ATTACHMENTS FOR CONTRACT SECTION J

ENGINEERING INSTRUCTIONS

Updated 02 August, 2004

SECTION J

LIST OF ATTACHMENTS

1. FORMS TO RECEIVE A TEMPORARY PASS. (Pages 3-5)

2. PAYMENT FORMS. (Pages 6-16)

3. EI 01D010, ENGINEERING INSTRUCTIONS, CONSTRUCTION COST ESTIMATES (1 SEPT 97). (Pages 17-144)

4. DISTRICT CADD GUIDELINES-July 2003 (Pages 145-149) or http://iss.poa.usace.army.mil/cadd

5. AE SPECIFICATIONS MANUAL w/attachments listed below. (26 July 04) (Pages 150-154)

6. ER 1110-345-700 (30 May 97) w/ Appendix A (References), Appendix B, Design Analysis, and Appendix C, Drawings (Pages 155-198)

7. ER 1110-2-1200(30 October 93), Plans and Specifications for Civil Works Projects. (Pages 199-210)

8. ER 415-1-10(15 April 1997), Contractor Submittal Procedures. (Pages 211-216)

9. ER 1110-1-8155(24 December 1998), Specifications.(Pages 217-228)

10. SP/100, Specifying for the Federal Government. (Pages 229-237)

11. Electronic Bid Set Manual (2 Aug 2004).(Pages 238-282)

12. EP 715-1-7 (31 Jul 02), AE Contracting, Chapter 6, Performance Evaluation. (Pages 283-291)

13. Fee proposal and profit forms. (Pages 292-293)

14. Uniform Facilities Criteria (UFC 1-200-01, 31 July 2002) – Design: General Building Requirements. (Pages 294-317)

15. Alaska Department of Environmental Conservation (ADEC) coordination. (Pages 318-399)

16. Travel Rates per JTR are available on the Internet: http://www.dtic.mil/perdiem/pdrates.html

17. Reference Websites:
Army Technical Manuals – http://www.usace.army.mil//inet/usace-docs/armytm/
Military Programs Design Guide – www.usace.army.mil/inet/usace-docs/design-guides/cemp.htm
Engineering Manuals – www.usace.army.mil/inet/usace-docs/eng-manuals/cemp.htm
Engineering Regulations – www.usace.army.mil/inet/usace-docs/eng-regs/cemp.htm
Engineering Technical Letters – www.usace.army.mil/inet/usace-docs/eng-tech-ltrs/etl-mp.html
Americans with Disabilites Act – http://www.usdoj.gov/crt/ada/adahom1.htm
UFAS – http://www.access-board.gov/ufas/ufas-html/ufas.htm
Alaska District – http://www.poa.usace.army.mil/
Technical Instructions - http://www.hnd.usace.army.mil/techinfo/ti.htm

With the implementation of the Uniform Facilities Guide Specifications (UFGS), all references to the old Corps of Engineers Guide Specifications (CEGS) for Military Construction in any of the above documents are superseded. Updates containing references to the new UFGS will be incorporated as they become available.
Note: For any reference to MIL-HDBK-1008C, UFC 3-600-01 shall be considered the correct reference.

NOTE: CONTRACT SECTION "J" MAY BE ACCESSED THROUGH THE DISTRICT'S INTERNET WEB SITE AT http://www.poa.usace.army.mil/hm/default.htm, Doing Business With Us/ Contracting/ Contract Section J.
Point of contact in the Alaska District for questions about this document is Stephen Eldridge, CEPOA-EN-ES-CT, (907) 753-5696.

Vehicle Pass Information

To obtain a base pass, please contact the appropriate contract specialist or contracting officer for this contract and request the electronic form (see the following example form). DO NOT submit the form manually (either by fax or mail). Only electronic forms will be accepted.

COMPANY NAME/GENERAL CONTRACTOR:

DATE UPDATED:

PREVIOUS LIST DATE:

CONTRACT OFFICER/PROJECT OFFICER ON BASE:

CONTRACT OFFICER PHONE NUMBER:

CONTRACTING AGENCY (3 CONS, 3 CES, COE): COE

CONTRACT NUMBER:

CONTRACT EXPIRATION DATE: 3 (Not to exceed one year)

EXAMPLE

LAST NAME	FIRST NAME	COMPANY	POSITION	DATED ADD TO LIST	DATE PASS EXPIRES:	MISSION ESSENTIAL YES	NO

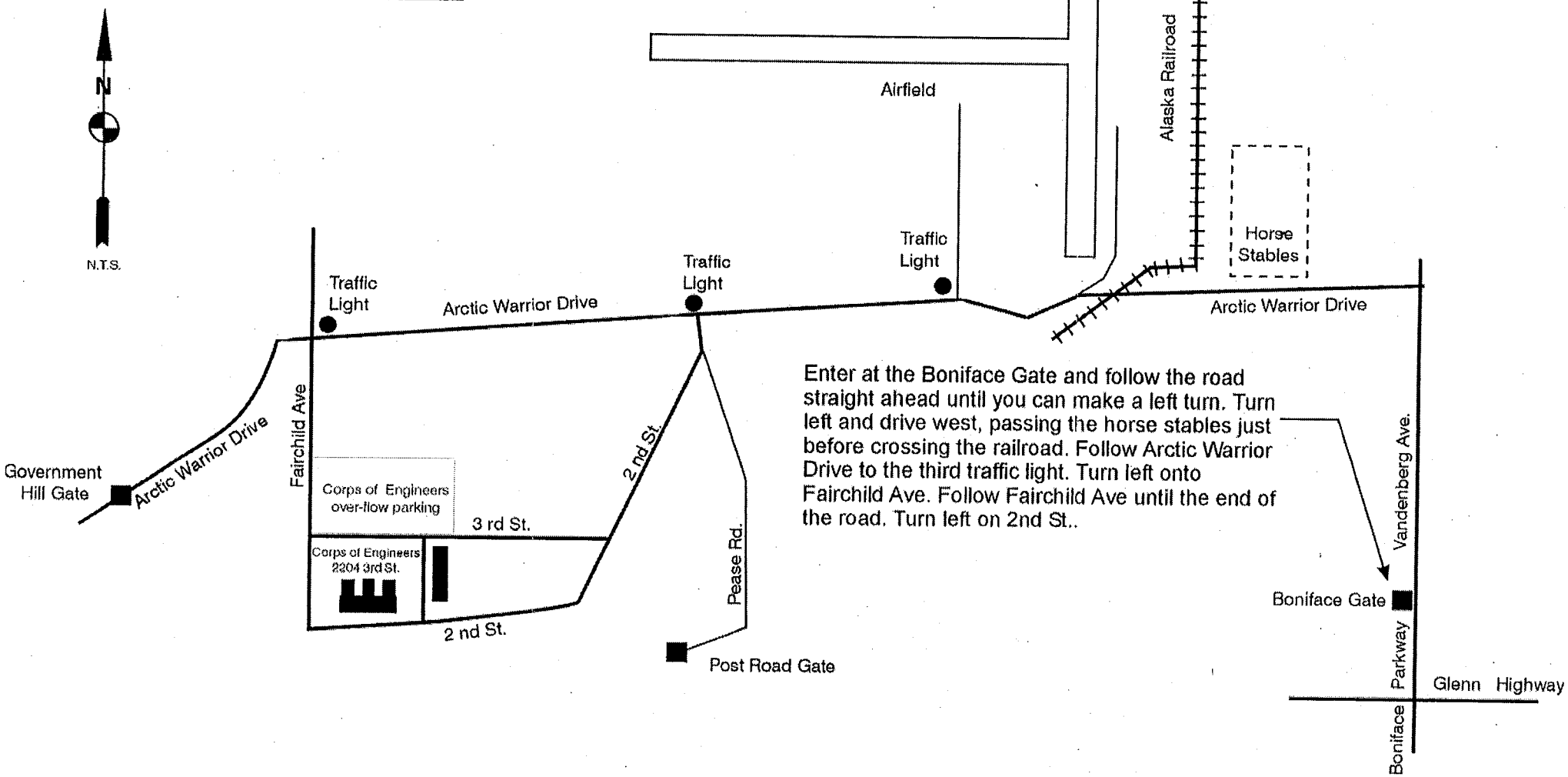
ALASKA DISTRICT

Headquarters, Alaska District
U.S. Army Corps of Engineers
2204 3rd Street
Elmendorf AFB, Alaska 99506-1538

[Above street address effective May 1, 1999]

Post Office/Mailing Address:
P.O. Box 6898
Elmendorf AFB, Alaska 99506-6898

Special Advisory: Most Visitors must use the Boniface Gate to enter Elmendorf Air Force Base. The only exception is for vehicles which have valid Department of Defense vehicle identification stickers, or acceptable military credentials. Base speed limits are strictly enforced.



Enter at the Boniface Gate and follow the road straight ahead until you can make a left turn. Turn left and drive west, passing the horse stables just before crossing the railroad. Follow Arctic Warrior Drive to the third traffic light. Turn left onto Fairchild Ave. Follow Fairchild Ave until the end of the road. Turn left on 2nd St..

INSTRUCTIONS FOR PREPARING
PAYMENT ESTIMATE FORMS (ENG FORM 93)

1. Documents which should be available to you:

a. Each award document: Contract, modifications to the contract, task orders and modifications to each task order.

b. Previous payment estimate(s).

2. General Guidelines:

a. If possible, pay estimates should not be for less than $5,000 (excluding final pay requests). See section G, "Contract Administration Data," paragraph 14 entitled, "Method of Payment."

b. Pay estimates may not be submitted more often than every 30 days. See section I, contract clause (52.232-10) entitled, "Payments under Fixed-Price AE Contracts."

c. For indefinite delivery AE contracts (DACA85-01-D-xxxx), submit separate pay estimates for each task order and its modifications. EXCEPTION: Pay estimates on task orders on project specific contracts (DACA85-01-C-xxxx) need not be submitted separately.

d. FINAL PAYMENTS: When the project is complete, your final pay estimate submission **must** be accompanied by an originally signed Release of Claims. The Alaska District may retain a percentage of the final payment to hold the project open for an undetermined time period if it is deemed to be in the best interest of the government.

e. Please submit ONE (1) pay estimate with **original signature** in block 12. Do not submit additional copies of pay estimates and associated documentation. They will be thrown away.

f. Please review and ensure that your math is correct.

g. Please use one envelope when sending multiple pay estimates. **Direct all submissions to the following address**:

U.S. Army Engineer District, Alaska
ATTN: Engineering Division, Engineering Services Branch, Contract Services Section (CEPOA-EN-ES-CT), Room 292
PO Box 6898
Elmendorf AFB, AK 99506-6898

h. If you have ANY questions or find a mistake, please call or fax:
Melissa Storey Phone: (907) 753-5783
Fax: (907) 753-2878

3. Hints in Preparing the Pay Estimate:

a. Payments are based upon the percentage of work that has been completed

b. List each modification (and task orders on project specific contracts) as a separate line item. See example entitled, "Basic Award w/Mod."

ALWAYS REMEMBER THE SIX P'S OF PAY ESTIMATES

PROPER
PAY ESTIMATE
PREPARATION
PROMOTES
PROMPT
PAYMENT

payest.ct/6 September, 2001

RELEASE OF CLAIMS
Sole Proprietorship

The undersigned Architect-Engineer under Contract No. _____,

Task Order_____ dated _____, between the United States of America and

said Architect-Engineer for _____

located at _____, hereby releases the United States, its officers,

agents, and employees from any and all claims arising under or by virtue of said Contract or any

modification or change thereof.

Executed at _____ on this date of _____.

FIRM NAME: _____

BY: _____

TITLE: _____

RELEASE OF CLAIMS
Corporation

The undersigned Architect-Engineer under Contract No. _____,

Task Order_____ dated _____, between the United States of America

and said Architect-Engineer for _____

located at _____, hereby releases the United States, its officers,

agents, and employees from any and all claims arising under or by virtue of said Contract or any

modification or change thereof.

Executed at _____ on this date of _____.

FIRM NAME: _____

BY: _____

TITLE: _____

RELEASE OF CLAIMS
Partnership

The undersigned Architect-Engineer under Contract No. _____,

Task Order_____ dated _____, between the United States of America and

said Architect-Engineer for _____

located at _____, hereby releases the United States, its officers,

agents, and employees from any and all claims arising under or by virtue of said Contract or any

modification or change thereof.

Executed at _____ on this date of _____.

FIRM NAME: _____

BY: _____

TITLE: _____

This is to certify that the names and signatures of all partners are listed below and that the person who signed this contract had authority to actually bind the partnership pursuant to its partnership agreement. Each individual partner has authority to enter into and execute contractual instruments on behalf of said partnership with the United States of America as noted below:

PRINT TO TYPE NAME	SIGNATURE	AUTHORITY*

*NOTE:
Full – Full authority to bind partnership.
Partial – Limited authority (please describe).
None – No authority.

RELEASE OF CLAIMS
Joint Venture

The undersigned Architect-Engineer under Contract No. _____,

Task Order_____ dated _____, between the United States of America and

said Architect-Engineer for _____

located at _____, hereby releases the United States, its officers,

agents, and employees from any and all claims arising under or by virtue of said Contract or any

modification or change thereof.

Executed at _____ on this date of _____.

FIRM No 1. NAME: _____

BY: _____

TITLE: _____

FIRM No 2. NAME: _____

BY: _____

TITLE: _____

PAYMENT ESTIMATE - CONTRACT PERFORMANCE For use of this form, see ER 37-2-10 and 37-345-10.	1. DATE	SHEET ___ of ___

2. CONTRACTOR AND ADDRESS	3. CONTRACT NO.	4. DISTRICT
5. DESCRIPTION OF WORK	6. APPROPRIATION AND PROJECT	7. REQUIRED COMPLETION DATE

8. LOCATION	9. PERIOD COVERED BY THIS ESTIMATE FROM THRU	10. JOB ORDER NO.	11. ESTIMATE NO.

ITEM NO. a	DESCRIPTION b	CONTRACT			TOTAL TO DATE	
		QUANTITY AND UNIT c	UNIT PRICE d	AMOUNT e	QUANTITY AND UNIT f	AMOUNT g
INCLUDES MODIFICATION THRU:		TOTAL CONTRACT →		$	TOTAL EARNINGS TO DATE →	$

12. PRESENTED FOR PAYMENT	
PAYEE	PER
DATE	TITLE

13. APPROVED FOR PAYMENT		
I CERTIFY that I have checked the quantities covered by this bill or estimate; that the work was actually performed; that the quantities are correct and consistent with all previous computations as actually checked; that the quantities and amounts are wholly consistent with the requirements of the contract or other instrument involved.		
SIGNATURE	TITLE	DATE
CONTRACTING OFFICER APPROVAL (Signature)		DATE

14.		
A. PREVIOUS DEDUCTIONS OTHER THAN RETAINED PERCENTAGE**		
B. PREVIOUS RETAINED PERCENTAGE		
C. PREVIOUS PAYMENTS		
D. PREVIOUS EARNINGS (A+B+C)		
E. EARNINGS THIS PERIOD (TOTAL EARNINGS TO DATE MINUS D)		
F. LESS RETAINED PERCENTAGE		
G. LESS DEDUCTION OTHER THAN RETAINED PERCENTAGE FOR		
H. TOTAL DEDUCTIONS FOR THIS PERIOD (F+G)		
I. RETAINAGE REFUNDED		
J. OTHER REFUNDS		
K. TOTAL REFUNDS THIS PERIOD		
L. AMOUNT DUE CONTRACTOR (E - H+K)		

15. RECAPITULATION:

TOTAL RETAINED PCTG. (B+F - I) TOTAL PAID (C+L)

ENG FORM 1 MAR 78 93 PREVIOUS EDITION OF THIS FORM IS OBSOLETE. **(USE REVERSE SIDE FOR DETAILED EXPLANATION AND-OR REMARKS)

PAYMENT ESTIMATE - CONTRACT PERFORMANCE (Continuation)	3. CONTRACT NO.	SHEET OF

2. CONTRACTOR AND ADDRESS	9. PERIOD COVERED BY THIS ESTIMATE FROM THRU

ITEM NO. a	DESCRIPTION b	CONTRACT			TOTAL TO DATE	
		QUANTITY AND UNIT c	UNIT PRICE d	AMOUNT e	QUANTITY AND UNIT f	AMOUNT g

ENG FORM 1 MAR 75 93a EDITION OF 1 JUN 54 IS OBSOLETE.

PAYMENT ESTIMATE - CONTRACT PERFORMANCE For use of this form, see ER 37-2-10 and 37-345-10.	1. DATE *Today's Date*	SHEET 1 of 1

2. CONTRACTOR AND ADDRESS	3. CONTRACT NO.	4. DISTRICT
XYZ & Associates, 987 K Street, Anchorage, Alaska, 99501	DACA85-02-D-00**	Alaska
5. DESCRIPTION OF WORK	**6. APPROPRIATION AND PROJECT**	**7. REQUIRED COMPLETION DATE**
Structural Analysis, Building 10-200		

8. LOCATION	9. PERIOD COVERED BY THIS ESTIMATE	10. JOB ORDER NO.	11. ESTIMATE NO.
Elmendorf AFB, Alaska	FROM 1 May 02 THRU 31 May 02	0001	1

ITEM NO. a	DESCRIPTION b	CONTRACT QUANTITY AND UNIT c	CONTRACT UNIT PRICE d	CONTRACT AMOUNT e	TOTAL TO DATE QUANTITY AND UNIT f	TOTAL TO DATE AMOUNT g
1	Task Order #0001 EXAMPLE EXAMPLE EXAMPLE	1 EXAMPLE	JOB	$30,253.00	25%	$7,563.00
INCLUDES MODIFICATION THRU:			TOTAL CONTRACT →	$ 30,253.00	TOTAL EARNINGS TO DATE →	$ $7,563.00

12. PRESENTED FOR PAYMENT	
PAYEE XYZ & Associates	PER *Original Signature* James P. Smith
DATE 1 Jun 02	TITLE President

13. APPROVED FOR PAYMENT

I CERTIFY that I have checked the quantities covered by this bill or estimate; that the work was actually performed; that the quantities are correct and consistent with all previous computations as actually checked; that the quantities and amounts are wholly consistent with the requirements of the contract or other instrument involved.

SIGNATURE	TITLE	DATE

CONTRACTING OFFICER APPROVAL (Signature)	DATE

14.		
A. PREVIOUS DEDUCTIONS OTHER THAN RETAINED PERCENTAGE**		
B. PREVIOUS RETAINED PERCENTAGE		
C. PREVIOUS PAYMENTS		
D. PREVIOUS EARNINGS (A+B+C)		
E. EARNINGS THIS PERIOD (TOTAL EARNINGS TO DATE MINUS D)		$7,563.00
F. LESS RETAINED PERCENTAGE		
G. LESS DEDUCTION OTHER THAN RETAINED PERCENTAGE FOR		
H. TOTAL DEDUCTIONS FOR THIS PERIOD (F+G)		
I. RETAINAGE REFUNDED		
J. OTHER REFUNDS		
K. TOTAL REFUNDS THIS PERIOD		
L. AMOUNT DUE CONTRACTOR (E - H+K)		

15. RECAPITULATION:

TOTAL RETAINED PCTG. (B+F - I) TOTAL PAID (C+L)

BASIC AWARD

ENG FORM 1 MAR 78 93 PREVIOUS EDITION OF THIS FORM IS OBSOLETE. **(USE REVERSE SIDE FOR DETAILED EXPLANATION AND-OR REMARKS)

PAYMENT ESTIMATE - CONTRACT PERFORMANCE For use of this form, see ER 37-2-10 and 37-345-10.	1. DATE *Today's Date*	SHEET 1 of 1

2. CONTRACTOR AND ADDRESS	3. CONTRACT NO.	4. DISTRICT
XYZ & Associates, 987 K Street, Anchorage, Alaska, 99501	DACA85-02-D-00**	Alaska
5. DESCRIPTION OF WORK	**6. APPROPRIATION AND PROJECT**	**7. REQUIRED COMPLETION DATE**
Structural Analysis, Building 10-200		

8. LOCATION	9. PERIOD COVERED BY THIS ESTIMATE	10. JOB ORDER NO.	11. ESTIMATE NO.
Elmendorf AFB, Alaska	FROM 1 May 02 THRU 31 May 02	0001	2

ITEM NO. a	DESCRIPTION b	CONTRACT QUANTITY AND UNIT c	CONTRACT UNIT PRICE d	CONTRACT AMOUNT e	TOTAL TO DATE QUANTITY AND UNIT f	TOTAL TO DATE AMOUNT g
1	Task Order #0001	1	JOB	$30,253.00	25%	$7,563.00
2	Modification #1	1	JOB	$10,500.00	15%	$1,575.00
	EXAMPLE EXAMPLE EXAMPLE	EXAMPLE				

INCLUDES MODIFICATION THRU:	TOTAL CONTRACT →	$ 40,753.00	TOTAL EARNINGS TO DATE →	$ $9,138.00

12. PRESENTED FOR PAYMENT	
PAYEE XYZ & Associates	PER *Original Signature* James P. Smith
DATE 1 Jun 02	TITLE President

13. APPROVED FOR PAYMENT		
I CERTIFY that I have checked the quantities covered by this bill or estimate; that the work was actually performed; that the quantities are correct and consistent with all previous computations as actually checked; that the quantities and amounts are wholly consistent with the requirements of the contract or other instrument involved.		
SIGNATURE	TITLE	DATE
CONTRACTING OFFICER APPROVAL (Signature)		DATE

14.		
A. PREVIOUS DEDUCTIONS OTHER THAN RETAINED PERCENTAGE**		
B. PREVIOUS RETAINED PERCENTAGE		
C. PREVIOUS PAYMENTS	$7,563.00	
D. PREVIOUS EARNINGS (A+B+C)		$7,563.00
E. EARNINGS THIS PERIOD (TOTAL EARNINGS TO DATE MINUS D)		$1,575.00
F. LESS RETAINED PERCENTAGE		
G. LESS DEDUCTION OTHER THAN RETAINED PERCENTAGE FOR		
H. TOTAL DEDUCTIONS FOR THIS PERIOD (F+G)		
I. RETAINAGE REFUNDED		
J. OTHER REFUNDS		
K. TOTAL REFUNDS THIS PERIOD		
L. AMOUNT DUE CONTRACTOR (E - H+K)		

15. RECAPITULATION:

TOTAL RETAINED PCTG. (B+F - I) TOTAL PAID (C+L)

BASIC AWARD WITH MODIFICATION

ENG FORM 1 MAR 78 93 PREVIOUS EDITION OF THIS FORM IS OBSOLETE. **(USE REVERSE SIDE FOR DETAILED EXPLANATION AND-OR REMARKS)

PAYMENT ESTIMATE - CONTRACT PERFORMANCE For use of this form, see ER 37-2-10 and 37-345-10.	1. DATE *Today's Date*	SHEET 1 of 1
2. CONTRACTOR AND ADDRESS XYZ & Associates, 987 K Street, Anchorage, Alaska, 99501	3. CONTRACT NO. DACA85-02-D-00**	4. DISTRICT Alaska
5. DESCRIPTION OF WORK Structural Analysis, Building 10-200	6. APPROPRIATION AND PROJECT	7. REQUIRED COMPLETION DATE
8. LOCATION Elmendorf AFB, Alaska	9. PERIOD COVERED BY THIS ESTIMATE FROM 1 May 02 THRU 31 May 02	10. JOB ORDER NO. 0001 / 11. ESTIMATE NO. 3 & FINAL

ITEM NO. a	DESCRIPTION b	CONTRACT QUANTITY AND UNIT c	CONTRACT UNIT PRICE d	CONTRACT AMOUNT e	TOTAL TO DATE QUANTITY AND UNIT f	TOTAL TO DATE AMOUNT g
1	Task Order #0001	1	JOB	$30,253.00	100%	$30,253.00
2	Modifications #1	1	JOB	$10,500.00	100%	$10,500.00
	EXAMPLE EXAMPLE EXAMPLE	EXAMPLE				
INCLUDES MODIFICATION THRU:			TOTAL CONTRACT →	$ 40,753.00	TOTAL EARNINGS TO DATE →	$ $40,753.00

12. PRESENTED FOR PAYMENT		14. A. PREVIOUS DEDUCTIONS OTHER THAN RETAINED PERCENTAGE**		
PAYEE XYZ & Associates	PER *Original Signature* James P. Smith	B. PREVIOUS RETAINED PERCENTAGE		
		C. PREVIOUS PAYMENTS	$9,138.00	
DATE 1 Jun 02	TITLE President	D. PREVIOUS EARNINGS (A+B+C)		$9,138.00
13. APPROVED FOR PAYMENT		E. EARNINGS THIS PERIOD (TOTAL EARNINGS TO DATE MINUS D)		$31,615.00
I CERTIFY that I have checked the quantities covered by this bill or estimate; that the work was actually performed; that the quantities are correct and consistent with all previous computations as actually checked; that the quantities and amounts are wholly consistent with the requirements of the contract or other instrument involved.		F. LESS RETAINED PERCENTAGE		
		G. LESS DEDUCTION OTHER THAN RETAINED PERCENTAGE FOR		
		H. TOTAL DEDUCTIONS FOR THIS PERIOD (F+G)		
SIGNATURE / TITLE / DATE		I. RETAINAGE REFUNDED		
		J. OTHER REFUNDS		
		K. TOTAL REFUNDS THIS PERIOD		
		L. AMOUNT DUE CONTRACTOR (E - H+K)		
CONTRACTING OFFICER APPROVAL (Signature)	DATE	15. RECAPITULATION: TOTAL RETAINED PCTG. (B+F - I) TOTAL PAID (C+L)		

FINAL PAY ESTIMATE

ENG FORM 1 MAR 78 93 PREVIOUS EDITION OF THIS FORM IS OBSOLETE. **(USE REVERSE SIDE FOR DETAILED EXPLANATION AND-OR REMARKS)

EI 01D010
1 September 1997

US Army Corps
of Engineers®

Engineering Instructions

CONSTRUCTION COST ESTIMATES

Approved for public release; distribution is unlimited.

Headquarters
U.S. Army Corps of Engineers
Engineering Divisions
Directorate of Military Programs
Directorate of Civil Works
Washington, DC 20314-1000

CEMP-E/CECW-E

EI 01D010
1 September 1997

FOREWORD

These engineering instructions (EI) provide design criteria and guidance for all U.S. Corps of Engineers (USACE) commands having military construction (MILCON), civil works, and Hazardous, Toxic, and Radioactive Waste (HTRW) design responsibility. These engineering instructions are to be used as a guide when planning, programming, and designing military, civil works, and HTRW projects.

EI are living documents and will be periodically reviewed, updated, and made available to users as part of the HQUSACE responsibility for technical criteria and policy for military, civil works, and HTRW construction. CEMP-EA is responsible for administration of the EI system; technical content of EI is the responsibility of the HQUSACE element of the discipline involved. As these engineering instructions were prepared under the joint responsibility of both Cost Engineering Branches in Military Programs and Civil Works, respectively, changes to these instructions will be reviewed by both Directorates in USACE. Recommended changes to EI, with rationale for the changes, should be sent to HQUSACE, ATTN: CEMP-EA, 20 Massachusetts Ave., NW, Washington, DC 20314-1000.

EI are effective upon issuance. EI are distributed only in electronic media, primarily through TECHINFO Internet site at http://www.hnd.usace.army.mil/techinfo/index.htm and the Construction Criteria Base (CCB) compact disk. Hard copies produced by the user from the electronic media should be checked against the current electronic version prior to use to assure that the latest instructions are used.

FOR THE COMMANDER:

STEVEN L. STOCKTON, P.E.
Chief, Engineering Division
Directorate of Civil Works

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

CEMP-E/CECW-E

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

EI 01D010

Engineering Instructions
No. 01D010

1 September 1997

CONSTRUCTION COST ESTIMATES

Table of Contents

Subject	Paragraph	Page
CHAPTER 1		
INTRODUCTION		
Purpose	1-1	1-1
Applicability	1-2	1-1
References	1-3	1-1
Scope	1-4	1-1
Arrangement	1-5	1-1
Program Specific Requirements	1-6	1-1
CHAPTER 2		
BACKGROUND AND OBJECTIVES		
Estimating Philosophy	2-1	2-1
Responsibility for Preparation and Review	2-2	2-1
Work Breakdown Structure (WBS)	2-3	2-1
Estimating Methodology	2-4	2-1
Degree of Detail	2-5	2-2
Parametric Estimates	2-6	2-2
Accuracy and Completeness	2-7	2-2
Rounding Figures	2-8	2-2
Price Level/Escalation Adjustment	2-9	2-3
Safeguarding Cost Estimates	2-10	2-3
Security and Disclosure of Government Estimate	2-11	2-3
Release of Government Estimates under the Freedom of Information Act (FOIA)	2-12	2-4
Team Involvement	2-13	2-5
Life-Cycle Cost (LCC) Study Support	2-14	2-5
Work Breakdown Structure by Program	2-15	2-5
Civil Works Program Specific Requirements	2-16	2-6
Military Program Specific Requirements	2-17	2-7
HTRW Program Specific Requirements	2-18	2-7
CHAPTER 3		
BASICS FOR PREPARATION OF ESTIMATES		
General	3-1	3-1
Planning the Work	3-2	3-1
Quantities	3-3	3-1
Types of Costs	3-4	3-1
Price Sources	3-5	3-2
Costs and Pricing	3-6	3-3
Cost Estimate Format and Supporting Documentation	3-7	3-3
Civil Works Program Specific Requirements	3-8	3-3
Military Program Specific Requirements	3-9	3-3
HTRW Program Specific Requirements	3-10	3-4
CHAPTER 4		
COMPOSITION OF GOVERNMENT ESTIMATES		
General	4-1	4-1
Government Estimate of Contract Cost	4-2	4-1
Narrative of Contract Costs	4-3	4-1
Government Estimate Backup Data	4-4	4-2
Miscellaneous Support Data	4-5	4-3
Requirements for Revision to a Government Estimate for Bidding	4-6	4-3
CHAPTER 5		
LABOR		
General	5-1	5-1
Crews	5-2	5-1
Wage Rates	5-3	5-1
Overtime and Shift Differential	5-4	5-1
Taxes and Insurance	5-5	5-2
Fringe Benefits and Travel/ Subsistence	5-6	5-2
HTRW Program Specific Requirements	5-7	5-3
CHAPTER 6		
LABOR PRODUCTIVITY		
General	6-1	6-1
Productivity Adjustment Considerations	6-2	6-1
Civil Works Program Specific Requirements	6-3	6-1

Table of Contents (continued)

Subject	Paragraph	Page
HTRW Program Specific Requirements	6-4	6-1
CHAPTER 7		
CONSTRUCTION EQUIPMENT AND PLANT		
General	7-1	7-1
Selection of Equipment	7-2	7-1
Estimating Methodology	7-3	7-1
Production Rate	7-4	7-1
Mobilization and Demobilization	7-5	7-1
Equipment Ownership and Operating Expense Cost Rates	7-6	7-2
Plant Cost	7-7	7-2
Small Tools	7-8	7-2
HTRW Program Specific Requirements	7-9	7-2
CHAPTER 8		
MATERIALS AND SUPPLIES		
General	8-1	8-1
Sources of Pricing Data	8-2	8-1
Waste Allowance	8-3	8-1
Forward Pricing	8-4	8-1
Freight	8-5	8-1
Handling and Storage	8-6	8-2
Taxes	8-7	8-2
Materials or Supplies Manufactured or Produced at the Site	8-8	8-2
Government-Furnished Materials (GFM) or Equipment (GFE)	8-9	8-2
CHAPTER 9		
SUBCONTRACTED WORK		
General	9-1	9-1
Use of Quotations	9-2	9-1
Civil Works Program Specific Requirements	9-3	9-1
CHAPTER 10		
OVERHEAD COSTS		
General	10-1	10-1
Job Office Overhead	10-2	10-1
General Home Office Overhead (G&A)	10-3	10-2
Duration of Overhead Items	10-4	10-2
Sources for Pricing	10-5	10-2
Distribution of Overhead	10-6	10-3
Civil Works Program Specific Requirements	10-7	10-3
HTRW Program Specific Requirements	10-8	10-3
CHAPTER 11		
PROFIT		
General	11-1	11-1
Weighted Guidelines Method	11-2	11-1
Civil Works Program Specific Requirements	11-3	11-2
HTRW Program Specific Requirements	11-4	11-2
CHAPTER 12		
SURETY BONDS		
General	12-1	12-1
Purpose of Bonds	12-2	12-1
Amount of Required Surety Bonds	12-3	12-1
Rules Governing the Application of Bond Rates	12-4	12-1
Cost of Performance and Payment Bonds	12-5	12-2
Civil Works Program Specific Requirements	12-6	12-2
HTRW Program Specific Requirements	12-7	12-2
CHAPTER 13		
OTHER COSTS		
General	13-1	13-1
Contractor Competition and Market Analysis	13-2	13-1
Other Project Costs	13-3	13-1
Cost Escalation	13-4	13-3
Contingencies	13-5	13-3
Application of Contingencies	13-6	13-4
CHAPTER 14		
CONTRACT MODIFICATIONS AND OTHER NEGOTIATED PROCUREMENT		
General	14-1	14-1
Directives	14-2	14-1
Negotiated Procurement and Contract Modifications	14-3	14-1
Preparation of Cost Estimates and Negotiation	14-4	14-2
Cost Considerations	14-5	14-2
Timeliness of Preparation	14-6	14-2
Impact Costs	14-7	14-3
Support for the Negotiations	14-8	14-4
HTRW Program Specific Requirements	14-9	14-4

Table of Contents (continued)

Subject	Paragraph	Page
CHAPTER 15 PREPARATION OF DREDGE COST ESTIMATES		
General	15-1	15-1
Definitions	15-2	15-1
Development of Dredging Estimate	15-3	15-2
Project Overview	15-4	15-2
Selection of Equipment	15-5	15-3
Production	15-6	15-3
Monthly Costs	15-7	15-4
Fixed Costs	15-8	15-4
Pay Items	15-9	15-4
CHAPTER 16 PROTESTS OR LITIGATION CONCERNING THE GOVERNMENT ESTIMATE		
General	16-1	16-1
Preparation of Technical and Cost Analysis by Cost Engineer	16-2	16-1
Review of the Government Estimate	16-3	16-1
Security and Disclosure of Government Estimates	16-4	16-2
Mistake in Bids	16-5	16-3
Civil Works Program Specific Requirements	16-6	16-3
CHAPTER 17 STANDARD ESTIMATING FORMS		
General	17-1	17-1
Standard Forms	17-2	17-1

APPENDIX A REFERENCES
APPENDIX B SAMPLE ESTIMATE PAGES
APPENDIX C WORK BREAKDOWN STRUCTURE
APPENDIX D SAMPLE CHECKLIST FOR COST ESTIMATE PREPARATION
APPENDIX E AUTOMATION
GLOSSARY ABBREVIATIONS AND ACRONYMS

LIST OF FIGURES

4-1. Composition of an Estimate 4-4
6-1. Productivity versus Overtime 6-5
6-2. Levels of Protection 6-6
6-3. HTRW Productivity Factors 6-7
11-1. Weighted Guidelines Profit Sheet 11-3
15-1. Dredging Pay Prism 15-6
17-1. Example Reasonable Contract Estimate (ENG Form 1738-R) 17-3
17-2. Example Reasonable Contract Estimate Detail Summary Sheet, (ENG Form 1739-R) 17-4
17-3. Example Reasonable Contract Estimate Worksheet Summary, (ENG Form 1740-R) 17-5
17-4. Example Reasonable Contract Estimate Worksheet, (ENG Form 1741-R) 17-6
17-5. Example Reasonable Contract Estimate Worksheet, (ENG Form 1741a-R) 17-8
17-6. Example Reasonable Contract Estimate Worksheet, (ENG Form 1741b-R) 17-9
17-7. Example Reasonable Contract Estimate Worksheet, (ENG Form 1741c-R) 17-10
17-8. Example Telephone Quotation Sheet 17-11
17-9. Example Wage Rate Calculations, (DA Form 5420-R) 17-12
17-10. Example Estimate Detail Summary Sheet, (DA Form 5417-R) 17-13
17-11. Example Cost Estimate Analysis (DA Form 5418-R) 17-14
17-12. Example Construction Cost Estimate Worksheet, (ENG Form 150a) 17-15
17-13. Example Crew and Productivity Worksheet, (DA Form 5419-R) 17-16
B-1. Sample Control Record for Government Estimates B-1
B-2. Sample Signature Page for Government Estimates B-2
B-3. Sample Price Schedule B-3
B-4. Sample Construction Schedule B-4
B-5. Sample Telephone Quotation Sheet B-5
E-1. TRACES System E-5

Table of Contents (continued)

Subject Paragraph Page

LIST OF TABLES

2-1. Feature Codes and Descriptions 2-5
5-1. Overtime and Shift Differential 5-4
6-1. HTRW Light Work 6-8
6-2. HTRW Heavy Work 6-9
10-1. Pollution Liability Insurance Cost 10-3
10-2. Level of Effort Per Discipline 10-5
11-1. Guidelines for Weighted Factors Profit Determination 11-4
12-1. Bond Rates 12-3
12-2. Contract Bonds Rate Classifications 12-4
12-3. HTRW Bond Rates 12-5
13-1. Contingency Factors for Construction Features 13-5
13-2. Technical Complexity Levels and Design Contingency Factors for Military Construction Projects 13-6
13-3. Design Contingencies for Remedial Action Projects 13-6
C-1. Military Programs Work Breakdown Structure C-2
C-2. HTRW Work Breakdown Structure (Levels 1 and 2) C-3

CHAPTER 1
INTRODUCTION

1-1. Purpose

This document establishes uniform guidance to describe methods, procedures, and formats for the preparation of construction cost estimates for U. S. Army Corps of Engineers projects. Guidance is also provided for the preparation of estimates for project/construction contract modifications.

1-2. Applicability

This manual applies to all U. S. Army Corps of Engineers commands having military construction, civil works, and HTRW design responsibility.

1-3. References

References cited in this manual are listed in appendix A.

1-4. Scope

This document addresses all phases of construction cost estimating from planning phases through modification estimates during construction. The term construction includes remedial action environmental projects, dredging and other construction type work often implemented as service contracts. For the purposes of this document, the term cost engineer applies to all individuals, whether employed by the Government or under contract to the Government, who are engaged in the preparation or review of cost estimates.

1-5. Arrangement

The information in this document is arranged by chapters. Contents in each chapter begin with information and instructions common to all programs. The last paragraph of each chapter is used for program specific requirements, i.e., military, civil works, and HTRW programs. Therefore, the cost engineer should first become familiar with the common guidance and then refer to the program specific guidance. Appendix B contains sample estimate pages. Appendix C contains the work breakdown structure for civil, military, and HTRW. Appendix D contains a checklist for cost estimate preparation. Appendix E contains an overview of automation systems used for developing cost estimates. Reproducible blank forms are included at the end of this document.

1-6. Program Specific Requirements

a. Overall cost engineering policy, guidance, and procedures for all projects assigned to USACE for civil works, military programs, and HTRW programs are provided in Engineer Regulation (ER) 1110-1-1300. Additional guidance is provided in specific cost engineering regulations as specified in the following paragraphs. Further supplemental guidance is referenced in Engineer Federal Acquisition Regulations System (EFARS), Part 36. Supplemental guidance is also provided in ER 5-7-1 (FR).

b. Civil Works. The appropriate guidance is provided in ER 1110-2-1302. Further, Public Law (PL) 95-269 requires that no works of river and harbor improvement will be done by private contract if the contract price is more than 25 percent in excess of the estimated comparable cost of doing the work by Government plant or more than 25 percent in excess of a fair and reasonable estimated cost (without profit) of a well-equipped contractor doing the work.

c. Military. The appropriate guidance is provided in ER 1110-3-1300. Further guidance is provided in Army Regulation (AR) 415-15. The Chief of Engineers is responsible for design, including preparation of construction cost estimates and construction of Army facilities, unless the responsibilities are otherwise assigned. The Chief of Engineers is also responsible for preparing and supporting budget estimates for construction financed with Military Construction Army (MCA) funds.

d. Hazardous, Toxic, and Radioactive Waste. The appropriate guidance for HTRW is provided in ER 1110-3-1301. This includes cost estimates for Superfund, Defense Environmental Restoration Program (DERP), Base Realignment and Closure Environmental Restoration (BRACER), and HTRW work for others.

CHAPTER 2
BACKGROUND AND OBJECTIVES

2-1. Estimating Philosophy

Cost estimates should be prepared as though the Government were a prudent and well-equipped contractor estimating the project. Therefore, all costs which a prudent, experienced contractor would expect to incur should be included in the cost estimate. This philosophy prevails throughout the entire project cycle--from programming through completion of construction. Each estimate should be developed as accurately as possible, in as much detail as can be assumed, and be based upon the best information available. This objective is to be maintained so that, at all stages of the project design and during construction, the cost estimate will in all aspects represent the "fair and reasonable" cost to the Government. Directives for military, civil works, and HTRW programs require cost engineers to use automation. The complete Tri-Service Automated Cost Engineering System (TRACES) automation tools are discussed in appendix E.

2-2. Responsibility for Preparation and Review

a. Preparation and review of construction cost estimates through contract award is, by regulation, the responsibility of the Cost Engineering Office. In concert with this responsibility, the cost engineer must be accountable for the completeness, quality, and accuracy of the reasonableness of the cost estimate.

b. When it is necessary to contract services for the preparation of quantities and/or cost estimates, such services will be provided by competent firms specializing in cost engineering. In all cases, the procedures and requirements of this manual will apply. Other specific needs, submittal, and requirements should also be provided to insure a complete understanding of the Corps cost engineering requirements. These supplementary requirements should be included as part of a comprehensive contract scope of work. Architect-Engineer (A-E) contracts should provide that each final estimate submitted to the Government be accompanied by a letter of transmittal which includes the following statement: "To the best of my knowledge the confidential nature of this estimate has been maintained." This statement should be signed and dated and maintained until the official markings have been removed.

c. All construction cost estimates, whether prepared in-house or by contract, will be given an independent review by government cost engineers. The estimate should be reviewed for the purpose of confirming the validity of the assumptions and the logic used in estimating the cost of construction tasks. The review should always include a check of the quantities, unit prices, and arithmetic. It is important that the reviewer develop and use a uniform checklist procedure in the review process to better assure that important considerations have not been overlooked (see checklist in appendix D).

2-3. Work Breakdown Structure (WBS)

It is important that the format of all estimates be as consistent as possible. A WBS has been established for this purpose. It is a hierarchical presentation of the scope of work. The WBS provides a common, ordered hierarchy framework for summarizing information and for quantitative reporting to customers and management. The purpose of the WBS is to: (1) provide an organized manner of collecting project cost data in a standard format for cost reporting and cost tracking; (2) provide a checklist for categorizing costs; and (3) provide a means to maintain historical cost data in a standard format. Separate unique WBS's have been developed for civil works, military, and HTRW programs. Each WBS is provided both in hard copy and electronically within Microcomputer Aided Cost Engineering System (MCACES). The appropriate WBS is to be used.

2-4. Estimating Methodology

a. Detail estimating methods are to be employed whenever adequate design information is known or can be reasonably assumed. Detail can be reasonably assumed for many projects from experience in past

designs, designer and cost engineer experience, and use of parametric models. When details cannot be reasonably assumed then historical bid unit prices will be used. Methodologies and procedures discussed in this manual are applicable whether the cost estimate is prepared manually or by using automation.

b. When analyzing construction tasks in an estimate, the cost engineer should identify the tasks that account for the major costs in the estimate. These tasks can be identified by applying the 80/20 rule, which states that approximately 80 percent of the project cost is contained in 20 percent of the tasks. Because these significant tasks account for most of the project cost, they should receive prime emphasis and effort in both preparation and review.

2-5. Degree of Detail

a. All cost estimates within the scope of this manual will be prepared on the basis of calculated quantities and unit prices that are commensurate with the degree of detail of the design known or assumed. This is accomplished by separating construction into its incremental parts. These parts are commonly referred to as construction tasks and are the line-by-line listings of every estimate. Each task is then defined and priced as accurately as possible. Tasks are seldom spelled out in the contract documents, but are necessary for evaluating the requirements and developing their cost.

b. At the most detailed level, each task is usually related to and performed by a crew. The cost engineer develops the task description by defining the type of effort or item to be constructed. Task descriptions should be as complete and accurate as possible to lend credibility to the estimate and aid in later review and analysis. An example, sample forms and a brief explanation of forms used in preparing manually prepared construction cost estimates are provided in chapter 17.

c. Whenever a significant amount of design assumptions are necessary such as in design-build process, the cost engineer should use historical cost data from previous similarly designed projects and/or use parametric estimating models.

2-6. Parametric Estimates

As an alternate method to detail task-by-task estimate preparation, especially in the early stages of project development when details are not available, the use of parametric estimating may be incorporated. Parametric estimating is the process of using various factors to develop an estimate. The factors are based on engineering parameters, developed from historical data bases, construction practices and engineering/ construction technology. The parameters include physical properties that describe project definition characteristics (e.g., size, building type, foundation type, exterior closure material, roof type and material, number of floors, functional space requirements, interior utility system requirements, etc.). The appropriateness of selecting the parametric method depends upon the extent of project definition available, the similarity between the project and other historical data models, the ability to calculate details, and known parameters or factors for the project. Appendix E provides additional information on the automated parametric system.

2-7. Accuracy and Completeness

Accuracy and completeness are critical factors in all cost estimates. An accurate and complete estimate establishes accountability with the cost engineer and enables management to place greater confidence in the cost estimate.

2-8. Rounding Figures

a. Rounding of costs is desirable to avoid the use of decimals when allocating the total distributed cost (markup) to the direct subtotal costs for each work item.

b. Cost estimates prepared manually to determine preliminary or alternative cost estimates when design details are limited, may be rounded based on the experience of the cost engineer, whereby the end cost is not significantly affected.

c. For reporting purposes, the total cost of the project, represented by the Current Working Estimate (CWE) for Military and HTRW, and the Total

Current Working Estimate (TOTAL CWE) for Civil Works may be rounded to the nearest thousand dollars.

2-9. Price Level/Escalation Adjustment

All cost estimate elements will be priced to a common calendar date base (month and year). The establishment of this date should be based on the ability to obtain current known costs and adjust historical costs with reliability. This date is referred to as the effective price level date. Once the cost estimate has been prepared to the effective price level date, the estimate may require cost adjustment to accommodate the project schedule, therefore the cost engineer should calculate escalation as a separately identifiable element and calculation methodology should be clearly defined and indicated. Additional information on cost escalation is provided in chapter 13.

2-10. Safeguarding Cost Estimates

Although not required by regulations, estimates based on less than completed design should be handled by the cost engineer in a discretionary manner. Access to each estimate and its contents will be limited to those persons whose duties require knowledge of the estimate. Estimates prepared by A-E's will also be similarly handled. Any request by the public for information and pricing in the estimate will not be provided until coordination, verification of data, and approval have been given by the commander or designated authority.

2-11. Security and Disclosure of Government Estimate

a. Contents of the Government estimate. The Government estimate consists of a title page, signature page, and bid schedule. Supporting documents that are publicly available as part of the solicitation (such as plans, specifications, and project descriptions) are not part of the Government estimate. Government estimates for contract awards and contract modifications are treated the same.

b. Access to the Government estimate. Access to the estimate and its contents will be limited to personnel whose duties require they have knowledge of the subject. When an A-E is responsible for preparing any such estimate, the A-E submittal should include a list of individual's names who have had access to the total amount of the estimate. Government personnel also should sign the same or a similar list. A list similar to figure B-1, in appendix B should be filed with the Government estimate.

c. Marking the Government estimate. The Government estimate will be marked in accordance with AR 25-55. The preparer of the Government estimate will ensure that the protective marking " For Official Use Only" (FOUO) is properly applied to all pertinent documents, computer files, floppy disks, printouts, and other documents prepared manually or electronically for incorporation into the Government estimate.

d. Disclosure outside of the Government. After contract award, ordinarily, only the title page, signature page, and bid schedule are disclosed outside the Government. The Government estimate backup data should not be released since it contains sensitive cost data (e.g., contractor quotes, crews and productivity) that are proprietary or might compromise cost estimates for future similar procurement.

e. Bid protests and litigation. During bid protests and litigation, if appropriate and to the extent possible, Counsel should have the Government estimate and/or the Government estimate backup data placed under a "protective order." There are valid reasons for not releasing the backup data supporting the Government estimate to the contractors. In the case of a bid protest, there is a possibility that the contract could be re-advertised or converted to a negotiated procurement. Release of the backup data would provide bidders with the detailed cost data that supports the Government estimate. If, however, the apparent low bidder protests the details of the Government estimate, the Command may provide the details of the Government estimate and Government backup data, to the protestor only, upon receipt of complete details of the protestor's estimate. See, EFARS 33.103 (S-101). If the protest is not sustained and the proposal is re-advertised, all bidders are entitled to have the same information as the protestor.

2-12. Release of Government Estimates under the Freedom of Information Act (FOIA)

a. The Government estimate and Government estimate backup data, prepared for construction contracts and modifications, are sensitive procurement information and should in many cases be withheld under the FOIA.

b. Definitions.

(1) Government estimate. The Government estimate consists of a title page, signature page, and bid schedule.

(2) Governments estimate backup data. The Government estimate backup data is the detailed cost data, which includes production and crew development methodology, labor, equipment and crew backup files, subcontractor quotes, and all other data identified on MCACES software as detail sheets.

(3) Fair market price determinations, under the Small Business Program, Federal Acquisition Regulations (FAR) 19.202.6, will be treated as Government estimates for purposes of this guidance.

(4) Supporting documents that are publicly available as part of the solicitation, such as plans, specifications and project description, or that contain no cost information, such as sketches, soil boring and material classifications, are not part of the Government estimate or backup.

c. Government estimates and Government estimate backup data are intra-agency memoranda which may be withheld under FOIA Exemption 5, "confidential commercial information" and "deliberative process" privileges. Proper use of Exemption 5, however, requires a showing that release of information will harm the Government's interests. Therefore, requests for Government estimates and backup data will be reviewed on a case-by-case basis, based on the following guidance, to determine whether release will harm the Corps' interests. In reviewing requests the FOIA Officer will seek the assistance of the cost engineer. If the FOIA Officer determines that release will harm the Corps' interest, the information will be withheld.

(1) Before contract award.

(a) When sealed bidding is used, neither the Government estimate nor the Government estimate backup data should be released prior to bid opening. FAR 36-203(c), 36.204. It is well established that release of Government estimates and backup data before contract award would harm the interests of the Government. FAR 36.203, Federal Open Market Committee v. Merrill, 443 U.S. 340 (1979), Morrison-Knudson v. Department of the Army, 595 F. Supp. 352 (D.D.C. 1984), aff'd 762 F.2d 138 (D.C. Cir 1985).

(b) The Government estimate will normally be released when bids are opened. In some instances, however, the Government estimate will not be released at that time, such as when all bids received are nonresponsive and a re-procurement is envisioned.

(c) In negotiated procurement for construction under FAR Parts 15 and 36, the Government estimate should not be released prior to contract award, except that Government negotiators may disclose portions of the Government estimate in negotiating a fair and reasonable price, see FAR 36-203(c).

(d) Government estimate backup data should not be released.

(2) After contract award through contract completion.

(a) The Government estimate may be released.

(b) The Government estimate backup data should not be released. Release of Government estimate backup data after contract award and before completion of a construction contract, may also result in harm to the Government. The Government estimate backup data is used to develop cost estimates for modifications and claims. Release of the backup data prior to contract completion provides the contractor with the details of the Government's

position and would allow the contractor to develop a biased price proposal. This could harm the Government's ability to negotiate a fair and reasonable price for the modification or claim, putting the Government at a serious commercial disadvantage. Moreover, knowledge of the construction methods contemplated by the Government might reduce the contractors incentive to discover less expensive methods. This could also reduce the contractors incentive to locate and charge out materials at a lower cost, or to achieve project goals using less labor and equipment. Quarles v. Department of the Navy, 983 F.2d 390, (D.C. Cir 1990). Taylor Woodrow International, Ltd. V. Department of the Navy, No. 88-429R, (W.D. Wash. Apr 6, 1989).

(3) After contract completion (and after all claims have been resolved). Generally, the Government estimate backup data may be released after the contract is completed. Situations where the information should not be released include, multiple-phased projects where a series of similar contracts are awarded in sequence, and frequently recurring contracts. In those cases, each Government estimate is based upon the same backup data and the same analysis of how to perform the work.

2-13. Team Involvement

Cost engineers are an important member of the project team. The cost engineer is expected to have a clear understanding of those responsibilities and areas where contributions can be made. It is imperative that the team concept be enhanced and supported by each member. As such, the cost engineer is encouraged to lead in cost issues and provide ideas for cost control and sharing measures.

2-14. Life Cycle Cost (LCC) Study Support

Quality management policy requires LCC studies to be performed to evaluate system alternatives. These analyses are the responsibility of the design team. The cost engineer will be called upon to support the analysis by providing cost input. As preparation to such responsibility, the cost engineer should be familiar with the LCC procedures contained in Technical Manual (TM) 5-802-1 and should receive adequate formal training prior to performing LCC studies.

2-15. Work Breakdown Structure by Program

a. Civil Works. The Civil Works Breakdown Structure (CWBS) is a standard product oriented format that identifies all civil works related project requirements that include construction costs and the nonconstruction activity costs for Real Estate; Planning, Engineering and Design; and Construction Management. The CWBS groups the products by feature (table 2-1) and further requires an expansion to the appropriate title and detail level necessary to insure all product specific work tasks are included for preparation of the cost estimate.

Table 2-1 Feature Codes and Descriptions

Number	Feature Description
01	Lands and Damages
02	Relocations
03	Reservoirs
04	Dams
05	Locks
06	Fish and Wildlife Facilities
07	Power Plant
08	Roads, Railroads, and Bridges
09	Channels and Canals
10	Breakwaters and Seawalls
11	Levees and Floodwalls
12	Navigation Ports and Harbors
13	Pumping Plants
14	Recreation Facilities
15	Flood Control and Diversion Structures
16	Bank Stabilization
17	Beach Replenishment
18	Cultural Resource Preservation
19	Buildings, Grounds, and Utilities
20	Permanent Operating Equipment
21	Reconnaissance Studies
22	Feasibility Studies
30	Planning, Engineering, and Design
31	Construction Management
33	HTRW

b. Military Programs. The Military Construction Work Breakdown Structure (MCWBS) provides a common framework for preparing cost estimates, developing models, and collecting cost data for Department of Defense (DOD) military

construction projects. It is to be used for categorizing facility costs and associated supporting facility costs for all conventional military construction projects. This MCWBS is comprised of 15 primary facility systems and four supporting facility systems. Each system is divided into one or more subsystems, which are further divided into assemblies made up of construction line items. An example of MCWBS levels numbering is as follows:

Level 1	Scope
Level 2	Facility (Building)
Level 3 (System)	02 - Superstructure
Level 4 (Subsystem)	01 - Floor Construction
Level 5 (Assembly Category)	03 - Floor Decks and Slabs
Level 6 (Assembly)	03 - Precast Concrete Slab
Level 7 (Detail Line Item)	03412 1105 Erection 03412 1901 100 mm Precast Slab

(1) A unit of measure is associated with each level of the MCWBS and should be followed in all estimates to facilitate the estimating review process. This will allow estimates to be compared to other similar project estimates.

(2) The standard numbering structure and description manual is available and referred to as "Data Dictionary." The dictionary includes description of building functional components and associated supporting facilities. A sample MCWBS to level 2 is provided in appendix C. The complete MCWBS is located in MCACES.

c. HTRW

(1) The HTRW Remedial Action Work Breakdown Structure (RAWBS) is for categorizing remedial action construction costs only and does not include WBS items for pre-design studies, engineering and design, other pre-construction costs, or other estimated post-construction costs such as post-construction operation and maintenance which can also be charged to the project.

(2) The RAWBS consists of four numbered levels of cost breakdown. Each level is identified by a two digit number; Level 1 (Account) represents HTRW RA and is identified by 33. The detail increases with each succeeding level as shown below:

Level 1 (Account)	33 1 xx - HTRW Remedial Action
Level 2 (System)	15 - Stabilization/ Fixation/Encap
Level 3 (Subsystem)	07 - Sludge Stabilization
Level 4 (Assembly Category)	03 - Construction of Permanent Treatment Plant

(3) The RAWBS numbering system and standard descriptions may not be changed for HTRW estimates for the first three levels (Account, System, and Subsystem). Items not found in the HTRW RAWBS should be coded with the appropriate two digit number from 90-99 (Other). As a minimum, estimates are to be structured and include summaries to the third (Subsystem) level.

(4) The "Standard Description" manual (also referred to as the "Data Dictionary") for the HTRW RAWBS includes written descriptions of the second (System) and third (Subsystem) levels and can be used as a reference to assist in determining the appropriate breakdown of costs. Refer to appendix C for a listing of Level 2 (system) of the HTRW RAWBS. The complete RAWBS is located in MCACES.

2-16. Civil Works Program Specific Requirements

a. Virtually every study, project, or activity funded under the civil works program requires a project cost estimate. The cost estimate is an essential tool that serves as a foundation in accomplishing management objectives, budgetary submissions, and economic analysis. In a typical project life, cost estimates may be divided into a series of different types throughout the project development. The type of estimates occurring are identified below.

(1) Estimates for reconnaissance reports.

(2) Estimates for feasibility reports.

(3) Estimates during engineering and design.

(4) Government estimates for contract award and for contract modifications.

(5) The cost engineer may also be required to prepare cost estimates for special purposes such as continuing project management and budgetary submissions; special programs such as Continuing Authority Program (CAP), Dam Safety Assurance Program, Environmental Restoration 1135 projects and Operation, Maintenance, Repair, Rehabilitation and Replacement (OMRR&R).

b. The definitions and appropriate policies applicable to the wide variety of projects encompassed in the civil works program are described in ER 1110-2-1302. The technical details for preparing cost estimates are provided in this manual.

2-17. Military Program Specific Requirements

In the Military Construction (MILCON) program, construction cost estimates are prepared throughout the planning, design, and construction phases of a construction project. These construction cost estimates are categorized as follows: Programming estimate; concept estimate; final estimate; and Government estimate. In the planning phase, the cost estimate is called programming estimate and is prepared on a Department of Defense form, DD Form 1391. This programming estimate is developed based on preliminary project scope or mission requirements. Historical data and parametric estimating procedures are used to develop the estimate. The concept estimate is prepared during the 15 percent or 35 percent design phase of the project and is used to update the programming estimate. The estimate is refined more during this phase since the design criteria and project requirements have been defined. The accuracy and reasonableness of the concept estimate is critical as this estimate becomes the basis for Congressional funding authorization and appropriation for construction. The final estimate is the detailed bottoms-up cost estimate based on the final plans and specifications. This estimate serves as the basis for establishing the Government estimate.

2-18. HTRW Program Specific Requirements

a. Remedial action cost estimates are required during all phases of an HTRW project. Most existing HTRW sites are remediated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), which has distinct and legally required phases that differ from the design and construction process applicable to traditional USACE programs.

b. CERCLA project phases are: Preliminary Assessment (PA); Site Inspection (SI); Remedial Investigation (RI); Feasibility Study (FS); Record of Decision (ROD); Remedial Design (RD); and Remedial Action (RA). During the PA, SI, or RI phases of a HTRW project the estimates are called preliminary budget estimates. The project scope, type, level, or extent of contamination, and the primary remedial technology have not been defined during these early phases. All available tools such as HTRW historical information and parametric estimating procedures should be used to develop the preliminary budget estimates. The estimates are refined more during the FS phase, which compares the technical merits of alternative remedial action methods. Historical data, parametric estimating, detailed quantity take-off estimating and life cycle-cost techniques should be used to compare the costs of competing technologies. The cost estimate of the selected remediation alternative from the FS generally serves as a basis for the ROD estimate. The ROD estimate is the basis for funding authorization of an HTRW project. During the remedial design phase, the cost estimate for remedial action is a CWE. The CWE is the detailed cost estimate developed from design documents and serves as the basis for establishing the Government estimate. The remedial action phase is the actual site cleanup of an HTRW project.

c. HTRW projects not covered by CERCLA may fall under other applicable public laws such as the Resource Conservation and Recovery Act (RCRA).

