

DEPARTMENT OF THE ARMY
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Engineering and Design
INDEPENDENT TECHNICAL REVIEW

1. Purpose. This guidance defines responsibilities, requirements and procedures for the Independent Technical Review (ITR) of engineering products for civil works and military projects, including those in support of planning.
2. Applicability. This circular applies to all United States Army Corps of Engineers (USACE) commands responsible for producing engineering products.
3. Distribution. Approved for public release. Distribution is unlimited.
4. References.
 - a. ER 5-1-11, U. S. Army Corps of Engineers Business Process
 - b. USACE Project Management Business Process (PMBP) Manual
 - c. ER 1110-2-1150, Engineering and Design for Civil Works Projects
 - d. ER 1110-345-100, Design Policy for Military Construction
 - e. ER 1110-1-8159, DrChecks
5. Definitions.
 - a. Engineering Products. All engineering deliverables, including but not limited to:
 - (1) Civil Works Program – engineering technical appendices, design memoranda, design analyses, plans and specifications, and studies.
 - (2) Military Program – full spectrum of military planning documents, studies, programming estimates, and design documents.
 - (3) Environmental Program – various environmental studies and plans.
 - b. Independent Technical Review. A review by a qualified person or team not involved in the day-to-day production of a project/product, for the purpose of confirming the proper application of clearly established criteria, regulations, laws, codes, principles and professional practices.

c. Quality (per ER 5-1-11). The totality of features and characteristics of a product or service that bear on its ability to meet the stated or implied needs and expectations of the project. Quality expectations need to be negotiated among the Project Delivery Team (PDT) members, including the customer, and are set in the Project Management Plan (PMP).

6. General.

a. Project Quality. A quality project starts with proper development of the PMP, including the Project Quality Plan as required by ER 5-1-11 and the PMBP Manual. Project quality is a combination of the three key axes of quality: schedule, budget, and technical adequacy. Developing a quality product depends upon proper planning and execution, including: (1) defining measurable objectives; (2) understanding customer requirements (scope and deliverables), quality expectations, and USACE policies; (3) establishing appropriate and separate PDT and ITR teams; (4) assuring proper resources (time and funding) are available to both the PDT and ITR teams; and (5) maintaining a sound quality control process, for which ITR is just one aspect. Product quality will be measured using the objectives, goals and expectations defined in the PMP.

b. Technical Quality. ITR is a critical component of the process required to achieve technical quality. Technical quality is achieved mainly through a process that includes development of comprehensive work plans, compliance with USACE technical guidance, careful definition of functional and technical criteria, adequate coordination between the PDT and technical disciplines, and continuous coordination with the customer. In addition, proper oversight by senior technical experts and full compliance with ER 1110-2-1150 for civil works projects and ER 1110-345-100 for military projects are required. Quality is further achieved by participation in design charrettes; careful checking; supervisory review; Biddability, Constructibility, Operability, and Environmental Review; and review by qualified engineers, scientists, and technical specialists. Application of lessons learned and After Action Reviews (AAR) will also enhance the quality of future work.

c. ITR. All engineering products shall undergo ITR. ITR is a holistic, comprehensive review of the project. While ITR is a critical component of assuring quality, ITR shall not replace design checks or other quality control processes. Each ITR team member should review each product for consistency across the various disciplines of the project. Each ITR team member must also review his/her discipline's elements and how they impact and align with the project's functions. Comments should be limited to those that are required to ensure adequacy of the product; it is not the reviewer's prerogative to dictate matters based solely on personal preferences.

d. ITR Objectives. The primary objectives of ITR are to ensure that:

- (1) Formulation and evaluation of alternatives are consistent with applicable regulations and guidance;
- (2) Engineering concepts and project costs are valid;

- (3) Recommended alternative is feasible and will be safe, functional, constructible, environmentally sustainable, within the Federal interest, and economically justified according to policy;
- (4) All relevant engineering and scientific disciplines have been effectively integrated;
- (5) Appropriate computer models and methods of analysis were used and basic assumptions are valid and used for the intended purpose;
- (6) The source, amount, and level of detail of the data used in the analysis are appropriate for the complexity of the project;
- (7) Project complies with accepted engineering practice within USACE;
- (8) Project is biddable, constructible, operable, and environmentally sound;
- (9) Project meets the customer's scope, intent and quality objectives as defined in the PMP;
- (10) Engineering content is sufficiently complete for the current phase of the project and provides an adequate basis for future design effort;
- (11) Project documentation is appropriate and adequate for the project phase.

e. ITR and Project Risk. ITR should be commensurate with the scope, complexity, risk and cost of the project. It is critical that appropriately experienced and technically expert personnel be assigned to both the PDT and ITR teams. The ITR team must be selected based upon factors such as the project scope, complexity and size; sponsor/customer expectations; public scrutiny; life safety; technical expertise required; overall knowledge of the Corps' business; and other established guidelines.

