



US Army Corps
of Engineers ®

EIRS Bulletin

Engineering Improvement Recommendation System

No. 97-07

Date: 5 September 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 FNG 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 2 enclosures as follows:

ENCL 1: ENGINEERING AND DESIGN - Omega Sprinkler Alert

ENCL 2: RECOMMENDED CHANGES TO ENGINEERING DOCUMENTS - ENG Form 3078 Follow-up Actions

FOR THE COMMANDER:

2 Encls


KISUK CHEUNG, P.E.
Chief, Engineering Division
Directorate of Military Programs

ENGINEERING AND DESIGN

Omega Sprinkler Alert.

a. Problem: We have become aware of potentially serious problems with Omega model sprinklers manufactured by Central Sprinkler Company. There have been reports of one Omega sprinkler not activating at two sites. But each fire was controlled by the next Omega on the system line. This has cast suspicion on whether other Omega sprinklers will operate under fire conditions. According to publications by the Central Sprinkler Company which has been manufacturing and distributing Omega sprinklers since 1983, the cause of the failures is site related and not the fault of the manufacturer. There has not been a recall of the product as of this date. The reason for the non-activation is attributed to stop leak products contained within the sprinkler system. As a result of Central's further investigations, a second condition was discovered that can cause the Omega sprinkler to fail which was the presence of high concentrations of cutting oils in steel piping

(1) Stop-Leak Additives. Sprinkler standards such as NFPA 13, NFPA 13D and NFPA 13R prohibit stop-leak additives. However, they have been used. The reason for their usage is that some steel sprinkler systems use cast iron fittings. The casting process can leave a very small imperfection in a fitting that is undetectable until the fitting is under pressure. Stop leak additives can plug these small imperfections. Stop leak was also found to crystallize around an Omega sprinkler's ethylene propylene diene monomer (EPDM) o-ring. Crystallization is attributed to nature of the EPDM o-ring which is minutely permeable to air. Oxygen in the air reacts with the stop leak to form crystals. This crystallization can increase the pressure needed to dislodge the o-ring and cap and open the orifice. Enough crystallization can prevent a sprinkler from operation altogether. The presence of stop-leak additives can be confirmed by laboratory tests. If stop-leak additive is discovered and significant crystallization is occurring at the sprinkler, Central Sprinkler Company will assist with remediation by providing replacement sprinklers at cost.

(2) Cutting Oils. The Central Sprinkler Company also found that the EPDM o-rings used in Omega sprinklers from 1983 to 1996 can swell if exposed to high-enough amounts of cutting oil. The swelling of the o-ring increases the pressure needed to overcome the tight fit that the o-ring makes between the body of the sprinkler and its cap. The additional pressure needed to overcome the increased friction is not a problem in most cases because the system pressure will be more than enough to open the sprinkler. At best, the additional pressure required is slight. At worst, the swelling could require more than the available pressure and prevent the head from opening. Central has responded to the cutting oil problem by switching from a EPDM o-ring to a silicone rubber o-ring that performs with minimal swell in the presence of cutting oil. All Omega sprinklers manufactured on or after 7 June 1996 are equipped with the silicon rubber o-ring.

b. Probable Solution: The following action is recommended:

(1) In new construction, all Omega sprinkler heads will be the type that has an silicon rubber

Encl 1 (5 pages)

o-ring, and not the EPDM o-ring. Omega sprinklers manufactured on or after 7 June 1996 are equipped with the silicon rubber o-rings. Additives such as stop-leak additives must not be provided in any sprinkler systems.

(2) In existing buildings, the DPW (or his representative) or the user should survey sprinkler systems composed of steel piping to determine if any sprinklers are the Omega sprinklers. If Omega sprinklers are found in any building and the sprinklers are dated before 1997, the procedures established by Central Sprinkler Company should be followed. These procedures are as follows:

(a) The installation DPW or user will fill out the response card for each building where Omega sprinklers are discovered and send the card directly to the Central Sprinkler Company. A copy of the card is attached.

(b) The Central Sprinkler Company will send the user a test kit which contains approximately 6 sprinklers, depending on the number of sprinklers in building. Samples of Omega sprinklers are to be removed and replaced by the sprinklers in the kit and sent to Central Sprinkler Company for testing.

(c) The DPW or user will be notified of the test results. If there is a potential problem, e.g. pressure higher than system pressure is needed to open the sprinkler, arrangements will be made between the Central Sprinkler Company and the DPW or user to replace sprinkler heads. If the problem was caused by stop leak additive, Central will provide replacement sprinklers at a reduced cost. If the problem is caused by absorption of cutting oils by the EPDM o-ring, Central will assist with replacement of all sprinkler heads at its own expense.

(d) Omega heads can be identified by three thin metal disks that are 1/2-inch in diameter. They are the quick response type or residential type of sprinkler. They can be pendent or sidewall type. Catalog cuts of the sprinkler are attached.

(e) If there are any questions on Central Sprinkler Company's procedures, contact Mr. Kip Bilo or Mr. Andy Post at (800) 523-6512.