In general, the identification, study, decision, design, and remedial action processes are similar to CERCLA and have similar cost engineering implications. RCRA terminology differs from CERCLA as follows:

RCRA	CERCLA
RCRA Facility Assessment (RFA)	PA/SI
RCRA Facility Investigation (RFI)	RI
Corrective Measures Study (CMS)	FS
Corrective Measures Implementation (CMI)	RD/RA

d. USACE may or may not be involved in all the above phases of an HTRW project. Frequently, USACE takes responsibility for an HTRW project after the ROD has been completed. For those project phases for which USACE is responsible, the cost engineer must be involved in development and/or review of project cost estimates for remedial action.

CHAPTER 3
BASICS FOR PREPARATION OF ESTIMATES

3-1. General

a. This chapter establishes uniform guidance to be used prior to estimate preparation. In the normal sequence of events toward the preparation of any estimate, it is of utmost importance to understand basic fundamental principles and responsibilities.

b. Construction cost estimates consist of:

(1) Descriptions of work elements to be accomplished (tasks).

(2) A quantity of work required for each task.

(3) A cost for each task quantity.

c. A unit cost for each task is developed to increase the accuracy of the estimating procedure and should provide a reference comparison to historic experience. Lump sum estimating when used at the task level must be documented.

3-2. Planning the Work

The cost engineer must thoroughly understand the project scope of work, the biddability, environmental constructibility, operability (BECO), and aspects of the project being estimated. The cost engineer must also review drawings, specifications, and other references to formulate a construction sequence and duration. A site visit is strongly recommended to enable the cost engineer to relate the physical characteristics of the project to the available design parameters and details. This is particularly important on projects with difficult site conditions, major maintenance and repair projects, alteration/addition projects, environmental projects, and dredging projects. The construction sequence must be developed as soon as possible and should be used to provide a checklist of construction requirements throughout the cost estimating process. The overall format of major cost elements in an estimate must be compatible with current standards, management needs, the anticipated bidding schedule, and the appropriate WBS.

3-3. Quantities

a. The quantity "take-off" is an important part of the cost estimate. It must be as accurate as possible, and should be based on all available engineering and design data.

b. After the scope has been analyzed and broken down into the construction tasks, each task must be quantified prior to pricing. Equal emphasis should be placed on both accurate quantity calculation and accurate pricing. Quantities should be shown in standard units of measure and should be consistent with design units (inch-pound/metric). Assistance for making "take-off's" may be provided by others within the organization in support of cost engineering or by A-E contract; however, the responsibility for the accuracy of the quantities remains with cost engineering.

c. The detail to which the quantities are prepared for each task is dependent on the level of design detail. Quantity calculations beyond design details are often necessary to determine a reasonable price to complete the overall scope of work for the cost estimate. Project notes will be added at the appropriate level in the estimate to explain the basis for the quantity calculations, to clearly show contingencies , and to note quantities determined by cost engineering judgment that will be reconciled upon design refinement.

3-4. Types of Costs

a. Various types of cost elements must be evaluated in detail.

b. Direct costs are those costs which can be attributed to a single task of construction work. These costs are usually associated with a construction labor crew performing a task using specific materials for the task. Labor foreman cost should normally be considered as a direct cost. Subcontracted costs should be considered as direct costs to the prime contractor in estimates.

c. Indirect costs are those costs which cannot be attributed to a single task of construction work. These costs include overhead, profit, and bond. Indirect costs are also referred to as distributed costs.

d. Estimates based on detailed design will be developed from separate direct cost pricing of labor, material, construction equipment, and supplies. Applicable indirect costs will be added later to reflect the total construction cost. Other costs, including lands and damages, escalation, design contingencies, construction contingencies, construction supervision and administration (S&A), Engineering During Construction (EDC), As-built, and Operation and Maintenance (O&M) Manuals, will be added to the construction costs to determine the total project cost as required by program specific requirements.

3-5. Price Sources

a. Various pricing sources should be obtained and be available to the cost engineer. In pricing from any source, experience and ability to relate data in hand to a specific circumstance is important. The following discussion is provided on commonly used sources and source development.

b. Unit Price Book (UPB). The unit price book is the common name for the U. S. Army Corps of Engineers construction direct costs data base. This UPB is printed in hard copy and is part of MCACES. It contains repetitive construction tasks with direct cost pricing (labor, equipment, material) based on a typical crew and production rate for new construction. Some UPB line items may include quotes for work that is fully provided and installed by subcontractor. All quotes for work fully priced by subcontractor are shown in the UPB, column identified as "Unit Cost." Each office is encouraged to use this pricing source and to refine the data base to more accurately reflect local costs at the project site.

c. Historical data. Historical costs from past similar work are excellent pricing sources when adequate details have been saved and adjustment to project specifics can be defined. Portions of other estimates having similar work can be retrieved and re-priced to the current project rates. Automated historical data bases are discussed in appendix E.

d. Parametric data base. A parametric data base of predefined-assemblies for buildings and site work; and HTRW work using UPB pricing, has been developed and is discussed in appendix E.

e. Development of specific tasks. When standard tasks do not meet project needs, specific new tasks need to be developed. Such development requires experience. Descriptions developed must adequately define the scope and material requirement for each task. Unit cost for each task is developed as a direct cost with separate costing for the labor, equipment, and material components. Notes which explain key factors in the pricing and methodology should accompany the task development. Comparison with existing pricing guides is recommended.

(1) Labor unit cost. This cost is based on a defined crew from the UPB or on a newly developed crew which performs the tasks at an assigned production rate. Hourly rates for each craft are applied to the crew labor to arrive at the hourly crew labor cost. The total crew labor cost/hour is divided by the expected production rate (units/hour) to derive the labor cost/unit.

(2) Equipment unit cost. This cost is derived similar to labor unit cost. Hourly equipment rates are obtained from the appropriate regional manual, entitled, "Construction Equipment Ownership and Operating Expense Schedule" (herein referenced as, Equipment Ownership Schedule), Engineer Pamphlet (EP) 1110-1-8, or developed according to the methodology as described in this pamphlet.

(3) Material unit cost. This cost is developed using vendor quotes, historical costs, commercial pricing sources, or component calculations. The price should include delivery to the project site.

f. Commercial unit cost books. These common sources are typically available through subscription or purchase. Basis of costs shown are typically explained along with adjustment methodology. Such publications are valuable "second-opinion" verification and appropriate for minor commercial type work item pricing.

3-6. Costs and Pricing

a. The cost for each task should be developed by summing the direct cost elements for labor, equipment, and materials. The indirect costs and other markups associated with each task or work item should be identified and are considered separately for the specific project.

b. The direct cost of construction tasks of minor overall cost significance and of a repetitive nature can normally be priced from any of those sources discussed above.

c. When using historical pricing, adjustments must be made for project location, work methodology, quantity of work, and other dissimilarities which affect prices.

d. Use of lump sum items is discouraged. If lump sum items are used in the estimate they must have backup cost data relating to their tasks and source of the data.

e. As a general rule of thumb, when a task extended direct cost is $10,000 or more, or 5 percent of the total direct cost, whichever is less, detailed backup for the cost should be prepared or quotations obtained as pricing support to the cost estimate.

f. Applying the same rule of thumb, unit price bid items for Government estimates may be based on suitable experienced bid prices or historical cost data, i.e., predetermined bid item does not exceed $100,000, or 5 percent of the estimated total cost, whichever is less. For cost estimates prepared during preliminary or planning phases, where design is limited or not available, predetermined unit prices adjusted to current pricing level may be used by the cost engineer. Use of experienced prices should consider any necessary adjustments in prime contractor's profit or distributed costs appropriate to the contract requirements. The cost engineer must use extreme care and sound judgment when using predetermined unit costs. The basis for the unit costs should be well documented and included in the supporting data of the estimate. Where a bid item consists mostly of equipment and labor costs, with very little materials and supplies, it is advisable to develop the cost as indicated above, even though the item may fall under this rule of thumb.

3-7. Cost Estimate Format and Supporting Documentation

All construction cost estimates are composed of contract costs and other allowable project costs authorized by directives or regulations. The overall format of the cost estimate should be in accordance with the appropriate WBS as described in chapter 2. The cost engineer should always remain mindful of the documentation necessary to support the cost estimate submission requirements specified for each phase of project development. Support documentation such as project narrative, bid schedule, plan of construction, backup data, and drawings and sketches are further discussed in chapter 4.

3-8. Civil Works Program Specific Requirements

The total project cost summary provides a summary of project costs in accordance with ER 5-7-1, (FR). It relates the cost estimate and identified price level date to the fully funded cost estimate by applying the appropriate adjustments for inflation in accordance with the developed project schedule. A total project cost summary shall be prepared in conjunction with the preparation of cost estimates which support major project milestones. Approval and signature by the Chief, Cost Engineering, affirms that the construction feature costs are correct and that the backup data provided for the nonconstruction features (Lands and Damages; Planning, Engineering and Design; and Construction Management) have been included.

3-9. Military Program Specific Requirements

In addition to costs described in this chapter, the CWE for MILCON projects should include all other costs authorized by directive to be charged to construction as funded cost. These costs include installation costs or installed equipment in place to be furnished by the using service or other agency,

and the cost of Government-Furnished Materials (GFM) or Government-Furnished Equipment (GFE) purchased with construction funds and furnished to the contractor without reimbursement.

3-10. HTRW Program Specific Requirements

In addition to costs described in this chapter, for HTRW projects, the CWE should include an allowance for Government Laboratory Quality Assurance if applicable to the project. This is a Government cost to perform chemical analysis for verification purposes. Contingencies and other costs associated to HTRW are discussed in chapter 13.

CHAPTER 4
COMPOSITION OF GOVERNMENT ESTIMATES

4-1. General

The Government estimate is the formal, approved construction cost estimate prepared to support contract award. The presentation format for this type of estimate is: Government Estimate of Contract Cost, Narrative of Contract Cost, Government Estimate Backup Data, and Miscellaneous Support Data. Each part is shown in figure 4-1. Sample Government estimate sheets are illustrated in appendix B. Security and control of the Government estimate is described in chapter 2.

4-2. Government Estimate of Contract Cost

a. The Government estimate is the portion of the cost estimate to be submitted as required by procurement regulations. It includes the title page, signature page, and bid schedule.

b. Title page. The title page should include the name and location of the project, the district responsible for the project design, the cost engineer responsible for preparation of the cost estimate, and the date and price level of the cost estimate.

c. Signature page. The signature page should contain the names and signatures of those individuals responsible for the preparation, review, submittal, and approval of the cost estimate. It is necessary that the sheet contain the total amount of the estimated costs. The number of amendments included in the estimate should appear on the same page so that there will be no question as to the approved amount.

d. Bid/Price schedule. The bid schedule required by the solicitation documents must be completed as part of the Government estimate. As part of the design team, the cost engineer should be involved in the development of the bid schedule. The format of the bid schedule must be anticipated in planning and design estimates. When the bid schedule is finalized for procurement, it must show unit prices, quantities, extension of unit prices, lump sum items, and total costs. Rounding off is not permitted on the bid schedule between the unit price and extension. Any rounding adjustments must be performed in Details and Analysis. Instructions in the bidding request documents also pertain to the Government estimate.

4-3. Narrative of Contract Costs

a. This part of the estimate of construction cost consists primarily of those sheets, with notes, which describe the scope tasks and costing. It also contains discussions, considerations, and the developed construction plan. The types of items normally included are as follows:

b. Table of contents. This page denotes the backup content.

c. Project narrative. The project narrative provides general details of the project. The narrative defines the assumptions made during the preparation of the cost estimate. It describes the project requirements that must be performed in sufficient detail to give a clear understanding of the scope of work. It also describes project details including length, width, height and shape of primary features, special problems that will be encountered in performing the work, site conditions affecting the work, reasons for selection of major plant and equipment, method and time for mobilization and demobilization of all equipment, and the reasons for unusually high or low unit prices. Each estimate will include a statement which relates both the development of design, as appropriate, and date of effective pricing. Other factors to be considered in the project narrative include:

(1) Construction schedule, use of overtime, construction windows, phasing, acquisition plan, and subcontracting.

(2) Project-related details include site access, borrow areas, construction methodology, unusual conditions (soil, water or weather), unique techniques of construction, equipment/labor availability and distance traveled, environmental

concerns, contingencies by feature or subfeature, if appropriate, and effective dates and sources for labor, equipment and material pricing.

d. Construction Schedule. The cost engineer will prepare a construction schedule to support the cost estimate that is consistent with the schedule for completion of the project. It may be in the form of a bar chart or network analysis system ,or may be prepared using the MCACES Scheduling Interface module; but it must identify the sequence and duration of the tasks upon which the cost estimate is developed. The schedule must be prepared in sufficient detail to adequately develop the required labor, equipment, crew sizes, and production rates required for each of the identified construction tasks.

e. Equipment and materials utilization. On those projects involving considerable heavy construction equipment, it is necessary to sufficiently plan the equipment usage against the work schedule to identify the actual number of cranes, dozers, and allow for proper mobilization to assure that demand for the equipment is not over or understated. For equipment selected from EP 1110-1-8, Equipment Ownership Schedule, indicate the region and date of the equipment schedule used for pricing the equipment. Materials which require long lead-time and can become critical to the construction schedule should be noted, planned, and adequately considered.

f. Labor discussion and utilization. The estimate should clearly state the sources for the various labor classifications and rates and include a tabulation by crafts of the various composite wage rates used. When extensive overtime beyond the normal work day is used in the estimate, an explanation should be included.

4-4. Government Estimate Backup Data

a. This part of the estimate consists of all the support and backup documentation. The various categories of support documentation contained in this part are:

b. Cost analysis summary sheets. The MCACES or manually prepared summary sheets for direct, indirect and owner costs are used to summarize cost components for each bid item and by the appropriate Work Breakdown Structure. Distribution of overhead and profit is shown on this sheet.

c. Mobilization, preparatory work, and demobilization. These costs should be itemized and costed separately. These costs may be combined at summary level with overhead if these costs are not paid as a separate bid item. This item may be shown as a lump sum on the bid schedule.

d. Profit computation sheet. When profit is included, the weighted guidelines will be used to compute the profit and will be part of the cost estimate backup.

e. Overhead costs. The itemization and calculations of overhead costs, both job site and home office, should be accomplished in accordance with chapter 10.

f. Bond costs. Bond costs should be calculated in accordance with chapter 12. Distribution is made to bid items similar to or as part of overhead costs distribution.

g. MCACES detail sheets. The completed direct costs should be organized in the proper sequence by the appropriate Work Breakdown Structure for each bid item.

h. Production rates. The MCACES or manually prepared details are used to express production rate analysis of crews. See chapter 6 for further discussion.

i. Crew, labor, equipment rates. These MCACES or manually prepared details are used to express the crew composition, and associated rates for labor and equipment costs. The information contained on these sheets provides the backup support for the task unit labor and equipment costs shown.

j. Quantity computations. The quantity take-off computations for the tasks estimated, should be organized by task for the bid items and kept as backup. The take-off should reference the drawing and clearly explain the computation.

k. Quotations. Quotations should be collected and compiled by task or bid item into an organized reference. When quotations were not obtained for significant material and supply items, the basis for the cost used should be fully described. Quotations should be considered proprietary information and should be kept confidential to protect the information entrusted to the cost engineer.

4-5. Miscellaneous Support Data

a. Include all other information pertinent to the estimate such as drawings and sketches which were used as the basis of the cost estimate. Drawings may include a project map showing the location of the work with respect to principal cities, roads, railways, and waterways; a site map showing the location of the work, borrow, quarry, and spoil areas, and existing work access roads; any existing facilities usable by the contractor; a general plan and elevation, or profile of the work with typical sections; and a construction layout.

b. Supporting documents that are publicly available as part of the solicitation, such as plans, specifications and project description, or that contain no cost information, such as sketches, soil boring and material classifications, are not part of the Government estimate or backup.

4-6. Requirements for Revision to Government Estimate for Bidding

Prior to award, the Government estimate may be changed or revised as a result of errors, differing conditions or additional information. Approval authority for revision to the estimate remains the responsibility of the Contracting Officer or authorized original estimate approving official. Each office should assure that appropriate justification is attached to the revised cost estimate. Estimates may be revised by supplementary sheets or by actually changing the contents of the original estimate pages. The method used will be determined by the nature of the revision and the format of the estimate. Whichever the method, all revisions to the estimate must be clearly indicated, dated, justified, and approved. A new signature sheet relating both the previously approved total and revised total will be re-approved. A copy of each estimate that has been approved should be included in a file along with the details and circumstances reflecting the revisions.

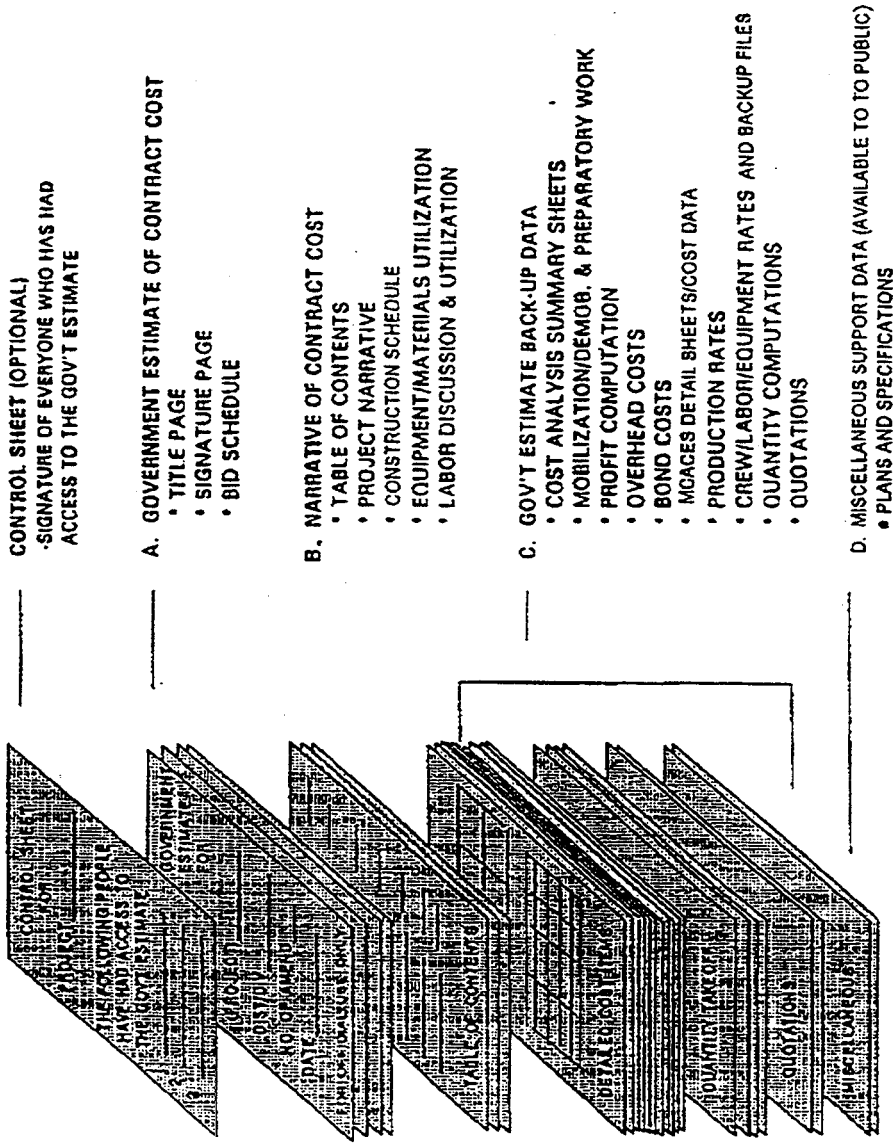


Figure 4-1. Composition of an estimate

CHAPTER 5
LABOR

5-1. General

a. Direct labor costs are defined as base wages plus labor cost additives including payroll taxes, fringe benefits, travel, and overtime allowances paid by the contractor for personnel who perform a specific construction task. In addition to the actual workers, there are generally working crew foremen who receive an hourly wage and are considered part of the direct labor costs.

b. Indirect labor costs are wages and labor cost additives paid to contractor personnel whose effort cannot be attributed to a specific construction task. Personnel such as superintendents, engineers, clerks, and site cleanup laborers are usually included as indirect labor costs (overhead).

5-2. Crews

Direct labor cost requirements are broken into tasks of work. Since each task is usually performed by a labor crew including equipment, the crew must be defined, costed, and a production rate established for the task. Crews may vary in size and mix of skills. The number and size of each crew should be based on such considerations as having sufficient workers to perform a task within the construction schedule and the limitation of work space. Once the crews have been developed, the task labor costs can be determined based on the production rate of the crew and the labor wage rates.

5-3. Wage Rates

a. A wage rate must be developed for each labor craft which will represent the total hourly cost rate to the construction contractor. This total rate will include the base wage rate plus labor overtime, payroll, taxes and insurance, fringe benefits, and travel or subsistence costs as further described in this chapter. The composite wage rate for each craft will be used for development of the estimate. The computation will be prepared on Department of Army (DA) Form 5420-R or similar local forms, or MCACES.

b. Wage rates are generally well defined. The Davis-Bacon Act, PL 74-403, requires a contractor performing construction in the United States for the Government to pay not less than the prevailing rates set by the Department of Labor. A schedule of minimum rates is included in the project specifications and is normally kept on file for each location by each local Office of Counsel. The cost engineer should consult with the District Labor Advisor on any questions regarding determination coverage, specific definitions, or concerns. Where labor is in short supply for certain crafts in the area, or the work is in a remote area, or it is well known that rates higher than the set rate scale will be paid, these higher wage rates should be used instead of the minimum wage since this would be required of the contractor in order to attract labor to the job. The wage rate should be adjusted to include travel time or night differential where these are a customary requirement.

c. For a long duration project, where future wage rates are known and used, care must be taken to avoid duplication by also applying an escalation rate to such costs.

5-4. Overtime and Shift Differential

a. The cost engineer should carefully consider the available working time in the construction schedule for each task accomplishment in a normal time period. The efficiency of both the second and third shifts should be adjusted to recognize that production will not be as high as the day shift for most types of construction operations. A three-shift operation should normally be avoided due to a lower labor efficiency and the requirement to include equipment maintenance.

b. Overtime should be included in the labor cost computation when work in excess of regular time is required by the construction schedule or is the custom of labor in the local vicinity. Overtime is normally calculated as a percentage of the base wage rate. It is usually based on time and one-half, but may be double time depending on the existing labor agreements. Tax and insurance costs are applied to overtime, but fringe

benefits and travel and/or subsistence costs are not. Example 5-1 shows overtime calculation for 40 hours regular time, plus 8 hours overtime at time and one half:

Example 5-1

48 hours at straight time	= 48.00 hours
8 hours at double time	= 4.00 hours
paid equivalent straight time	= 52.00 hours

(52 hrs paid/48 hrs worked = 1.0833) -1 x 100% = 8.33%

c. Many construction projects utilize multiple shift operations. When estimating direct labor costs for multiple shift operations, the cost engineer should estimate the number of hours to be worked (include shift differential work loss) and the number of hours to be paid for each shift based upon the developed construction schedule. Differential shift premiums may need to be added to the hourly rate.

d. A tabulation of overtime percentages for most conditions is shown in table 5-1. The percentage also includes an allowance for the direct work loss of multiple shift or shift differential, where applicable.

5-5. Taxes and Insurance

a. Rates for all taxes and insurance should be verified prior to computation for the following and any additional components.

b. Workman's compensation and employer's liability insurance costs applicable for the state in which the work is performed should be included in the composite wage rate. Insurance rates may be obtained from the state if the state law provides a monopoly or from insurance companies providing this type insurance. The project compensation rate is based on the classification of the major construction work and applies to all crafts employed by the contractor.

c. Unemployment compensation taxes are composed of both state and Federal taxes. Unemployment compensation tax will vary with each state while the Federal unemployment tax will be constant for all projects. Insurance rates can be obtained from the state unemployment office, commercial publications, or the Bureau of Labor Statistics.

d. The social security tax rates and the income ceilings on which social security taxes must be paid vary from year to year. Therefore, the cost engineer must verify the rate to be used in the cost estimate. Current and future rates can be obtained from the Social Security Administration.

e. The total percentage of the above taxes and insurance is summed and then applied to the basic hourly wage rate plus overtime for the various crafts. Example 5-2 illustrates the method for deriving the total tax and insurance percentage. Since rates are subject to change and in some cases vary by region, the calculations shown are presented as an example only. Actual values must be determined by the cost engineer for the specific project.

Example 5-2

Workman's compensation and employer's liability (varies with state and contractor)	7.60%
State unemployment compensation (varies with each state)	3.20%
Federal unemployment compensation	0.80%
Social Security & Medicaid	7.65%
Total taxes and insurance	19.25%

Note: Foreman and overhead labor rates must also include these applicable costs. See sample estimate sheets for method of application.

5-6. Fringe Benefits and Travel/Subsistence

a. Fringe Benefits. Fringe benefits may include health and welfare, pension, apprentice training, depending on the craft and the location of the work. These summed costs are usually expressed as an hourly cost with the possible exception of vacation which may be easily converted to an hourly cost. The type of

fringe and the amount for the various crafts can usually be found with the Davis-Bacon Act wage determination in the specifications. Non-union contractors pay comparable fringe benefits directly to their employees.

b. Example 5-3 illustrates the calculations for fringe benefits. Since the values change and vary by region and union agreement, the calculations shown are presented as an example only. Actual values must be determined by the cost engineer.

Example 5-3

Health and welfare	$0.70/hr
Pension	0.75/hr
Apprentice training	0.00/hr
(N/A in this case)	
Total fringe benefits	$1.45/hr

c. Travel and Subsistence. Travel and subsistence costs are normally expressed as a daily or weekly cost. When included in the cost estimate, they should be converted to an hourly cost and excluded from an overtime premium unless travel and subsistence are part of an increased hourly wage. See sample estimates for methodology.

d. Some fringe benefits and travel/subsistence are subject to payroll taxes. For example, vacation benefits are taxable and should be added to the basic wage rate.

5-7. HTRW Program Specific Requirements

HTRW cleanup projects may include activities classified as either construction and/or service (non-construction). HTRW contracts are frequently comprised of both types of activities. An example would be a contract which contains the construction of a permanent treatment plant and the operation of that plant for three years following construction completion. The overall contract classification is usually determined by which type of activity is more predominant. This determination will control the wage rates applicable to the particular activities, (i.e., Davis-Bacon for construction activities and Service Contract Act for service activities). Some union agreements may require an additional amount be added to the basic wage rate for a worker who must wear protective clothing, respirators, etc. The cost engineer must insure that appropriate wage rates are used in the HTRW cost estimate.

Table 5-1. Overtime and shift differential

Shift	Actual Hours Worked Day	Actual Hours Worked Week	Hours Paid Reg	Hours Paid OT	Percentages for OT and Shift Differential: 1.5x Wk/Sat 2x2x Sun	1.5x Week 2x Sat/Sun	Week All OT
One-shift operation							
5-Day Week	8	40	40	0	0	0	0
	9	45	40	5	5.55	5.55	11.11
	10	50	40	10	10.00	10.00	20.00
	11	55	40	15	13.64	13.64	27.27
	12	60	40	20	16.67	16.67	33.33
6-Day Week	8	48	40	8	8.33	16.67	16.67
	9	54	40	14	12.96	21.30	25.93
	10	60	40	20	16.67	25.00	33.33
	11	66	40	26	19.70	28.03	39.39
	12	72	40	32	22.22	30.56	44.44
7-Day Week	8	56	40	16	21.43	28.57	28.57
	9	63	40	23	25.40	32.54	36.51
	10	70	40	30	28.57	35.71	42.86
	11	77	40	37	31.17	38.31	48.05
	12	84	40	44	33.33	40.68	52.38
Two-Shift Operation (one 8 hours and one 7.5 hours)							
5-Day Week	15.5	77.5	80	0	3.23	3.23	3.23
	18	90	80	12.5	9.72	9.72	16.67
	20	100	80	22.5	13.75	13.75	25.00
	22	110	80	32.5	17.05	17.05	13.82
	24	120	80	42.5	19.79	19.79	37.50
6-Day Week	15.5	93	80	16.0	11.83	20.43	20.43
	18	108	80	30.5	16.44	24.77	30.56
	20	120	80	42.5	19.79	28.13	37.50
	22	132	80	54.5	22.54	30.87	43.18
	24	144	80	66.5	24.83	33.16	47.92
7-Day Week	15.5	108.5	80	32.0	25.35	32.72	32.72
	18	126	80	48.5	28.37	35.52	40.48
	20	140	80	62.5	31.25	38.39	46.43
	22	154	80	76.5	33.60	40.75	51.30
	24	168	80	90.5	35.57	42.71	55.36
Two-Shift Operation (each 7.5 hours)							
5-Day Week	15	75	80	0	6.67	6.67	6.67
	18	90	80	15	13.89	13.89	22.22
	20	100	80	25	17.50	17.50	30.00
	22	110	80	35	20.45	20.45	36.36
	24	120	80	45	22.92	22.92	41.67
6-Day Week	15	90	80	16	15.56	24.44	24.44
	18	108	80	33	19.91	27.24	35.19
	20	120	80	45	22.92	31.25	41.67
	22	132	80	57	25.38	33.71	46.97
	24	144	80	69	27.43	35.76	51.39
7-Day Week	15	105	80	32	29.52	37.14	37.14
	18	126	80	51	31.35	38.49	44.44
	20	140	80	65	33.93	41.07	50.00
	22	154	80	79	36.04	43.18	54.55
	24	168	80	93	37.80	44.94	58.33
Three-Shift Operation							
5-Day Week	22.5	112.5	120	0	6.67	6.67	6.67
6-Day Week	22.5	135	120	24	15.56	24.44	24.44
7-Day Week	22.5	157.5	120	48	29.52	37.14	37.14

CHAPTER 6
LABOR PRODUCTIVITY

6-1. General

Estimating labor productivity is subject to many diverse and unpredictable factors. There is no substitution for the knowledge and experience of the cost engineer when estimating labor productivity. For some types of work, the task productivity of crew members such as equipment operators, helpers, or oilers is determined by the productivity of the equipment. For some labor based crews, the task productivity of craftsman such as carpenters, steel workers, and masons may be based on average experience in the UPB, tempered with the experience of the cost engineer, historical records, or other appropriate reference manuals.

6-2. Productivity Adjustment Considerations

a. The complexity of the variables affecting productivity makes it difficult to estimate a production rate. Therefore, production rates should be based on averaging past production rates for the same or similar work. The cost engineer must incorporate particular job factors and conditions to adjust historical data to the project being estimated. Other sources for production rates include reference manuals, field office reports, construction log books, and observation of ongoing construction.

b. The labor effort needed to perform a particular task varies with many factors, such as the relative experience, capability, morale of the workers, the size and complexity of the job, the climatic and topographic conditions, the degree of mechanization, the quality of job supervision, amount of similar task repetition, and the existing labor-management agreements and/or trade practices. The effort from these labor efficiency factors and work practices that exist in the project locality must be considered in each productivity assignment.

c. The effect on worker productivity decrease from long periods of overtime is included in figure 6-1. Several tables and averaging charts have also been developed by private industry to show this effect. The cost engineer should carefully consider other alternatives such as schedule duration change instead of multiple shift work and discuss the impact of both options with the project manager.

6-3. Civil Works Program Specific Requirements

Civil works projects are normally heavy equipment oriented, and care should be used based on the tasks performed to insure reasonable production rates are used. Operational requirements for pumping on dredges is unique and appropriate details are covered in chapter 15 for preparing dredge estimates.

6-4. HTRW Program Specific Requirements

a. Labor productivity on an HTRW remedial action project will generally be lower than that of conventional construction due to the more stringent health and safety requirements associated with HTRW projects. One factor decreasing productivity is the restricted mobility of the worker due to the protective equipment and clothing which must be worn. Heat stress on the worker due to the protective gear will be a factor reducing productivity under certain climatic conditions. The amount of physical exertion required by a particular task may be classified in the range of light work to heavy work. Thus, production rates need to be estimated considering the classification of the work task, the climatic conditions, the restricted mobility, and other relevant factors in conjunction with the level of personal protection required for the task. These considerations will determine the amount of break time a worker needs based upon the task being performed. In addition to break time, other factors contributing to nonproductive time on a HTRW remedial action project include safety meetings, suiting-up, suit removal and personal decontamination, cleanup, and air tank change unless noted otherwise. The production rates (output) listed in the UPB are normal construction rates which do not take into account the non-productive time experienced on HTRW projects due to health and safety requirements stated above. Thus the UPB production rates will typically need to be reduced on an HTRW project.

b. The following are typical personal protection requirements depending on the level of protection

specified and example calculation to show reduced production rates.

c. Levels of personal protection. Each HTRW remedial action project will likely consist of work tasks requiring various levels of personal protection. 29 Code of Federal Regulations (CFR) 1910.120, appendix B (or 29 CFR 1926.65 appendix B) defines four basic levels: Level A, Level B, Level C, and Level D. Figure 6-2 depicts the different levels of protection. Each level is described below. An additional level, Modified Level D is also described. Together, the levels describe personal protective equipment options used to protect on-site workers at HTRW remedial action sites. The required protection levels for each HTRW contract is listed in the contract specifications.

(1) Level A: Level A is selected when the greatest level of skin, respiratory, and eye protection is required. Level A is the option of choice only in the most extreme exposure conditions Immediately Dangerous to Life and Health (IDLH) and is not used at typical HTRW sites except as a last option in an extreme emergency. Even then, SOP's for a site would typically specify evacuation in place of donning Level A. The following constitute Level A equipment:

Positive pressure, full-face, self-contained breathing apparatus (SCBA), or positive pressure supplied air respirator with escape SCBA.
Totally encapsulating chemical-protective suit.
Coveralls (optional).
Long underwear (optional).
Gloves, outer, chemical-resistant.
Gloves, inner, chemical-resistant.
Boots, chemical-resistant, steel toe and shank.
Hard hat (optional).

(2) Level B: Level B protection is used when the type and atmospheric concentration of substances have been identified which require a high level of respiratory protection, but a lesser level of skin protection; or when the atmosphere is less than 19.5% oxygen or other IDLH conditions exist without attendant severe skin hazards. The following constitutes Level B equipment:

Positive pressure, full-face, self-contained breathing apparatus (SCBA), or positive pressure supplied air respirator with escape SCBA.
Hooded chemical-resistant clothing (overalls and long-sleeved jacket; coveralls; one- or two-piece chemical splash suit; disposable chemical-resistant overalls).
Coveralls (optional).
Gloves, outer, chemical-resistant.
Gloves, inner, chemical-resistant.
Boots, outer, chemical-resistant, steel toe and shank.
Boot covers, outer, chemical-resistant, (disposable).
Hard hat (optional).
Face shield (optional).

(3) Level C: Level C protection is used when the concentrations and types of air contaminants are known and the criteria for using air purifying respirators are met. The atmospheric contaminants, liquid splashes, or other direct contact will not adversely affect or be absorbed through any exposed skin. The following constitute Level C equipment:

Full-face or half-mask air purifying respirators.
Hooded chemical-resistant clothing (overalls two-piece chemical splash suit; disposable chemical-resistant overalls).
Coveralls (optional).
Gloves, outer, chemical-resistant.
Gloves, inner, chemical-resistant.
Boots, outer, chemical-resistant, steel toe and shank.
Boot covers, outer, chemical-resistant (disposable).
Hard hat (optional)
Escape mask (optional).
Face shield (optional).

(4) Level D Modified: Level D Modified is a modified basic work uniform affording the same skin protection provided by Level C against direct contact with contaminated materials (i.e., contaminated dust) and/or liquid splashes, in the absence of inhalation hazards of any type. Level D Modified is not defined in 29 CFR 1910.120/29 CFR 1926.65, but has been defined through extensive reference in Site Safety and Health Plans prepared for HTRW projects. The following constitute Level D Modified equipment:

Hooded or nonhooded chemical-resistant or dust-resistant clothing (overalls; two-piece chemical splash suit; disposable chemical resistant and/or dust-resistant overalls).
Coveralls (optional).
Gloves, outer, chemical-resistant.
Gloves, inner, chemical-resistant.
Boots/shoes, chemical-resistant, steel toe and shank.
Boots, outer, chemical-resistant (disposable) (optional).
Safety glasses or chemical splash goggles.
Hard hat (optional).
Escape mask (optional).
Face shield (optional).

(5) Level D: Level D is a work uniform affording minimal protection, used for nuisance contamination only. Level D protection is used when the atmosphere contains no known hazard; and work functions preclude splashes, immersion, or the potential for unexpected inhalation of or contact with hazardous levels of any chemicals. The following constitute Level D equipment:

Coveralls.
Gloves (optional).
Boots/shoes, chemical-resistant, steel toe and shank.
Boots, outer, chemical-resistant (disposable) (optional).
Safety glasses or chemical splash goggles.
Hard hat (optional).
Escape mask (optional).
Face shield (optional).

d. Ideally, HTRW site chemical hazards should be controlled through engineering controls or work practices to the extent that most, if not all, routine work in the exclusion zone can be performed in Level D where possible. The use of Level D Modified and other levels of protection place a significant heat burden on the worker under relatively moderate ambient temperature (70 degree F) conditions, and otherwise significantly impact worker productivity and comfort.

e. Productivity example. Example 6-1, Production, illustrates how HTRW productivity could be presented in an estimate. The example reflects excavation of contaminated soil at a hazardous waste site, using levels of protection A, B, C, and D+ at various project stages. A column is also included which reflects normal productivity for comparison. Paid time per day is 8 hours (480 minutes). Nonproductive time is that time required for standard losses, scheduled heat stress breaks, and dexterity losses due to personal protection, and is developed based on job-site conditions. Standard losses account for all time losses independent of temperature variations. They include safety meetings, instructions, donning/doffing personal protective equipment (PPE), decontamination, switching air supply/filters, monitoring delays, and cleanup. Scheduled heat stress breaks account for all paid rest periods per day. Dexterity losses account for a slowdown of normal work due to factors such as discomfort, clumsiness, weight, and restricted breathing and communication as a result of wearing PPE. Productive time is obtained by subtracting nonproductive time from paid time. Productivity is then calculated as a percentage ratio of productive time for each level of protection divided by productive time for normal work (430 minutes). The 430 minutes is based on a total paid time of 480 minutes minus a 50 minute delay on a (normal) clean site. The 50 minute delay is composed of 10 minutes safety meetings and instruction plus 10 minutes for clean up plus 30 minutes for breaks. This percentage is applied to a normal production rate (190 m^3/ hr) to arrive at a reduced production rate for each level of protection.

f. Once the reduced crew production rate has been developed, the cost engineer must decide whether or not to add additional crews to reduce the excavation time. If reduced excavation time reduces the total project time, overhead cost will be lower. This may result in lower total cost than would occur if additional crews were not added. Each remedial action task requiring personal protective equipment requires a productivity evaluation.

g. A USACE report, entitled "Productivity Study" for HTRW remedial action, contains additional detailed productivity considerations for an HTRW cost estimate. This report is available in all MSC and District Cost Engineering Offices. Estimating assumptions used in the productivity calculations for a particular HTRW remedial action project will be documented with notes. Table 6-1 and table 6-2 indicate the standard losses, scheduled/heat stress breaks and dexterity losses as a

factor of temperature and protection level. Figure 6-3 graphically illustrates the correlation between the protection level and productivity for heavy and light work.

Example 6-1. Production Example

This example is for light work with average temperature > 85 degrees

PROTECTION LEVEL	A	B	C	D+	Normal
Paid Time (minutes) (per person or crew)	480	480	480	480	480
Nonproductive Time(minutes):					
Standard Losses	160	140	128	76	20
Scheduled Heat Stress Breaks	120	86	101	63	30
Dexterity Losses	60	64	44	3	0
Nonproductive Time (min.)	340	290	273	142	50
Productive Time (minutes)	140	190	207	338	430
Productivity	140/430	190/430	207/430	338/430	430/430
	x 100%	100%	100%	100%	100%
	= 33%	44%	48%	79%	100%
Example: Normal production Rate (M^3/HR)	190	190	190	190	190
X Productivity	x .33	x .44	x .48	x .79	x 1.00
= Reduced Production Rate (M^3/HR)	63	84	91	150	190

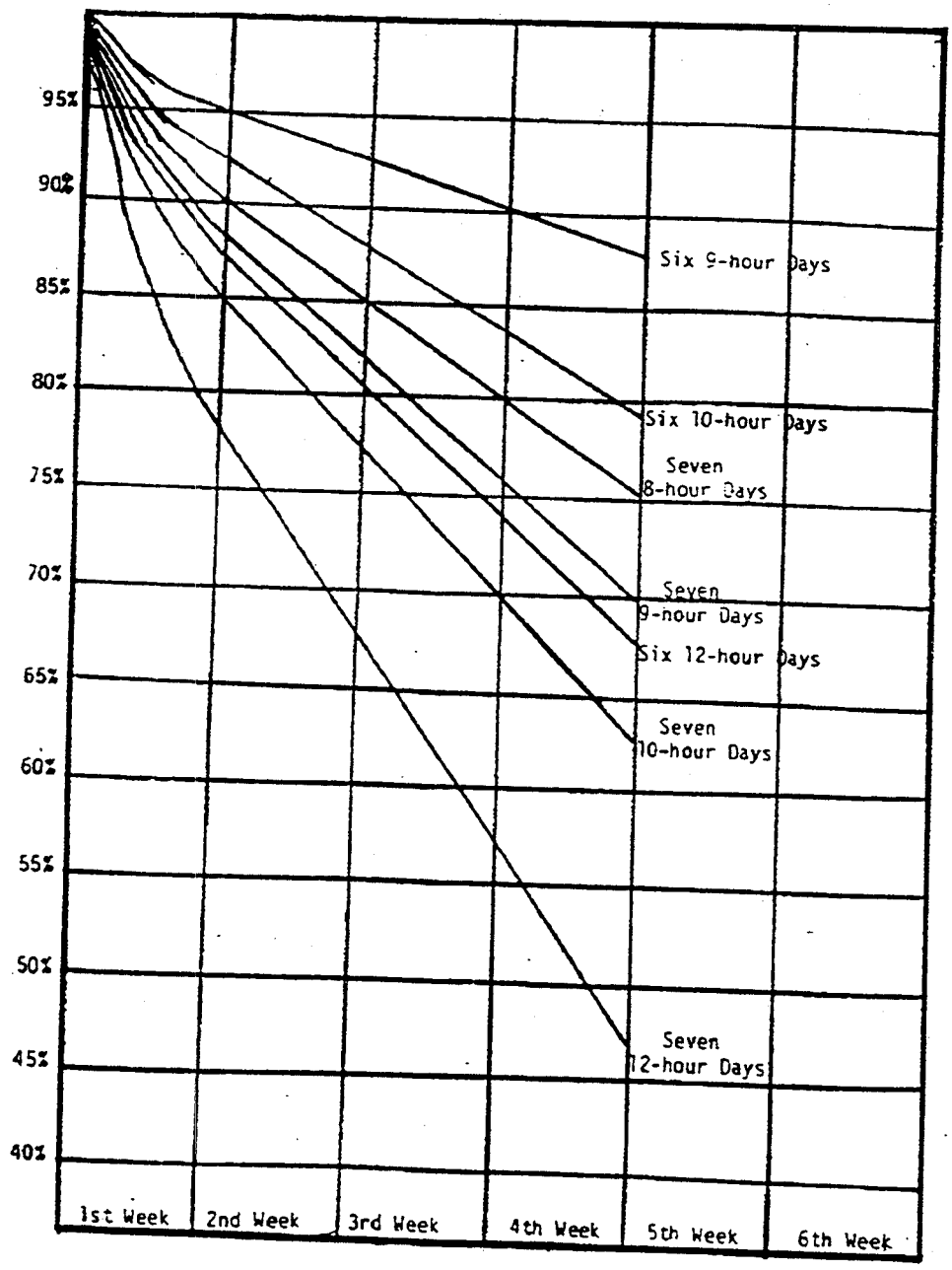
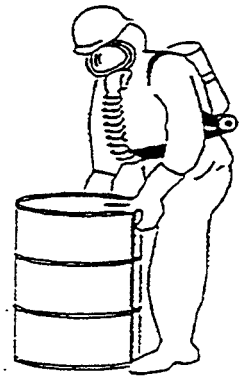


Figure 6-1. Productivity versus overtime

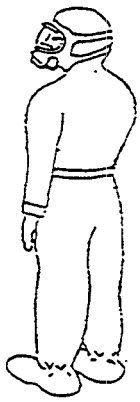
LEVEL A Protection

Totally encapsulating vapor-tight suit with full-facepiece SCBA or supplied-air respirator.



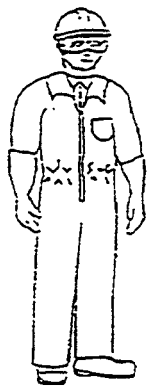
LEVEL B Protection

Totally encapsulating suit does not have to be vapor-tight. Same level of respiratory protection as Level A.



LEVEL C Protection

Full-face canister air purifying respirator. Chemical protective suit with full body coverage.



LEVEL D Protection

Basic work uniform, i.e., longsleeve coveralls, gloves, hardhat, boots, faceshield or goggles.

Figure 6-2. Levels of protection

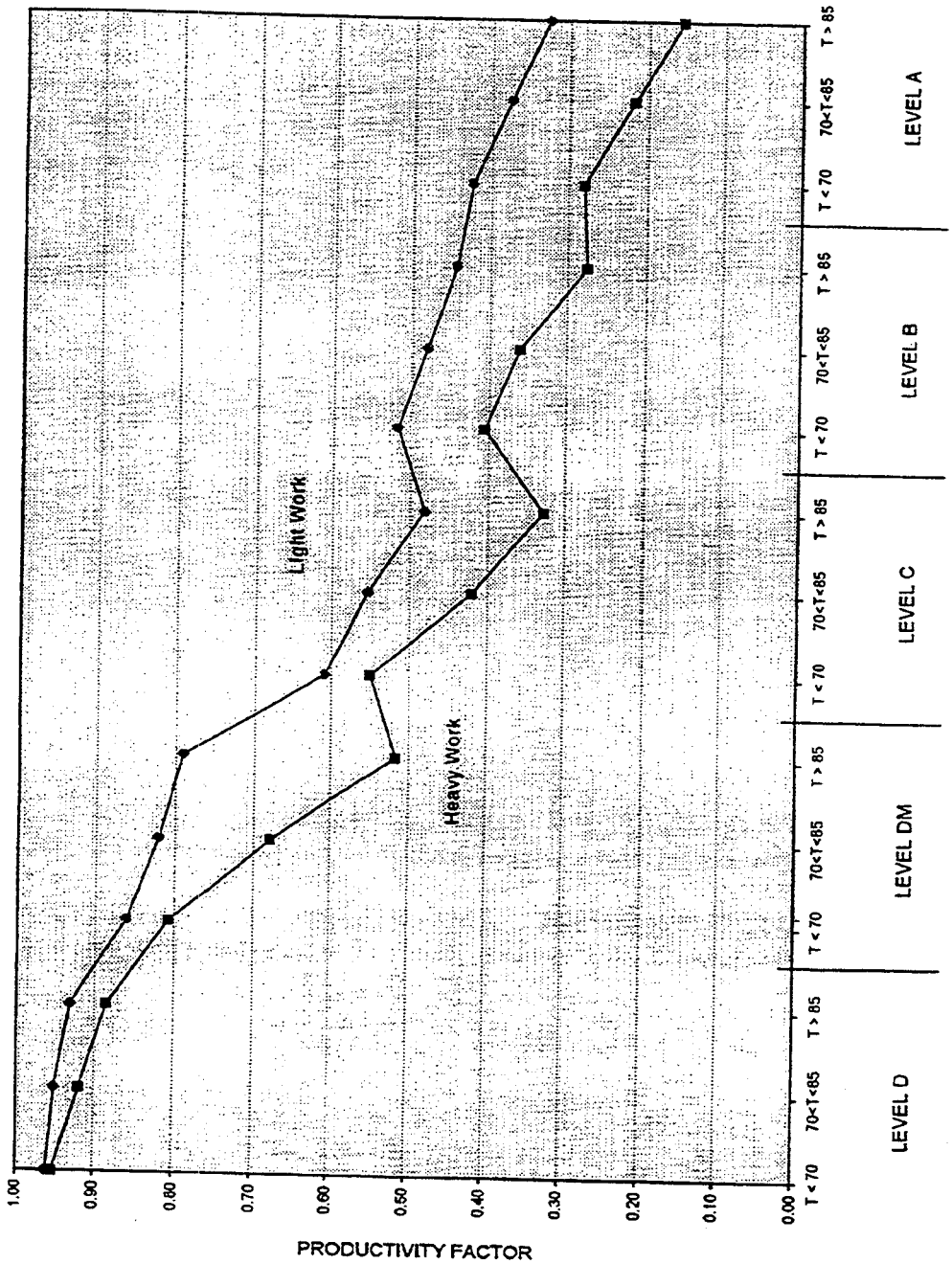


Figure 6-3. HTRW productivity factors

VARIABLES	U/M	LEVEL A			LEVEL B			LEVEL C			LEVEL D MODIFIED			LEVEL D		
		T < 70	0<T<8	T > 85	T < 70	0<T<8	T > 85	T < 70	0<T<8	T > 85	T < 70	0<T<8	T > 85	T < 70	0<T<8	T > 85
A. Standard Losses	Min	220	220	220	204	204	204	135	135	135	76	76	76	28	28	28
B. Scheduled / Heat Stress Breaks	Min	60	105	150	50	75	123	64	131	178	30	90	165	30	45	60
C. Dexterity Losses	Min	80	62	44	52	46	35	44	34	26	28	24	18	11	10	10
D. Total Time Lost per 8 hr MD	Min	360	387	414	306	325	362	243	300	339	134	190	259	69	83	98
E. Productive Time per 8 hr MD	Min	120	93	66	174	155	118	237	180	141	346	290	221	411	397	382
F. Productive Time on Clean Site	Min	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430
G. HTRW Productivity Factor		**0.28**	**0.22**	**0.15**	**0.40**	**0.36**	**0.27**	**0.55**	**0.42**	**0.33**	**0.80**	**0.68**	**0.51**	**0.96**	**0.92**	**0.89**

Notes:
1. Standard Losses account for all time losses independent of temperature variations. They include safety meetings, instructions, donning / doffing PPE, decontamination, switching air supply / filters, monitoring delays, and cleanup.
2. Scheduled / Heat Stress Breaks account for all paid rest periods per manday.
3. Dexterity Losses are based on subjective opinions of the percentage that PPE slows down a normal worker because of factors such as discomfort, clumsiness, weight, and restricted breathing and communication. The number of minutes actually worked is reduced by the percentage representing the average response for that particular PPE level.
4. Values for A, B, and C were derived by averaging the survey responses for each PPE level. Responses that varied greatly from the average were subject to omission at the author's discretion.
5. Total Paid Time = 480 Minutes
6. Delay on clean site = 10 min. safety meeting & instructions + 10 min. cleanup + 30 min. breaks
7. Calculations:
   D = A + B + C
   E = 480 - D
   F = 480 - 50
   G = E / F

   U/M = Unit of Measure
   MD = Man-Day
   Min = Minutes
   T = Temperature Farenheit
8. Level A protection is used in extreme emergency situations only. Productivity factors for Level A should be used with caution because they were extrapolated from 2 data points.

Table 6-1. HTRW Light Work

VARIABLES	U/M	LEVEL A			LEVEL B			LEVEL C			LEVEL D MODIFIED			LEVEL D		
		T < 70	0<T<8	T > 85	T < 70	0<T<8	T > 85	T < 70	0<T<8	T > 85	T < 70	0<T<8	T > 85	T < 70	0<T<8	T > 85
A. Standard Losses	Min	220	220	220	204	204	204	135	135	135	76	76	76	28	28	28
B. Scheduled / Heat Stress Breaks	Min	60	105	150	50	75	123	64	131	178	30	90	165	30	45	60
C. Dexterity Losses	Min	80	62	44	52	46	35	44	34	26	28	24	18	11	10	10
D. Total Time Lost per 8 hr MD	Min	360	387	414	306	325	362	243	300	339	134	190	259	69	83	98
E. Productive Time per 8 hr MD	Min	120	93	66	174	155	118	237	180	141	346	290	221	411	397	382
F. Productive Time on Clean Site	Min	430	430	430	430	430	430	430	430	430	430	430	430	430	430	430
G. HTRW Productivity Factor		0.28	0.22	0.15	0.40	0.36	0.27	0.55	0.42	0.33	0.80	0.68	0.51	0.96	0.92	0.89

Notes:
1. Standard Losses account for all time losses independent of temperature variations. They include safety meetings, instructions, donning / doffing PPE, decontamination, switching air supply / filters, monitoring delays, and cleanup.
2. Scheduled / Heat Stress Breaks account for all paid rest periods per manday.
3. Dexterity Losses are based on subjective opinions of the percentage that PPE slows down a normal worker because of factors such as discomfort, clumsiness, weight, and restricted breathing and communication. The number of minutes actually worked is reduced by the percentage representing the average response for that particular PPE level.
4. Values for A, B, and C were derived by averaging the survey responses for each PPE level. Responses that varied greatly from the average were subject to omission at the author's discretion.
5. Total Paid Time = 480 Minutes
6. Delay on clean site = 10 min. safety meeting & instructions + 10 min. cleanup + 30 min. breaks
7. Calculations:
   D = A + B + C
   E = 480 - D
   F = 480 - 50
   G = E / F

   U/M = Unit of Measure
   MD = Man-Day
   Min = Minutes
   T = Temperature Farenheit
8. Level A protection is used in extreme emergency situations only. Productivity factors for Level A should be used with caution because they were extrapolated from 2 data points.

Table 6-2. HTRW Heavy Work

CHAPTER 7
CONSTRUCTION EQUIPMENT AND PLANT

7-1. General

Construction equipment and plant refers to the tools, instruments, machinery, and other mechanical implements required in the performance of construction work. Construction plant is defined as concrete batch plants, aggregate processing plants, conveying systems, and any other processing plants which are erected in place at the job site and are essentially stationary or fixed in place. Equipment is defined as items which are portable or mobile, ranging from small hand tools through tractors, cranes, and trucks. For estimating purposes, plant and equipment are grouped together as equipment costs.

7-2. Selection of Equipment

a. An important consideration in the preparation of an estimate is the selection of the proper equipment to perform the required tasks. The cost engineer should carefully consider number, size, and function of equipment to arrive at optimum equipment usage. Some factors to consider during the selection process are: conformance to specification requirements; job progress schedule (production rate); magnitude of the job; type of materials; availability of space; mobility and availability of equipment; suitability of equipment for other uses; equipment capabilities; number of shifts; distances material must be moved; steepness and direction of grades; weather conditions; hauling restrictions; standby time; and mobilization and demobilization costs.

b. The cost engineer preparing the estimate must be familiar with construction equipment and job-site conditions. The equipment selected should conform to contract requirements and be suitable for the materials to be handled and conditions that will exist on the project.

7-3. Estimating Methodology

The "crew concept" discussed in chapter 5 for construction cost estimates requiring detailed estimating of labor, materials, and equipment is to also be considered in costing equipment. For each significant work task, workers and equipment are expressed in the hourly cost and expected production rate. Where a major piece of equipment serves more than one crew, the total equipment time should be prorated between both crews.

7-4. Production Rate

After determining the type of equipment to be employed, the cost engineer should select the specific equipment size which has a production rate suited to the efficient and economical performance of the work. The size and number of units required will be influenced by equipment production rate, job size, availability of space for equipment operations, the project construction schedule for the various work tasks, number of shifts to be worked, and the availability of equipment operators. Emphasis must be placed on the importance of establishing a reasonable production rate. Production may be based on actual performance data, commercial manufacturer tables and ratings on MCACES historical equipment models and assemblies adjusted for project conditions.

7-5. Mobilization and Demobilization

a. Mobilization costs for equipment include the cost of loading at the contractor's yard, transportation cost from the yard to the construction site, including permits, unloading at the site, necessary assembly and testing, and standby costs during mobilization and demobilization. Trucks for the project capable of highway movement are usually driven to the site and are often used to transport minor items. All labor, equipment, and supply costs required to mobilize the equipment should also be included in the mobilization cost. When the equipment location is unknown, the mobilization and demobilization distance should be based on a circular area around the project site which will include a reasonable number of qualified bidders. Demobilization costs should be based on that portion of the equipment that would be expected to be returned to the contractor's storage yard and may be expressed as a percentage of mobilization costs. Transporting rates should be

obtained periodically from qualified firms normally engaged in that type work.

b. Mobilization and demobilization costs for plant should be based on the delivered cost of the item, plus erection, taxes, and dismantling costs minus salvage value at the end of the project. Maintenance and repair are operating costs and should be distributed throughout work accomplishment.

7-6. Equipment Ownership and Operating Expense Cost Rates

a. The Equipment Ownership Schedule in EP 1110-1-8 determines the hourly rates for equipment ownership and operating expense. These rates are also included in the UPB and will be used in the preparation of all cost estimates for owned equipment. These pamphlets have been developed for different geographic regions in the United States, and the appropriate pamphlet or UPB should be used based upon project location. Rented and leased equipment is also discussed in the EP and is appropriate for inclusion in the estimate at competitive rates if judgment determines this to be a reasonable approach by a prudent contractor.

b. In the event, the cost engineer develops costs for the actual equipment being used at a job site exceeding 40 hours per week, the rates shall be adjusted as described by EP 1110-1-8.

7-7. Plant Cost

In cases of highly specialized plant, 100 percent write-off of the total value of the plant may be justified for a particular project. For less highly specialized plant, some salvage may be anticipated, depending on storage cost, resale value, and probability of sale or reuse in the immediate future. The total project charge including operation, maintenance, and repair should be distributed in proportion to the time and item the plant is used on the various contract items. Cost of plant required for the production of concrete, aggregates, ice or heat for cooling or heating of concrete, etc., should normally be included in the estimate as part of the cost of these materials or supplies manufactured or produced at the site.

7-8. Small Tools

The cost of small power and hand tools and miscellaneous non-capitalized equipment and supplies-should be estimated as a percentage of the labor cost. The allowance must be determined by the cost engineer in each case, based upon experience for the type of work involved. Unit prices based on historical data already include a small tools allowance. The small tool cost will be considered as part of equipment cost. Such allowance can range typically up to 12 percent of direct labor cost. The cost engineer must ensure that this cost is not duplicated in the overhead rate percentages. The crews data base in the UPB does not contain a small tools allowance.

7-9. HTRW Program Specific Requirements

a. Equipment productivity is frequently reduced on HTRW projects due to restricted operator mobility because of unique HTRW Health and Safety requirements. Equipment production rates should therefore be adjusted to coincide with operator efficiency. Additionally, HTRW projects typically have three work zones; exclusion (hot), contamination reduction, and support (clean) zones. Equipment must be decontaminated as it leaves the exclusion zone to enter the support zone. Decontamination is conducted in the contamination reduction zone prior to entering the support zone. Equipment decontamination time must be included in the estimated equipment costs for equipment leaving the exclusion zone.

b. Equipment used for construction at Department of Energy (DOE) or other radioactive sites normally becomes contaminated with ionizing radiation (Alpha, Beta, or Gamma radiation). Threat of radiation to humans is primarily reduced by the use of distance, time, and/or shielding; thus, radiation on the equipment cannot generally be decontaminated, unless the radiation is on the surface only, and can be "wiped" clean by manual decontamination procedures. Only the natural decay process (also known as "half-life") of unstable isotopes or radio nuclides over time, reduces the level of radioactivity. Construction equipment contaminated with

radioactive materials having an extended half-life are not permitted to leave a contaminated area. Equipment contaminated with long-term half-life radio nuclides, is for the most part rendered useless, unless there is some other future construction planned in the same area. As a result, this equipment is either "moth-balled" at a safe distance within the radioactive contaminated area, or buried at the site. It is not uncommon for many types of equipment to be buried including tractors, backhoes, dozers, etc. The cost of equipment (including disposal) that will be working in radioactive contaminated areas must be carefully considered. It may be necessary to purchase the equipment for dedicated use at these sites, rather than to price out depreciated ownership costs by the hour. The cost engineer must review the contract specifications and/or contact a local health physicist to determine the type and degree of radioactive contamination for calculating equipment ownership costs. Hourly operating costs, however, would still need to be included in the estimate. The hourly operating costs should be taken from EP 1110-1-8 and adjusted for higher repair costs of equipment that must be repaired in a "hot zone".

