross regulators on MC1 and MC2, and other gates for the structures in the command areas of the Kbal Hong and Kanghot sub-projects and sub-projects for Output 3.

Qualifications:

Having a Bachelor's degree in hydro-mechanical and electrical engineering or relevant subject with at least 10 years of professional experience. Preferably having experience in the design and construction supervision of hydraulic structures such as gates manufacturing and installation, gates lifting and control systems, and installation and commissioning.

#### **6. Hydro-Mechanical and Electrical Engineer Specialist – National**

Responsibilities:

Duties are to support the international specialist.

Qualifications:

Having a Bachelor's degree in hydro-mechanical or electrical engineering with preferably 8 years of experience in the design and construction supervision of structural steelwork, hydraulic operation equipment, and their power and control systems. Experience of large-scale river or irrigation flow control structures would be an advantage. Proficiency in spoken and written English

#### **7. Mechanical/Pump Engineer – International**

Responsibilities:

The specialist will be responsible for detailed designs of the pump station in the MC2 of the Kbal Hong subproject in Pursat province and for providing necessary inputs in the bidding documents.

Qualifications:

Having a Bachelor's degree in mechanical engineering and preferably 8 years of experience in supervising the construction of preferably one pumping station, pump installation, and other pump machinery and works.

#### **8. Mechanical/Pump Engineer – National**

Responsibilities:

Duties are to support the international specialist.

Qualifications:

Having a Bachelor's degree in mechanical or electrical engineering with preferably 8 years of experience in designing and supervising installation of pumps and pumping systems, preferably including high-capacity pumping stations for irrigation or drainage.

Proficiency in spoken and written English.

## **9. Fishery Specialist – International**

### Responsibilities:

Duties are to work closely with MOWRAM, MAFF, PDWRAMs, and PDAFFs of Pursat and Battambang provinces and relevant; to prepare detailed designs for the fish-ways, and with the support of the engineering staff in the team, develop cost estimates, engineering drawings, and bidding documents; to work closely with hydraulic structural design engineer. The designs shall be prepared based on consultation with district and village officials, water user groups and fisher-folk.

### Qualifications:

Having a Bachelor's degree in fishery, and preferably having previous experience of fishway design and construction

## **10. Fishery Specialist – National**

### Responsibilities:

Duties are to support the international specialist.

### Qualifications:

Having a Bachelor's degree in fishery or relevant subject, and preferably having previous experience of fishway design and construction

## **11. Procurement/Contract Management Specialist – International**

### Responsibilities:

The tasks include:

- (i) assist the PMU in preparing bidding documents;
- (ii) assist the PMU in advertising bids and/or preparing request for proposal for external monitoring agency (EMA); and
- (iii) providing inputs for the QPRs, annual reports for submission to PMU.

### Qualifications:

Having a Master's degree or equivalent in business administration, bachelor's degree in engineering or in other relevant field with at least 10 years' professional experience. Preferably having experience in procurement of works and goods, preparation of tender and contract documents, evaluation of bids, and contracts management of projects, and recruitment of consultants following regulations of multilateral development banks. Having experience of preparation and administration of contracts under International Federation of Consulting Engineers (FIDIC) contracts for large works.

## **12. Procurement/Contract Management Specialist – National**

### Responsibilities:

Duties are to support the international specialist.

### Qualifications:

Having a Bachelor's degree in engineering, business administration, or related fields and 10 years' experience in procurement and contract administration. Preferably having experience of donor financed procurement procedures. Preferably having experience of contract administration of contracts under FIDIC conditions of contract. Excellent communication skills in spoken and written English.

