US Army Corps
of Engineers ®

EIRS Bulletin

Engineering Improvement Recommendation System

No. 97-04 Date: 30 May 1997

The Engineering Improvement Recommendation System Bulletin is part of our Information Feedback System and is used in military construction programs to expedite dissemination of information regarding problems. The probable solutions included in the EIRS BULLETIN have not been thoroughly explored or staffed. Accordingly, these probable solutions do not represent a final HQUSACE position, and their use is not mandatory. Probable solutions are considered as informational in nature for the purpose of permitting prompt consideration by the field. EIRS Bulletin recipients are encouraged to comment on the probable solutions presented so that other viewpoints can be considered in the development of the final HQUSACE position. Since changes to criteria approved by ENG Form 3078, Recommended Changes to Engineering Documents, are expected to remain firm, they are identified as final solutions and should be used in current design. To defray printing costs, local reproduction of this bulletin is authorized. This issue of the EIRS Bulletin contains 5 enclosures as follows:

ENCL 1: ENGINEERING AND DESIGN - Air Force Interior Design Presentation Format

ENCL 2: ENGINEERING AND DESIGN - USACE Points of Contact for Programming Documents (1391s)

ENCL 3: ENGINEERING AND DESIGN - Family Housing Conversation Improvements

ENCL 4: RECOMMENDED CHANGES TO ENGINEERING DOCUMENTS - ENG Form 3078 Follow-up Actions

ENCL 5: ENGINEERING AND DESIGN - CURRENT DESIGN CRITERIA - Recently Issued Criteria

FOR THE COMMANDER:

5 Encls

KISUK CHEUNG
Chief, Engineering Division
Directorate of Military Programs

Prepared in accordance with AR 25-30 by HQUSACE Directorate of Military Programs, 20 Massachusetts Ave., NW, Washington, DC 20314

ENGINEERING AND DESIGN

Air Force Interior Design Presentation Format:

a. Problem: A memorandum from HQ AFCEE/CC to SEE DISTRIBUTION, SUBJECT: Interior Design Presentation Format, dated 26 November 1996, distributes detailed guidance on the subject. USACE interior designers have asked for clarification on the mandatory and advisory aspects of this document. They are concerned that full application of all requirements stated will raise design costs and result in lost effort. HQUSAF, AFCEE, and HQUSACE met on 20 March 1997 to discuss interpretation and application of the subject document.

b. Probable Solution: The goal of the format is to establish commonality in submittals for interior design in Air Force project. The format addresses all facility types, defines maximum requirements, and provides examples of submittal elements in the appendices. The following guidance should be used in interpreting the format.

(1) Number of Submittals. Although the format shows four submittal levels, only two submittals and corrections for procurement will be required on most projects. The first submittal should demonstrate the design concept and should be aimed at obtaining the approval of the Structural Interior Design (SID). The second submittal should address the completed SID and Comprehensive Interior Design (CID) (i.e., complete Furniture-Related Interior Design). The last submittal should reflect corrections to the second submittal necessary for construction or procurement.

(2) Content and Time Lines for Submittals.

(a) Project definition (PD) is interpreted as approved concept level design (approximately 35%). To facilitate review, this submittal should be made concurrent with the building concept design.

(b) A 60% submittal is only required for complex projects, such as medical facilities. The 60% submittal and review may be conducted as an on-board review with brief handouts for most projects. It is not intended as a stop work submittal.

(c) A 90% submittal is intended to be the primary submittal for CID. The design should be essentially complete for this submittal. The 90% submittal will occur with the final design submittal for the building.

Encl 1 (3 pages)

(d) Ready to advertise (RTA) is interpreted to be the correction of design documents for procurement of the building including SID.

(e) RTA is interpreted to be completed procurement information for procurement of furniture and furnishings as it relates to CID. The correction of the CID submittal should normally occur approximately one year prior to the expected installation of furniture.

(3) Use of Appendices. The appendices are designed to indicate the content of submittals and are not intended to be required forms. These appendices provide important information for contract design firms, who may be unfamiliar with the level of detail or the specificity of information required for procurement. They are especially important when the Air Force installation will be procuring the CID items. When USACE is procuring the CID items, established formats which reflect the same information are equally acceptable. For example, CEGS-09915, Color for Buildings, meets the requirements of Appendix D. Automated formats equivalent to the DD Form 1348-6, provided in Appendix E, are equally acceptable. Air Force Form 9, provided as Appendix E, is required by some MAJCOM when the installation will procure furniture items in which installation is part of the procurement cost. This form is not required if USACE is doing the procurement.