Please complete the questions on the response card and fold and seal the postage paid card to Central Sprinkler Company at your soonest convenience. If you have questions regarding the completion of this questionnaire, please contact Mr. Kip Bilo or Mr. Andy Post at 800/523 6512.

QUESTIONS TO BE COMPLETED BY BUILDING OWNER

Location Name: _____

Address: _____

Contact Person: _____ Title: _____

Telephone: _____ Fax: _____

Property Management Company (if one is used): _____

Address: _____

Contact Person: _____ Title: _____

Telephone: _____ Fax: _____

Installing Sprinkler Contractor (if known): _____

Year of Sprinkler System Installation: _____

Approximate Number of Omega Sprinklers in Location: _____

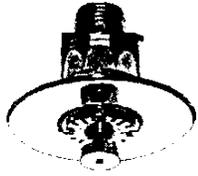
Type of Omega Sprinkler(s) installed in Location (i.e. AC Concealed, C- I A, EC-20A, HEC-12, HEC-20, Prohibitors, Model M): _____

Contact for Test Sprinklers/Instructions (if different than contact person for location).

STATIC PRESSURE: _____



Central Sprinkler - Omega Head Identification Sheet



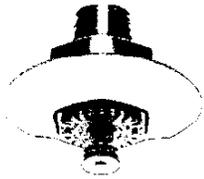
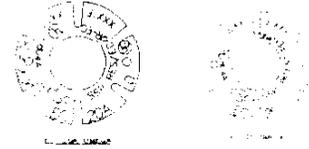
C-1 or C-1A
Quick Response Commercial, Pendant



C-1A 3/8
Quick Response Standard Commercial, Pendant

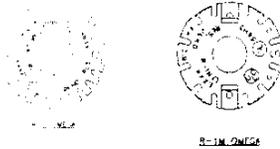


EC-20 or EC-20A
Residential, Extended Coverage, Quick Response Extended Coverage, Pendant



R-1A
Residential, Pendant

R-1
Residential, Pendant



R-1M
Residential, Pendant

Collectors are the item which extends farthest away from the head (except in the Protector M style) and absorbs heat.

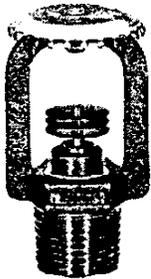
QR = Quick Response and can be identified by larger collector rings, which are usually stacked, slightly separated in a group of three.



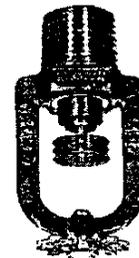
AC
Adjustable Concealed, Pendant



The AC model, in place looks like a white disc on the ceiling, easily confused with other types.



Protector-M (1)
Quick Response, Standard, Upright or Pendant

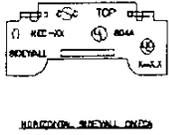


Protector-M (2)
Standard, Quick Response, Sidewall



Protector-M (3)
Extended Coverage (16'x20'), Extended Coverage Quick Response (16'x18'), Sidewall





HEC-12
Quick Response, Sidewall

EC = Extended Coverage
which can be recognized
by larger fins on the
deflector.

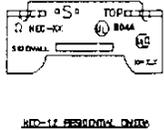


HEC-12 Res
Residential, Sidewall

Deflectors are the items
shown by mechanical / line
drawings throughtout these
two pages.



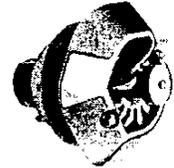
HEC-12EC
Extended Coverage Quick Response (16'x18'), Extended
Coverage (16'x20'), Sidewall



HEC-20
Extended Coverage (16'x18'), Extended Coverage Quick
Response (16'x18'), Sidewall



Prohibitor QR
Institutional Pendant & Sidewall

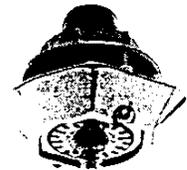


HEC-12EC Pro
Extended Coverage Quick Response (16'x18'), Extended Coverage
(16'x20'), Institutional, Sidewall



HEC-12 Pro
Institutional, Sidewall

C-1A Pro
Institutional, Pendant



The deflectors for this model are the same as those shown above.



Flow Control-FC
On - Off, Pendant or Flush



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 2 (18 pages)

ENG FORMS 3078

<u>CONTROL NO.</u>	<u>PUB NO.</u>	<u>OFFICE SYMBOL</u>
9087	CEGS-11145	CESPK-CO-C
9096	CEGS-13203	CESPK-ED-M
1001	CEGS-02551 CEGS-02556	CESWF-ED-DP
1003	CEGS-02225	CESAD-ET
1013	CEGS-15556	CESPK-ED-M