CHAPTER 8
MATERIALS AND SUPPLIES

8-1. General

a. Materials and supplies are defined below and, for the purpose of estimating, both can be considered materials unless they need to be separated because of different tax rates.

b. Materials. Those items which are physically incorporated into and become part of the permanent structure.

c. Supplies. Those items which are used in construction but do not become physically incorporated into the project such as concrete forms.

8-2. Sources of Pricing Data

a. General. Prices for materials and supplies may be obtained from pricing services, the UPB, catalogs, quotations, and historical data records. Each office should review the source of the pricing contained in these publications and assess the reasonableness prior to use. Standard unit prices from these sources are considered satisfactory only after an applicability determination has been made. Care should be taken when using this type of cost data to make proper allowances for quantity discounts, inflation, and other factors affecting contractor cost.

b. Quotes from manufacturers and suppliers. Quotes should be obtained for all significant materials and installed equipment and for specialized or not readily available items. Quotations may be received either in writing or telephonically. It is preferable to obtain quotes for each project to ensure that the cost is current and that the item meets specifications. If possible, more than one quote should be obtained to be reasonably sure the prices are competitive. The cost engineer should attempt to determine and ensure that contractor discounts are considered in the estimate. Quotes should be kept proprietary to preserve the confidentiality entrusted. A standard telephone quotation data sheet similar to that shown in appendix B should be utilized for recording.

8-3. Waste Allowance

Waste and loss considerations may be included in material unit price computations. This methodology results in a quantity takeoff of work placement which is not altered to reflect material losses. However, the alternative methodology of increasing the measured quantity by waste and loss quantity is acceptable if the excess quantity will not be used for any other purpose. The methodology used by the cost engineer should consider the impact of charging labor on the excess quantity. In either case, a note statement is required in the estimate explaining the methodology used.

8-4. Forward Pricing

Sometimes quotes are requested in advance of the expected purchase date. However, suppliers are reluctant to guarantee future prices and often will only quote current prices. It may, therefore, be necessary to adjust current prices to reflect the cost expected at the actual purchase date. This cost adjustment, if required, should not be included as a contingency, but should be clearly and separately defined in each estimate. Adjust current pricing to future pricing using program specific escalation factors. Computations of adjustment should be clear and should be maintained as cost estimate backup support.

8-5. Freight

a. The cost engineer should check the basis for the price quotes to determine if they include delivery. If they do not include delivery, freight costs to the project site must be determined and included. The supplier can usually furnish an approximate delivery cost. For delivery charge, Free on Board (FOB) refers to the point to which the seller will deliver goods without additional charge to the buyer.

b. If the materials or supplies are FOB factory or warehouse, freight costs to the construction site should be added to the cost of the materials or supplies.

c. If the cost of materials or supplies includes partial delivery, FOB to the nearest rail station, the

cost of unloading and transporting the materials or supplies should be included in the estimate.

d. If the materials or supplies are a large quantity in bulk from which would require extensive equipment for unloading and hauling, it may be desirable to prepare a labor and equipment estimate for the material handling and delivery.

8-6. Handling and Storage

The contractor is usually required to off-load, handle and stockpile, or warehouse materials on site. These costs should be included in the estimate. An item of electronic equipment requiring special low-humidity storage might have this special cost added to the direct cost of the equipment. For common items, such as construction materials or equipment needing secure storage, the cost for the security fencing, temporary building and material handling should be considered as an indirect cost and be included in the job-site overhead cost.

8-7. Taxes

When applicable, state and local sales tax should be added to the materials or supplies cost. In some states, material incorporated into Federal construction is exempt, but supplies are not. Care should be taken, therefore, that the sales tax rate is applied as required. The cost engineer should verify the tax rates and the applicability of these rates for the project location. Sales tax is considered to be a direct cost of the materials and supplies, and also should be applied to Government-Furnished Equipment (GFE) and included in the estimate.

8-8. Materials or Supplies Manufactured or Produced at the Site

If it is likely the contractor will manufacture or produce materials or supplies at the project site, a separate estimate component should be developed for this work. This estimate should be detailed equipment, labor, materials, and supplies estimate, and should conclude with a unit cost of material or supply delivered to the stockpile, storage yard, or other end point.

8-9. Government-Furnished Materials (GFM) or Equipment (GFE)

On some projects, the Government may provide some of the project materials. Government-furnished materials and equipment should be estimated in the same manner as other materials, except that the purchase price is not included. The estimate should include an allowance for transporting handling, storage from point of delivery and assembly, sales tax and installation if applicable. There may be special costs associated with Government-furnished materials such as insurance to cover loss until final installation, special storage costs, or special security measures. Note that these materials and procurement costs are normally to be included as part of the total project cost.

CHAPTER 9
SUBCONTRACTED WORK

9-1. General

a. In construction, specialty items such as plumbing, heating, electrical, roofing, plastering, and tile work are usually more effectively performed by subcontract. With so many specialties being performed, subcontract work becomes a very significant portion of the total costs of construction. Since each estimate should be prepared as practically and as realistically as possible, subcontract costs becomes a necessary consideration.

b. The cost engineer must first determine those parts of the work that will probably be subcontracted. When the work to be subcontracted has been determined, those items will be identified in the estimate. The appropriate subcontractor overhead and profit costs should be applied to subcontractor direct cost items in addition to the appropriate prime contractor overhead and profit.

c. The cost of subcontracted work is the total cost to the prime contractor for the work performed. Subcontractor's costs include direct labor, materials and supplies, equipment, second tier subcontracts, mobilization and demobilization, transportation, set-up, and charges for overhead and profit. Particular attention should be given to large items such as turbines, generators, and incinerators. The total subcontract cost is considered a direct cost to the prime contractor.

9-2. Use of Quotations

The cost engineer may utilize quotes for the expected subcontracted work when reviewed and verified as reasonable. In lieu of a quotation, each task of the subcontract should be priced as a direct cost with an appropriate rate of subcontractor's overhead and profit added. Subcontractor installed cost is shown in the UPB "Unit Cost" column. The "Unit Cost" must be a direct cost column in the MCACES cost estimate, or the "Unit Costs" will not be included in the project cost.

9-3. Civil Works Program Specific Requirements

On major rehabilitation projects, such as dams, locks, or power generating facilities, the cost engineer must ensure that costs for mobilization and demobilization, access to site, tear down or demolition work, contractor markup is included with the subcontractor costs or added to the prime contractor. This is particularly important for rebuilt or replacement of turbines for previously constructed projects, where ancillary costs, in addition to the rebuilt costs can exceed $1 million.

CHAPTER 10
OVERHEAD COSTS

10-1. General

a. Overhead costs are those costs which cannot be attributed to a single task of construction work. Costs which can be applied to a particular item of work should be considered a direct cost to that item and are not to be included in overhead costs. The overhead costs are customarily divided into two categories:

(1) Job office overhead, also referred to as General Conditions or Field Office Overhead.

(2) General home office overhead, commonly referred to as General and Administrative (G&A) costs.

b. The cost engineer must be sure that overhead costs are not duplicated between the two categories. Because of the nature of overhead costs, it is not practical to discuss all overhead items. Specific considerations must be carefully evaluated for each project. The cost engineer must use considerable care and judgment in estimating overhead costs. Many indirect cost items are frequently described in the General Requirements Section (CSI Division 01) of the contract specifications. If not related to a specific work task, these costs must be identified and appropriately assigned as overhead costs.

c. The application of a previously determined overhead rate may be used for early design stages, but it is not an accurate or reliable method of forecasting costs. Overhead will vary from project to project and may even vary from month to month within any given project. Job overhead items for the prime contractor should be estimated in detail for all projects at final design requiring a Government estimate. Detailing of overhead costs for subcontract work is recommended when the impact of these costs is significant. A job overhead model is included in the MCACES model data base and should be followed in estimating costs for overhead.

10-2. Job Office Overhead

a. Job overhead costs are those costs at the project site which occur specifically as a result of that particular project. Some examples of job overhead costs are:

(1) Job supervision and office personnel.

(2) Engineering and shop drawings/surveys.

(3) Site security.

(4) Temporary facilities, project office.

(5) Temporary material storage.

(6) Temporary utilities.

(7) Preparatory work and laboratory testing.

(8) Transportation vehicles.

(9) Supplies and maintenance facilities.

(10) Temporary protection and Occupational Safety and Health Administration (OSHA) requirements.

(11) Telephone and communications.

(12) Permits and licenses.

(13) Insurance (project coverage).

(14) Schedules & reports.

(15) Quality control.

(16) Cleanup.

(17) Taxes.

(18) Equipment costs not chargeable to a specific task.

(19) Operation and maintenance of temporary job-site facilities.

b. The costs of mobilization and preparatory work, including the setup and removal of construction facilities and equipment are part of overhead costs unless there is a specific bid item. For large projects, the cost for each part of this initial work should be estimated on a labor, materials, and equipment basis. For smaller projects, these costs may be estimated based on experience.

10-3. General Home Office Overhead (G&A)

a. Home office overhead expenses are those incurred by the contractor in the overall management of business, associated with all costs at the home office. Since they are not incurred for any one specific project, they must be apportioned to all the projects. Many expenses such as interest and entertainment are not allowable. Construction equipment depreciation is included in the EP 1110-1-8, Equipment Ownership Schedule cost rates and should not be included in the G&A rate. An accurate percentage of G&A can only be determined by an audit. On major changes requiring an audit, it is important to request that the G&A rate be determined.

b. Of all the categories of costs, the contractor's G&A costs are the least definable. Each contractor organizes its company differently from any other. Each incurs costs differently from varying sources and manages operations of that home office by itsown methodology. It is important to understand that home office costs are not standard and fixed. Even though the cost for a specific contractor varies from period to period, a rate is normally averaged as a computation of total home office costs over a sufficient period divided by the total volume of business during that specific period. This rate computation methodology allows distribution and projection to future project estimates. When more specific data is not available, the cost engineer may include empirical rates. Empirical G&A rates typically range from three percent for large contractors to ten percent for small contractors. Home office costs are typically included in the estimate of overhead as the product of an average experienced percentage rate times the expected contract amount. Typical categories of home office overhead are:

(1) Main office building, furniture, equipment.

(2) Management and office staff, salary and expense.

(3) Utilities.

(4) General communications and travel.

(5) Supplies.

(6) Corporate vehicles.

(7) General business insurance.

(8) Taxes.

10-4. Duration of Overhead Items

After the overhead items have been listed, a cost must be determined for each. Each item should be evaluated separately. Some items such as erection of the project office may occur only once in the project. The cost engineer should utilize the developed job schedule in estimating duration requirements. Costs reflective of each particular item during the scheduled period should then be applied. The product of duration and unit cost is the overhead cost for the item.

10-5. Sources for Pricing

The cost engineer must rely on judgment, historical data, and current labor market conditions to establish overhead costs. Sources for information can be obtained from current or past contractors bid data and audits. Some contractors will informally discuss and furnish information for overhead items and audit reports of previous similar projects. Other sources include previously negotiated modifications and review of organizational charts of construction firms for staffing and overhead costs evaluation. Overhead salaries should include an allowance for payroll taxes and fringes such as Federal Insurance Contributions Act (FICA), health benefits, and vacation.

10-6. Distribution of Overhead

The prime contractor's overhead costs, which have been costed in an organized format, should be summed and distributed to the various bid items. A proportionate distribution is commonly made by percentage ratio of total direct costs to those direct costs in each item. When additive or split-bid items are included, only those overhead costs which relate directly to the additive work should be distributed to those additive items. Those overhead costs which the contractor will incur regardless of additive or deductive items should be distributed to base bid schedule items only. Selective distribution ensures re-coupment of costs if only the basic contract scope is awarded. Regardless of the method of distribution, the estimates should clearly demonstrate the procedures and cost principles applied. For modification estimates, overhead requirements should be itemized and costed to reflect the actual net change in cost of overhead, that is, costs before and after the modification work. As a refinement to distribution, the cost engineer may reasonably and justifiably reduce the prime overhead distribution on subcontract work items. The balance of the total prime overhead should then be distributed as discussed above to the remaining prime items of work.

10-7. Civil Works Program Specific Requirements

For large cost civil works projects, the various tasks for overhead should be developed for each project, rather than using flat overhead percentage rates. Flat rates may be used during the preliminary studies, or when alternatives must be prepared if design is limited or not available.

10-8. HTRW Program Specific Requirements

a. A detailed checklist of overhead (general requirements) costs for HTRW projects is located under the second level 33 22 of the HTRW RAWBS document. Due to the importance of overhead costs in a HTRW estimate, a detailed listing of overhead should be developed for all remedial action estimates at the 30% design stage and beyond, in lieu of using a flat percent-age overhead rate. Some of the checklist items unique to HTRW projects includes the following:

b. Pollution liability insurance. HTRW contractors must generally insure themselves against causing increased pollution as a result of their construction activities. This requires that they procure adequate protection in the form of pollution liability insurance. However, on some HTRW jobs funded by Environmental Protection Agency (EPA), pollution liability insurance coverage may not be required if EPA indemnifies the contract. Indemnification basically holds the contractor harmless against liability resulting from release of a hazardous substance as a result of the construction activities for a period of 10 years. If the contract is not indemnified, a cost for pollution liability insurance must be included in the estimate (unless the premiums are reimbursed by EPA to the contractor) to cover that portion of the project that may be subject to pollution liability. Rates for pollution liability insurance are generally on a sliding scale with smaller insurance policies requiring a greater premium percentage. Table 10-1 serves as an example of pollution liability premium costs:

Table 10-1. Pollution liability insurance cost

Contract Amount	Pollution Liability Insurance Cost (% of Contract Amount)
Up to $1,000,000	2.0%
$1,000,000 to $5,000,000	1.2%
$5,000,000 to $15,000,000	0.8%
Over $15,000,000	0.7%

Coverage amounts and rates periodically change and should be verified by obtaining quotes from insurance companies.

c. Decontamination facilities. HTRW projects generally require decontamination of personnel and

equipment exiting the exclusion zone. Decontamination facilities commonly reside in the contamination reduction zone, located between the exclusion and support zones. Support costs for personnel, equipment, and supplies for the operation of the decontamination facilities must be included in the estimate. Costs should also be included for proper disposal of contaminated water, chemicals, and supplies/materials.

d. HTRW health and safety. This can be a significant portion of an HTRW project's costs. Some examples of health and safety are costs for a Certified Industrial Hygienist; Industrial Hygiene Technician, Radiation Protection Technologist; Certified Health Physicist; Site Safety and Health Officer; Air monitoring Technician; Chemical Quality Control Manager; Health and Safety Training; Medical Personnel and Exams; Personal Protective Equipment such as protective coverings, respirators, filters, and air supply; emergency equipment such as eye and body wash stations and showers; radioactive contamination protective equipment, etc. All necessary health and safety personnel, equipment such as monitoring equipment for release of hazardous substances, and other requirements must be included in the estimate. Health and safety costs do not however, include the additional cost attributable to production reduction. Additional costs due to reduced productivity are reflected in the labor and equipment direct cost work tasks. The unit price book contains costs for health and safety supplies and equipment. Costs for proper disposal and treatment of contaminated health and safety supplies and equipment must also be included in the estimate.

e. HTRW permits/taxes/fees. Some states require special permits and impose taxes and fees on HTRW waste generation. These would include taxes and fees for land disposal, incineration, treatment, and storage of hazardous wastes. These fees can have a tremendous impact on the ultimate disposal costs hazardous wastes. A USACE report, entitled "Report on Treatment, Storage, & Disposal Facilities," contains a detailed listing of taxes and fees by state and is available in all division and district cost engineering offices.

f. HTRW video monitoring/recording systems and photographs. HTRW projects usually require project photographs and videos throughout the remedial action process. Contract specifications will describe requirements in detail. Costs for photographs and video monitoring and recording systems are included in the UPB.

g. HTRW unique submittal. HTRW projects require some unique pre-construction plans. Costs for these plans should be included in the estimate. Some plans unique to HTRW and the professional level of effort and disciplines required to prepare the plans are shown in the table below. Level of effort depends on the nature and complexity of the project. The UPB contains average production rates and costs for each of the plans listed below. The cost engineer should consult with the appropriate technical personnel for each plan to insure that the correct level of effort is applied to each plan for the project. Some project specifications combine plans. Economies of scale should be considered when costing out combined plans. Also, full-time professional personnel costed out in job overhead may prepare plans as part of their normal salary. In such cases, costs for preparation of plans should not be double counted. Table 10-2 may be used to estimate the level of effort for the principal discipline to prepare each type of plan. It does not include time for secretarial, project manager, or other support personnel and incidentals such as reproduction, and mailing. These costs should be added separately.

Table 10-2. Level of effort per discipline

TYPE OF PLAN	LEVEL OF EFFORT (MH)	DISCIPLINE
Chemical Data Acquisition Plan	50 - 300	Chemist
Spill Control Plan	20 - 40	Environmental Engineer
Pollution Control Plan	40 - 100	Environmental Engineer
Site Safety and Health Plan	24 - 240	Certified Industrial Hygienist
Air Monitoring Plan	24 - 240	Certified Industrial Hygienist
Site Security Plan	8 - 24	Environmental Engineer
Contaminated Water Storage & Treatment Plan	0 - 100	Environmental Engineer
Work Plan	16 - 40	Civil Engineer
Well Installation Plan	8 - 80	Geologist
Soil Sampling Plan	8 - 80	Geologist

CHAPTER 11
PROFIT

11-1. General

Profit is defined as a return on investment. It is what provides the contractor with an incentive to perform the work as efficiently as possible. A uniform profit rate should be avoided.

11-2. Weighted Guidelines Method

a. Reference is made to FAR and EFAR Subparts 15.9 concerning the use of weighted guidelines method for determining profit. EFAR directs the use of the weighted guideline method when price is negotiated. The determination of profit, as appropriate for each procurement action, may be determined and submitted on the sample worksheet identified as figure 11-1. Explanation of the factors to be used in calculating profit, are described below, and shown in table 11-1.

b. The weighted guidelines method yields a reasonable profit value and should be used to determine profit for all contracts that include profit. The methodology is also to be used wherever a detailed direct costing method is used for baseline and control estimates. A rate of profit may be used based on historical experience for early stage estimates prepared for programming, reconnaissance, or concept design.

c. Based on the circumstances of each procurement action, each of the factors listed in table 11-1 will be weighted from 0.03 to 0.12 as discussed in the following text and provided in table 11-1. Statements in sufficient detail to explain the reasons for assigning the specific weights shall be included on the profit computation sheet. The value will then be obtained by multiplying the rate column by the weight column. The value column when totaled indicates the fair and reasonable profit percentage.

(1) Degree of risk. Where the work involves no risk or the degree of risk is very small, the weighting should be 0.03; as the degree of risk increases the weighting should be increased up to a maximum of 0.12. Lump sum items will have, generally, a higher weighted value than unit price items for which quantities are provided. Other things to consider include the portion of the work to be done by subcontractors; the nature of work; where the work is to be performed; the reasonableness of negotiated costs; the amount of labor included in the costs; and whether the negotiation occurs before or after the period of performance of work.

(2) Relative difficulty of work. If the work is difficult and complex, the weighting should be 0.12 and should be proportionately reduced to 0.03 on the simplest of jobs. This factor is tied in to some extent with the degree of risk. Some things to consider include technical nature of the work; by whom work is to be done; location of work; and time schedule.

(3) Size of the job. Work not in excess of $100,000 will be weighted at 0.12. Work estimated between $100,000 and $5,000,000 will be proportionately weighted from 0.12 to 0.05. Work from $5,000,000 to $10,000,000 shall be weighted at 0.04 and work in excess of $10,000,000 at 0.03.

(4) Period of performance. Jobs in excess of 24 months are to be weighted at 0.12. Jobs of lesser duration are to be proportionately weighted to a minimum of 0.03 for jobs not to exceed 30 days. No weight is given when additional performance time is not required.

(5) Contractor's investment. Jobs are to be weighted from 0.03 to 0.12 on the basis of below average, average to above average of contractor investment. Things to consider include amount of subcontracting; mobilization payment item; Government-furnished property; method of making progress payments; and front end requirements of the job.

(6) Assistance by Government. Jobs are to be weighted from 0.12 to 0.03 on the basis of below average to above average. Things to consider include use of Government-owned property; equipment and facilities; and expediting assistance.

(7) Subcontracting. Jobs are to be weighted inversely proportional to the amount of subcontracting. Where 80 percent or more of the work is to be subcontracted, the weighting is to be 0.03 and such weighting proportionately increased to 0.12 where all work is performed by the contractor's own forces.

d. A separate profit calculation should be performed for the prime contractor and for each subcontractor. When the subcontractor assumes the risk and responsibility for portions of the work, the prime contractor's profit rate on that work should be decreased. As a general rule, profit is applied as a percentage rate to the total of all costs required by the contract or modification scope. For early design stage estimates, a rate of profit may be assumed based on past historical experience.

11-3. Civil Works Program Specific Requirements

a. Contract Award. Profit is not included in civil works Government estimates prepared for contract award. However, profit is included in all estimates prepared for programming of funds for projects and for contract modifications.

b. Work for Others. Profit may be included for projects funded by nonfederal users in work for others.

11-4. HTRW Program Specific Requirements

For HTRW Remedial Action work funded by civil works appropriations, the paragraph above governs concerning profit. However, for HTRW Remedial Action Work funded by HTRW or military appropriations, all CWE's and Government estimates are to include prime contractor profit.

Project: _____ Estimated By: _____

Contract No: _____ Checked By: _____

Change Order No. _____ Date: _____

Profit Objective For: (Prime Contractor, Subcontractor)

Factor	Rate (%)		Weight (0.03 - 0.12)		Value
1. Degree of Risk	20	x	_____	=	_____
2. Difficulty of work	15	x	_____	=	_____
3. Size of Job	15	x	_____	=	_____
4. Period of Performance	15	x	_____	=	_____
5. Contractor's Investment	5	x	_____	=	_____
6. Assistance by Government	5	x	_____	=	_____
7. Subcontracting	25	x	_____	=	_____
	100%		Profit Factor:		_____%

COMMENTS (Reasons for Weights Assigned):

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____

Figure 11-1. Weighted guidelines profit sheet

Table 11-1. Guidelines for weighted factors profit determination

Degree of Risk (Judgmental):

Degree	Weight
Small	0.03
High	0.12

Relative Difficulty of Work (Judgmental):

Degree	Weight
Difficult	0.12
Simple	0.03

Size of Job:

Value (x 1000)			Weight
$ 0	to	100	0.120
101	to	200	0.119
201	to	300	0.117
301	to	400	0.116
401	to	500	0.114
501	to	600	0.113
601	to	700	0.111
701	to	800	0.110
801	to	900	0.109
901	to	1,000	0.107
1,001	to	1,100	0.106
1,101	to	1,200	0.104
1,201	to	1,300	0.103
1,301	to	1,400	0.101
1,401	to	1,500	0.100
1,501	to	1,600	0.099
1,601	to	1,700	0.097
1,701	to	1,800	0.096
1,801	to	1,900	0.094
1,901	to	2,000	0.093
2,001	to	2,100	0.091
2,101	to	2,200	0.090
2,201	to	2,300	0.089
2,301	to	2,400	0.087
2,401	to	2,500	0.086
2,501	to	2,600	0.085
2,601	to	2,700	0.084

Value (x 1000)			Weight
$ 2,701	to	2,800	0.081
2,801	to	2,900	0.800
2,901	to	3,000	0.079
3,001	to	3,100	0.077
3,101	to	3,200	0.076
3,201	to	3,300	0.074
3,301	to	3,400	0.073
3,401	to	3,500	0.071
3,501	to	3,600	0.070
3,601	to	3,700	0.069
3,701	to	3,800	0.067
3,801	to	3,900	0.066
3,901	to	4,000	0.064
4,001	to	4,100	0.063
4,101	to	4,200	0.061
4,201	to	4,300	0.060
4,301	to	4,400	0.059
4,401	to	4,500	0.057
4,501	to	4,600	0.056
4,601	to	4,700	0.054
4,701	to	4,800	0.053
4,801	to	4,900	0.051
4,901	to	5,000	0.050
5,001	to	10,000	0.040
Over		10,000	0.030

Table 11-1 (continued)

Period of Performance:	Weight
Over 24 Months	0.120
23 to 24 Months	0.116
22 to 23 Months	0.112
21 to 22 Months	0.109
20 to 21 Months	0.105
19 to 20 Months	0.101
18 to 19 Months	0.098
17 to 18 Months	0.094
16 to 17 Months	0.090
15 to 16 Months	0.086
14 to 15 Months	0.082
13 to 14 Months	0.079
12 to 13 Months	0.075
11 to 12 Months	0.071
10 to 11 Months	0.068
9 to 10 Months	0.064
8 to 9 Months	0.060
7 to 8 Months	0.056
6 to 7 Months	0.052
5 to 6 Months	0.049
4 to 5 Months	0.045
3 to 4 Months	0.041
2 to 3 Months	0.038
1 to 2 Months	0.034
Under 30 Days	0.030

Contractor's Investment (Judgmental):

Degree	Weight
Below average	0.03
Average	0.07
Above average	0.12

Assistance by Government (Judgmental):

Degree	Weight
Below average	0.12
Average	0.07
Above average	0.03

Table 11-1 (continued)

Subcontracting :

Subcontracting	Weight
80% or more	0.030
70% to 80%	0.042
60% to 70%	0.055
50% to 60%	0.068
40% to 50%	0.080
30% to 40%	0.092
20% to 30%	0.105
10% to 20%	0.118
0	0.120

CHAPTER 12
SURETY BONDS

12-1. General

a. Surety bonds are three-way agreements between a bidder or contractor (the principal), and a second party (the surety), to assure fulfillment of the principal's obligations to a third party (the obligee). If the principal obligations are not met, the bond assures payment to the extent stipulated of any loss sustained by the obligee.

b. In most Government construction contracts, these three parties are as follows:

Three Party:	Under a General Contract:	Under a Subcontract:
The Principal	Contractor	Subcontractor
The Obligee	Government	Contractor
The Surety	Surety	Surety

12-2. Purpose of Bonds

a. The purpose of surety bonds varies with the type of bond.

b. Bid bonds or bid guarantee provide an assurance that the bidder will not withdraw his (her) bid within the specified period for acceptance and will execute a written contract and furnish the required bonds if the bid is accepted.

c. Payment bonds protect subcontractors, suppliers, and laborers against nonpayment by the prime contractor.

d. Performance bonds ensure the contractor will complete the project as specified and for the agreed price. It does not shift responsibility for administering the contract to the surety. A performance bond provides a financial guaranty for the work and provides the contractor with a method of freeing his(her) working capital and other assets which might otherwise be tied up by other forms of security such as certified checks, retainage, or deposits.

12-3. Amount of Required Surety Bonds

The amount included in the estimate should be based on the contract requirements, the bond rules, premium rates, and, if known, the actual contractor bond cost.

Performance and payment bonds are required for all construction contracts of $100,000 or more and some form of payment guarantee for lesser value contracts (FAR 28.102). The cost of all performance, payment bonds, and other types of bonds determined to be appropriate by the cost engineer are allowable costs.

12-4. Rules Governing the Application of Bond Rates

a. Bonds are classified as Class A, Class B, or Class A-1, depending on the type of construction to be performed. If the contract is susceptible to two classifications, normally the higher rate is applicable (table 12-1).

b. Separate contracts take the same classification as a general contract. Neither the classification nor the rate is changed by subdividing the work or by the Government's providing certain materials.

c. Subcontracts take the same classifications and rates as general contracts.

d. For states in conformance (nondeviating) with the Surety Association of America (SAA) rates (table 12-1) where the construction time exceeds the bond stipulated time of 12 months, add 1 percent of the bond premium for each month in excess of 12 months.

e. For states in conformance (nondeviating) with the SAA rates (table 12-1) where the construction time exceeds the bond stipulated time of 24 months, add 1 percent of the basic premium for each month in excess of 24 months.

f. For states not conforming (deviating) with the SAA rates where the construction time exceeds the bond stipulated time of 12 months, add 2 percent of the basic premium for each month in excess

of 12 months up to 24 months and 1 percent of the basic premium for each month in excess of 24 months.

g. If the consent of the surety is not required and given for changes or extras, first and renewal premiums for the additional cost thus caused are computed at manual rates from the date of the bond.

h. If the consent of the surety is required and given for changes or extras, premium for the additional cost thus caused is computed at manual rates from the date of such surety's cost.

12-5. Cost of Performance and Payment Bonds

a. Performance and payment bonds are normally obtained as a single package. The premium is the same as for the performance bond alone. Rates vary with the type of the contract work, the dollar value, and the length of the contract.

b. The coverage limit of performance bonds is specified in each contract and is usually for the full amount of the contract price (bid amount). The premium is adjusted at the completion of the work for any modification changes in the contract price other than changes due to time bonuses or penalties. If the original contract price is increased through change order, the contractor must pay an additional premium. Conversely, if any part of the original work is deleted and the original price thereby reduced, the contractor will receive a refund from the surety.

c. It should be noted the surety industry has become a state regulated industry. The SAA issues advisory rates, but these rates may or may not be accepted by the state involved. Therefore, actual rates charged by surety corporations may vary from state to state.

d. Table 12-2 shows the various types and classes of bonds.

e. Example 12-1 illustrates the calculation of bond premium cost. Since the rates are subject to change and may vary by state, the calculations are to be used as a sample only. The cost engineer is responsible for ensuring the rates used are accurate and current. This example assumes a canal excavation project in Tennessee to be accomplished at an estimated cost of $2.5 million, including profit with a duration of 20 months. From table 12-2 excavation is found in Class B. Referring to the Class B rate schedule in table 12-1, the premium for a performance-payment bond written in the full amount of the contract price (including bond) and by a nondeviating Surety Association Company would be calculated as follows:

Example 12-1 - Bond premium calculation

	Estimated Amount	x	Bond Rate	=	Premium
First	$ 100,000		@ $25.00/M		$ 2,500
Next	400,000		@ 15.00/M		6,000
Next	2,000,000		@ 10.00/M		20,000
Anticipated Estimated Amount (inc. bond)	$2,500,000				$28,500
(20 mos - 12 mos = 8 mos surcharge)					
Eight additional months @ 1%/ MONTH					
	(8 mo x 1% x $28,500)				2,280
TOTAL PREMIUM					$30,780

12-6. Civil Works Program Specific Requirements

Most types of civil works projects are classified as Class B.

12-7. HTRW Program Specific Requirements

The cost of performance bond for HTRW projects is normally higher than for conventional construction projects. This is primarily due to the surety industry concern regarding uncertainties related to changing state-of-the-art design requirements and risk associated with HTRW projects. The SAA does not publish separate pricing guidelines for HTRW

projects. Some surety companies will quote rates to contractors for remedial action contracts. The rates depend on the contractor qualifications such as size of company, past performance, HTRW cleanup experience, and other factors. When preparing a remedial action estimate, the cost engineer should contact surety companies in an attempt to obtain a bond rate for the project. If the cost engineer does not obtain direct information from the surety companies, table 12-3 is a guideline developed by the HTRW CX which may be used to estimate bond cost for HTRW projects.

Table 12-1 Bond Rates

1. Performance and performance-payment bond rates and lump sum and unit fixed -price contracts where the stipulated time for completion is not over 12 months (Bond rates may change and should be verified on an annual basis).

a. Non-deviating SAA advisory rates per $1,000 of contract value for all jurisdictions except South Carolina, Louisiana, Delaware, Hawaii, and Arkansas are as follows:

Amount of Contract Price	Class B	Class A	Class A-1
First $ 100,000	$25.00/M	$15.00/M	$9.40/M
Next 400,000	15.00	10.00	7.20
Next 2,000,000	10.00	7.00	6.00
Next 2,500,000	7.50	5.50	5.00
Next 2,500,000	7.00	5.00	4.50
Over 7,500,000	6.50	4.50	4.00

b. Deviating rates from companies that may or may not belong to the SAA and are dependent on competition and contractor net worth. The following rates per $1000 of contract value are typical of a large contractor having a preferred rate structure:

Amount of Contract Price	Class B	Class A	Class A-1
First $100,000	$10.00/M	$7.50/M	$4.90/M
Next 400,000	8.00	5.50	4.50
Next 2,000,000	7.00	5.00	4.10
Next 2,500,000	6.00	4.40	3.80
Next 2,500,000	5.00	3.80	3.50
over 7,500,000	4.50	3.25	2.95

2. Performance and performance-payment bond rates for lump sum and unit fixed -price contracts where the stipulated time for completion is not over 24 months (Bond rate may change and should be verified on an annual basis). Nondeviating SAA advisory rates per $1,000 of contract value for South Carolina, Louisiana, Delaware, Hawaii, and Arkansas are as follows:

Amount of Contract Price	Class B	Class A	Class A-1
First $ 500,000	$14.40/M	$10.80/M	$7.20/M
Next 2,000,000	8.70	6.72	6.00
Next 2,500,000	6.90	5.28	4.92

Table 12-2 Contract bonds rate classifications

Next 2,500,000	6.30	4.92	4.44
Over 7,500,000	5.76	4.44	3.96

Class A
Unless otherwise stated, the rates on the preceding page apply to contracts for furnishing and installing, or installing only, certain services or equipment such as the following:

Airport runways
Aluminum siding
Athletic fields
Beacon or flood lights
Burial contracts
Ceilings (metal or acoustical tile)
Certain walls (nonstructural)
Coal storage
Ducts (underground power, light, phone)
Elevators/escalators
Glazing
Greenhouses
High-pressure power piping
Janitorial service
Machinery made to special order
Map making
Mill work
Murals
Parking areas
Planting and cultivation of land
Playgrounds and parks
Research contracts
Ski lifts
Sprinkler systems
Stone (furnishing, delivering only)
Storage tanks, metal
Tennis courts
Water carnage of freight
Water proofing (except with gunite)
Wind tunnels

Class B
Unless otherwise stated, the rates on the preceding page apply to contracts such as the following:

Airport buildings
Aqueducts
Atomic energy plants
Breakwaters
Canals and canal lining
Carpentry
Coal stripping
Commercial buildings
Concrete work
Dams
Dikes
Ditches
Docks and dry-docks
Drilling contracts
Educational buildings
Electrical
Embankments
Excavations
Filling stations
Filtering plants
Fountains
Garbage disposal plants
Gasoline cracking plants
Gas compressor stations
Gas mains and laterals
Gas piping
Golf courses
Grain elevators
Gunite contracts
Heating systems
Hospital buildings
Incinerators
Industrial buildings and plants
Jetties
Landscaping
Locks
Masonry
Missile installations
Nuclear reactors
Office buildings
Offshore platforms
Painting
Piers
Piling
Pipelines for water
Plastering
Plumbing
Power plants
Public improvement
Railroad roadbeds
Sand blasting
Sculptures
Sea walls
Sewage disposal plants
Sewers/septic tanks
Shipyards
Spillways
Stone
Subways
Swimming pools
Terminals - buses
Test boring
Tile and terrazzo
Transmission or distribution lines
Tunnels
Underwater cables
Ventilation systems
Water works
Wells
Wharves

Table 12-2 (Continued)

Class A-1

Unless otherwise stated, the rates on the preceding page apply to contracts for furnishing and installing, or installing only, certain services or equipment such as the following:

Arms
Ash conveyors
Automatic stokers
Automatic telephone exchange equipment
Automotive service contracts
Band concerts
Bird control
Boiler re-tubing and repair
Bookbinding
Cataloging
Coal handling machinery
Computers and data processing equipment
Conveyors
Data processing and computer work
Doors/Dynamos
Exterminating contracts
Fire alarm systems
Fire escapes
Flag poles
Floats
Floors
Furnishing food services
Gas tanks
Generators
Grain doors, salvage and disposal
Guard rails
Heating
Incinerator operation
Insulation contracts
Kitchen equipment
Laboratory equipment
Leasing of motor vehicles
lightning rods
Lock gates
Mail handling machinery
Metal windows and shutters
Mosquito control contracts
Movies
Office personnel
Organ repairs
Ornamental iron work
Parking meters
Photogrammetric work
Pipelines for oil or gas
Police alarm systems
Projectiles
Public address and music systems
Radio towers
Radiological equipment
Recapping automobile tires
Repair of automobiles and trucks
Re-smelting old metal
Rip rap stone (furnishing only)
Rolling stock
Scaffolding cost engineer should
Sidewalks
Signaling systems on railroads
Signs (all)
Stack rooms
Stand pipes
Street and subway lighting systems
Temporary personnel services
Thermostat equipment
Toll gates
Track laying
Traffic control systems on highways
Training manuals
Tree trimming and removal
Watchmen and signal services
Water towers
Weather stripping
Weed mowing
Window cleaning
Work and labor
X-Ray inspections

Table 12-3. HTRW bond rates

Contract Amount	Asbestos Only	Asbestos and Lead Only	Other HTRW
Up to $3,000,000	2.0%	3.0%	4.0%
$3 M to $5 M	1.9%	2.8%	3.5%
$5 M to $ 7.5 M	1.8%	2.6%	3.0%
Over $7,500,000	1.7%	2.4%	2.5%

CHAPTER 13
OTHER COSTS

13-1. General

This Chapter provides guidance regarding other costs not specifically identified in previous Chapters, but costs that must be included in the preparation of detailed project cost estimates.

13-2. Contractor Competition and Market Analysis

a. Each Government estimate for procurement will reflect the fair and reasonable cost to a prudent contractor for performing the scope specified. Although contractor bids will reflect the anticipated competitiveness, the Government estimate must remain the "yardstick" against which cost reasonableness is judged. Therefore, Government estimates can contain adjustments due to quotations on direct and indirect costs, but no separate adjustment due to competitiveness or bid strategies.

b. During development of the design-stage CWE, market competitiveness may be considered for funding and design alternatives. When competition is included in the CWE, it should be clearly defined and made known to the program manager.

13-3. Other Project Costs

a. Civil Works. The total CWE includes all Federal and authorized non-Federal costs. Specific components of the TOTAL CWE include lands and damages; construction features; planning, engineering and design; construction management and the appropriate contingencies and escalation through completion of construction. The specific other costs not previously discussed are addressed in the following paragraphs:

(1) Lands and damages. Costs will be included for all Federal and non-Federal real estate activities necessary for implementation of the project after completion of the feasibility study for land acquisition, construction, and completion of crediting lands, easements, right-of-way, relocation, and disposal (LERRD), mitigation requirements, and other items as delineated in the CWBS, along with the appropriate contingencies and escalation.

(2) Engineering and design. Costs will be included for all activities associated with the planning, engineering, and design effort necessary for preparation of each construction contract and for support during construction through project completion. This includes all in-house labor based upon work-hour requirements, material and facility account costs, AE contracts, additional studies, travel and overhead, along with appropriate contingencies and escalation. Costs will be developed in detail in accordance with the established CWBS.

(3) Construction management. Costs will be included for all construction management activities from pre-award requirements through final contract close-out, including in-house labor based upon work-hour requirements, materials, facility costs, support contracts, travel, and overhead along with the appropriate contingencies and inflation. Costs will be developed in detail in accordance with the established CWBS.

b. Military. The CWE for military projects include the sum of the costs for construction, other allowable direct projects costs such as communications, plus contingencies, S&A, and EDC.

(1) Construction S&A. An allowance or cost calculation for construction management is normally included in each CWE. Planning estimates may include S&A, a factor expressed as a percentage applied to the subtotal of the construction contract. The rate of S & A and its application is further discussed in the specific program regulation. The current authorized S&A percentages for MILCON projects are 6 percent for CONUS and 6.5 percent for OCONUS. For operation and maintenance projects the current authorized S&A percentages are 8 percent for CONUS and 8.5 percent for OCONUS.

(2) In order that a total project estimate be prepared, other project costs identified in project requirements and in Corps procedures need to be

estimated. These costs, such as EDC, as-built drawing preparation, O & M manual preparation, need to be identified and included as determined by the project manager and specific program requirements.

c. *HTRW*. The CWE or Total Project Cost for HTRW projects may include cost escalation, design contingencies, construction contingencies, S&A, EDC, as-built, O&M manuals, and Government laboratory Quality Assurance (QA).

(1) These costs are typically funded as part of construction and thus are added at the recap of all remedial action estimates. The cost engineer should coordinate with the project manager to determine whether or not all of these costs are applied to the project. These costs except escalation and design contingencies (in design/build projects) are not added to official Government estimates that are used for comparison with contractor bids or proposals, unless specified to be included with the contractor bid or proposal.

(2) Government laboratory QA costs are costs incurred by the Government for verification of questionable contractor laboratory results and for analysis of samples taken by Government representatives during the course of the remedial action. These costs are normally included as the last cost item to make up a HTRW total CWE. The following percentages will be used for other estimated costs for HTRW remedial action projects. If the cost engineer has an alternative method of determining these costs, then the basis, rationale, and/or calculations shall be shown in the project notes portion of the estimate. Any future guidance from HQUSACE reflecting rate changes will supersede the rates below.

(a) Construction management costs (S&A): S&A costs for EPA projects are charged based on actual costs. If available, actual historical S&A cost information on past similar projects should be used as a basis for S&A, in lieu of the fixed percentage shown below:

<u>EPA Superfund and Other EPA</u>:
8% for contracts up to $2,000,000
6% for contracts over $2,000,000

<u>DOD/DERP and DOE</u>:
8% for all contracts.

(b) Engineering During Construction (EDC):

<u>EPA Superfund and Other EPA</u>:
1.5% for contracts up to $2,000,000
1.0% for contracts over $2,000,000

<u>DOD/DERP and DOE</u>:
0.5% for all contracts.

(c) O&M Manual Costs:

<u>EPA Superfund and Other EPA</u>:
1.5% for all contracts.

<u>DOD/DERP and DOE</u>:
1.5% for all contracts.

(d) As-Built:

<u>EPA Superfund and Other EPA</u>:
0.5% for all contracts.

<u>DOD/DERP and DOE</u>:
0.5% for all contracts.

(e) Government Laboratory Quality Assurance:

<u>EPA Superfund and Other EPA</u>:
1.0% for all contracts.

<u>DOD/DERP and DOE</u>:
1.0% for all contracts.

(3) Operation costs for HTRW projects. For remedial action projects which include treatment or disposal, it is likely that the project will include operation of a plant during construction and following construction. Operation includes labor, equipment, and materials necessary to operate the plant. It includes such items as bulk chemicals, raw materials, fuel and utilities usage, maintenance and repair, etc. Short- term operation of plant is typically included in the construction contract. Long-term operation of plant typically is under a service contract. The cost engineer must check the wage determinations since wage rates for service contracts are generally different than wage rates for construction contracts.

(4) HTRW disposal costs. There are special requirements and costs associated with disposal and transportation of HTRW waste. Disposal of HTRW waste at an offsite Treatment, Storage, or Disposal Facility (TSDF) requires that standards imposed by Federal and State regulatory agencies be met. For instance, the EPA has created specific standards for each of ten types of TSDF regulated under the Resource Conservation and Recovery Act (RCRA). Types of disposal or treatment at these facilities include containers, tanks, surface impoundments, waste piles, land treatment facilities, landfills, thermal treatment units, chemical, physical and biological treatment facilities, and injection wells. As a result, disposal costs for HTRW materials are significantly higher than for other materials. A number of TSDF's are engaged in commercial disposal of hazardous waste. Some of the TSDF's publish fee schedules and will give price quotes for disposal of various categories of hazardous waste. However, because hazardous waste frequently consists of many different types of contaminants, TSDF's sometimes require that a sample of the hazardous material be submitted to them for analysis before they quote a price for disposal, or even agree to accept the waste. A USACE report entitled, A Report on Treatment, Storage, and Disposal Facilities (TSDF) for HTRW has been prepared that lists in detail all operating commercial hazardous waste landfills, incinerators, cement kilns, and deep well injection facilities in the United States. Facility brochures and fee schedules are provided in the report for some of the facilities. The report is available in all Division and District cost engineering offices.

(5) Transportation. Transportation of hazardous waste to TSDF's is also subject to special charges. Licensing is required by both Federal and State authorities for intrastate and interstate hauling of hazardous waste. Manifests must accompany transportation of the waste material. Specialized containers and packaging are often required to transport hazardous waste, such as roll-off containers, rubber or poly-lined containers, drums and drum over-packs. Costs incurred for transportation and disposal of hazardous waste should be included in HTRW estimates. Division 2 of the UPB contains unit price costs for transportation packaging. Division 13 contains unit prices for landfill disposal costs and disposal fees and taxes. The report on TSDF's also includes transportation fees for hazardous waste.

13-4. Cost Escalation

a. Cost estimates, when finalized, must reflect the total cost during the entire duration of construction. These costs will reflect cost inflation beyond the effective pricing level (date) of the baseline estimate. Such escalation must be identified as a separate element within the cost estimate. This allows the cost engineer the ability to easily adjust the estimate to reflect schedule changes. The methodology for developing cost escalation varies with each program.

b. Civil Works. EM 1110-2-1304 will be used to update unit prices and various project cost features to current price levels. Inflation factors for use in predicting future costs will be those developed by the Office of Management and Budget (OMB). The OMB factors are published by HQUSACE, Programs Division (CECW-B), in an Engineer Circular (EC) for the Annual Program and Budget Request for Civil Works Activities.

c. Military Programs. The Tri-Service Military Construction Program (MCP) Index will be used to project escalation due to inflationary factors. The Tri-Service indexes are based on forecasts of anticipated escalation for the future fiscal years issued by the Comptroller of the Department of Defense. The MCP index is updated annually and available through EIRS Bulletins and PAX System Newsletters.

d. HTRW. The Tri-Service MCP Index will be used to project escalation costs for all military HTRW remedial action estimates.

13-5. Contingencies

a. Contingencies are used to cover unknowns, unforeseen uncertainties, and/or unanticipated conditions that are not possible to adequately evaluate from the data on hand at the time the cost estimate is prepared, but must be represented by a sufficient cost to cover the identified risks.

Contingencies relate to a known and defined project scope and are not a prediction of future project scope or schedule changes.

b. Contingencies are normally separated into two elements for incremental analysis - design contingencies and construction contingencies.

(1) Design contingencies are assigned to cover construction cost increases due to design incompleteness, detail changes, alternative design changes, and associated costing inaccuracy. Design contingencies will normally decrease as design information becomes known.

(2) Construction contingencies are a reserve for construction cost increases due to adverse or unexpected conditions such as unforeseeable relocations; foundation conditions; utility lines in unknown locations; quantity overruns; or other unforeseen problems beyond interpretation at the time of or after contract award.

c. When considerable uncertainties are identified, cost risk analysis can establish the areas of high cost uncertainty and the probability that the estimated project cost will or will not exceed the actual cost. Cost risk analysis is a process to consider costs and risks as follows:

(1) Identify risks within a project that could result in cost change.

(2) Measure this change impact on the estimated cost.

(3) Manage these risk elements to avoid their negative consequences. This type of analysis is an in-depth approach that replaces a simple percentage rate contingency assignment. Computer programs are commercially available to perform cost risk analysis and are discussed in appendix E.

13-6. Application of Contingencies

a. Contingency allocations are specifically related to the project uncertainties and should not be reduced without appropriate supporting justification. The decision to reduce these uncertainties and improve the cost estimate through additional investigations or studies, or to proceed with the higher cost estimate, is a management decision.

b. Civil Works.

(1) The goal in contingency development is to identify the uncertainty associated with an item of work or task, forecast the risk/cost relationship, and assign a value to this task that will limit the cost risk to an acceptable degree of confidence. Consideration must be given to the details available at each stage of planning, design, or construction for which a cost estimate is being prepared. During development of the project cost estimate, sufficient contingencies should be added at the lowest title or detail level where the risks or uncertainties have been identified. Contingencies may vary throughout the cost estimate and could have a significant impact on overall costs. The reasons for final contingency development and assignment must be included in the cost estimate as a part of the project narrative. When the contingency factors shown in table 13-1 are applied to any portion of the cost estimate up to the feature level, the statement "Normal design variances are expected - normal contingency values used" is acceptable in addressing that specific portion.

(2) The contingency factors in table 13-1 are based on percentage and represent a reasonable guide for the construction features of the cost estimate. The table provides a guide for contingency development and is not intended to restrict or limit contingencies to these values. If the overall contingency value developed through a detailed analysis exceeds these guidelines, additional site analysis and/or design should be considered in those areas where uncertainties may be reduced.

(3) At construction contract award, a minimum contingency of five percent of the contract amount must be available for contract modification. This contingency is not included in the Government estimate, but must be available in accordance with ER 5-7-1 (FR). As a project nears completion, this contingency must be reduced accordingly.

c. Military Programs.

(1) The design contingency covers component items that cannot be analyzed or

evaluated at the time the estimate is prepared; however, such items are susceptible to cost evaluation as engineering and design progresses. The magnitude of design contingency is determined by the level of technical complexity of the project for which the estimate is being prepared.

(2) The following design contingency factors in table 13-2 represent a reasonable guide for the component items of the estimate. Non-Army programs should be checked for other specific guidance provided by the agency responsible for criteria concerning design specifically related to contingencies.

(3) Construction contingencies. Contingency percentages for military projects should be determined in accordance with ER 1110-3-1300 and/or Army latest guidance. The current authorized construction contingency percentages are 5 percent for new construction and 10 percent for renovation/alteration for projects within the boundaries, continental United States (CONUS). Construction contingencies more than the authorized percentages should be fully justified and supported by a risk analysis.

d. HTRW. Contingency percentages for HTRW projects should be determined for and applied at each second (system) level WBS cost in the HTRW remedial action estimate as structured by the HTRW RAWBS. The total HTRW contingency is the sum of the design contingency plus construction contingency. HAZRISK is the statistical cost risk analysis system that will be used to determine contingencies.

(1) Design contingencies represent construction cost unforeseen when the estimate is prepared due to incomplete design. The extent of site characterization and assessment that has been accomplished to compute project quantities must be considered when determining design contingencies for HTRW construction costs. For example, estimates of groundwater volume and concentration are often possible only after field pump tests are completed. Many feasibility study estimates are prepared prior to these tests and so must rely on assumed volumes and concentrations. Unit price history is also lacking for many of the newer remedial technologies. Design contingencies should be higher for new or emerging state-of-the-art remedial action systems than for systems with well-documented histories. Design contingencies should be developed using cost risk analysis prediction tools or a design/cost team group analysis. Design contingencies may need to be included in estimates at the as-advertised project stage for those remedial action treatments for which the design is not available to the cost engineer such as design-build or performance specification processes/ treatments where the remedial action (construction) contractor performs the design. The design contingency percentages in table 13-3 represent a reasonable guide for design contingencies for remedial action projects.

(2) Construction contingencies should be higher for new state-of-the-art remedial action systems than for well-documented systems. Considerations will include the technological, geotechnical, and other unknowns applicable to the construction or remedial action phase. Construction contingencies are applied to all pre-design estimates and on CWE during the design stages. Official Government estimates which are used for comparison with contractor bids or proposals will not include an amount for construction contingencies. Generally, fifteen percent is the recommended percentage to use for construction contingencies, unless there is a basis for a different percentage such as a risk analysis prediction or a design/cost team group analysis.

Table 13-1. Contingency factors for construction features

Phase of Project Development	Factors: Const. Cost ≥$10,000,000	Factors: Const. Cost <$10,000,000
Reconnaissance/ Feasibility	20%	25%
Project/Feature Design Memorandum	15%	20%
Plans and Specifications	10%	10%

Table 13-2. Technical complexity levels and design contingency factors for military construction projects

Technical Complexity Level		Design Contingency Factor	
Level	Description	Pre-Concept	Concept
LOW	Site adapted, repetitive standard design project involving routine technology	1.050	1.025
MEDIUM	Unique design involving complex technology	1.100	1.050
HIGH	Unique design involving highly complex technology	1.150	1.100
ULTRAHIGH	Unique design involving extremely complex or innovative technology	1.250	1.150

Table 13-3. Design contingencies for remedial action projects (The following design contingencies represent construction costs, unforeseeable at the time of estimate preparation, which are likely to become known as project design proceeds.)

Remedial Action Technology (RAWBS)	Project Stage 0%	30%	Design 60%	90%	100%
Soil Excavation (33.08.)	15-55%	10-40%	5-25%	0-10%	0%
Groundwater Treatment (Multiple) (33.12.)	15-35%	10-25%	5-15%	0-5%	0%
On-Site Incineration (33.14.)	15-35%	10-25%	5-15%	0-5%	0%
Extraction Wells (33.06.)	10-30%	5-20%	5-15%	0-5%	0%
Vertical Barriers (33.06.)	10-30%	5-20%	5-15%	0-5%	0%

Table 13-3. (continued)

On-Site Storage (33.05.,33.06.,33.09.)	15-20%	10-15%	5-10%	0-5%	0%
Synthetic Cap (33.08.)	10-20%	5-15%	5-10%	0-5%	0%
Sludge Stabilization (33.15.)	10-20%	5-15%	5-10%	0-5%	0%
Off-Site Disposal (33.18.,33.19.)	5-15%	5-10%	0-5%	0%	0%
Off-Site Incineration (33.14.)	5-15%	5-10%	0-5%	0%	0%
Drum Processing (33.10.)	5-15%	5-10%	0-5%	0%	0%
Bulk Liquid Processing (33.09.)	5-15%	5-10%	0-5%	0%	0%
Groundwater Treatment (Single) (33.12)	5-10%	5-10%	0-5%	0%	0%
Clay Cap (33.08.)	5-10%	5-10%	0-5%	0%	0%
Surface Grading/Diking (33.05.)	5-10%	5-10%	0-5%	0%	0%
Revegetation (33.20.)	5-10%	5-10%	0-5%	0%	0%

CHAPTER 14

CONTRACT MODIFICATIONS AND OTHER NEGOTIATED PROCUREMENT

14-1. General

a. FAR/ EFAR, Part 36 requires an independently prepared Government estimate for modifications in excess of $100,000. Normally, estimates are not required for changes less than $100,000, but are required by the Contracting Officer for unilateral modifications. For contract modifications, the amount refers to the sum of the absolute value of increases and decreases. For example, a modification containing an increase of $60,000 and decrease of $45,000 has an absolute value of $105,000, and a Government estimate would be required.

b. The cost engineer should become familiar with the modification and claim processes. Training relevant to construction modifications is included in the prospect program.

14-2. Directives

Those responsible for the preparation of cost estimates for contract modifications should be thoroughly familiar with the requirements set forth in FAR, DFAR, AFAR, EFAR, and the appropriate ER. The acronyms for the Federal Acquisition Regulations are listed in the Glossary

14-3. Negotiated Procurement and Contract Modifications

a. The cost engineer has several important tasks to perform prior to actually preparing the estimate. The cost engineer will prepare a technical analysis of the proposed procurement action or contract modification. Some of the major activities to be considered in preparing the technical and cost analysis in addition to labor, material, equipment and construction techniques include:

(1) *Reviewing available documents and becoming thoroughly familiar with the scope and requirements of the changed work.* This will perhaps entail a comparison and analysis and discussions with the designer or field office to ensure common understanding of the scope of work. The cost engineer must assure that the proposed modification or procurement action is clearly defined with regard to specified work requirements, proposed measurement, and payment.

(2) *Determining the status of construction and the effect the changed work will have impact on the construction schedule.* This will require obtaining progress reports, schedules, and discussion with the field office responsible for the construction. For major or complex changes, a visit to the construction site is required.

(3) *Becoming fully aware of the contractor's existing methods, capabilities, and rates of accomplishment.* The estimate should not arbitrarily include methods and capabilities different from the method in which the contractor is performing the ongoing work. The cost engineer should base the change on existing contractor operations for similar work. When work is anticipated to be subcontracted, the estimate should be prepared to include subcontractor costs.

(4) *Obtaining current labor and equipment rates for the work force and work actually ongoing.* These rates are usually available from labor reports or from the contractor upon request. Suppliers for materials should be contacted for quotes. The price which the contractor is expected to pay should be the basis for estimating material costs. A list of equipment on the job should be obtained and equipment rates be determined in accordance with EP 1110-1-8, Equipment Ownership Schedule.

b. As a team member working with the negotiator, coordinate with the contractor to agree on scope of work and format prior to preparation of the Government estimate and submittal of the contractors proposal. This discussion will assist both the Government and contractor in reaching a mutually accepted scope of work to eliminate unnecessary effort for both parties during negotiations.

14-4. Preparation of Cost Estimates and Negotiation

a. The estimate can be prepared after all the information has been collected and analyzed, and the cost engineer decides upon the format to present the change. It is important to have a prior agreement and discussion as previously indicated with the contractor. Generally, successful negotiations depend on agreement in scope of work and accurate quantity take-off and a detailed estimate supported by accurate cost data for all elements. General guidance for the calculation of direct costs are noted as follows:

b. For additional work, items and format should be priced similar to a new contract as performed by the known contractor. New work should be priced at the rates anticipated to be in effect at the time the work will be performed.

c. For changed work, a separate quantity takeoff for each item directly affected will be required for both before and after the change. Each item should be priced at the rates which would be in effect at the scheduled time of accomplishment. Typically, each item of changed original work is priced, and each comparable item of revised work is priced at the applicable rates. The net cost (or credit) would be obtained by subtracting the total of the original work from the total of the revised work. It is important that the cost engineer maintain a comparable scope of work for both estimates. When an item of work will be performed as originally specified, except for a revision in quantity, the net quantity may be estimated directly for that item.

d. For deleted work, the item and format should be priced similar to a new procurement as performed by the current contractor. Rates in effect at the time the work would have occurred should be used. In addition to the direct cost of the work, overhead, profit, and bond costs should be included for credit on the deleted work.

e. Impact related costs, if applicable, should be clearly described and included as a part of each cost estimate.

f. The cost estimate for a modification should be prepared in as much detail as required to clearly cost the change for negotiations. In many instances, even more detail is required to negotiate the lowest reasonable price. The estimate should, however, be modified to reflect a negotiated procurement in lieu of an advertised procurement. It should include a general summary sheet relating the major categories of cost of the modification, both for increases and decreases. Revised construction drawings and specifications are included in the modification supporting documents. When the cost engineer prepares the estimate, the effort should be the same as the contractor acting prudently under the given conditions. The results will generally provide an accurate estimate which can be used as a firm basis for negotiation. The Government estimate should not rely on past generalized rates and settlements unless actually appropriate to the specific modification under consideration.

14-5. Cost Considerations

The estimate should be based on the data actually collected and experienced from the project. Time motion studies are important, and periodic field visits and log records can provide this data. Previous modifications can also provide valuable data. Valuable cost data is often available from past audit reports on other modifications. With the assistance of the auditor, many costs can be readily obtained and may be directly applicable to the present modification. The cost engineer must exercise judgment in the use of audit information from a specific report which may not be released.

14-6. Timeliness of Preparation

Timeliness of the estimate for modification is as important as its accuracy. Procurement requirements stress the importance of settlement prior to commencing the work. Therefore, the cost engineer should immediately proceed to obtain the necessary data for the modification and notify the appropriate authorities of the earliest date that the estimate can be completed. It is generally understood that the larger and more complex the change, the longer the time requirement for the initial preparation of a accurate cost estimate.

14-7. Impact Costs

a. When a modification is initiated, the settlement of that modification includes not only the cost and time change of the work directly affected but also the cost and time impact on the unchanged work. The impact portion of a modification is very important to be estimated accurately. The scope of impact may be broad and susceptible to a large variety of situations. The following discussion will provide guidance and understanding of impact cost considerations.

b. Generally, the greatest portion of impact costs results from acceleration and/or delays due to changes. When delays due to a change can be minimized, impact costs are reduced. Impact costs are normally determined on a case-by-case basis for each particular situation. The determinations have been based on interpretation of the Contract Clauses and on Board of Contract Appeals and court decisions.

c. Impact costs are generally presented by the contractor as part of the proposal. The existing construction schedule furnished by the contractor must be analyzed to determine the actual construction and the extent of the impact at the time of the change. The modification work must be superimposed upon the original schedule in such a position to determine and minimize the delay. The revised plan must then be thoroughly reviewed relative to the existing job plan. This comparative review should indicate those areas which have been affected by the modification.

d. Once the extent of impact has been determined, each cost claimed must be classified as either factual or judgmental. The factual costs are those which are fixed and established and can be determined directly from records. These include rental agreements, wage rate agreements, and purchase orders. Once the item has been determined valid as a factual impact, the item cost may be directly calculated. The amount of cost change is stated on the certified document or can be determined from the scheduled time change of the construction progress plan. Judgmental costs are those which are dependent on variable factors such as performance, efficiency, or methodology and cannot be stated factually prior to actual accomplishment. These must be negotiated and based upon experienced judgments. In actual practice, most factual costs are based to varying degrees upon judgment.

e. The estimate of impact should be prepared for each activity affecting the change. In some cases, the impact items are typically so interrelated that it is often best to develop a detailed plan for accomplishing the remaining work. Each item in this plan would be estimated at the productivity and rate in effect at the time the work is to be accomplished. The same items of work under the original plan would also be estimated at the productivity and rate in effect at the originally scheduled time. The comparison of the these two estimates yields the cost of impact. Impact costs determined to be valid must be estimated by the most accurate method available and included in the modification.

f. The following impact factors or conditions play a recurring role in determining impact costs. Each modification must be evaluated separately and impact costs considered specially for the implications of the particular change.

