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	Engineering and Design STRUCTURAL STEEL CONNECTIONS	
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CEMP-ET

DEPARTMENT OF THE ARMY
U.S. Army Corps of Engineers
Washington, D.C. 20314-1000

ER 1110-345-53

Regulation
No. 1110-345-53

22 July 1994

Engineering and Design
STRUCTURAL STEEL CONNECTIONS

1. Purpose. This regulation prescribes the policy and procedures for the design and approval of structural steel connections for military construction projects.
2. Applicability. This regulation applies to HQUSACE elements, major subordinate commands, districts, and field operating activities (FOA) having military construction design responsibility.
3. Reference.
 - a. FAR 52.236-23
 - b. AR 340-17
 - c. ER 415-1-10
 - d. ER 415-1-11
 - e. ER 1110-345-100
 - f. ER 1110-345-700
 - g. ER 1110-345-710
 - h. ER 1110-345-720
4. Definitions.

a. Critical Connections. Critical connections are those connections subjected to moment, axial and shear loads or combinations thereof. For the purpose of this regulation, these connections are not standard.

b. Simple Connections. Simple connections are connections classified as shear connections and subjected to shear loads only. Design and detailing of these connections should follow the American Institute of Steel Construction (AISC) Manual of Steel Construction.

This ER supersedes ER 1110-345-53 dated 30 April 1993

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c. Engineer of Record. For in-house designs, the Engineer of Record (EOR) is the Chief of Engineering of the office performing the design. For Architect-Engineers (A-E) designs the EOR is the principal of the firm in charge of the project.

d. Independent Reviewer. A senior engineer who is not involved with the project and who reviews the design for completeness is the independent reviewer.

5. General. The elimination of inconsistencies and achievement of uniformity in design and detailing of structural steel connections among Corps of Engineers design elements is necessary. Until now, the definition of EOR and responsibilities of the Chief of Engineering, including the role of the designer during the construction phase of the project, have been absent from established policies.

6. Policy.

a. Design responsibility for in-house or A-E design of all structural steel connections will remain with the Corps of Engineers designer or the A-E firm respectively; transfer of this responsibility to the construction contractor will not be permitted. For in-house design or A-E design, the connection shop drawings will be reviewed and approved by the EOR.

b. In cases where simple connections are not shown in the contract documents, the design responsibility will be retained by the Corps of Engineers designer or the A-E firm respectively, through the shop drawing review and approval process.

c. Commanders are responsible for strict implementation of this policy without exception.

7. Design Responsibility.

a. For designs performed in-house, the Corps of Engineers EOR is responsible for the design of all structural steel connections.

b. The A-E will be held fully accountable for the design of the structural steel connections in accordance with the "Responsibility of the Architect-Engineer Contractor" clause set out in FAR 52.236-23 and in accordance with ER 415-1-10.

c. Division and district offices preparing contract documents or having jurisdiction over A-E prepared designs will ensure that all critical structural steel connections are completely detailed and shown on the contract drawings. Recognizing the increased engineering effort necessary to design, review and approve all critical connections, whether designs are performed in-house or by A-E, the design schedule should reflect the added engineering and drafting efforts. During the A-E negotiations, the requirement for complete design, review and approval of the critical connections should be emphasized.

d. Construction contractors will not be permitted to design critical steel connections, but will be permitted to select and detail simple connection details (shear connections) from the AISC Manual of Steel Construction.

e. Additional guidance on the responsibility of design is included in the following: AR 340-17, ER 415-1-11, ER 1110-345-100, ER 1110-345-700, ER 1110-345-710 and ER 1110-345-720.

8. Design Verification.

a. Completed 100% designs will be given an independent review by the design office as part of the design procedure and will be included in the Project Management Plan (PMP). This review will be accomplished prior to advertising for bids.

b. Independent reviewers will ensure that the project specifications and notes on the drawings do not transfer design responsibility from the Government to the construction contractor.

c. Independent reviewers will check design computations, verify design adequacy and ensure all critical connections are completely detailed and shown on the contract drawings.

9. Shop Drawings.

a. The contract documents will include a clause requiring the construction contractor to certify erection drawings are in conformance with the contract drawings and specifications.

b. Reviewers will ensure that the construction contractor has not deviated from the contract drawings in detailing the critical connection components.

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c. The construction contractor will be required to notify the Government when errors or omissions are discovered in the contract documents.

d. The construction contractor will be required to submit all structural steel shop drawings through the resident engineer for Corps of Engineers EOR or A-E EOR review and approval.

10. Services During Construction.

a. To maintain the responsibility of design, periodic site visits at critical milestones during construction by the designer are required to strengthen the engineering-construction interface. Therefore, divisions and districts will ensure the role of the designer is extended into the construction phase of the project by planned visits at critical points of the construction. The frequency and timing of these visits shall be established during the planning stage of the project. These visits shall be funded by districts from EDC accounts, and the Special Design Instructions (SDI) to DD Form 1391 shall reflect the cost for this added inspection effort. The resident engineer will be responsible for requesting the designer*s involvement at the established critical milestones of the structural steel erection.

b. Architect-Engineer*s involvement during construction is also required to maintain responsibility of design. The cost for this effort shall be indicated on the SDI and handled as indicated above.

11. Engineering Instruction Manuals. Division and district Engineering Instruction Manuals should be updated to reflect requirements of this regulation.

FOR THE COMMANDER:



WILLIAM D. BROWN
Colonel, Corps of Engineers
Chief of Staff