(4) Special Considerations for Design-Build or Turnkey Negotiated Procurements. In design-build, design requirements require extensive definition in the request for proposals. The design proposal submitted to obtain award should be treated as a concept level submittal for purpose of this guidance. The contractor's final design submittal will be treated as the 90% submittal described above. Corrections to this submittal (RTA), should be made quickly, and submittal dates established to allow adequate time for procurement

(5) Special Considerations for Prewired Workstations. Prewired workstations are defined in AR 415-15, Army Military Construction Program Development and Execution, 30 August 1994, Appendix H. The definition is unchanged from ER 1110-345-122, Interior Design, 15 April 1994, Appendix B. Prewired workstations are to be treated as SID. This means that a block diagram is required at the concept level submittal to ensure that required capacity can be achieved. The final submittal (90%) should represent their completed design.

(6) Furniture Systems. Furniture systems is a new term reflecting a family of furniture products and is used in GSA schedules. Specifications are not currently available from the Air Force or Army to cover all these products. The terms furniture

systems and prewired workstations are not interchangeable. Prewired workstations are procured in the construction contract using CEGS-12705. Furniture systems, as defined in Glossary of the format, include a broader range of products which are normally O&M funded.

(7) Negotiation. USACE activities should use the Air Force Interior Design Presentation Format as a reference to negotiate their scopes of services. Scopes should be consistent with the format, reflect user submittal needs and time lines, and should use scarce design resources (both contract and in-house) in the most effective manner.

c. Implementation: This policy reflects agreement between the Air Force and Army on these issues. The implementation of this policy is considered to have ***special application*** as defined by ER 1110-345-100.

d. Additional Information: For additional information concerning prewired work stations, contact Mr. Frank A. Norcross, CEMP-EA, telephone (202) 761-0881 or DSN 763-0881, telecopier (202) 761-8815, email frank.norcross@inet.hq.usace.army.mil.

ENGINEERING AND DESIGN

USACE Points of Contact for Programming Documents (1391s):

a. Problem: Enhanced networking and teamwork between Headquarters, Major Subordinate Commands (MSC), Districts and Directors of Public Works (DPW) are needed to improve 1391s for projects.

b. Probable Solution: A USACE Points of Contact Directory for Programming Documents (1391s) is now provided on the Internet. It is a directory of **Headquarter proponents** and their areas of expertise and Points of Contact at Technical Centers of Expertise. It can be accessed through the Technical Engineering Branch Homepage, or using the following address:

http://www.hq.usace.army.mil/cemp/e/et/1391pocs.htm

Districts, MSC and DPW are encouraged to contact the appropriate person for additional information/clarification and assistance pertaining to technical criteria and policy during development and/or certification of programming documents.

ENGINEERING AND DESIGN

Family Housing Energy Conservation Improvements:

a. Problem: Executive Order 12902, Energy Efficiency and Water Conservation in Federal Facilities, March 8, 1994, is implemented through Department of Energy guidelines issued as Buying Energy Efficient Products. The document is available from DOE at (800) 363-3732 or http://www.eren.doe.gov/femp. This EIRS Bulletin includes recommendations through February 1997.

b. Probable Solution: The following paragraphs of Architectural and Engineering Instructions, Army Family Housing (AEI-AFH), 1 November 1996, Volume 2, Statement of Work (SOW), should be revised. This is change 2 to AEI-AFH. See EIRS Bulletin 97-02 for change 1. The revised SOW, including changes 1 and 2 is dated 29 May 1997 and is available from the COS for family housing (CENAO). Changed wording is **bolded**:

5.p. **Doors. See Table 7-2 for thermal performance requirements for exterior doors.**

5.p.(4) Interior doors. Interior doors shall be 2050 mm [6 ft -8 inches] in height by 35 mm [1-3/8 inch] thick, hollow core wood or hollow panel. Wood doors will be painted. **[Insert "Louvered doors are required for closets." This is a user and district option in areas where humidity, mold, or mildew are problems.]**