(1) Impact costs considered factual include escalation of material and labor wage rates, and change in equipment rates.

(2) Impact costs considered judgmental include change of efficiency resulting from rescheduling; loss of labor efficiency resulting from longer work hours; loss of efficiency caused by disruption of the orderly existing processes and procedures; inefficiency from tearing out completed work and the associated lowering of morale; loss of efficiency during rescheduling of manpower; inefficiency incurred from re-submittal of shop drawings, and sample materials; additional costs resulting from inability to transfer manpower expertise to other work; and change in management for the revised work.

(3) Impact costs considered factual but should be based on judgmental decisions including increase from extending the storage period for

materials and equipment; increase from extending the contract for labor cost and subsistence; increase from a longer period of equipment rentals or use; increase from a longer period of utilizing overhead personnel, materials, and utilities; and increase from a longer period of providing overhead and project office services.

g. Impact costs should only be included by detailed itemization and only after having been found to be valid.

14-8. Support for the Negotiations

a. Before participating as part of a negotiating team, the cost engineer must become thoroughly familiar with negotiating requirements and techniques. The expertise and support of the cost engineer can be very beneficial in major and complex changes.

b. Many of the costs that are presented in the contractor's proposal breakdown must be reviewed for allowability. Of those costs found allowable, each item must further be reviewed for applicability for that portion relevant to the particular change. The auditor has primary responsibility for this determination and should advise the negotiation team accordingly. For those cases where the auditor is not directly involved, the negotiation team must base their decisions on regulatory guidance and the best expertise available. In accomplishing the review of the proposal, the cost engineer should remain constantly aware of the contractor's profit motivation. The Government must consider all reasonable costs anticipated to be incurred by the contractor.

c. In some cases, portions of the cost estimate may be revealed only to the extent determined necessary by the negotiator to settle disputed items of work. The total of the Government estimate will not be released during negotiations. On occasion, important information has been revealed through negligence by allowing the estimate to lay open upon the negotiation table. The "For Official Use Only" designation will be removed after issuance of a signed modification.

d. Revision of the Government estimate may be necessary as a result of an error, changed conditions, or additional information. Approval authority for revisions to the estimate remains the responsibility of the Contracting Officer or authorized original estimate approving official. When the Government estimate is changed during or subsequent to conferences or negotiations, the details of the basis for the revision or changes in price shall be fully explained and documented in the price negotiation memorandum, see EFAR 36.203(102). A copy of each estimate that has been approved should be included in the official modification file along with the details and circumstances causing the revisions.

14-9. HTRW Program Specific Requirements

a. Special types of contracts have been developed to accomplish work for HTRW remediation. The following list discusses these contracts in very broad terms to aid the cost engineer to be aware of the various special contracts and significant features and intended use of each. These contracts are not necessarily available for use by all divisions and districts. This summary is not intended to aid in a decision as to the appropriateness of a specific type for a specific remediation, but only to aid the cost engineer in awareness of the type of contracts that may be available for use. The list includes contracts for studies and investigations, remedial design, and remedial action (construction). As new technologies and methods of clean-up are developed, it is expected that new specific remediation contracts will be developed; therefore, the following list will likely change over time.

b. Environmental Compliance Assessment System Contracts (ECAS). These are Cost-Plus Award Fee (CPAF), Architect Engineer Indefinite Delivery Type (AEIDT) contracts for environmental assessments at installations or facilities (Army Installations, Air Force Bases).

c. Rapid response contracts. These are Cost-Plus (CP), Indefinite Delivery Type contracts, one year plus four one-year options to perform time-

critical removal actions as defined by CERCLA. Work on-site is typically initiated within 45 days. Either Service Act rates or Davis-Bacon wage rates are paid based on the nature of the work. This contract provides on-site remedial action and minimal design services.

d. Immediate response contracts. These contracts provide immediate response to cleanup, remove, stabilize, etc., of hazardous substances. The contracts are CP type that require the contractor to respond within 72 hours of notice to clean up a site. These are not the Emergency Response Actions contracts that perform within 24 hours to an incident or spill. The Immediate Response contract provides a permanent solution to the incidence.

e. Pre-placed Remedial Action Contracts (PPRA). These are preplaced contracts to accomplish remedial action. No provisions are included for design. These are indefinite delivery order contracts with a base plus four one-year options and either firm-fixed price or cost reimbursable delivery orders.

f. Preplaced Architect-Engineer Indefinite Delivery Type contracts. These are preplaced design contracts with base plus four one-year options.

g. Total Environmental Restoration Contracts (TERC). These are Indefinite Delivery Type contracts to accomplish design, investigations, and construction for HTRW remediations.

h. Disposal or environmental contracts. These are typically preplaced Indefinite Delivery Type contracts. Disposal contracts can be HTRW or Naturally Occurring Radioactive Materials (NORM) type contracts which provide for long-term disposal at approved sites. Environmental contacts can be for the transportation or collection of HTRW type wastes.

CHAPTER 15
PREPARATION OF DREDGE COST ESTIMATES

15-1. General

a. This chapter provides guidance for estimating the dredging portion of a project.

b. Associated work items, such as clearing and grubbing, dike or weir construction, disposal area operation and maintenance, drilling and blasting, and environmental protection, are not included and should be estimated separately in accordance with other parts of this manual.

c. Each cost engineer should be aware of various techniques that have proven to produce the most accurate results for specific projects in their district/MSC.

d. Estimates will be prepared in accordance with the software program entitled, "Cost Engineering Dredge Estimating Programs (CEDEP)" and will contain a narrative documenting reasons for decisions and selections made by the cost engineer. Figure 15-1, Dredge Prism, indicates project dimensions and quantity of material considerations to determine pay items.

15-2. Definitions

a. Allowable down time. "Allowable down time" is "Non-effective working time" (see Noneffective working time).

b. Allowable over depth not dredged. "Allowable over depth not dredged" is the volume of "Allowable over depth volume" that is estimated and will not be dredged.

c. Allowable over depth volume. "Allowable over depth volume" is the volume of material between the required pay prism and the maximum pay prism.

d. CEDEP. CEDEP is the acronym for the three Cost Engineering Dredge Estimating Programs that operate on Microcomputers. The three software programs developed are Pipeline; Mechanical CEDEP; and Hopper CEDEP.

e. Dredging time. "Dredging time" is "Operating time" plus "Allowable downtime."

f. Effective working time. "Effective working time" is time during the dredging operation when actual production is taking place, such as material moving through the pipeline. "Effective working time" is chargeable to the cost of work.

g. Gross production cost. "Gross production cost" is the cost of dredging the gross volume. It is determined by multiplying the total monthly cost by the dredging time in months and adding the fixed and indirect costs.

h. Gross volume. "Gross volume" is the "Net pay volume" plus the "Nonpay volume."

i. Lost time. "Lost time" is downtime, which is not operational, normally due to a lack of required crew, major repairs and alterations, dry-docking, cessation, and collisions. "Lost time" is not chargeable to the cost of work.

j. Maximum pay volume. "Maximum pay volume" is the sum of the "Required volume" and the "Allowable over depth volume."

k. Net pay volume. "Net pay volume" is the "Maximum pay volume" minus the "Allowable over depth not dredged."

l. Non-allowable downtime. "Nonallowable downtime " is " Lost time" (See "Lost Time").

m. Noneffective working time. "Noneffective working time" is time during the dredging operation when the dredge is operational but no production is taking place, such as making changes to pipelines, cleaning trash from the suction head, minor operating repairs, and moving between locations. "Noneffective working time" is chargeable to the cost of work.

n. Nonpay volume.

(1) "Nonpay volume" based on excavation measurement is the volume of material estimated to be removed from outside the maximum pay prism.

(2) "Nonpay volume" based on fill measurement is the volume of material that results in overfill and/or washes away.

o. Operating time. "Operating time" is the "Effective working time" (See "Effective working time").

p. Percentage of effective working time. (See "Time efficiency.")

q. Required volume.

(1) "Required volume" based on excavation measurement is the volume of material to be removed from within the required pay prism.

(2) "Required volume" based on fill measurement is the volume of material to be placed within the pay prism.

r. Time efficiency. "Time efficiency" is the ratio of the "Operating time" to the "Dredging time," and is expressed as a percentage. Also known as "Percentage of effective working time" (% of EWT).

15-3. Development of Dredging Estimate

a. It is the general policy of the Corps of Engineers that dredging estimates be performed by cost engineers. The method of development of dredging estimates, in descending order, are as follows:

b. Historical information. The simplest and most reliable approach for estimating production for all types of dredges is to rely upon dredging records for the same or similar type work performed by the same or at least a similar dredge. The dredging records include the daily dredging reports. If project conditions have changed, for example, a different horsepower or haul distance, historical production information must be adjusted and documented for use in the estimate. Using such adjustments is a valid method for obtaining production rates when historical data is not available. Some valuable sources of historical dredging data include daily reports of operations, operations personnel, other districts, and regional dredge teams. Cost and pricing data may be obtained from audits and contract modifications. Adjustments should be made to this data reflecting current pricing levels.

c. Similar projects. Information may be obtained from similar projects with similar characteristics to prepare a dredging estimate.

d. Regional dredge teams. The use of regional dredge teams is recommended. Members of regional dredge teams can be contacted for guidance on production rates, effective times, cost data, or other pertinent information.

e. Combining Methods. A combination of the methods, as previously described, may be used at the discretion and judgment of the cost engineer.

f. Computer programs. When historical data is not available, CEDEP may be used to compute a production rate, or the production rate may be computed using recognized commercially generated programs or industry generated programs. The cost engineer should include in the estimate a complete statement of the source of computer program used in the estimate.

15-4. Project Overview

a. The cost engineer should review the known project conditions and scope of work for the following items and determine which items are judgmental and which are factual at the time the estimate is prepared.

b. Location of work. This information is necessary to make a determination of availability of historical data, plant availability, mobilization distances, disposal areas, and restraints placed on the various types of dredge operations.

c. Type of material to be dredged. Information may be obtained from geotechnical investigations, expert opinion, historical data of specific site or adjoining areas, site visits, or similar projects with similar characteristics.

d. Placement area. Information should be obtained on location, size, type, regulatory and permit requirements.

e. Project dimensions. Project dimensions may include such items as length, width, depth, and channel alignment.

f. Site restrictions. This may include such items as waterway usage, vessel traffic, as well as time, weather, noise, and environmental restraints. Many areas are subject to restricted dredging seasons. To minimize environmental impacts creating scheduling conflicts, higher costs may occur and must be considered and documented in the cost estimate.

15-5. Selection of Equipment

a. An economical dredge shall be selected. Dredge type and size depend mainly on availability, job duration, type of material, exposure to the elements, disposal area restraints, environmental restraints, and production requirements. The narrative will include the rationale used by the cost engineer for equipment selection.

b. Pipeline Dredging. The term "pipeline" refers to the discharge method through on-board pumps. The common types are cutterhead, suction, and dustpan dredges which refer to the intake method. Pipeline dredges are sized by the inside diameter of the dredge discharge flange, and they are effective in dredging densely packed materials. Although they are best suited for low-traffic areas and sheltered waterways such as rivers, bays, harbors, and canals, some pipeline dredges are equipped to operate in calm to moderate seas offshore. Pipeline dredges lend themselves well to shore disposal operations.

c. Hopper Dredging. Hopper dredges are sized or classed by their hopper capacity. However, a particular size dredge is actually limited by its weight carrying capacity and the environmental restrictions of the project. Hopper dredges operate in cycles, and they normally cover the length of the total dredging area, deepening it gradually. They are the most efficient type dredge for excavating loose, unconsolidated material and are used mainly in exposed harbors and shipping channels where traffic and operating conditions rule out the use of stationary dredges.

d. Mechanical Dredging. Mechanical dredges include bucket, bucket-ladder, clamshell, and dragline dredges. Transportation of the dredged material is made by additional plant, tug and barge, or scow. Mechanical dredges are classified by bucket size and are best adapted for dredging fine-grained material. They are the most efficient dredge for working near bridges, docks, wharfs, piers, or breakwater structures.

e. Specialty Dredging. Some dredging projects have unusual conditions or unique project requirements that cannot readily utilize standard dredge plant. There are a variety of specialized dredge plant which must be considered under these circumstances.

15-6. Production

a. In calculating production rates for dredging, effective time is commonly used. Lost time due to major repairs and alteration, cessation, and collisions is not used in dredging time calculations. Whenever possible, the production rate used in CEDEP should be based on historical data. When historical data is not available, the sequence described in this chapter shall be used.

b. Pipeline Dredging. Production is determined by the pumping rate and the effective time.

(1) Pumping rate is affected by items such as water depth, density of material, distance discharged, available horsepower, bank height, wave climate, disposal area restraints, environmental restraints, and dredge configuration, such as spud carriage, ladder pump, degassers, and hoffa valve.

(2) The effective time is affected by items such as weather, handling pipeline, moving swing wires, minor operating repairs, vessel traffic, repositioning the dredge, and surveys.

c. Hopper Dredging. Hopper dredge production is best evaluated in terms of its cycle components and the effective time.

(1) The hopper dredge cycle consists of excavation time, transport time, and disposal time.

Excavation time per load may be limited to pumping to overflow only, due to environmental concerns, or may be continued beyond overflow to obtain an economic or a maximum load. Transport time may be affected by items such as ship traffic, weather, distance, and tides. Disposal consists of either gravity dumping or pumping out the material. The time required to gravity dump the material in open water depends on the type of material and the dredge. If the material is pumped out, the time becomes a function of pump size, discharge diameter, and pipeline length, similar to a pipeline dredge. The volume per load depends on the hopper size, the dredge's load carrying capability, type and characteristics of material, distance to the placement area, and environmental concerns.

(2) The effective time is affected by items such as vessel traffic, minor operating repairs, and refueling.

d. Mechanical Dredging. To determine mechanical dredge production, the cost engineer must calculate both a dredge excavation cycle time and a haul cycle time. Effective time is considered separately for each cycle. The longer of these two cycle times determines the production rate. When the haul cycle time is longer than the dredge excavation time, the dredge is sitting idle while waiting on scows. Normally, when this occurs, the number of scows required is increased to achieve the most efficient cost.

(1) The dredge excavation cycle consists of excavating the material and loading scows. This cycle is affected by items such as bucket size, type of material, operator efficiency, and size of dredge. Effective time is affected by items such as weather, vessel traffic, repositioning of dredge, and minor operating repairs.

(2) The haul cycle consists of transport time and disposal time. This cycle is affected by the size, type, and number of scows available, as well as the size, type, and number of towing vessels available. Effective time is affected by items such as weather, vessel traffic, and minor operating repairs.

e. Specialty Dredging. The cost engineer will have to investigate in detail the method, equipment, and expected production on a case-by-case basis.

15-7. Monthly Costs

a. The monthly costs for all types of dredges are based on labor, equipment, and other monthly costs.

b. Labor costs consist of wages, fringe benefits, taxes, and insurance. Labor consists of personnel necessary for the operation of the dredge, attendant plant and equipment with required supervision, and shore personnel used for the dredging work.

c. Equipment costs consist of ownership costs and operating costs. Costs for dredge plant will be based on historical data. In the absence of valid historical data, the CEDEP will be the basis for cost of dredge plant. Other equipment costs shall be obtained from EP 1110-1-8, Equipment Ownership Schedule.

d. Indirect costs are to be determined by the cost engineer. In addition, such things as surveys, environmental monitoring, and navigation aids may need to be included.

15-8. Fixed Costs

The fixed costs for all types of dredges are project specific. They are one-time costs for the project that are not included elsewhere.

15-9. Pay Items

a. Mobilization and demobilization. The cost estimate for this item consists of the following:

(1) Preparing dredge and attendant plant for transfer. Costs incurred may consist of such items as preparing laid-up equipment for use, re-inspection, and stocking equipment and supplies.

(2) Mobilization transfer costs. This item includes the cost to move all plant and equipment and the return of the tug or towing vessels(s).

(3) Preparing the plant for work. This item includes preparation costs which are incurred to set up the equipment to start work, assemble, and place discharge line and boosters.

(4) Construction support site. Establishing a work yard at or near the project site may be necessary and is a part of mobilization cost.

(5) Demobilize plant. This item includes preparing the dredge and attendant plant for transfer.

(6) Demobilization transfer costs. This item is similar to mobilization transfer costs. Mobilization and demobilization distances may not necessarily be the same. Reasons for using different distances must be documented.

(7) Prepare plant for lay-up. This item includes all costs to secure machinery and equipment for storage.

(8) Indirect costs. Indirect costs must be included in the mobilization and demobilization pay item. They should be the same as those used for the dredging pay item.

b. Dredging. Pay for unit price contracts may be based on volume, area, time, scow or bin measure, or lump sum as described in ER 1130-2-307. To determine the unit cost of dredging, divide the gross production cost by the number of pay units.

(1) Pipeline dredge gross production costs consist of costs associated with dredging time and are not separated by elements of work.

(2) Hopper dredge and mechanical dredge gross production costs consist of costs associated with excavation time, transportation time, and disposal time.

(3) Specialty dredging gross production costs will be determined on a case-by-case basis.

c. Total Dredging Costs. Total dredging cost includes mobilization and demobilization cost plus dredging cost as previously discussed.

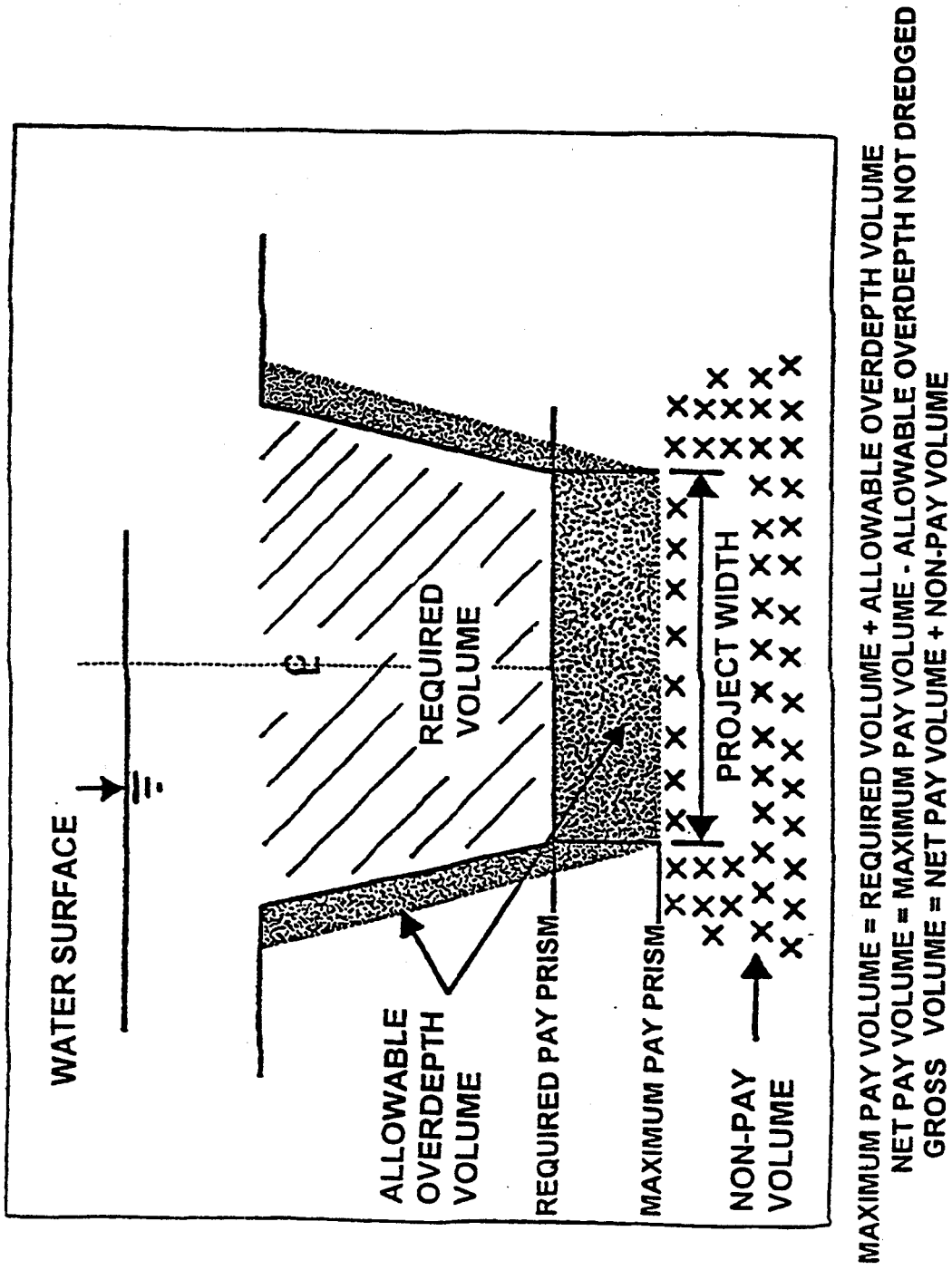


Figure 15-1. Dredging pay prism

CHAPTER 16
PROTESTS OR LITIGATION CONCERNING THE GOVERNMENT ESTIMATE

16-1. General

a. There are two major situations when the cost engineer may become involved in litigation concerning the Government estimate.

(1) Either a bid protest when bids are opened,

(2) Or if a proposed change order/ modification is not accepted by a contractor, and the contractor pursues the dispute.

b. The procedure to process the issues are the same for all types of projects or contracts associated with military, civil works or HTRW programs. When either of the above occurs, the cost engineer has a major role in reviewing the Government estimate and evaluating the Government's position.

c. Bid protests. During the bidding process, and upon receipt of bids, if all bids are sufficiently higher than the Government estimate, any one of the proposer/offerers can protest the unreasonableness of the Government estimate by stating it contains errors or omissions; too low and not fair and reasonable. A major concern occurs for a bid opening in Civil Works as the contract cannot be awarded to the low bidder if the low bid exceeds the Government estimate by 25 percent; and 15 percent for military programs. In such a case, a bid protest will delay all further contractual action to award until either the bid protester withdraws the protest; the Government estimate is revised; or a determination is made through the judicial process.

d. Contract modifications/change orders. During the on-going construction, changes will occur, including overruns of quantities, and disagreements may occur between the contractor and the Government. If a dispute does arise, it generally concerns a disagreement between what the government considers a fair and reasonable cost as compared to the proposal offered by the contractor. In the event agreement can be reached between the contractor and the Government, a dispute, or claim may result.

16-2. Preparation of Technical and Cost Analysis by Cost Engineer

a. The cost engineer should prepare a technical and cost analysis evaluation for documentation of the contract file. Major factors in the analysis include:

(1) The technical analysis will consist of an in-depth, point-by-point response to all issues raised on the cost estimate by the protestor or contractor.

(2) The cost analysis will consist of a review of the Government estimate, including all backup and supporting data, and assumptions made which support the estimate.

b. Additional information concerning factors to be considered in the technical and cost analysis are presented in chapter 14. Reference is made to FAR sub-part 15.608 for proposal evaluation.

16-3. Review of the Government Estimate

a. Bid protests. If there is a bid protest concerning the reasonableness of the Government estimate, i.e., a bidder is claiming the estimate is too low, the cost engineer should conduct an independent review of the Government estimate.

(1) The cost engineer should review the estimate to be sure that it does not contain mistakes. This evaluation must be completed as soon as possible to provide timely advice to the District staff to preclude delay in award. If the Government estimate is revised, and the revised estimate brings an offeror's price within the range of a fair and reasonable price, award will be made provided funds are available. The revised estimate requires the same approval authority as the original Government estimate.

(2) When the Government estimate is reviewed and has been determined to be fair and reasonable for the intended scope of work, unless the protestor withdraws the bid protest, the usual procedure will require a Contracting Officers

Decision (COD) in the form of a (letter) memorandum of denial of the protest unless the protestor withdraws the bid protest.

(3) Meetings may be held with the apparent low bidder or contractor prior to issuance of the COD memoranda to ensure that both the Government and the protestor have the opportunity to review the project and agree to the scope of work as specified by the plans and specifications. Meetings will also allow discussion whether there are unusual conditions or circumstances that may affect or complicate the work. If a meeting reveals an error or omission in the Government estimate, it may be revised as previously discussed.

(4) The protest/dispute may take several months to resolve. The Government's position may be reviewed and evaluated at the district, MSC, and HQUSACE, as well as by the General Accounting Office, a court, or a board of contract appeals. During each of these reviews, questions will arise, and the cost engineer will be called on to support the estimate. The cost engineer(s) responsible for preparing the Government estimate are most familiar with the estimate, and as such, should be prepared to assist counsel, contracting, and other staff to resolve the issue; and be prepared to testify in court and certify the validity of the estimate.

b. Contract modifications/change orders. The cost engineer may also be required to prepare cost estimates for major or complex changes; or design change orders for on-going construction projects; major or extensive quantity overrun bid items; or even assisting in evaluating claims occurring during construction whereby an Government estimate is required.

(1) Prior to the cost engineer finalizing the Government estimate, it is important to meet with the contractor to agree on the scope of work concerning change orders for on-going construction. The cost engineer will prepare the cost estimate as detailed in chapter 14. On occasion, disputes arise between the Government and the contractor, primarily due to a very wide variance between the value of work estimated by the contractor and the Government estimate being on the low side. When a dispute arises, meetings are necessary in an attempt to resolve the difference in cost between the contractor and the Government. Even when the scope may be in general agreement, the cost may be in dispute. The Contracting Officer may issue a unilateral modification establishing the cost and the modification may result in litigation. The procedure upon encountering an impasse, generally results in the Government issuing a COD, and the process is the same as previously discussed for a bid protest.

(2) It is possible that not all of the facts of a claim, change, or major overrun of quantities have been provided or verified by the cost engineer. In those cases where the cost engineer has prepared a Government estimate, but due to circumstances has not met with the contractor, and if additional facts are revealed, the cost engineer may revise the Government estimate as appropriate. The revised Government estimate requires the same approval authority as the original Government estimate. Upon revising the Government estimate and mutual agreement by the contractor and Government, a modification is processed.

(3) In May 1995, EFAR was revised as follows, " When the Government estimate is changed during or subsequent to conferences or negotiation, the basis for the revision or changes in price shall be fully explained and documented in the price negotiation memorandum or Business Clearance Memorandum (EFARS 36.203.102). Judgment in making this type of decision should be based on the circumstances of a particular issue, not all encompassing, and recommendations should be made to the Contracting Officer. For major differences in cost, disputes or claims not resolved, a revised Government estimate is recommended, supported by a technical and cost analysis of the dispute in litigation.

16-4. Security and Disclosure of Government Estimates

Security and disclosure of the revised Government estimate should be handled in the same manner as the original Government estimate. Procedures for handling the Government estimate are described in chapter 2.

16-5. Mistake in Bids

a. General. After the opening of bids, contracting officers shall examine all bids for mistakes. In cases of apparent mistakes and in cases where the contracting officer has reason to believe that a mistake may have been made, the contracting officer shall request from the bidder a verification of the bid, calling attention to the suspected mistake. Any clerical mistake, apparent on its face in the bid, i.e., obvious misplacement of a decimal point, may be corrected by the contracting officer before award, after first receiving verification of the bid intended.

b. For other mistakes disclosed before award in sealed bidding, the bidder must provide clear and convincing evidence to establish both the existence of the mistake and the bid actually intended. The contracting officer must make a determination as to the circumstances to verify the mistake; to allow the bidder to withdraw the bid; or make a determination that the bid be neither withdrawn nor corrected. The cost engineer may be part of the team of specialists to provide an analysis and a recommendation to the contracting officer. For the cost engineer, the evaluation could be the verification of a quantity as related to a unit price bid item; or determination of a fair and reasonable cost for a service or product. The cost engineer may refer to FAR part 14 for the appropriate definitions, discussions, and overview of the acquisition requirements pertaining to sealed bidding.

c. The process for determination of a mistake in bid when the solicitation of a project is contracted by negotiated procurement is similar to the procedure as for sealed bidding. Additional tools are available to the Government to amend a solicitation before award as compared to sealed bidding. Clarification may be used to communicate with an offerer for the sole purpose of eliminating minor irregularities, informalities, or apparent clerical mistakes in the proposal. In negotiated procurement, discussions means any oral or written communications between the Government and an offeror that involves information essential to determine the acceptability of a proposal or provides the offeror an opportunity to revise or modify its proposal. When, either before or after receipt of proposals, the government changes, relaxes, increases, or otherwise modifies its requirements, the contracting officer shall issue a written amendment to the solicitation. In the event evaluation factors are selected to evaluate proposals, price or cost to the Government shall be included as an evaluations factor in every source selection. If a mistake in a proposal is suspected, the contracting officer shall advise the offeror or otherwise identifying the area of the proposal where the suspected mistake is and request verification. If the offeror verifies its proposal, award may be made. If an offeror alleges a mistake in its proposal, the contracting officer shall advise the offeror that it may withdraw the proposal or seek correction by submitting clear and convincing evidence and a determination is made by agency. The cost engineer may also be involved in providing support to the contracting officer if any mistake concerns scope, quantity or prices in the Government estimate. The cost engineer may refer to FAR part 15 for the appropriate definitions, discussions and overview of the acquisition requirements pertaining to negotiated procurement. In the event negotiations are conducted with offerors in the competitive field, the cost engineer should be a member of the negotiation team.

16-6. Civil Works Program Specific Requirements

a. Statutory cost limitations. In accordance with 33 U.S.C. 622 and 624, no civil works construction shall be awarded if the contract price exceeds the Government estimate prepared in accordance with 36.203.100 by more than 25 percent. This limitation does not apply to change orders or contract modifications.

b. Special problems.

(1) For special cost engineering dredging problems or concerns, the use of the Corps' Regional Dredge Teams are recommended. These teams are composed of cost engineering and construction-operations personnel most experienced in dredging and established for the East Coast, West Coast, Gulf Coast, the Great Lakes, and Mississippi River and tributaries. The appropriate team is convened at the request of the District Engineer. The chairman of the regional dredge teams shall be appointed by HQUSACE, Chief, Cost Engineering Branch, CECW-EC, and

Chief, Operations Branch, CECW-OM, and is responsible to ensure that the teams are maintained with competent cost engineering and construction operations personnel and that requests for assistance are promptly fulfilled.

(2) The regional dredge teams are designed to provide assistance to all districts in the evaluation of bid protests, mistakes in bids, or other unique issues that may be required to validate the estimate for the Government. Further, the teams are available to support districts that seldom do large dredging contracts and, therefore, may have little expertise or historical cost data that is needed to prepare accurate planning estimates and/or Government estimates for contract award. The teams' role in all cases is to act in an advisory capacity with the requesting district having the responsibility and authority to make all final decisions.

(3) The regional dredge teams are represented in geographical areas and the office of the chairman of each team is located in North Atlantic Division; Seattle District; New Orleans District, and Detroit District.

CHAPTER 17
STANDARD ESTIMATING FORMS

17-1. General

a. This chapter contains a discussion of the standard estimating forms with a brief explanation of their use in presenting manually prepared construction cost estimates. A project narrative will be provided for each cost estimate prepared using these forms. Refer to chapter 4 for factors to be considered when preparing the narrative.

b. Completed examples of these forms are provided in this chapter. Estimates developed using these forms may be prepared in an electronic format, however, pencil format is the preferred method. For uniformity in form completion, the following general guidance is given:

(1) Each original sheet should be in reproducible quality.

(2) Once the estimate has been completed, checked, and approved, the desired number of copies should be reproduced from the original.

(3) For A-E prepared estimates, the original should be forwarded with the final submittal.

(4) Pencil originals should normally be retained by the cost engineering office preparing the estimate.

(5) Each sheet should be initialed by both the preparer and the reviewer.

17-2. Standard Forms

a. Civil Works Program. The following standard estimating forms will be used in preparing cost estimates when the use of the MCACES software is exempted by ER 1110-2-1302. These forms have been designated as a guide in the development of a reasonable cost estimate for civil works.

(1) Reasonable Contract Estimate, ENG Form 1738-R (figure 17-1), is used to summarize the total cost estimate by tabulating the required work items and the corresponding unit prices and lump sum amounts developed on the detail summary sheets. The last page of this form, or the page that shows the estimated total cost, will include the appropriate signatures necessary to support the type of cost estimate being prepared.

(2) Reasonable Contract Estimate Detail Summary Sheet, ENG Form 1739-R (figure 17-2), is used to summarize the various direct cost components and to allocate distributed costs in developing the unit or lump sum prices for the various work items being estimated. It is useful for showing the equipment, labor, material, and supply costs for the whole job as general information and can be used for comparison with the records on other jobs of a similar nature. The work item and quantity data shall be entered in the first four columns. Mobilization and demobilization costs and the total equipment, labor, material, and supply costs, as determined from the supporting worksheets (ENG Forms 1741-R, 1741a-R, 1741b-R, or 1741c-R) or from the Worksheet Summary (ENG Form 1740-R) will be entered in the appropriate columns provided. The total distributed cost, including bond costs and profit when appropriate, will be added to the subtotal direct cost for each work item on a proportional basis. The unit cost for each unit price item will then be determined by dividing the total cost by the quantity for that item. The adjusted unit cost column will be used to round off the unit cost or lump sum amounts to avoid the use of decimals. The adjusted unit costs and amounts should be transferred to ENG Form 1738-R or other similar type tabulation sheet.

(3) Reasonable Contract Estimate Worksheet Summary, ENG Form 1740-R (figure 17-3), is used to summarize the cost of equipment, labor, materials, and supplies for a specific construction task prior to transfer to the Detail Summary Sheet (ENG Form 1739-R) for those work items which require more than one set of worksheets.

(4) Reasonable Contract Estimate Worksheets, ENG Forms 1741-R, 1741a-R, 1741b-R, and 1741c-R (figures 17-4, 17-5, 17-6, and 17-7) are used in developing the costs of equipment, labor, materials, and supplies necessary to accomplish a specific construction task. ENG Form 1741 should define the plan of operation for performing the work for the specific construction task. It should include a clear description of the scope of the construction task and any parameters that may influence productivity. Equipment or labor output controlling the rate of production should be stated along with the calculations to show the time required to perform the work. ENG Forms 1741a-R and 1741b-R

provide a step-by-step procedure in developing the total equipment, labor, materials, and supply costs to support the construction task plan of operations described on ENG Form 1741-R. ENG Form 1741c-R combines the information described on ENG Forms 1741a-R and 1741b-R and may be used when the equipment, labor, material, and supply requirements for the work item are small.

(5) Telephone quotation sheet (Figure 17-8), example shown in appendix B, is used to identify and record costs obtained from subcontractors or vendors in developing an estimate.

(6) Wage Rate Calculations, DA Form 5420-R (figure 17-9), will be used to develop the total hourly rate for the various classifications of labor required for the job. The "Effective Period" block on the form should show the dates the wage rates are applicable. The basic hourly wage rate should be a reasonable estimate of the average wage the contractor would expect to pay during the construction period. In an estimate for a construction contract modification, the actual wage rates paid by the contractor should be used if available. Enter the number of shifts per day, hours per shift and days per week in the "Operational Shifts" block to support the overtime factor used. For example, 2/8's 5 days, indicates two 8-hour shifts per day, 5 days per week. Details and procedures for developing the costs for each item identified in the column headings are described in chapter 5, table 5-1.

b. Military Program. Although no forms are mandatory for use in preparing early design estimates, it is recommended that the cost engineer consider using forms expressing unit price and extended price in columns. The following standard estimating forms will be used in preparing detailed construction cost estimates for military projects.

(1) Estimate Detail Summary Sheet, DA Form 5417-R (figure 17-10), is used to summarize project costs, to relate the method of distribution of overhead and profit to the various bid items, and to determine the overall price for each bid item. For unit price bid items, calculations, results, and rounding may be shown on the line following the total bid item price calculation. Rounding of Lump Sum bid items may also be shown similarly. The total cost, or adjusted cost, should be transferred to the bidding schedule.

(2) Cost Estimate Analysis, DA Form 5418-R (figure 17-11), is used to itemize and quantify work tasks and to calculate the direct cost for each task. The form follows, column-by-column, the format shown in the UPB. It is also intended as the direct cost summary sheet for each bid item. Items of significant cost should relate to other detailed backup sheets of analysis or quotations.

(3) Construction Cost Estimate Worksheet, ENG Form 150a (figure 17-12), is used for miscellaneous cost items. Common uses include quantity take-off, description and discussion pages, and price quotations.

(4) Crew and Productivity Worksheet, DA Form 5419-R (figure 17-13), is used to develop a crew analysis and task unit cost for labor and equipment. This is necessary for significant and unusual construction tasks. The "CREW REF NO" can be completed similar to the crew names described in the UPB.

(5) Wage Rate Calculations, DA Form 5420-R (figure 17-9), is the same form as used for civil works.

c. HTRW. For HTRW estimates which are prepared manually, the DA Form 5400 Series and/or the ENG Form 1700 Series estimating forms may be used.

REASONABLE CONTRACT ESTIMATE
(ER 1110-2-1302)

SHEET 1 OF 1

PROJECT
CONSTRUCT PUMP PLANT A

INVITATION NO.
DACW97-01-0001

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	ESTIMATED AMOUNT
1	MOBLIZATION/DEMOBLIZATION (WBS 13.01)	1	JOB	L.S.	$19,700.00
2	PUMPING PLANT A (WBS 13.00)	1	JOB	L.S.	$893,800.00
		TOTAL			$913,500.00
	APPROVED:				
	CHIEF COST ENGINEERING BRANCH				
	DATE				
	EFFECTIVE PRICE DATE				

ENG FORM 1738-R, MAR 94 EDITION OF APR 87 IS OBSOLETE. Proponent: CECW-EC

Figure 17-1. Example reasonable contract estimate
(ENG Form 1738-R)

REASONABLE CONTRACT ESTIMATE DETAIL SUMMARY SHEET

SHEET 1 OF 1

PROJECT: CONSTRUCT PUMP PLANT A

326

BID ITEM NO	DESIGNATION	QUANTITY	UNIT	EQUIPMENT	MOBILIZATION AND DEMOBILIZATION	LABOR	MATERIALS	SUPPLIES	SUBTOTAL	DISTRIBUTED COSTS	TOTAL COSTS	UNIT COST	AWARDED UNIT COST	AWARDED AMOUNT	NO.
1	(WBS 13.01) MOB/DEMOB	1	JOB	$ 7,850		$ 3,270		$ 3,800	$ 14,920	$ 4,774	$ 19,694	L.S.	L.S.	$ 19,700	
2	(WBS 13.00) PUMP PLANT A	1	JOB	101,586		146,731	408,385	20,419	677,121	216,679	893,800	L.S.	L.S.	893,800	
	TOTALS:			$ 109,436		$ 150,001	$ 408,385	$ 24,219	692,041	$221,453	$ 913,494	L.S.	L.S.	$ 913,500	

ENG FORM 1739-R, MAR 84 EDITION OF FEB 79 IS OBSOLETE. (BR 1110-3-1303)

Figure 17-2. Example reasonable contract estimate detail summary sheet (ENG Form 1739-R)

REASONABLE CONTRACT ESTIMATE WORKSHEET SUMMARY					SHEET 1 OF 29	
PROJECT CONSTRUCT PUMPING PLANT						
SUBJECT BI 02. (WBS 13.00) PUMP PLANT A					QUANTITY 1-JOB	
SUBITEM	EQUIPMENT	LABOR	MATERIALS	SUPPLIES	SUBTOTAL	REF.PG.
.01-(WBS 13.03) CARE& DIVERSION OF WATER	$35,200.00	$7,800.00	$900.00	$1,000.00	$44,900.00	4
.02 (WBS) 13.10) EARTHWORK FOR STRUCTURE	$45,100.00	$6,200.00	$0.00	$490.00	$51,780.00	7
.03 (WBS 13.74) SUBSTRUCTURE	$3,806.00	$51,581.00	$26,785.00	$12,809.00	$94,981.00	11
.04 (WBS 13.75) SUPERSTRUCTURE	$780.00	$35,600.00	$65,100.00	$1,300.00	$102,780.00	15
.05 (WBS 13.76) MACHINERY & APPT.	$12,800.00	$28,300.00	$265,000.00	$4,320.00	$310,420.00	18
.06 (WBS 13.77) GATES & VALVES	$2,200.00	$12,400.00	$38,100.00	$400.00	$53,100.00	22
.07 (13.78) AUXILIARY EQUIPMENT	$500.00	$1,200.00	$8,400.00	$100.00	$10,200.00	24
.08 (WBS 13.98) ASSOCIATED ITEMS	$1,200.00	$3,650.00	$4,100.00	$0.00	$8,950.00	26
NOTE: BID ITEM 01 & SUBITEMS 02.01 THROUGH						
02.08 HAVE DETAILED COSTS DEVELOPED SIMILIAR						
TO THOSE SHOWN FOR ITEM 02.03. THE DETAILED						
ESTIMATING SHEETS AND BACK-UP SHEETS ARE						
EXCLUDED FROM THIS EXAMPLE TO MINIMIZE PRINTING.						
TOTALS	$101,586.00	$146,731.00	$408,385.00	$20,419.00	$677,121.00	

ENG FORM 1740-R, MAR 94 (ER 1110-2-1302) EDITION OF AUG 69 IS OBSOLETE. Proponent: CECW-EC

Figure 17-3. Example reasonable contract estimate worksheet summary (ENG Form 1740-R)

REASONABLE CONTRACT ESTIMATE WORKSHEET (ER 1110-2-1302)		SHEET 8 OF 29
PROJECT CONSTRUCT PUMP PLANT		
SUBJECT BI 02.03 (WBS 13.74) SUBSTRUCTURE	QUANTITY 165 M3	
	SHIFTS PER DAY 1	HOURS PER SHIFT 10

PLAN OF OPERATIONS

USE READY-MIX SUPPLIER FOR 20.7 MPA CONCRETE

1. PLACE CONCRETE - 164M3 @ 7.5M3/HR = SAY 22 HRS
   USE: HYD S.P. CRANE - 30T C7522000
   CONCRETE BUCKET - 2CY B30Z1055
   AIR COMPRESSOR - 250CFM A1520140
   CONCRETE VIB - 2.5 IN AIR C65XX001
   LAB 4/M
   5 LABORERS
   1 CARPENTER

2. FINISH WORK -
   FLOAT 2 CEMENT FIN - 293M2/16.3M2/HR = SAY 18 HRS
   STEEL TROWEL - 109M2/7.3M2/HR = SAY 15 HRS
   USE 1 CEMENT FIN
   1 EA. POWER TROWEL

3. INSTALL WATER STOP - 8"
   1 CARP @ 2M/HR = 53/2 = SAY 27 MHRS

4. CURE CONCRETE -
   USE 2 LABORERS - 4HR/DAY X 14 DAYS = 56 HRS

ENG FORM 1741-R, MAR 94 EDITION OF NOV 81 IS OBSOLETE. Proponent: CECW-EC

Figure 17-4. Example reasonable contract estimate worksheet
(ENG Form 1741-R, Sheet 1 of 2)

REASONABLE CONTRACT ESTIMATE WORKSHEET
(ER 1110-2-1302)

SHEET 9 OF 29

PROJECT
CONSTRUCT PUMP PLANT A

SUBJECT
BI 02.03 (WBS 13.74) SUBSTRUCTURE

QUANTITY 165 M3

SHIFTS PER DAY 1

HOURS PER SHIFT 10

PLAN OF OPERATIONS

5. USE SUBCONTRACT QUOTE FOR RESTEEL 7.4 MT

6. FORMING - USE 1 CARP 4/M + 4 CARP

A. BLDG. WALL FORMS - 2 USES - 315M2/2 = 158M2

BLDG @ 3.9M2/CREW HR = 40.5 CREW HRS

B. SET & STRIP -

WALLS @ 3.9M2/CREW HRS = 314M2/3.9 = 80.5 HRS

SLAB EDGE @ 7M2/CREW HRS 53/7 = 7.6 HRS

ELEVATED SLAB @ 3M2/CREW HRS = 109/3 = 36.3 HRS

SET/REMOVE SHORING @ 2M2/HR = 109/2 = 54.5 HRS

TOTAL CREW HRS. BLDG/SET/STRIP = 219.4

SAY 220 HRS

C. FORM LUMBER -

SLAB @ 30BF/M2 = 30 (53) = 1590 BF

WALL @ 35BF/M2 = 35 (153) = 5530 BF

ELEV SLAB @ 40BF/M2 = (109) = 4360 BF

TOTAL 11,480 BF

ENG FORM 1741-R, MAR 94 EDITION OF NOV 81 IS OBSOLETE. (Proponent: CECW-EC)

Figure 17-4. Example reasonable contract estimate worksheet (ENG Form 1741-R, Sheet 2 of 2)

REASONABLE CONTRACT ESTIMATE WORKSHEET
(ER 1110-2-1302)

SHEET 10 OF 29

SUBJECT ITEM 02.03 SUBSTRUCTURE CONCRETE (WBS 13.74)

QUANTITY 165M3

EQUIPMENT

UNIT OF EQUIPMENT	SIZE	NO.	HOURS*	RATE	AMOUNT
1. PLACE CONCRETE					
HYD S.P. R.T. CRANE - C75Z2000	30T	1	22.00	$42.61	$937.42
CONCRETE BUCKET - B30Z1055	2CY	1	22.00	$0.56	$12.32
AIR COMPRESSOR - A15Z0140	250CFM	1	22.00	$8.66	$190.52
CONCRETE VIBRATOR - C65XX001	2.5"	2	22.00	$0.85	$37.40
AIR HOSE - 100LF - A20Z0430	1.5"	2	22.00	$0.56	$24.64
2. FINISH CONCRETE					
STEEL POWER TROWELL - C25Z1560	46"	1	15.00	$1.63	$24.45
EQUIPMENT RATES TAKEN FROM EP-1110-1-8					
VOL.#8, AUG 95. RATES HAVE BEEN ADJUSTED					
FOR 50 HR. WORK WEEK.					
*NOTE: USE WORKING HOURS				SUBTOTAL	$1,226.75
	SMALL TOOLS		5.0	% OF LABOR	$2,579.00
				TOTAL EQUIPMENT COST	$3,805.75

LABOR

OPERATIONS	CRAFT	NO.	HOURS	RATE	AMOUNT
1. PLACE CONCRETE	4/M X - LABOR	1	22	$32.56	$716.32
	X-LABOR	5	22	$29.51	$3,246.10
	X-CARPENTER	1	22	$35.76	$786.71
	X- EQOPRMED	1	22	$38.15	$839.30
2. FINISH CONCRETE					
FLOAT	X-CEMTFINR	2	18	$33.63	$1,210.68
STEEL TROWELL	X-CEMTFINR	1	15	$33.63	$504.45
3. INSTALL WATER STOP	X-CARPENTER	1	27	$35.76	$965.52
4. CURE CONCRETE	X-LABOR	2	56	$29.51	$3,305.12
6. FORMWORK	4/M X-CARPENTER	1	220	$38.81	$8,538.20
	X-CARPENTER	4	220	$35.76	$31,468.80
				TOTAL LABOR COST	$51,581.20

ENG FORM 1741a-R, MAR 94 EDITION OF NOV 81 IS OBSOLETE. Proponent: CECW-EC

Figure 17-5. Example reasonable contract estimate worksheet (ENG Form 1741a-R)

REASONABLE CONTRACT ESTIMATE WORKSHEET
(ER 1110-2-1302)

SHEET 11 OF 29

SUBJECT
ITEM 02.03 SUBSTRUCTURE CONCRETE (WBS 13.74)

QUANTITY
165 M3

MATERIALS

DESCRIPTION	UNIT	QUANTITY	PRICE	AMOUNT
* READY MIX CONCRETE 20.7 MPA (INCLUDES WASTE)	M3	175	$78.60	$13,755.00
* WATER STOP 9" PVC X 3/8" THK	M	53	$11.75	$622.75
SUBTOTAL: $14,378				
SALES TAX: 6%				$863.00
RESTEEL SUBCONTRACTOR	MT	7.4	$1,560.00	$11,544.00
			TOTAL MATERIALS COST	$26,784.75

SUPPLIES

DESCRIPTION	UNIT	QUANTITY	PRICE	AMOUNT
CURING SUPPLIES	M2	476	$0.50	$238.00
FORM PLYWOOD 1/2"	M2	56	$7.00	$392.00
FORM PLYWOOD 3/4"	M2	267	$10.00	$2,670.00
FORM LUMBER	MBF	12	$375.00	$4,500.00
FORM TIES & OIL	M2	476	$9.00	$4,284.00
SUBTOTAL: $12,084				
SALES TAX 6%				$725.00
			TOTAL SUPPLIES COST	$12,809.

SUMMARY FOR TRANSFER TO ENG FORM 1739-R OR 1740-R

EQUIPMENT	$3,806.00
LABOR	$51,581.00
MATERIALS	$26,785.00
SUPPLIES	$12,809.00
TOTAL	$94,981.00

REMARKS: (Indicate by askerisk (*) prices on items which are based on quotations from manufacturers or suppliers.)

DATE: 03 01 97

PREPARED BY: J. SMITH

CHECKED BY: J. DOE

ENG FORM 1741b-R, MAR 94 EDITION OF NOV 81 IS OBSOLETE. (Prescribed: CECW-EC)

Figure 17-6. Example reasonable contract estimate worksheet (ENG Form 1741b-R)

REASONABLE CONTRACT ESTIMATE WORKSHEET	SHEET 12 OF 29
SUBJECT ITEM 02.03 SUBSTRUCTURE CONCRETE (WBS 13.74)	QUANTITY 165 M3

EQUIPMENT

UNIT OF EQUIPMENT	SIZE	NO.	HOURS*	RATE	AMOUNT
HYD S.P. R.T. CRANE - C752000	30	1	22	$42.61	$937.42
CONCRETE BUCKET - B30Z1055	2CY	1	22	$0.56	$12.32
AIR COMPRESSOR - A15Z0140	250CFM	1	22	$8.66	$190.52
CONCRETE VIBRATOR - C65XX001	2.5"	2	22	$0.85	$37.40
AIR HOSE - 100LF - A20Z0430	1.5"	2	22	$0.56	$24.64
STEEL POWER TROWEL - C25Z156	46"	1	15	$1.63	$24.45
*(*NOTE: USE WORKING HOURS)*				SUBTOTAL	$1,226.75
				MOBILIZATION AND DEMOBILIZATION	
				SMALL TOOLS 5.00 % OF LABOR	$2,579.00
				TOTAL EQUIPMENT COST	$3,805.75

LABOR

OPERATION	CRAFTS	NO.	HOURS	RATE	AMOUNT
1. PLACE CONCRETE	4/M X-LABOR	1	22	$32.56	$716.32
	X-LABOR	5	22	$29.51	$3,246.10
	X-CARPENTER	1	22	$35.76	$786.71
	X-EQOPRMED	1	22	$38.15	$839.30
2. FINISH CONCRETE	X-CEMFINR	1	51	$33.63	$1,715.13
3. INST WATER STOP	X-CARPENTER	1	27	$35.76	$965.52
4. CURE CONCRETE	X-LABOR	2	56	$29.51	$3,305.12
6. FORMWORK	4/M X-CARPENTER	1	220	$38.81	$8,538.20
	X-CARPENTER	4	220	$35.76	$31,468.80
				TOTAL LABOR COST	$51,581.20

MATERIALS

DESCRIPTION	UNIT	QUANTITY	PRICE	AMOUNT
* READY MIX CONCRETE - 20.7 MPA	M3	175	$78.60	$13,755.00
* WATER STOP 9" X 3/8 THK	M	53	$11.75	$622.75
SUBTOTAL: $14,378				
SALES TAX 6%		1	$863.00	$863.00
* RESTEEL SUBCONTRACTOR	MT	7.4	$1,560.00	$11,544.00
			TOTAL MATERIALS COST	$26,784.75

SUPPLIES

DESCRIPTION	UNIT	QUANTITY	PRICE	AMOUNT
CURING FORM TIES & OIL	M2	476	$10.07	$4,793.32
PLYWOOD 2IN	M2	56	$7.42	$415.52
PLYWOOD 3/4 IN	M2	267	$10.60	$2,830.20
FORM LUMBER	MBF	12	$397.50	$4,770.00
			TOTAL SUPPLIES COST	$12,809.04
TOTAL FOR TRANSFER TO ENG FORM 1739-R OR 1740-R				$94,981.00

REMARKS: *(Indicate by asterisk (*) prices on items which are based on quotations from manufacturers or suppliers.)*	DATE 3 Jan 97	PREPARED BY J. SMITH CHECKED BY J. DOE

ENG FORM 1741c-R, MAR 94 EDITION OF NOV 81 IS OBSOLETE. *(ER 1110-2-1302)* Shreveport: CECW-EC

Figure 17-7. Example reasonable contract estimate worksheet
(ENG Form 1741c-R)

SHEET 13/29

TELEPHONE QUOTATION SHEET

CSI NUMBER: BI 02.03

FIRM QUOTING & ADDRESS: STRONG STEEL
ANY TOWN, ANY STATE

RFP/CONTRACT NO.: DACW 97-01-0001

PROJECT: PUMP PLANT

PHONE (503) 326-3864

LOCATION: RM 13, SPRUCE RIVER

PERSON QUOTING: JOE JONES

ESTIMATOR: J. SMITH

ITEM QUOTED: RESTEEL
QUOTED

DATE: 1/1/97

TOTAL QUANTITY QUOTED:

AMOUNT: 7.4 MT @ $1560/MT = $11,544

DESCRIPTION: FURNISH & INSTALL ALL RESTEEL

INCLUDES SALES TAX YES X NO ___

PER PLANS & SPECS YES ___ NO X

EXCEPTIONS:

EXCEPT USING #4 BAR ILO #3
EXCLUDES SCAFFOLD & HOOK SERVICE

FREIGHT INCLUDED TO:

___ FAS PORT ___ FOB FACTORY ___ OTHER X FOB JOB

TOTAL QUOTATION $

ALLOWANCE FOR WASTE AND LOSS ___ $

WEIGHT EXPORT PACKING

VOLUME US INLAND FREIGHT $

QUOTE VALID FOR ___ DAYS TOTAL MATERIAL COST $ ___

REMARKS

telephone quotation sheet

Figure 17-8. Example telephone quotation sheet

WAGE RATE CALCULATIONS

For use of this form, see TM 5-800-2; the proponent agency is USACE.

EFFECTIVE PERIOD: OCT 94 - SEP 95

PROJECT: CONSTRUCT PUMP PLANT

OPERATIONAL SHIFTS: 1/10-5 DAY WEEK

LOCATION: RT. BANK, RM 13, SPRUCE RIVER

ESTIMATOR: J. SMITH

CHECKED BY: J. DOE

LABOR COST

CRAFT DESCRIPTION a	BASIC HOURLY WAGE RATE b	OVERTIME % OF (b) c	OVERTIME AMT. d	SUB-TOTAL (b + d) e	TAXES & INS % OF (e) f	TAXES & INS AMT. g	SUB-TOTAL (e + g) h	FRINGE BENE-FITS i	TRAVEL OR SUB-SIST j	TOTAL HOURLY COST (h + i + j) k
X-CARPENTER 4/M	20.49	10	2.05	22.54	38.7	8.72	31.26	5.55	2	38.81
X-CARPENTER	18.49	10	1.85	20.34	38.7	7.87	28.21	5.55	2	35.76
X-LABOR 4/M	16.47	10	1.65	18.12	38.7	7.01	25.13	4.43	3	32.56
X-LABOR	14.47	10	1.45	15.92	38.7	6.16	22.08	4.43	3	29.51
X-EQOPRMED	18.97	10	1.90	20.87	29.7	6.20	27.07	6.08	5	38.15
X-EQOPOIL	14.80	10	1.48	16.28	29.7	4.84	21.12	6.08	5	32.20
X-CEMTFINR	17.91	10	1.79	19.70	29.7	5.85	25.55	5.08	3	33.63
USE "ANY STATE" DAVIS BACON WAGE AGREEMENT #AS970004 ADM #2 2/20/97 ***										
50 HR WORK WEEK (5 - 10's) - O.T. = 10% (PER O.T. TABLE)										
USE 4/M PREMIUM =			$2.00/HR							
FICA & FED UNEMPLOYMENT			7.7%							
STATE UNEMPLOYMENT			3.0%							
WORKMAN COMP										
CARPENTER			28%							
LABOR			28%							
OPERATORS			19%							
CEMENT FINISHER			19%							
*** LOCAL PREVAILING WAGES ARE LESS THAN DAVIS BACON WAGES										

DA FORM 5420-R, Apr 85

Figure 17-9. Example wage rate calculations
(DA Form 5420-R)

ESTIMATE DETAIL SUMMARY SHEET

For use of this form, see TM 5-800-2; the proponent agency is USACE.

PROJECT: WAREHOUSE BUILDING

LOCATION: FORT HUNTSVILLE, AL

ESTIMATOR: J. SMITH

CHECKED BY: J. DOE

SHEET 1 OF 1

DATE PREPARED: 10 MAY 1997

No.	BID ITEM Description	Quantity	Unit Meas	SUB-CONTRACT COST	PRIME CONTRACT COST	TOTAL DIRECT COST	OVERHEAD 14.5%	SUB-TOTAL	PROFIT 7.05%	TOTAL COST
1	WAREHOUSE BUILDING	JOB	LS	325,781	615,361	955,142	186,253	1,141,395	80,468	1,221,863
2	SITE WORK	JOB	LS		294,636	294,636	57,454	352,090	24,822	376,912
	TOTAL			325,781	919,997	1,249,778	243,707	1,493,485	105,240	1,598,775

DA FORM 5417-R, Apr 85

Figure 17-10. Example estimate detail summary sheet
(DA Form 5417-R)

COST ESTIMATE ANALYSIS

For use of this form, see TM 5-800-2; the proponent agency is USACE.

INVITATION/CONTRACTOR	DACA 85-B-97-B-0001
EFFECTIVE PRICING DATE	AUGUST 1997
DATE PREPARED	10 MAY 1997
PROJECT	WAREHOUSE BUILDING
CODE (Check one)	☐ A ☐ B ☐ C ☐ OTHER _____
DRAWING NO.	
SHEET 1 OF 1 SHEETS	
LOCATION	FORT HUNTSVILLE, AL
ESTIMATOR	J. SMITH
CHECKED BY	J. DOE

TASK DESCRIPTION	QUANTITY		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
	NO. OF UNITS	UNIT MEAS	MH UNIT	TOTAL HRS	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST		UNIT WT	TOTAL WT
01 SUBSTRUCTURE													
01 STANDARD FDN													
03110-1118 WALL FTG FORMS	52	M^2	0.75	39	23.44	1,214	0.43	23	6.67	347	1,584		
03210-1003 FTG REBAR	6390	KG	0.014	89	0.52	3,302	0.003	19	0.46	2,921	6,242		
03311-1123 FTG CONCRETE	80	M^3	0.52	42	15.50	1,240	0.54	43	65.80	5,264	6,547		
⋮													
02221-3401 COMPACT BACKFILL	35	M^3	0.92	32	9.64	337	0.32	11	-	—	348		
TOTALS				426		13,474		359		10,288	24,120		
03 SLAB ON GRADE													
03110-1662 BLACKOUT FORMS	20	M^2	2.26	45	69.58	1,390	1.40	28	9.80	196	1,614		
03210-1003 REBAR	9482	KG	0.014	119	0.52	4,411	0.003	26	0.46	3,902	8,339		
03311-1164 CONCRETE SLAB	245	M^3	0.35	86	10.62	2,602	0.37	91	65.83	16,129	18,822		
⋮													
07111-5002 POLY VAPOR BARRIER	1300	M^2	0.029	39	0.95	1,235	0.01	13	0.20	260	1,508		
~~TOTAL THIS SHEET~~													

DA FORM 5418-R, Apr 85

Figure 17-11. Example cost estimate analysis (DA Form 5418-R)

CONSTRUCTION COST ESTIMATE WORKSHEET	DATE PREPARED 10 MAY 1997	SHEET 1 OF 1
PROJECT WAREHOUSE BUILDING		
LOCATION FORT HUNTSVILLE, AL		
PLAN NO.	ESTIMATOR J. SMITH	CHECKED BY J. DOE

SITE WORK

QUANTITY TAKE-OFF CALCULATIONS SHOULD BE PREPARED IN A MANNER THAT IS CONSISTENT WITH THE DISTRICT'S ESTABLISHED PROCEDURE.

