

**USAID’s Trade Central Asia Activity (TCA)**

Request For Proposals (RFP)

No. RFP-TCA-KYR-24-0001

Supply and installation of auxiliary equipment at the piloting checkpoint

Issue Date: January 9, 2024

**WARNING**: Prospective Offerors who have received this document from a source other than the TCA Project, located at 506/99, Seifullin ave., non-residential premises 6, 2nd floor, office 201, Almaty, Kazakhstan, should immediately contact TCA\_procurement@dai.com and provide their name and mailing address in order that amendments to the RFP or other communications can be sent directly to them. Any prospective Offeror who fails to register their interest assumes complete responsibility in the event that they do not receive communications prior to the closing date. Any amendments to this solicitation will be issued and posted via email.

DAI conducts business under the strictest ethical standards to assure fairness in competition, reasonable prices and successful performance or delivery of quality goods and equipment. DAI does not tolerate corruption, bribery, collusion or conflicts of interest. Any requests for payment or favors by DAI employees should be reported as soon as possible to ethics@dai.com or by visiting [www.dai.ethicspoint.com](http://www.dai.ethicspoint.com). Further, any attempts by an offeror or subcontractor to offer inducements to a DAI employee to influence a decision will not be tolerated and will be grounds for disqualification, termination and possible debarment. See provision No. 11 for more details.

 Synopsis of the RFP

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| --- | --- |
| RFP No.  | RFP-TCA-KYR-24-0001 |
| Issue Date | January 9, 2024 |
| Title | Supply and installation of auxiliary equipment at the piloting checkpoint |
| Issuing Office & Email/Physical Address for Submission of Proposals | Attn: Procurement Department, TCA ProjectTCA\_procurementINBOX@dai.com |
| Familiarization trip | January 23, 2024 at 10:00 local Bishkek time.See Section 2.4 for more details. |
| Deadline for Receipt of Questions | January 26, 2024 17:00 local Almaty, Kazakhstan time. |
| Deadline for Receipt of Proposals. | February 2, 2024 17:00 local Almaty, Kazakhstan time. |
| Contact Person  | TCA\_procurement@dai.com – Procurement Manager |
| Anticipated Award Type | Firm Fixed Price Subcontract. |
| Basis for Award | An award will be made based on the Lowest Price, Technically Acceptable Source Selection process. The award will be issued to the responsible Offeror submitting the lowest evaluated price that meets or exceeds the acceptability requirements for technical/non-cost factors described in this RFP.  |

# Introduction and Purpose

## Purpose

DAI Global LLC, (DAI) invites qualified offerors to submit proposal for the supply and installation of auxiliary equipment at the piloting checkpoint necessary for implementation of IT module of ACS “Intelligent checkpoint” component of the National Digital Platform “Smart Bazhy” within the framework of implementation of the action plan of the Concept of Development of the State Customs Service under the Ministry of Finance of the Kyrgyz Republic for 2022-2024.

## Issuing Office

The Issuing Office above is the sole point of contact at DAI for purposes of this RFP. Any prospective offeror who fails to register their interest with this office assumes complete responsibility in the event that they do not receive direct communications (amendments, answers to questions, etc.) prior to the closing date.

## Type of Award Anticipated

DAI anticipates awarding a Firm Fixed Price Subcontract. This subcontract type is subject to change during the course of negotiations.

A Firm Fixed Price Subcontract is: An award for a total firm fixed price, for values more than $150,000, for the provision of specific services, goods, or deliverables and is not adjusted if the actual costs are higher or lower than the fixed price amount. Offerors are expected to include all costs, direct and indirect, into their total proposed price.

# General Instructions to Offerors

## General Instructions

Proposals are due no later than February 2, 2024, 5 pm local Almaty, Kazakhstan time, to be submitted to the Issuing Office. Late offers will be rejected except under extraordinary circumstances at DAI’s discretion. DAI reserves the right not to evaluate a non responsive or incomplete proposal. The completion of all RFP requirements in accordance with the instructions in this RFP and submission to DAI of the proposal will constitute an offer and indicate the Offeror’s agreement to the terms and conditions in this RFP and any attachments hereto. DAI reserves the right to enter into an agreement without discussion and/or negotiation; however, DAI also reserves the right to conduct discussions and/or negotiations, which among other things may require an Offeror(s) to revise its proposal. Issuance of this RFP in no way obligates DAI to enter into any agreement. All documents from the Offeror related to this RFP shall be in English or Russian. Offerors will not be reimbursed for any costs associated with the preparation or submission of their proposal. DAI shall in no case be responsible for liable for these costs.

Offerors are required to fully review all instructions and specifications contained in this RFP. Failure to so will be at the Offeror’s risk.

Offerors shall submit proposals via procurement email to TCA\_procurementinbox@dai.com with the RFP number and Title in the subject line.

Offerors shall confirm in writing that the Offeror fully understands that their proposal/offer must be valid for a period of 90 calendar days. Time is stated in calendar days, unless otherwise specified.

If the solicitation is amended, then all terms and conditions not modified in the amendment shall remain unchanged. Offerors shall acknowledge receipt of amendments in the cover letter.

Offerors shall:

1. Furnish all of the information required by the RFP
2. Ask any questions to clarify the requirements if necessary
3. Sign and submit the cover letter
4. Use and submit forms as provided in the Attachments as required.

## Proposal Cover Letter

A cover letter shall be included with the proposal on the Offeror’s company letterhead with a duly authorized signature and company stamp/seal using Attachment B as a template for the format. The cover letter shall include the following items:

* The Offeror will certify a validity period of 90 calendar days for the prices provided.
* Acknowledge the solicitation amendments received
* Acknowledge having adequate financial resources to finance and perform the work or the ability to obtain financial resources without receiving advance funds from DAI.

## Questions regarding the RFP

Each Offeror is responsible for reading very carefully and understanding fully the terms and conditions of this RFP. All communications regarding this solicitation are to be made solely through the Issuing Office. Requests for clarification or additional information must be submitted via email to the Issuing Office no later than the date and time specified in the Synopsis above. Only written communications relative to the procurement shall be considered. No questions will be answered over the phone or in person, except for administrative questions regarding the project office location, packaging of the bid, etc. The subject line of the email or the heading of the letter must include the RFP Number and Title.

Questions and requests for clarifications – and the responses thereto – that DAI believes may be of interest to other offerors will be circulated in writing to all RFP recipients who have indicated interest in responding to this RFP. Both questions and answers will be distributed, without identification of the inquirer(s), to all prospective Offerors who are on record as having received this RFP. Any verbal information received from a DAI or TCA employee or other entity shall not be considered as an official response to any question regarding this RFP.

## Familiarization trip

DAI, together with the State Customs Service of the Kyrgyz Republic, organizes a visit to the Dostyk checkpoint in order to enable Participants:

2.4.1 study the communication lines of existing equipment

2.4.2 analyze and recommend equipment for the necessary replacement, recommend an improved version of the equipment according to the requirements of using industrial standards based on PLC solutions, taking into account uninterrupted operation 24/7, further integration of the SCADA platform.

2.4.3 Collect the necessary measurements

The visit is scheduled for January 23, 2024, in front of the entrance to the Dostuk checkpoint. Since the Dostuk checkpoint is a sensitive facility, all interested Participants, before 17:00 on January 12, 2024, must send a scanned copy of their passports in order for the State Customs Service to prepare passes. Passports must be sent in a password-protected ZIP file, the password must be sent as a separate message. Since e-mail often fails, after sending passports, please call the following number and confirm sending +77072726117.

Please note that Participants will not be reimbursed for any expenses associated with this trip. DAI is not responsible for these costs under any circumstances.

Necessary information will be provided to all potential Participants during the visit. Although attendance is not a requirement, all interested potential suppliers are encouraged to attend to formulate an acceptable proposal.

# Instructions for the Preparation of Technical Proposals

Technical proposals shall include the following sections:

1. Thorough description of the proposed good or service which meets or exceeds the stated technical specifications or scope of work.
2. Submission of documents which demonstrates that the offeror can meet or exceed the listed non-cost factors that determine technical acceptability.
3. A list of Past Performance

## Goods or Services Specified

For this RFP, DAI needs the goods and services described in detail in Attachment A.

**Offerors MUST NOT provide any goods and/or services that utilize** **telecommunications and video surveillance products from the following companies: Huawei Technologies Company, ZTE Corporation, Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company, or any subsidiary or affiliate thereof, in compliance with FAR 52.204-25.**

Final delivery is required within 7 months after signing the Subcontract. It shall be understood that by that date, the Offeror would have met all the technical specifications or deliverables.

Equivalent items (i.e. substitutes or alternatives) will be acceptable unless stated otherwise.

## Technical Acceptability Requirements

To be considered technically acceptable, offerors must demonstrate how they will meet or exceed all of the requirements that are outlined below as Technical Acceptability Requirements. If the proposal fails to meet one or more of the requirements, it will be deemed technically unacceptable. Proposals deemed technically unacceptable contain significant weaknesses or deficiencies that are not able to be corrected without a major rewrite or revision of the original proposal.