RECOMMENDED CHANGES TO ENGINEERING DOCUMENTS <i>(Submit a separate form in quadruplicate for each report)</i> <i>(ER 1110-345-100)</i>		OFFICE SYMBOL AND DATE CESPK-CO-C 14 MAY 1997
DOCUMENT NUMBER AND DATE REGS 11145 (JUNE 1993) NOTICE 9 FEB 1996	DOCUMENT TITLE AVIATION FUELING SYSTEMS	
DOCUMENT TYPE <input type="checkbox"/> DRAWING ((STANDARD) (DEFINITIVE)) <input checked="" type="checkbox"/> SPECIFICATION ((GUIDE) (STANDARD)) <input type="checkbox"/> DESIGN GUIDES <input type="checkbox"/> TECHNICAL MANUAL <input type="checkbox"/> ENGINEER MANUAL <input type="checkbox"/> ENGINEER REGULATION <input type="checkbox"/> OTHER		<input checked="" type="checkbox"/> MILITARY <input type="checkbox"/> CIVIL WORKS
SUBJECT "GA" CONTRACTOR SUBMITTALS		
ROUTING <i>(Check)</i>	ACTION RECOMMENDED BY DISTRICT COMMANDER <i>(See Sheet 2)</i>	
FROM: District Commander U.S. Army Engineer District, Sacramento CESPK-ED-M	OFFICE SYMBOL CESPK-ED	NAME AND TITLE <i>(Print or Type)</i> BRIAN W. DOYLE, CHIEF, ENGINEERING DIVISION
	DATE 15 May 97	SIGNATURE <i>[Signature]</i>
	INFORMATION COPY OF THIS ENG FORM 3078 WAS SENT <u>14 May 97</u> <i>(Date)</i>	
1a. TO: HQUSACE (CEMP-EA)	COMMENTS, ACTION, OR RECOMMENDATION BY DIVISION COMMANDER RECOMMEND APPROVAL.	
1b. TO: Division Commander U.S. Army Engineer Division, South Pacific CESPD-ET	OFFICE SYMBOL CESPD-ET-E	NAME AND TITLE <i>(Print or Type)</i> JACK E. FARLESS Chief, Engineering Division
	DATE 6/30/97	SIGNATURE <i>[Signature]</i>
	COMMENTS OR ACTION BY COMMANDER, USACE <i>Ernst</i> See attached sheet.	
2. TO: HQUSACE (CEMP-EA) WASH DC 20314-1000	OFFICE SYMBOL CEMP-E	NAME AND TITLE <i>(Print or Type)</i> KISUK CHEUNG, P.E. C, ENGR. DIV., D/MP
3. TO: Division Commander U.S. Army Engineer Division, South Pacific ATTN: CESPD-ET 333 Market Street San Francisco, CA 94105	OFFICE SYMBOL	NAME AND TITLE <i>(Print or Type)</i>
	DATE 11 Aug 97	SIGNATURE <i>[Signature]</i>
	COMMENTS BY DIVISION COMMANDER	
4. RETURN TO: District Commander U.S. Army Engineer District, Sacramento CESPK-ED-M (ET&S)	COPY FURNISHED CESPK-CO-C (GENE ERNST) CESPK-ED-M (MECHANICAL)	

RECOMMENDED CHANGES TO ENGINEERING DOCUMENTS (Cont'd)

OFFICE SYMBOL AND DATE
CESPK-CO-C

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

1. PROBLEM:

Instruction from HQ is to minimize the quantity of contractor submittals that require Government approval, "GA" action. But the CEGS specifies the following as "GA" even though they do not appear to fall under the "Government Approved" submittals of CEGS-01300, Paragraph 1.1.1.

- SD-01: Manufacturer's Catalog Data "GA"
- SD-04: Aviation Fueling System Drawings "GA"
- SD-04: Leak Detection for Underground Piping "GA"
- SD-08: Experience "GA"
- SD-08: Welding "GA"
- SD-08: Radiographic Piping Tests "GA"
- SD-09: Factory Tests "GA"
- SD-09: Tests "GA"
- SD-14: Flushing Acceptance "GA"
- SD-14: Cleaning Acceptance "GA"
- SD-19: Operations Manuals "GA"
- SD-19: Maintenance Manuals "GA"

2. RECOMMENDED SOLUTION:

Change the "GA" submittals to "FIO" (For Information Only) as follows for the above.

NAME OF SUBMITTER (Optional)
Gene Ernst, CESPK-CO-C, thru Steve Freitas - Criteria Management Unit

WORK TELEPHONE NUMBER (Optional)
(916) 557-7296

CEGS-11145 Aviation Fueling Systems
NOTICE 9 FEB 1996

Concur with intent to limit the need for government approval of submittals to the most critical features. We have recently completed a review of the guide specifications to confirm the need for government approval and eliminate the requirement where not considered essential. The guide specifications have or are being revised to reflect these changes. In many cases we are giving the designer the option of determining the review level depending on the project specific requirements.