ENG FORM 1 AUG 88 150a (EM 1110-345-730) REPLACES EDITION OF 1 AUG 88, WHICH MAY BE USED.

Figure 17-12. Example construction cost estimate worksheet (ENG Form 150a)

CREW AND PRODUCTIVITY WORKSHEET
For use of this form, see TM 5-800-2; the proponent agency is USACE.

PROJECT	WAREHOUSE BUILDING
LOCATION	FORT HUNTSVILLE, AL
PREPARED BY	J. SMITH
CHECKED BY	J. DOE
DATE PREPARED	10 MAY 1997
CREW REF NO.	B-25

CREW COMPOSITION

WORK TYPE	WORK SCHEDULE	SPECIAL INFORMATION
PLACE CONCRETE	1-10 HR; 5 DAYS/WK	

CREW DESCRIPTION	NO. REQUIRED IN CREW	LABOR COST: HOURLY* RATE ($/HR)	LABOR COST: TOTAL FOR CREW ($/HR)	EQUIPMENT COST: HOURLY RATE ($/HR)	EQUIPMENT COST: TOTAL FOR CREW ($/HR)
HYD, SPCRANE 30T, C757200	1			42.61	42.61
CONC BKT, 2 CY, B3071055	1			0.56	0.56
CONC VIB, 2 1/2" A, C65XX00	1			0.35	0.35
AIR COMP, 250 CFM, A1570140	1			8.66	8.66
AIR HOSE, 1 1/2" X 100', A2070480	2			0.56	1.12
X- EQOPR MED	1	38.15	38.15		
X- LABOR A/M	1	32.56	32.56		
X- LABOR	4	29.51	118.04		
X- CEMTFNR	1	33.63	33.63		
TOTALS — MANHOURS	7	LABOR COST	222.38	EQUIPMENT COST	53.80

CREW PRODUCTIVITY

WORK TASK	PRODUCTIVITY RATE UNIT/HR	LABOR: MH/UNIT	LABOR: $/UNIT	EQUIPMENT $/UNIT	COMMENTS
PLACE CONCRETE	7.53 M3/HR	0.93	29.65	7.17	

EQUIP RATES HAVE BEEN ADJ FOR 50 HR WORK WEEK
AND RATES TAKEN FROM EP 1110-1-8 VOL 3, AUG 96
LABOR RATES TAKEN FROM DAVIS BACON AGREEMENT
AS970004, ADM # 2, 2/20/97

*Including fringe benefits

DA FORM 5419-R, Apr 85

Figure 17-13. Example crew and productivity worksheet
(DA Form 5419-R)

APPENDIX A
REFERENCES

GOVERNMENT PUBLICATIONS

Public Law:	
PL No. 74-403	Davis Bacon Act
PL No. 95-269	Rivers and Harbors - Improvements
Department of Labor:	
29 CFR 1910.120	Occupational Safety and Health Standards
29 CFR 1926.65	Safety and Health Regulations for Construction
Department of Defense:	
FAR Sub-part 28.102	Performance and Payment Bonds for Construction Contracts
FAR, Part 36	Construction and Architect-Engineer Contracts
Department of Army:	
AR 25-55	Department of Army Freedom-of-Information Act Program
AR 415-15	Army Military Construction Program Development and Execution
US Army Corps of Engineers:	
TM 5-800-4	Programming Cost Estimates for Military Construction
TM 5-802-1	Economic Studies for Military Construction Design-Applications
EFAR, Part 36	Construction and Architect-Engineer Contracts
EFAR Sub-part 36.203 (102)	Revision of Government Estimate
ER 5-7-1(FR)	Project Management
ER 1110-1-1300	Cost Engineering Policy and General Requirements
ER 1110-2-1150	Engineering and Design for Civil Works Projects
ER 1110-2-1302	Civil Works Cost Engineering
ER 1110-3-1300	Military Programs Cost Engineering

ER 1110-3-1301	Cost Engineering Policy and General Requirements for Hazardous, Toxic, and Radioactive Waste Remedial Action Cost Estimates
ER 1125-2-304	Plant Inspection, Maintenance, Operation and Repair
ER 1130-2-307	Dredging Policies and Practices
EM 1110-2-1304	Civil Works Construction Cost Index System (CWCCIS)
EP 415-1-2	Modification and Claim Guide
EP 1110-1-8	Construction Equipment Ownership and Operating Expense Schedule

OTHER:

Architect-Engineer Instruction (AEI)	Project Engineering with Parametric Estimating

APPENDIX B
SAMPLE ESTIMATE PAGES

B-1. General

The information contained in this appendix is described in chapters 2 and 4. The information applies to all types of projects. This appendix contains sample estimate pages, figures B-1 through B-5. A current and complete MCACES example estimate for each program (military, civil works, and HTRW) is included in the electronic data bases as part of MCACES.

CONTROL RECORD FOR GOVERNMENT ESTIMATE

Date Received: _____ Date of Document: _____ No. of Copies: _____ Copy No.: _____

From: Engineering Division

SUBJECT:

_____

_____

Number & Description of Inclosures: _____

GOVERNMENT ESTIMATE

INTRA-OFFICE ROUTING DATA

Division or Branch	Date	Division or Branch	Date

NAME OF ALL PERSONS HANDLING THE ATTACHED DOCUMENT
OR WHO HAVE BEEN INFORMED OF ITS CONTENT

Name	Date	Name	Date

Figure B-1. Sample control record for Government estimates

GOVERNMENT ESTIMATE

FOR

Furnishing all plant, labor, materials, and equipment and performing all work for

_____ in strict accordance with the specifications schedules, drawings, and amendments. (DACA _____ - ____ -B - _____)

See attached Price Schedule for Items.

The project manager has budgeted adequate funds to cover estimated price of this project as contained in this Government estimate.

SUBMITTED:

REVIEWED AND CONCUR:

Chief, Cost Engineering Branch
Engineering Division
Dated:

APPROVED:

Chief, Engineering, Engineering Division
Dated:

PROTECTIVE MARKINGS ARE CANCELED AFTER THIS ESTIMATE HAS BEEN PUBLICLY OPENED, READ, AND RECORDED.

_____ Date Canceled

_____ Signature

Division

(NOTE: Completed signature page and all pages of the Government estimate should be marked "FOR OFFICIAL USE ONLY")

Figure B-2. Sample signature page for Government estimates

IFB No. DACA ____ - ____ - B

PRICE SCHEDULE

FY _____ Contingency Communications Element Facility and Vehicle Maintenance Facility

CLIN	Contract Line Item No. (description of bid item)	UOM	UNIT	QUANTITY	TOTAL PRICE
0001	All work for the Contingency Communications.	LS	1,000,000.00	1	$ 1,000,000.00
0002	All work for the Vehicle Maintenance Facility.	LS	600,000.00	1	$ 600,000.00
0003	All work for the decorative screening contained in the contingency Communications Element Facility project.	LS	100,000.00	1	$ 100,000.00
0004	Site Preparation	SM	5.00	10,000	$ 50,000 .00
TOTAL AMOUNT OF CLIN ITEMS 0001 THROUGH 0004					**$ 1,750,000.00**

(Additives/deductives will also be shown on the price schedule)

NOTES TO BIDDERS **(May vary according to the District and/or type of project, military, civil or HTRW)**

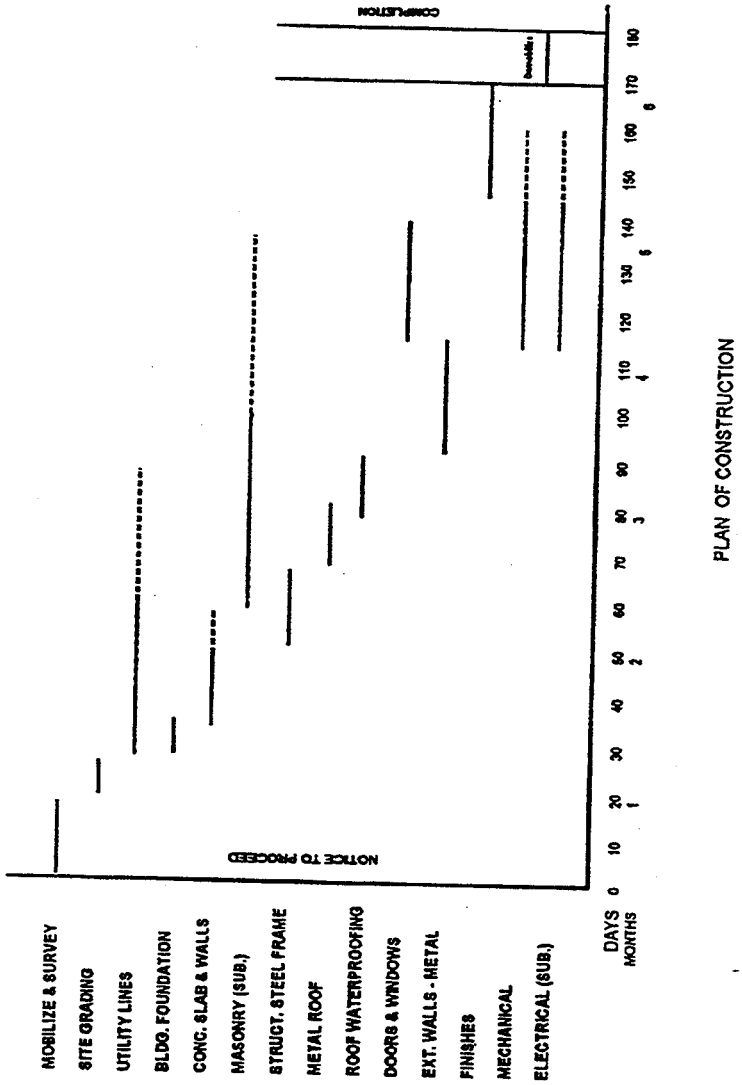
1. The low bidder for purpose of award will be determined on the basis of the bidder offering the lowest total of Contract Line Items Numbers (CLIN) 0001 through 0004.

2. The bidders are required to bid on all items or their bid will be rejected.

3. Bidders are reminded that they must bid on the issued plans and specifications, as amended. Any deviations, conditions or attachment made by the bidder himself thereto may render the bid non-responsive and be cause for its rejection.

4. Any bid which is materially unbalanced as to prices for each Contract Line Item Number, may be rejected. An unbalanced bid is one which is based on prices significantly less than cost for some work and prices which are significantly overstated for other work.

Figure B-3. Sample price schedule



PLAN OF CONSTRUCTION

Figure B-4. Sample construction schedule

TELEPHONE QUOTATION SHEET

CSI NUMBER:

FIRM QUOTING ADDRESS: _____

RFP/CONTRACT NO _____

PROJECT: _____

PHONE: _____

LOCATION:

PERSON QUOTING: _____

ESTIMATOR:

ITEM QUOTED/DATE: _____ TOTAL QUANTITY QUOTED: _____ AMOUNT:

DESCRIPTION:

INSTALLED: YES ____ NO

INCLUDE SALES TAX: YES ____ NO

PER PLANS/SPECIFICATIONS: YES ____ NO ____ (EXPLAIN EXCEPTIONS)

FREIGHT INCLUDED TO:

_____ FAS PORT _____ FOB FACTORY _____ FOB JOB

OTHER

TOTAL QUOTATION $ _____

WEIGHT _____

EXPORT PACKING _____ $ _____

VOLUME _____

US INLAND FREIGHT _____ $ _____

QUOTE VALID FOR _____ DAYS

TOTAL MATERIAL COST $ _____

REMARKS

Figure B-5. Sample telephone quotation sheet

APPENDIX C
WORK BREAKDOWN STRUCTURE

The information contained in this appendix is to aid in presentation of cost estimates for civil works, military, and HTRW programs. The structure outlined in this appendix is described in chapter 2. A current and complete WBS for each program is provided in the models data base of the latest version of MCACES.

a. Civil Works Work Breakdown Structure. The civil works WBS format follows the feature description in table 2-1.

b. Military Construction Work Breakdown Structure. See table C-1, Military Programs Work Breakdown Structure.

c. HTRW Remedial Action Work Breakdown Structure. See table C-2, HTRW Work Breakdown Structure (to second level).

Table C-1. Military Programs Work Breakdown Structure

(Systems Level)

SYSTEM	SUBSYSTEM	TITLE	UOM
01		SUBSTRUCTURE	M^2
02		SUPERSTRUCTURE	M^2
03		EXTERIOR CLOSURE	M^2
04		ROOFING	M^2
05		INTERIOR CONSTRUCTION	M^2
06		INTERIOR FINISHES	M^2
07		CONVEYING SYSTEMS	M^2
08		PLUMBING	M^2
09		HVAC	M^2
10		FIRE PROTECTION SYSTEMS	M^2
11		ELECTRIC POWER AND LIGHTING	M^2
12		ELECTRICAL SYSTEMS	M^2
13		EQUIPMENT	M^2
14		FURNISHINGS	M^2
15		SPECIAL CONSTRUCTION	M^2
16		SELECTIVE BUILDING DEMOLITION	M^2
17		SITE PREPARATION	M^2
18		SITE IMPROVEMENTS	M^2
19		SITE CIVIL/MECHANICAL UTILITIES	M^2
20		SITE ELECTRICAL UTILITIES	M^2

Table C-2. HTRW WORK BREAKDOWN STRUCTURE (Levels 1 and 2)

RAWBS Number	Description of Item
(*) 331XX	HTRW REMEDIAL ACTION (CONSTRUCTION)
01	MOBILIZATION AND PREPARATORY WORK
02	MONITORING, SAMPLING, TESTING, AND ANALYSIS
03	SITE WORK
04	ORDNANCE AND EXPLOSIVE- CHEMICAL WARFARE MATER (OECWN) REMOVAL AND DESTRUCTION
05	SURFACE WATER COLLECTION AND CONTROL
06	GROUNDWATER COLLECTION AND CONTROL
07	AIR POLLUTION/GAS COLLECTION AND CONTROL
08	SOLIDS COLLECTION AND CONTAINMENT
09	LIQUIDS/SEDIMENTS/SLUDGE COLLECTION AND CONTAINMENT
10	DRUMS/TANKS/STRUCTURES/MISCELLANEOUS DEMOLITION AND REMOVAL
11	BIOLOGICAL TREATMENT
12	CHEMICAL TREATMENT
13	PHYSICAL TREATMENT
14	THERMAL TREATMENT
15	STABILIZATION/FIXATION/ENCAPSULATION
16	RESERVED FOR FUTURE USE
17	DECONTAMINATION AND DECOMMISSIONING (D&D)
18	DISPOSAL (OTHER THAN COMMERCIAL)
19	DISPOSAL (COMMERCIAL)
20	SITE RESTORATION
21	DEMOBILIZATION
22	GENERAL REQUIREMENTS (OPTIONAL BREAKOUT)
9x	OTHER (use numbers 90-99)
332XX	ENGINEERING DURING CONSTRUCTION (EDC)
333XX	SUPERVISION AND ADMINISTRATION (S&A - CONSTRUCTION MANAGEMENT)

(*) The first 3 digits are from the USACE Superfund Accounting System. The last 2 digits are user-defined for estimating flexibility. Account 33 includes Remedial Action, O&M during Construction, Engineering during Construction (EDC), and Supervision and Administration (S&A) (Construction Management)

APPENDIX D
SAMPLE CHECKLIST FOR COST ESTIMATE PREPARATION

1. Comply with applicable guidance (ER 1110-1-1300, ER 1110-2-1302, ER 1110-3-1300, and ER 1110-3-1301).

2. Prepare cost estimate using MCACES, as appropriate, and structured using the appropriate Work Breakdown Structure for military programs, civil works and HTRW.

3. Prepare narrative with statement summarizing purpose of estimate and brief statement and description of the project.

4. Identify stage of estimate (reconnaissance, pre-design, 30%, 60%, 90%, 100%, and bid).

5. Clearly identify and define assumptions, identify significant features upon which the cost estimate is based.

6. Identify significant findings during preparation

7. Develop notes throughout the estimate, particularly to identify sequencing of construction activities and crew productions and include in the MCACES notes reference.

8. Separate subcontract work from prime contract work.

9. Identify separate markups for subcontractors and prime contractor.

10. Identify sources of unit prices and vendor or subcontractor quotes.

11. Include design contingencies and construction contingencies in the cost estimate, if appropriate.

12. Include cost growth (escalation) from the date of the estimate to the mid-point of construction and/or operation. Identify source of index used for escalation (Tri-service, CWCCIS, etc.)

13. For Military and HTRW projects, the Current Working Estimates (CWE) includes amounts for Construction Management (S&A), Engineering During Construction (EDC), O&M Manuals, As-Built, and Government Laboratory Quality Assurance (QA) as applicable for the particular project.

14. For Civil Works, the TOTAL CWE includes all Federal and authorized non-Federal costs. Ensure the project manager provides costs for land and damages; engineering and design; construction management; and construction features are coordinated with CWBS. The cost engineer will incorporate these costs into the TOTAL CWE utilizing MCACES as appropriate. The cost estimate becomes fully funded when inflation is added to the estimate. An estimate for profit is included in the reconnaissance and feasibility phases to ensure costs represent the total cost of the project; however, profit is not included in the Government estimate for authorized civil work contracts for award. Profit is included in construction contracts for modifications and change orders.

15. Minimize use of lump sum pricing. If used, the lump sum description must indicate in detail what is included in the price and whether or not it is based on a quotation.

16. Use prevailing current location-specific wage rates in the estimate. Consider market rates for labor to ensure there is reasonable competition on-going in the area where the construction is being performed and/or may be competing with the domestic projects being constructed.

17. Check derived unit costs with historical data when available. Override UPB labor and/or material unit prices as required, to fit project-specific conditions.

18. Complex or Major features of a project should include a detailed breakdown for labor, equipment and material.

19. Calculate home office overhead as a percentage of total contract cost.

20. Include bond costs in estimate.

21. Calculate prime and subcontractor profit by Weighted Guidelines method.

22. Provide Cost Engineering Branch point of contact and telephone number.

23. For HTRW projects, identify and calculate productivity factors for level of protection.

24. For HTRW projects, include costs for all specification Division I Health and Safety requirements and personnel, and itemize prime contractor overhead items for estimates prepared at the 30% design stage and after in lieu of using a flat rate overhead percentage.

25. Include all applicable costs for permits, licenses, taxes, and fees.

APPENDIX E
AUTOMATION

E-1. General

a. General. Cost engineer regulations for civil works, military programs, and HTRW direct the use of automation in developing cost estimates. This appendix provides general information on using this automation and an overview of existing systems. Detailed guidance on the use of each system can be found in the appropriate system user manual for each software program.

b. Use of cost engineering automated systems. The use of cost engineering automated systems enhances the efficiency, accuracy and credibility of project cost estimates. Automation assists in the standardization of estimating procedures and provides estimates that are easily reviewed, revised and adapted to new projects or situations. Standardization assists in collection and analysis of historical costs that can be used to develop budget estimates, for cost comparison purposes, for reporting and tracking of project cost data, and for the building of parametric models.

c. Software updates and new systems. Automation continues to develop at a rapid pace. Minor upgrades may occur annually and major system changes can occur every two or three years. Major new systems may be fielded at any time. Cost engineers should insure that they are using the latest available version of the software as directed by HQUSACE.

d. Limitations on the use of automation. Automation is just a tool and cannot take the place of professional cost engineering knowledge or judgment. The cost engineer should always be knowledgeable of the system's capabilities and limitations in relation to a project. The cost engineer must be especially careful in using models and in adapting existing estimates to new projects to insure that there are neither duplications or omissions in the estimate. Output should be checked for reasonableness and assumptions and methodology should be verified and documented. The best cost automated system is not a replacement for good estimator judgment.

e. Automation proponents. HQUSACE is the proponent for all cost engineering systems with providing software support for system development.

E-2. Overview of Tri-Service Automated Cost Engineering System (TRACES)

a. TRACES is the Tri-Services umbrella linking all automated cost engineering systems and their associated data bases. The entire system seeks to provide a user friendly cost engineering platform in a standard environment that will provide the cost engineer the tools to prepare, review, and maintain all types of cost estimates. Software for scheduling construction projects is also linkable to TRACES. Figure E-1 depicts the overall components of TRACES.

b. TRACES includes the following systems/ modules: a detailed quantity take-off, cost engineering system (MCACES); a parametric system for the preparation of less than fully detailed design estimates; a dredge cost engineering system (CEDEP); a cost estimating system for preparation of programming cost estimates (PC Cost); a life-cycle cost (LCC) module for analysis of system design alternatives; a historical cost analysis generator (HAG) to collect, store, and analyze historical cost data for facilities, and sitework. Other system/modules in TRACES include the scheduling interface module and risk analysis systems.

(1) Micro Computer-Aided Cost Engineering System (MCACES). The MCACES is a multi-user software program used for the preparation of detailed construction cost estimates for military, civil works, and HTRW programs. The system also includes a project data base and supporting data bases. The supporting data bases include UPB, crews, assemblies, labor rates, equipment ownership schedule costs and models. All data bases work in conjunction with each other to produce a detailed cost estimate. The data bases are described in the MCACES users manual.

(2) Parametric system. The parametric system provides the capability to prepare cost estimates based on past designs on less than fully detailed design information. It uses the appropriate Work Breakdown Structure (WBS), a data base of models and assemblies from historic projects, and a series of detailed linking algorithms used to develop a cost estimate. The estimate can then, if desired, be transferred to MCACES for task-by-task analysis of the cost estimate.

(3) Cost Engineering Dredge Estimating Program (CEDEP). CEDEP is a stand-alone program used for the preparation of pipeline, hopper, and mechanical dredge estimates. Two support data files are also provided within CEDEP. The Check rate support program also included in the CEDEP is a computerized version of the Dredge Ownership and Operating Rate Worksheet, chapter 4 of EP 1110-1-8.

(4) PC-Cost. PC-Cost is the personal computer version of the DD Form 1391 Processor cost estimate generator. It is a comprehensive software package that allows the user to prepare and submit programming or budgetary construction cost estimates based on historical costs. PC-Cost also allows the user to create an estimate from an existing detailed or parametric cost estimate, download a DD Form 1391 cost estimate for revisions, or create a new DD Form 1391 estimate from a template. PC-Cost provides a mechanism for a user interface access capability with MCACES data bases, historical module data bases, and TRACES parametric system data bases.

(5) LCC module. The LCC module is a stand-alone program designed primarily to conduct life-cycle cost (LCC) analyses among competing design alternatives for a given project providing a record of the results. The program comes with an extensive maintenance and repair (M&R) data base tailored for Army buildings. Estimates of construction/acquisition costs can be transferred electronically into the LCC module from any MCACES Gold project estimate. The most prominent capabilities are: (a) to conduct LCC analyses in accordance with the provisions of statutes, regulations, and requirements; (b) to calculate the present worth of individual building or facility components; and (c) to compare M&R costs for building components in the M&R data base.

(6) Historical Cost Analysis Generator (HAG). The HAG is a stand-alone software module which is used to collect and display historical cost data from awarded projects. The HAG uses the standard WBS structure to track historical bid costs by type, location, size and time, and has the capability of automatically normalizing and adjusting awarded costs. The HAG system also provides a vehicle to retrieve selected statistical cost information from the historical cost data base for use in the preparation of programming or budgetary cost estimates.

(7) Scheduling Interface module. The MCACES Scheduling Interface (SI) module is a stand-alone program that provides project scheduling capabilities for MCACES cost estimates. The SI module produces a pure logic sequencing of project activities for scheduling purposes. The module also allows export of this data to various scheduling software packages for the development of more detailed scheduling functions. The scheduling data produced by the SI module is stored with the MCACES estimate (Project Data Base) and can be saved as a master template or as a model for future use by other projects.

(8) Risk Analysis Systems. The risk analysis module is a stand-alone program to help identify high elements of risk in a project, to measure their impact on the cost of the project, and to manage these risks through contingency assignments. Software is being developed that will be used for civil works and military projects. HAZRISK is an HTRW risk analysis program which develops a statistical model utilizing project specific information to predict both design contingency and construction contingency requirements for each of the HTRW RAWBS second level (system) work breakdown elements used in a project.

(9) DD Form 1391 Processor (DD 1391). The DD Form 1391 Processor is an interactive computer program which assists users in preparing the programming construction cost estimate shown on the DD Form 1391, Military Construction Project Data. The DD Form 1391 is used by DOD agencies to justify the need of a military project and serves as a funding request for the Authorization and Appropriation of Military Construction funds by Congress. The cost estimate generator of the DD Form 1391 Processor has capabilities for automatic computation of area cost factor adjustments, size factor adjustments, and automatic escalation computation. It uses the cost data from HAG to generate costs of facilities. PC cost is recommended over this main frame module.

E-3. Overview of TRACES Data bases and Files

a. Data bases and files used by the TRACES modules are as follows:

b. UPB data base. The UPB data base is a collection of common construction detail line item tasks used in developing project estimates for military, civil works, and HTRW programs. The UPB is organized in accordance with the Construction Specification Institute (CSI) numbering system. These material costs can be modified to reflect localized costs for other locations. Each task listed provides unit costs for labor, equipment, and materials. Localized UPB's can be developed by modifying the key rates in the national UPB.

c. Models data base. This data base contains groupings of assemblies for a whole facility or sitework entity. Linkage between assemblies and assemblies to tasks are by WBS or as exists in a historic estimate. Linkage algorithms are provided to the cost engineer for project-specific estimate refinement. At the heart of the detail pricing is the UPB task costs. Using models can reduce the time for estimate preparation but relies heavily on past designs using default linkages.

d. Assemblies data base. The Assemblies data base stores common groupings of related work tasks, each representing a composite cost required to create a larger piece of a project rather than a single task. The individual cost items within each assembly are either extracted from the UPB or from the labor and equipment data bases. The data base is broken down according to the WBS. Each assembly includes parameter worksheets, requiring only that you input the parameters appropriate for your specific job. Using assemblies can greatly reduce the amount of data entry required to build a project or model.

e. Other data bases. Other TRACES data bases include the crews data base, labor rates data base, and equipment rates data base.

f. Work Breakdown Structure. This data file provides a separate hierarchical work breakdown master structure for use as a template in formatting cost estimates for civil works, military, and HTRW projects.

g. Cost escalation index. The cost escalation index provides a historic and projected cost index for cost escalation adjustment due to inflationary factors. These index values are national average which applies to construction costs.

h. Area Cost Factor (ACF) index. The ACF index is used in adjusting estimated costs to a specific geographical area. The factors reflect the average surveyed difference for each location in direct costs between that location and the national average location.

i. Facility cost ($/SF). This index is a listing of facility unit costs normalized to a geographical location factor of 1.00. Unit prices reflect costs forecast on the basis of an assumed midpoint of construction date.

j. Historical Cost Analysis System (HCAS). HCAS is a stand-alone system to store historical cost data for HTRW remedial action projects. Project costs are stored in the program using an HCAS-developed category code and the Remedial Action Work Breakdown Structure (RAWBS). The user

may search the data base by using the query function and specifying the type of media, type of contaminant and type of technology. The search can also be narrowed by additional criterion such as contract types, geographic location, award date, HTRW RAWBS, etc. Project cost can be printed or exported to other programs.

E-4. Assigned Agency

The Assigned Responsible Agency (ARA) for TRACES is the U.S. Army Engineering and Support Center, Automated Systems Branch, TRACES group, Huntsville, Alabama. The ARA serves as the focal point for support usage of these software programs by providing operation, maintenance, and "Hot-Line" telephone support.

E-5. Cost Engineers Bulletin Board System (CEBBS)

The CEBBS gives the cost engineers an opportunity to exchange information between districts, divisions, and authorized commercial vendors. Data such as programs, files, messages, project cost estimates, or any other computerized data can be transmitted over the telephone lines. The system contains four on-line conferences, MCACES Gold, Historical Cost Analysis Generator , Cost Engineers Phone List (CE LIST,) and Training Information. The CEBBS and its system operators (SYSOP) are physically located at the ARA.

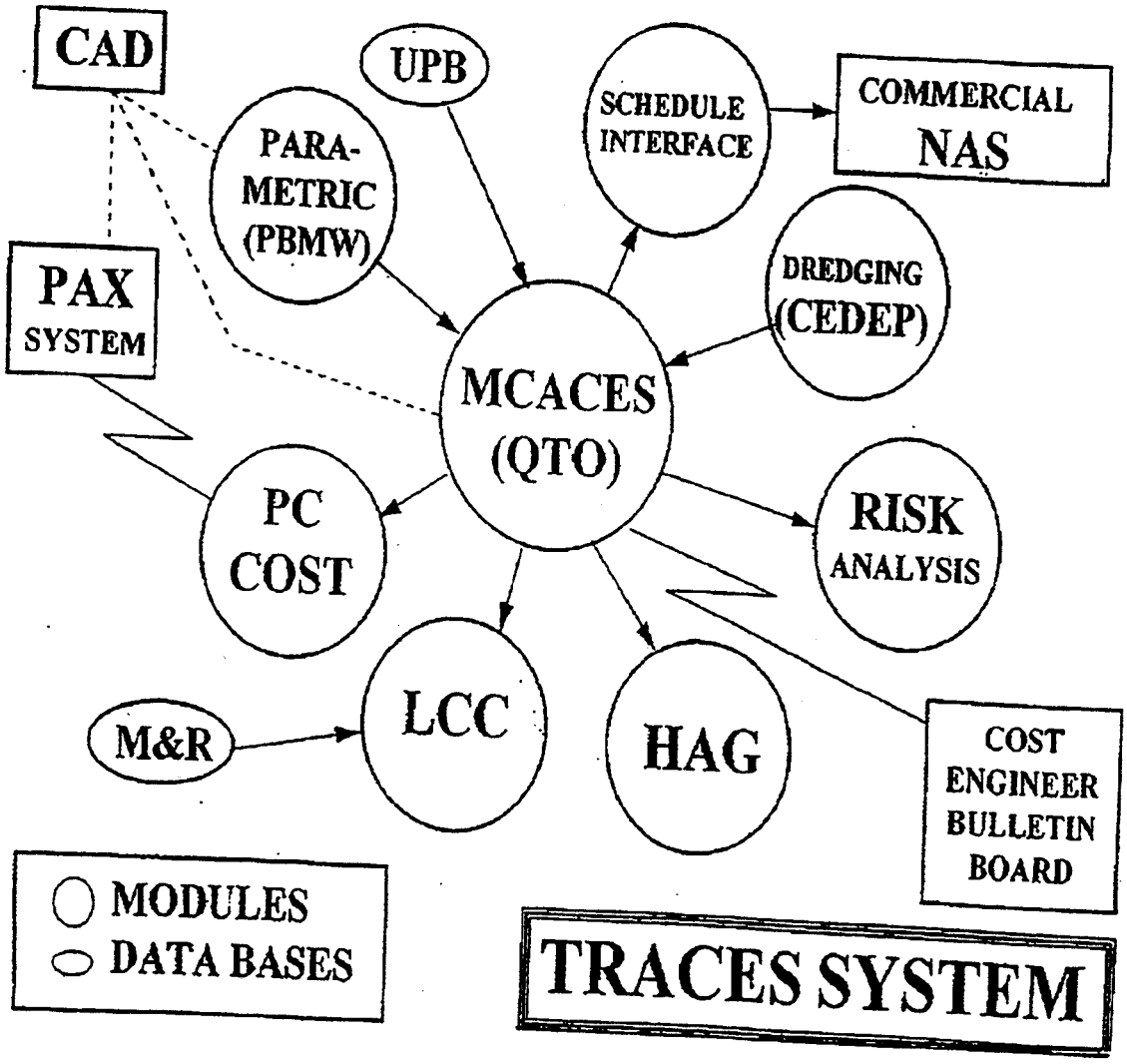


Figure E-1. TRACES system

Glossary
Abbreviations and Acronyms

ACO	Administrative Contracting Officer
ACF	Area Cost Factor
A-E	Architect-Engineer
AFAR	Army Federal Acquisition Regulation
AR	Army Regulation
ASA(CW)	Assistant Secretary of the Army (Civil Works)
BCE	Baseline Cost Estimate
BCO	Biddability, Constructibility, and Operability
CACES	Computer Aided Cost Engineering System
CAP	Continuing Authorities Program
CEBBS	Cost Engineers Bulletin Board System
CECW-B	Headquarters, Civil Works Program Division
CECW-OM	Headquarters, Civil Works Operations Division
CEDEP	Cost Engineering Dredge Estimating Program
CEHNC	Corps of Engineers Engineering and Support Center
CERCLA	Comprehensive Environment Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CP	Cost Plus
CPAF	Cost Plus Award Fee
CSI	Construction Specification Institute
CWBS	Civil Works Breakdown Structure
CWCCIS	Civil Works Construction Cost Index System
CWE	Current Working Estimate (for Military and HTRW) (for Civil Works see TOTAL CWE)
DA	Department of the Army
DERP	Defense Environmental and Restoration Program
DFAR	Defense Federal Acquisition Regulation
DM	Design Memorandum
DOD	Department of Defense
DOE	Department of Energy
DPR	Detailed Project Report
EC	Engineer Circular
ECAS	Environmental Compliance Assessment System
E&D	Engineering and Design
EDC	Engineering During Construction
EFAR	Engineer Federal Acquisition Regulation

EM	Engineer Manual
EP	Engineer Pamphlet
EPA	Environmental Protection Agency
ER	Engineer Regulation
FAR	Federal Acquisition Regulation
FOA	Field Operating Activity
FOB	Freight on Board
FOIA	Freedom of Information Act
FOUO	For Official Use Only
FS	Feasibility Studies
FULLY FUNDED	This term is used to indicate that the costs presented include allowances for cost growth due to inflation through project completion. Certain estimates by definition include cost growth and are considered fully funded.
G&A	General Home Office Overhead
GE	Government Estimate
GFE	Government Furnished Equipment
GFM	Government Furnished Material
HAG	Historical Analysis Generator
HCAS	Historical Cost Analysis System
HQUSACE	Headquarters, U. S. Army Corps of Engineers
HTRW	Hazardous, Toxic and Radioactive Waste
IDLH	Immediately Dangerous to Life or Health
IDT	Indefinite Delivery Type
IFB	Invitation for Bid (Sealed Bidding)
IPMP	Initial Project Management Plan
LCC	Life Cycle Cost
LERRD	Land, Easement, Right-of-way, Relocation and Disposal
MCA	Military Construction, Army
MCACES	Microcomputer Aided Cost Engineering System
MCP	Military Construction Program
MILCON	Military Construction
MSC	Major Subordinate Command
MWBS	Military Work Breakdown Structure
NORM	Normally Occurring Radioactive Materials
OMB	Office of Management and Budget
O&M	Operation and Maintenance
OMRR&R	Operation, Maintenance, Repair, Rehabilitation and Replacement
OMSC	Operating Major Subordinate Command
PA	Preliminary Assessment
PED	Preconstruction Engineering and Design

PES	Project Executive Summary
PL	Public Law
PM	Project Manager
PMP	Project Management Plan
PPE	Personal Protective Equipment
PPRA	Preplaced Remedial Action Contracts
QA	Quality Assurance
RA	Remedial Action
RAWBS	Remedial Action Work Breakdown Structure
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RFP	Request for Proposal
RI	Remedial Investigation
ROD	Record of Decision
S &A	Supervision and Administration
SAA	Surety Association of America
SCBA	Self Contained Breathing Apparatus
SI	Scheduling Interface
SI	Site Inspection
SOP	Standard Operating Procedure
TERC	Total Environmental Restoration Contracts
TOTAL CWE	Total Current Working Estimate (for Civil Works). A term used to indicate all Federal and non-Federal costs, LERRD, construction features, E&D, construction management, contingencies, and inflation through project completion.
TRACES	Tri-Service Cost Engineering System
TSDF	Treatment Storage Disposal Facility
UPD	Unit Price Book
USACE	U. S. Army Corps of Engineers
VE	Value Engineering
WBS	Work Breakdown Structure
WLRC	Washington Level Review Center
WRDA	Water Resources Development Act

ESTIMATE DETAIL SUMMARY SHEET

For use of this form, see TM 5-800-2; the proponent agency is USACE.

PROJECT	ESTIMATOR	SHEET OF
LOCATION	CHECKED BY	DATE PREPARED

BID ITEM				SUB-CONTRACT COST	PRIME CONTRACT COST	TOTAL DIRECT COST	OVERHEAD	SUB-TOTAL	PROFIT	TOTAL COST
No.	Description	Quantity	Unit Meas							
TOTAL										

DA FORM 5417-R, Apr 86

COST ESTIMATE ANALYSIS

For use of this form, see TM 5-800-2; the proponent agency is USACE.

PROJECT	INVITATION/CONTRACTOR	EFFECTIVE PRICING DATE	DATE PREPARED
LOCATION	CODE (Check one) ☐ A ☐ B ☐ C ☐ OTHER _____	DRAWING NO.	SHEET OF SHEETS
		ESTIMATOR	CHECKED BY

TASK DESCRIPTION	QUANTITY		LABOR				EQUIPMENT		MATERIAL		TOTAL	SHIPPING	
	NO. OF UNITS	UNIT MEAS	MH UNIT	TOTAL HRS	UNIT PRICE	COST	UNIT PRICE	COST	UNIT PRICE	COST		UNIT WT	TOTAL WT
TOTAL THIS SHEET													

DA FORM 5418-R, Apr 85

CREW AND PRODUCTIVITY WORKSHEET

For use of this form, see TM 5-800-2; the proponent agency is USACE.

PROJECT	PREPARED BY	DATE PREPARED
LOCATION	CHECKED BY	CREW REF NO.

CREW COMPOSITION

WORK TYPE	WORK SCHEDULE	SPECIAL INFORMATION

CREW DESCRIPTION	NO. REQUIRED IN CREW	LABOR COST		EQUIPMENT COST	
		HOURLY* RATE ($/HR)	TOTAL FOR CREW ($/HR)	HOURLY RATE ($/HR)	TOTAL FOR CREW ($/HR)
TOTALS	MANHOURS		LABOR COST		EQUIPMENT COST

CREW PRODUCTIVITY

WORK TASK	PRODUCTIVITY RATE UNIT/HR	LABOR		EQUIPMENT $/UNIT	COMMENTS
		MH/UNIT	$/UNIT		

* Including fringe benefits

DA FORM 5419-R, Apr 85

GPO: 1959 O - 516203

CONSTRUCTION COST ESTIMATE WORKSHEET

DATE PREPARED

SHEET OF

PROJECT

LOCATION

PLAN NO.

ESTIMATOR

CHECKED BY

ALASKA DISTRICT CADD GUIDELINES

I DRAWING NAME CONVENTION

All drawing names shall be filenames that begin with the project code, abbreviated to five characters, followed by the discipline letter and the sheet number, i.e. FR001A05 for Project FTR001, Architectural sheet A-5, FR171a1_01 for Project FTR171, Architectural sheet A1.01. The Technical Lead will coordinate the drawing name for each project.

Following is a brief list of abbreviated location codes and typical discipline letters, this list is not complete, but is a guide to the major project locations and disciplines within the Alaska District. Check with the Project Manager for codes not listed here.

Location	**Code**
Clear Air Station	CR
Elmendorf A.F.B.	EM
Eielson A.F.B.	EE
Earackson A.S.	ER
Ft. Richardson	FR
Ft. Wainwright	FW
Ft. Greely	FG
King Salmon	KL

Discipline	**Code**
General	G
Location & Vicinity	LV
Survey and Mapping	V
HTRW/Environmental	V
Demolition	D
Civil/Site	C
Civil Works	W
Geotechnical	B
Utilities	U
Landscape Architecture	L
Architectural	A
Interior Design	I
Equipment	Q
Structural	S
Mechanical	M
Plumbing	P
Electrical	E
Fire Protection/Suppression	F
Telecommunications	T
Cathodic Protection	CP
Real Estate	R
Planning	P
Resource	R
Hydrology	H
Other Disciplines	X
Facility Management	N
Contractor/Shop Drawings	Z

II BORDERS & BACKGROUND DRAWINGS

All projects will use the new border sheet with the vertical border along the right side of the sheet. Sheet size is metric A1(841mm x 594mm) approximately 23" x 33". Civil Works and Master Planning projects have the option of using the metric A0 (1189mm x 841mm) approximately 47" x 33". See Sheet Size chart. There are two orientations for the title block, one for Army projects, one for Air Force and other projects. Coordinate with Project Manager or Technical Lead for correct border.

All changeable text on each of the standard border sheets are attributes and can be edited using DATTE.

A set of AutoCAD© templates is available in various drawing scales in both imperial and metric formats. All border sheets and templates are in the NFM Library COE Standard Drawings and on the ftp site

ftp://ftp.usace.army.mil/incoming/POA/COE_STD_DWGS/new_borders/

These files are self-extracting files.

III Text

All notes, dimension text, and general text shall be ROMANS. All general text shall have a plotted height of 1/8" or 3mm on a full size plot.

Standard text style for larger text such as titles shall be ROMAND. Title text shall have a plotted height of 1/4" or 6mm on a full size plot.

Keep the styles and fonts to a minimum to minimize the number of fonts. Only standard fonts supplied with AutoCad shall be used, no "third party" fonts shall be used. The District is frequently required to modify and/or plot various drawings created by others and the Contractor is required to use these files for "as built" drawings. Non-standard fonts cause problems opening these files.

IV Layers

The District is following the standards established by the Tri-Service CADD/GIS Technology Center. The layer naming conventions are based on the recommendations set forth in the American Institute of Architects (1990) publication "CAD Layer Guidelines".

V Plotting

In order to coordinate plotting, the following drawing colors, pen numbers, and line widths have been standardized. The District plotters have been standardized per the following chart in order to provide uniformity on all plots. The following drawing colors and pen assignments are standard on all District work

Color	**Pen #**	**Line/Pen Width** (mm)	**Line Type**
1 Red	1	.25	Solid
2 Yellow	2	.35	Solid
3 Green	3	.50	Solid
4 Cyan	4	.70	Solid
5 Blue	5	.18	Solid
6 Magenta	6	.35	40% Screen
7 White	7	.35	50% Screen
8 Grey	8	.35	60% Screen
9	9	1.00	Solid
10	10	1.50	Solid
11	11	2.00	Solid

If additional colors are used, all plotter configuration files and a table similar to that above shall be provided in order to ensure that drawings can be plotted with the correct symbology.

VI Final Submittal

Drawing file format: All drawing files submitted to the District shall be Autocad drawing files, *.dwg extension.

A text file containing a complete list of all sheets with filename, reference number, drawing title, and plotting scale shall be submitted with the drawing files.

All XRefs must be bound to each drawing, not just attached.

Each file shall be a separate drawing. Multiple drawings created in a single file by using various layer schemes shall be converted into separate drawing files.

All drawings using Paperspace & Modelspace shall be in Paperspace mode.

Zoom all drawings to extents.

Drawings shall require no more than a standard version of AutoCAD and the minimum hardware requirements recommended by Autodesk in order to successfully open, manipulate and plot.

If Autodesk or third party extensions are used, drawings must still be provided in a manner consistent with the previous requirement, but they must also be provided with all additional “project” files used by the extension to allow advanced manipulation by others with the same extension.

VII Additional Standards and Guidelines

The Tri-Service CADD/GIS Technology Center has established standards, generic details, and other items of interest concerning use of CADD. The Center can be accessed on the Internet at the following address: http://tsc.wes.army.mil/

Various regulations, technical information publications, etc can be accessed on the internet at the TECHINFO page at the following address: http://www.hnd.usace.army.mil/techinfo/tiindex.html

All of the standard drawings listed in this document and these standards can be accessed from the District FTP server. Contact the Design Manager for information and permission on use of the FTP server.

VIII STANDARD SHEET SIZES, SCALES, TEXT SIZES

METRIC UNIT PROJECTS

DRAWING SIZES

Name	Metric Size	Imperial Size	Use
A0	1189 x 841 mm	46.8 x 33.1 inches	Master Planning/Civil Works
A1	841 x 594 mm	33.1 x 23.4 inches	Standard Sheet
A3	420 x 297 mm	16.5 x 11.7 inches	Half Size
A4	297 x 210 mm	11.7 x 8.3 inches	Reports

SCALES & TEXT

Metric Scale	Approx. Imperial Scale	Heights for Text		
		Notes and Dimensions	Title Text	Border Dimensions (Limits)
1:200	Close to 1/16"=1'-0"	600 mm	1200 mm	188200 x 118800
1:100	Close to 1/8"=1'-0"	300 mm	600 mm	84100 x 59400
1:50	Close to 1/4"=1'-0"	150 mm	300 mm	42050 x 29700
1:20	Between 1/2"=1'-0" & 3/4"=1'-0"	60 mm	120 mm	16820 x 11880
1:10	Between 1"=1'-0" & 1-1/2"=1'-0"	30 mm	60 mm	8410 x 5940
1:5	Close to 3"=1'-0"	15 mm	30 mm	4205 x 2970
Full Size		3 mm	6 mm	841 x 594

UNIT USAGE

For building dimensions use millimeters instead of feet and inches and for large site plans and civil engineering drawings use meters. Unit notations are unnecessary: if there's no decimal point, it's millimeters; if there's a decimal point carried to one, two, or three places, it's meters. Centimeters are not used in construction.

Use only one unit of measure on a drawing. Except for large scale site or cartographic drawings, the unit should be the millimeter(mm).

Delete unit symbols but provide an explanatory note (eg. "All dimensions are shown in millimeters") Whole numbers always indicate millimeters; decimal numbers taken to three places always indicate meters.

Where modules are used, the recommended basic module is 100 mm, which is similar to the 4-inch module used in building construction (4 inches = 101.6 mm).

IMPERIAL UNIT PROJECTS

DRAWING SIZES

Name	Imperial Size	Use
A0	46.8 x 33.1 inches	Master Planning/Civil Works
A1	33.1 x 23.4 inches	Standard Sheet
A3	16.5 x 11.7 inches	Half Size
A4	11.7 x 8.3 inches	Reports

SCALES & TEXT

Imperial Scale	Scale Factor	Heights for Text		
		Notes and Dimensions	Title Text	Border Dimensions (Limits)
1/16" = 1'-0"	192	24”	12”	8064 x 5760
1/8" = 1'-0"	96	12”	6”	4032 x 2880
1/4" = 1'-0"	48	6”	3”	2016 x 1440
1/2" = 1'-0”	24	3”	2”	1008 x 720
3/4” = 1’-0”	16	2”	1.5”	672 x 480
1” = 1’-0”	12	1.5”	1”	504 x 360
1-1/2"=1'-0"	8	1”	.5”	336 x 240
3"=1'-0"	4	.5”	1/8”	168 x 120
Full Size	1	1/8”	1/4”	42 x 30

ARCHITECT-ENGINEER SPECIFICATIONS MANUAL

US ARMY CORPS OF ENGINEERS, ALASKA DISTRICT

July 26, 2004

Corps Of Engineers, Alaska District
A-E Specifications Manual
July 26, 2004

1. PURPOSE: This manual is intended for use as the primary guidance document in the preparation of construction specifications for projects under design by Architect-Engineer firms for the Corps of Engineers, Alaska District.

2. GENERAL: Each designer shall be responsible for complying with the provisions of this manual, and for coordinating their specifications with their project drawings. In addition, each designer shall be sufficiently familiar with portions of the design prepared by other disciplines to ensure the overall project design is complete and thoroughly coordinated.

3. REFERENCES: Construction specifications shall be prepared in accordance with criteria set forth in the following publications.

Military and HTRW Projects

ER-1110-345-700 - Design Analysis, Drawings and Specifications, (copy enclosed) (Excluding Appendix D. See ER1110-1-8155 listed below for Appendix D information).

Civil Works Projects

ER 1110-2-1200 - Plans and Specifications for Civil Works Projects (copy enclosed).

All Projects

ER 415-1-10 - Contractor Submittal Procedures (copy enclosed).

ER 1110-1-8155 - Specifications (copy enclosed).

Guidance for the Preparation of the Unified Facilities Guide Specifications for Military Construction (copy enclosed).

Construction Specifications Institute (CSI) Manual of Practice – SP/100 Specifying for the Government (copy enclosed), except as otherwise provided herein.

Other criteria documents specifically designated for the project.

1. FORMAT: Specifications shall be prepared using approved version of Unified Facilities Guide Specifications (UFGS), and SPECSINTACT software. Contact CEPOA-EN-ES-SP for the approved version of SPECSINTACT software. These are available on compact disc from the Construction Criteria Base (CCB), with updates issued quarterly. Annual cost for CCB is approximately $250. A limited subscription is available at no cost to A-E's under design contracts with the Corps of Engineers. The A-E should prepare a list of technical specifications to be used in the project and coordinate with CEPOA-EN-ES-SP to obtain the approved technical specification data files.

2. CONTENT: The specification package shall include a Bid (or Proposal) Schedule and Division 1 through 16 technical specification sections, as applicable. A table of contents for each specification section and a combined submittal register covering all sections shall be included. The Alaska District will incorporate contract administration type Division 1 specification sections into the design.

3. LOCAL CRITERIA: The District has developed several "District" guide specs in SPECSINTACT to cover local, repetitive use items. "Addenda" has also been developed for several of the regular UFGS. These items will be provided to the A-E following the concept design stage as applicable for use in preparing specifications for the project.

4. EDITING: Each guide specification shall be tailored to meet the specific requirements of the project under design. Non-applicable items shall be consistently deleted throughout the text.

All work by the designer must be precisely delineated in the contract documents (specifications or drawings). Certain requirements in the guide specifications have general applicability to all projects, while other requirements that vary from project to project have blanks to be filled in; alternative words, phrases, or paragraphs to be chosen; or special paragraphs to be added. Where brackets are used to indicate alternative requirements, the parentheses or brackets will be removed from the expression chosen to be a part of the contract specifications.

Final editing tasks shall be performed using the automated features of the SPECSINTACT program including, but not limited to the following:

a. Renumbering paragraphs to account for added/deleted/text

b. Checking to ensure bracketed selections have been made

c. Reconciling standards referenced in the text with those listed in Part 1 of each section

d. Checking to ensure that cross-references to other sections are valid (the sections are in fact included in the job)

e. Generating a table of contents for each section

f. Generating a composite submittal register (ENG Form 4288) with a combined listing of submittals required from all sections.

g. Generating reports to confirm that items a. through f. above have been completed.

h. Generating a project table of contents.

5. ADDITIONS: If the guide does not cover a feature that is in the project, new sentences and/or paragraphs shall be inserted in the proper locations to adequately cover the feature of work. If a new material is added, it shall be properly referenced in "Applicable Publications" or "References", "Materials," "Submittal," "Tests," and "Installation" paragraphs, as applicable.

6. OTHER REPORTS: The A-E shall submit the following Specsintact reports with each design submittals including 100 percent and Ready to Advertise: Address Verification, Reference Verification, Section Verification, Bracket Verification, Submittal Verification, Submittal Register and any other reports requested by the Corps of Engineers. References shall be reconciled when printing reports. The reports to be submitted for review shall be after the A-E has corrected the errors generated by these reports. From the errors generated by the reference verification reports, fix those errors where there is a discrepancy with the issue date of a publication (i.e., NFPA 70, revise to the latest code requirement). Address, Reference and Submittal Reconciliation shall be completed prior to submittal of the 100 percent design.

7. PRODUCT: Completed specifications shall be provided in both hard copy and on electronic disc in SPECSINTACT. Hard copies of the automated reports referenced in 4g and 6 above shall be included.

8. ALTERNATE SPECIFICATIONS: Where no Unified Facilities Guide Specifications (UFGS) or District specification exists for a required item, the designer shall review other specifications available (Navy, industry, etc.) and, if no appropriate section is found, prepare a new specification title and 5-digit section number shall be created. The new guide specification shall be inserted in the most appropriate division. In accordance with Federal Acquisition Regulation (FAR), use of the “brand name or equal” method of specifying will be allowed only if a more adequate specification or detailed description cannot feasibly be made available by means other than inspection and analysis within the time allotted for

design. When this method is used, all salient features of the item must be listed. Alternate specifications shall be prepared in the same format as the UFGS.

9. ATTACHMENT: Items to be attached to sections of the specifications, such as test reports, boring logs, etc., shall be complete, concise, orderly, and free of contradictions. Portions not germane to the specification shall be so identified and/or excluded, as appropriate. Pages of attachments shall be numbered consecutively as a continuation of the body of the specification section, with the last page of the last attachment marked “End of Section”.

10. CROSS-REFERENCE: Cross-reference to other paragraphs of the specification by number designation is improper. Reference shall be made to paragraphs by title in lieu of their respective numbers. Cross-reference to other Specification Sections should be made by both number and title.

11. REFERENCE TO DRAWINGS: Information noted, "as shown on the drawings", must be correlated with the drawing to assure such information is actually shown on the drawings. Phrases "or as shown on the drawing," "unless otherwise detailed," etc., shall be deleted unless the feature is actually shown or otherwise detailed.

12. CONFLICTS: Notes and details on the drawings that conflict with specifications shall be corrected or deleted. Sizes, thicknesses, spacings, etc., must agree with the specifications. Special engineering instructions concerning latest publications and criteria requirements shall take precedence over information furnished in the issued guide specifications. The guide specifications shall be modified accordingly.

13. AMENDMENTS AND MODIFICATIONS: Specific instructions shall be obtained from the Alaska District, through CEPOA-EN-ES-SP, on the format to be used in preparing amendments or modifications to the 100 percent design.

14. ELECTRONIC BID SETS: Additional requirements will be specified for projects to be advertised electronically.

CEMP-EA Regulation No. 1110-345-700	Department of the Army U.S. Army Corps of Engineers Washington, DC 20314-1000	ER 1110-345-700 30 May 97
	Engineering and Design DESIGN ANALYSIS, DRAWINGS AND SPECIFICATIONS	
	Distribution Restriction Statement Approved for public release; distribution is unlimited.	

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

CEMP-EA

Regulation
No. 1110-345-700

30 May 1997

Engineering and Design
DESIGN ANALYSIS, DRAWINGS AND SPECIFICATIONS

1. Purpose. This regulation provides U.S. Army Corps of Engineers (USACE)-wide consistent criteria and requirements for developing design and engineering documents, such as design analysis, drawings and specifications, necessary for the construction of military construction (MILCON) and/or Hazardous, Toxic and Radioactive Waste (HTRW) projects including EPA Superfund.

2. Applicability. This regulation is applicable to all USACE Commands having MILCON, and/or HTRW design responsibility.

3. Organization. This regulation is divided into appendices that contain criteria and requirements related to the subject of the respective appendix. Each appendix is structured to provide criteria and requirements applicable to military construction and/or HTRW projects, except as may be otherwise provided for in other Engineer Regulations (ER), design directives or special instructions.

a. Appendix A, References. This appendix provides a listing of references used in this regulation.

b. Appendix B, Design Analysis. This appendix prescribes requirements and procedures for the preparation of design analysis (basis for design) of military and/or HTRW construction projects.

c. Appendix C, Drawings. This appendix prescribes requirements, procedures and drafting standards for the preparation and approval of drawings for military and/or HTRW construction projects. It includes drawings, other than shop drawings, prepared at all stages of design and construction.

d. Appendix D, Specifications. This appendix prescribes policy and requirements for the preparation of contract specifications for military and/or HTRW construction projects. It includes USACE guide specifications and project specifications, and procedures for the construction industry to follow when introducing new materials, equipment and methods into HQUSACE guide specifications.

4. Distribution. This regulation is approved for public release, distribution is unlimited.

5. General Design Policy. The Commanding General (CG) of the USACE is responsible for design, engineering and construction mission of the Army worldwide. The CG is also responsible for the execution of assigned design and construction programs or projects for other Department of Defense (DoD) agencies, other Federal agencies, and foreign governments. Highest standards of professional skills, experience and management practice are required to support this responsibility. Required facilities and component parts thereof will be carefully sited, designed, and executed so the resulting construction is of the highest quality that could possibly be provided within the cos t and time authorized, without sacrificing aesthetics, user requirements, life-cycle

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This regulation replaces ER 1110-345-700, dated 19 February 1982; ER 1110-345-710, dated 17 April 1981 and Ch.1 dated 29 October 1982; and ER 1110-345-720, dated 31 October 1989.

economy, energy conservation, environmental protection. or life safety. Additional design policy information is contained in ER 1110-345-100, Design Policy for Military Construction.

6. Proponency. Proponent for this regulation is the Architectural and Planning Branch, Directorate of Military Programs (CEMP-EA). Comments regarding improvements and/or clarifications should be submitted to the proponent office at HQUSACE, 20 Massachusetts Ave., NW, Washington, DC 20314-1000.

FOR THE COMMANDER:

4 Appendices:
APP A - References
APP B - Design Analysis
APP C - Drawings
APP D - Specifications

Colonel, Corps of Engineers
Chief of Staff

APPENDIX A

REFERENCES
(References used in this regulation)

1. Public Law. Public Law 94-168, Metric Conversion Act of 1975 as amended by the Omnibus Trade and Competitiveness Act of 1988 (Public Law 100-418).

2. Executive Order. Executive Order 12770, 25 July 1991, Metric Usage in Federal Government Programs.

3. Federal Acquisition Regulation.

a. FAR, Part 10, Specifications, Standards, and Other Purchase Descriptions. Specifically cited are subparts 10.002, Policy and 10.004, Selecting Specifications or Descriptions for Use.

b. Subpart 6.3, Other Than Full and Open Competition.

4. Engineer FAR Supplement. EFARS 14.201-1(a)1, USACE Construction Contract Format.

5. Department of the Army.

a. AR 190-13, The Army Physical Security Program.

b. AR 190-50, Physical Security for Controlled Medical Substances and Other Medically Sensitive Items.

c. AR 200-1, Environmental Protection.

d. AR 380-5, Department of the Army Information Security Program Regulation.

e. AR 385-60, Coordination With Department of Defense Explosives Safety Board.

f. AR 415-1-10, Contractor Submittal Procedures.

g. AR 415-11, Air Force Contract Construction.

h. AR 415-15, Army Military Construction Program Development and Execution.

i. AR 415-17, Cost Estimating for Military Programming.

j. AR 415-28, Real Property Category Codes.

k. TM 5-802-1, Economic Studies for Military Construction.

6. U.S. Army Corps of Engineers.

a. ER 385-1-92, Safety and Occupational Health Document Requirements for HTRW and Ordnance Explosives Waste Activities.

b. ER 415-1-10, Contractor Submittal Procedures.

c. ER 415-1-11, Biddability, Constructibility and Operability.

d. ER 415-345-38, Transfer and Warranties.

e. ER 715-1-10, Architect-Engineer Responsibility Management.

f. ER 1110-1-12, Quality Management.

g. ER 1110-1-263, Chemical Data Quality Management for Remedial Activities.

h. ER 1110-1-1300, Cost Engineering Policy and General Requirements.

i. ER 1110-1-8152, Professional Registration.

j. ER 1110-3-113, Department of the Army Facilities Standardization Program.

k. ER 1110-3-1300, Military Programs Cost Engineering.

l. ER 1110-3-1301, Cost Engineering Policy and General Requirements for Hazardous, Toxic, and Radioactive Waste (HTRW) Remedial Action Cost Estimates.

m. ER 1110-345-100, Design Policy for Military Construction.

n. ER 1110-345-122, Interior Design.

o. ER 1180-1-6, Construction Quality Management.

p. ENG Form 3078, Recommended Changes to Engineering Documents.

q. EP 310-1-6, Graphics Standard Manual.

r. EP 1110-1-21, Air Pathways Analysis for Design of HTRW Remedial Action Projects.

s. EP 1110-345-2, Index of Drawings.

t. EM 200-1-2, Technical Project Planning Guidance for HTRW Data Quality Design.

u. Architectural and Engineering Instructions (AEI).