1. Offerors are required to meet or exceed the significant non-cost factors listed below:
	1. Offeror’s technical proposal shall meet or exceed the stated technical specifications or scope of work.
	2. Offeror must possess a minimum of 3 years of relevant in-country experience in the supply and installation of similar equipment.
	3. Offeror must have completed or have currently in progress a minimum of 3 projects in the specific technical area.
	4. Offeror must have documented ability to meet required delivery timelines, as demonstrated through reference letters from prior clients.
	5. Offeror’s key personnel must possess:
		1. necessary technical background and at least 3 years of relevant experience, as demonstrated through CVs of key personnel that will be involved in this assignment.
		2. The following certifications: ISO 27001; ISO 27001:2013; ISO 31000:2018 as demonstrated through the scanned copies of certificates.
	6. Offeror must be registered in the Kyrgyz Republic’s Tax Service, and Ministry of Justice and have an office in Bishkek, Kyrgyz Republic.

## Past Performance

The technical proposal shall include information on past performance. Provide a list of at least three (3) recent awards of similar scope and duration. The information supplied shall be stated in a table, and shall include the legal name and address of the organization for which services were performed, a description of work performed, the duration of the work and the value of the contract, description of any problems encountered and how it was resolved, and a current contact phone number of a responsible and knowledgeable representative of the organization. See Attachment F.

# Instructions for the Preparation of Cost/Price Proposals

## Price Schedule

Provided in Attachment C is a template for the Price Schedule. Offerors shall complete the template including as much detailed information as possible. The sections of the template are as follows:

* Item number
* Item name
* Description/Specifications
* Quantity
* Unite Price
* Total Price
* VAT
* Delivery Cost
* Hourly rate

It is important to note that Value Added Tax (VAT) shall be included on a separate line, and that delivery cost per kilometer (unit) and total delivery cost are included on their designated budget line. These products or services are eligible for VAT exemption under the DAI prime contract. The Subcontractor is responsible for all applicable taxes and fees, as prescribed under the applicable laws for income, compensation, permits, licenses, and other taxes and fees due as required.

# Required documents to Determine Responsibility

## General Responsibility

DAI will not enter into any type of agreement with an Offeror prior to ensuring the Offeror’s responsibility. When assessing an Offeror’s responsibility, the following factors are taken into consideration:

1. Provide evidence of the required business licenses/ state registrations to operate in the host country.
2. Evidence of a Unique Entity ID (SAM) number (explained below and instructions contained in Attachment D).
3. The source, origin and nationality of the products or services are not from a Prohibited Country (explained below).
4. Having adequate financial resources to finance and perform the work or deliver goods or the ability to obtain financial resources without receiving advance funds from DAI.
5. Ability to comply with required or proposed delivery or performance schedules.
6. Have a satisfactory past performance record.
7. Be qualified and eligible to perform work under applicable laws and regulations.

Unique Entity ID (SAM) There is a **mandatory** requirement for your organization to provide a Unique Entity ID (SAM) to DAI. Without a Unique Entity ID (SAM), DAI cannot deem an Offeror “responsible” to conduct business with and therefore, DAI will not enter into a subcontract/purchase order or monetary agreement with any organization. The determination of a successful offeror/applicant resulting from this RFP/RFQ/RFA is contingent upon the winner providing a Unique Entity ID (SAM) DAI. Offerors who fail to provide a Unique Entity ID (SAM) will not receive an award and DAI will select an alternate Offeror.

All U.S. and foreign organizations which receive first-tier subcontracts/ purchase orders with a value of $30,000 and above **are required** to obtain a Unique Entity ID (SAM) prior to signing of the agreement. Organizations are exempt from this requirement if the gross income received from all sources in the previous tax year was under $300,000. DAI requires that Offerors sign the self-certification statement if the Offeror claims exemption for this reason.

For those required to obtain a Unique Entity ID (SAM), see Attachment D - Instructions for Obtaining a Unique Entity ID (SAM) - DAI’S Vendors, Subcontractors

For those not required to obtain a Unique Entity ID (SAM), see Attachment E: Self Certification for Exemption from Unique Entity ID (SAM) Requirement

# Basis of Award and Selection Process

## Basis of Award

Award will be made to a responsible offeror, whose proposal offers the lowest evaluated price and meets or exceeds the acceptability standards for technical/non-cost factors, using United States Federal regulations (FAR 15.101-2 – Lowest Price Technically Acceptable Source Selection Process) as a guide. DAI will classify a proposal as not acceptable for award if it does not meet the requirements of this RFP. DAI may also determine that an Offeror is "not responsible", i.e., that it does not have the management and financial capabilities in all respects to perform the work required.

For Offerors to be considered technically acceptable, they must meet all of the technical acceptability requirements and business requirements as specified in this RFP. Proposals will be evaluated by committee against the acceptability requirements contained herein.

DAI may award to an Offeror without discussions with the Offeror. Therefore, the initial offer must contain the Offeror’s best price and technical terms.

## Selection Process

All proposals shall be received and remain unopened until the due date. All proposals shall be stored in a secure and locked location. On the due date, all proposals shall be opened by the Procurement Officer and shall be witnessed by at least one other project employee.

An Evaluation Committee comprised of a minimum of three (3) people shall be convened, and each committee member will receive a copy of the solicitation requirements and shall sign a Statement of Non-Disclosure/Conflict of Interest form. The Evaluation Committee shall jointly review the technical proposals and determine which proposals 1) are complete, and 2) meet the technical acceptability requirements. Those proposals which are determined to be “technically acceptable” shall be considered in the “Competitive Range”. Prior to concluding on those offerors in the Competitive Range, DAI may contact offerors to seek clarification to proposal submissions that are insufficient. Competitive Range offerors may then be contacted to answer questions, negotiate and discuss offers, and potentially be asked to submit a “Best and Final Offer”. Upon receiving all Best and Final Offers (if a Best and Final Offer is requested), the Evaluation Committee shall select the offer which is the lowest price amongst those in Competitive Range and investigate to ensure that the offeror is responsible and the price is reasonable.

# Source and Nationality

Under the authorized geographic code for its contract DAI, may only procure goods and services from the following countries.

**Geographic Code 937:** Goods and services from the United States, the cooperating country, and "Developing Countries" other than "Advanced Developing Countries: excluding prohibited countries. A list of the "Developing Countries" as well as "Advanced Developing Countries" can be found at: <https://www.usaid.gov/about-us/agency-policy/series-300/references-chapter/310maa>  and <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groupsrespectively>

(An “advanced developing country” means any country categorized by the World Bank as an upper middle income country according to its gross national income per capita. Goods and services with an advanced developing country source or nationality are only eligible under 937 when the procurement is for a USAID program in that advanced developing country, i.e., it is the “cooperating” or “recipient” country).

**Geographic Code 110:** Goods and services from the United States, the independent states of the former Soviet Union, or a developing country, but excluding Prohibited Countries.

DAI must verify the source, nationality and origin, of goods and services and ensure (to the fullest extent possible) that DAI does not procure any goods or services from prohibited countries listed by the Office of Foreign Assets Control (OFAC) as sanctioned countries. The current list of countries under comprehensive sanctions include: Cuba, Iran, North Korea, Sudan, and Syria. Goods may not transit through or be assembled in comprehensive sanctioned origin countries nor can the vendor be owned or controlled by a prohibited country. DAI is prohibited from facilitating any transaction by a third party if that transaction would be prohibited if performed by DAI.

By submitting a proposal in response to this RFP, Offerors confirm that they are not violating the Source and Nationality requirements of the goods or services being offered and that the goods and services comply with the Geographic Code and the exclusions for prohibited countries outlined above.

# Anticipated post-award Deliverables

Upon award of a subcontract, the deliverables detailed in below table will be submitted to DAI according to deadlines established by DAI and the selected subcontractor. The deliverables are intended as evidence or confirmation that the activities have been successfully completed. The Offeror should detail proposed costs per deliverable in the Price Schedule.

All of the deliverables must be submitted to and approved by DAI before payment will be processed.

|  |  |  |
| --- | --- | --- |
| **#** | **Stage** | **Deliverable** |
| 1 | Stage 1 | 1. Implementation plan
2. Finalized Term of Reference
 |
| 2 | Stage 2 | 1. Report on the pilot, which shall contain lessons learned and preferred type of PLC solutions.
 |
| 3 | Stage 3 | 1. Technical plan
2. Technical document on proposed options of installation sites, and interaction scenarios.
3. Report on provided trainings that shall include list of participants, training materials and photo confirmation.
4. Report on conducted testing accepted by State Customs Committee
5. Final list of equipment
 |
| 4 | Stage 4 | 1. Signed acceptance certificates.
2. All technical documentation and schemes.
3. Training materials
4. Manufacturer’s warranty certificates.
5. Source codes and admin access to systems and databases.
 |

## Branding Implementation Plan and Marking Plan

Markings under this subcontract shall comply with the USAID “Graphic Standards Manual" available at www.usaid.gov/branding or any successor branding policy. In accordance with ADS 320 “Branding and Marking,” this subcontract incorporates USAID’s policy directives and required procedures on branding and marking of USAID-funded programs, projects, activities, public communications, and commodities with the USAID identity. The Branding Implementation Plan and Marking Plan template is included as Attachment H.

# Inspection & Acceptance

The DAI Project Manager will inspect from time to time the services being performed to determine whether the activities are being performed in a satisfactory manner, and that all equipment or supplies are of acceptable quality and standards. The subcontractor shall be responsible for any countermeasures or corrective action, within the scope of this RFP, which may be required by the DAI Chief of Party as a result of such inspection.

