US Army Corps of Engineers

ENGINEERING AND CONSTRUCTION BULLETIN

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SUBJECT: Technical Lead for Engineering and Construction Deliverables.

CATEGORY: Directive and Policy.

1. **References**:

   a. Engineer Regulation (ER) 5-1-11, USACE Business Process, 31 July 2018

   b. ER 1110-3-12, Military Engineering and Design - Quality Management, 25 March 2021

   c. ER 1110-2-1150, Engineering and Design for Civil Works Projects, 31 August 1999

   d. ER 1110-2-1156, Safety of Dams – Policy and Procedures, 31 March 2014

   e. ER 1165-2-217, Review Policy for Civil Works, 1 May 2021

   f. Engineer Manual (EM) 5-1-11 Project Delivery Business Process, 1 September 2022

2. Purpose.

The purpose of this Engineering and Construction Bulletin (ECB) is to reiterate the importance of the Technical Lead (TL) and clarify and reaffirm the roles and responsibilities of the TL.

3. Applicability.

This policy applies to all Engineering and Construction (E&C) deliverables executed by or through USACE labs, centers, and districts for all stakeholders. E&C deliverables include, but are not limited to, the generation of and/or contributions to planning/programming documents, Requests for Proposal, scopes of work and other solicitation documents, plans and specifications, engineering considerations and information for field personnel, etc.

4. Definitions.

Current USACE policy documents use terms such as “Lead Engineer/Architect,” “Engineer-in-Charge” or “Engineering Technical Lead” to describe a technical leadership role within each Project Delivery Team (PDT). This ECB uses TL to refer to each of these roles. The following definitions are copied directly from the respective guidance and demonstrate the overlap in guidance regarding this role. This ECB does not supersede any existing guidance but serves to clarify and expand on the following definitions.

<u>ER 5-1-11 USACE Business Process</u>

“Designated PDT member responsible for ensuring technical quality is achieved. Role may be filled by a design manager, discipline lead, or senior technical team member and assigned by the District that is responsible for technical deliverables. The TL must be involved in all project

decisions that affect quality management processes. For projects that require professional engineering services, the TL must possess an active professional registration… unless waived by the division chief responsible for Engineering."

ER 1110-3-12 Military Engineering and Design – Quality Management

"The TL is a technically qualified PDT member. Typically, the TL has discipline-specific PDT duties, or on the determination of local Engineering, acts only as TL without additional PDT responsibilities. The TL confirms that all design deliverables include the authorized project scope and addresses compliance with all applicable code, policy, and criteria. The TL has specific, individual responsibility to ensure that each deliverable is prepared and reviewed according to the Project Management Plan and USACE standards and guidance. The TL roles do not overlap those of the PM, and a clear delineation should be established at the beginning of each project to avoid duplicate efforts."

ER 1110-2-217 Civil Works Review Policy

"The TL, formerly called Lead Engineer/Architect or Engineer-in-Charge, serves as the proponent for the project's technical quality on the PDT. While the TL serves as the proponent for technical quality on all E&C deliverables, each member of the PDT retains their responsibility for technical quality."

ER 1110-2-1150 Engineering and Design for Civil Works Projects

"When more than one individual from the Engineering organization is on the PDT, the technical chief shall designate a "lead engineer". The lead engineer may change as the project moves through the different phases of development. Note that ER 1110-2-1150 is under revision and will include updated roles and responsibilities for TLs in the Civil Works program.

ER 1110-2-1156 Safety of Dams - Policy and Procedures

"The Lead Engineer must be a registered professional engineer and must be either a senior level (typically civil/geotech/structural) engineer or engineering geologist with extensive knowledge and skills related to the primary features associated with the project. The engineering geologist is required to be a registered professional engineer."

EM 5-1-11 Project Delivery Business Process

"The TL is responsible for:

Confirming all design deliverables include the authorized project scope and comply with all applicable codes, policies, and criteria.

Ensuring each deliverable is prepared and reviewed per the Project Management Plan and USACE standards and guidance.

Monitoring the quality of the products and services produced by their team members serving on the PDT or the contractors they use to supplement their in-house capability."