(1) Design Criteria, issued by HQUSACE (CEMP-E). Copies are available from the Huntsville Engineering Support Center (CEHNC-ED-ES-1), P.O. Box 1600, Huntsville, AL 35807-4301.

(2) Medical Design Standards, issued by HQUSACE (CEMP-EM).

(3) Simplified Design Methods, issued by HQUSACE (CEMP-EA).

v. USACE Supplement 1 to AR 190-13, The Army Physical Security Program.

w. USACE Supplement 1 to AR 380-5, Department of the Army Information Security Program Regulation.

7. National Building Codes.

a. International Conference of Building Officials, Uniform Building Code (UBC), 5360 South Workman Mill Road, Whittier, CA 90601.

b. National Fire Protection Association (NFPA) 101, Life Safety Code, Batterymarch Park, Quincy, MA 02269.

8. National Standards Organizations.

a. American National Standards Institute. 28 October 1992. "American National Standard for Metric Practice," ANSI/IEEE 268-1992, IEEE Standards Coordinating Committee 14 on Quantities, Units, and Letter Symbols, New York.

b. American Society for Testing and Materials. 1991. "Standard Practice for the Use of Metric (SI) Units in Building Design and Construction," ASTM E 621-84 (Reapproved 1991), Committee E-6 on Performance of Building Construction, Philadelphia, PA.

c. American Society for Testing and Materials. 1992. "Standard Practice for the Use of the International System of Units (SI) (the Modernized Metric System)," ASTM E 380-92, Committee E-43 on Metric Practice, Philadelphia, PA.

d. National Institute of Building Sciences.1991. "Metric Guide for Federal Construction," Interagency Council on Metric Policy, Washington, DC.

e. MasterFormat™, Construction Specifications Institute (CSI), 601 Madison Street, Alexandria, VA 22314-1791.

APPENDIX B

DESIGN ANALYSIS

1. General. This appendix prescribes the requirements and procedures for the preparation of design analysis (basis for design) for military and/or HTRW construction projects.

2. Design Analysis Requirement.

a. A design analysis will accompany project drawings and specifications required for all new construction and/or HTRW remedial action projects, and projects involving major alteration or expansion of existing facilities, unless specifically exempted.

b. A design analysis shall be developed by the architect-engineer (design agency in-house or contracted design professional) of record for the military and/or HTRW construction project being designed.

c. The design analysis is developed in coordination with installation or customers, and summarized in a format appropriate for:

(1) Review, approval and record purposes.

(2) Revision of designs during construction, as required.

(3) Use in adapting designs to other sites.

(4) Operations and maintenance (O&M) enhancement and cost reduction.

(5) Post-occupancy evaluation.

d. Design analysis shall be prepared in metric. Where computer programs or technical references are used, the metric version of the program or reference is preferred and should be used. Where metric versions are not readily available or practical, that portion of the design analysis based on non-metric program or reference may use inch-pound (IP) units. In these cases, the final values that are to be placed in the contract documents shall be converted to their metric equivalent in the design analysis prior to use in project drawings or specifications. Unit designations and conversions shall be in accordance with ASTM E 621-84 as modified by the Metric Guide for Federal Construction, unless specifically indicated otherwise.

3. Definition. A design analysis is a document that contains written material covering general parameters, functional and technical requirements, design objectives, design assumptions, and provides design calculations applicable to a project's design.

4. Organization and Content. The design analysis will be organized into three parts; Part 1 - "General Description," Part 2 - "Design Requirements and Provisions," and Part 3 - "O&M Provisions." Characteristics of the three parts of a design analysis are as follows:

a. General Description (Part 1). This part of the design analysis will state the purpose, authorization, applicable criteria and the project description for the project, and provide a summary of the factors influencing the choice of the civil, environmental, architectural, structural, mechanical, electrical, communications, fire protection, physical security systems, and HTRW aspects used in the project along with an indication of how the initial and life cycle costs were considered. Identify all additional utility requirements,

calculate the total requirement, and compare the total existing capabilities. The requirements of the Record of Decision or other decision document will be included for HTRW projects.

b. Design Requirements and Provisions (Part 2). This part of the design analysis will include subparts for each major design discipline and basic project design requirements that should be addressed in the design analysis with justifications to validate the design decisions. Additional facility requirements are provided in Architectural and Engineering Instructions (AEI), Design Criteria, and its appendices, and special medical facility design requirements in AEI, Medical Design Standards.

(1) Civil. This includes soil analysis and survey data, site design, site improvements, planting and landscaping, paving, grading and drainage, water, waste-water and soil treatment, contaminant containment, utilities systems analysis and design, and provisions for airfields, ports and railroads, if required.

(2) Environmental. This includes an impact assessment checklist covering air, water and noise effects from the project and construction; worker health and safety; HTRW remediation cleanup and action levels; transportation and disposal regulation requirements; quality control for chemical sampling/analysis; wetlands determination (tidal and nontidal); special wildlife, plant, and endangered species considerations; ground water, waterway and floodplain protection assessment; pollution prevention control requirements; and design measures to be implemented (i.e., construction site sediment and erosion control requirements by Federal, state and local governments); and hazardous material management, natural and cultural resources, and environmental permits.

(3) Architectural. This includes space allowance, functional layout, interior design, furniture planning, signage, accessibility, security, energy conservation, space-mass composition, materials used and details with respect to image, safety, maintenance and cost effectiveness.

(4) Structural. This includes foundation, structural, seismic, hardened structure, nuclear radiation and blast protection systems analysis and design.

(5) Mechanical. This includes heating, ventilation and air conditioning systems, refrigeration, plumbing, elevators and cranes, energy conservation, pollution control, noise and vibration control, heating and chilled water distribution, gas distribution, fuel storage and dispensing, and process systems design.

(6) Electrical. This includes power generation, transmission and distribution systems, lighting (interior and exterior), voice and video communications, intrusion detection, utilities monitoring control systems (UMCS), cathodic protection, lightning and static electricity protection systems analysis and design, aviation lighting, and electromagnetic protection.

(7) Fire Protection and Life Safety. This includes building construction, exit requirements, fire extinguishing systems, fire protection water supplies, surge analysis, and alarm and detection systems analysis and design.

(8) Physical Security. This includes fencing, vaults, protective lighting, security systems, locks, arms rooms, controlled substances, entrances, guard facilities, classified material, patrol roads, clear zones, restricted areas, surveillance and penetration resistance.

c. Operation and Maintenance (O&M) Provisions (Part 3). This part of the design analysis will describe the design provisions

made to enhance and to reduce the cost of operating and maintaining the facility when completed.

(1) This part of the design analysis should include the O&M design intentions for the major design disciplines covered in Part 2.

(2) This part of the design analysis will be in a format that can be used separately to supplement the completion records required by Army Regulation (AR) 415-1-10, or to form the basis for assembling a facility user's manual.

d. Special Aspects for HTRW Projects. The design analysis for HTRW projects will include all applicable regulatory, chemical sampling/analytical, safety and occupational health, geotechnical, cost engineering, and process engineering provisions and criteria required by the HTRW guidance references listed in Appendix A and the HTRW examples listed in Appendix B (Part 2).

5. Preparation.

a. Assembly and Identification.

(1) The design analysis should be assembled, when possible, into a single volume with a complete table of contents. When more than one volume is required, each volume should be labeled, numbered sequentially and assembled under a cover page. The cover page should indicate the volume number and the total number of volumes in the design analysis for the project. Likewise, the cover page should indicate the name and location of the project, the project number and fiscal year, and the identification of the design agency. Applicable local file numbers and references to drawings, including Computer Aided Drafting and Design (CADD) file numbers, and specification numbers will be included as appropriate.

(2) Studies performed as part of the design process, such as life cycle cost analysis, energy use budget and design energy use calculations and simulations, solar feasibility analysis, treatability studies, and hydro geological modeling will be stand alone reports and included in the design analysis as appendices (referenced in the design analysis as appropriate).

b. Size and Layout.

(1) The table of contents, cover page layout and page layouts, as appropriate, will be guided by the standards prescribed and delineated in this ER. Supplemental guidance may be found in Engineer Pamphlet (EP) 310-1-6.

(2) The design analysis will be clearly and legibly expressed.

(3) All materials will be prepared in relation to a vertically oriented A4 metric, 210 mm x 297 mm (8.3 inches x 11.7 inches) standard page size (8-1/2 x 11-inch when metric paper stock is not available). Larger material may be folded to the standard page size, i.e., when reduction is not feasible, the A3 metric sheet, 297 mm x 420 mm (11.7 inches x 16.5 inches), easily accommodates folding in to the A4 metric sheet as a half-size of a standard A1 metric construction drawing.

(4) When drawings, published data or automated data processing printouts are used, these materials will be trimmed, reduced or folded to conform to the standard page size.

c. Classified Material. Every effort will be made to prepare the design analysis to be an unclassified document with proper references to sources of classified material.

d. Design Calculations. Design calculations will be computed and checked for accuracy and initialed or signed by qualified design professionals, applicable by discipline,

other than the project's designer. The names or initials of these individuals will be indicated on the page, or an insert, carrying the calculation.

(1) All design assumptions, loads and conditions, as applicable, will be clearly indicated and legible with tabulations indicated on the page, or an insert, carrying the calculation, and will be clear and legible with the tabulation. The sources of loading conditions, design assumptions, formulas and references will be identified. Assumptions and conclusions will be explained and cross-referenced.

(2) When a commercial computer program (software) is used:

(a) The program will be named and described to include a flow chart, or other documentation, showing how the program attains the solution. This description must be sufficient to verify the validity of methods, assumptions, theories and formulas, but should not require source code documentation or otherwise compromise any proprietary programs.

(b) The input shall be reviewed for accuracy and initialed or signed by a registered architect or engineer, or design professional as applicable to the input being checked. The output shall be reviewed to ensure the reasonableness and applicability of the result and initialed or signed by the design professional that reviewed the input.

e. Use of Existing Design Analysis. If a standard design or other design is being site adapted, the design analysis for the new project will include appropriate material from the existing design analysis modified to incorporate site adaptations and other essential requirements.

6. Exceptions to Appendix B Requirements.

a. Medical Facility Projects.

b. Family Housing Projects.

c. Army Reserve Projects.

d. Non-appropriated Funds (NAF) Projects.

e. Design-Build Projects.

f. Simplified Design Method (SDM) Projects.

g. Defense Environmental Restoration Program, Superfund, and BRAC time critical removal actions (including Ordnance and Explosives projects).

- PART 1 -

GENERAL DESCRIPTION

1. Design Analysis. The design analysis -Part 1- will comprise five (5) sections with subsections as follows:

a. Purpose. A purpose section will be provided with a description of the project's functional purpose and other supporting dialogue from project information prepared by the installation and the organization for which the project is to be designed.

b. Authorization.

(1) Directives. A synopsis of applicable design directives for the project will be included in this part of the design analysis. For HTRW projects, include a discussion of the appropriate Federal and/or state regulations governing the project (RCRA, CERCLA, Clean Water Act, etc.).

(2) Scope of Work. A synopsis of the project authorized under the DD Form 1391 program, A106, FUDS work plan or ROD (record of decision) will be included in this part of the design analysis, to include the authorized project scope of work and programmed amount.

c. Criteria. References will be made to applicable Technical Manuals (TM), ER, AEI, Engineering Instructions (EI), other prescribed criteria, specific studies and minutes of meetings held to define the scope of the project, cost limitations and the character of the design.

d. Project Description.

(1) Project Site. A synopsis will be provided that indicates the general site conditions, project siting requirements, existing utilities available to the site, topography, wetlands designated areas, unusual environmental characteristics to be impacted by the project, and conformance with the installation master plan.

(2) Functional Objective. The basic functional objective or objectives of the proposed project and the estimated functional life will be described.

(3) Personnel and Equipment. The number of civilian and military personnel and visitors, and the types of service and/or organizational equipment to be accommodated in the project will be described.

(4) Constructibility. The basic construction materials and systems selected, and the estimated structural life of the project will be described.

e. Economic Summary. Economic factors affecting the project will be described, especially those factors influencing the choice of basic materials, and the civil, architectural, structural, mechanical, electrical and fire protection systems selected to include:

(1) Results of economic studies which consider not only the initial construction cost but also costs incurred over the estimated functional life of the project. Applicable requirements in ER 1110-1-1300, ER 1110-3-1300, ER1110-3-1301, and TM 5-802-1 must be adhered to in preparation of cost estimates.

(2) Results of value engineering studies performed on the project design.

(3) Design analysis prepared so that they may be edited using computer systems and

software standards by the design agency.

2. Review and Approval. Review and approval of design analysis will coincide with the review and approval of the project drawings and specifications in accordance with Appendices C and D of this ER including:

a. Project Engineering with Parametric Estimating Design Stage (Code 3). The general summary statement will be in accordance with Architectural and Engineering Instructions (AEI), Code 3 Design.

b. Concept Design Stage (Code 2). The design analysis will cover the progress of all of the design disciplines (refer to Part 2).

c. Final Design Stage (Code 6). All parts of the design analysis, including the O&M provisions (refer to Part 3), will be complete within themselves, without requiring reference back to earlier design analysis. Review and approval of final design drawings and specifications will be done concurrently with the review and approval of the final design analysis.

d. Drawing Modifications. When modifications of project drawings are authorized, as set forth in Appendix C of this regulation, the design analysis for the changed conditions will be added to the design analysis and the revision date or dates noted.

3. Disposition and Reference Copy. The final design analysis with revisions and the as-built drawings will be transferred to the using service after acceptance of the project. A reference copy of the design analysis will be retained separately by the design agency for possible use in adapting the project design to another site or in evaluating lessons learned. Reference copies of the design analysis will be retained by the design agency for at least two years after the beneficial occupancy date (BOD) of the project.

- PART 2 -

DESIGN REQUIREMENTS AND PROVISIONS

1. Civil.

a. General Parameters. Examples of general civil parameters that need to be addressed are:

(1) Site boundaries controlled and uncontrolled access, limits (boundries) of contaminated soil and/or ground water, and total area.

(2) Topography and soil drainage characteristics.

(3) Results of geotechnical explorations, laboratory and field testing; soil and rock elevations, classifications and characteristics; and groundwater elevations.

(4) Special considerations, such as dynamic loading, expansive soils, permafrost or dewatering, and precautions during construction.

(5) Prevailing winds, sun angles, design temperatures and precipitation.

(6) Existing structures, parking, vegetation, open spaces and outdoor recreation areas. Functional relationships relative to adjacent facilities, exclusion zone, or decontamination facilities.

(7) Disposition of major utilities, transportation arteries and access roads to include other planned projects by title, fiscal year and line item number.

(8) Proposed facilities, buildings, support buildings, parking, access roads, service areas, utilities and helipads.

(9) Former use, demolition responsibilities and location (with justification) of borrow pits, disposal areas and contractor plant areas, including HTRW wastes.

(10) Local construction practices, availability of materials, labor and skills, and use of industrialized components.

(11) Installation compatibility, and future use considerations.

(12) Permit requirements, as applicable.

(13) Contaminant characteristics and final treatment parameters

(14) Treatment facilities startup.

(15) Any other civil parameters necessary for special project designs.

b. Functional and Technical Requirements. Examples of civil related functional and technical requirements that need to be addressed are:

(1) Orientation of elements of the project to conserve energy and to reduce site preparation.

(2) Exterior functional areas, relationships and space allowances for operational, storage and support activities.

(3) Accessibility for handicapped (physically impaired or disabled) persons.

(4) Grading, storm drainage and irrigation.

(5) Landscape design and planting.

(6) Exterior signage and outdoor furnishings.

(7) Area and sign lighting.

(8) Sidewalks, retaining walls, fencing, traffic controls and barriers.

(9) Parking, access roads, including haul roads for transport of hazardous material for disposal, and access for service and emergency vehicles, to include paving design, and railroads and airfields.

(10) Service areas for pick-up and deliveries, bulk waste storage or disposal and exterior utility elements (transformer, chillers, etc.).

(11) Building set-backs, spacing of structures and maximum walking distances.

(12) Exterior utility support systems, to include fire protection water and storm drainage.

(13) Heliport and airfield clear approach and landing.

(14) Heliport and airfield illumination, and marking.

(15) Treatment equipment layout and operational flexibility.

(16) Operation, maintenance, and staffing levels at treatment facilities.

(17) Material selection for monitoring and extraction well construction and associated discharge piping.

c. Design Objectives and Provisions. Examples of civil related design objectives and provisions that need to be addressed are:

(1) Vehicular and pedestrian circulation patterns.

(2) Landscape preservation, composition and perception.

(3) Functional relationships of buildings and support facilities, to include off-site facilities and areas impacting on the site design.

(4) Barrier-free design for handicapped (physically impaired) persons.

(5) Utility support and isolation.

(6) Economy of construction and the operations and maintenance of the project relative to life-cycle cost effectiveness in accordance with TM 5-802-1, ER 1110-1-1300, ER 1110-3-1300, and/or ER 1110-3-1301.

(7) Future expansion, if applicable.

(8) Economy of construction and procurement, and life-cycle cost effectiveness in accordance with TM 5-802-1, ER 1110-1-1300, ER 1110-3-1300, and/or ER 1110-3-1301.

(9) Instrumentation requirements at treatment facilities.

(10) Evaluation of construction materials.

d. Calculations. The calculations for civil design elements, such as those listed below, will utilize metric units. If the project is permitted to use inch-pound (IP) units, the calculations shall be performed in normally accepted and recognized IP units.

(1) Soil bearing capacities, settlement analysis, slope stability, erosion control, lateral earth pressures and frost design.

(2) Road, paving, grading and storm drainage design.

(3) Landscape design irrigation systems, if applicable.

(4) Parking allowances for civilian, military and visiting personnel, handicapped (physically impaired) persons and organizational equipment.

(5) Verification of the adequacy of existing and planned utility systems required for complete project support.

(6) Sizing of domestic water and fire protection systems.

(7) Sizing of waste-water collection systems, to include maximum flow rated in liters per second for waste-water and sewage, and the total flow per day.

(8) Railroad design, if applicable.

(9) Cost comparison of competitive designs and materials, in terms of both construction costs, acquisition costs, and life-cycle costs in accordance with TM 5-802-1, ER 1110-1-1300, ER 1110-3-1300, and/or ER 1110-3-1301.

(10) Estimated cost of construction.

(11) Treatment equipment sizing and selection

(12) Treatment facility mass balances for all major process streams.

(13) Aquifer parameter determination, fluid (ground water or air) production rates and/or velocities, extraction/injection well spacings, filter pack design, and documentation of modeling used in system design.

e. Coordination with Installation or Outside Agencies. Coordination should include, but not be limited to:

(1) Siting in accordance with the Major Army Command (MACOM) approved installation master plan.

(2) Utility service capacities and central plant support.

(3) Water supply and sanitary discharge, including on-site treatment plant discharge.

(4) Demolition and debris disposal.

(5) Fire fighting support.

(6) Bulk trash and non-hazardous waste disposal procedures.

(7) Signage makeup and maintenance.

(8) Construction and other permits, as applicable.

(9) Safety siting approval for explosives-handling facilities as required in AR 385-60 for coordination with the DoD Explosives Safety Board, if applicable.

(10) Waste Manifesting.

2. Environmental.

a. General Parameters. Examples of general environmental parameters that need to be addressed are:

(1) Completed Environmental Impact Assessment (EIA) checklist covering the air, water and noise effects of the project on the site and adjacent sites. This is often already completed by the installation, but validation by the design agency or contract Architect-Engineer (A-E) is required.

(2) Identification of wildlife and plants that are adversely impacted by the placement and operation of the project on the site. Rare or endangered species must be identified and

specifically reported.

(3) Maps indicating wetland designations on the site or adjacent sites affected by the project or the construction of the project.

(4) Archeological preservation, to include cemetery identification.

(5) Ground water and waterway locations.

(6) Pollution prevention and control measures during construction and the operation of the project.

(7) A comprehensive environmental permit/regulation analysis which addresses air, water, solid and hazardous waste as appropriate. Examples include Clean Water Act operating permits, storm water and point source discharge permits, hazardous waste storage and treatment permits, emergency planning and community right-to-know (EPCRA) and state and local environmental permits and related issues.

(8) Health and Safety Design Analysis (HSDA) in accordance with ER 385-1-92.

(9) Air Pathways Analysis (APA) in accordance with EP 1110-1-21.

(10) Data Quality Objectives (DQOs) for cleanup verification/process performance chemical sampling and analysis developed in accordance with EM 200-1-2.

(11) Media-specific cleanup levels on ARARs or acceptable residual risk calculations.

(12) Contaminant-specific ambient air action levels for health protection of offsite human receptors.

(13) Substantive elements of the Quality Assurance/Quality Control (QA/QC) program to be utilized in generation of any chemical analytical data. (Refer to ER 1110-1-263 for QA/QC program elements).

b. Functional and Technical Requirements. Examples of environmental related functional and technical requirements that need to be addressed are:

(1) Project orientation relative to environmentally sensitive areas on or adjacent to the site.

(2) Site modification and storm water runoff affects on ground water, waterways and wetlands.

(3) Discharges relative to the affects on the immediate environs.

(4) Sound and vibration control.

c. Design Objectives and Provisions. Examples of environmental related design objectives and provisions that need to be addressed are:

(1) Functional relationship of the project to the environment.

(2) Roadway and parking areas storm water runoff effects.

(3) Utilities placement relative to environmentally sensitive areas.

(4) Economic aspects for environmental protection measures and methods.

(5) Future expansion possibilities affects on the environs.

(6) Economic aspects of construction and procurement, and life-cycle cost effectiveness in accordance with TM 5-802-1, ER 1110-1-1300, ER 1110-3-1300, and/or ER 1110-3-1301.

(7) For HTRW remediation designs, an evaluation of remediation goals (i.e., projected endpoints) as they relate to proposed remediation goals and the remedial design.

d. Calculations. The calculations for environmental design elements, such as those listed below, will utilize metric units. If the project is permitted to use IP units, the calculations shall be performed in normally accepted and recognized IP units.

(1) Erosion control protection measures and methods.

(2) Ratio of the paved areas and the building area relative to the total site area.

(3) Storm water runoff.

(4) Air, water, HTRW and sanitary discharge, and impacts on receiving media.

(5) Pollution abatement systems and their scopes.

(6) Cost comparison of competitive designs and materials, in terms of both construction costs, acquisition costs, and life-cycle costs in accordance with TM 5-802-1, ER 1110-1-1300, ER 1110-3-1300, and/or ER 1110-3-1301.

(7) Estimated cost of construction.

e. Coordination with Installation or Outside Agencies. Coordination should include, but not be limited to:

(1) Validation (check) of the approved siting relative to the designated areas of the installation for preservation and pollution protection requirements.

(2) Federal, state, and local governmental approvals as required for wetlands and other environmental protection laws.

(3) Storm water runoff.

(4) Air, water, HTRW, and sanitary discharges.

(5) Sediment and erosion control during construction.

3. Architectural.

a. General Parameters. Examples of general architectural parameters that need to be addressed are:

(1) Purpose, functions and capacities of the project.

(2) Desired image or visual appearance to include the design of the exterior and interiors of the building, refer to Engineer Regulation (ER) 1110-345-122 regarding interior design.

(3) Number of civilian, military and visiting personnel to use the project.

(4) Types of activities, equipment and vehicles involved.

(5) Anticipated life of the functions to be accommodated.

(6) Type and method of construction; permanent, temporary or relocatable.

b. Functional and Technical Requirements. Examples of architectural related functional and technical requirements that need to be addressed are:

(1) Functional areas, occupant capacities and space allowances.

(2) Exterior and interior finish materials, to include textures, colors and damage resistant.

(3) Equipment, furniture and furnishings, to

include all items required regardless of funding; refer to ER 1110-345-122 regarding funding distinctions.

(4) Directional, informational and motivational signage.

(5) Accessibility for handicapped (physically impaired) persons, barrier free design, and provisions for blind vending areas operated by State agencies.

(6) Energy conservation, to include solar energy applications and energy use budget goals.

(7) Occupational safety and health.

(8) Sound and vibration control.

(9) Interior parking and service areas.

c. Design Objectives and Provisions. Examples of architectural related design objectives and provisions that need to be addressed are:

(1) Adaptation of the building to the size, shape and orientation of the site, to include benefits from natural warming and cooling effects afforded by the site.

(2) Organization of functional spaces to establish workable adjacency relationships.

(3) Building layout to establish convenient circulation flows for people, services, materials and equipment, to include evacuation during emergencies.

(4) Consolidation of spaces into sound-compatible zones and protective construction zones, to include fire, storm and fallout.

(5) Space layout compatible with modular (structural and environmental) support systems.

(6) Types of construction materials, architectural systems and finishes, to include the basis for their selection.

(7) Composition of masses and spaces, and architectural details to reflect the desired image, and the scale and nature of the activities involved.

(8) Perception of the building details and volumes. Specific provisions made, to include an identifiable sequence of viewing positions for experiencing the architectural and interior design.

(9) Building expandability and changeability.

(10) Energy conservation.

(11) Acoustical design.

(12) Enhancement of materials and systems operations and maintenance.

(13) Economy construction and procurement, and life-cycle cost effectiveness in accordance with TM 5-802-1.

d. Calculations. The calculations for architectural design elements, such as those listed below, will utilize metric units. If the project is permitted to use IP units, the calculations shall be performed in normally accepted and recognized IP units.

(1) Net room areas, occupant capacity and gross building areas. Categorize these areas and capacities under administrative, operational, storage and support requirements.

(2) Ratio of exterior window and room area, where applicable.

(3) Thermal conductance values for each

building section, which should be selected in coordination with the mechanical engineer design professional to satisfy life cycle cost and energy conservation requirements.

(4) Estimated annual unit energy consumption, which is, in coordination with the mechanical engineer, to determine the design energy use and compliance with the energy use budget.

(5) Acoustics, if applicable.

(6) Roof drainage.

(7) Estimated cost of construction.

(8) Cost comparison of competitive designs and materials, in terms of both construction costs, acquisition costs, and life-cycle costs in accordance with TM 5-802-1.

e. Coordination with Installation or Outside Agencies. Coordination should include, but not be limited to:

(1) Blind vending area operations.

(2) Make-up of signage.

(3) Government-furnished furniture and equipment.

(4) Occupational safety and health, as required.

(5) Operations and maintenance support.

4. Structural.

a. General Parameters. Examples of general structural parameters that need to be addressed are:

(1) Foundation characteristics based on geotechnical survey and subsurface investigation.

(2) Conditions related to possible seismic events, wind, storms and blast.

(3) Size of areas and volumes to be inclosed, and floor loads.

(4) Permanency of construction and expediency of erection.

(5) Apparent competitive structural systems in view of local constructibility parameters to include potential use of building systems fabricated off of the site.

(6) Need for fallout protection or shelter space in accordance with the Installation's Army Survival Measures Plan.

b. Functional and Technical Requirements. Examples of structural related functional and technical requirements that need to be addressed are:

(1) Allowable settlement soil bearing capacity and pile loads, as applicable.

(2) Dead, live, wind, snow and seismic design loads.

(3) Allowances for future loads or expansion.

(4) Dynamic loads, to include weapons effects, as applicable.

(5) Design methods; allowable working stress or strength (load factor).

(6) Design stresses; allowable unit stress or yield stress of materials.

(7) Deflection, to include maximum limits.

(8) Nuclear radiation (fallout) protection.

c. Design Objectives and Provisions. Examples of structural related design objectives and provisions that need to be addressed are:

(1) Foundation design as required by foundation or soil characteristics.

(2) Bay sizes and module spacing for functional requirements and economy.

(3) Seismic protection, to include symmetrical configuration of framing system, where applicable.

(4) Type and fabrication or construction of structural system, to include the basis for selection for at least three competitive systems.

(5) Speed of erection.

(6) Fallout protection or shelter space potential.

(7) Economy of construction and procurement, and life-cycle cost effectiveness in accordance with TM 5-802-1.

d. Calculations. The calculations for structural design elements, such as those listed below, will utilize metric units. If the project is permitted to use IP units, the calculations shall be performed in normally accepted and recognized IP units.

(1) Wind, snow, seismic and dynamic loads, as applicable.

(2) Shears, moments and axial loads, to include stress analysis diagrams and torsional effects, where applicable.

(3) Deflection of members and walls.

(4) Type and sizing of foundations, structural members and connections.

(5) Uplift and stability of the structure.

(6) Expansion and crack control.

(7) Construction or erection limitations.

(8) Structural adequacy of existing structures, where applicable, to account for new functional loads or new criteria.

(9) Fallout protection factors as required, or to identify Protection Factor (PF) 40 and above shelter spaces. Include single line plans showing the location of shelter areas and minimum PF rating.

(10) Cost comparison of competitive designs and materials, in terms of both construction costs, acquisition costs, and life-cycle costs in accordance with TM 5-802-1.

(11) Estimated cost of construction.

e. Coordination with Installation or Outside Agencies. Coordination should include, but not be limited to:

(1) Construction or erection limitations.

(2) Need for fallout shelter space.

5. Mechanical.

a. General Parameters. Examples of general mechanical parameters that need to be addressed are:

(1) Temperature extremes and other impacts of climate such as wind, precipitation, sun angles and humidity.

(2) Apparent competitive mechanical systems relative to fuel alternatives, energy use budgets and environmental impacts.

(3) Indoor environmental conditions

including temperatures, humidity, pressurization, ventilation and exhaust requirements.

(4) General Heating, Ventilation and Air Conditioning (HVAC) zones and occupant capacities.

(5) General toilet and sanitation zones, and occupant capacities.

(6) Water supply pressure.

(7) Existing or planned sanitary sewer capacities.

(8) Toxic or hazardous pollutant sources.

(9) Functions and occupancies requiring mechanical lifts, elevators and cranes.

(10) Special waste and drainage systems such as acid waste.

(11) Energy sources and capacities including heating and chilled water distribution, gas distribution, and fuel storage.

(12) Building and related mechanical system commissioning.

b. Functional and Technical Requirements. Examples of mechanical related functional and technical requirements that need to be addressed are:

(1) Design temperatures.

(2) Heating and/or cooling (air conditioning), and humidity control.

(3) Mechanical ventilation (air circulation) and special exhausts.

(4) Energy conservation, to include solar and recovery systems.

(5) Total energy and selective energy systems.

(6) Standby heating and cooling, and emergency environmental systems.

(7) Toilet fixture allocation.

(8) Hot and cold water systems, to include recovery systems.

(9) Heating and chilled water distribution, gas distribution and special liquid storage and distribution systems.

(10) Compressed air and vacuum production components.

(11) Sanitary waste and vent piping.

(12) Acid waste and chemical piping, and neutralization.

(13) Coordination with the connection to site utilities.

(14) Mechanical lifts, hoists and elevators.

(15) Control of airborne-polluting substances within the project.

(16) Control of polluting substances from energy systems.

(17) Treatment and disposal of toxic and/or polluting substances within the project.

(18) Accessibility and features for handicapped (physically impaired or disabled) persons.

c. Design Objectives and Provisions. Examples of mechanical related design objectives and provisions that need to be addressed are:

(1) Impacts and benefits from natural warming and cooling effects afforded by the site and coordination with passive solar design.

(2) Zoning of HVAC by occupancy.

(3) Heating and/or cooling system life cycle cost design, to include the basis for selection of the system. Provide an analysis of each competitive system.

(4) System expandability and feasibility.

(5) Energy conservation.

(6) Vibration and noise isolation and control.

(7) Consolidation of toilet and sanitation facilities.

(8) Supply and waste piping systems.

(9) Connection to utilities.

(10) Mechanical lift, hoist, crane and elevator designs.

(11) Control of polluting substances.

(12) Enhancement of systems operations and maintenance.

(13) Economy of construction and procurement, and life-cycle cost effectiveness in accordance with TM 5-802-1.

(14) Provisions for building and related mechanical system commissioning, and the testing adjusting and balancing of mechanical systems.

d. Calculations. The calculations for mechanical design elements, such as those listed below, will utilize metric units. If the project is permitted to use IP units, the calculations shall be performed in normally accepted and recognized IP units.

(1) Heating and cooling design loads. Computerized calculations will indicate the basis of all input data.

(2) Estimated annual unit energy consumption (see architectural).

(3) Determine the design energy use and compliance with the energy use budget.

(4) Energy recovery systems.

(5) Total energy and selective energy studies.

(6) Complete system and unit capacities, indicating the dimensions of all equipment.

(7) System vibration and noise isolation and control, safety, security and fire protection.

(8) Allocation of toilet and other fixtures.

(9) Maximum flow rates in liters per minute [gallons per minute] for hot and cold water, and the total flow per day.

(10) Size of hot and cold water supply systems, to include storage tanks inside the building and the supply of water for fire protection.

(11) Size of heating and chilled water distribution, gas distribution, fuel storage, and special liquid, compressed air and vacuum systems.

(12) Size of waste water and sewage drainage systems inside the building.

(13) Sizing of mechanical lifts, hoists and passenger and service elevators. Indicate the peak hour capacities for passenger elevators.

(14) Energy system pollution abatement.

(15) Disposal systems for toxic and/or polluting substances within the project.

(16) Outside air, ventilation and exhaust air design.

(17) Supply, return and exhaust air duct sizing, and pressures.

(18) Acoustic analysis including system noise isolation and reduction.

(19) Safety, security and fire protection and suppression.

(20) Building and related mechanical system commissioning, and the testing, adjusting, and balancing of mechanical systems.

(21) Surge analysis of closed loop systems.

(22) HVAC control system parameters and constraints.

(23) Cost comparison of competitive designs and materials, in terms of both construction costs, acquisition costs, and life-cycle costs in accordance with TM 5-802-1.

(24) Estimated cost of construction.

e. Coordination with Installation or Outside Agencies. Coordination should include, but not be limited to:

(1) Total energy and selective energy planning.

(2) Operations and maintenance support.

(3) Indoor environmental requirements including temperatures, humidity, and outside and exhaust air requirements.

(4) Type, number, schedule and activity level of occupants.

(5) Equipment to be installed along with utility requirements, environmental requirements, and heat release.

(7) Requirements for mechanical lifts, hoists, cranes, and elevators.

6. Electrical.

a. General Parameters. Examples of general electrical parameters that need to be addressed are:

(1) Type of occupancies.

(2) Specialized functions and equipment.

(3) Communications support.

(4) Electrical characteristics of the power supply.

(5) Adequacy of the existing system supporting the project site.

b. Functional and Technical Requirements. Examples of electrical related functional and technical requirements that need to be addressed are:

(1) Point of interface between the existing electrical system and the system to be constructed needs to be defined.

(2) Load characteristics including connected load, demand load, diversity factors, power factor, load profiles, nonlinear loads, transformer(s) peak loading and load growth provisions.

(3) Basis for selection of primary and secondary distribution voltages.

(4) Overhead and underground exterior distribution; voltage drop, interrupting requirements, physical characteristics of the circuits including types of conductors, ampacity of service, feeder and branch conductors, pole line and duct bank, conduit, or direct buried equipment characteristics.

(5) Illumination levels, to include general and task lighting, and visual qualities of lighting requirements .

(6) Low and high system voltage.

(7) Low and high voltage switching.

(8) Loads and load factors, to include allowances for future loads.

(9) Installation and equipment standards.

(10) Emergency lighting, distribution, security, communications and standby generation systems.

(11) Power, lighting, communications and security for site elements.

(12) Communications, to include call systems.

(13) Electronic clock systems.

(14) Electronic security, surveillance and Intrusion Detection Systems (IDS).

(15) Audio visual systems, to include central television (TV) systems.

(16) Energy conservation and energy monitoring.

(17) Power generation.

(18) Electromagnetic protection (EMP).

(19) Explosion-proof connections in hazardous environments.

c. Design Objectives and Provisions. Examples of electrical related design objectives and provisions that need to be addressed are:

(1) Electrical feeder and distribution systems.

(2) Spare capacities.

(3) General illumination and task lighting coordinated with interior layouts, safety and security requirements.

(4) Relamping and adjustments.

(5) Nonlinear loads and harmonics.

(6) Communications systems.

(7) Emergency power generation and distribution.

(8) Energy conservation.

(9) Enhancement of systems operations and maintenance, to include systems flexibility.

(10) Economy of construction and procurement, and life-cycle cost effectiveness in accordance with TM 5-802-1.

d. Calculations. The calculations for electrical design elements, such as those listed below, will utilize metric units. If the project is permitted to use IP units, the calculations shall be performed in normally accepted and recognized IP units.

(1) Maintained lux [Foot candle (FC)] levels in all areas. Where areas are similar in size and usage, only a typical calculation is required.

(2) Individual circuit and system loads

tabulated in amperes for each panel board or switchboard.

(3) Transformers, generators, switchboards and feeders indicating all demand, diversity, and ambient-temperature or conductor-grouping factors considered in the selection of equipment or conductor sizes.

(4) Cost comparison of illuminating, power and communication systems.

(5) Nonlinear loads and harmonic contributions, kilowatt rating of transformers, etc.

(6) Ground fault and its circuitry protection.

(7) Selective system protection.

(8) Voltage-drop on all service and feeder circuits, and on worst-case branch circuits supplied by each panel board and switchboard.

(9) Weight, dimensions and electrical characteristics of each major item of equipment supported by manufacturer's names, and catalog and model numbers.

(10) Cost comparison of competitive designs and materials, in terms of both construction costs, acquisition costs, and life-cycle costs in accordance with TM 5-802-1.

(11) Estimated cost of construction.

(12) Short circuit calculations.

(13) Electromagnetic Protection.

e. Coordination with Installation or Outside Agencies, i.e., electrical utility company, and the Installation's electrical distribution organization. Coordination should include, but not be limited to:

(1) Telephone system requirements and availability.

(2) Central TV.

(3) Power requirements of the installation's service and cleaning equipment of the installation.

(4) Provost Marshal or police response to IDS alarms.

(5) AR 190-13 for Army physical security, IDS design approvals, when required.

(6) Incorporation of maintenance and commissioning requirements of the Installation.

(7) Intrusion Detection System (IDS) Center of Expertise, Huntsville Engineer Technical Center, for design assistance.

(8) Utility Monitoring and Control System (UMCS) Center of Expertise, Huntsville Engineer Technical Center, for UMCS/EMCS design assistance.

7. Fire Protection and Life Safety.

a. General Parameters. Examples of general fire protection parameters that need to be addressed are:

(1) Types of occupancies.

(2) Hazard classification of specific areas and list of hazards.

(3) Specific criteria; standards and codes.

(4) Type of construction.

(5) Type of fire protection.

(6) Water supply.

b. Functional and Technical Requirements. Examples of fire protection related functional and technical requirements that need to be addressed are:

(1) Fire resistance of building components, to include floor and ceiling assemblies, exterior and interior walls, permanent partitions, shafts, and location of fire separation walls and partitions.

(2) Allowable floor area and building height in accordance with the Uniform Building Code (UBC) based on occupancy classification, construction, separations and fire suppression or protection.

(3) Exit requirements in accordance with NFPA 101, Life Safety Code (LSC). The design and analysis must address exit types, required exit widths, maximum travel distance for exiting, dead-end distances and common exit paths of travel limitations, arrangement of exits, remoteness of exits, discharge from exits, illumination of exits and exit marking.

(4) Flame spread and smoke development rating of interior finishes and insulations.

(5) Building access for local fire department fire fighters.

(6) Building separation and exposure protection.

(7) Smoke control methods.

(8) Automatic extinguishing systems.

(9) Fire alarm evacuation systems.

(10) Fire detection systems.

(11) Fire hydrants and standpipes.

(12) Water supply, to include new or additional water storage, pumping, and/or water distribution mains.

(13) Special hazards and methods for protection.

c. Design Objectives and Provisions. Examples of fire protection related design objectives and provisions that need to be addressed are testing and field investigation reporting requirements:

(1) Water flow tests at the point of connection for sprinklered buildings.

(2) Existing water supply.

(3) Existing fire hydrants.

(4) Existing fire alarm reporting system information for connection of new fire alarm systems.

(5) Economy of Construction and procurement, and life-cycle cost effectiveness in accordance with TM 5-802-1.

d. Calculations. The calculations for fire protection design elements, such as those listed below, will utilize metric units. If the project is permitted to use IP units, the calculations shall be performed in normally accepted and recognized IP units.

(1) Complete exit requirement calculations based on the LSC.

(2) Allowable floor area and building height calculations based on UBC.

(3) Water supply calculations indicating the adequacy of the design to meet sprinkler and hose stream flow demands. Calculations must be based on residual and static pressures and flow data obtained from water flow tests.

(4) Sprinkler calculations to determine water flow and pressure demands.

(5) Fire alarm system calculations for elements such as, wire sizing, battery, and alarm annunciator sound level.

(6) Complete hydraulic design calculations for detailed sprinkler and Aqueous Film Forming Foam (AFFF) system designs.

(7) Layout and sizing of special fire extinguishing systems, such as carbon-dioxide, halon, and AFFF (low pressure foam system).

e. Coordination with Installation or Outside Agencies. Coordination should include, but not be limited to:

(1) Fire fighting support, to include tie-ins with local fire department alarm and communication systems.

(2) Adequacy of water supply, to include flow tests.

(3) Inspection and testing of systems performance.

(4) Obtain the specific fire alarm type(s), fire protection and central reporting requirements of the Installation's Fire Marshall/Chief.

8. Physical Security.

a. General Parameters. Examples of general physical security parameters that need to be addressed are:

(1) Mission of the project.

(2) Size of the site.

(3) Installation threat statement.

(4) Anticipated aggressor tactics.

(5) Personnel and materials being protected.

(6) Activities performed.

(7) Security forces available.

b. Functional and Technical Requirements. Examples of physical security related functional and technical requirements that need to be addressed are:

(1) Defensible site layout.

(2) Securable building layout.

(3) Resistance to aggressor penetration.

(4) Vandal-proofing.

(5) Intrusion denial.

c. Design Objectives and Provisions. Examples of physical security related design objectives and provisions that need to be addressed are:

(1) Maximum security.

(2) No detraction from mission.

(3) Cost effective security features.

(4) Provisions for expansion.

(5) Efficient security zoning.

(6) Maximum use of standard designs.

(7) Economy of construction and procurement, and life-cycle cost effectiveness in accordance with TM 5-802-1.

d. Calculations. The calculations for physical security design elements, such as

those listed below, will utilize metric units. If the project is permitted to use IP units, the calculations shall be performed in normally accepted and recognized IP units.

(1) Time for aggressor to penetrate.

(2) Time for security force to respond.

(3) Power requirements for security systems.

(4) Protective lighting intensities.

(5) Costs.

e. Coordination with Installation or Outside Agencies. Coordination should include, but not be limited to:

(1) Conformance to the installation security plan.

(2) Appropriate local police agencies regarding patrol and alarm responses.

(3) Signal office regarding security communications.

(4) Security office regarding any AR 380-5 for classified material protection requirements.

(5) Protective Design Center of Expertise (Omaha District Engineer Office).

(6) Intrusion Detection System Center of Expertise, Huntsville Engineering and Support Center, for design assistance.

(7) Installation military police regarding any Army physical security of arms, ammunition and explosives, protection requirements.

(8) Intrusion detecting system approval in accordance with Army physical security criteria, when required.

(9) Installation medical office regarding any AR 190-50 requirements.

(10) Facility user regarding any automation security requirements.

- PART 3 -

OPERATION AND MAINTENANCE (O&M) PROVISIONS

1. Using Service Responsibilities For O&M. The following are using service responsibilities for O&M that should be considered by the design agency during the design development process:

a. Control Responsibilities.

(1) Parking allowances and assignment.

(2) Pavement and floor loadings.

(3) Spare parts, equipment, consumables, and miscellaneous storage.

(4) Energy use.

(5) Site access restrictions.

b. Service Responsibilities.

(1) Access-egress maintenance.

(2) Landscape maintenance.

(3) Snow and ice removal.

(4) Housekeeping, trash collection and disposal.

(5) Signage.

(6) Mail handling, shipping and receiving.

(7) Food service and supply.

(8) Health (dispensary) and sanitation.

(9) Reproduction (copy) service.

(10) Vending (state blind agencies and others).

(11) HVAC systems.

(12) Electrical and communications services.

(13) Security and fire protection.

(14) Shop support.

(15) Plumbing systems.

(16) Lifts, hoists, cranes, and elevators.

(17) Compressed air and vacuum systems.

(18) Fuel storage and dispensing systems.

(19) Industrial gas systems.

(20) Treatment facility operation and maintenance.

(21) Residuals disposal and manifesting.

(22) Permit compliance monitoring.

(23) Extraction/injection remediation system maintenance.

(24) Worker safety and occupational health.

2. Provisions For O&M Enhancement and Cost Reduction. The following are provisions for O&M enhancement and cost reduction that should be considered by the design agency during the design development process:

a. Control Related.

(1) Preventive overloading factors.

(2) Food service efficiency maximizers, preparation, serving, seating and dish washing.

(3) HVAC efficiency maximizers; sub- and main plant.

(4) Lighting efficiency maximizers, intensities and switching.

(5) Communications efficiency maximizers.

(6) Elevator efficiency maximizers.

(7) System expandability and flexibility.

b. Service Related.

(1) Below-grade flood protection.

(2) Above grade solar, water, and wind protection and resistance.

(3) Finish materials, textures and colors.

(4) Window washing provisions.

(5) Provisions for cleaning equipment.

(6) Vibration and expansion contraction controls.

(7) Energy conservation and pollution control measures.

(8) Access to mechanical systems; HVAC, elevators, plumbing, process and special equipment.

(9) Provisions for building and system recommissioning and testing, adjusting and balancing of mechanical, electrical and communications systems.

(10) Relamping and lighting relocation.

(11) Electrical distribution allowance for future loads.

(12) Emergency power system testing, and monitoring power quality.

(13) Vandalism and intrusion resistance.

(14) Confined spaces reduction/elimination or identification.

(15) Toxic or hazardous pollutant sources and exposure potentials.

APPENDIX C

DRAWINGS

1. General. This appendix prescribes the requirements, procedures and drafting standards for the preparation and approval of drawings for military construction and/or HTRW projects. It includes drawings, other than shop drawings, prepared at all stages of design and construction.

2. Standard Drawings. Standard drawings are developed under the guidance and criteria issued by HQUSACE (CEMP-E). A listing of current standard drawings is available from the TECHINFO system accessed through the USACE Home Page on the Internet, http:/www.hnd.usace.army.mil, or by direct telephone dialing the system data line at (205) 895-1826. The purpose of standard drawings is to aid in project planning and design, and to reduce the cost and time for the preparation of project drawings.

a. Types of Drawings. Types of standard drawings are described as follows:

(1) Standard Design Drawings. Standard design drawings can range in completeness from definitive or sketch level, to completed construction documents with the drawings of sufficient detail as to materials and methods of construction to serve as project construction drawings after the necessary field modifications covering site adaptations and deletion of inapplicable materials.

(a) Standard designs generally provide for site adaptation in widely separated geographical areas with design data for different climatic and seismic conditions, and building materials. Alternate wall sections, details and building elevations are included as required to illustrate these variations.

(b) These drawings are sometimes accompanied by a standard technical guide specification.

(2) Definitive Design Drawings. Definitive design drawings delineate functional layouts, space allowances, special features or requirements, and the configuration of elements both horizontally and vertically. Definitive design drawings usually recommend basic building systems; materials and construction details; architectural treatments; and structural, mechanical, electrical and fire protection systems with criteria and guidance necessary for making selection. These drawings typically include floor plans, elevations and cross sections with controlling and critical dimensions, gross and net area tabulations. Definitive design drawings also address the most likely and alternative site support facilities and utility requirements for mechanical and electrical systems. These drawings are sometimes accompanied by a design analysis.

(3) Department of the Army (DA) Facilities Standardization Program Standard Design Packages. The drawings in these packages are normally developed to a level of design that is similar to definitive design drawings. The basic DA Standard Design Package includes both standard design drawings and design analysis. Additional requirements and information on the DA Facilities Standardization Program are contained in ER 1110-3-113 and AR 415-15.

(4) Sketch Design Drawings. Sketch designs are usually single-line drawings delineating functional layouts, space allowances

and the basic features of a facility type. These drawings typically include plans, and elevations and cross sections with controlling dimensions and area tabulations.

(5) Design Guide Drawings. Design guides are published and issued in printed form with both narrative and graphic data to describe the functional layout, space allowance and special features of a facility type. Design guides typically include drawings delineating individual space requirements, and drawings showing the organization of spaces into alternative facility layouts and designs. These designs are usually illustrated further by plans, and elevations and cross sections with controlling dimensions and area tabulations. Perspective sketches may be included to illustrate recommended interior designs and exterior design treatments. Drawings are reduced to manual size for publication.

(6) Project Design Drawings from the CADD Library. These drawings are completed facility specific project documents available for site adapt use to reduce cost and time for the preparation of project drawings.

b. Modification of Standard Drawings. The design agency responsible for the development of a project design is authorized to modify standard drawings, except those drawings contained in the DA Facilities Standardization Program standard design packages, to meet local siting, foundation, topographic, climatic and seismic conditions, energy and utility availability, and life cycle cost. Criteria and waiver request procedures for DA Facilities Standardization Program designs are governed under ER 1110-3-113, and DAIM-FDR memorandum, 7 Oct 95, SUBJECT: Request for Waivers from the Use of DA Standard Design and Space Planning Criteria.

(1) Modifications. Modifications to standard drawings are authorized to avoid unnecessary construction features or costs, to correct errors, and to adapt the drawings to local materials and methods of construction, metric measurements (when originally prepared in IP unit measurement), or CADD techniques.

(2) Directed Modifications. Other modifications may be directed by HQUSACE (CEMP-E) in AEI or design directives. Modifications and changes may be promulgated through Engineer Technical Letters (ETL) or revisions to guide specifications.

(3) Deviations. Modifications that cause deviations from functional and operational requirements, space criteria or cause significant increases in cost shall be avoided. Deviations to the functional and operational requirements contained in DA Facilities Standardization Program standard design drawings are unauthorized.

c. Deficiency Reports and Recommendations. HQUSACE (CEMP-EA) will be promptly informed of any errors or omissions in DA Standard Designs, including drawings. Under the provisions in ER 1110-345-100, ENG Form 3078 may be used for this purpose or the deficiency may be reported directly to HQUSACE (CEMP-EA), Washington, DC 20314-1000.

3. Project Drawings.

a. Concept Design Drawings. Concept designs are used to define the functional, technical, and architectural and engineering aspects of a project, and to help verify project costs in order to provide a firm basis upon which to initiate the final project design. Completion of concept design drawings, together with a design analysis, outline specifications and cost estimate, normally represents about one-third of the total design effort. Concept designs will be prepared in accordance with AR 415-15, utilizing the

project requirements documents and applicable standard drawings.

(1) When standard design drawings are used, the drawings for the new project will include appropriate sheets from those drawings modified to depict site adaptations and other essential requirements. Duplication will be avoided except as required for clarity.

(2) Concept design drawings will generally include the following information:

(a) Project site plan showing existing and proposed buildings, roads, parking, landscape planting masses, contours, and the utilities in the immediate vicinity of the project.

(b) Building floor plans, cross sections and elevations showing the functional layout, space configuration and form, and building system characteristics, to include the required properties and/or performance of the construction materials and methods.

(c) Design details of exterior and interior elements; schedule of windows, doors, and finishes and colors; details related to architectural, structural, mechanical, electrical and fire protection systems; and energy usage and other special requirements.

(d) Foundation plans and details showing geotechnical investigation results, boring data, subsurface soil classification, allowable soil bearing capacity, ground water elevations, etc.

b. Final Design Drawings. Final design drawings will be prepared from the approved concept designs. When standard design drawings are used, additional sheets will be incorporated as appropriate. Final design drawings together with a complete design analysis, construction specifications, and a cost estimate covering all technical, architectural and engineering details will form the basis for construction contracting. The drawings will be sufficient in detail to provide for fair and competitive bids from contractors, and to provide for the construction of the project without additional drawings, except for shop drawings or as may be required to deal with unforeseen conditions encountered during construction.

c. Shop Drawings. These are drawings submitted by a contractor, manufacturer, vendor or others, which show in detail the proposed fabrication and assembly of specific building components or which show the installation details (i.e., form, fit and attachment) of materials or equipment. Preparation, approval and transmittal of shop drawings are outside the scope of this regulation.

d. As-built Drawings. As-built drawings will be prepared as part of the completion records transferred to the using service upon completion of the project. The contract drawings will be revised and corrected to indicate the actual construction of the project, including all change orders. Site plans, building plans, cross sections and elevations, schedules and all other portions of the drawings to include the location of mechanical services, utility lines and outlets, will be revised to provide a clear understanding of the project, as built. As-built drawings, together with as-built construction specifications, final shop drawings and the design analysis will be furnished to the using service in accordance with ER 415-345-38.

4. Drawing Preparation. Drawings will be prepared so as to clearly and adequately delineate the work to be accomplished.

a. Quality. Because of the number of copies of drawings normally required for a project, most drawings are reduced to half-size for reproduction. Original drawings and details; therefore, must be of adequate size, and be

clear and sharp, so that the use of half-size reproducibles will result in legible and easy to read copies.

b. Drafting Standards and Practices. Format and organization, control data blocks, drawing conventions, schedules and standard details will conform to the requirements and guidance contained in paragraph 5 of this appendix.

c. Codification. Drawing sheets will be assigned a drawing code in accordance with the guidance contained in paragraph 10 of this appendix.

d. Metrication. The criteria and requirements for the application of metric measurements in drawings were addressed in paragraph 4 of this regulation. The following ANSI and ASTM standards will be used in the preparation of drawings:

(1) American National Standards Institute. 28 October 1992. "American National Standard for Metric Practice," ANSI/IEEE 268-1992, IEEE Standards Coordinating Committee 14 on Quantities, Units, and Letter Symbols, New York.

(2) American Society for Testing and Materials. 1991. "Standard Practice for the Use of Metric (SI) Units in Building Design and Construction," ASTM E 621-84 (Reapproved 1991), Committee E-6 on Performance of Building Construction, Philadelphia, PA.

(3) American Society for Testing and Materials. 1992. "Standard Practice for the Use of the International System of Units (SI) (the Modernized Metric System)," ASTM E 380-92, Committee E-43 on Metric Practice, Philadelphia, PA.

e. Computer-Aided Design and Drafting (CADD). Commercially available CADD systems have demonstrated significant potential for improving the efficiency and quality of drawing production. Standards for USACE CADD application are contained in Tri-Service CADD/GIS Technology Centers Architectural, Engineering and Construction (A/E/C) CADD Standards available at Internet site http://mr2.wes.army.mil. Those criteria that meet the quality requirement in the paragraph above are acceptable for use in preparing project and other drawings. Manually prepared drawings will also follow the general guidance in this manual as it applies to general drafting standards.

5. Drafting Standards and Practices.

a. Format and Organization.

(1) Concept and final design drawings, and drawings for standard and definitive designs, will be prepared on standard A1 metric size sheets, 594 mm x 841 mm (23.39 inches x 33.11 inches); an American National Standards Institute (ANSI) "D" equivalent sheet.

(2) When preparing large maps, i.e., installation master plans and drawings for Civil Works projects, the standard A0 metric sheets; 841 mm x 1189 mm (33.1 inches x 46 inches) should be used; an ANSI "E" equivalent sheet.

(3) When preparing half-size drawings for inclusion to booklets such as "Design Analysis," the standard A3 metric sheet; 297 mm x 420 mm (11.7 inches x 16.5 inches) should be used; an ANSI "B" equivalent sheet, that conveniently folds in to the standard A4 metric size; 210 mm x 297 mm (8.3 inches x 11.7 inches), an ANSI "A" equivalent sheet.

(4) The sheet layout, including the standard title and information blocks, for drawings are provided at Figure C-1 and Figure C-2 which depict expanded views of the title, revision and other information blocks on the

standard sheet.

b. Cover Sheet.

(1) Project drawings will have a cover sheet or sheets with the project name, project location, design agency logo and identification, project number and fiscal year. Applicable file numbers will be included as appropriate. The overall sheet layout of title and other information blocks shall follow the theme in Figure C-1 and Figure C-2.

(2) Cover sheets for in-house work shall comply with the requirements of ER 1110-1-8152, paragraph 6 concerning signatures, and will include the following statement:

"This project was designed by the (name of district) District of the U.S. Army Corps of Engineers. The initials or signatures and registration designations of individuals appear on these projects documents within the scope of their employment as required by ER 1110-1-8152."

c. Index Sheets. Project drawings, and drawings for standard and definitive designs, will have an index sheet or sheets. The index sheet or sheets will identify by reference number, date and title, each of the other sheets in the set of drawings, and indicate the total number of sheets in each design discipline group. The overall sheet layout of title and other information blocks shall follow the theme in Figure C-1 and Figure C-2.

d. Legend Sheets. A legend sheet or sheets should follow the index sheet or sheets, or may be combined with the index sheet or sheets. The legend sheet or sheets will include definitions of abbreviations used; legends for materials, mechanical and electrical symbols; a graphic illustration of details and cross section reference indicators; and other information as required for that particular set of drawings. The overall sheet layout of title and other information blocks shall follow the theme in Figure C-1 and Figure C-2

e. Drawing Sheets. Drawing sheets will follow the cover, index and legend sheets in order of the following design discipline groups: civil to include the site design; architectural to include interior design; structural; mechanical; electrical; and others. The architectural drawings should normally show plans, elevations, cross sections and details in that order. The overall sheet layout of title and other information blocks shall follow the theme in Figure C-1 and Figure C-2.

f. Supplemental Drawing Sheets. When it is required that any drawing sheet for a specific project be redrawn and/or new drawing sheets added, such as in the preparation of as-built drawings or contract modifications, the redrawn or new drawing sheets will be consecutively numbered to follow the last drawing sheet of the design discipline group. The basic sheet that is replaced or supplemented by a supplemental drawing sheet will be retained in its original position with a note in the revision block indicating the sheet number where the changed conditions are shown.

6. Control Data Blocks.

a. Title Blocks. Except for the cover sheet, title blocks will be placed on each individual drawing sheet in the space inside the right hand margin of the drawing sheet, as indicated in Figure C-1, to identify the name of the project, the project number and fiscal year, and the installation where the project is located. Title block data will also include the title of the drawing on the sheet, the sheet reference number, the drawing code assigned in accordance with paragraph 10 of this appendix, applicable local file numbers, and the approval date of the drawing sheet. Local design agency standards may be used for recording in the title

blocks of individual drawing sheets, the names or initials of the person or persons responsible for the design, drawing and checking of each drawing sheet, and for overall review and approval in accordance with ER 1110-1-8152 . However, the local design agency standard shall comply with the sheet size standards in the appendix, and the standard configuration at Figures C-1 and C-2.

b. Authentication Blocks. Authentication blocks will be placed on the index sheet or sheets to the left of the title block. Authentication blocks will provide spaces for the signatures of those individuals responsible for the preparation, review and approval of the drawings. Approval is required for both technical and functional adequacy. Space will also be provided to indicate the date of approval next to the signature. Use of authentication blocks on other drawing sheets will be at the discretion of the design agency responsible for the design.

c. Revision Blocks. Except for the cover sheet, revision blocks will be placed on each drawing sheet above the title block to describe any revision made to the drawings, to indicate the number and date of the revision, and the initials of the official approving the revision; see Figure C-1.

7. Drawing Conventions. Methods used for drawing, lettering, dimensioning and cross-referencing must be economical and assure legibility when drawing sheets are reduced to half-size sheets. Lettering styles and sizes should be standardized within a set of drawings regardless of the design discipline involved.

a. Symbols. Symbols used in the preparation of civil, architectural, structural, mechanical, electrical and other drawings will reflect usage, for example, established by the American National Standards Institute (ANSI) standards or generally accepted professional standards.

b. Abbreviations. Abbreviations will reflect common usage.

c. Scales. Graphic scales will be provided on drawings to allow for measured scaling. Project drawings, standard and definitive designs will generally be drawn to the scales indicated in Table C-1.