# Compliance with Terms and Conditions

Offerors shall be aware of the general terms and conditions for an award resulting from this RFP. The selected Offeror shall comply with all Representations and Certifications of Compliance listed in Attachment G.

# Anti-Corruption and Anti-Bribery Policy and Reporting Responsibilities

DAI conducts business under the strictest ethical standards to assure fairness in competition, reasonable prices and successful performance or delivery of quality goods and equipment. **DAI does not tolerate the following acts of corruption:**

* Any requests for a bribe, kickback, facilitation payment or gratuity in the form of payment, gift or special consideration by a DAI employee, Government official, or their representatives, to influence an award or approval decision.
* Any offer of a bribe, kickback, facilitation payment or gratuity in the form of payment, gift or special consideration by an offeror or subcontractor to influence an award or approval decision.
* Any fraud, such as mis-stating or withholding information to benefit the offeror or subcontractor.
* Any collusion or conflicts of interest in which a DAI employee, consultant, or representative has a business or personal relationship with a principal or owner of the offeror or subcontractor that may appear to unfairly favor the offeror or subcontractor. Subcontractors must also avoid collusion or conflicts of interest in their procurements from vendors. Any such relationship must be disclosed immediately to DAI management for review and appropriate action, including possible exclusion from award.

These acts of corruption are not tolerated and may result in serious consequences, including termination of the award and possible suspension and debarment by the U.S. Government, excluding the offeror or subcontractor from participating in future U.S. Government business.

Any attempted or actual corruption should be reported immediately by either the offeror, subcontractor or DAI staff to:

* Toll-free Ethics and Compliance Anonymous Hotline at (U.S.) +1-503-597-4328
* Hotline website – www.DAI.ethicspoint.com, or
* Email to Ethics@DAI.com
* USAID’s Office of the Inspector General Hotline at <https://oigportal.ains.com/eCasePortal>

By signing this proposal, the offeror confirms adherence to this standard and ensures that no attempts shall be made to influence DAI or Government staff through bribes, gratuities, facilitation payments, kickbacks or fraud. The offeror also acknowledges that violation of this policy may result in termination, repayment of funds disallowed by the corrupt actions and possible suspension and debarment by the U.S. Government.

# Attachments

## Attachment A: Scope of Work for Services or Technical Specifications

1. **BACKGROUND**

The goal of the United States Agency for International Development (USAID) Trade Central Asia (TCA) Activity is to improve region-wide trade connectivity to accelerate economic growth and increase economic opportunity in Central Asia through harmonization of customs and border procedures, increasing public-private dialogue on trade and investment, improving cross-border firm-to-firm connectivity, and addressing gender-relevant trade issues. USAID Trade Central Asia activity will support women traders and businesses in the region by reviewing current trade policies and practices for bias against women and designing activities to help women overcome these challenges.

As part of the Kyrgyz Republic's efforts to implement its Customs Service Development Concept for 2022-2024, approved by the Cabinet of Ministers on April 8, 2022 (No. 202), there is a plan to expedite customs operations concerning the movement of goods across the customs border. The goal is to reduce the human element's influence in decision-making throughout all phases of customs administration. This will be achieved through the automation of customs procedures and the utilization of information systems. It is important to note that the effectiveness of the customs service not only impacts economic metrics and national security but also plays a significant role in shaping public sentiment, attracting investors, and enhancing the country's international reputation.

In light of these considerations, the Customs Service of the Kyrgyz Republic has set forth a mission to streamline and digitize all customs processes, with a primary focus on activities conducted at points of preliminary customs processing (referred to as PPCP). Addressing this issue is crucial as it addresses two paramount challenges: firstly, the need to minimize instances of non-compliance with customs regulations, and secondly, the imperative to simplify and optimize customs procedures, which will have a positive impact on increasing the country's trade volume.

To tackle the aforementioned challenges, the Customs Service of the Kyrgyz Republic has initiated the development of a component within the National Technology Platform (NTP) known as "Smart Bazhy." This component aims to seamlessly integrate with the equipment such as barriers, cameras, signs, and loudspeakers installed at PPCP locations. The objective is to efficiently manage traffic flows at these points while minimizing the need for extensive staff involvement.

1. **Objective**

As part of the development and implementation of the components of the NCP “Smart Bazhy” in accordance with the Concept for the Development of the Customs Service of the Kyrgyz Republic for 2022-2024, it is planned to create an Automated Management System “Intelligent Checkpoint” (ACS “IPP”) with the integration of the CTS IS. For the full implementation of the automated control system "IPP" it is necessary to equip the PP with auxiliary equipment. ACS "IPP" is one of the components of the Scientific and Production Center "Smart Bazhy".

The main goals of creating an automated control system "IPP" are:

* + - * increasing the efficiency of customs administration through the introduction of automated systems for processing and exchanging information.
			* acceleration of the passage of goods and vehicles through the MPTP.
			* increasing the effectiveness of the fight against smuggling and administrative customs offenses;
			* increasing income by increasing the growth of trade turnover in the domestic and foreign markets of the Kyrgyz Republic
			* increasing the efficiency and reliability of information provided to the management of the State Customs Service of the Kyrgyz Republic and higher authorities.
			* automatic control of traffic flow at MPTP;
			* reduction of time for passing through the automatic telephone exchange;
			* rational and efficient use of resources at the MPTP;
			* prevention of corruption risks;
			* improved TRS scores;
			* assistance in increasing the receipt of customs duties;
			* development of the transport and logistics industry of the Kyrgyz Republic, through the phased implementation of an electronic queue of automatic telephone exchanges to manage traffic flow, two-way interaction for preliminary information on both borders with the Republic of Uzbekistan

**The main goal of this project** is to select a responsible supplier who will be responsible for the selection of auxiliary equipment and its installation for the full implementation of the IPP automated control system project as a pilot project at the checkpoint. In this regard, this project is an integral part of the ACS “IPP” project.

The implementation of this project is aimed at:

* + - * provision of technical conditions for controlling the flow of vehicles at the checkpoint using the automated control system "IPP";
			* creation of a fault-tolerant infrastructure using a solution based on industrial PLC controllers (PLC) supporting the operation of the MODBUS protocol in uninterrupted mode 24/7 at low/high temperature conditions (+45/-50C);
			* the use of elements of industrial equipment and automated control system “IPP” in the border crossing point infrastructure, which makes it possible to implement an automated and self-configurable traffic flow management system with minimal participation of Customs personnel;
			* ensuring the safety of the Kyrgyz Republic, environmental safety of goods imported into the territory.
1. **FAMILIRIZATION TRIP**

As stated above, TCA will be organizing the familiarization trip to Dostyk Checkpoint to give Offerors opportunity to:

* 1. study of communication lines of existing equipment at the time of project implementation
	2. analysis and recommendation of equipment for the necessary replacement, recommendation of better type of equipment on the requirements for the use of industrial standard on the basis of PLC solutions, taking into account the operation in uninterrupted mode 24/7, further integration of SCADA platform;
	3. take necessary measurements;

all the collected data shall be the basis for the preparation of technical and commercial proposal, based on which TCA collectively with State Customs Service will select the winning Vendor.

1. **Task**

Further the selected Vendor shall be responsible for performing the following tasks:

* 1. **Stage 1: Project Start-up**.
		1. Prepare the implementation plan including schematic diagram of the project considering the specifics of the Dostuk, Kyzyl Kiya, Torugart, Irkeshtam Checkpoints location.
		2. Finalize and agree the final implementation / execution plan with TCA and SCS For their respective concurrence.
	2. **Stage 2: Pilot implementation**.
		1. purchase of a test set on the basis of PLC (PLC) solutions for trial integration with ACS "IPP" and further development of the scenario of work of traffic flow management taking into account the peculiarities of using electronic queue;
		2. study the possibility of using different types of industrial PLC equipment in conjunction with different SCADA platforms for better integration of ACS "ICP".
	3. **Stage 3: Procurement and installation of equipment**
		1. to propose variants of the program shell of interaction on software and hardware control of the equipment used in the project taking into account the technical minimum requirements;
		2. to provide interaction scenarios for possible variants of integration with ACS "ICP", taking into account the requirements for logging, use of different kinds of "framework" for this purpose the visual plan of BCP will be presented.
		3. prepare and agree with TCA and SCS the Technical plan, which shall include place of installation of equipment and high-rise masts, the plan for laying cable systems.
		4. Submit the final plan with exact list of equipment that shall be prepared based Technical plan for TCA and SCS’s approval.
		5. Procure and deliver approved equipment.
		6. Install equipment in accordance with the approved Technical plan.
		7. Perform all commissioning and testing works in accordance with the approved Technical plan.
		8. Provide necessary trainings to the employees of State Customs Services on usage and further operation of whole system.