RECOMMENDED CHANGES TO ENGINEERING DOCUMENTS (Submit a separate form in quadruplicate for each report) (ER 1110-345-100)		OFFICE SYMBOL AND DATE
DOCUMENT NUMBER AND DATE	DOCUMENT TITLE	CESPK-ED-M 22 May 1997
CEGS-13203 August 1993	Tightness Testing of Underground Fuel Systems	
DOCUMENT TYPE		<input checked="" type="checkbox"/> MILITARY
<input type="checkbox"/> DRAWING ((STANDARD) (DEFINITIVE)) <input checked="" type="checkbox"/> SPECIFICATION ((GUIDE) (STANDARD)) <input type="checkbox"/> DESIGN GUIDES <input type="checkbox"/> TECHNICAL MANUAL <input type="checkbox"/> ENGINEER MANUAL <input type="checkbox"/> ENGINEER REGULATION <input type="checkbox"/> OTHER		<input type="checkbox"/> CIVIL WORKS
SUBJECT "GA" Contractors Submittals		
ROUTING (Check)		ACTION RECOMMENDED BY DISTRICT COMMANDER
FROM: District Commander U.S. Army Engineer District, Sacramento CESPK-ED-M	(See Sheet 2)	
	OFFICE SYMBOL	NAME AND TITLE (Print or Type)
	DATE	SIGNATURE
	CESPK-ED	Brian W. Doyle; Chief, Engineering Division
	22 May 97	<i>[Signature]</i>
1a. TO: HOUSACE (CEMP-EA) WASH DC 20314-1000	INFORMATION COPY OF THIS ENG FORM 3078 WAS SENT <u>22 MAY 1997</u> (Date)	
1b. TO: Division Commander U.S. Army Engineer Division, South Pacific CESPD-ET	COMMENTS, ACTION, OR RECOMMENDATION BY DIVISION COMMANDER RECOMMEND APPROVAL.	
	OFFICE SYMBOL	NAME AND TITLE (Print or Type)
	CESPD-ET-E	JACK E. FARLESS Chief, Engineering Division
	DATE	SIGNATURE
	6/30/97	<i>[Signature]</i>
2 TO: HOUSACE (CEMP-EA) WASH DC 20314-1000	COMMENTS OR ACTION BY COMMANDER, USACE See attached sheet.	
	OFFICE SYMBOL	NAME AND TITLE (Print or Type)
	CEMP-E	KISUK CHEUNG, P.E. C, ENGR. DIV. D/MP
	DATE	SIGNATURE
	11 Jun 97	<i>[Signature]</i>
3. TO: Division Commander U.S. Army Engineer Division, South Pacific ATTN: CESPD-ET 333 Market St. San Francisco CA 94105	COMMENTS BY DIVISION COMMANDER	
	OFFICE SYMBOL	NAME AND TITLE (Print or Type)
	DATE	SIGNATURE
4. RETURN TO: District Commander U.S. Army Engineer District, Sacramento CESPK-ED-M (ET&S)	COPY FURNISHED	

RECOMMENDED CHANGES TO ENGINEERING DOCUMENTS (Cont'd)

OFFICE SYMBOL AND DATE

CESPK-ED-M

22 MAY 1997

PROBLEM DESCRIPTION AND ACTION RECOMMENDED (Use additional sheets if necessary.)**1. PROBLEM:**

Instruction from HQ is to minimize the quantity of contractor submittals that require Government approval, "GA" action. But the CEGS specifies the following as "GA" even though do not appear to fall under the "Government Approved" submittals of CEGS-01300, Paragraph 1.1.1.

SD-01: Tightness Test "GA"

SD-08: Spills "GA"

SD-09: Test Plan "GA"

SD-09: Tightness Test "GA"

SD-13: Qualifications "GA"

SD-14: Fuel Supply "GA"

2. RECOMMENDED SOLUTION:

Change the "GA" submittals to "FIO" (For Information Only) for the above.

NAME OF SUBMITTER (Optional)

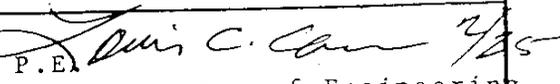
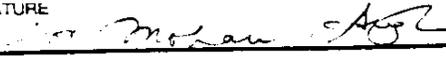
Gene Ernst (916) 557-7776 CO-C
thru Steve Freitas; ED-M, CRITERIA MANAGEMENT UNIT

WORK TELEPHONE NUMBER (Optional)

(916 557-7296)

CEGS-13203 Tightness Testing of Underground Fuel System
August 1993

Concur with intent to limit the need for government approval of submittals to the most critical features. We have recently completed a review of the guide specifications to confirm the need for government approval and eliminate the requirement where not considered essential. The guide specifications have or are being revised to reflect these changes. In many cases we are giving the designer the option of determining the review level depending on the project specific requirements.