Table C-1
Drawing Scales

Type	SI Metric	Inch-Pound (IP) Customary Equivalent
Site Plan	1:250 /1	(1" = 25')
	1:200	(1/16" = 1'-0")
Floor Plan	1:50 /2	(1/4" = 1'-0")
	1:100	(1/8" = 1'-0")
	1:200	(1/16" = 1'-0")
Roof Plan	1:200	(1/16" = 1'-0")
Exterior Elevation	1:10	(1" or 1-1/2" =1'-0")
	1:100	(1/8" = 1'-0")
	1:200	(1/16" = 1'-0")
Interior Elevation	1:50	(1/4" = 1'-0")
	1:100	(1/8" = 1'-0")
Boring Logs	1:10	(1" or 1-1/2" = 1'-0")
	1:100	(1/8" = 1'-0")
	1:200	(1/16" = 1'-0")
Cross-Section	1:50	(1/4" = 1'-0")
	1:100	(1/8" = 1'-0")
	1:200	(1/16" = 1'-0")
Wall Section	1:20	(1/2"or 3/4" = 1'-0")
Stair Detail	1:10	(1"or 1-1/2" = 1'-0")

Table C-1
Drawing Scales, Continued

Type	SI Metric	Inch-Pound (IP) Customary Equivalent
Details	1:5	(3" = 1'-0")
	1:10	(1" or 1-1/2" = 1'-0")

/1 May be necessary for landscape plans
/2 May be used for partial floor plans

d. Keys. All cross-referencing conventions, symbols and abbreviations will be keyed, and shown on the legend and other drawing sheets as appropriate.

e. Revisions. Conventions for describing revisions will include marking of the area of the drawing sheet revised so that the area can be easily located.

7. Schedules.

a. Window Schedules. A tabular schedule of windows will also be included on the drawings. Each type of window will be assigned a number preceded by the letter "W." An elevation drawing of each type of window will be provided along with pertinent details. Every window will be clearly indicated by type on the elevation drawings.

b. Door Schedules. A tabular schedule of doors will be included on the drawings. Every door will be assigned a separate number and this number will be clearly indicated on the plans. Door numbers should be as nearly consecutive as possible, by floor, beginning with the principal building entrance area and progressing counter-clockwise through the plan. An elevation drawing of each type of door, identified by an upper case letter will indicate the material of which the door is made and other pertinent details. Details of each type of door frame will be shown and each type will be identified.

c. Finish and Color Schedules. A tabular schedule of interior finishes and colors will be included on the drawings. Finish and color schedules should identify by room number the finish materials and colors to be used for the floor to include the base, the walls to include any wainscoting and trim, and the ceiling. The meaning of the abbreviations used in naming the materials and finishes will appear on the legend sheet or on the same sheet as the schedules.

8. Standard Details. The classification and type of standard details on drawings will conform as "CLASS 40" listed in Table C-2. When sequence numbers for standard details, i.e., DET 40-06-04 is Lighting Fixtures, are established; the sequence numbers are obtained from the U.S. Army Engineering and Support Center, Huntsville (CEHNC-ED-ES), telephone (205) 895-1402.

Table C-2
Class 40 - Standard Details

Type No.	Type of Detail
01	Architectural Details
02	Structural Details
03	Heating Details
04	Equipment Layouts & Details
05	Legends, Notes, Schedules, and Symbols
06	Electrical Details
07	Water System Details
08	Sanitary Sewer Details
09	Gas System Details
10	Field Survey Details
11	Athletic Equipment Details
12	Railroad Details
13	Plumbing details
14	Air Conditioning Details
15	Fire Protection Details
16	Fence Details
17	Pavement, Curb and Sidewalk Repair Details

Table C-2
Class 40 - Standard Detail, Continued

Type No.	Type of Detail
18	Storage Racks, Grounds & Equipment Details
19	Tent Frame Details
20	Storm Water Details
21	Standard Component Layouts and Details
22	Kitchen Equipment Layouts and Details
23	Overhead Carrier System Details
24	Aircraft Arresting Barrier Details

9. Area Computations and Room Numbering.

a. Area Computations. Gross area of buildings and net area breakdowns for each floor will be provided on plans and computed in accordance with the method specified in AR 415-17, AEI Design Criteria.

b. Room Numbering. Every room will be assigned a separate number and this number will be clearly indicated on the plans. Room numbers will generally be assigned as shown in Table C-3. Room numbers should be as nearly consecutive as possible, beginning with the principal entry area and progressing counter-clockwise through the plan. Spaces added by revision should be given the number of the primary or nearest room followed by the letter "A," or if more than one additional space "B."

Table C-3
Room Numbering

Floor	Numbering Sequence
Basement	01 through 99
First	100 through 199
Second	200 through 299

10. Drawing Codification. Drawings will be assigned a drawing code consisting of a letter prefix and three numerical parts as follows:

a. Prefixes. Letter prefixes will be used to differentiate between the various types of drawings, and between drawings prepared for Army, Air Force, and other projects as shown Table C-4.

Table C-4
Drawing Prefixes

Drawing other	Type	Army Prefix	Air Force Prefix	
Project Drawings	Concept	C	AC	XC
	Final	F	AF	XF
BLT	As-Built	AS-BLT	AS-BLT	AS-
Standard Drawings	Standard	STD	AW	XW
	Definitive Design	DEF	AD	XD
	Sketch Design	SK	ASK	XSK
	Design Guide	DG	-	-

b. Class Number. The first numerical part of the drawing code is a class number based on the first three digits of the facility category codes given in AR 415-28, and for Air Force projects obtain the information from the project Air Force command.

c. Type Number. The second numerical part of the drawing code is a type number based on the last two digits of the facility category codes given in AR 415-28 for Army projects, and the last three digits given Air Force Command for an Air Force project.

d. Sequence Number. The third numerical part of the drawing code is a chronological

sequence number to indicate succeeding numbers of drawings for a particular class and type of building or structure prepared within a particular design agency.

(1) Sequence numbers for project drawings will be assigned by the design agency responsible for the project and follow the criteria in this appendix. The first sequence number will be 01 after implementation of the coding system herein.

(2) Sequence numbers for standard drawings will be assigned by HQUSACE (CEMP-EA).

e. Examples. The following subparagraphs show how prefixes and numbers are combined to form a complete drawing code:

(1) To establish the drawing code for a training facility; the class number is 171, training buildings. If the facility is for the Army and for general instruction, the type number is 20; if the facility is for the Air Force and for pilot training, the type number is 213. Assuming this coding is the first design for this type of facility by the design agency since implementation of the coding system herein, the sequence number is 01.

(2) For the above example, the drawing code at the concept design stage becomes C-171-20-01 for an Army project and AC 171-213-01 for an Air Force project. A sequence number once assigned, is henceforth fixed for that particular set of drawings.

(3) During the development of drawings from the concept to final design stage, the numbers are retained but the prefix is changed from C to F. The drawing code at the final design stage becomes F-171-20-01 for an Army project and AF 171-213-01 for an Air Force project.

(4) In the case of an Army project standard design, the drawing code is STD 171-20-01, or AW 171-213-01 for an Air Force project. These drawing codes will be assigned by HQUSACE (CEMP-EA). The drawing code assigned by the design agency in site adapting this standard to an Army project would be F-171-20-01, assuming this was the first set of drawings for this type of facility prepared by the design agency.

(5) When modifying the final drawings to reflect as-built conditions, the numbers are retained but the prefix will be changed from F to AS-BLT. The drawing code becomes AS-BLT 171-20-01 for an Army project and AS-BLT 171-113-01 for an Air Force project (confer with the project's Air Force Command.

(6) If a final project drawing is designated as a standard drawing, the basic class and type numbers are retained, but the sequence number is changed to that assigned by HQUSACE (CEMP-EA). The prefix is also changed from F to FD to indicate designation as a field design.

11. Use of Additional SE Coding or Numbering Systems. No changes will be made in the coding system prescribed herein without prior approval of HQUSACE (CEMP-EA). If a design agency requires a class or type number not clearly covered by the facility category codes in AR 415-28, an appropriate number will be furnished upon request to HQUSACE (CEMP-EA). All requests concerning Air Force definitive numbers and facility nomenclature should be made to the Air Force Civil Engineer Support Agency, Tyndall AFB, FL 32403-53191, and the project's Air Force Command. When a design agency requires an additional coding or numbering system to comply with an existing system, these additional codes or numbers may be included on the drawings.

12. Review and Approval of Project Drawings.

a. Using Service. Submittal of drawings to the using service for review and approval of the functional aspects of the design will be compatible with the provisions of AR 415-15 .

b. Corps of Engineers Design Agency. Review and approval of drawings by the design agency will be in accordance with the design verification provisions set forth in ER 1110-345-100.

c. Headquarters, U.S. Army Corps of Engineers (HQUSACE). Project drawings shall not be submitted to HQUSACE (CEMP-E), except as provided by specific regulations, design directive or other HQUSACE instructions. Review or approval by HQUSACE (CEMP-E), that is directed by regulation or HQUSACE (CEMP-E) instruction, will in no way relieve the design agency of its approval responsibility.

13. Drawing Authentication. Approved drawings will be so designated by authentication on an index sheet or sheets that identifies by reference number, date and title, each of the other sheets in the set. This sheet or sheets will bear the signature of the appropriate officials responsible for the preparation, review and approval of the drawings. Drawings will be certified as official and final, see ER 1110-1-8152.

14. Modification of Project Drawings After Approval. The design agency responsible for the project design is authorized to make modifications to the project drawings that have been approved in accordance with paragraph 12 of this appendix to correct errors, omissions and ambiguities, or to meet changes in local conditions occurring during construction.

a. Modifications after Approval. Modifications may be undertaken provided that the modifications are necessary or desirable to allow construction to proceed in an efficient and economical manner, and do not alter the quality of construction, general functions, appearance or scope of the project.

b. Identifying Modifications. Modification of project drawings will be clearly indicated and identified by date and the office authorizing the change.

15. A-E Prepared Drawings. A-E contractor drawings shall comply with Figure C-1 and Figure C-2, and ER 1110-1-8152, paragraph 7. A-E contractor prepared drawings shall not be signed as accepted or approved by Corps of Engineers' personnel.

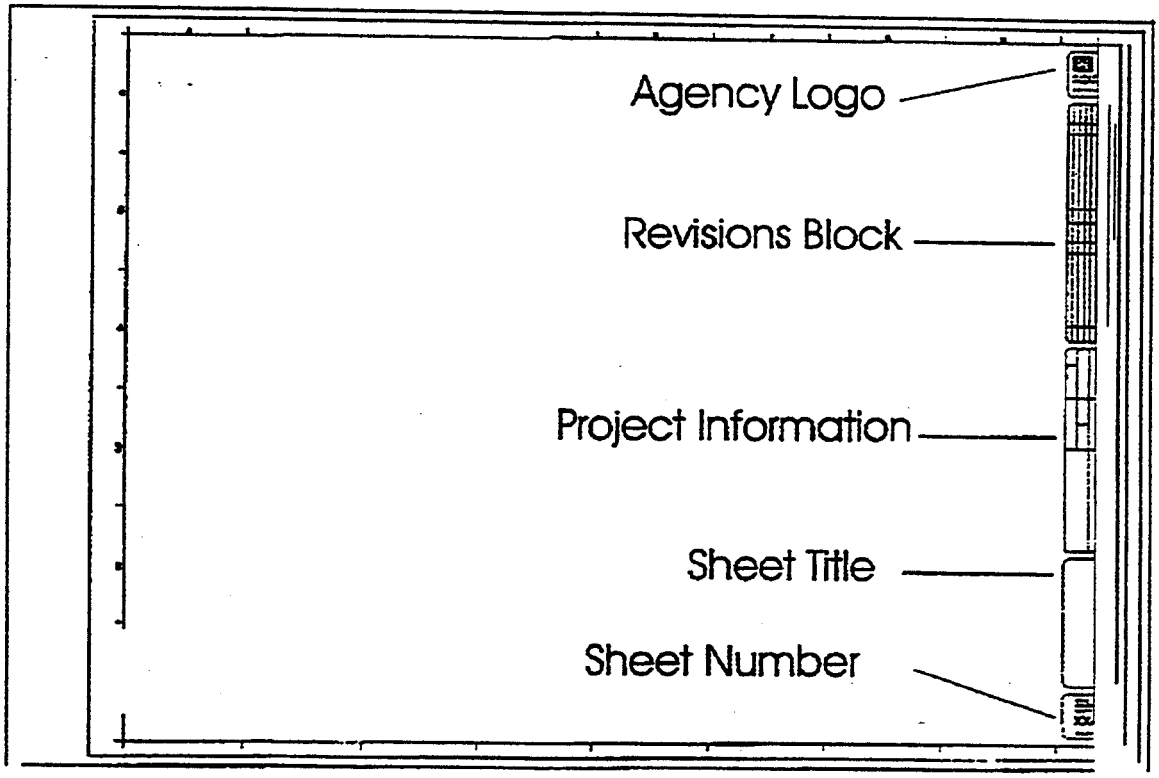

Figure C-1 Metric Sheet with Vertical Title Block

1\ Cover Sheets for in-house work must include the statement as indicated in Appendix C, paragraph 15 of this ER.

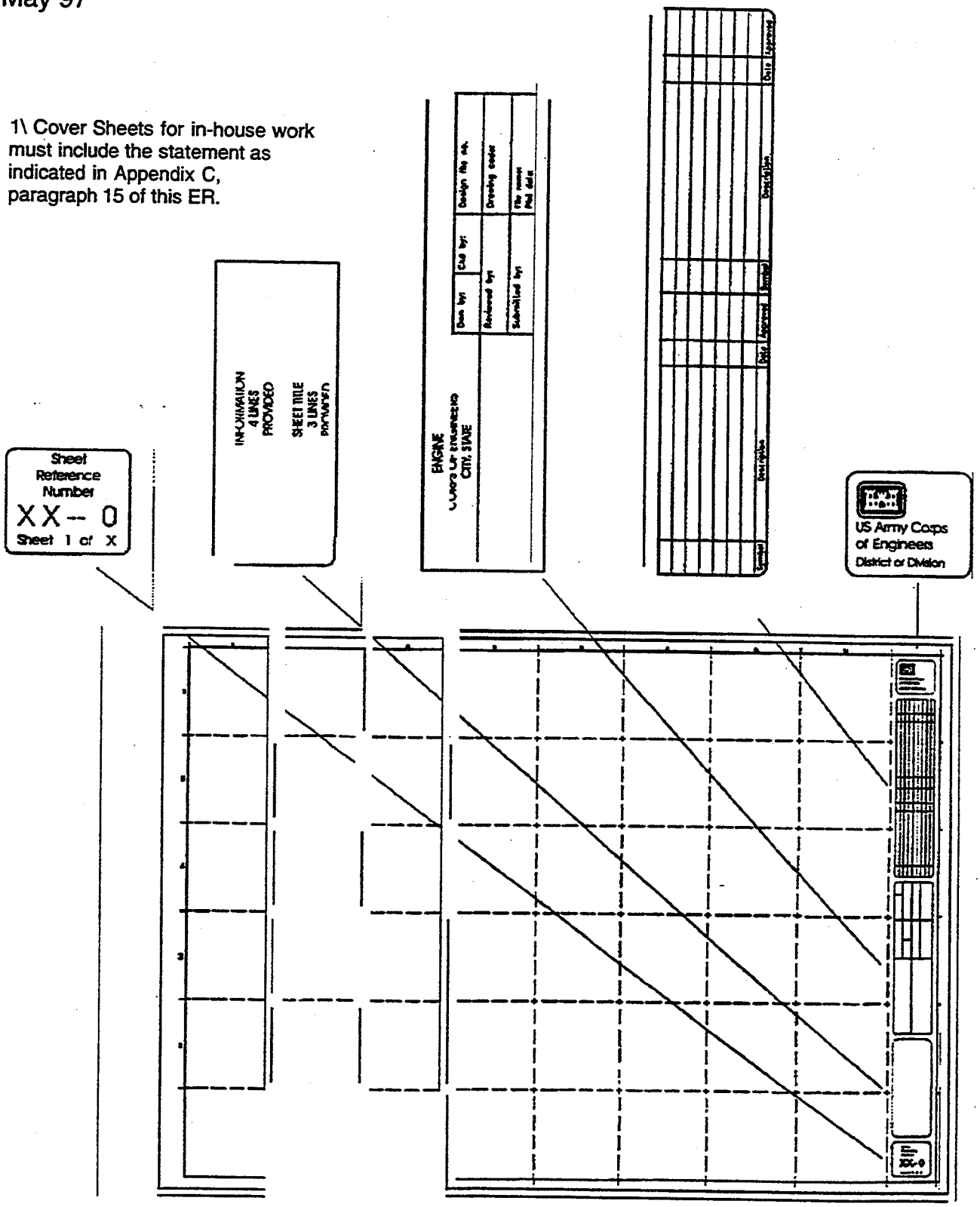

Figure C-2 1\
Metric Sheet with
Vertical Title Block

CECW-EP Engineer Regulation 1110-2-1200	Department of the Army U.S. Army Corps of Engineers Washington, DC 20314-1000	ER 1110-2-1200 30 October 1993
	Engineering and Design PLANS AND SPECIFICATIONS FOR CIVIL WORKS PROJECTS	
	Distribution Restriction Statement Approved for public release; distribution is unlimited.	

CECW-EP

Regulation
No. 1110-2-1200

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

ER 1110-2-1200

30 October 1993

Engineering and Design
PLANS AND SPECIFICATIONS FOR CIVIL WORKS PROJECTS

1. Purpose

This regulation prescribes the responsibilities, requirements, principles, and procedures for the preparation, review, approval, and distribution of plans and specifications (P&S) for civil works projects.

2. Applicability

This regulation applies to all HQUSACE/OCE elements, major subordinate commands (MSC), district commands, laboratories and field operating activities (FOA) having civil works responsibilities.

3. References

a. PL 91-190, National Environmental Policy Act of 1969.

b. FAR 52.212.11.

c. ER 1-1-11, Progress, Schedules, and Network Analysis Systems.

d. ER 415-1-11, Biddability, Constructibility, Operability.

e. ER 415-1-15, Construction Time Extensions for weather.

f. ER 1110-2-109, Hydroelectric Design Center.

g. ER 1110-2-1002, Maps and Drawings.

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

i. ER 1125-2-303, Design Acquisition and Construction.

j. EM 1110-1-1807, Standards Manual for U.S. Army Corps of Engineers Computer-Aided Design and Drafting (CADD) Systems.

4. Policy

a. The policy of the Chief of Engineers requires the highest standards of engineering in the preparation of P&S. Pursuant to this policy, P&S for all Civil Works projects shall be prepared by the Engineering Division using current engineering standards and criteria, cost control management and sound professional judgement.

b. P&S for construction, procurement by supply contract, and extraordinary maintenance leading to major alterations, major item replacement, or rehabilitation for existing civil works projects shall be prepared in accordance with approved decision documents (i.e., Engineering Appendix to Feasibility Report, Detailed Project Report, subsequent design memorandums, etc.) and shall conform to the approved cost estimate. As prescribed in ER 1110-2-1150, approval shall be obtained for any substantial deviation from approved DMs (or other decision documents previously mentioned) found necessary or desirable during the preparation of P&S.

c. The preparation of P&S shall be scheduled to ensure that ample time is allowed for review, approval, revisions, and reproductions.

d. Construction/Supply bidding and contract documents shall be carefully prepared to eliminate all

This regulation supersedes ER 1110-2-1200, 12 June 1972

conditions or practices that might delay the work or result in disputes and subsequent claims. Changes in design drawings and specifications affecting work in progress and contracts for which bids may have been received shall be limited to cases of absolute necessity.

e. For projects requiring local cooperation, detailed P&S shall not be prepared until there is assurance that the conditions of local cooperation will be met.

5. Types of Contracts Requiring P&S

Plans (consisting of one or more drawings including notes located thereon) are required for all construction contracts and for some supply contracts. Technical specifications shall be prepared for both construction and supply contract documents. The design drawings and technical specifications for both types of contracts shall be provided by the Engineering Division and forwarded to the Contracting Division for processing (advertisement through award).

a. Construction contract documents are normally prepared for those contracts requiring a construction type of activity, i.e. building a new facility or modifying an existing structure by construction forces.

b. Supply contract documents are normally prepared for those items of work that are fabricated or assembled in a plant or manufacturing facility off-site and do not normally involve site installation by the construction trades or for such special items (equipment) which are to be Government furnished under a separate contract.

6. Application of Engineer Regulations (ER), Engineer Manuals (EM), and Engineering Technical Letters (ETL).

The basic technical guidance, criteria, and design procedures set forth in ERs, EMs, and ETLs shall be used in the preparation of P&S. When criteria or procedures not covered in the ERs and EMs or ETLs are proposed, or when departure from criteria in these documents is proposed, full explanation and justification shall be included in or appended to the appropriate DM and/or decision document as required by ER 1110-2-1150.

7. Preparation of Plans (Contract Drawings)

Contract drawings shall be prepared on a Computer Aided Design and Drafting (CADD) System whenever feasible in accordance with the Corps of Engineers CADD Standards outlined in EM 1110-1-1807. These standards include details, symbols, levels to place various details of a drawing (lettering , reinforcing, electrical-mechanical details, etc.), units of resolution, fonts, colors, title blocks, drawing size, and many other details. These standards shall be followed whether the work is performed by an Architect-Engineer (A-E) firm or prepared in-house. Contract drawings prepared by hand shall follow the applicable drafting standards established by the district and shall, as much as possible, conform to the applicable CADD standards outlined above. When surveys, maps and engineering site drawings are included, they shall conform to the requirements of ER 1110-2-1002.

a. Keep number of drawings to a mimimum. To achieve maximum economy when preparing contract drawings, omit all unnecessary details and avoid repetitive presentation. Include only those details that are necessary to ensure a full understanding of the contract requirements. Specific practices to be adopted to this end are listed below. This list is by no means complete, but all contract drawings shall be treated in a manner consistent with those mentioned.

(1) Omit details of alternatives when all such alternatives will yield features of acceptable quality. Avoid details that may be described clearly in notes or specifications or by reference to trade publications, catalogues, standard specifications, building codes, or other accepted criteria.

(2) Omit reinforcing bar lists and bending schedules; however, reinforcement drawings shall be prepared in sufficient detail to reflect design requirements.

(3) No contract drawings shall be prepared that are intended primarily to facilitate review of plans by higher authority. Copies of office sketches or preliminary CADD drawings that permit thorough understanding will suffice for this purpose.

(4) Avoid excessive sectioning and the repetition of views, dimensions, and notes where these practices are intended primarily to improve the reading of a drawing. The use of CADD reference files and close coordination of the automated drafting process are encouraged to

ensure that all elements make optimal use of previously generated details and plans. From both a contractual point of view and that of economy in the drafting process, it is better to show a requirement only once.

b. Enhance for clarity. Shading, annotation, coloring (if color plotters or color reproductions are available), and different line weights and line symbols may be used on contract drawings when it is felt that such use is needed to enhance the clarity of some important feature, such as the differentiation between existing conditions and future work.

c. Show work limits. Right-of-way and work limits and access to these limits shall be clearly delineated on the drawings. Indicate other topographic detail that may be affected by or may restrict the construction.

d. Eliminate all construction interference wherever possible. The design shall provide for the accomplishment of new construction with minimum interference with other essential operations of any existing project facility or any other contractor on site. Unless construction strategy so dictates, the practice of having two contractors with individual contracts working on the same site should be discouraged. The order and schedule of construction work shall not be established and shall not be reflected in the contract documents unless it is necessary to ensure construction is accomplished in the most economical manner.

8. Preparation of Specifications

a. Consistency. Technical specifications shall be clear, concise, and complete to ensure that neither the included part manufacturer or construction firms experience undue difficulty in preparing bids, and that the most probable questions arising during the performance of the contract can be determined and settled by reference to the contract documents. It is essential that terminology be consistent between the design drawings and the technical specifications. Unless thoroughly researched and coordinated with higher authority, unusual or unproven construction requirements shall be avoided. Tolerances and inspection standards shall conform to standard commercial practice as much as possible. Provisions in the contract clauses shall not be repeated in the technical specifications, nor shall any conditions or provisions that conflict with the contract clauses be incorporated in the technical specifications.

b. Promote competition. Technical specifications shall be written in a manner that will promote competition. Designation by trade names is not permitted unless it is impractical to identify the article desired in any other way. Whenever possible, articles and materials shall be identified in terms of their salient physical or chemical composition, test qualifications, performance criteria, or similar descriptions.

c. Federal Acquisition Regulation (FAR). Requirements in connection with labor regulations, taxes, and similar matters, and procedures for invitations of bids, awards, and other contract procedures, are identified in the Federal Acquisition Regulation (FAR).

d. Time of commencement and completion. With the aid of network analysis schedules (ER-1-1-11) the time specified for commencement and completion of contract work shall be based on a rigorous analysis of the specified work. The contract duration provision should reflect a minimum reasonable duration for the specified work without restricting bidder competition or increasing costs. The analysis shall take into consideration cost, desired completion date, seasonal work, adverse weather delays (ER 415-1-15), document submittal and "turnaround" time for approvals, lead time for manufactured items, and job complexity.

e. Insurance coverage. For contracts where progress payments will be made and title to property will pass to the Government while remaining in the custody of the contractor, the Contracting Officer may require the contractor to carry insurance to protect the Government interest. Insurance will not be required unless circumstances warrant the additional cost.

f. Protection of the environment. In order to implement the National Environmental Policy Act of 1969 (PL 91-190) and all applicable Federal environmental laws, the specifications for each construction contract shall contain a section on protection of the environment during construction operations. This section shall include instructions to the contractor concerning layout and the construction of project plant facilities (roads, camps, storage yards, shops, etc.); landscape preservation; the control of air, water and noise pollution; and other factors necessary to prevent the degradation of project site(s) during construction, and to govern the restoration of contractor-caused environmental damage to the greatest extent practicable. Requirements for the control of water quality and air pollution shall be based on standards obtained from the

regional offices of the Environmental Protection Agency and the responsible State water and/or air pollution control agency.

g. Government-furnished plant or materials. When Government-owned plant or materials are available for use by contractors on the work included in the contract, suitable provisions shall be made in the specifications to ensure that all bidders have full information and equal opportunity to permit use of the plant or materials available for the work. The description of items of materials and/or equipment shall include approximations of weight, value, expected delivery date and special storage or handling requirements such as:

(1) when the weight exceeds the capacity of the material handling equipment that the contractor might otherwise have at the job-site by the date of delivery.

(2) when the equipment requires special care and protection at a significant expense to the contractor, and,

(3) when providing such descriptive information will probably reduce contingencies in the contractors' bids.

When procurement arrangements for Government-furnished equipment are complete prior to the advertisement for bids, the specifications will indicate that the data provided was extracted from the Government procurement contract or purchase order. If the data shows the value of the equipment, the specifications will reflect the same. It must be clearly stated that said data is the best available at the time the specifications were prepared and is offered for information purposes only.

h. Bid Items.

(1) Variations in estimated unit cost bid item quantities. Bid quantities are extremely important. Only when bid items are properly described and isolated from other items, and the quantities are accurately described, can bidders submit a bid that is in the best interest of the Government. The standard clause for variations in estimated quantities is found in FAR 52.212.11. Subdivided items can be a source of significant cost growth and, therefore, extreme caution shall be exercised in their use. If a small quantity (relative to the first subdivided item) is placed in the second, or subsequent, subdivided items, the contractor may price it at a high unit price without considerably raising the overall bid price. Any overrun in the quantities listed in the second, or following, subdivided items could lead to unreasonable contract costs. When subdivided items are used, careful consideration shall be given to the structuring of the bidding schedule to ensure that the Government is adequately protected in situations where inordinately high unit prices are charged for subdivided items of the same nature, and where only the quantity varies.

(2) Lump-sum bid items. Lump sum items shall be permitted only when the limits of the item is well defined or fixed and there cannot be a variance of any part within the item.

(3) Buildings. Where building work not subject to variation in quantities is an adjunct to a heavy construction contract, the bid item should be a lump-sum rather than separated into a large number of bid items. For large buildings it may be advisable to prepare the bidding schedule so that the work of various subcontractors (plumbing, electrical, excavation, etc.) is broken into separate bid items to allow for more reasonable negotiations of modifications, should the need arise.

i. Payment for Materials. Provisions may be made in the specifications for partial payments of high cost material or equipment when delivered to the site, even before incorporation in the work. Such payments may not be dependent on the time such material or equipment is actually incorporated into the construction product as much as being dependent on market conditions. Specifications shall contain suitable provisions to ensure safe storage of all such materials by the contractor until installation. An arbitrary percentage payment shall not be used, but shall be derived from an analysis of the work progress of the item(s) to incorporate the material or equipment. Where conditions warrant, further provision may be made for partial payments of materials delivered to a fabricating plant and for the work of fabrication. Payment for such materials shall be contingent only on the approval of the Contracting Officer.

j. Payment for care and diversion of water and cofferdam construction. The intent of these requirements is to ensure that the contractor is compensated as the work progresses in essentially the same manner as for the permanent work and in proportion to the amount of work actually completed. An arbitrary percentage payment shall not be used. Because the cofferdam and flow diversion portion of the project is usually unique to each project, each such feature will require consideration when specifying a payment method.

k. CSI format. Construction contract technical specifications shall be presented in the standard Construction Specification Institute (CSI) sixteen-division format, three-part section, and five-digit numbering system, insofar as practicable. Only the technical specifications shall be maintained in the CSI format. The remainder of the bid/construction documents shall be in accordance with the U. S. Army Corps of Engineers standard contract format as facilitated through the Standard Army Automated Contracting System (SAACONS).

l. Use of guide specifications. Civil Works Guide Specifications (CWGS) issued by HQUSACE shall be used as much as possible when preparing technical provisions for civil works projects. These CWGS can be retrieved and processed electronically from an automated data base maintained by CEHND-ED-ED and are available in different electronic media (CD-ROM, floppy disk, magnetic tape).

(1) Except for conversion to the Construction Specification Institute (CSI) format as provided in paragraph 8k, CWGS shall be used without modification as much as possible in the preparation of project technical specifications. Modifications to the CWGS shall be made to provide for changes in design criteria, local conditions, special project requirements, and/or new improvements in construction technology.

(2) For project work not covered in existing CWGS or when CWGS are not particularly suitable, other non-CWGS specifications, such as military construction guide specifications (CEGS), MSC or district "in-house" specifications, recently approved specifications for other projects, guide specifications issued by other Federal agencies, and industry specifications, may be used to develop project specifications.

m. Use of standards

(1) Materials and equipment shall be described, where possible, by documents commonly known to the construction industry. Nationally recognized industrial and technical society specifications and standards shall be used as much as practicable to ensure that specified requirements are compatible with current industrial practices and manufacturing resources. If industry documents are not available or not suitable, applicable Federal or Military specifications shall be used. Where the use of nationally recognized industry standards or Federal and Military specifications is not practicable, specifications shall require materials, equipment and workmanship that satisfy sound commercial standards and are available from commercial sources. Specifications for highways and highway bridges shall conform to the standard specifications of the American Association of State Highway and Transportation Officials (AASHTO) or to those of the State, County or City Highway Department having jurisdiction. Specifications for railroads and railroad bridges shall conform to the general specifications of the American Railway Engineering Association (AREA) or to the applicable specifications and standards of the railroad system involved.

(2) It is not necessary to refer to a standard in its entirety. The documents shall be specific, however, in making reference only to the applicable portions of a standard. Requirements that are too restrictive for the intended application or add unnecessarily to the cost shall be omitted from the project specifications. The following general rules should be used to determine the applicability of Federal Specifications and other standards:

(a) Use Federal Specifications to designate supplies and materials other than equipment of standard manufacture to be provided for Government stock.

(b) Specifications for equipment of standard manufacture, whether intended for Government stock or for incorporation in a specific permanent feature, need not make reference to Government and industry standard specifications for materials of the component parts, but, shall be prepared in order to base acceptability of the equipment upon capacity, performance, life cycle costs, or other requirements. When a Government or industry standard specification covers the desired item in its entirety, such a specification shall be used.

(c) For special design equipment which is not a standard manufactured product, state the quality of the materials for the major component parts by referencing those Government and industry standard specifications that are considered necessary. For minor parts it will usually be advantageous to permit a manufacturer to use stock materials of acceptable quality.

(d) For temporary construction or for small permanent structures such as operations and service buildings, a specification requiring commercially available products and workmanship is satisfactory for the components of these structures. When warranted by the quantities involved, recognized standards shall be used for prod-

ucts, such as paint, which otherwise would be difficult to properly evaluate. For these structures, insofar as possible, show technical requirements on the drawings, identify reference publications by number and issue, avoiding lengthy titles, and/or state installation requirements as being in accordance with approved manufacturer's recommendations or instructions, but omit detailed descriptions and procedures.

(e) Reference standard specifications by specific editions, including amendments. Include the date of the specification or amendment. Such phrases as "the edition in effect on the date of the invitation for bids" or "the current edition" shall not be used to designate editions of standard specifications applicable to the work.

(3) References to industry standards and codes, contained in the guide specifications shall be carefully checked for correctness, applicability to the particular project, and revisions subsequent to the date of the guide specification. To determine the applicability of a referenced specification or standard, each command that prepares or reviews project specifications shall maintain a file copy of the current edition of each referenced specification.

n. Excavation. In rare instances provisions may be stated for the Government to reserve the right to increase or decrease the dimensions of the excavation, or to modify the cross-sections indicated on the plans in such a manner as to take advantage of the contractors' progress with equipment being used at the site, provided the changes are within allowable contract quantity changes. If field conditions require extensive revisions, particularly for those portions of the work that have been completed, these revisions shall be directed by "change order" under the applicable contract provisions for "change of conditions."

9. Review and Approval of Plans and Specifications

a. Every effort shall be made to ensure that P&S are free of error. Before advertising for bids, completed P&S shall be independently reviewed in accordance with ER 415-1-11. Except as otherwise provided in this paragraph, all P&S prepared by A-Es will be reviewed by the district or MSC, as appropriate and those prepared by district personnel will be reviewed at the MSC level.

b. The Commanders of CEPOD and CENED, as operating MSCs, will ensure that their approval process includes an in-depth, rigorous technical review in a manner similar to higher authority oversight.

c. P&S may be submitted to HQUSACE for review provided: (1) the district and MSC Commanders are in major disagreement and/or (2) the technical expertise is not available at the MSC.

d. Except in rare instances, the complete review and approval of P&S will be accomplished prior to advertising for bids. In those rare instances where this review and approval process is not completed prior to advertising, it will be expedited so that any required changes can be made by amendment prior to bid opening.

e. The basis for review of P&S is the approved DM and previous "decision" document. However, the MSC commander may request further design analyses, calculations, or details for use in the review of the P&S.

f. The main features of design to be included in review of P&S are-

(1) location and arrangement of structures and equipment;

(2) adequacy for the intended purpose without unnecessary complication;

(3) reliability;

(4) environmental and aesthetic treatment;

(5) safety;

(6) economy;

(7) ease of operation and maintenance;

(8) the restrictive or nonrestrictive character of the design and possible limits to competition;

(9) conformance with HQUSACE guide specifications, regulations, manuals, technical letters, and safety regulations; industry and Federal specifications, codes, and standards; and manufacturers' current designs and practices;

(10) the extent to which the P&S define a project that can be constructed within budget as prescribed in the baseline estimate (i.e., designed to cost).

g. Detailed points to consider in review of P&S shall include, but shall not necessarily be limited to-

(1) site-development design, including siting, access roads, parking areas, walks, outdoor recreational areas, grading, drainage, turfing, planting, etc., to ensure that the development is complete and efficient from operation and maintenance standpoints and attractive in appearance;

(2) adequacy of geotechnical information, foundation preparation, and earthwork methods and sequencing;

(3) basic structural design concept, service-loading assumptions, wind and seismic considerations, allowable stresses, foundation evaluations, compliance with applicable codes and design criteria, allowances for unusual loading anticipated during construction not covered by normal live-load considerations, critical surface features such as expansion and crack control, and construction joint locations, and unusual construction or erection methods;

(4) stability of all structures and of the sizing and selection of all structural members, elements and connections, and their associated specifications;

(5) architectural finishes, materials, and components, such as roofing, windows, and doors, for suitability for the local market and climatic conditions;

(6) mechanical and electrical design concepts with capacity requirements, specified codes and arrangements, and acceptability of all mechanical and electrical components;

(7) review of dimensions, clearances, and locations including structural, mechanical, electrical, or other equipment to ensure the dimensional, space, and aesthetic compatibility of all elements;

(8) review of drawings and specifications for clarity of architectural, structural, mechanical, and electrical detail so that the checking of shop-drawings will be facilitated;

(9) adequacy of safety, fire-prevention, and fire-protection features;

(10) ensuring that new construction will provide minimum interference with essential operations of any existing project facilities;

(11) review to coordinate requirements of drawings and specifications to eliminate conflicts, vagueness, and ambiguities;

(12) availability and suitability of specified construction materials;

(13) construction procedures and water and sediment control plans.

h. The authority to prepare and approve P&S for floating plant is defined in ER 1125-2-303.

i. P&S prepared by the Hydroelectric Design Center (HDC) for hydroelectric power plants and pumping plants will be reviewed by an independent HDC unit. When work prepared by HDC is subsequently incorporated into work performed by others, the completed document will be furnished to HDC for review to ensure proper coordination of HDC's work. HDC's and MSC's review may be concurrent. If this review generates any conflicts or differences that cannot be resolved by mutual agreement, HQUSACE (CECW-E) will be consulted for final resolution.

j. Significant revisions of approved project P&S, whether made prior to advertising or by amendment of an invitation for bids or by modification of an existing contract (by supplemental agreement or change order), will be approved by the same authority that approved the P&S being revised. This specifically includes revisions resulting from Value Engineering actions. For purposes of the present regulations and this paragraph in particular, significant revisions are those that modify the structural features, functional purpose, or operational and maintenance characteristics of the equipment or work involved, or have an appreciable effect on bid price, competition for the work, or administration of the contract. HQUSACE (CECW-E) should be informed before implementation whenever such revisions constitute significant departures from the design concept as presented in the approved DM. Districts will make those minor changes needed to meet field conditions or to correct errors and omissions, and will provide information copies to the office having approving authority.

10. Submission of Plans and Specifications

a. P&S which require review by either the MSC or by HQUSACE shall be forwarded with the district commander's endorsement. The number of copies of P&S to be submitted for review is as follows:

(1) Four copies where the work involves no more than three engineering disciplines;

(2) Eight copies where the work involves four or more engineering disciplines.

b. When P&S are returned to the preparer by the reviewing authority, subject to indicated modifications, the P&S need not be resubmitted for further review unless resubmission has been specifically requested by the reviewing office, or unless reconsideration of specified modifications is desired. When resubmission has not been requested and all modifications requested have been accomplished without substantial change, the P&S may be issued whenever all other requirements, such as funding and conditions of local cooperation, have been satisfied. When modifications requested in an earlier review have not been incorporated in the P&S being resubmitted, full explanation will be provided to the reviewing office. Any change in the supplemental information originally submitted will also be indicated when P&S are resubmitted.

c. Prior to advertisement for bids on any work, the district commander shall compare the most current estimates of cost for the work with the updated project baseline estimate and with the program amount available for the work. The district commander shall withhold advertisement for bids and request advice of the MSC commander and HQUSACE in any case in which there is doubt as to the adequacy of funds available for the work.

11. Alternative Bids and Bidders' Options

a. Instructions to bidders requiring each bidder to submit separate bid prices for named alternative items of equipment or alternative methods of accomplishing a given feature of work shall not be used. Such determinations shall be made before the issuance of invitations for bids, based on the requirements and economy of the work.

b. Solicitations on large supply or construction contracts shall provide for the subdivision of the work into separate lots or schedules whenever necessary to ensure adequate competition. Such solicitations shall provide that each bidder may bid on any or all of the separate lots or schedules and shall state that the Government reserves the right to either award a contract for the work as a whole or award separate contracts for each lot or schedule. An example of a situation where the subdivision of the work may be advisable is found in the procurement of switchgear equipment for hydroelectric power plants. In this case it is desirable to advertise for several different items (such as 480-volt metal-clad switchgear, a 480-volt metal-enclosed buss, and 480-volt motor control centers) under a single solicitation. Some bidders may manufacture all such items, while other bidders may manufacture only one or two.

c. When two or more construction materials, combination of materials, or methods of construction will result in equally satisfactory construction for a project feature as designed, provision shall be made in the specifications and bid forms for the bidder to select between such equally satisfactory materials or methods in order to ensure maximum competition and lowest cost to the Government.

d. When bidders' options are permitted, the instructions to bidders shall clearly state that a bid on only one option is desired and that in evaluating bids, all options will be considered as defining equivalent amounts and equivalent levels of quality regarding the completed work. In setting up quantities for such options, care shall be taken to ensure that the quantities listed do represent equivalent amounts of completed work. If a bidder submits bids on more than one option in a group, only the lowest bid option will be accepted.

12. Consulting and Engineering Services

ER 1110-23-1 describes the general policies and procedures for using the services of other elements of the Corps of Engineers, A-E firms, owners of facilities to be relocated, technical specialists in HQUSACE, and individual consultants and experts.

13. Shop Drawings

Shop drawings shall be reviewed by technical personnel who are fully qualified to evaluate such drawings,

including the verification of critical design details. Particular care shall be exercised in assigning responsibility for review and approval of shop drawings affecting basic design, and, where possible, such reviews shall be assigned to the designer. This work shall include architectural review to preclude aesthetic conflict of piping, ductwork, conduits, transformer stations, etc., with architectural treatment. When review and approval of shop drawings by Government forces are impracticable, A-E firms may be employed for this purpose. When an A-E is employed for this purpose, extreme care shall be taken to provide sufficient criteria and instructions to ensure proper review.

14. Corrections and Suggestions for Improving Designs

To take full advantage of the experience gained through construction and to avoid the repetition of mistakes, the following actions shall be taken:

a. For designs prepared by the USACE commands or by A-E firms working directly under the supervision of USACE commands, these provisions apply:

(1) Errors, omissions, and ambiguities discovered by the USACE commands responsible for the design shall be reported promptly to the responsible MSC and any other offices to which copies of related P&S have been provided. Such reports shall include recommended remedial action or remedial action taken, as appropriate.

(2) Where designs are used in USACE commands other than the USACE commands responsible for the original design, errors, omissions, and ambiguities by the using districts or MSCs shall be reported promptly to the USACE command responsible for the design together with a statement of corrective action taken.

b. Upon discovery, errors, omissions, and ambiguities in guide specifications and EMs shall be reported promptly to HQUSACE. MSC and district commanders are also encouraged to inform HQUSACE concerning suggested changes to guide specifications and EMs that are considered desirable to improve construction or functional use, or, to effect savings. Such information shall include suggested improvements based on local experience and suggested optional materials and methods of construction.

c. ENG Form 3078, Recommended Changes to Engineering Documents, shall be used for reporting to HQUSACE errors, omissions, ambiguities, and suggested improvements in design, guide specifications, and EMs. ENG Form 3078 does not require a letter of transmittal. Four copies of the ENG Form 3078 report shall be provided to CECW-EP.

15. Report on Latent Deficiencies

MSC and district commands shall promptly submit reports to HQUSACE in all cases where latent deficiencies develop that are attributable to weaknesses in generally accepted design and construction practices. The report shall be in letter form and shall contain a complete statement of the deficiency, its cause or probable cause, and the corrective action taken or recommended. Where a case is urgent or of major consequence, a telecopy or copy by way of other comparable electronic means shall be sent immediately, followed by a detailed letter report.

16. As-Built Drawings

a. As construction of a project progresses, plans shall be prepared showing the work as actually constructed. In order that the preparation of the as-built drawings may be supervised by personnel familiar with the actual construction, the drawings for each major component of the project shall be prepared as soon as practicable after the component is completed.

b. The original tracings or CADD equivalent, which are maintained at the district office, shall be revised to show the work as constructed.

c. A minimum of one complete set of as-built drawings shall be maintained at the project, and a complete set on microfilm (or CADD drawings on CD ROM) shall be maintained in the district office. Maintenance of these drawings in the MSC office is at the discretion of the MSC commander. It is not required that the drawings be provided to HQUSACE.

d. For hydroelectric projects, the original tracings and/or CADD file, revised to show actual construction, shall be transferred to the respective project drawing files in the powerhouse. When approved changes are completed, the changes shall be made on the tracings and/or CADD file, and the revised prints distributed.

FOR THE COMMANDER:

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

CEMP-CE
CECW-OC

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

ER 415-1-10

Regulation
No. 415-1-10

15 April 1997

Construction
CONTRACTOR SUBMITTAL PROCEDURES

1. Purpose. The purpose of this regulation is to establish a system whereby the contractor can maintain effective scheduling, control and processing of submittals required by the contract in order to regulate the timely flow of materials to be incorporated into the construction.

2. Applicability. This regulation is applicable to all Major Subordinate Commands (MSC) and District Commands (DC) awarding and/or supervising any contracts requiring construction activities and shall be considered in conjunction with, and as a supplement to, ER 1180-1-6 during its implementation.

3. References.

a. ER 37-2-10

b. ER 37-345-10

c. ER 415-1-16

d. ER 1180-1-6

e. EP 415-1-260

4. General. The submittals referred to in this regulation include all shop drawings, samples, letters of certification, tests and other engineering information that may be required for quality control and assurance. The contractor is required to furnish a specified quality of construction, including materials and equipment to be incorporated in the work. Control of the quality of materials and equipment requires timely review, testing, or other evaluation. All required submittals must be made in time to allow for evaluation, approval, procurement, and delivery prior to the preparatory control phase and before the item is needed in the construction process.

5. Policy. This regulation prescribes standard procedures which are applicable to all contracts containing construction activities. The primary responsibility for the overall

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This regulation supersedes ER 415-1-10, 30 May 1995

management and control of contractor submittals, in context with ER 1180-1-6, lies with the prime contractor. Monitoring of the contractor's quality management control to assure that submittals are timely, appropriately certified, and in compliance with the contract is the responsibility of the government.

6. Submittal Classifications. Submittals are classified as "government approved" or "information only." Submittals which will always require government approval are: extensions of design, critical materials, deviations, O&M manuals or those involving equipment that must be checked for compatibility with the entire system. The number of submittals requiring government approval should be kept to a minimum. All submittals not requiring government approval are for information only. Within the terms of the Contract Clause entitled "Specifications and Drawings for Construction", government approved submittals are considered to be "shop drawings" whereas information only submittals are not. Examples of extensions of design are fire alarm and sprinkler protection systems, prefabricated buildings, structural steel drawings, standing seam metal roof drawings, coordination studies such as short circuit analysis of contractor selected electrical equipment, etc. Critical materials are defined as materials which must meet specific quality performance standards required by design parameters, the failure of which will have a major impact on the operation, maintenance, quality of life or life safety of the system. Examples of critical materials are coatings for cathodic protection of storage tanks, high pressure piping and controls, acid and hazardous waste systems, or architectural finishes for customer approval. Deviations are any submittal by the construction contractor which varies from the construction contract specifications. Examples of equipment which must be checked for compatibility with existing systems or the entire new system are equipment for sewage treatment and water purification plants, energy management control systems, intrusion detection systems, power generation and distribution systems, etc. The examples provided here are not all inclusive and are used only for illustration purposes.

7. Contractor Responsibilities. The contractor is responsible for total management of his/her work. This includes the scheduling, control, and certification of all submittals. The contractor's responsibilities will be established by the inclusion of properly edited CEGS-013~~0~~3 in the contract specifications.

8. Government Responsibilities.

a. The designer will prepare a list of submittals required for each contract. This list must be very specific to allow the construction contractor to know exactly what it is that is required to be submitted. This list will be prepared electronically on ENG Form 4288-R (Submittal Register) (Appendix A) and will be limited to columns "d" thru "o". This list will be provided in hard copy and on computer disc which is compatible with the Resident Management System (RMS) software. Prior to advertisement, construction and engineering elements of the FOA will jointly determine what submittals require government approval and what submittals are for information only. This will be noted in columns "p" and "q" on the ENG Form 4288-R. Column "r" will be used to designate the reviewer in accordance with MSC/DC procedures. The information on ENG Form 4288-R will be incorporated into the specifications prior to advertisement. ENG Form 4288-R is authorized for electronic generation in accordance with existing guidelines on electronic generation of forms. Further guidance on electronic generation of forms is available through the local Forms Management Officer (FMO).

b. The appropriate elements of the MSC/DC will review the contractor's submittal control document in accordance with procedures established by the MSC/DC. The review will be coordinated within the MSC/DC to assure that all required submittal schedules, review time, and procurement lead times are reasonable. In addition, the document shall be checked against the Network Analysis System or other approved construction schedule. The master copy of the control document shall be maintained in the Area/Resident Office. Control at this level is necessary to ensure effective management of the contractor and timely response by the government. It is essential that a complete record of all action dates be maintained and that the document reflect current information for each contract. It is important that certifications required after completion of construction, like roofing systems and underground heat distribution systems, be monitored and obtained at the appropriate times. The Area/Resident Engineer should monitor progress at all times and take appropriate action for any delay. Examples of appropriate actions for contractor caused delays include letters advising of delinquency, retainage for unsatisfactory progress, and nonpayment for unapproved materials.

c. Submittals will be received from the contractor as directed by the specifications. ENG Form 4025 (Transmittal of Shop Drawings, Equipment Data, Material Samples, or Manufacturer's Certificates of Compliance) will be used as the transmittal document. Review will be as previously determined. The cost for reviewing shop drawings will be charged in accordance with ER 415-1-16, ER 37-2-10 and ER 37-345-10. Approval actions and correspondence with the contractor shall be made by the Area/Resident Engineer Office (ACO/COR) . Government personnel shall perform quality assurance reviews of information only submittals to assure that the contractor's quality control program is properly handling submittals. The number of reviews will be at the DC discretion, however, a minimum of 10 percent of all information only submittals will be reviewed.

9. Implementation. The contract documents will include a section based on CEGS 013~~0~~0 which will establish contractual procedures for submittals. MSC/DC will establish necessary internal procedures to carry out the intent of this regulation.

FOR THE COMMANDER:

OTIS WILLIAMS
Colonel, Corps of Engineers
Chief of Staff

2 Appendices
APP A - ENG Form 4288-R
APP B - ENG Form 4025

TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR MANUFACTURER'S CERTIFICATES OF COMPLIANCE
(Read instructions on the reverse side prior to initiating this form)

DATE

TRANSMITTAL NO.

SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS *(This section will be initiated by the contractor)*

TO:

FROM:

CONTRACT NO.

CHECK ONE:
☐ THIS IS A NEW TRANSMITTAL
☐ THIS IS A RESUBMITTAL OF TRANSMITTAL _____

SPECIFICATION SEC. NO. *(Cover only one section with each transmittal)*

PROJECT TITLE AND LOCATION

CHECK ONE: THIS TRANSMITTAL IS FOR ☐ FIO ☐ GOV'T. APPROVAL

ITEM NO. a.	DESCRIPTION OF ITEM SUBMITTED *(Type size, model number/etc.)* b.	MFG OR CONTR. CAT., CURVE DRAWING OR BROCHURE NO. *(See instruction no. 8)* c.	NO. OF COPIES d.	CONTRACT REFERENCE DOCUMENT: SPEC. PARA. NO. e.	CONTRACT REFERENCE DOCUMENT: DRAWING SHEET NO. f.	FOR CONTRACTOR USE CODE g.	VARIATION *(See instruction No. 6)* h.	FOR CE USE CODE i.

REMARKS

I certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as otherwise stated.

NAME AND SIGNATURE OF CONTRACTOR

SECTION II - APPROVAL ACTION

ENCLOSURES RETURNED *(List by item No.)*

NAME, TITLE AND SIGNATURE OF APPROVING AUTHORITY

DATE

ENG FORM 4025-R, MAR 95 *(ER 415-1-10)* EDITION OF SEP 93 IS OBSOLETE. SHEET ___ OF ___ (Proponent: CEMP-CE)

INSTRUCTIONS

1. Section I will be initiated by the Contractor in the required number of copies.

2. Each transmittal shall be numbered consecutively in the space provided for "Transmittal No.". This number, in addition to the contract number, will form a serial number for identifying each submittal. For new submittals or resubmittals mark the appropriate box: on resubmittals, insert transmittal number of last submission well as the new submittal number.

3. The "Item No." will be the same "Item No." as indicated on ENG FORM 4288-R for each entry on this form.

4. Submittals requiring expeditious handling will be submitted on I separate form.

5s. Separate transmittal form will be used for submittals under separate sections of the specifications.

6. A check shall be placed in the "Variation" column when a submittal is not in accordance with the plans and specifications-alsoa written statement to that effect shall be included in tea space provided for "Remarks".

7. Form is self-transmittal, letter of transmittal is not required.

8. When a sample of material or Manufacturer's Certificate of Compliance is transmitted, indicate "Sample" or "Certificate" in column c, Section L

9. U.S. Army Corps of Engineers approving authority will assign action codes as indicated below in space provided in Section 1, clumn 1 to each leam submitted. In addition they will ensure enclosures are indicated and attached to the form prior to return to the contractor. The Contractor W assign action codes as indicated below in Section 1, column g, to each item submitted.

THE FOLLOWING ACTION CODES ARE GIVEN TO ITEMS SUBMITTED

A -- Approved as submitted.

B -- Approved, except as noted on drawings.

c -- Approved, except as noted on drawings.
Refer to attached sheet resubmission required.

D -- Will be returned by separate correspondence.

E - Diaapproved (See I ttached).

F - Receipt acknowledged.

FX - Receipt acknowledged, does not comply as noted with contract requirements.

G - Other (Specify)

10. Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

(Reverse of ENG Form 4025-R)

CEMP-E
CECW-E

Regulation
No. 1110-1-8155

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

ER 1110-1-8155

24 December 1998

Engineering and Design
SPECIFICATIONS

1. **Purpose.** This joint Civil Works and Military Programs regulation prescribes specifications policy and requirements, incorporates Total Army Quality principles, and enables Headquarters U.S. Army Corps of Engineers (HQUSACE) elements and U.S. Army Corps of Engineers (USACE) commands to produce quality specifications.

2. **Applicability.** This regulation is applicable to all HQUSACE elements and USACE commands having design or construction responsibilities.

3. **References.** Required and related publications are listed in Appendix A.

4. **Distribution.** This regulation is approved for public release; distribution is unlimited.

5. **Definitions.**

a. **Design Agency.** A HQUSACE element or USACE command having military and/or civil works design responsibilities.

b. **Specifications Engineer.** The individual within a design agency who is assigned primary responsibility for overseeing the preparation of complete project specifications and coordinating contract documents.

c. **Designer.** An individual within a design agency who has design responsibility for certain features of a project involving one or more engineering and design discipline, e.g., architectural, structural, mechanical, electrical.

d. **HQUSACE Specifications Proponents.** The individuals within HQUSACE Directorates of Military Programs (Engineering and Construction Division, CEMP-E) and Civil Works (Engineering and Construction Division, CECW-E) designated to address the needs and concerns of design agencies related to the preparation of quality guide specifications and project specifications.

e. **HQUSACE Technical Proponent.** An individual who develops technical policy and approves guide specifications. Technical policy is contained in documents such as engineering manuals, engineering regulations, technical instructions, and similar publications issued by HQUSACE. Technical policy is reflected in the Corps of Engineers Guide Specifications (CEGS).

f. **Technical Representative.** An individual designated to serve as technical expert for a certain guide specification or criteria document.

This regulation supercedes Appendix D, ER 1110-345-700, dated 30 May 1997, and ER 1110-2-1201 dated 30 June 1997.

g. Corps of Engineers Guide Specifications (CEGS). A system of master guide specifications that define the qualitative requirements for products, materials, and workmanship for work features that occur in USACE construction projects on a repetitive basis. CEGS include Military Programs and Civil Works guide specifications and facilitate the efficient production of quality project specifications.

h. Notice Program. The program administered by Civil Works and Military Programs to maintain the CEGS.

i. Notice Program Coordinators. The individuals designated to manage Military Programs and Civil Works functions of the Notice Program and serve as points of contact for program operations.

j. TECHINFO. An Internet-based construction criteria information system that is managed for HQUSACE by the U.S. Army Engineering and Support Center, Huntsville (CEHNC-ED-ES). Because the system is updated as criteria are approved or revised, TECHINFO contains the most current editions of CEGS and engineering criteria documents.

k. Construction Criteria Base (CCB). A database developed by the National Institute of Building Sciences and available in CD-ROM and DVD media and on the Internet. The database contains design and construction documents from federal and private organizations, including Army, Navy, and NASA guide specifications.

l. SPECSINTACT. The software program, copyrighted by the National Aeronautics and Space Administration (NASA), mandated for use in producing USACE project specifications and maintaining guide specifications. The software provides state-of-the-art specification automation to users, incorporating a wide range of quality control features. The software is a cooperative effort by Army, Navy, and NASA that provides greater uniformity and better transportability of guide specifications of the other departments and agencies. SPECSINTACT is available through TECHINFO and CCB.

m. Construction Specifications Institute (CSI). A non-profit organization, with members from all areas of the construction and engineering industry, that establishes and publishes formats and organization standards for use in the preparation of construction specifications and other construction documents.

n. CSI Manual of Practice. An industry-recognized reference manual that contains recommended methods and practices for preparing, organizing, and formatting construction specifications and other construction documents.

o. Project Specifications. Specifications (also known as construction specifications) produced using the CSI format that define construction requirements which apply to a specific project.

p. Standard Specifications for Military Construction. Specifications that are developed under direction of HQUSACE (CEMP-E) as part of a standard design package that provides unique requirements for facilities intended for site adaptation at several locations, e.g., POL

Storage Facilities. Standard specifications are based on CEGS format and are developed in sufficient detail to serve as construction documents after site-specific requirements are incorporated. Standard specifications are packaged with the design drawings to which they apply and are available from the U.S. Army Engineering and Support Center, Huntsville (CEHNC-ED-ES).

q. Federal Specifications and Standards (FED-SPECS and FED-STDS). Documents issued or controlled by the General Services Administration (GSA) which are sometimes referenced in the CEGS to define requirements. Active FED-SPECS and FED-STDS cited in DoD documents are available from the GSA Federal Supply Service Bureau.

r. Military Specifications and Standards (MIL-SPECS and MIL-STDS). Documents issued or controlled by one of the military departments which are sometimes referenced in the CEGS to define requirements. Active MIL-SPECS and MIL-STDS are available from the DoD Single Stock Point (DoDSSP).

s. Reference Standards. Documents that contain requirements set by authority, custom, or general consensus and are established as accepted criteria. They are published by trade associations, professional societies, standards-writing organizations, governments, and institutional organizations, e.g., the American National Standards Institute (ANSI) and the American Society for Testing and Materials (ASTM). These documents are incorporated by reference into CEGS and project specifications to define qualitative and performance requirements for materials, equipment, systems, test methods, and workmanship.

6. <u>HQUSACE Specifications Proponents.</u> HQUSACE specifications proponents use input from a variety of sources to ensure that specifications issues affecting USACE are addressed at the headquarters level. The specifications proponents maintain a liaison between the Military Programs and Civil Works Directorates at HQUSACE, as well as the specifications proponents from other agencies and DoD departments. HQUSACE specifications proponents jointly represent USACE specifications concerns and issues involving other agencies and departments as appropriate, e.g., SPECSINTACT enhancements and CCB issues.

7. <u>Specifications Steering Committees.</u> Specifications steering committees may be established by HQUSACE specifications proponents to support Civil Works and/or Military Programs mission requirements. Steering committees established to meet directorate-unique requirements will be coordinated between the HQUSACE specifications proponents. The Corps of Engineers Specifications Steering Committee (CSSC) has been established by ER 15-1-41 to provide policy recommendations for improving CEGS and project specifications.

8. <u>Corps of Engineers Guide Specifications (CEGS).</u>

a. Purpose. CEGS provide design agencies and their contractors a set of master guide specifications reflecting HQUSACE technical policy that will enhance productivity, quality, and uniformity of USACE construction. CEGS are revised and reissued periodically to incorporate lessons learned and technological advances.

(1) CEGS promote full and open competition in procurement in accordance with FAR Subpart 11.002 and maximize construction economy consistent with sound functional, aesthetic, environmental, energy conservation, and architectural and engineering practices.

(2) CEGS contain designer notes providing guidance on use of the specifications and the coordination required with the other project specification sections and with the project drawings. Additionally, through the use of "brackets", the guide specifications identify blanks to be filled in and alternative text for selection by designers.

(3) CEGS used in combination with SPECSINTACT automated processing methods improve project specification production, uniformity, consistency, and overall quality in accordance with USACE policy. Uniformity and consistency of project specifications aid contractors in their preparation of bids, improve quality of construction, and reduce cost to USACE customers.