*Note: installation works such as laying optical, low current, and electrical cables, installation of high-rise masts are omitted from this scope of work.*

* 1. **Stage 4: Project handover**
		1. Submit the following documents to TCA:
			1. Signed acceptance certificates.
			2. All technical documentation and schemes.
			3. Training materials
			4. Source codes and admin access to systems and databases.
1. **DELIVERABLE AND ANTICIPATED PAYMENT TERMS**

The Selected Vendor will be responsible for the timely delivery of the following deliverables:

|  |  |  |  |
| --- | --- | --- | --- |
| **#** | **Stage** | **Deliverable** | **Anticipated payment (%)\*\*\*** |
| 1 | Stage 1 | 1. Implementation plan
2. Finalized Term of Reference
 | 20% of the total Subcontract amount |
| 2 | Stage 2 | 1. Report on the pilot, which shall contain lessons learnt and preferred type of PLC solutions.
 | 20% of the total Subcontract amount |
| 3 | Stage 3 | 1. Technical plan
2. Technical document on proposed options of installation sites, and interaction scenarios.
3. Report on provided trainings that shall include list of participants, training materials and photo confirmation.
4. Report on conducted testing accepted by State Customs Committee
5. Final list of equipment
 | 40% of the total Subcontract amount |
| 4 | Stage 4 | 1. Signed acceptance certificates.
2. All technical documentation and schemes.
3. Training materials
4. Manufacturer’s warranty certificates.
5. Source codes and admin access to systems and databases.
 | 20% of the total Subcontract amount |

*\*\*\* This payment schedule is preliminary and must be agreed upon with the selected Supplier.*

1. **Reporting**

The Selected Vendor will work closely with the State Customs Service under the Ministry of Finance of the Kyrgyz Republic and will directly report to USAID TCA Team Lead Customs and Borders – Mr. Medet Tursaliev.

1. **TERM OF REFERENCE**
	1. **Abbreviations**

|  |  |  |
| --- | --- | --- |
| **TRS** | **-** | Time Release Study  |
| **HSC** | **-** | Hardware and software complex |
| **ACS** | **-** | Automated control system |
| **MV** | **-** | Motor vehicle |
| **SSA** | **-** | State supervisory authorities |
| **SCS KR** | **-** | State Customs Service under the Ministry of Finance of the Kyrgyz Republic |
| **UAIS** | **-** | Unified automated information system of the SCS KR |
| **EAEU** | **-** | Eurasian Economic Union |
| **EEC** | **-** | Eurasian Economic Commission |
| **ISSC** | **-** | Inspection and security screening complex. |
| **ICP** | **-** | Intelligent checkpoint |
| **LPP** | **-** | Locations of pre-clearance processes |
| **NDP** | **-** | Smart Bazhy National Digital Platform |
| **RPM** | **-** | Radiation and portal monitoring |
| **CP** | **-** | Checkpoint |
| **RMS** | **-** | Risk management system |
| **SC** | **-** | Situation Center, a system for automatic processing of big data and its visualization to users |

* 1. **Term and definitions**

The concepts used in the current document are those that mean the following:

**MODBUS** is a communication protocol widely used in industrial automation systems for communication between devices and controllers, provides a simple and efficient way to exchange data between devices such as controllers, sensors, actuators and other peripherals and computers or SCADA systems (supervisory control systems).

**OPC DA** - (Open Platform Communications Data Access) is an older version of the OPC protocol that was developed for data exchange between clients and servers in industrial systems. This standard provides mechanisms for accessing real-time data from processes and devices such as sensors, controllers and other devices connected to industrial automation. It is based on Microsoft's DCOM (Distributed Component Object Model) technology, which makes it less suitable for use in modern network environments and for applications outside of local area networks.

**OPC UA** - (Open Platform Communications Unified Architecture) is a new and more modern version of the OPC protocol, which was designed to overcome some of the limitations and shortcomings of OPC DA. OPC UA is a platform-independent and more secure protocol that uses modern technologies such as XML and HTTPS to exchange data between clients and servers. OPC UA provides a high degree of flexibility and extensibility, and supports various platforms and operating systems.

**SCADA** - (Supervisory Control and Data Acquisition) is a system or platform used to manage and control industrial processes in real time. It is a hardware and software platform that allows you to monitor, collect data, analyze and control various manufacturing operations and processes in industrial or infrastructure systems.

**A PLC** (Programmable Logic Controller) is a specialized device used in the automation and control of industrial processes. It is a computer that is specifically designed to perform monitoring and control tasks in industrial systems. The main task of a PLC is to control various processes and devices in industrial systems such as production lines, automated machines, building control systems and many more. A PLC takes input signals from sensors and other devices, processes them using software, and then controls output devices such as actuators, valves, motors, and other actuators.

* 1. **Implementation timeframe**

Final delivery is required within 7 months after signing the Subcontract. It shall be understood that by that date, the Offeror would have met all the technical specifications or deliverables.

* 1. **Anticipated Work Schedule.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Stages | Name of works | 1month | 2months | 3months | 4months | 5months | 6months | 7months |
| Stage #1. | **Study of the possibility of equipment implementation taking into account the current infrastructure** |  |  |  |  |  |  |  |
|  | study of communication lines of existing equipment at the time of project realization; |  |  |  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | analysis and selection of equipment for the necessary replacement, addition of better on the requirements for the use of industrial standard on the basis of PLC(PLC) solutions, taking into account the operation in uninterrupted mode 24/7,further integration of SCADA platform; |  |  |  |  |  |  |  |
|  | departure of technical staff for expert assessment at PP"Dostuk" for collection, additionalmeasurement, additional study; |  |  |  |  |  |  |  |
|  | preparation of the technical plan of the project taking into account the specifics of the Dostuk PPlocation. |  |  |  |  |  |  |  |
|  | Writing and agreeing the revised Terms of Reference |  |  |  |  |  |  |  |
| Stage #2. | **Pilot implementation** |  |  |  |  |  |  |  |
|  | purchase of a test set on the basis of PLC (PLC) solutions for trial integration with ACS "IPP" and further development of the scenario of work of traffic flow management taking into account thepeculiarities of using electronic queue; |  |  |  |  |  |  |  |
|  | to study the possibility of using different types of industrial PLC equipment in conjunction with different SCADA platforms for better integrationof ACS "ICP". |  |  |  |  |  |  |  |
| Stage #3 | **Procurement and implementation of equipment** |  |  |  |  |  |  |  |
|  | license plate recognition systems |  |  |  |  |  |  |  |
|  | infrastructure management systems |  |  |  |  |  |  |  |
|  | visual alarm systems |  |  |  |  |  |  |  |
|  | public address systems |  |  |  |  |  |  |  |
|  | related equipment |  |  |  |  |  |  |  |
|  | server hardware |  |  |  |  |  |  |  |
|  | backup power |  |  |  |  |  |  |  |
|  | software |  |  |  |  |  |  |  |
|  | commissioning |  |  |  |  |  |  |  |
| Stage #4 | **Project delivery** |  |  |  |  |  |  |  |
|  | signing of acceptance certificates |  |  |  |  |  |  |  |
|  | transfer of documentation and technical schemes |  |  |  |  |  |  |  |
|  | training materials |  |  |  |  |  |  |  |
|  | source codes and admin access to systems anddatabases |  |  |  |  |  |  |  |

* 1. **Brief description of ACS "ICP"**

ACS "ICP" is designed for rational and efficient use of resources at the PPCP on the basis of automated control of the flow of MVs at the PPCP.

The realization of this project involves the following works:

* + - * 1. Development of an automated control system "ICP"
				2. Integration with auxiliary equipment installed at the Dostuk checkpoint, such as:

smart cameras recognizing MVs and license plates;

traffic lights;

smart barriers;

electronic indexes;

electronic information monitors (scoreboards);

speaker system;

underbody inspection system;

motion sensors;

control system for this equipment - SCADA system;

and other things.

* + - * 1. Integration with information systems to obtain the necessary data:

AIS "Sanarip Tamga" - preliminary informing;

AIS "Electronic queue management at the border" between KR and RUz;

AIS "Portal of information exchange with RUz";

And other information systems as needed.

* + - * 1. Integration with hardware and software complexes at the checkpoint:

Radiation-portal monitors;

Equipment for weight and dimensional control;

with an inspection and testing facility;

Bottom inspection equipment.

* + - * 1. Implementation of the report generator used for generation:

statistical reports;

analytical reports;

report templates of established forms.

Separately, infographics (analytical graphs) should be implemented in the ACS "IPP" for operational management decision-making.

Development of the system is intended for automated control of the flow of vehicles at the border crossing point under various processes and scenarios. Processes and scenarios in the system should be customizable in accordance with the business processes at the border crossing point.

The ACS ICP will need to interface with the following systems:

* NDP Smart Bazhy;
* Situation Center of SCS KR;
* RMS SCS KR
* UAIS SCS KR;
* And other services when specified in the specified terms of reference by the contractor.

The technical implementation of integration of ACS "ICP" with other systems should be performed using generally accepted means and complying with information security requirements.

# Requirement for technical project implementation

The full-fledged provision of automation and control of the MV flow at the Checkpoints provides for equipping the following areas of the Checkpoints with auxiliary equipment:

1. before CP - **parking area** for entering into the Electronic Queue system for all arriving vehicles, further pre-information for issuing by the system the time and route before entering CP. The realization of this item is not foreseen in this ToR. However, it is necessary to take into account the integration with the ACS "Electronic queue";
2. The territory of CP - **Import and Export directions** with division into 3 lanes with privileged passage for cargo vehicles.
3. The territory of CP - **passenger lane**, for cars and buses for 1 lane.