## **13. Social Safeguards/Resettlement Specialist – International**

### Responsibilities:

Together with the National Social Safeguards/Resettlement Specialist, the expert will:

- (i) screen the IR and IP impacts of the activities in each proposed subproject;
- (ii) work closely and discuss with the subproject engineering design team, GDR, executing



- agency and/or implementing agency, and relevant agencies on the measures to avoid involuntary resettlement impacts - if it is impossible to avoid, at least minimized;
- (iii) verify the impacts of the subprojects, based on the detailed engineering design on the involuntary land acquisition and resettlement, and prepare site verification reports;
  - (iv) support GDR in the preparation of detailed resettlement plans (DRPs) based on the detailed design and work contract packages of (a) Kbal Hong Barrage and Intake Structures, (b) Kbal Hong Irrigation System, (c) Kanghot Irrigation System and other land acquisition documents for Output 3 activities based on the final **detailed design** prepared by the engineering team;
  - (v) support PMU in the preparation of any social safeguards due diligence reports for output 2 and 3 activities to confirmed the absence of IR impacts and community participation plan (CPP) of output 2 activities (excluding Kbal Hong barrage) based on the final **detailed design** prepared by the engineering team;
  - (vi) lead, organize and train a team of enumerators and surveyors for the SES/IOL/DMS data collection for the preparation of DDRs and DRPs, this includes preparing and testing the data collection instruments;
  - (vii) support PMU in the preparation of due diligence report (DDR) for section that has no IR impacts and preparation of Community Participation Plan (CPP) for VLD application based on the final and approved DED;
  - (viii) prepare the training program and modules on social safeguards management, IR screening procedures, CPP implementation, project GRM implementation and monitoring the safeguard requirements implementation for the project;
  - (ix) assist PMU and MEF-GDR in the demarcation of the final subproject alignments, detailed measurement survey, information disclosure and meaningful consultations with affected households and communities and also assist by the topographical survey at the site in the command area;
  - (x) assist MEF-GDR in updating the land acquisition and resettlement plan based on the detailed engineering designs of the subproject following requirements of ADB (SPS, 2009) and the government's policies; and
  - (xi) support the PMU in ensuring the provision social safeguard requirement in the bidding document and contractor contracts especially for the compensation for damages occur during construction activities; and (xii) in coordination with PMU/PMIC communication specialist develop community consultations and participation plans for CPF implementation.

Qualifications:

Having a Master's degree or equivalent in social sciences with at least 10 years of relevant work experience, preferably in donor funded projects. Prior experience of ADB financed projects in Cambodia would be an advantage

#### **14. Social Safeguards/Resettlement Specialists (3) – National**

Responsibilities:

The national specialist will also coordinate and supervise the team of surveyors and enumerators for DRP and DDR preparation.

Qualifications:

Having a Bachelor's degree in social sciences with preferably 5 years of relevant work experience, preferably in donor funded projects and government institutes. Preferably having experience working on ADB financed projects and familiar with ADB's SPS, 2009 and the Government's Standard Operating Procedures for Externally Financed Projects/Programs in Cambodia: Land Acquisition and Involuntary Resettlement, 2018. Proficiency in spoken and written English. Duties are to support the international specialist.

#### **Data and Deliverables**

The firm submitting proposals shall review the TRTA Report, Mid Term Progress Report, Feasibility Study for Kbal Hong Irrigation Scheme in Pursat province and Kanghot irrigation scheme in Battambang province plus two flood mitigation subprojects (Svay At in Pursat and Ou Sralau in Battambang province and other relevant reports available including descriptions for survey data and geotechnical information already available.