RECOMMENDED CHANGES TO ENGINEERING DOCUMENTS <small>(Submit a separate form in quadruplicate for each report) (ER 1110-345-100)</small>		OFFICE SYMBOL AND DATE CESWF-ED-DP 25 Oct 93
DOCUMENT NUMBER AND DATE 02551, w/Not. 5, Jan 93 CEGS-02556, w/Not. 3, Nov 92	DOCUMENT TITLE Bituminous Paving for Roads, Streets and Open Storage Areas Asphaltic Bituminous Heavy-Duty Pavement (Central-Plant Hot-Mix)	
DOCUMENT TYPE <input type="checkbox"/> DRAWING ((STANDARD) (DEFINITIVE)) <input type="checkbox"/> SPECIFICATION ((QUICK) (STANDARD)) <input type="checkbox"/> DESIGN GUIDES <input type="checkbox"/> TECHNICAL MANUAL <input type="checkbox"/> ENGINEER MANUAL <input type="checkbox"/> ENGINEER REGULATION <input type="checkbox"/> OTHER		<input type="checkbox"/> MILITARY <input type="checkbox"/> CIVIL WORKS
SUBJECT Acceptability of Work Paragraph 3.13 in CEGS-02551 and Percent Payment Paragraph 3.15 in CEGS-02556.		
ROUTING (Check)	ACTION RECOMMENDED BY DISTRICT COMMANDER (See Sheet 2)	
FROM District Commander U.S. Army Engineer District. ATTN: CESWF-ED-DP Fort Worth, TX 76102-0300	OFFICE SYMBOL CESWF-ED	NAME AND TITLE (Print or Type) R. TERRY COOMES, P.E., Chief Engineering Division
	DATE 11/12/93	SIGNATURE 
	1a. TO: HOUSACE (CEMP-EA) WASH DC 20314-1000 INFORMATION COPY OF THIS ENG FORM 3078 WAS SENT _____ (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 <i>(initials)</i>	
	OFFICE SYMBOL CESWD-ED-TA	NAME AND TITLE (Print or Type) LOUIS C. CARR, P.E., Acting Director, Directorate of Engineering
	DATE 25 Feb 94	SIGNATURE 
2. TO: HOUSACE (CEMP-EA) WASH DC 20314-1000	COMMENTS OR ACTION BY COMMANDER, USACE Concur	
	OFFICE SYMBOL CEMP-ET	NAME AND TITLE (Print or Type) Kisuk Cheung, P.E., C, Engr. Div., D/MP
	DATE 7 Aug 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-DP Fort Worth, TX 76102-0300	COPY FURNISHED	

Subject: Acceptability of Work Paragraph 3.13 in CEGS-02551
and Percent Payment Paragraph 3.15 in CEGS 02556.

CESWF-ED-DP
25 Oct 93

1a. PRESENT SITUATION

The subject paragraphs in each of the Guide Specifications were introduced several years ago as tools to enable Government contract administrators, within the quality assurance program, to accept or refuse newly constructed pavements based on Quality Assurance Tests of asphalt materials, asphalt mixes and completed pavements, and allows acceptance of pavements that do not meet all specified test requirements. Pavements that do not pass 100% of all test requirements, but that are otherwise found to be within defined test parameters, can be accepted by the Government with a corresponding adjustment in payments due the Contractor. The allowed deficiencies and corresponding percentage of payment reductions are scheduled within the two paragraphs.

1b. PROBLEM

There is no question that the quality assurance procedures outlined in the two Guide Specifications enable the Government to obtain a better end product. CESWF field offices concur with this, as well as other CE Districts that administer asphaltic concrete pavement construction contracts. Estimates made by in-house personnel indicate that the quality assurance testing paragraphs can be cost effective if warranted by the project and if the personnel and equipment are available. The two guides as written however, apply Government quality assurance testing requirements without regard to quantities involved or to end use of the pavement. The Guide Specification requirements for quality assurance tests apply equally to a vehicular driveway, or a major airfield runway/taxiway. The requirements are basically identical in the two guides, and do not allow a design option if the cost/benefit of the assurance testing does not warrant the additional expense. Many construction field offices do not have in-house testing capability, and significant costs can be generated setting up open-ended asphaltic concrete testing contracts, with even greater costs incurred for projects located in remote areas. The cost of equipping all field offices with full-time in-house, testing laboratory capability would be even more prohibitive. Designers cannot modify the requirements of the guides without time-consuming efforts to obtain approval from a higher authority, or being technically guilty of a deviation from Guide Specification requirements.

2. RECOMMENDATION

CESWF Engineering Division and CESWF Construction Division recommend that Guide Specifications CEGS-02551 and CEGS-02556 be revised to allow flexibility in applying the Government Quality Assurance Testing Requirements. Discussions with other Corps' offices have affirmed our belief that the primary objective of these requirements can be economically achieved best when applied to airfields and heavy duty pavements of 1,000 tons or more and medium to light-duty road projects of 5000 tons or more. On lesser projects, the Contractor Quality Control System, with the Government exercising supervision, can produce a product consistent with quality and cost objectives.

SHEET 3 of 4 SHEETS

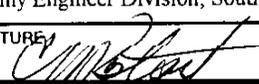
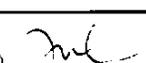
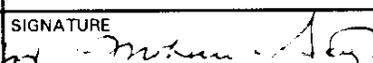
Our specific recommendation is that notes similar to the following be placed in each Guide Specification, allowing the above flexibility based on tonnage:

Guide Specification 02551, Paragraph 3.13 ACCEPTABILITY OF WORK.- Change the Note immediately below Paragraph 3.13.1 General to read: (See Below.)

