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Construction Risk Management

A Mandatory Reference for ADS Chapter 201

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TABLE OF CONTENTS

I. Overview	2
II. Primary Responsibilities	2
III. Required Procedures	2
IV. Construction Risk at USAID	3
V. USAID's Preferred Approach to Construction	5
VI. Required Construction Risk Screening	9
VII. Mitigating Risk in the Program Cycle	9
VIII. Mandatory References	12
IX. Definitions	13

I. Overview

This Construction Risk Management mandatory reference requires that, during activity design, all USAID Operating Units must explicitly identify all construction activities performed under acquisition, assistance, Public International Organization (PIO) agreements or Government-to-Government (G2G) mechanisms. A risk screening of each identified and discrete construction activity (at any level) must be performed and documented by the Operating Unit prior to construction implementation. The following sections describe definitions, background, and guidance for identifying construction activities and performing construction risk screening.

II. Primary Responsibilities

The Activity Manager or Agreement Officer's Representative/Contracting Officer's Representative (AOR/COR) has the primary responsibility for:

1. Identifying construction activities in USAID projects and programs;
2. Conducting and filing construction risk screening analyses; and
3. Following up on the implementation of risk mitigation measures through the program cycle.

The responsible program officer must ensure compliance with the requirements of this mandatory reference. USAID engineering staff in the responsible Operating Unit, geographic Bureau or the Engineering Division of E3's Office of Energy and Infrastructure (E3/E&I) can provide technical assistance in the assessment of risk and mitigation options and monitoring performance.

III. Required Procedures

As described in this mandatory reference, construction risk management at USAID includes three required steps:

1. Identification of construction activities: All discrete construction activities (at any level) performed under acquisition, assistance, G2G and PIO agreements must be identified in activity planning documents (PAD's, activity designs, etc.).
2. Assessment of construction risk: The Activity Manager or A/COR must complete a screening of the risk of each construction activity relative to the Agency's preferred approach (see Section V below) and consider mitigation measures as appropriate. Activity risk screenings must be filed electronically in the Agency's enterprise tracking system (e.g.: upload to ASIST). Approval of construction risk screening is not required in order to

advance activity implementation. However, activity managers and AOR/CORs are responsible for accurately assessing risk and taking reasonable steps to avoid and mitigate known risks associated with construction activities.

3. Mitigation and monitoring of risk: AOR/CORs should monitor the performance of construction risk management and mitigation measures as part of the activity performance monitoring. Risk screening and selected mitigation measures can be updated throughout the activity implementation period to reduce risk and improve the performance of construction activities.

The Agency's engineering staff, backstopped by the Engineering Division of E3/E&I, are available to support activity managers and AOR/CORs in the identification of construction, screening of risk, and risk mitigation and monitoring.

IV. Construction Risk at USAID

Construction is an integral part of the Agency's practice and development portfolios worldwide. In 2014, a comprehensive survey and assessment of construction activities across the USAID portfolio identified construction activities in nearly every Operating Unit in the Agency. Since 2014, the estimated construction underway at any one time has averaged more than \$2 billion. The assessment concluded that where USAID identifies construction activities early in the program cycle, performance is generally good and risk is relatively low. Fundamentally, good planning leads to appropriate resource allocation, which facilitates implementation, enhances sustainability, and improves health and safety through implementation. USAID policy ([ADS 201](#)) requires early identification of planned construction activities, construction risk screening, and appropriate mitigation.

The term "construction" is specifically defined in the Federal Acquisition Regulation, but in general, construction is a specific type of activity that involves creating, modifying or demolishing physical infrastructure such as a school, clinic, well, water and wastewater facilities or road. For purposes of the construction policy in [ADS 303](#) and [304](#), when selecting the choice of instrument, USAID defines 'construction' as the "construction, alteration, or repair (including dredging and excavation) of buildings, structures, or other real property and includes, without limitation, improvements, renovation, alteration and refurbishment. The term includes, without limitation, roads, power plants, buildings, bridges, water treatment facilities, and vertical structures." The policy defines "improvements, renovation, alteration and refurbishment" to include "any betterment or change to an existing property to allow its continued or more efficient use within its designed purpose (renovation), or for the use of a different purpose or function (alteration)." The definition further includes items such as improvements to or upgrading of primary mechanical systems, and excludes

others such as non-structural, cosmetic work, such as painting. This definition only includes construction activities and does not include ancillary or other related activities such as architectural and engineering design or construction oversight.