5.t.**(8)** **Ceiling Fans. See paragraph 10.k.**

7.b.(1) **To limit air infiltration, buildings will be sealed with an air infiltration barrier installed in accordance with the manufacturer's recommendations**. The building envelope shall be caulked, gasketed, weatherstripped or otherwise sealed: around window and door frames, between wall cavities and frames, between walls and ceiling and roof, between walls and floors, at access doors and panels, at utility penetrations through walls, floors, and roofs, and at any other exterior envelope joint which may be a source of air leakage. **These steps, in combination with provision of a continuous vapor barrier and sealed ductwork as specified in paragraph 10.d., shall constitute tight building construction.**

8.i.(1) Gas fired water heaters shall be in accordance with ANSI Z21.10.1, Water Heaters, Gas, Volume I, Storage Type, 22 kW [75,000 BTUH] Input or less, **and shall be sealed combustion high efficiency type.** Water heaters with powered ventilation shall be vented in accordance with manufacturer's instructions.

8.i.(3) Electric water heaters shall comply with UL 174, Water Heaters, Household Electric Storage Tank Type, **and shall have an Annual Energy Use (kWh) of 4,773 or less based on DOE test procedure 10 CFR430, Sub-Part B, Appendix E.**

Encl 3 (2 pages)

9.g.(2)(a) Dining room ceiling light fixtures (hanging type) shall be movable by means of a track, chain and hooks, or other means in order to accommodate other than the typical dining room furniture arrangement. Fixtures may be designed for incandescent use, and do not have to meet the 50 L/Watt requirement. A **Ceiling fan with integral lighting fixture may be substituted for this requirement.**

TABLE 10-3 - MINIMUM EQUIPMENT EFFICIENCIES

	Oil fired equip	Natural gas fired equip	LP gas fired equip	Electric heat pump (air cooled)		Electric cooling equip
Furnace AFUE	**90%1**	**90%1**	**90%1**	**Size A2**	**Size B2**	
Boiler Combustion Efficiency	80%	80%	80%			
HSPF				7.7	8.5	
SEER (Regions 1-5)				**123**	**133**	**123**
SEER (Regions 6-11)				**123**	**133**	**123**

Note1: Efficiency is based on DOE test procedure 10CFR430, Sub-Part B, Appendix N.
Note2: Size A heat pumps have a capacity of 5.9 kW [20,000 Btu/hr] or less. Size B heat pumps have a capacity of 5.9 to 13.5 kW [20,000 to 46,000 Btu/hr].
Note3: Efficiency is based on DOE test procedure 10CFR430, Sub-Part B, Appendix M.

10.k.Ceiling Fans. **[Ceiling fans are an optional feature which may be requested by the installation. Delete paragraph if not required.]** Provision of ceiling fans is encouraged as a means of increasing occupant comfort, and as an aid to improve the performance of heating and cooling systems. **Ceiling fans with lights may be substituted for ceiling fixture requirements in bedrooms and in the dining room. Ceiling fans will be low profile 1050-1350 mm (42-52 inch), four blade type. Motors shall be three speed reversable, with air volume range between 613 and 2832 lps (1300 and 7000 CFM) and speeds between 75 and 225 rpm. Maximum power consumption shall be 80 Watts and 0.7 amps. Manufacturer's 20 year warranty is required.**

c. Implementation: The implementation of this policy is considered to have ***routine application*** as defined by ER 1110 345 100.

d. Additional Information: For additional information concerning family housing criteria, contact Mr. Frank A. Norcross, CEMP-EA, telephone (202) 761-0881 or DSN 763-0881, telecopier (202) 761-8815, email frank.norcross@inet.hq.usace.army.mil. For additional clarification of the family housing heating, ventilation, air condtioning, and energy conservation issues described above, please contact Mr. Joe McCarty, CEMP-ET, telephone (202) 761-8619.

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RECOMMENDED CHANGES TO ENGINEERING DOCUMENTS

ENG Form 3078 Follow-up Actions:

a. Problem: ENG Forms 3078 which indicate an affirmative action by HQUSACE are provided to the originating USACE Commands. Since the ENG Forms 3078 will result in changes to the criteria and guidance, all USACE Commands should receive the same information to be used in criteria designs.

b. Probable Solution: Reviewed ENG Forms 3078 which make a commitment to change guide specifications, manuals, etc. will be included in the EIRS Bulletin, unless the change has been accomplished. This enclosure includes a copy of ENG Form 3078.