f. ITR Team Membership. The ITR team members will demonstrate senior-level competence in the type of work being reviewed. Junior-level staff cannot be members of ITR teams without appropriate senior-level technical monitoring. For most projects, ITR members should be sought from the following sources: regional technical specialists (RTS); appointed subject matter experts (SME) from other districts; senior level experts from other districts; Center of Expertise staff; appointed SME or senior level experts from the responsible district; experts from other USACE commands; contractors; academic or other technical experts; or a combination of the above. ITR should be performed outside of the responsible command for large and/or complex projects, high-risk projects, and when the responsible command does not have sufficient resources to conduct proper ITR. All ITR teams should strive to include personnel who are registered in their field of expertise, if applicable. While the selection of the ITR team and team leader is ultimately the responsibility of the command managing the project, it may be appropriate to obtain recommendations for ITR team members from outside the command such as from other districts, other Regional Business Centers (RBC), HQUSACE, Centers of Expertise, or expert groups outside USACE.

g. ITR Team and PDT Relationship. Appropriate and separate PDT and ITR teams shall be established during the initial PMP development. ITR reviews shall be conducted as necessary to ensure that the product is consistent with the PMP and established criteria, guidance, procedures and policy. ITR team members will be identified in the Quality Control Plan (QCP), and any personnel changes are to be coordinated with the PDT and the QCP updated. The ITR team must assure independence from the PDT by not becoming involved in the routine day-to-day production decisions, including formulation, evaluation, analyses, or design, including value engineering studies. The ITR team will be available to act as advisers to the PDT during the production of the product. ITR should focus on offering the advantages, disadvantages and concerns of options considered by the PDT, and offer any other alternatives and/or better practices not considered by the PDT. The PM must ensure that the ITR team maintains situational awareness with respect to project challenges and opportunities. This could include, at a minimum, scheduled periodic project briefings and site visits. The PDT is responsible for production decisions.

h. Continual Review. The ITR process shall be a continual process with formal reviews coordinated with the PDT at critical points, saving time and money, and minimizing unproductive design effort and rework. ITR team members will be available, knowledgeable and willing to offer guidance as major issues arise. PDT members will be encouraged to seek concurrence or guidance from the ITR throughout the product delivery process through formal venues as prescribed in the PMP and as a matter of regular informal practice. The PM is responsible to ensure that a robust dialogue exists between the ITR Team and the PDT. The ITR team will furnish the PDT feedback at critical points during project formulation and design, and will conduct formal reviews at scheduled milestones and as products are completed. Formal ITR of products only occurs when a holistic, comprehensive review of the overall product is performed.

i. Formal Reviews. The ITR team shall document its comments and recommendations, for all formal reviews, utilizing the DrChecks module in ProjNet in accordance with ER 1110-1-8159. Comments should be structured to give a clear statement of the concern, the basis of the concern and, when appropriate, the actions necessary to resolve the concern. Comments should cite appropriate references. The PDT shall respond to each comment in DrChecks. Responses shall clearly state agreement or disagreement with the comment and include explanation or proposed alternative action. All comments are to be resolved and backchecked in the DrChecks project record prior to ITR certification. The ITR team should also use the Design Quality Lessons Learned (DQLL) module in ProjNet to document project lessons learned.

j. Informal Reviews. The ITR team and the PDT must keep close contact throughout the project development process. The ITR team will render comments and recommendations to the PDT from time-to-time in order to avoid lost effort due to technical error.

k. Editorial Comments. Some comments and suggestions about minor issues, while valid, may be best made informally, in parallel with but external to the official ITR process in order to insure the ITR focuses on significant deficiencies. Examples of comments best handled informally include:

- (1) Spelling, grammar, format or language in the report;

- (2) Minor numerical errors, which do not affect validity of the results;
- (3) Other issues that will not contribute towards a safer, more functional, or more economical project.
- (4) Repetitive comments on same subject where one comment is adequate.

1. Statement of Technical Review. A statement of technical review must be completed for all final products and final documents. In the case of civil works decision documents forwarded to HQUSACE for review, a statement of technical review must accompany both draft and final documents.

m. Engineering Technical Appendices (ETA) for Civil Works Projects. The ETA will be reviewed as described in this circular for technical adequacy prior to Engineering delivering the ETA to Planning. However, the ETA is an appendix to a planning report. The planning report, and other planning products that include engineering input, including the ETA, will have ITR review conducted in accordance with planning policy and guidance. Planning policy requires that the overall ITR be performed outside of the responsible command for all feasibility and post authorization studies.

7. Responsibilities.

a. District or Center. The command that has project management responsibility for a project is responsible for ensuring that ITR is performed and certified within established guidelines. As such, the command must assure that all requirements and processes are understood and followed. Each command will have procedures defined in their local PMBP processes defining:

- (1) ITR Requirements. Determine the ITR requirements for the product.
- (2) ITR Team Selection. Selection of the ITR team leader and ITR members within established guidelines.
- (3) Resources. Resources (time and funding) available for the ITR members.
- (4) Change Management Process. How resources or ITR members are changed.
- (5) Process for ITR Comment Resolution. The PM is responsible to maintain contact between the ITR team and the PDT throughout the project development process. When the PDT disagrees with a comment, the best means of resolution is a discussion between PDT and ITR team members. However, when such a discussion does not result in an appropriate resolution, the issue should be elevated through the chain of command. The ITR team does not have authority to cause resolution of comments; the authority for comment resolution lies with the chain of command. The chief of the engineering function in the responsible command is the final authority for resolution of ITR comments. All comments in the DrChecks module must be backchecked against the final documents prior to closing and issuing the ITR Certification.