5. Technical Lead Qualifications.

In accordance with ER 1110-3-12, the District Chief of Engineering will consider the qualification requirements below and assign the TL for each project that generates E&C deliverables. When a project contains work performed by multiple E&C disciplines, the TL determination is based on the most appropriate skill set needed to execute the full scope of the

project within the parameters of the project budget and schedule. The TL shall be identified as such in the PDT members list in the Project Management Plan.

a. For projects with deliverables that require professional engineering services (per Federal Acquisition Regulation (FAR) Part 36) or for projects with specific licensure requirements, the TL must have an active professional registration (e.g., Professional Engineer, Professional Geologist, Professional Landscape Architect, Registered Architect).

b. For projects with deliverables that do not require professional engineering services (per FAR Part 36), the TL is not required to have an active professional registration. The size, scope, risk, and complexity of each project must be considered when determining the minimum qualifications for the TL assignment in these circumstances.

c. Pursuant to the above qualifications, assignment of non-licensed personnel may only be waived by written memorandum by the Chief of Engineering function and must be documented in the Project Management Plan.

d. For projects in which a home district has partnered with another district(s) (e.g., reach back work, regional projects), the home district's Chief of Engineering Function will designate which district holds the TL responsibility based on the scale of work for which the PDT is responsible.

e. For Dam Safety related projects, the selection of technical leads should follow dam safety program standard operating procedures.

6. Roles and Responsibilities.

a. To summarize and expand on the previous definitions in current guidance, the TL has specific, individual responsibilities to ensure that deliverables are prepared and reviewed according to the Project Management Plan, required criteria, standards, and guidance. While the TL serves as the proponent for technical quality on all E&C deliverables, each member of the PDT retains their responsibility for technical quality. Every project must have a TL who is an equal co-leader of the PDT with the Project Manager (PM) and is responsible for the technical elements of the project. The TL roles do not overlap those of the PM and a clear delineation should be established at the beginning of each project to avoid duplicative efforts. Any conflicts that arise between the PM, TL, and PDT concerning roles, responsibilities, or project changes that impact technical quality should be resolved through District procedures as established in the PMP. Reference Attachments A and B for an example checklist and guidance to aid in the coordination and discussion of the project roles and responsibilities between the PM and TL. This checklist is not meant to be all-inclusive, nor applicable to all projects, but is a resource to improve communication and consistency.

b. TL responsibilities must be assigned to one member of the PDT to serve as the proponent for the project's technical quality. The role should be performed by current personnel within USACE Districts' and Centers' organizational structure (e.g. design managers, senior designers, subject matter experts). This policy reinforces the need for the TL and PM to collaborate both with each other and the rest of the PDT. Revisions to the project scope, budget, or schedule that affect project quality must be coordinated with the TL to ensure quality objectives are still achieved at project completion. The TL must be involved in all project decisions (i.e. schedule and budget) that could affect quality management processes.

c. The TL is responsible for directing, coordinating, and leading a team of multi-disciplinary engineers and technical staff developing technical products (designs, models, calculations, quantity take-offs, plans, specifications, reports), cost estimates, schedules, and scopes of work to produce or review complete designs for projects. More specifically:

d. The TL acts as the leader of the engineering PDT and must:

(1) Serve as the primary engineering quality point of contact throughout the project life cycle.

(2) Provide briefing and status updates, elevate critical issues to Engineering functional chiefs. Represent PDT and Engineering Division in technical briefings to MSC and HQ USACE, as needed.

(3) Develop/refine and monitor the scope, budget, and schedule, to include all changes, for the engineering elements of the project throughout the project life cycle.

(4) Lead the engineering team, to include any supporting Districts, design centers, and AE contractors, directly or through other District personnel, in preparing project implementation documents, to include documenting risks and decisions during the course of the project.

(5) Prepare or support the preparation of AE scopes of work and lead or assist with AE negotiations.

(6) Ensure that all design deliverables include the authorized project scope (function, performance, aesthetics, sustainability, etc.) and identify, document, and address compliance with all applicable code, policy, and criteria.

(7) Ensure use of the quality review program (DrChecks) and the document management system (e.g., ProjectWise) for the project to include document archiving at the end of projects.

(8) Facilitate and ensure resolution of technical issues and comments among PDT members for the engineering and design deliverables.

(9) Facilitate documentation of best practices and lessons learned.