Guide Specification 02556, Paragraph 3.15 PERCENT PAYMENT.- Change the Note immediately below the Paragraph title to read: (See Below).

"NOTE: The lot size can be specified on the basis of time (i.e., 4 hours, 1 day, etc.) or amount of production (i.e., 500 tons, 1000 tons, etc.). If the lot size is based on the amount of production, it should be selected to be approximately equal to the amount of asphalt mix produced in one day's operation. The lot size should not exceed 2000 tons of asphalt mix. If the asphalt pavement is bid on a line item basis as Job Sum, the percent payment is applied to the line item price. The paragraph will be edited accordingly.

(The requirements of this paragraph may be deleted for airfield and heavy-duty road and street projects of less than 1,000 tons, and for projects for medium to light-duty roads and streets of less than 5,000 tons; however, the value of requiring Government quality assurance testing on projects having asphaltic concrete tonnages which fall below the stated minimums should be reviewed on an individual basis for the cost/benefit of the testing.)".

RECOMMENDED CHANGES TO ENGINEERING DOCUMENTS <i>(Submit a separate form in quadruplicate for each report)</i> <i>(ER 1110-345-100)</i>		OFFICE SYMBOL AND DATE
DOCUMENT NUMBER AND DATE EGS-02225 (December 1994)	DOCUMENT TITLE EarthWork for Roadways, Railroads, and Airfields	
DOCUMENT TYPE		
<input type="checkbox"/> DRAWING ((STANDARD) (DEFINITIVE)) <input checked="" type="checkbox"/> SPECIFICATION ((GUIDE) (STANDARD)) <input type="checkbox"/> DESIGN GUIDES <input type="checkbox"/> TECHNICAL MANUAL <input type="checkbox"/> ENGINEER MANUAL <input type="checkbox"/> ENGINEER REGULATION <input type="checkbox"/> OTHER		<input checked="" type="checkbox"/> MILITARY <input type="checkbox"/> CIVIL WORKS
SUBJECT Earthwork		
ROUTING <i>(Check)</i>	ACTION RECOMMENDED BY DISTRICT COMMANDER	
FROM:	<i>(See Sheet 2)</i>	
District Commander U.S. Army Engineer District,	OFFICE SYMBOL	NAME AND TITLE <i>(Print or Type)</i>
	DATE	SIGNATURE
<input checked="" type="checkbox"/> 1a. TO: HQUSACE (CEMP-EA) WASH DC 20314-1000	INFORMATION COPY OF THIS ENG FORM 3078 WAS SENT _____ <i>(Date)</i>	
<input checked="" type="checkbox"/> 1b. TO: Division Commander U.S. Army Engineer Division.	COMMENTS, ACTION, OR RECOMMENDATION BY DIVISION COMMANDER Recommend Approval	
	OFFICE SYMBOL	NAME AND TITLE <i>(Print or Type)</i>
	CESAD-ET	Carl R. Postlewait, Director of Engineering and Technical Services US Army Engineer Division, South Atlantic
	DATE 7/15/97	SIGNATURE 
<input checked="" type="checkbox"/> 2. TO: HQUSACE (CEMP-EA) WASH DC 20314-1000	COMMENTS OR ACTION BY COMMANDER, USACE Concur with revisions (see attached)	
	OFFICE SYMBOL	NAME AND TITLE <i>(Print or Type)</i>
	CEMP-ET	Kisuk Cheung, P.E., C. Engr. Div., D/MP
	DATE 	SIGNATURE 
<input checked="" type="checkbox"/> 3. TO: Division Commander U.S. Army Engineer Division,	COMMENTS BY DIVISION COMMANDER	
	OFFICE SYMBOL	NAME AND TITLE <i>(Print or Type)</i>
	DATE	SIGNATURE
<input checked="" type="checkbox"/> 4. RETURN TO: District Commander U.S. Army Engineer District,	COPY FURNISHED	

RECOMMENDED CHANGES TO ENGINEERING DOCUMENTS (Cont'd)

OFFICE SYMBOL AND DATE
CESAD-ET-CC
7 July 1997

ITEM DESCRIPTION AND ACTION RECOMMENDED (Use additional sheets if necessary.)