On the territory of the BCP, as part of the general work on digitalization of the SCS of the Ministry of Finance of the Kyrgyz Republic, it is planned to install auxiliary equipment of the automated control system " **Intelligent checkpoint** " in the form of the following complexes (general requirements for systems):

* **Complex license plate recognition system** - which will consist of a specialized software system with support for installation on two types of operating systems Windows/Linux, configured on an updated database of license plate templates of more than 90 countries and specialized cameras having in its functionality built-in/external pulse IR/laser-illumination, mandatory synchronization with the camera shutter, which significantly increases the probability of recognition up to 99%, especially in difficult weather conditions: dusk, dust, fog.
* **Visual warning system complex** - includes installation of tickers and large LED screens of high brightness installed in parking lots, in places of parking at customs checkpoints for preliminary visual warning to control the flow of traffic at each stage of the vehicle.
* **The complex of auxiliary** equipment - includes the use of building systems in the infrastructure equipment from specialized barriers, sensors real-time identification of vehicles in a particular area, elements of traffic light/LED signs to control the flow of vehicles on a selected lane.
* **Infrastructure management system complex:**
* includes the use of solutions based on industrial PLC controllers (PLC) based on the MODBUS, OPC DA/UA protocol, and industrial network equipment based on 100BASE/1000BASE-TX network protocols, taking into account the integration of the existing current network equipment infrastructure for uninterrupted operation 24 /7 at low/high temperature conditions.
* includes the installation of a digital sound (broadcast type) warning system through loudspeakers in parking lots at the Customs checkpoint for additional sound notification of all participants in the electronic queue system.
* includes industrial-type equipment for backing up the logging database, building cluster duplication of functionality, and in case of failures at the hardware/software level.
* includes the creation of an Intelligent Checkpoint at each element of the general infrastructure - a temporary backup power system for a time interval of 1-3 hours for uninterrupted operation 24/7, without rebooting the power at the time of shutdown. The exception is during the period of use of backup power - turning off the LED screens, due to the high electrical load demands on the general electrical backup line. An alternative solution would be to use it in parking lots and checkpoint parking lots to automatically switch to duplicating text information through a sound warning system.
* includes the use of a software shell from the equipment manufacturer for configuring, setting up and building a structure for interaction at a low level of control of all available equipment based on a PLC (PLC), operating on industrial protocols of the MODBUS/OPC UA/DA standard in the customs point area.
1. **Equipment and software minimum technical specifications**
	1. **Specialized camera with Software for recognizing license plate numbers of all types of vehicles.**

**The software should** have specificity in the direction of the system of recognition of license plates of MV: support for simultaneous operation of two methods of recognition on one platform, with the possibility to combine, optical recognition of each letter/number of the entire license plate, as well as support for the use of full training of elements from the neural network - in conditions of blurred visibility of the license plate of the MV, specific reflection of sunlight (use of film), mechanical impact and any other factors affecting the clarity of the iso

* Support for more than 90 to 170 countries, with a current updated (up-to-date) database of MV number templates for every country on the list for 2023.
* Support for installation on two types of Windows/Linux operating systems
* Support for a large number of amateur-level cameras and specialized cameras for installation on highways, support for radar functionality.
* License support by one-time purchase unlimited use, further free upgrade for the entire period of use
* Support for technical advice on an ongoing basis

**Specialized camera for license plate recognition of all types of vehicles:**

* Support CMOS camera sensor resolution of at least 2 MP 1/3 Light level of at least 0.01 lux, support 10-bit, RAW data format, H-264
* Supports MODBUS (RS485) operation protocol for controlling external devices;
* Supports pulsed IR/laser illumination for external/embedded use synchronized with the camera shutter;
* Support number fixation at speeds from 20 km/h to 50 km/h in difficult shooting conditions: dusk, dust, fog, heavy snow.
	1. **Tickers:**
* use of 0.96x0.96M type only;
* IP65 moisture protection requirements;
* P7/P10 Scan pixel size up to 1/32;
* brightness not less than 8000 cd/m2 to 12000 cd/m2;
* LED SMD/DIP LED manufacturer is only one of SANAN/EPISTAR brands;
* with an operating life of at least 100 thousand/hour;
* LED controller have support connection via asynchronous way of connecting LED modules P7/P10 for one screen regardless of the size;
* support of LED controller integration for control reception/transmission through PLC equipment via MODBUS RTU/ASCII protocol with status output in the mode of current display of real TXT information on LED screen to SCADA software platform;
* LED controller has support for 4 fonts (Kyrgyz, Russian, English, Symbols);
* The LED controller has support for at least 32 layers for pattern configuration;
* should be realized integration for synchronous transmission of text information voice at the moment of displaying from LED screen to the system of network sound notification on IP Audio SIP 2.0/3.0 protocol;
* support of the functionality of addressable transfer of text information to any of LED screens via PLC (PLC) equipment when building a common infrastructure.
	1. **LED screens**
* use of 0.96 x 1.92M type only;
* IP65 moisture protection requirements;
* P7/P10 Scan pixel size up to 1/32;
* brightness not less than 8000 cd/m2 to 12000 cd/m2;
* LED SMD/DIP LED manufacturer is only one of SANAN/EPISTAR brands;
* with an operating life of at least 100 thousand/hour;
* LED controller have support connection via asynchronous way of connecting LED modules P7/P10 for one screen regardless of the size;
* support of LED controller integration for control reception/transmission through PLC equipment via MODBUS RTU/ASCII protocol with status output in the mode of current display of real TXT information on LED screen to SCADA software platform;
* LED controller has support for 4 fonts (Kyrgyz, Russian, English, Symbols);
* The LED controller has support for at least 32 layers for pattern configuration;
* should be realized integration for synchronous transmission of text information voice at the moment of displaying from LED screen to the system of network sound notification on IP Audio SIP 2.0/3.0 protocol;
* support of the functionality of addressable transfer of text information to any of LED screens via PLC (PLC) equipment when building a common infrastructure.
	1. **55 inches LED screens:**
* Matrix type: with parallel alignment of crystals (In-Plane Switching);
* Matrix backlight type: carpet (Direct LED);
* Video panel format: no less than 16:9;
* Pixel size: no more than 0.63 x 0.63 mm;
* Resolution of one video panel: at least 1920 x 1080 pixels;
* Viewing angle: at least 178 degrees vertically and horizontally;
* Brightness: no less than 500 cd/m2;
* Static contrast: no less than 1000:1;
* Dynamic contrast: no less than 100000:1;
* Anti-glare: no less than 28 %;
* Operating hours: at least 24/7;
* Seam width between panels: no more than 1.74 mm;
* Input interfaces: at least 1 DisplayPort 1.2 port, 1 DVI-D port, 2 HDMI 2.0 ports with HDCP 2.2, 1 USB port, 1 Stereo miniJack port;
* Output interfaces: at least 1 DisplayPort 1.2 port, 1 Stereo miniJack port;
* External control interfaces: no less than RS232 input/output;
* Ethernet port: at least 1;
* Auto switching and restoration of signal sources: yes;
* Built-in temperature sensor: yes;
* Support for DaisyChain serial connection technology: yes;
* Use in vertical mode: yes;
* Certification of dust and moisture protection: no worse than IP5x;
* EMC classification: no less than class B;
* Maximum energy consumption: no more than 220 Watt/h;
* Average energy consumption: no more than 133 Watt/h;
* Physical dimensions of the screen of one video panel: no more than 1212.2 x 683 x 70.4 mm;
* Weight: no more than 19.5 kg;
* Displays must have pre-installed software for remote control and monitoring of displays via LAN.
* Cable products: the video system must be equipped with a set of cables no less than the following: a set of cables and adapters for internal switching of equipment; a set of cables for connecting power supplies.
	1. **Barrier**
* Support for the use of “Smart barriers” in the rotor part of the servo motor, with an initial load on a long arm from 4 to 6.5 meters, adjustable lifting speed from 3-6 seconds;
* Support for full control with PLC integration based on the MODBUS RTU/ASCII protocol via the RS485 port with the status of the hose position;
* The barrier controller supports the ability to connect two-circuit sensors based on RF/mmWave for identification of vehicles in a given area for exit/entrance notification;
* The barrier body must combine the fastening elements of the vehicle recognition camera body, have a cutout for installing an informative LED screen P3.75/P5, elements for fastening 2 or more traffic lights with a diameter of 200 mm, have space inside the body for placing a 12V 60/100A battery for support backup power up to 1-3 hours and the ability to install related equipment;
* The barrier body must be vandal-resistant and corrosion-resistant to weather conditions;
* the use of artificial PVC road barriers based on a material that is durable and resistant to dynamic loads, the purpose of which is to force vehicles to follow along the separation of lanes and parking restrictions.
	1. **Traffic light**

Two-signal LED traffic lights in parking areas for preliminary visual warning and control of traffic flows at each stage of the vehicle

 This equipment includes the following requirements:

* Supply voltage 220 V
* Incandescent lamp power 70 W
* Rotation angle on brackets +/- 100 degrees
* Overall dimensions (HxWxD) 410x180x90 mm
* Weight, no more, kg 2.7
* Lens diameter 100 mm
	1. **Signs**
* Housing – polycarbonate, ABS plastic, aluminum
* Case color – black
* Light source – LEDs
* Recognition range – at least 30 m
* Operating time in emergency mode – at least 3 hours
* Battery charging time – no more than 24 hours
* Input operating voltage for autonomous indicators – 230V AC/50-60Hz
* Electrical safety class – II
* Protection class – IP65
* Operating temperature range: from minus 45 to plus 60
* Case dimensions – at least 300x100 mm
	1. **Set of infrastructure management systems.**