(10) Provide technical items to the PM for inclusion in PDT meeting agendas and provide design/technical coordinating documents for PDT meetings. Lead engineering team meetings to ensure technical quality of engineering deliverables, design intent, scope of work and execution of quality procedures.

(11) Serve as a technical mentor.

(12) Sign, approve, and serve as the submitter on implementation document cover sheets (i.e., Plans, Specs, Design Documentation Report, and other supporting documentation) for the purposes of confirming quality control procedures have been followed and completed.

(13) Ensure design coordination with the appropriate USACE Centers of Expertise – including, Centers of Standardization, Technical Centers of Expertise and Mandatory Centers of Expertise – to meet all applicable requirements and criteria.

(14) Provide input on technical related source selection criteria for Contractor evaluation.

(15) Coordinate with the engineering team to ensure required construction site visits are scheduled, budgeted, and occur in accordance with the Engineering Considerations and Instructions for Field Personnel.

e. The TL acts as an advocate for quality and shall:

(1) Act as the lead proponent for technical quality of engineering deliverables during all project phases.

(2) Ensure design deliverables meet authorized project scope, schedule, and cost.

(3) Support the PM with preparing and implementing the quality plans (Review Plan, Quality Control Plan, etc.,) in accordance with ER 1165-2-217, ER 1110-3-12.

(4) Ensure work performed by others complies with applicable guidance (ER 1165-2-217, ER 1110-3-12)

(5) Coordinate the engineering team integration with internal and external technical reviews (DQC, ATR, ITR, IEPR, etc.) and ensure resolution of review comments on engineering deliverables.

(6) Obtain certification(s) for the various quality reviews, in collaboration with the PM.

(7) Ensure compliance with Regional and District business processes for preparation of engineering and design products.

(8) Ensure that engineering team members are effectively coordinating design interfaces and hand-offs between disciplines.

(9) Maintain complete records of quality management activities.

(10) Serves as liaison to engineering team during the construction phase, ensuring that all Requests for Information and technical changes during construction are coordinated with the design team and resolved.

f. The TL acts as Technical Risk Manager and shall:

(1) Manage technical risks by ensuring design coordination between team members, mediating impasses when necessary, and elevating through supervisory chain to the Engineering Chief when critical.

(2) Guide the engineering team in analyzing the project scope to identify and document technical risks in the Project Management Plan, Review Plan, and risk register.

(3) Ensure engineering/performance risks are included in the project risk register and the risk register is updated as the project evolves and as discipline-specific risk-informed decisions are made.

(4) Assist the cost engineer with the development and completion of the Cost and Schedule Risk Analysis, when required.

(5) Integrate technical risk analysis into the development of the scope and scale of project quality plans and reviews.

(6) Facilitate succession planning and knowledge transfer during PDT member attrition.

7. Technical Lead Training and Development.

TLs can come from any number of technical backgrounds. In addition to expertise in their technical field, they should be well-versed in USACE design process development and possess excellent leadership and communication skills. Additionally, TLs should consider the following professional development topics: quality management, contracting, scheduling, conflict management, communication, time management, critical thinking, risk assessment, and lateral leadership. For mega-projects and other large or complex projects, the TL is recommended to be graded at the GS-13 level. To develop additional senior TLs and aid in professional development, organizations should consider formalizing mentor/protégée relationships when there are insufficient senior TLs available. Regular coordination and collaboration among TLs can also aid in professional development for TLs.

8. Quality Documents.

Since the TL is responsible for technical quality, they must have significant input during the preparation and implementing of project quality plans. ER 5-1-11 and EM 5-1-11 require a Quality Management Plan as part of the Project Management Plan for all projects. For Military projects, details regarding the Quality Management Plan and its required content are provided in ER 1110-3-12. For Civil Works projects, the Review Plan meets the specific project requirements for a Quality Management Plan and details regarding its required content are provided in ER 1165-2-217.

9. Point of Contact.

HQUSACE point of contact for this ECB is Vanessa Bateman, CECW-EC, (202) 761-7423, vanessa.c.bateman@usace.army.mil.

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Encl.
Attachment A – PM and TL Roles and Responsibilities Checklist
Attachment B – PM and TL Roles and Responsibilities Guidance