Encl 4 (6 pages)

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ENG FORMS 3078

CONTROL NO.	PUB NO.	OFFICE SYMBOL
9077	CEGS-06100	CESWF-CD-ST

RECOMMENDED CHANGES TO ENGINEERING DOCUMENTS

(Submit a separate form in quadruplicate for each report)

(ER 1110-345-100)

OFFICE SYMBOL AND DATE: CESWF-CD-ST / CESWF-ED-CS / 29 Feb 96

DOCUMENT NUMBER AND DATE	DOCUMENT TITLE
CGS-06100 (Dec 1993) w/Notice 2 (May 1995)	Rough Carpentry

DOCUMENT TYPE

☐ DRAWING ([STANDARD] [DEFINITIVE]) ☒ SPECIFICATION ([GUIDE] [STANDARD])

☐ DESIGN GUIDES ☐ TECHNICAL MANUAL

☐ ENGINEER MANUAL ☐ ENGINEER REGULATION ☐ OTHER

☒ MILITARY ☐ CIVIL WORKS

SUBJECT: Additional Requirements for Primary Nailers Fastening/Anchorage to Roofing System

ROUTING (Check)

FROM:
District Commander
U.S. Army Engineer District,
ATTN: CESWF-ED-CS
Fort Worth, TX
76102-0300

ACTION RECOMMENDED BY DISTRICT COMMANDER

(See Sheet 2)

OFFICE SYMBOL: CESWF-ED
NAME AND TITLE (Print or Type): for MICHAEL J. MOCEK, P.E. Chief, Engineering Division
DATE: 3-4-96
SIGNATURE:

1a. TO.
HQUSACE (CEMP-EA)
WASH DC 20314-1000

INFORMATION COPY OF THIS ENG FORM 3078 WAS SENT 3/6/96 (Date)

1b. TO.
Division Commander
U.S. Army Engineer Division,
ATTN: CESWD-ED-T
Dallas, TX
75242-0216

COMMENTS, ACTION, OR RECOMMENDATION BY DIVISION COMMANDER
Concur and recommend approval.

OFFICE SYMBOL: CESWD-ET
NAME AND TITLE (Print or Type): PAUL D. ROBINSON, P.E. Acting Director, Engineering & Technical Svc Dir.
DATE: 21 Mar 96
SIGNATURE:

2. TO:
HQUSACE (CEMP-EA)
WASH DC 20314-1000

COMMENTS OR ACTION BY COMMANDER, USACE
CONCUR

OFFICE SYMBOL: CEMP-E
NAME AND TITLE (Print or Type): KISUK CHEUNG, Chief, Engineering Division
DATE: 05/08/97
SIGNATURE:

3. TO.
Division Commander
U.S. Army Engineer Division,
ATTN: CESWD-ED-T
Dallas, TX
75242-0216

COMMENTS BY DIVISION COMMANDER

OFFICE SYMBOL
NAME AND TITLE (Print or Type)
DATE
SIGNATURE

4. RETURN TO.
District Commander
U.S. Army Engineer District,
ATTN: CESWF-ED-CS
Fort Worth, TX
76102-0300

COPY FURNISHED

ENG FORM 3078, Mar 92 EDITION OF OCT 88 IS OBSOLETE. (Proponent, CEMP-EA)

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RECOMMENDED CHANGES TO ENGINEERING DOCUMENTS *(Cont'd)*

OFFICE SYMBOL AND DATE
CESWF-CD-ST
CESWF-ED-CS
29 Feb 96

PROBLEM DISCRIPTION AND ACTION RECOMMENDED *(Use additional sheets if necessary.)*

1. PROBLEM:

See Attached Sheets.

2. RECOMMENDED SOLUTION:

See Attached Sheets.