Industry standard PLC(PLC) equipment includes the following requirements:

* Use in the project of PLC(PLC) of industrial standard to build highly efficient automatic control systems in uninterrupted mode 24/7 at low/high temperature conditions (+45/-50C), taking into account the peculiarities of the climate at the PP "Dostuk";
* The use of well-known brands in the project, which has in its assortment the whole line of PLC(PLC) equipment, the history of production for at least 15 years;
* free updated software for PLC controllers;
* the line should use a series of PLC controllers of modular type with a wide range of connectable additional PLC end components for full control of frequency/servo motor, control of backup power system - UPS/inverter, support for encoder equipment, RF/mmWave sensors for PBX identification, support elements for network equipment.
* in the line of PLC (PLC) support basic standards MODBUS (TCP/RTU/ASCII) through RS-232 / RS-485 port, support EtherCAT, EtherNet/IP, PROFINET;
* Configuration support in ISPSoft software and support for Codys**,** LD, FBD, ST (IEC 61131-3 standard) programming languages to configure the entire PLC range;
* the manufacturer's lineup should include PLC models with high performance of at least 0.30 sec per basic command;
* DIN rail mounting support, external power supply less than 24V-48V;
* preference will be given if only one brand of equipment will be used in the lineup in the selection of equipment for building the infrastructure for maximum compatibility.

Hardware for networking solutions includes the following requirements:

* Use of industrial type network equipment for uninterrupted operation 24/7 at low/high temperature conditions (+60/-50C)
* Support line management via WEB GUI/Console on Layer 2/Layer 3 for network equipment
* Support brand line of network equipment from 8 to 48 ports on the basis of managed switches / unmanaged switches, support POE solutions, various kinds of configurations, as well as in combo version support SFP optical single-mode modules 1GB/10GB/100GB
* Support minimum IEEE 802.1Q VLAN, TCP/IP IP4/IP6, MODBUS TCP, EtherCAT, etherNet/IP, Profinet, CC-LINK IE
* Support minimum requirements of standards in network equipment IEEE 802.3u 100Base- T(X) 100Base-FX / IEEE 802.3ab 1000Base-T / IEEE 802.3z 1000Base-X / IEEE 802.3x Flow Control

Sound warning equipment includes minimum requirements:

* the sound warning system is realized on the basis of amplifiers and loudspeakers through a digital audio system of repeater type;
* the system equipment should be built through the transmission of the IP Audio network protocol (SIP2.0/SIP3.0) on the basis of already available network equipment on the standard 1000Base-T in the network local environment in the PP "Dostuk";
* have support for addressable audio notification transmission of up to 10 zones;
* Power supply of loudspeakers should be realized on POE power supply 24/48V, have IP65 moisture protection Range 350Hz-16KHz, SNR range from 100 dB to 130 dB;
* there shall be hardware integration with LCD controllers for synchronized alerting of real- time audio and visual display of text information.

Hardware includes minimum server hardware requirements:

* Utilizing only modular type fanless industrial computers of well-known brands;
* Based on Intel Xeon LGA 1200 from 10th generation at least Intel Core i7, DDR4 at least 16GB; SSD at least 1TB, availability of RS232/RS485/USB 2-3.0/RJ45 1GB ports;
* Supports software/hardware solution for remote management;
* Supports 3 x PCI / 2 x SSD/HDD expansion modules;
* Supports DIN rail mounting, external power supply less than 24V-48V;
* 2U server hardware with chassis support for 12 x HDD 3.5' processor at least Intel XEON GOLD series. 64GB DDR4 3200 Mhz, 2 x SSD 1.6TB, 10 x 8TB SAS 15K.

Hardware includes minimum backup power supply requirements:

* using only equipment that utilizes inverter-type solutions with UPS function to automatically switch to the backup line most of the elements from the infrastructure;
* The equipment includes charge/discharge prevention functionality for high-capacity batteries during prolonged downtime;
* The backup power supply must be distributed independently of the main electrical network.

Low-level software to integrate with hardware for the following requirements:

* support of industrial standard PLC (PLC) control, asynchronous control via MODBUS/OPC UA protocol in real time mode and related equipment on other data exchange standards;
* control should be realized by requesting status every 2 seconds for each element from the common infrastructure;
* graphical visualization of the entire infrastructure should be implemented, where for each change in the status of an equipment item the graphical schematic icon changes. The frequency of updating the time interval should be every 2 seconds, when updating the statuses on the ongoing processes of equipment control for each element for the entire infrastructure in real time;
* preference will be given to software platforms (SCADA) from equipment manufacturers, or universal platforms (SCADA) of well-known brands with great support for other standards;
* the software platform should keep a database of logging all changes (statuses), errors, equipment failures in a separate database with fixing the date, time and error codes for a period of up to 12 months, with the ability to view for any time interval - hour, day, month;
* the software platform interaction scheme should have a server - multipoint (client)
* the software platform should have support for cluster duplication of the main server functionality, automatic switching to a backup server in case of hardware/software failures;
* the software platform should have support for hot standby of the database, logging bases, algorithms and scripts for software/hardware level interaction;
* Preference will be given to a software platform that has support for dual Linux/Windows platforms;
* the platform should have support for integration with "IPP" ACS (high level) for interaction of receiving/transmitting commands, receiving statuses on any of the equipment elements using third-party framework (all licenses should be included), or other options via API protocol, REST API (JSON), bases with SQL (for reading statuses) and other proposed options.
	1. **High-performance computer equipment:**
* NOTE: the proposed computer shall be of one brand name (not assembled with parts from different manufacturers)

|  |  |  |
| --- | --- | --- |
| Item | Model | quantity |
| Motherboard | extended-ATX workstation motherboard with Intel dual 10G LAN USB 3.2 Gen 2x2 Type-C port7 x PCIe 4.0 x16 slots3 x M.2 PCIe 4.0ASMB9-iKVM2 x U.2 and 16 power stagesWIFI 6E | 1 |
| Processor | "64 # threads 128Maximum overclocking frequency Up to 4.5 GHzBase hours 2.7 GHzL1 Cache 4 MBL2 Cache 32 MBL3 Cache 256 MBDefault TDP is 2906Processor technology for CPU cores TSMC 7nm FinFETUnlocked for overclocking YessWRX8 CPU ConnectorNumber of sockets 1PMaximum operating temperature (Tjmax) 95°C" | 1 |
| power unit | Power (nominal)2000 W1250 W (166.7%) bettervs750W12 V line power1999 W1250 W (166.9%) bettervs749 WLine current +3.3 V24 А4 A (20%) bettervs20 ALine current +5 V24 A4 A (20%) bettervs20 ADuty source current (+5 V Standby)3 A0.5 A (20%) bettervs2.5 ANumber of 15-pin SATA connectors166 (60%) bettervs10Number of 4-pin Molex connectors62 (50%) bettervs4CPU power cable length 750 mm50 mm (7.1%) bettervs700 mm | 1 |
| Case | ATX Full Tower, Black, ATX, EATX, Micro ATX, Mini ITX, SSI EEB, USB 3.2 Gen 1 Type A, USB 3.2 Gen 2 Type C, 800 mm x 505 mm x 800 mm, 323 L, 400 mm. | 1 |
| RAM | DIMM type UnbufferedTechnology DDR5Density 96GB Kit (2x48GB)Module quantity 2Voltage 1.1V/(5V ext)Module type UDIMMDefault(JEDEC) 46-45-45 | 2 |
| Video card | Graphics Processing Unit NVIDIA® GeForce RTX™ 4090Interface PCI Express® Gen 4Core ClocksExtreme Performance: 2535 MHz (MSICenter) Boost: 2520 MHz (GAMING & SILENTMode)CUDA® CORES 16384 UnitsMemory Speed 21 GbpsMemory 24GB GDDR6XMemory Bus 384-bitOutputDisplayPort x 3 (v1.4a)HDMI™ x 1 (Supports 4K@120Hz HDR,8K@60Hz HDR, and Variable Refresh Rate asspecified in HDMI™ 2.1a)HDCP Support YPower consumption 450 WPower connectors 16-pin x 1Recommended PSU 850 WCard Dimension (mm) 337 x 140 x 77 mmWeight (Card / Package) 2170 g / 3093 gDirectX Version Support 12 UltimateOpenGL Version Support 4.6Maximum Displays 4G-SYNC® technology YDigital Maximum Resolution 7680x4320 | 2 |
| Storage device | hard drives can achieve sequential read rates of up to 7,300Mbps and sequential write speeds of up to 6,900MBps. With a 1.8M MTBF (mean time between failures) and a capacity of up to 5,100 TBW, the SSD may also survive for a longer period of time (TeraBytes Written). | 3 |
| Water cooling | AlphacoolSocket: AMD AM4;AMD AM5 ;AMD SP3 ;AMD sTRX4 ;AMD sWRX8 ;AMD TR4 ;Intel 2011(-3) ;Intel 2011(-3) narrow ILM ;Intel 2066 ;Intel LGA 3647 ;Intel LGA 1700 ;Intel LGA 4189;Pre-filled: YesHose dimensions: 12.7/7.6mmRadiator size: 360mmPerformance class CPU Cooler:Radiator thickness: 30mmRadiator dimension: 390 x 120 x 30mmWeight: 3.192kg | 1 |
| Cooler | maximum operating speed of up to 2000 RPM producing a consistent airflow of 58.35 CFM with 2.41 mm-H2O static pressuremaintaining a low audio noise level of 22.3 dB-A. The 2nd Generation Hydraulic Bearing:The 2nd generation hydraulic bearing incorporates a new shaft design with inside etches allowing preservation of lubricant on both sides whilst reducing noise during operation. | 9 |