Consideration of construction risk extends beyond activities performed under acquisition. Construction activities performed under assistance (grants and cooperative agreements) as well as through G2G agreements and PIO agreements must also be identified based on the preceding definition and assessed according to this guidance (see [ADS 303maw, USAID Implementation of Construction Activities](#)). This reference does not apply to those activities for which [ADS 303maw](#) waivers are in place.

Construction activities are generally designed to facilitate the delivery of services like education (schools), energy (generation systems and transmission lines), potable water (wells, treatment plants and pipelines), wastewater facilities (pipes and treatment plants) and healthcare (hospitals) to name a few. Construction activities differ from other types of development activities in the way they are planned, procured and implemented. Specifically, construction must be preceded by engineering/architecture design, procured in compliance with specific regulations and policy, and then managed and independently inspected from beginning to end with qualified technical expertise and specific controls.

The 2014 Construction Assessment identified 11 critical success factors for USAID construction activities. These success factors serve as the foundation for the Agency's construction risk management approach and are briefly described below:

1. Project Definition - Realistic assessment and approval based on sound technical information.
2. Stakeholder Engagement - Active participation and support of individuals and organizations required for successful implementation and ownership of construction projects.
3. Procurement Procedures, Contract Types, and Approaches - Effective and locally appropriate contract mechanisms that are consistent, balanced, enforceable and well understood by the local construction industry.
4. Institutional Capabilities to Operate and Maintain Investments - Engagement of competent organizations with responsibility and capability to effectively manage, operate, and maintain completed construction projects.

5. Health, Safety, Environmental and Social Requirements - Ability to address and assure compliance with local and international applicable health, safety, environmental and social requirements.
6. Appropriate Design Standards and Technology - Technical capability to develop project designs in accordance with applicable standards, using locally appropriate technologies.
7. Quality of Cost Estimating and Scheduling - Ability to establish realistic budgets and schedules within established levels of accuracy, while accounting for potential contingencies and risks.
8. Appropriate Levels of Contractor Qualifications - Determination and assurance of required contractor capabilities for successful completion of work within established quality requirements.
9. Risk Management Methodology - Incorporation of consistent and systematic approach for identification, assessment, and mitigation of risks.
10. Construction Oversight and Quality Verification - Assurance of successful execution and completion of construction by a qualified inspector and in accordance with established requirements and standards.
11. Monitoring and Evaluation Process - Established process for assessment of results and the ability of completed projects to achieve project objectives.

V. USAID's Preferred Approach to Construction

USAID has identified a preferred approach to implementing construction activities that minimizes construction risk through thorough planning and allocation of Agency resources to design and oversight. The preferred approach represents a benchmark against which Operating Units should screen their risk.

The principal elements of the Agency's preferred approach are described in the following paragraphs:

- **Perform pre-design/pre-construction analyses**: Analyses performed at the planning stages of a construction activity can help to determine the 'feasibility' of the planned activity and inform design decisions and actions during construction. Critical issues to be considered in a feasibility study or other pre-design/pre-construction analyses include:
 - Alternatives/cost-benefit analysis: Have project alternatives (including 'no project') been considered and evaluated using cost-benefit analysis? Costs and benefits should be inclusive of findings

from all analyses (i.e. environmental and social costs, etc.) and should consider life-cycle costs (including operations and maintenance costs).

- Climate risk: How might climate change impact the performance of construction/infrastructure? What should be considered in planning and design to mitigate potential impacts? See [Climate Risk Management for USAID Projects and Activities Guidance](#).
- Gender equity and violence prevention: How might the proposed construction/infrastructure reduce or contribute to gender equality and gender-based violence (GBV)? What should be considered in project design & implementation to mitigate potential negative impacts? See [ADS 205, Integrating Gender Equality and Female Empowerment in USAID's Program Cycle](#).
- Land rights: Have all legitimate landholders been identified and consulted? Are the legitimate landholders uncontested, or, if yes, have all disputes been resolved? Has the use of land for project purposes been secured through legal sale, lease or other means in consultation with all legitimate landholders? See [Guidelines on Compulsory Displacement and Resettlement in USAID Programming](#).
- Local Construction Capacity: Is the planned construction within the local contractor capacity? What actions should be considered to strengthen local contractor capability through construction?
- Stakeholder analysis: Have all project stakeholders been identified and consulted in a formal process? Is a system established to receive and address stakeholder feedback and grievances through construction?
- Building codes: Have local building codes been reviewed to determine adequacy (factors of safety, seismic, hydrology, geology, etc.) for use in design? How will the Americans with Disabilities Act (ADA) compliance be addressed in design?
- Environmental impact: Have cultural and natural resources impacts of construction and the resulting infrastructure and services been appropriately assessed, avoided and mitigated according to [22 CFR 216](#) requirements?
- **Engage a USAID qualified engineer when available and where appropriate for project management:** The USAID manager of engineering and construction activities should be a qualified engineer