(6) Architect Engineer (A-E) Contractors. A-E contractors will typically be required to accomplish ITR of their products as part of their quality control process, also using the DrChecks module of ProjNet, and the responsible USACE command will perform quality assurance. USACE may, however, on an exception basis, perform an ITR to integrate the products of multiple A-E contractors. An example may be if an A-E contractor performs the geotechnical and structural design while the civil and electrical design is either performed in-house by the USACE command or by another A-E contractor. In a situation like this, a single comprehensive ITR of the total product is required. The ITR may be conducted by the USACE command. These exceptions must be noted in the A-E contract(s) and PMP. However, an A-E contractor is still responsible for quality control of its work. The USACE command is responsible for policy compliance on all projects.

(7) ITR Certification Process. A certification by the project manager and the chief of the engineering function that the issues raised by the ITR team have been resolved is required as part of the statement of technical review. A statement of technical review is included as Appendix A. Also, when the ITR is performed by an A-E contractor, the appropriate principal of the contractor shall sign the statement. A statement of technical review for an A-E contractor is included as Appendix B. Commands may modify the statements if justified.

b. Regional Business Centers. With its quality assurance mission and through its Quality Management Program, the RBC is responsible for the effectiveness of ITRs across the region.


(1) The RBC Quality Manager provides oversight of the quality management and the ITR processes in the RBC and is the point of contact for the subordinate districts and HQUSACE for ITR issues. The RBC Quality Manager will serve as the regional champion for quality. The Quality Manager will coordinate best practices and all ITR issues through the corporate and regional communities of practice (CoP), with the RTSs, as well as within the RBC (including the Regional Integration Team) and with HQUSACE CoPs.

(2) ITR selection, issue resolution, certification processes, and quality assurance of A-E contractors, including use of the DrChecks module, will be reviewed during RBC Quality Assurance Audits of subordinate districts.

(3) RBC staff will be responsible for review, acceptance and dissemination of identified lessons learned and best practices. The RBC will use RTSs and SMEs to assist in this effort. Project-specific issues will be conveyed to the appropriate District Support Team, the RBC and the appropriate CoPs.

FOR THE COMMANDER:

2 Appendices
App A - Statement of Technical Review
App B - A-E Contractor Statement of
Technical Review



DONALD L. BASHAM, P.E.
Chief, Engineering and Construction
Directorate of Civil Works

APPENDIX A

STATEMENT OF TECHNICAL REVIEW

COMPLETION OF INDEPENDENT TECHNICAL REVIEW

The District has completed the (*type of product*) of (*project name and location*). Notice is hereby given that an independent technical review, that is appropriate to the level of risk and complexity inherent in the project, has been conducted as defined in the Quality Control Plan. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions; methods, procedures, and material used in analyses; alternatives evaluated; the appropriateness of data used and level obtained; and reasonableness of the result, including whether the product meets the customer's needs consistent with law and existing Corps policy. The independent technical review was accomplished by (*an independent team*). All comments resulting from ITR have been resolved.

(Signature)
Technical Review Team Leader

(Date)

(Signature)
Project Manager

(Date)

CERTIFICATION OF INDEPENDENT TECHNICAL REVIEW

Significant concerns and the explanation of the resolution are as follows:

(Describe the major technical concerns, possible impact, and resolution)

As noted above, all concerns resulting from independent technical review of the project have been fully resolved.

(Signature)
Chief, Engineering Division

(Date)

APPENDIX B

A-E CONTRACTOR STATEMENT OF TECHNICAL REVIEW

COMPLETION OF INDEPENDENT TECHNICAL REVIEW

The A-E Contractor (*A-E Contractor*) has completed the (*type of product*) of (*project name and location*). Notice is hereby given that an independent technical review, that is appropriate to the level of risk and complexity inherent in the project, has been conducted as defined in the Quality Control Plan. During the independent technical review, compliance with established policy principles and procedures, utilizing justified and valid assumptions, was verified. This included review of: assumptions; methods, procedures, and material used in analyses; alternatives evaluated; the appropriateness of data used and level obtained; and reasonableness of the result, including whether the product meets the customer's needs consistent with law and existing Corps policy. The independent technical review was accomplished by (*an independent team*). All comments resulting from ITR have been resolved.

(Signature)
Technical Review Team Leader

(Date)

(Signature)
Project Manager, A-E Contractor

(Date)

CERTIFICATION OF INDEPENDENT TECHNICAL REVIEW

Significant concerns and the explanation of the resolution are as follows:

(Describe the major technical concerns, possible impact, and resolution)

As noted above, all concerns resulting from independent technical review of the project have been fully resolved.

(Signature)
Principal, A-E Contractor

(Date)