* 1. **Scanner**
* Type – scanner
* Scanner Sensor Type – CIS
* Paper size - A4
* Scanning area - 215.9x6096 mm
* Scanning speed (b/w) - 35 ppm (A4)
* Scanning speed (color) - 35 ppm (A4)
* Scanner resolution - 600x600 dpi
* Color depth (internal) - 30 bit
* Color depth (external) - 24 bit
* Light source type – LED
* Slide adapter – no
* Supports - ISIS, TWAIN, WIA standards
* Interfaces: USB interfaces
* USB version USB 3.0
* Automatic feeder: There is an automatic feeder
* Type of automatic feeder: double-sided
* Automatic feeder capacity 50 sheets
* Additional information:
* Compatibility Linux, Windows, macOS
* Technologies and functions scanning of dense materials, Ready Scan LED technology, ultrasonic detection of double paper feeding, paper protection function, sensor contamination control function
* No display
* Contents CD with software, documentation, USB cable, power cable
* Features load per day: minimum 4000 scans
	1. **Laptop**
* Intel Core i7
* RAM - 16 GB
* ROM - SSD 512 GB
* Display – 15’6 FullHD 1920\*1080
* Interface – USB-3.0, USB-C, HDMI, 3.5 mm, Ethernet
* Communication - Wi-Fi, Bluetooth
* Russian keyboard layout
* Laptop bag
	1. **High-Definition IR Speed Dome Camera**
* Quick installation with magnetic base and tripod bracket.
* Wi-Fi hotspot, directly connect your mobile phone to the camera
* Removable battery for continuous operation for 9 hours.
* Replaceable battery for stable operation
* Infinite 360° pan and -20° to 90° tilt range (auto flip) for PTZ
* Built-in screen to display status e.g. battery, GPS, 3G/4G, recording status, memory capacity, Bluetooth, platform access,
* Wi-Fi and Smart Algorithm Mode
* Supports access via browser and IE client, as well as remote control
* Supports customized audio import, intelligent analysis alarm linking
	1. **GPS tracker**
* Type GPS tracker
* GPS Tracker Sensors - Motion Sensor
* GPS tracker notification – SMS
* Power supply for GPS tracker – Autonomous
* Positioning accuracy, m – 2
* Communication standards - 2G
* Features - Waterproof housing
* Navigation systems - GPS, LBS, GLONASS
* Interfaces – microUSB
* Powered by – batteries
* Degree of protection - IP67
* Operating temperature range −40...+55
* Warranty period - 6 years
	1. **IP video camera for surveillance**
* Type (form factor) - Cylindrical
* IR illumination range - 30 meters
* Recording - To SD memory card, to HDD hard drive
* Features - Video analytics, Audio recording, Microphone, Remote viewing
* Resolution - 4 MP
* Connection type - Wired
* Installation - Indoor, Outdoor
* Audio interfaces - built-in microphone and speaker
* Weight – no more than 1.2 kg
* Operating temperature - 0 °C - 40 °C
* BLC - Supports
* Defog - Supports
* HLC - Supports
* ROI -1 for main stream
* WDR - 120 dB
* Aperture - F1.6
* Video compression - H.265+(performance mode)/H.265/H.264+(performance mode)/H.264
* Illumination range - 30 m
* Number of simultaneous connections - 6
* Number of threads - 2
* Matrix - 1/3"
* Storage method - ANR, microSD up to 256 GB
* Min. Sensitivity - 0.01 lux/ F1.0, 0 lux with IR
* Power consumption - 5 W
* Noise Reduction (DNR) - 3D
* Browser support - IE 10+, Chrome 57.0+, Firefox 52.0+
* Users/levels - 32/3
* Software - iVMS-4200, Hik-Connect, Hik-Central
* Dimensions - 246 × 156 × 214 mm
* Network interfaces - 4G (LTE-TDD, LTE-FDD, WCDMA, GSM), 1 RJ45 10 M/100 M
* Shutter speed - 1/3 - 1/100,000 s
* Degree of protection - IP66
* Illumination type - IR
* Viewing angles - D: 83.7°, V: 44°, D: 99.5°
* Focal length - 4 mm
* Frame rate (mainstream) - 2688 × 1520, 1920 × 1080, 1280 × 720 12.5 fps
* Frame rate (additional stream) - 640 × 480, 640 × 360 12.5 fps
* Electronic Image Stabilization (EIS) - Supports
* Electronic Image Stabilization (EIS) – Supports
1. **GENERAL REQUIREMENTS**
	1. **Requirements to the set of commissioning works**

Minimum Requirements:

* The optical cable shall be characterized by the parameters FEATURED
* Network cable at least F/UTP CAT6 23AWG
* Electrical cable rated at least 2.5 mm/m2
* Factory-designed cabinets only, with moisture protection requirements, access via 2 keys, tamper switch support
* The composition and scope of commissioning works should be agreed on the technical plan (the document should be developed by the contractor), includes the Customer's approval - the place of installation of equipment, the plan for laying cable systems, installation of high- rise matches.
	1. **Information security requirements**

In case of emergency situations in the organization, failures of technical means (including power failure), the information safety in the system shall be ensured, for which purpose periodic backup copying of the System Data Base by Data Base Management System means shall be provided. The Contractor shall provide the Customer with a proposal on the backup copying regulations (backup copying frequency, time of creation and storage period of the database backup copies), as well as a detailed instruction on how to organize the backup copying and restore the database from the backup copy by DBMS means.

* 1. **Requirements for protection of information from unauthorized access**

The whole complex of equipment and systems shall ensure the fulfillment of legal requirements on personal data protection in accordance with the Law of the Kyrgyz Republic dated April 14, 2008 No. 58 "On Personal Information". The implemented complex of equipment and systems shall reliably protect confidential information by means of authorization, monitoring of unauthorized activity and data encryption.

* 1. **Requirements to the Systems licensing policy**

The whole complex of auxiliary equipment and systems of ACS "ICP", installed within the framework of this project, will be the property of DAI and later officially transferred to the SCS KR based on USAID approval.

Preferentially it is required to use Open Source solutions when implementing the complex of auxiliary equipment and systems of ACS "ICP".

In case it is necessary to license third-party software, it will be carried out by the Customer on the basis of license agreements of third-party developers. The Contractor shall inform the Customer of all nuances and costs associated with the availability and renewal of such licenses.

* 1. **Warranty**

The Contractor guarantees the operability of the equipment and software used in accordance with the service life determined by the manufacturer or software developer.

## Attachment B: Proposal Cover Letter

[On Firm’s Letterhead]

<Insert date>

TO: Click here to enter text.

DAI Global LLC

Click here to enter text.

We, the undersigned, provide the attached proposal in accordance with **RFP-**Click here to enter text.**-**Click here to enter text.dated Click here to enter text.. Our attached proposal is for the total price of <Sum in Words ($0.00 Sum in Figures) >.

I certify a validity period of Click here to enter text. days for the prices provided in the attached Price Schedule/Bill of Quantities. Our proposal shall be binding upon us subject to the modifications resulting from any discussions.

*Offeror shall verify here the items specified in this RFP document.*

* We confirm that we are not providing any goods and/or services that utilize telecommunications and video surveillance products from the following companies: Huawei Technologies Company, ZTE Corporation, Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company, or any subsidiary or affiliate thereof, in compliance with FAR 52.204-25
* We acknowledge the solicitation amendments received.
* We acknowledge acceptance of DAI’s standard Subcontract form
* We acknowledge having adequate financial resources to finance and perform the work or deliver goods or the ability to obtain financial resources without receiving advance funds from DAI.

We understand that DAI is not bound to accept any proposal it receives.

Yours sincerely,

Authorized Signature:

Name and Title of Signatory: Click here to enter text.

Name of Firm: Click here to enter text.

Address: Click here to enter text.

Telephone: Click here to enter text.

Email: Click here to enter text.