(graduate of an accredited engineering program) who has completed USAID's engineering contracting and construction management (ECCM) training and has a minimum of two years of experience managing the implementation of construction activities. More stringent experience requirements are recommended for management of large and complex engineering and construction programs.

- **Engineering design completed by licensed engineering firm:** The engineering design (defining construction requirements, producing the drawings and technical specifications, and preparing the construction cost estimate) should be prepared, reviewed and certified by a locally licensed engineering firm, (international or local firm legally registered to practice the relevant engineering disciplines) to ensure their quality, accuracy and completeness prior to procurement of construction services. The approach for design review, certification, and construction must conform to local legal requirements and/or standard professional practice. In some cases, the role of design review and approval can be performed by an appropriate local government agency. Requirements for obtaining appropriate permits for construction should be included either in the contract with the independent engineer or in the construction contract.
- **Include operations and maintenance considerations in the project planning:** At the completion of detailed design (or earlier if appropriate), USAID should identify additional resources (financial and human resources) that will be required of the beneficiary/recipient for the operations and maintenance of resulting infrastructure and related services. A determination of the source of these resources should be made and appropriate accommodations (training, management contract, etc.) should be included in the project execution. Per the Foreign Assistance Act, Section 611(e), the host country or recipient organization's financial and human resources capability for operations and maintenance must be certified by the Mission Director or USAID representative for all construction activities exceeding \$1 million in value. See additional 611e analysis and certification guidance.
- **Use a Design-Bid-Build project delivery approach:** In executing construction activities, USAID recommends a standard phased approach with discrete, sequential steps for completing (100 percent) engineering design, procurement (bidding) and construction (building). Generally, engineering design and bidding support are achieved through an engineering services contract, and construction is completed under a separate award to a construction contractor. Construction and architect-engineer contracting/sub-contracting approach must comply with FAR Part 36 and USAID construction policy requirements as applicable. Under some USAID implementation approaches (Assistance, G2G, PIO agreements, etc.), USAID may not be directly responsible for the selection

and management of all elements of construction project delivery. Nevertheless, a design-bid-build approach to construction implementation is preferred for all construction activities regardless of the selected overall implementation approach.

- **Establish appropriate minimum qualifications and experience for construction contractors:** Minimum contractor qualifications must be established to ensure that proposal evaluation will result in the selection of a contractor with adequate financial and technical capacity as well as prior experience performing similar construction projects in similar contexts. Qualification standards should be established by USAID or partner staff knowledgeable of local construction contracting requirements and capacity.
- **Firm fixed price contract used for construction:** Firm fixed price contracts provide greater cost control on construction projects and can mitigate change orders when a detailed design is used as part of the procurement documents. Firm fixed price contracting for construction is preferred whether construction is performed under direct contract with USAID or through a different implementation approach (Assistance, G2G or PIO agreements) where construction would be performed as a sub-award.
- **Include performance bonding, guarantees, and warranty requirements in construction contract:** Construction contracts must include bid and performance bonds, liquidated damages and/or guarantees to ensure contract completion. Additionally, warranty clauses should be included to guarantee performance of infrastructure for a specified period after completion. All bid and performance bonds, guarantee, and warranty clauses should be consistent with the FAR, local professional standards and legal practices.
- **Independent engineering firm contracted for quality assurance:** Each USAID Operating Unit managing a construction activity should hold a separate engineering services contract with a qualified engineering firm to perform construction oversight and quality assurance throughout the life of the construction activity. In many cases this is the engineering/architectural design firm.
- **Use fully funded contract mechanisms for construction related activities:** The ADS recommends seeking an exception to the maximum length of forward funding ([ADS 602.3.3](#)) to avoid funding gaps prior to the completion of a fully constructed activity. It is recommended to fully fund not only the construction contractor, but all engineering related services associated with the project as well.