1. PROBLEM:

- a. Both paragraphs 1.2.1 and 1.2.2 cover the excavation of borrow material.
- b. Paragraph 1.4.2 sets forth the classification of materials that are considered unsatisfactory. Since paragraph 1.4.1 states the classification of materials that are satisfactory, everything else is unsatisfactory. When both satisfactory and unsatisfactory materials are specified, any classification that is not covered would be left to the contractor's discretion. The legend included with most soil borings contains a listing of "Additional Soil Classifications". Included under this heading are the dual classifications of soils.
- c. Paragraph 1.4.1 sets forth satisfactory materials using the Unified Soil Classifications to describe suitable material. Paragraph 1.9 implies that rock excavation is suitable in certain types of fills. Rock is not listed as a satisfactory material. These two paragraphs need to be coordinated.
- d. Paragraph 3.6 specifies both the end result "compacted to at least 90 percent laboratory maximum density for cohesive materials of 95 percent laboratory maximum density for cohesionless materials" and the method "compaction shall be accomplished by sheepfoot rollers, pneumatic-tired rollers, steel-wheeled rollers, vibratory compactors, or other approved equipment." If the end result is specified (% of compaction) then the method is not to be specified.
- e. Paragraph 3.7, 3.8.1, 3.9.2, and 3.10 (same comment as 3.6 above).
- f. Paragraph 3.8.1 requires frozen material and rocks to be less than 75 mm yet paragraph 1.4.1 states the material is satisfactory if the frozen material or rocks are less than 150 mm.
- g. Throughout this specification, dimensions are given in both metric and English. Since no manufactured products are involved, dual measurements are not needed.

2. RECOMMENDED SOLUTION:

- a. Delete paragraph 1.2.2 and renumber the remaining paragraphs.
- b. Delete paragraph 1.4.2 and renumber the remaining paragraphs.
- c. Revise paragraph 1.4.1 to read as follows: "Satisfactory materials shall comprise any material classified by ASTM D 2487 as GW, GP, SW, [] that is free from roots and other organic matter, trash, debris, and frozen materials and stones larger than 150 mm in any dimension. Rock excavation shall be considered suitable material for use in all but the top foot of any fill, unless specific classifications or types of fill materials are required by the contract drawings.
- d. In paragraph 3.6, delete the sentence that begins with "Compaction shall be" and ends with "or other approved equipment."
- e. Paragraph 3.7, 3.8.1, 3.9.2, and 3.10 (same comment as 3.6 above.)
- f. In paragraph 3.8.1, delete everything after satisfactory material in the first sentence. The definition of satisfactory material has already been given in paragraph 1.4.1.
- g. Delete the English dimensions shown after the metric measurements.

NAME OF SUBMITTER (Optional)
A. George Baker, CESAD-ET-CC



WORK TELEPHONE NUMBER (Optional)
(404) 331-6813

CEGS 02225 - 3078 Recommendations.

- 1.a) We concur that there is quite a bit of repetition between these two paragraphs. We recommend that paragraph 1.2.2 be omitted and paragraph 1.2.1 be edited to read as follows (the double underlined items are what is to be added to the existing paragraph and the items that are struck-out should be omitted):

"1.2.1 Excavation and Borrow

The unit of measurement for excavation and borrow will be the cubic [^]meter, [^]~~yard,~~ computed by the average end area method from cross sections taken before and after the excavation and borrow operations. The volume to be paid for will be the number of cubic [^]meters[^] ~~yards~~ of material measured in its original position and removed from the excavation and borrow areas, including the excavation for ditches, gutters, and channel changes, when the material is acceptably utilized or disposed of as herein specified. The measurements will include authorized excavation of rock, authorized excavation of unsatisfactory subgrade soil, and the volume of loose, scattered rocks and boulders collected within the limits of the work; allowance will be made on the same basis for selected backfill ordered as replacement. The measurement will not include the volume of subgrade material or other material that is scarified or plowed and reused in-place, and will not include the volume excavated without authorization or the volume of any material used for purposes other than directed ~~purposes~~. The volume of overburden stripped from borrow pits and the volume of excavation for ditches to drain borrow pits, unless used as borrow material, will not be measured for payment. The measurement will not include the volume of any excavation performed prior to the taking of elevations and measurements of the undisturbed grade."

- 1.b) We disagree with this recommendation. When the guide specification is edited for a particular project, the designer must determine which materials are satisfactory and which are unsatisfactory and fill in the blanks appropriately. The items that are listed are either always satisfactory or always unsatisfactory. The designer should determine (utilizing local conditions and design information) what the remaining soil classifications should be listed as and fill in the blanks utilizing all of the remaining soil classifications. We recommend that the notes be changed to instruct the designer to edit these paragraphs appropriately.
- 1.c) We disagree with this recommendation. Paragraph 1.9 does refer to the use of coarse rock that is excavated, but it does not say that this material is to be used in "EARTHWORK FOR ROADWAYS, RAILROADS, AND AIRFIELDS". This material is unsatisfactory for that type of use, but it is very beneficial to the government for the uses mentioned along with many other potential uses.
- 1.d) We disagree with this recommendation. Our main concern is the end results, but we are

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also concerned with how he gets them. We want consistent results throughout the compacted area and if we allow the contractor to use anything we could end up with variable compaction through-out the compacted areas. We have included the standard equipment that is normally used and we have given him the option to submit other equipment for approval. The Contractors have plenty of choices with what is called out.