14. The Firm will produce the following reports and deliverables in English language as indicated in the table 3:

**Table: 3 - List of Expected Outputs**

No	Expected output/ Deliverables	Format	Indicative Delivery Date (Weeks)	
			Draft	Final
D1	Inception Report	Word and PDF report files	8	10
D2	Detailed topographical/bathymetric and geotechnical survey for area of work, including Kanghot irrigation scheme, and the two flood mitigation subprojects: Svay At in Pursat and Ou Sralau in Battambang.	Word and PDF report files	8	10
D3	Hydraulic design of the Kanghot river, and two flood mitigation subprojects; Svay At and Ou Salau	Word and PDF report files	12	16
D4	Hydraulic design of canal intakes work, and any other structures identified for advanced work	Word and PDF report files	16	20
D5	Structural design/ analysis, electrical and mechanical design of Kanghot river, and the other two flood mitigation subprojects	Word and PDF report files	20	24
D6	Technical drawings (architectural, structural and mechanical design drawings of Kanghot regulator and the other flood mitigation subprojects	Word and PDF report files	24	28
D7	Technical specification for the construction of Kanghot regulator and associated facilities, including dam safety reports, gates, mechanical and electrical system, erosion projection works, safety measures, etc.	Word and PDF report files	24	28
D8	Tender package including Bill of Quantity and Engineering cost estimate for all the schemes under the scope of work.	Word and PDF report files	28	32
D9	Tending package including specification, Bill of Quantity, and engineering cost estimate for other works agreed if any.	Word and PDF report files	30	36
D10	Draft DRP	Word and PDF report files	28	30

D11	Due Diligence Report (DDR)	Word and PDF report files	32	36
D12	Final report on completion of consultant inputs	Word and PDF report files	40	44

**Deliverable:** On top of the deliverables listed above, the firm shall also submit all the deliverables to PMU-MOWRAM:

- (i) QPRs to the PMU for review and transmission to ADB by Week 14 end of each quarter;
- (ii) Mid-term report on design activities, by Week 28 after contract signed
- (iii) Draft DRPs based on the final detailed design for GDR review and finalization, by week 30 after contract signed
- (iv) Due Diligence Report (DDR) for section that has no IR impacts, by week 36 and

**Contract Amount.** The contract will be a lump sum based. The payment schedule is based on the deliverable submitted and subject for approval from MOWRAM through certify by the National Project Management Coordinator as below:

Payment Number	Deliverable	Percentage (%)
Payment No. 1	Mobilizations	10% of total contract amount
Payment No. 2	Inception report D1 Deliverable D2	20% of total contract amount
Payment No. 3	Mid-term report on design activities Deliverable D3 Deliverable D4 Deliverable D5	20% of total contract amount
Payment No. 4	Deliverable D6 Deliverable D7 Deliverable D8 Deliverable D9	20% of total contract amount
Payment No. 5	Deliverable D10 Draft DRPs Deliverable D11 - DDR	20% of total contract amount
Payment No. 6	Final report	10% of total contract amount

### Relevant background information or materials for the assignment

15. All available project reports and data, feasibility reports, detailed engineering designs, and drawings of the irrigation schemes include main canals, secondary canals and tertiary canals, if required.

### Training and capacity building requirement

16. The Consultant will provide necessary capacity building to the counterpart staff to perform their duties through classroom training as well as on-the-job training. The capacity building should include, financial management, procurement and contract administration, safeguard management and its monitoring and report preparation. The certain training topics, locations and number of participants will be decided and confirmed by the PMU-MOWRAM.

The training shall include as follows:

- (i) PDWORAM staffs: 5 engineers, 1 administrative and 1 finance/accountant –

total 7staffs for each province.

- (ii) Locations of the training will be in PDOWRAM office or rent place and project site
- (iii) Site observation and taking notes during the observation, which are important points for the design works
- (iv) The required arrangement and documents for the DED works
- (v) The concept of design
- (vi) Hydraulic design
- (vii) Structural design

### **Clients Input and Counterpart Personnel**

17. Services, facilities, and property to be made available to the Consultant by the Client comprise: (i) furnished office space including furniture, desktop computers, printers; (ii) vehicles (with drivers, fuel and O&M), (iii) administrative support; (iii) necessary data and reports.

18. Professional and support counterpart personnel to be assigned by the Client to the Consultant: The project steering committee, comprising of high-level representatives from the relevant government agencies will provide overall guidance and strategic advice to the project and will be responsible for policy direction and project oversight. The PMU will be responsible for the smooth management and coordination of project activities and administration, including planning, budgeting, procurement, monitoring, coordination, maintaining all project documents, maintaining the advance account, as well as submitting required progress reports, annual audit reports, and financial statements as per agreed frequency and in proper formats, and for ensuring that the project outcomes and outputs are achieved as planned and within the agreed schedule and budget.