NAME OF SUBMITTER *(Optional)*

Jay Gorman, CESWF-CD-ST

WORK TELEPHONE NUMBER *(Optional)*

(817) 334-4948

7077

CESWF CD ST
CESWF-ED-CS
29 Feb 96

1. PROBLEM

A. Recently, the roof membranes on several barracks buildings at Fort Bliss partially blew off at wind gusts approaching the 80 mph design wind speed. The membranes were mechanically attached, elastomeric type (CSPE). The cause of the blow-offs was failure of the fastening system for the perimeter, stacked wood nailers. The User will have to spend thousands of dollars to repair damage that could have been prevented by the addition of not over $50 worth of 16 penny nails.

B. Nailers are typically shown in section on the contract drawings, but fastening requirements are usually not called out. Paragraph 3.6.4 in subject Guide Specification contains partial fastening requirements for secondary stacked nailers on roof decks, but none for primary nailers.

C. Guide Specifications CEGS-07530, Elastomeric Roofing (EPDM), and CEGS-07555, Polyvinyl Chloride (PVC) Roofing, and Navy guide NFGS-07531A (31 December 1993), Elastomeric Sheet Roofing System (CSPE), all require the specified roof systems to be Factory Mutual (FM) Wind Uplift Class 1-60 or 1-90 rated. Factory Mutual guidelines for perimeter nailer installation for wind rated roof systems are contained in FM Loss Prevention Data Sheet 1-49, titled: "Perimeter Flashing." The stacked nailer installation requirements in this publication are much more stringent than those contained in paragraph 3.6.4 of subject Guide. Also, the FM publication contains primary nailer anchorage requirements missing in subject Guide.

D. Wind uplift is highest at the perimeter and especially at the corners of buildings. That is why blow-offs typically originate at those locations, and why it is very important that FM nailer guidelines be followed.

2. RECOMMENDATION:

a. Paragraph 3.6.4: Add the following sentence to the end of the paragraph:

"Nailers and nailer installation for Factory Mutual wind uplift rated roof systems specified in other sections of these specifications shall conform to the recommendations contained in \-FM-05-\."".

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b. Paragraph 1.1 REFERENCES: Add the following publication:

"FACTORY MUTUAL ENGINEERING AND RESEARCH (FM)

\-FM-05\- (June 1985) Loss Prevention Data Sheet 1-49, Perimeter Flashing"

c. Paragraph 1.2, SUBMITTALS: Add the following submittal requirements to submittal description SD-04:

"*Roof Nailer Installation*\; *[FIO]*\.

Submit drawings detailing materials, field erection details, and methods of fastening for nailer installation for Factory Mutual wind uplift rated roof systems specified in other sections of the specifications."

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CURRENT DESIGN CRITERIA

Recently Issued Criteria:

a. Problem: There have been instances where current design criteria were not used in project designs because recently issued Engineering and Design documents were placed in a central office file and were not distributed to design personnel who need to be aware of the current criteria and guidance.

b. Probable Solution: From all reports, EIRS Bulletins are widely circulated within the Engineering Division of USACE Commands and are readily accessible to all engineering and design personnel. This enclosure includes a listing of recently issued criteria.

Engineering and Design criteria for Civil Works and Military Programs are distributed by the "Construction Criteria Base (CCB)" System, National Institute of Building Sciences NIBS. CCB is available in CD-ROM format and is on the CCB web site at "http://www.nibs.org/ccb". Information about subscribing to CCB may be obtained by calling NIBS at (202) 289-7800. Current Military Programs Engineering and Design criteria are also available on our TECHINFO web site at "http://w2.hnd.usace.army.mil". For further information on TECHINFO, call the Huntsville Engineering and Support Center, CEHNC-ED-ES-G, at (205) 895-1821 between 8:00 a.m. and 4:00 p.m., Central Time.

Encl 5 (2 pages)

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PUBLICATION LIST

PUB-NO.	PUBLICATION	PUB-DATE
CEGS-01320	Project Schedule	Apr 97
CEGS-01330	Submittal Procedures	Apr 97
CEGS-01451	Contractor Quality Control	Apr 97
CEGS-02150	Piping; Off-Gas	Apr 97
CEGS-04900	Restoration and Cleaning of Masonry in Historic Structures	Apr 97
CEGS-07900	Joint Sealing	Jun 97
CEGS-08210	Wood Doors	May 97
CEGS-08810	Glass and Glazing	May 97
CEAGS-08810A	Glass and Glazing	May 97
ER 715-1-20	Architect-Engineer Contracting	May 97