- 1.e) Same as above
- 1.f) We agree that there is a discrepancy here that needs to be resolved. We recommend that the maximum size stone be left blank in the guide and it should be determined and filled in by the designer. We should then add a note telling the designer that he needs to determine the maximum rock size (depending on how thick the fill is and how it is going to be accomplished) and as a rule of thumb it should be no larger than 1/2 the allowable lift thickness. We also recommend that the wording of the specification be changed so it clearly states that frozen materials are always unsatisfactory materials regardless of size. Paragraph 1.4.1 should be changed to:

1.4.1 Satisfactory Materials

Satisfactory materials shall comprise any materials classified by, \-ASTM D 2487-\ as GW, GP, SW, []. Satisfactory materials for grading shall be free from roots and other organic matter, trash, debris, ~~and~~ frozen materials, and stones larger than ~~150 mm~~ ^{6 inches} [] in any dimension.

- 1.g) This is not a technical issue and is a metrification issue. This specification should be done in a manner consistent with all other CEGS with regard to this issue.

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RECOMMENDED CHANGES TO ENGINEERING DOCUMENTS (Submit a separate form in quadruplicate for each report) (ER 1110-345-100)		OFFICE SYMBOL AND DATE
DOCUMENT NUMBER AND DATE CEGS-15556 January 1990	DOCUMENT TITLE Forced Hot Water Heating Systems using Water and Steam Heat Exchangers	CESPK-ED-M 5 June 1997
DOCUMENT TYPE <input type="checkbox"/> DRAWING ([STANDARD] [DEFINITIVE]) <input checked="" type="checkbox"/> SPECIFICATION ([GUIDE] [STANDARD]) <input type="checkbox"/> DESIGN GUIDES <input type="checkbox"/> TECHNICAL MANUAL <input type="checkbox"/> ENGINEER MANUAL <input type="checkbox"/> ENGINEER REGULATION <input type="checkbox"/> OTHER		<input checked="" type="checkbox"/> MILITARY <input type="checkbox"/> CIVIL WORKS
SUBJECT "GA" Contractor Submittals		
ROUTING (Check)		ACTION RECOMMENDED BY DISTRICT COMMANDER
FROM: District Commander U.S. Army Engineer District, Sacramento CESPK-ED-M		(See Sheet 2)
		OFFICE SYMBOL CESPK-ED
		NAME AND TITLE (Print or Type) Brian W. Doyle, Chief, Engineering Division
		DATE 16 JUN 97
		SIGNATURE <i>Milton [Signature]</i>
1a. TO: HOUSACE (CEMP-EA) WASH DC 20314-1000	INFORMATION COPY OF THIS ENG FORM 3078 WAS SENT 12 June 1997 (Date)	
1b. TO: Division Commander U.S. Army Engineer Division, South Pacific CESPD-ET	COMMENTS, ACTION, OR RECOMMENDATION BY DIVISION COMMANDER RECOMMEND APPROVAL.	
	OFFICE SYMBOL CESPD-ET-E	NAME AND TITLE (Print or Type) JACK E. FARLESS Chief, Engineering Division
	DATE 7/21/97	SIGNATURE <i>Albert [Signature]</i>
2. TO: HOUSACE (CEMP-EA) WASH DC 20314-1000	COMMENTS OR ACTION BY COMMANDER, USACE See Attached Sheet	
	OFFICE SYMBOL CEMP-ET	NAME AND TITLE (Print or Type) Kisuk Cheung, P.E., C, Engr. Div., D/MP
	DATE 11 JUN 97	SIGNATURE <i>[Signature]</i>
3. TO: Division Commander U.S. Army Engineer Division, South Pacific ATTN: CESPD-ET 333 Market St. San Francisco CA 94105	COMMENTS BY DIVISION COMMANDER	
	OFFICE SYMBOL	NAME AND TITLE (Print or Type)
	DATE	SIGNATURE
4. RETURN TO: District Commander U.S. Army Engineer District, Sacramento CESPK-ED-M (E1&S)	COPY FURNISHED	

RECOMMENDED CHANGES TO ENGINEERING DOCUMENTS (Cont'd)

OFFICE SYMBOL AND DATE

CESPK-ED-M

5 June 1997

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

1. PROBLEM:

Instruction from HQ is to minimize the quantity of contractor submittals that require Government approval, "GA" action. But the CEGS specifies the following as "GA" even though they are not so called extensions of design.

SD-14: Finishes "GA"

SD-18: Test Procedures "GA"

SD-19: O&M Manuals "GA"

2. RECOMMENDED SOLUTION:

Change the "GA" submittals to "FIO" (For Information Only) for the above.

NAME OF SUBMITTER (Optional)

Gene Ernst

CO-C

thru Steve Freitas; ED-M, CRITERIA MANAGEMENT UNIT

WORK TELEPHONE NUMBER (Optional)

916 557-7296

COMMENT

Concur with intent to limit the need for government approval of submittals to the most critical features. We have recently completed a review of the guide specifications to confirm the need for government approval and eliminate the requirement where not considered essential. The guide specifications have or are being revised to reflect these changes. In many cases we are giving the designer the option of determining the review level depending on the project specific requirements.