VI. Required Construction Risk Screening

The Agency's preferred construction approach is considered the 'least risky' approach for construction implementation and serves as the benchmark for required construction risk screening. Nevertheless, for a variety of programmatic, pragmatic and/or contextual reasons, it may be necessary to deviate from this preferred approach. The Operating Unit must identify, analyze and evaluate the additional risk accrued through variations from the preferred approach.

Each discrete construction activity (contract, cooperative agreement, G2G activity, PIO agreement, subcontract, etc.) should be screened at the lowest distinguishable level (ideally per specific construction contract/sub-contract). Screening is to be initiated and completed by the Activity Manager as soon as construction is identified as a planned activity. The screening should be updated throughout the life of the activity to improve the risk profile (lower risk) when additional mitigation actions are taken or to decrease scoring when additional risk is perceived.

Risk screening for each construction activity must be filed electronically by the Activity Manager in the Agency's enterprise tracking system (upload to ASIST) and will become part of the activity performance record. The Operating Unit must also include the risk screening conclusion (or overall risk rating) in the award files (ASIST). All construction activities with risk screening profiles captured in the Agency's enterprise system (e.g. uploaded to ASIST) can be monitored by USAID engineering staff. Engineering technical assistance or other resources should be allocated to manage and mitigate the highest risk activities.

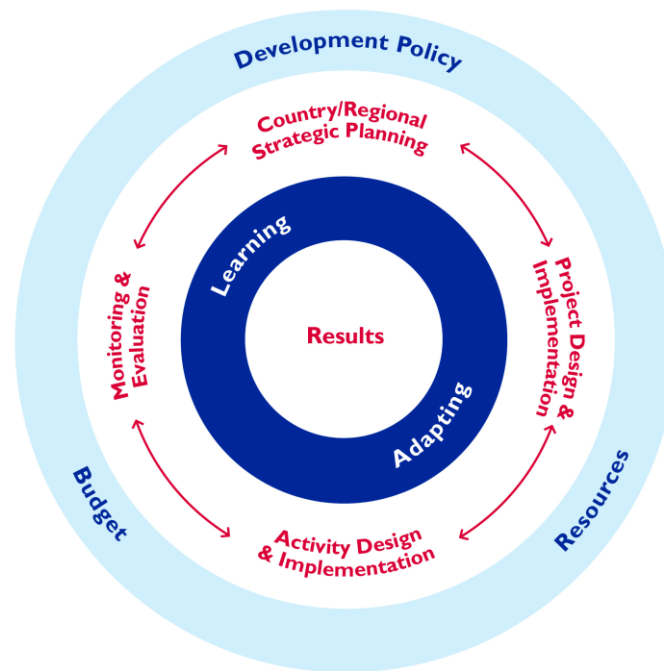
At a minimum, the construction screening for each activity must address conformance with, or variation from, each of the principal elements of the Agency's preferred approach described above. The screening should be organized to describe actions taken (or planned) to mitigate construction risk at different stages of activity implementation: Planning, (Engineering) Design, (Construction) Procurement and Implementation.

To facilitate preparation of required construction risk screening, the E3 Bureau has developed and maintains a [Construction Risk Estimator](#) tool to guide activity managers through a complete risk screening. Application of the construction risk estimator for a specific activity meets the risk screening requirements set forth in this mandatory reference.

VII. Mitigating Risk in the Program Cycle

Elements of planning, design and implementation of construction activities occur throughout the project cycle. Consequently, opportunities to identify and mitigate construction risk also present themselves at different stages. The following

paragraphs briefly describe construction risk mitigation opportunities that can be taken at different phases to reduce activity risk.



USAID Program Cycle

Country/Regional Strategic Planning

- Identify intent to perform construction, type and sectors - Identifying the general intent to perform construction activities early in the planning process help to ensure adequate resources will be allocated and is a requirement of the ADS ([Chapter 201](#)).
- Assess Operating Unit resources and gaps - Operating Units considering construction activities should ensure there are, or will be, adequate, qualified staff to plan, procure and oversee implementation of construction activities of similar scope and complexity. This may include engineering staff and contracting officers with construction procurement experience. Additionally, anticipated Operating Unit budgets should be aligned with infrastructure development expectations. Any gaps should be identified and addressed in further planning efforts.
- Perform broad determination of local engineering capacity – This is a broad determination of the local engineering and construction capabilities to affirm that engineering and construction capacity within the host country is adequate to complete anticipated infrastructure works. The

determination should consider the type and complexity of the work and use of locally available materials and appropriate technology.