Company Seal/Stamp:

## Attachment C: Price Schedule

|  |
| --- |
| **Labor (including fringe, indirect, and fee)** |
| ***Stage 1: Project Start-up*** |
|  | **Labor Type/Position** | **Unit** | **Level of Effort**  | **Rate per Hour, KGS** | **Total, KGS** |
| 1 | Project Manager | Hours |  |  |  |
| 2 | Other – please, specify | Hours |  |  |  |
| 3 | Other – please, specify | Hours |  |  |  |
| 4 | Other – please, specify | Hours |  |  |  |
|  | \*\*\* if required, please add as many lines here as deem necessary. |  |  |  |  |
| **Total Stage 1** |  |  |  |
| ***Stage 2: Pilot implementation*** |
|  | **Labor Type/Position** | **Unit** | **Level of Effort**  | **Rate per Hour, KGS** | **Total, KGS** |
| 1 | Project Manager | Hours |  |  |  |
| 2 | Other – please, specify | Hours |  |  |  |
| 3 | Other – please, specify | Hours |  |  |  |
| 4 | Other – please, specify | Hours |  |  |  |
|  | \*\*\* if required, please add as many lines here as deem necessary. |  |  |  |  |
| **Total Stage 2** |  |  |  |
| ***Stage 3. Installation*** |
|  | **Labor Type/Position** | **Unit** | **Level of Effort**  | **Rate per Hour, KGS** | **Total, KGS** |
| 1 | Project Manager | Hours |  |  |  |
| 2 | Other – please, specify | Hours |  |  |  |
| 3 | Other – please, specify | Hours |  |  |  |
| 4 | Other – please, specify | Hours |  |  |  |
|  | \*\*\* if required, please add as many lines here as deem necessary. |  |  |  |  |
| **Total Stage 3** |  |  |  |
| ***Stage 4. Project Handover*** |
|  | **Labor Type/Position** | **Unit** | **Level of Effort**  | **Rate per Hour, KGS** | **Total, KGS** |
| 1 | Project Manager | Hours |  |  |  |
| 2 | Other – please, specify | Hours |  |  |  |
| 3 | Other – please, specify | Hours |  |  |  |
| 4 | Other – please, specify | Hours |  |  |  |
|  | \*\*\* if required, please add as many lines here as deem necessary. |  |  |  |  |
| **Total Stage 4** |  |  |  |
| **TOTAL LABOR (Stage 1,2,3,4)** |  |  |  |
| **TRAVEL** |
|  | **Description** | **Unit** | **Quantity** | **Unit price in KGS** | **Total in KGS** |
| 1 | Ground Transportation | Trip |  |  |  |
| 2 | Air fair |  |  |  |  |
| 3 | Accommodation  | Night |  |  |  |
| 4 | Per diems  | Days |  |  |  |
|  | \*\*\* if required, please add as many lines here as deem necessary. |  |  |  |  |
| **TOTAL TRAVEL** |  |
| **Equipment** |
|

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **No.** | **Description and technical specifications****Requested** | **Q-ty** | **Country of origin** | **Suggested Specifications** | **Delivery period** *(in calendar days)* | **Unit price in KGS** *(excluding VAT if applicable)* | **VAT per unit in KGS** *(if applicable)* | **Total price in KGS** *(including VAT if applicable)* |
| 1 | **Specialized Camera with software for license plate recognition of all types of vehicles:** *(see attachment A for more technical details)* | 64 |  |  |  |  |  |  |
| 2 | **Tickers:** *(see attachment A for more technical details)* | 20 |  |  |  |  |  |  |
| 3 | **LED screens:** *(see attachment A for more technical details)* | 66 |  |  |  |  |  |  |
| 4 | **55” LED screens:** *(see attachment A for more technical details)* | 4 |  |  |  |  |  |  |
| 5 | **Barrier** *(see attachment A for more technical details)* | 30 |  |  |  |  |  |  |
| 6 | **Traffic light** *(see attachment A for more technical details)* | 20 |  |  |  |  |  |  |
| 7 | **Signs** *(see attachment A for more technical details)* | 20 |  |  |  |  |  |  |
| 8 | **Set of infrastructure management systems.** *(see attachment A for more technical details)* | 4 |  |  |  |  |  |  |
| 9 | **High-performance computer equipment** *(see attachment A for more technical details)* | 1 |  |  |  |  |  |  |
| 10 | **Scanner** *(see attachment A for more technical details)* | 20 |  |  |  |  |  |  |
| 11 | **Laptop** *(see attachment A for more technical details)* | 13 |  |  |  |  |  |  |
| 12 | **High-Definition IR Speed Dome Camera** *(see attachment A for more technical details)* | 2 |  |  |  |  |  |  |
| 13 | **GPS tracker** *(see attachment A for more technical details)* | 100 |  |  |  |  |  |  |
| 14 | **IP video camera for surveillance** *(see attachment A for more technical details)* | 10 |  |  |  |  |  |  |
|  **Total** *(only the cost of all 14 items above including VAT (if applicable) and excluding installation, warranty maintenance support services, delivery, and other expenses:* |  |
| **Shipping costs** *(all international (if any) and domestic shipping costs must be included:* |  |
| **Costs and duties for customs clearance** (all costs associated with customs, if applicable): |  |
| **Other expenses (describe briefly): \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:** |  |
|  |  |
| **TOTAL EQUIPMENT** *(all lines included above):* |  |

 |
| **GRAND TOTAL (LABOR +TRAVEL+EQUIPMENT)** |  |
| *Note: the Offeror shall provide detailed breakdown of the items included under Section “TRAVEL”* |

## Attachment D: Instructions for Obtaining an Unique Entity ID (SAM) - DAI’S Vendors, Subcontractors

## Attachment E: Self Certification for Exemption from Unique Entity ID (SAM) Requirement

## Attachment F: Past Performance Form

Include projects that best illustrate your work experience relevant to this RFP, sorted by decreasing order of completion date.

Projects should have been undertaken in the past three years. Projects undertaken in the past six years may be taken into consideration at the discretion of the evaluation committee.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| # | Project Title  | Description of Activities | LocationProvince/District | Client Name/Tel No  | Cost in US$ | Start-EndDates | Completed on schedule (Yes/No) | Completion Letter Received?(Yes/No) | Type of Agreement, Subcontract, Grant, PO (fixed price, cost reimbursable) |
| 1 |  |  |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |  |  |  |
| 5 |  |  |  |  |  |  |  |  |  |

## Attachment G: Representations and Certifications of Compliance

1. Federal Excluded Parties List - The Bidder Select is not presently debarred, suspended, or determined ineligible for an award of a contract by any Federal agency.
2. Executive Compensation Certification- FAR 52.204-10 requires DAI, as prime contractor of U.S. federal government contracts, to report compensation levels of the five most highly compensated subcontractor executives to the Federal Funding Accountability and Transparency Act Sub-Award Report System (FSRS)
3. Executive Order on Terrorism Financing- The Contractor is reminded that U.S. Executive Orders and U.S. law prohibits transactions with, and the provision of resources and support to, individuals and organizations associated with terrorism. It is the legal responsibility of the Contractor/Recipient to ensure compliance with these Executive Orders and laws. Recipients may not engage with, or provide resources or support to, individuals and organizations associated with terrorism. No support or resources may be provided to individuals or entities that appear on the Specially Designated Nationals and Blocked persons List maintained by the US Treasury (online at [www.SAM.gov](http://www.SAM.gov)) or the United Nations Security Designation List (online at: http://www.un.org/sc/committees/1267/aq\_sanctions\_list.shtml). This provision must be included in all subcontracts/sub awards issued under this Contract.
4. Trafficking of Persons – The Contractor may not traffic in persons (as defined in the Protocol to Prevent, Suppress, and Punish Trafficking of persons, especially Women and Children, supplementing the UN Convention against Transnational Organized Crime), procure commercial sex, and use forced labor during the period of this award.
5. Certification and Disclosure Regarding Payment to Influence Certain Federal Transactions – The Bidder certifies that it currently is and will remain in compliance with FAR 52.203-11, Certification and Disclosure Regarding Payment to Influence Certain Federal Transactions.
6. Organizational Conflict of Interest – The Bidder certifies that will comply FAR Part 9.5, Organizational Conflict of Interest. The Bidder certifies that is not aware of any information bearing on the existence of any potential organizational conflict of interest. The Bidder further certifies that if the Bidder becomes aware of information bearing on whether a potential conflict may exist, that Bidder shall immediately provide DAII with a disclosure statement describing this information.
7. Prohibition of Segregated Facilities - The Bidder certifies that it is compliant with FAR 52.222-21, Prohibition of Segregated Facilities.
8. Equal Opportunity – The Bidder certifies that it does not discriminate against any employee or applicant for employment because of age, sex, religion, handicap, race, creed, color or national origin.
9. Labor Laws – The Bidder certifies that it is in compliance with all labor laws..
10. Federal Acquisition Regulation (FAR) – The Bidder certifies that it is familiar with the Federal Acquisition Regulation (FAR) and is in not in violation of any certifications required in the applicable clauses of the FAR, including but not limited to certifications regarding lobbying, kickbacks, equal employment opportunity, affirmation action, and payments to influence Federal transactions.
11. Employee Compliance – The Bidder warrants that it will require all employees, entities and individuals providing services in connection with the performance of an DAI Purchase Order to comply with the provisions of the resulting Purchase Order and with all Federal, State, and local laws and regulations in connection with the work associated therein.

By submitting a proposal, offerors agree to fully comply with the terms and conditions above and all applicable U.S. federal government clauses included herein, and will be asked to sign these Representations and Certifications upon award.

## Attachment H: Proposal Checklist

Offeror: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Have you?

[ ]  Submitted your proposal to DAI in a sealed envelope to the address (electronic or mailing) as specified in General Instructions above?

Does your proposal include the following?

[ ]  Signed Cover Letter *(use template in Attachment B)*

[ ]  Proposal of the Product or Service that meets the technical requirements as per Attachment A

[ ]  Demonstration of how you meet or exceed each of the technical acceptability criteria.

[ ]  Documents use to determine Responsibility

[ ]  Evidence of an Unique Entity ID (SAM) OR Self Certification for Exemption from Unique Entity ID (SAM) Requirement

[ ]  Past Performance *(use template in Attachment F)*

[ ]

[ ]