- Identify planned project delivery method (design-bid-build or other) - Identifying on a preliminary basis the preferred project delivery method at the strategic level can help avoid confusion and additional risk mitigation requirements at later stages of construction planning and implementation.

Project Design and Implementation

- Identify source of feasibility analyses - During project design, the Operating Unit should identify the source of all infrastructure/construction feasibility analysis including preliminary studies, required stakeholder mapping and engagement, social assessments, land rights analysis, environmental impact analysis, and climate risk assessment. Where information is not readily available or verifiable, additional USAID-funded analyses may be addressed as part of the activity design process for the construction activity.
- Identify source of engineering design - The project design should include an independent engineering design as an activity. In cases where engineering design is available from a third-party source (like a host government), quality review and validation of the design by a licensed engineering firm is recommended.
- Procurement planning to phase feasibility analyses, engineering design, construction and quality assurance activities - The project design should consider appropriate timelines to allow for completion of feasibility analyses and design prior to construction procurement.
- Initial cost estimation – An initial estimation of construction costs should be completed by the Activity Manager at the project design stage. If an engineering firm is supporting infrastructure design through a separate agreement with USAID, the engineering firm may be the source of the Activity Manager’s initial cost estimate. Planned awards for construction activities and estimated costs must be entered into USAID’s A&A Plan System.
- Establish contingency plan - Operating Units should have a plan to address potential changes or cost overruns. Plans could include financial contingency and a change management system (specified approach, protocol or process) to address variances.

Activity Design and Implementation (Construction Activities)

- Where construction is performed under direct contract to USAID:

- Prepare firm fixed price procurement package based on engineering design and specifications - Construction contract documents should be based on 100 percent design prepared by third-party engineering firm. Contract documentation should include requirements for appropriate performance guarantees and warranty clauses.
- Include construction schedule and cost estimation in construction contract - The schedule and cost estimate should be validated by a qualified engineer. Draft versions may also be included if validation is not available.
- Include site health and safety plan in contract - The construction contractor's health and safety plan should be prepared and validated by an independent engineering firm prior to commencement of construction. The Initial Environmental Examination and Environmental Assessment may contain related requirements.
- Where construction is performed under an alternate implementation approach (assistance, G2G, PIO agreement or sub-contract): Ensure that the USAID partner is using firm fixed price contracts for construction as much as practicable; including an engineer validated schedule and cost estimate in the construction contract or sub-contract; and preparing a health and safety plan for construction activities.

Monitoring and Evaluation

- Utilize engineering quality assurance reports/documentation to evaluate performance - The Activity Manager should use monitoring and inspection reports prepared by an independent quality assurance contractor (engineering firm) to monitor construction progress. Construction activities must conform to the engineering design unless variances are documented, validated by an engineering firm and approved by the USAID A/COR.
- Update construction risk screening - The Activity Manager should update the construction risk screening as required (e.g. when the risk profile has changed due to changed conditions or changes in implementation approach) to maintain an accurate presentation of the risk profile of each discrete construction activity.

VIII. Mandatory References

- a. [ADS 303maw, USAID Implementation of Construction Activities](#)

b. [Section 611 of the Foreign Assistance Act of 1961: Completion of Plans and Cost Estimates](#)

IX. Definitions

Architect/Engineer Services: As defined in U.S. Code Title 40 Chapter 11: (1), Professional services of an architectural or engineering nature, as defined by state law, if applicable, that are required to be performed or approved by a person licensed, registered, or certified to provide those services; (2) Professional services of an architectural or engineering nature performed by contract that are associated with research, planning, development, design, construction, alteration, or repair of real property; and (3) Those other professional services of an architectural or engineering nature, or incidental services, that members of the architectural and engineering professions (and individuals in their employ) may logically or justifiably perform, including studies, investigations, surveying and mapping, tests, evaluations, consultations, comprehensive planning, program management, conceptual designs, plans and specifications, value engineering, construction phase services, soils engineering, drawing reviews, preparation of operating and maintenance manuals, and other related services.

Architect and Engineering Firm (A/E): For the purposes of this mandatory reference, A/E means any individual, firm, partnership, corporation, association, or other legal entity permitted by applicable law to practice the professions of architecture or engineering.

Bonds and Guarantees for Construction: In construction, bonds and guarantees represent a promise and assurance to the government that the contractor will guarantee a bid, perform according to contract terms, or guarantee payments to subcontractors and material suppliers (FAR 28.1).

Construction: Construction, alteration, or repair (including dredging and excavation) of buildings, structures, or other real property and includes, without limitation, new structures, improvements, renovation, alteration and refurbishment. The term includes, without limitation, roads, power plants, buildings, bridges, water and wastewater treatment facilities, pipe systems, and vertical structures. The term includes any betterment or change to an existing property to allow its continued or more efficient use within its designed purpose (renovation), or for the use of a different purpose or function (alteration). Improvements also include improvements to or upgrading of primary mechanical, electrical, or other building systems. The term does not include non-structural cosmetic work, including painting, floor covering, wall coverings, window replacement that does not include changing the size of the window opening, replacement of plumbing or conduits that does not affect structural elements, and

non-load bearing walls or fixtures (e.g., shelves, signs, lighting, etc.). Construction includes water supply systems such as groundwater wells.

Construction Activity: A construction activity is a sub-component of a project that contributes to a project purpose through the use of an award (such as a contract or cooperative agreement) that includes construction services as a portion of the entirety of the scope.

Construction Risk: Construction risk is the probability of damage, injury, liability, loss, or any other negative impact on the performance in terms of schedule, cost, quality or safety, that is caused by external or internal vulnerabilities, and that may be avoided through preemptive action. In general, the construction is widely associated with a high degree of risk due to the nature of construction business activities, processes, environment and organization. Construction projects entail long period, complicated processes, financial intensity and dynamic organization structures.

Design Review and Certification: Design review is a process in which building plans or architecture-engineering designs are reviewed to make sure they comply with basic safety, engineering and planning rules and are certified or approved to obtain appropriate construction permits.

Engineering/Architecture Design: The engineering/architecture design includes the drawings, calculations specifications and other documents from which the building or infrastructure is to be constructed, altered, demolished or removed, including the proposed procedures for inspection during construction and the definition of specified systems and procedures for operations and maintenance.

Operations and Maintenance: The decisions and actions regarding the control and upkeep of property and equipment. These are inclusive, but not limited to, the following: 1) actions focused on scheduling, procedures, and work/systems control and optimization; and 2) performance of routine, preventive, predictive, scheduled and unscheduled actions aimed at preventing infrastructure failure or decline with the goal of increasing efficiency, reliability, and safety.

Quality Assurance (QA): QA refers to the various functions, including inspection performed by the government or the government's designee (Architect-Engineer firm) to determine whether a contractor has fulfilled the contract obligations pertaining to quality and quantity. This includes steps that the government or designee takes to ensure that the QC procedures performed by the construction contractor are followed.

Qualification Based Selection: Architect-engineer contracting is unique in that we are required to look for the most highly qualified firm for the particular project (FAR 36.602). The Qualification Based Selection is a process by which the

Agency first evaluates each architect-engineer firm in terms of its professional qualifications, and then selects a firm to negotiate and award a contract based on the requirements of the job. Selection of architect-engineering service contracts must not be based on price, or even include price as a factor in the decision process.

Quality Control (QC): QC is the process conducted by the producer of the supplies or purveyor of services to ensure that the final results meet the requirements of the contract. For construction activities, QC is the responsibility of the construction contractor.

Qualified USAID Engineer: For purposes of this Mandatory Reference, a USAID engineer is an engineer who is employed directly by USAID as a U.S. Direct-Hire (USDH), a Foreign Service National (FSN), a Third Country National (TCN) or U.S. Personal Services Contractor (USPSC). Professional qualifications should include a professional degree from an accredited engineering program, completion of USAID's engineering contracting and construction management (ECCM) training and a minimum of two years of experience managing the implementation of construction activities. More stringent experience requirements are recommended for management of large and complex engineering and construction programs.

Risk Screening: A process that considers what can go wrong with a project, but can also be framed in terms of "critical success factors" (CSFs), or what needs to happen right for a successful project outcome. Much of the literature on international development construction focuses on CSFs, so this Mandatory Reference has adopted that approach to develop USAID's Preferred Approach to Construction.

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