(4) The CEGS designation is restricted to HQUSACE use only.

b. CEGS Development and Update Process. CEGS are developed and maintained (along with other design tools and criteria documents) under independent Standards and Criteria (S&C) Programs administered by Military Programs and Civil Works, respectively, to be responsive to directorate-unique mission requirements. HQUSACE technical proponents identify CEGS and S&C to be developed under the appropriate program from a variety of factors, e.g., new federal mandates, DoD and DA policy requirements, technological advances, and user feedback from lessons learned during design and construction. CEGS and S&C are approved for the S&C Programs each fiscal year based on program priorities and available resources.

(1) When a CEGS is approved for development, the HQUSACE technical proponent for the document will establish a scope of work (SOW) formulating overall policy and requirements to be included and designate an appropriate technical representative to execute the work. Technical representatives will be recognized experts on the designated subject matter and may be located within USACE, other government agencies, or private industry.

(2) All phases of the work will be approved by the HQUSACE technical proponent in accordance with the SOW. Additionally, when appropriate, CEGS will be coordinated with the construction industry during the development process to ensure the specifications reflect state-of-the-art materials, equipment, systems, and practices.

(3) Upon completion of the work, technical representatives will submit CEGS to the HQUSACE technical proponent for final approval.

c. Notice Program. This program is funded under the HQUSACE S&C Programs to perform minor maintenance to CEGS between major document updates. This may include incorporation of lessons learned and changes in technology, standards, and referenced publications. The program also ensures that the CEGS are useable with SPECSINTACT software. The U.S. Army Engineering and Support Center, Huntsville, and the U.S. Army Engineer District, Vicksburg, have been designated by the HQUSACE specifications proponents

to execute the program with a Notice Program Coordinator at each office to manage program functions. Changes to CEGS under this program are issued in the form of notices.

d. Distribution. CEGS with change notices are distributed electronically through TECHINFO and CCB.

e. Recommended Changes. Design agencies are encouraged to submit proposals for new criteria and CEGS that may have USACE-wide application. Proposals for technical or editorial changes to existing criteria and CEGS that are necessary or desirable for general application or to reflect local availability of materials and construction practice are also encouraged. Such proposals may be submitted to HQUSACE electronically using the TECHINFO Recommended Changes Page or by hard copy ENG Form 3078. Recommended changes may also be presented to CSSC members. A current list of members is provided on TECHINFO.

f. CEGS Points of Contact. Questions about individual CEGS may be directed to the designated technical proponent for the document. A current list of technical proponents with their phone numbers is provided on TECHINFO.

9. Project Specifications.

a. General Requirements. Design agencies will ensure that high-quality and concise specifications are prepared, that the preparation of project specifications is fully coordinated with agency construction and contracting representatives, and that the project specifications comply with industry standards for format and content as established by the CSI Manual of Practice. It is recommended that each design agency designate a specifications engineer to oversee and coordinate the preparation of project specifications to ensure compliance with these requirements. A specifications engineer should have knowledge and experience in developing construction contract documents and project specifications.

b. Use of Existing Project Specifications. Where a previous project design is adapted for use on a project, where standard specifications are used for military construction, or where a project design has been completed and held in abeyance for more than six months, the project specifications will be reviewed and revised as necessary.

c. Use of CEGS. CEGS provide a set of master guide specifications that should be used for developing project specifications. CEGS must be tailored to fit specific project requirements. The intent and wording of CEGS should be preserved to the extent practicable as they incorporate public laws, federal mandates, DoD and DA policy, industry coordination, and lessons learned. Additional information concerning the use of CEGS in the preparation of project specifications is contained in the document "CEGS General Notes" which is available on TECHINFO and CCB.

d. SPECSINTACT. The use of SPECSINTACT is mandatory for production of all project specifications, except for overseas areas. Maximum efficiency and quality are obtained when project specifications are prepared using SPECSINTACT and the latest CEGS edited to suit the specific requirements of projects.

e. Specifications Development During Project Phases. Project specifications, when combined with the project drawings, must provide a comprehensive set of construction documents that can be bid fairly and competitively and executed without change, except as necessary to resolve unforeseen conditions or changes made during construction. (See ER 1180-1-6 and ER 415-1-11 for guidance on biddability, constructibility, operability, and environmental review.) Design agencies will identify and resolve unusual design or contract administration problems and assure that project specifications comply with technical policy established by HQUSACE. Close coordination between the specifications engineer and the designers is important throughout all design phases to produce complete and accurate project specifications.

(1) Specifications engineers should assist designers in identifying CEGS sections that are to be used in the project, operating the SPECSINTACT software, and incorporating the designer's input into the project specifications.

(2) Designers are responsible for the design of technical project features and are responsible for the technical content of Divisions 2-16 of the project specifications for those features. Specifications engineers are responsible for the format of all project specification sections and for ensuring that proper and non-contradictory contract language is used throughout. Specifications engineers are also responsible for determining the project-specific information that must be inserted into the non-technical provisions and the Division 1 General Requirements sections.

(3) Designers will prepare technical requirements for which no CEGS exists. When a new specification section must be developed for a particular project, the designer will provide the technical information and ensure that the section contains proper language and is properly formatted in accordance with the the document "Guidance for the Preparation of Corps of Engineers Guide Specifications (CEGS)" which is available on TECHINFO and CCB.

(4) Project Bid Schedules will be prepared in close coordination with Contracting, Counsel, Project Management, Design, Cost Engineering, and Construction. For Civil Works projects, the lump sum and unit-priced items defined for incorporation in the bid schedule must be consistent with the work breakdown structure. Bid schedules will conform to USACE guidance and all aspects of the federal acquisition regulations (FAR Subpart 36.207).

(5) As part of the routine quality assurance/quality control (QA/QC) process, specifications engineers should perform quality checks (e.g., SPECSINTACT reports, visual scan of pages for errors, verification of specification inserts such as the submittal register, etc.) on project specifications prior to advertisement.

(6) Appropriate design staff should make field trips during the construction phase of projects to identify specifications and contract administration problems to be avoided in future project specifications. Corrective action will be implemented to resolve problems identified during all project phases that could have been prevented by improved specifications, e.g., recommend changes in CEGS.

f. Specifications Prepared by Architect-Engineer (A-E) Firms. The requirement to use SPECSINTACT for production of project specifications will be included in all procurement of A-E design services. Design agencies will assist the A-E by providing copies of regulations, manuals, engineer technical letters, and other information not available on TECHINFO and CCB. A-E firms under contract with DoD agencies may receive a no-cost subscription to CCB by providing contract documentation to the National Institute of Building Sciences. Design agencies will provide guidance to A-E firms on preparation of Division 1 sections and provide agency-unique information to be incorporated into the Division 1 sections. Previous project specifications may be furnished as samples of the form and content for completed work but should not be used where applicable guide specifications exist.

g. Construction Documents Format. Construction contracts shall be prepared in accordance with the HQUSACE format for construction contracts in EFARS Subpart 14.2, Solicitation of Bids. Specification section numbering will follow CSI MasterFormat (latest edition). The format of the sections within the specifications will be based on the CSI SectionFormat as modified under the "CEGS Organization Guidance" attachment to the document "Guidance for the Preparation of Corps of Engineers Guide Specifications (CEGS)".

h. Reference Publications. Materials, workmanship, and equipment will be described, where possible, by reference to industry and government standards generally known to the construction community, citing the type, class, or other designation necessary to identify fully the item required. The reference approval date and the dates of any applicable amendment and revisions will be included in the solicitation (FAR Subpart 11.201a). Reference standards should not be used to describe minor, non-critical items (such as incidental fasteners) when any commercially available product of that nature would be adequate. To the maximum extent practicable, references will be to nationally recognized industry and technical society specifications and standards. If industry documents are unavailable or unsuitable, applicable commercial item descriptions (CID) may be referenced. Publications referenced in project specifications need be no later than the editions cited in the current notice for the corresponding CEGS. Publications not readily available to bidders, such as engineer regulations (ER), engineer technical letters (ETL), and technical manuals (TM), should not be referenced but if referenced must be furnished with the solicitation (FAR Subpart 11.201b). In accordance with DoD direction, FED-SPECS, FED-STDS, MIL-SPECS, and MIL-STDS are not to be used in contracts unless exempted by HQUSACE or an approved waiver is provided by the design agency. A list of exempted FED-SPECS, FED-STDS, MIL-SPECS, and MIL-STDS is maintained on TECHINFO.

i. Submittals. Submittals, such as shop drawings, test reports, certificates, and samples, will not be required for non-critical items of relatively low value when the cost of making the submittal exceeds the benefit to the project (see ER 415-1-10). Avoidance of such submittal requirements is particularly encouraged for small projects. Submittals are classified as "Government Approved" or "For Information Only." Design agencies must keep submittals requiring government approval to a minimum due to funding limitations. Only those submittals that are critical to safety, construction execution, or system or facility operation should be required for government approval. Critical submittals requiring government approval are extensions of design, critical materials, deviations, O&M manuals, or those involving equipment that must be checked for compatibility with the entire system.

j. Testing. Ordinarily, testing is the responsibility of the contractor under the contractor QC provisions of the specifications (see ER 1180-1-6). Requirements in the specifications making testing the contractor's responsibility will not be written in such a way as to void the right of the contracting officer to perform confirmation testing and QA testing or to witness testing by the contractor. Testing by the government should be kept to a minimum and should be done only when necessary to assure the quality of critical construction.

k. Warranties. Warranty requirements extending beyond the normal one-year construction warranty period or such other period required by CEGS will be specified only for materials, equipment, or systems for which longer warranties are normally provided in the industry. The increased cost of the extended warranties, and the costs of administering and enforcing such warranties, should be evaluated prior to their specification.

l. New Materials and Methods. Designers are encouraged to consider the use of new, unusual, or innovative materials, equipment, systems, or methods in designs when evidence shows that such use is in the best interest of the government in terms of value, lower life-cycle costs, and quality of construction. Manufacturers are to prove the merits of their product by certified laboratory results, evidence of satisfactory installation under conditions similar to those anticipated for the proposed construction, and compliance with appropriate industry standards, if they exist. For a specific project, where different requirements from those in the CEGS are specified, and where the requirements may have application beyond that specific project, design agencies will submit a recommended change (either by ENG Form 3078 or by TECHINFO) to report the new, unusual, or innovative items to HQUSACE. The recommended change report will allow HQUSACE to implement changes to criteria or disseminate useful information through the Engineering Improvement Recommendation System (EIRS) Bulletin.

m. Brand Names and Proprietary Items. Specifying items peculiar to one manufacturer (sole source), either by brand name or by peculiar characteristic, is prohibited unless specially justified and approved (FAR, Subpart 11.104). Brand name or equal descriptions are appropriate only as a last resort and should be used with great care and discretion. Where the brand name or equal description is used, the contract provisions will include those salient features of the item or items specified upon which equality can be determined (FAR, Subpart 36.202c).

n. Contractor's Options. Optional materials and methods of construction that are acceptable are included in CEGS as a means of increasing competition and reducing project costs. Project specifications should include all contractors' options contained in the CEGS. Additional optional materials and methods may be specified if a study of conditions affecting a particular project shows that other options are consistent with good architectural and engineering practice, are economically justifiable, and provide the best value to the government. Where a contractors option is specified which is not part of the CEGS, and where the specified contractor's option may have application beyond that specific project, the design agencies will submit a recommended change (either by ENG Form 3078 or by TECHINFO) to report the optional materials and methods to HQUSACE.

10. Training. Design agency staff involved in preparation of specifications should attend the Proponent-Sponsored Engineer Corps Training (PROSPECT) Course "Specifications for

Construction Contracts." Training should also be provided in bidding procedures and the preparation of the non-technical provisions of contract documents, personal computer software, SPECSINTACT, and, if SPECSINTACT is used on a network, in network operation and software. Specifications staff should be encouraged to become certified under the CSI Certified Construction Specifier Program.

FOR THE COMMANDER:

1 Appendix
APP A - References

ALBERT J. GENETTI, JR.
Major General, USA
Chief of Staff

APPENDIX A

REFERENCES

1. **Required Publications.**

a. Federal Acquisition Regulation (FAR), Part 11.

b. Federal Acquisition Regulation (FAR), Part 36.

c. ER 15-1-41, Corps of Engineers Specifications Steering Committee (CSSC).

d. ER 415-1-10. Contractor Submittal Procedures.

e. ER 415-1-11, Biddability, Constructibility, and Operability.

f. ER 1180-1-6, Construction Quality Management.

g. Engineering FAR Supplement (EFARS) Subpart 14.2, Solicitation of Bids.

h. Manual of Practice (MOP), Construction Specifications Institute (CSI), 601 Madison Street, Alexandria, VA 22314.

2. **Related Publications.**

a. AR 5-1, Army Management Philosophy.

b. ER 690-1-414, Proponent-Sponsored Engineering Corps Training (PROSPECT).

c. ER 1110-1-12, Quality Management.

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

e. ER 1110-2-1200, Plans and Specifications for Civil Works Projects.

f. ER 1110-2-1302, Civil Works Cost Engineering.

g. ER 1110-3-1300, Military Programs Cost Engineering

h. ER 1110-345-100, Design Policy for Military Construction.

i. ER 1110-345-700, Design Analysis, Drawings, and Specifications.

SUBMITTAL REGISTER
ER 415-1-10

CONTRACT NO.

TITLE AND LOCATION

SPECIFICATION SECTION

CONTRACTOR

ACTIVITY NO.	TRANSMITTAL NO.	ITEM NO.	SPECIFICATION PARAGRAPH NUMBER	DESCRIPTION OF ITEM SUBMITTED	TYPE OF SUBMITTAL	CLASSIFICATION	CONTRACTOR SCHEDULE DATES			CONTRACTOR ACTION			G. ENG ACTION			REMARKS
							SUBMIT	APPROVAL NEEDED BY	MATERIAL NEEDED BY	CODE	DATE	SUBMIT TO GOVERNMENT	CODE	DATE		
a.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	l.	m.	n.	o.		p.
					DATA											
					DRAWING											
					INSTRUCTION											
					SCHEDULE											
					STATEMENT											
					REPORT											
					CERTIFICATE											
					SAMPLE											
					MANUAL											
					OTHER											
					INFORMATION											
					REQUIRED											
					REVIEW											

SP/100 Specifying for the Federal Government

Many federal agencies administer construction programs and each has different construction document preparation requirements. The first experience with a federal agency client may be awkward and troublesome for an architect/engineer (A/E) whose previous experience has been entirely in the private sector. Many of the practices and procedures to which the A/E has become accustomed must be changed to conform to the requirements of the federal agency client. This chapter will help the A/E to prepare bidding and contract documents for federal agency projects. Many of the principles discussed here will also apply when the client is a city, county, or state government agency, or a school district with specific requirements for the form and content of their construction documents.

MasterFormat is often the common link between federal government and private sector specifications. Most government agencies use *MasterFormat* to organize their guide specifications. However, their section numbers and titles may sometimes differ from those in the current edition. Additionally, federal agencies sometimes intentionally deviate from *MasterFormat* to accommodate their unique requirements. For example, the Veterans Administration considers "General Conditions" a Division 1 – General Requirements section.

Most government guide specifications conform to the CSI SectionFormat. However, the method of numbering paragraphs may not always follow the preferred alpha-numeric arrangement in the suggested *PageFormat*. Some agencies number their paragraphs and subparagraphs in a legal style, Arabic numeral format 1.1, 1.1.1, 1.1.2, 1.1.2.1. Rather than specifying procedural matters in the appropriate Division 1 section, some agencies repeat statements concerning general requirements for maintenance information and shop drawings in each Division 2 through 16 section.

BIDDING REQUIREMENTS, CONTRACT FORMS, AND CONDITIONS OF THE CONTRACT

Federal agencies usually do not require the A/E to prepare all the components of the project manual. In some cases the A/E will write the specifications in Divisions 1 through 16, and the client agency will provide the bidding requirements, contract forms, and conditions of the contract to the A/E for incorporation into the project manual. The A/E must be familiar with these client agency documents before preparing the Division 1 through 16 specifications. This may require persistent requests to the client agency to obtain the documents, and even then the A/E cannot be entirely sure the samples provided will be identical to those finally used in the project manual. When agency-furnished documents are used, the content of Division 1 will vary greatly from a Division 1 prepared for use in the private sector.

The first difference about the general conditions of the contract for a federal project is the name of the document. Comparable to the American Institute of Architects (AIA) Document A201, *General Conditions of the Contract for Construction*, or the Engineers Joint Contract Documents Committee (EJCDC) Document 1910-8, *Standard General Conditions of the Construction Contract*, the federal documents might be titled "General Provisions," "General Standards," "Special Provisions," or "Contract Clauses." They are all based on the Federal Acquisition Regulations (FAR).

There are other significant ways in which federal general conditions differ from their private-sector counterparts.

- A "contracting officer," rather than the A/E, is responsible for administering the bidding and construction phases of the contract. The contracting officer is either a military officer or a civilian employee of the government. Consequently, the A/E does

not exercise the same authority on federal projects that it ordinarily would on projects in the private sector.

- The federal government is both the owner and the primary regulating authority.
- Local building code authorities do not have jurisdiction on federal property, although other federal agencies may have authority.
- The federal government is self-insuring and does not procure commercial insurance for its buildings or their contents. Therefore, federal guide specifications generally contain more stringent requirements for fire protection, safety, and component and construction durability than those in the private sector.
- The means of settling disputes is different from those encountered in the private sector. Although this normally does not directly affect the specifications, it does have a significant impact on administration of the contract.

SOCIAL VALUE REGULATIONS

Federal government contracts normally include certain "social value" regulations designed to assist particular industries and other special-interest groups. Some examples are wage rates, environmental regulations, preference to American shipping, affirmative action, utilization of small businesses, utilization of businesses owned by women and minorities, labor standards, and accessibility standards.

The "Buy American Act" is another such provision. It gives U.S. manufacturers an advantage by imposing penalties or restrictions on the use of foreign-made products. A product is considered to be a U.S.-manufactured product if it is manufactured in the U.S. and at least 50 percent of its components, by cost, are mined, produced, or manufactured in the U.S. Some materials are exempt from "Buy American" provisions, such as raw materials of which there are limited domestic supplies. Use of most other foreign products is generally prohibited unless the contractor can furnish reliable evidence that the cost of an equivalent U.S.-made product will be more than six percent greater than the cost of the foreign-made equivalent; or if the foreign product is used in a "unique" situation where no domestic product can meet the criteria.

USE OF MANUFACTURERS' NAMES

It is the policy of most federal agencies to prohibit use of brand names, manufacturers' names, or other proprietary or restrictive requirements for products. The intention is to encourage unlimited competition consistent with the type and quality of work, and to maximize the use of standard products and current models meeting the functional requirements of the facility. Drawings, specifications, standards, or purchase descriptions for acquisitions should state only the government's actual minimum requirements and describe the supplies or services in a manner that will encourage maximum practicable competition. Brand names may be used in federal government specifications under the following conditions:

- When there is no other feasible way of describing the essential functional or physical characteristics (such as to describe the appearance of stone or the performance of a high-technology product)
- When an agency is extending or connecting to an existing system and the new portion or components must match the existing system
- When specifications include a statement explaining that the brand names are included only to describe stated salient characteristics such as color, pattern, and operational characteristics, and that other products having the same characteristics will not be excluded
- When specifications list a minimum of three products and state specifically that acceptable products are not limited to the manufacturers of those products.

When brand-name descriptions are necessary, the specifications must clearly identify and describe the particular physical, functional, or other characteristics of the brand name items that are considered essential to satisfying the requirement.

In order to eliminate any chance that the use of brand names in specifications might limit competition, the FARs require the following clause to be included in fixed-price contracts:

Reference in the specifications to equipment, material, articles, or patented processes by trade name, make, or catalog number shall be regarded as establishing a standard of quality and shall not be construed as limiting competition. The Contractor may, at its option, use any equipment, material, article, or process that, in the judgment of the Contracting Officer, is equal to that named in the specifications, unless otherwise specifically provided in this contract.

FEDERAL SPECIFICATION PRODUCT STANDARDS

There are four classifications of reference standards used for specifying government construction. Listed in the order of preferred usage, they are private sector standards, Commercial Item Descriptions (CID), Federal Specifications (FS). and Military Specifications (MS or MIL).

Federal Specifications were originally established to meet a vital procurement need and many of them have also set standards for industry. However, current government policy encourages development and use of non-government standards to replace Military Specifications and Federal Specifications. Private-sector organizations such as the American Society for Testing and Materials (ASTM), the National Fire Protection Association (NFPA), and the American National Standards Institute, Inc., (ANSI) are now more active in developing standards for construction products, and Federal Specifications are being replaced by these standards, or by "Commercial Item Descriptions," which include references to ASTM, ANSI, and other industry standards. Government policy currently favors the use of such private-sector standards when they exist, and when they meet the needs of the agency concerned. It is also the current Department of Defense policy to convert Military Specifications to private-sector standards or to Federal Specifications when used in non-military construction. Many Federal Specifications have not been updated for years, and they should not be used when more current standards are available.

Federal Specifications are documents issued by the General Services Administration (GSA) Federal Supply Service, and cover a wide variety of items used by the federal government, including some construction products. Federal Specifications generally appear as a reference under PART 2 PRODUCTS of a specification section. Military Specifications are similar, except that they are issued by the Department of Defense and include only a few construction products. Military Specifications are organized with various classifications of type and quality.

Most Federal Specifications are classification documents that include all quality levels of the product described and grade the product in accordance with its physical and functional characteristics. When referencing a Federal Specification, it is usually necessary to state the particular class or grade of the product being specified.

SPECIFICATION ITEMS FOR CONSIDERATION DURING CONTRACT FEE NEGOTIATION

Preparing a specification for a federal agency will often take more time than a specification for a private-sector owner, including the time required to read agency manuals and other documents containing requirements relating to the project.

Consider the following items when the project fee is being negotiated:

- What is the form of the available master guide specifications (e.g., printed copy that will require complete retyping, CD-ROM requiring special equipment to read optical disks, 9-track magnetic tape that will require some programming to use, or computer text files not compatible with the A/E's word processing system)?
- Who develops or provides specification sections that are not included in the agency-furnished specifications?
- How many reviews are required by the client agency?
- In what form are the specifications to be for each review?
- How many copies are required for submittal at each review?
- Will the agency provide the front-end documents, or will the A/E be required to write them? What effect will this have on preparation of the remainder of the project manual?
- What is the time frame for reviewing submittals and for review by the agency?
- Will the agency's own page format require additional work?
- Will the agency require all sections to be produced in the same typeface (e.g., a mixture of letter quality and dot matrix printing developed by separate disciplines may not be accepted)?
- Will reference documents need to be acquired, and if so, will the client agency provide copies or reimburse their acquisition cost?

FEDERAL GOVERNMENT AGENCIES' CONSTRUCTION DOCUMENTS POLICIES

Each agency involved in construction has its own policies and procedures for administering construction programs. Each agency also publishes its own construction documents and forms or has combined with other federal agencies to publish common documents. In Divisions 1 through 16, federal guide specifications are tailored to the specific project by the

A/E. Bidding requirements, contract forms, and conditions of the contract are later incorporated into the contract documents by the agency prior to issuance of the project for bidding. *Figure SP/FG-1* illustrates policies followed by several federal agencies in issuing such documents to A/E firms for use in construction contracts.

FEDERAL GOVERNMENT GUIDE SPECIFICATION PROGRAM

The General Services Administration (GSA) and the National Institutes of Health (NIH) have adopted a commercially available master guide specification for use on their projects. GSA uses the complete specification system with the exception of Divisions 1, 15, and 16. The master guide specifications are coordinated with *MasterFormat*. A/Es working on a GSA project should obtain the appropriate front-end documents.

Most other federal agencies involved in construction have developed master guide specifications independently to meet their own particular needs. Various groups and individuals have recommended uniform specifications development to minimize duplication of effort and to make it easier and less costly for contractors, A/Es, manufacturers, and others to do business with the federal government. These recommendations prompted the Federal Construction Council (FCC) to study the feasibility and desirability of developing uniform master guide specifications for all federal construction work. Their

Figure SP/FG-1
This Chart Illustrates the Policies Followed by Several Federal Agencies in Issuing Documents to A/E Firms for Use in Construction Contracts.

Agency Name	Bidding Requirements, Contract Forms, Conditions of the Contract			Divisions 1 - 16		
	Agency Supplies	Agency Supplements	A/E Supplies	Agency Supplies Guide Specs	Agency Approves A/E Specs	Agency Supplements A/E Specs
COE	X			X		
EPA		X			X	
Far. HA	X			X		
FAA		X		X		
FBOP	X				X	X
Fed. Hwy. Admin.			X			X
FHA	X			X		
FS	X			X		
GSA	X			*		
HUD		X			X	
NASA	X			X		
NAVFAC	X			X		
NIH		X		X		
NPS	X			X		
SCS	X				X	X
USPS	X				X	X
VA	X			X		

Acronyms for the definition of abbreviations used in this figure.

COE	Department of the Army, Corps of Engineers
EPA	Environmental Protection Agency
Far HA	Farmers Home Administration
FAA	Federal Aviation Administration
FBOP	Federal Bureau of Prisons
Fed Hwy Admin.	Federal Highway Administration
FHA	Federal Housing Authority
FS	Forest Service
GSA	General Services Administration
HUD	Department of Housing and Urban Development
NASA	National Aeronautics and Space Administration
NAVFAC	Naval Facilities Engineering Command
NIH	National Institutes of Health
NPS	National Park Service (agency of the Dept. of Interior)
SCS	Soil Conservation Service
USPS	United States Postal Service
VA	Veterans Administration

* GSA uses a commercially available master guide specification system.

1968 study concluded that complete and mandatory standardization of all agency construction specifications would not be practical or desirable. However, a high degree of uniformity could be achieved, along with most of the benefits of standardization, through a program that would generate high quality interagency master guide specifications.

Given these conclusions, the FCC initiated its Federal Construction Guide Specifications (FCGS) program in 1971. This program was aimed at making available to all federal agencies, for use on a voluntary basis, a series of master guide specifications covering the majority of work items encountered on federal construction projects. Since the advent of the Construction Criteria Base (CCB), however, the FCC no longer sponsors the program, and the FCGS documents are no longer maintained.

Construction Criteria Base

A recent development that has revolutionized the acquisition and preparation of specifications for federal government projects is the National Institute of Building Sciences (NIBS) Construction Criteria Base. The CCB grew out of a study of problems experienced in disseminating federal master guide specifications for construction. The result is an effort to organize construction criteria into an electronic database on a compact disk read-only-memory (CD-ROM) system.

The system was developed for electronic dissemination of information such as master guide specifications, technical manuals, standards, and other documents. Its objective is to put information at the user's fingertips as quickly and cost effectively as possible. Use of the CCB will improve the quality of construction, decrease overlap and conflicts that exist among criteria, speed introduction of new technology into the construction process, and improve dissemination of master guide specifications and other design and construction documents. Information on the CCB CD-ROM is updated quarterly and is easily transferred to diskette, tape, or other media.

The CCB includes master guide specifications from the Army Corps of Engineers (COE) for both civil works and construction, from the Naval Facilities Engineering Command (NAVFAC), the Veterans Administration (VA), Federal Aviation Administration, Federal Highway Administration, General Services Administration (GSA), and National Aeronautics and Space Administration (NASA). The system includes specifications processing software called SPECSINTACT. The CCB also includes handicap accessibility regulations, asbestos regulations, Federal Acquisition Regulations, OSHA standards, federal standards, and some private-sector standards.

SPECSINTACT, meaning "specifications kept intact," is an automated system created by NASA for developing construction project specifications. SPECSINTACT features include verification that references listed in the front of each section are actually cited in the document, submittal verification, generation of submittal lists, paragraph renumbering, note deletion, testing requirement report generation, page numbering options, creation of tables of contents, section reference verification, use of multiple specification sources, and on-line help at all times. Once the appropriate specifications have been located and listed, the user can access SPECSINTACT, which will process a specification section tailored to the requirements of the project. SPECSINTACT embeds notes into the body of the specification section. The software includes a feature that will delete the notes during the print process; however, the notes stay in the working file until manually deleted.

Development, improvement, and enhancement of the CCB continues. Some federal agencies may insist that the CCB be used to prepare contract documents for their projects. When this is the case, the subscription cost and necessary equipment should be considered in fee negotiations.

Obtaining Master Guide Specifications

If only hard-copy master guide specifications are available from the client agency, the A/E's request for copies should be made in the early phases of project development, and selections should be made from the most current list of section titles available from the client agency. The request for copies of master guide specifications should take place after the agency's review and approval of the preliminary design. If requested by the client agency, this first submittal could include outline specifications that were not derived from the agency master guide specifications, or only a listing of proposed specification section titles. Such a listing can serve as a basis for the request for copies of master guide specification sections. As the project design develops, it is often necessary to request additional sections.

The methods of acquiring specifications

from government agencies are varied. In the past, the only option was to obtain a hard copy of the agency specification and have it completely retyped. This is very time consuming, and should be considered during fee negotiation.

A second option for A/E firms doing occasional work for federal clients, or where the client's agency allows use of magnetic media to produce the specifications, is to acquire guide specifications on magnetic media. Guide specifications on magnetic media are usually obtained either directly from the client agency or from its service organizations. The A/E firm normally provides blank diskettes onto which the client agency transcribes the requested data. This method is practical only if the word processing software of the agency and the A/E firm are compatible. Some agency field offices make their master guide specifications available electronically using on-line access by computer modem to download to the A/E firm's computer. The A/E firm is issued a coded password to access the master guide specifications in the agency library and the transfer is done in the American Standard Code for Information Interchange (ASCII) format. This approach takes less time than receiving hard copy and ensures that the A/E is receiving the latest version of each section. However, the text must be converted from ASCII format to the A/E's word processing format, which may involve a considerable amount of time. After the conversion, additional time may be required to further adapt the material to a compatible format by deleting hidden codes within the text.

A third option may be to obtain government guide specifications through service organizations that offer Corps of Engineers Guide Specifications (CEGS), NAVFAC Guide Specifications, and GSA guide specifications on magnetic media and in hard copy form. The service is available in many word processing formats and can be obtained by subscription, with updates.

Whatever method is used, the A/E should verify that the latest update of each section is being used. The latest, and some consider the best option, is to obtain the CCB system.

USING FEDERAL GOVERNMENT MASTER GUIDE SPECIFICATIONS

Before entering into a design contract with a federal agency, the A/E should determine if the agency has master guide specifications, if their use is required, and whether copies will be provided free of charge. The time required to produce project specifications from agency guide specifications is subject to many variables. Chief among these is the A/E's degree of familiarity with the required methods of specifying products and systems within the client agency guide specifications (e.g., extensive use of reference standards and general descriptions in lieu of manufacturers' names and model numbers). The greater the differences between the client agency documents and the A/E's office master guide specification, the more time will be required. Difficulties may be compounded if the client agency master guide specifications do not conform with CSI principles and practices, and if the section numbers and titles differ considerably from the current edition of *MasterFormat*. If differences exist between the agency's specifications and *MasterFormat*, the A/E is usually expected to use the numbers and titles defined by the agency.

Editing Master Guide Specifications

The agency master guide specifications are just that — guides — and must be edited to suit each project. Guide specifications are usually written for new construction and require considerable modification for maintenance, repair, or rehabilitation projects. Where coverage is lacking, the A/E must provide the needed material in an agency-approved form. Individual guide specification sections may often be much more detailed than those to which the A/E is accustomed. For example, some Corps of Engineers Division 15 sections are over 100 pages long, and in electronic form may be issued in several subsections. If help is needed to interpret master guide specifications, most agencies will provide assistance.

A number of guidelines should be followed when editing agency master guide specifications.

- The sections should be tailored to suit the project, not simply copied in their entirety.
- Identification markings should be deleted on the "master" (such as headers or footers with the section number or revision number, and revision notations within the text of the section). If the CCB is used, the software is capable of doing this electronically.
- The sections should be edited to avoid conflicts related to products occurring in

more than one section.

- Additional information should be added as necessary.
- Paragraphs should not be selected by title alone.
- The entire section should be read and edited, not just the bracketed text.
- All required selections should be made and all blanks edited.
- Applicable requirements from the editing notes should be incorporated.
- Requirements in the editing notes should be coordinated by the A/E. If the CCB is used, the software is capable of deleting editing notes electronically.
- The references listed at the beginning of the section should be edited to include only the standards remaining within the body of the edited specification. If the CCB is used, the software is capable of doing this electronically.
- Each reference listed should indicate the current issue or revision date, unless there is a specific reason to reference an older standard, or unless the agency directs otherwise. For the proper use of reference standards, refer to the chapter "Methods of Specifying" in the "Construction Documents Fundamentals and Formats Module."
- The written instructions from the client agency should be carefully followed for page format, layout, and placement of the agency's contract number. Most agencies are very explicit concerning these details.
- All specifications should be proofread; do not depend on client-agency reviewers to find errors and discrepancies.
- The index in the front of each section should be deleted after the editing process is complete unless the agency requires otherwise. If the CCB is used, the software is capable of producing an index electronically.
- If the agency requires submittal of the marked-up section:
  - A readable copy of the "original" should be used so that it can be reproduced for the submittal.
  - Use of a highlighter on a review copy should be avoided, as some photocopy solid black.
  - Pencil should be used for additions and deletions, marked dark enough so notations will photocopy clearly. If permitted by the agency, make the insertions and deletions electronically using the "redline" and "strike-out" feature of the word processing software.

If the client agency does not have a guide specification for a required section, the A/E must prepare the section using other resources. The new section must conform to the agency standards for format and numbering, and must avoid proprietary or restrictive product requirements. The specifications should permit unlimited competition consistent with the type and quality of work. They should be prepared based on standard products and current models of equipment that meet the functional requirements of the facility.

THE REVIEW PROCESS

Depending on the agency and the size and complexity of the project, the submittal and review process can either be brief or extend over several years before a project is ready to be advertised for bids. This time frame should be clearly described in the A/E contract with the government agency.

The A/E should review submittal requirements with the agency prior to starting a new phase of the work. During the contract document phase, the agency will often want reviews at milestones of 30 percent, 50 percent, 90 percent, and final completion. Even when following a prescribed format for submittals, an A/E firm working with an agency for the first time often has a submittal totally rejected, or found inadequate, and a resubmittal is required.

The following list outlines what may be expected from the A/E at each of the construction document phase reviews.

- 30 percent review, one of the following:
  - A list of specification sections intended for use on the project. The list should be generated from a master list of section titles furnished by the client agency.
  - An outline specification identifying products to be used. Refer to the chapter "Preliminary Project Descriptions and Outline Specifications" in the "Construction Documents Fundamentals and Formats Module" for more information about outline specifications.
- 50 percent review, one of the following:
  - A pencil or electronically marked-up copy of the complete agency guide specification including specification pages that will be completely deleted.
  - A draft consisting of a pencil or electronically marked-up copy of the agency guide specifications with unnecessary pages deleted.

- A typed or printed rough draft, which may be in dot matrix form.
- 90 percent review, one of the following:
  - Resubmittal of the pencil or electronically marked-up copy of the complete guide specification including all specification pages, even though some will be completely deleted.
  - Resubmittal of the draft consisting of a pencil or electronically marked-up copy with unnecessary pages deleted.
  - Resubmittal of the typed rough draft.
  - Typed copy in final draft form.
  - One section in final form as a sample of the intended product.
- Final review:
  - Typed copy in final form.
  - If the reviewers have no comments, the project will be advertised for bids by the agency.

Review Comments

Agency reviewers often require changes to the drawings or specifications to make the documents conform to specific government criteria. The A/E should expect comments from the client-agency reviewers after each of the submittals. The A/E is expected to revise the contract documents and incorporate the review comments before the next submittal. There are several aspects of the review process.

- Each of the disciplines involves a different reviewer (e.g., architectural, structural, fire protection, plumbing, HVAC, and electrical), whose comments may result in conflicting requirements. The agency's project manager should resolve conflicting requirements among the various reviewers.
- Reviewers have particular strengths and weaknesses, even within their own area of expertise, and the A/E must diplomatically deal with suggested subjects and allow additional time for research.
- Each reviewer's comments must receive a written response, usually on a form provided by the agency.
- Time schedules for agency review, A/E response time, and subsequent resubmittals should be documented in writing.
- Normally a "compliance check" submittal is required after major changes.
- Adequate time should be allowed in the contract document schedule to make revisions directed by the reviewers.

Printing for the Review Process

Depending on the terms of the agreement between the A/E and the client agency, either the A/E or the agency may be responsible for printing and distributing review copies of the contract documents. This can be an important item of both time and expense and should be considered when negotiating an agreement.

REGIONAL VARIATIONS

Some federal agencies administer their construction programs through autonomous regional or district offices. As a result, there are often significant variations in interpretation and enforcement among the various field offices of a given agency. For example, the Corps of Engineers publishes its guide specifications from its Washington D.C. office, but the District offices often supplement and modify the specifications. Additionally, a local military facility may contract directly with a local A/E firm for projects not subject to Corps of Engineer District jurisdiction. In such cases, the local military facility may have its own version of the guide specifications, or may allow use of the A/E office master guide specification. The source of funding for a project may also dictate the procedures to be followed in executing the design contract. The A/E should be aware of possible variations in procedures.

SUMMARY

Although each federal agency has its own procedures for administering design contracts, there are some similarities among various agencies.

- The use of a five-digit numbering system based on *MasterFormat* is common to most agencies.
- The A/E is prohibited from naming manufacturers or brand names for products except in special circumstances.
- A number of agencies issue guide specifications for use by A/Es when preparing construction documents.
- A number of agencies have combined their resources to publish guide specifications in a common format (SPECSINTACT), and to distribute guide specifications quarterly on a CD-ROM called the Construction Criteria Base (CCB).
- Most agencies issue their own bidding requirements, contract forms, and conditions of the contract and require that

they be used in the project manual.

- Contract documents are subject to a review process, which can be lengthy, and may require extensive changes and several resubmittals by the A/E.

Preparing specifications for federal government construction for the first time can be an involved and confusing experience if the A/E does not know what to expect. These difficulties are usually the result of having to follow rules and procedures that are very different from similar work in the private sector. The general guidelines in this chapter will help the A/E anticipate and prepare for some of the differences likely to be encountered.

Electronic Bid Set (EBS) Manual

(Thru Attachments A and B)

Alaska District

NOTE: Some of the guidance and references provided in this manual are dated or no longer apply. The manual is undergoing a comprehensive update and this version will be replaced in the near future. Please contact the Alaska District's POC Mr. Regan Sarwas at 907-753-2632 for further guidance.

26 July 2004

I INTRODUCTION 4

II OVERVIEW OF THE PAPER BID 5
Set /Solicitation Process 5
Composition and Preparation 5
Advertisement and Announcement 5
Reproduction and Distribution 6
Amendments 6

III THE ELECTRONIC BID SET/SOLICITATION PROCESS 6
What is an Electronic Bid Set? 6
How is an EBS Made? 6
Who Makes the Electronic Bid Set? 7
What Software is Required? 8
What Hardware is Required? 8
How Do You Sign the EBS? 8
Quality Control 10
CD-ROM Implementation 10
Reproduction 11
PDFPDFPDFPDFPDFpdfpdfpdfpdfpdfPDFVIEWING THE SOLICITATION 12

APPENDIX A AK DISTRICT EN STANDARD OPERATING PROCEDURES 14
File Preparation Responsibility 14
(DWGS).CAL File Conversion via Autocad 2000 14
(DWGS).CAL File Conversion via Ghostscript 14
(DWGS).CAL File Conversion via Scanner 16
(Bidnumber).txt Files 16
(Bidnumber).MaxFR Files 17
Indexi.txt File 17
Dwginfo.txt File 18
Specifications Files 18
(Specifications).tif conversion from Hardcopy 19
(Specifications).tif conversion to PDF 19
(Specifications).sec/doc Conversion to PDF via Adobe Writer 19
(Specifications).PDF Attachment Files 20
(Specifications).pdf Fit to View on Open 20
(Specifications).pdf Haziness Fix 20
Specs.txt File 21
In-House Signature Requirements 23
AE Signature Requirements 27
Engineering EBS Work Completion 30
Amendments 30
File Naming Convention 36
File Storage, Original Solicitation 36
File Storage, Amendments 37
File Storage, Templates 37
Advance Cal File Viewing 37
Printing CAL Files 37

APPENDIX B AK DISTRICT EN-TE STANDARD OPERATING PROCEDURES 39

Designation of Duties 39
File Preparation Responsibilities 39
File Storage, TE EBS Administrator Working Area, Original Solicitation 39
File Storage, TE EBS Administrator Working Area, Amendment 39
Design Authentication 39
Charrette, PD, or 35% Design Stage 42
95% Review Stage, In-House Designs 42
100% Review Stage, In-House Designs 42
Design Complete Stage, In-House Designs 43
95% Review Stage, AE Designs 44
100% Review Stage, AE Designs 44
Design Complete Stage, AE Designs 45
AE Firm EBS Information Sheet 45

I Introduction

The standard process involves the placing of an announcement in the Federal Business Opportunities (FedBizOpps), and sending pre-solicitation notices to potential bidders. If interested, potential bidders notify the contracting office of their interest in receiving a copy of the plans, specifications and contract documents.

The Electronic Bid Sets project changes the standard process by which the government solicits contractor bids for construction projects.

The use of EBS improves the process from the use of paper documents into one which prospective bidders may view project plans, specifications and contract documents electronically via the Internet and CD-ROM technology.

The Electronic Bid Sets (EBS) project consists of a standard for delivery and distribution of electronic solicitation. A procedure and methodology were developed which include an announcement that points potential bidders to an Internet address where they may view project plans, specifications, and contract documents and if interested, request a CD containing those files. In order to view the solicitation documents, bidders need only have a Windows-based personal computer with a CD-ROM drive and Internet access. Two royalty-free viewers are included on the CD-ROM to enable users to utilize the documents and also can be accessed via the Internet. One viewer enables bidders to view and utilize all text-based documents (specifications and contract clauses) and the other viewer is used for graphic documents (drawings). A simple icon based menu was developed to assist the user in manipulating through the documents and software.

II Overview of the Paper Bid

Set /Solicitation Process

For the sake of this report, the contracting process has been categorized into five areas of consideration.

- Composition and Preparation
- Advertisement and Announcement
- Reproduction and Distribution
- Amendments
- Submittal and Award

Composition and Preparation

The composition of a contract bid document can be divided into two sections, bidding requirements and contract requirements.
The contracting office prepares bidding requirements. Bidding requirements include all the necessary instructions and forms pertaining to how a bid is submitted, what is required for bid submittal, and when a bid must be received.

Contract requirements involve the preparation of contract clauses, specifications and plans. The contracting office is responsible for preparing all contract clauses while specifications are prepared by one or several departments involved in supporting the product or service desired. A specification includes all text, drawings and sketches necessary to convey what is needed and required of the contractor.

Within the Alaska District, preparation of a contract bid document can involve use of various types of software such as word processors, spreadsheets, CADD packages, forms programs and specification programs. Within each type of software exist various software applications and software versions. The most common software applications used within the Alaska District are as follows:

Word Processor:	Word for Windows
Spreadsheet:	Excel
CADD:	Autocad
Forms:	Formflow
Specifications:	SpecsIntact, SAACONS

Although most of the applications used by the Alaska District are commercial off the shelf (COTS) applications, numerous programs have been created and developed at government expense. These programs are designed to accomplish a specific need or task that cannot be performed by COTS software. Longevity and changes to the program depend primarily upon agency funding and support.

Advertisement and Announcement

Contracting offices advertise and announce contract bids through the Federal Business Opportunities (FedBizOpps), the posting of bulletins and the mailing of flyers. Bulletins are posted in local bid rooms and contracting offices while flyers are mailed to prospective bidders identified

within a database maintained by the contracting office. In some instances, agencies with gateways to the Internet are posting contract announcements on the World Wide Web.

Reproduction and Distribution

The Defense Printing Service (DPS) is responsible for reproducing contract bid documents throughout DoD. Contracting offices submit to DPS an original contract bid document and a request for reproduction. The number of reproductions required is estimated by contracting personnel and varies. An average construction contract bid document may require 25-150 copies. The contracting office pays costs for reproduction services.

Contracting offices distribute contract bid documents. Contractors can either pick-up or receive contract bid documents through the mail. Costs for mailing are paid for by the contracting office. In some instances, a contractor may be charged a reproduction fee for requesting full size or half size engineering drawings.

Alaska District currently contracts with private companies for reproduction of bid sets. In the near future, bid sets will be sent to the Defense Printing Service in Anchorage.

Amendments

Changes to a contract bid document occur frequently. If modifications to a contract bid document occur before bids are submitted, the contracting office is required to notify all prospective bidders of the necessary changes. To keep track of bidders, contractors requesting a copy of a contract bid document must register with the contracting office.

At the Alaska District, once a project is awarded, any narrative amendments are incorporated into the drawings and specifications. The awarded documents are then sent out for reproduction and distributed to various Alaska District offices. The Contractor is furnished with a reproducible paper copy of the contract drawings and specifications. CDROM electronic copies of the awarded contract drawings are distributed to various offices, including Construction Division, who furnishes a copy to the Contractor for his use in preparing As-built Drawings. Although EBS will do away with the need to mass reproduce bid sets for bidders, the Alaska District for reference and contract administration purposes will require a small number of paper sets.

III The Electronic Bid Set/Solicitation Process

What is an Electronic Bid Set?

An electronic bid set (EBS) is a group of electronic files. These files consist of all the documents contained in a paper bid set. Instead of giving potential bidders a paper copy of a master bid set, they are given electronic files that contain the same documents. These files are combined with viewing software to make an EBS package that can be easily viewed and printed. The EBS is distributed to potential bidders via CD-ROM and via the Alaska District Contracting Division homepage on the Internet. Using EBS, the Corps of Engineers reduces bid set reproduction costs, the reproduction time, and eventually will make receipt of bid documents almost instantaneous through the Internet.

How is an EBS Made?

All documents, forms, and drawings used in the electronic bid set must be in an electronic file format. The electronic files must be either an Adobe Acrobat Portable Data Format (PDF) or a MaxView Continuous Acquisition Life support (CAL) type. Documents electronically created in other than PDF or CAL format must be converted. Paper documents must be scanned into electronic format and converted to either PDF or CAL electronic format, depending on the type of

documents (drawings or narratives). Listed below are the software applications normally used in the preparation of a bid set. The electronic file type required for the EBS is shown in parenthesis.

Word Processor:	MS Word (PDF)
Spreadsheet:	MS Excel (PDF)
CADD:	AutoCAD (CAL)
Forms:	FormFlow (PDF)
Specifications:	SpecsIntact, SAACONS (PDF)
Scans:	Varies, (TIF, PDF or CAL, as applicable)
Operating System:	Windows 2000, Windows XP Pro.

Once converted to PDF or CAL, Adobe Acrobat or MaxView software is used to create PDF and CAL indexes that can be used to jump to the desired document. The files are then joined to the Contract Viewer (CON.EXE) software, which provides a tool bar to view the document indexes. Acrobat PDF file reader and MaxView CAL reader software are also provided so the actual document can be viewed. All of these software files are then written onto a CD-ROM to create the master EBS. The master is used to create CD-ROM copies for distribution to prospective bidders, is placed on the District LAN system for viewing within the District, and is loaded onto the Alaska District WEB Server for document download via the Internet.

Who Makes the Electronic Bid Set?

Since the conversion to PDF files must be performed via commercial software, it is not economically feasible to furnish everyone associated with a bid set a license to convert. At present, the CAL conversion can be accomplished with freeware, and also with an Autocad 2000 CAL driver. Indexing of the CAL files, though requires commercial software.

Alaska District has a government furnished Abode Acrobat package, licensed for 16 individual (as opposed to concurrent) users. There are two MaxView Author packages presently in the District, which were purchased for the purpose of implementing EBS (more licenses will be purchased as needed to implement EBS).

It is recommended that the drawing originators, since there is no commercial software to produce perform conversion of Autocad drawings to CAL files, and since the originator is responsible for the drawing content. Since indexing of the CAL files and conversion of text documents to PDF requires commercial software, it is recommended that an Engineering EBS Administrator, at branch level, be used to complete these tasks. Having a Branch EBS Administrator at branch level allows branches to establish their own Standard Operating Procedures (SOP), which can be tailored to fit their needs. For A-E projects, it will be left to the branch's discretion whether the A-E will be tasked with a part, or all, of EBS preparation. Similarly, it will be a branch decision as to whether the Branch EBS Administrator actually does the conversion and indexing, or monitors the conversion and indexing performed by others.

The Branch EBS administrator would also be responsible for PDF conversion and indexing for text files originating in the branch. It will be a branch decision whether the Administrator actually performs the conversion and indexing, or just acts as a quality control point.

It is the responsibility of the Branch EBS Administrator to provide Contracting Division properly converted and indexed PDF and CAL packages.

A Contracting Division EBS Administrator is responsible for converting Contracting's PDFfiles to PDF and upgrading the PDF index furnished by the branch administrator to include files originating in Contracting Division. The Contracting EBS Administrator is also responsible for preparing the contract file (.CON), adding the Adobe (PDF) and MaxView (CAL) viewers, and producing the master CD-ROM and CD-ROM copies. Whether the Administrator performs the actual work or monitors the work by others would be at Contracting Division's discretion.

What Software is Required?

EBS Files

Adobe Acrobat Exchange is required to convert text files to PDF, merge multiple files into one file, and to create an index file.

Autocad 2000 is required to convert image/CAD files to CAL.

Ghostscript, freeware available from MaxView, is required to convert Autocad files to CAL when the Autcad file contains true type fonts or screening.

MaxView Author is required to create the CAL file index.

Contract Viewer is required to provide bidders a single tool bar where file indexes can be accessed.

Adobe Acroread Reader is required to provide bidders with the capability of viewing PDF files.

MaxView Reader is required to provide bidders with the capability of viewing indexed CAL files.

CD-ROM

CD-ROM writer software is required for making the master CD-ROM, and for making CD-ROM copies of the master.

Internet

Windows NT 4.0 Server

Web Server software that supports Secure Sockets Layer, and Cold Fusion Professional.

Cold Fusion Professional

What Hardware is Required?

EBS FILES

A Pentium III or newer PC is required for timely CAD to CAL and text to PDF conversion, with 256MB RAM, a 20 GB hard drive for file storage, 10/100 Ethernet card, and a CD-R. Quality scanners are required for text documents and full size (E) drawings for conversion from hard copy, with a document feeder for 8.5x11 documents.

Internet

Pentium III or newer PC with 256 MB RAM, a 20 GB hard drive for file storage, 10/100 Ethernet card, and a CD-R, CDR-RW.

How Do You Sign the EBS?

In the paper bid set, there are drawings and forms that presently require signatures. For Military Invitation For Bid projects, each Technical Engineering section chief signs the first drawing of that design discipline. For English projects the Branch Chief, Division Chief, and the District Commander sign the Location and Vicinity Map. They sign the Title sheet for metric projects. Typically, those who sign the Loc/Vic or Title sheet see only the drawing they are signing.

A different method of signing these documents is required with EBS. The new method should be a paperless as possible.

It is recommended that an 8x11 hardcopy be routed to obtain the signatures of the Branch, Division, and Colonel's signatures. This page can be scanned and added to the bid set. Since the Colonel's and Division's signatures are based upon the presence of the Branch signature, it will be left to the Branch chief to determine what will be required to document submittal at the section level. The method chosen should agree with the applicable Quality Management Plan for design and review certification. The EBS process should not proceed until the project has all of the required signatures.

Professional Engineer seals, typically required to be stamped on the drawings, present a problem for EBS. The State of Alaska, at this time, does not have a policy regarding the use of electronic files or electronic seals. Two AE's were asked about their policy regarding electronic stamps. Both stated that when issuing electronic files, they did not include electronic replicas of their seal. One AE placed a note on the electronic file stating the record document was on file in their office. The AE's clearly stated that they did not want to provide electronic stamps for their electronic files. With that in mind, it is recommended that for AE projects, the AE should be required to submit their final electronic files that will be used for the EBS on CD, and that they submit an 8x11 hardcopy form stating that they are in effect sealing the CD. There should be a means of clearly identifying CD as being the one submitted by the AE.

PDFPDFPDFPDFContracting Division:

Prepares all necessary clauses and notifies Chief that all clauses are ready for conversion

Receives any e-mail required for signature of forms

Stores e-mail signatures either electronically or as hardcopy in the permanent file for the solicitation/contract.

Administrator, working in coordination with Branch Chief, copies files into proper EBS Administrator directory and e-mails Contracting EBS Administrator that files are ready for conversion.

Contracting EBS Administrator (or designated representative)

Stores files 'complete e-mail' messages received

When all e-mails are received, Administrator locks "proper EBS directory" to prevent file alteration.

In the "proper EBS directory", converts all document/text files to PDF (See "File Conversion" below)

Moves converted files into "Current" directory

Completes PDF index (See "PDF Conversion" below)

Prepares Summary PDF files

Prepares CON files

Installs files on CDROM

Completes CDROM labeling

Signs label

Performs quality check

Makes multiple copies.

Distribute to contractors, plan centers and in-house

Update Web page appropriately

Quality Control

It is critical that every file prepared for the EBS package, and every program used for creating and viewing the EBS package, be checked for errors or malfunctions before the EBS is made available to the public. The drawing and specification files must view at the right scale. Files must be in the proper order. Indexes used to jump to view a particular document must operate correctly. Drawing CAL files must display the same size, line weights and fonts as the original drawing. Each EBS (CD-ROM, Internet, and current directory sets) must be tested.

CD-ROM Implementation

The accepted media for distributing electronic plans and specifications to contractors is the compact disk-read only memory (CD-ROM). CD-ROM's provide contractors with a physical electronic reproduction of a solicitation and eliminates the need for paper.
Standardizing the look and feel of CD-ROM solicitations will minimize contractor confusion and enhance the use of CD-ROM technology. The following standards and guidelines are recommended for CD-ROM implementation and should be incorporated with agency standards. Agencies within the Department of Defense should review MIL-HDBK-9660 "DOD-Produced CD-ROM Products" dated 1 December 1995 for further guidance.

Standard Format

International Standard Organization (ISO) 9660 is the de facto standard for formatting CD-ROM. This universal standard can be read and interpreted by Macintosh, PC, UNIX, and VAX operating systems. The recommended CD-ROM for standard data storage is the 74-minute or 650 MB CD-ROM.

Volume File Structure

The volume of a CD-ROM should be used to describe the CD-ROM content. ISO 9660 Volume Identifier allows a maximum of 32 characters.
Directory and files placed on the CD-ROM must also conform to ISO 9660 file naming conventions. Directory structures should consist of a maximum of eight-characters. File structures should consist of an eight-character filename and a three-character or less file extension separated by the '.' character. Characters used in ISO 9660 file naming conventions are limited to 'A' to 'Z', '0' to '9', and '_' (called the 'ASCII' character set).

Volume Naming Convention

Volume names are used to describe the contents of the CD-ROM. Although users rarely use volume identifiers, its function will surely benefit organization of future computerized archiving and data retrieval systems. For solicitations, the recommended volume identifier should be the contract solicitation number. A short version of the solicitation number can be used, such as A98B0008:

A - designates either military or civil funding
98 - the fiscal year
B - the type of solicitation (can be B for bid or R for request for proposal)

0008 - sequence number

Reproduction

Stamping Method

The stamping method is designed for mass reproduction and is typically performed through CD manufacturing centers. It requires preparation and organization of data files to reflect how data will look on the CD. Whenever possible, create a test CD using the writing method (which will be discussed next) to ensure proper organization, format and quality control. Once a test CD is approved for mastering, it can be sent to a CD manufacturing center where the test CD is used to create a glass master. CD replication is performed by using the glass master to "stamp out" copies of the master CD and packaged in a variety of containers. The average turnaround time for stamping CD's is 5-7 working days while the average costs associated in stamping CDs is broken into components as follows:

Glass Master ($400-$1,000)
CD-ROM + Silkscreen or Label ($1.10 - $1.75/CD)
Packaging ($0.05 - $0.25)

Problems associated with stamping CDs include quality control during data preparation, dust or airborne particles during the "stamping" process and delays in delivery orders. In the data preparation stage, file or data corruption can occur when data is transferred to the CD manufacturer or during the creation of the glass master. During the "stamping" process, dust and airborne particles can be sealed or trapped within layers of plastic resulting in read errors. And finally, the shipment and delivery of CDs depend upon production cycles and production backlogs of CD manufacturers.

Writing Method

The writing method is becoming the most popular way to reproduce CDs. It is ideal for small batch reproduction and can be generated in-house with minimal hardware and software investment. The process of writing a CD involves purchasing a CD-Recordable (CD-R) writer and blank CD-R discs. The CD-R writer uses a laser beam, which reacts to an organic dye coated on the blank CD-R disc. As the laser beam hits the dye, the equivalent of pits is created which CD-ROM readers can interpret. The quality of CD-R discs should conform to the Orange Book standard, which is functionally equivalent to CD-ROM quality. The time it takes to write a CD-R depends upon the CD-R writing speed and the amount of data transferred. Costs associated with writing CD-R is as follows:

CD-R Writer ($500 - $2,000)
CD-R Disc ($7 - $12)

Although the error rate of a CD-R is lower than the error rate of a CD-ROM, problems during the writing of a CD-R will result in an unusable CD-R disc. These problems, which can affect writing CD-R discs, include CD-R dye quality, interruptions to the writing process, hard disk speed, fragmentation, calibration and recording speed.

Dye formulas are proprietary and licensed by manufacturers and can vary between brands.

During the writing process data is streamed to the CD-R writer at a constant rate. Any interruptions to this transfer caused by terminate and stay resident (TSR) applications, slow hard disk access speeds, the searching of files on fragmented hard disks and intermittent hard disk calibrations can affect the writing process and render the CD-R disc useless.

There are many CD-R writers on the market with the capacity to record at two, four and even six times the standard writing/playback speed of 150 kilobytes per second. Although higher writing speeds translates to shorter recording time, the risk of error also increases. Much of the errors associated with recording at higher speeds are a result of problems mentioned above in the writing process.

Fortunately, tests on the quality of dyes have shown that dye formulas are resulting in acceptable media and becoming less of a factor. To alleviate the chances of interruptions during the CD-R writing process due to your PC, higher quality CD-R writers include a separate hard disk used to temporarily store unfragmented data before writing to the CD.

Silkscreening and Labeling

Since a CD-ROM is only read on one side of the disc, the other side is generally used for silk screening or labeling. Silk screens or labels can be applied on the CD after the "stamping" process or performed in-house using a CD labeler. The quality and cost for silk screens and labels depend upon number of colors used and quality of the CD labeler. The silkscreen or label format should comply with DOD MIL-HDBK-9660 "DOD-Produced CD-ROM Products" dated 1 December 1995 as much as possible.

Packaging and Mailing

The distribution of plans and specifications on CD-ROM require packaging and mailing. Based on the two reproduction methods stated above, packaging can consist of the following:

If plans and specifications are sent to a CD manufacturer, the manufacturer will typically provide customers with several packaging options. A customer can request CD's to be placed in either jewel case or cardboard mailers (with or without Tyvek sleeves). The recommended method of packing is the cardboard mailer with Tyvek sleeves. Use of the cardboard mailer eliminates further packaging saving time and money. The expected costs associated with these packaging options are as follows:

Jewel Case $0.25 ea.
Cardboard Mailers $0.16 ea.
Tyvek Sleeves $0.03 ea.

If plans and specifications are to be written in-house using a CD-R writer, CD-R recordables are generally purchased with jewel cases. Therefore, the recommended practice would be to package CD-R jewel cases into cardboard mailers.

PDFPDFPDFPDFPDFpdfpdfpdfpdfPDFVIEWING THE SOLICITATION

CD ROM

The CD-ROM contains both Adobe Acrobat and MaxView. In order to properly view the CD-ROM, you will need to follow the instruction listed in the README.TXT file on the CD ROM itself.

Open MS Word and access the CD-ROM drive.
Double click on the README.TXT file.
Print the file and follow the instructions.

The instructions tell you to double click on the Contract.exe button.
After you click on the Contract.exe button, a message window will appear with information about the bid opening date.

A toolbar will pop up on the screen.

Look at the button bar. From Left to Right, the buttons are:

Open Contract
Close Contract
Contract Forms & Clauses
Specifications
Drawings
Amendments
Help
Exit

Practice moving through the options to become familiar with the program.

Viewing a Solicitation through the local area network

This can only be done if an icon has been created on the computer.
The icon will be stored either on the desktop or under Start, Programs, Contract, Contract Viewer.
Click on the Contract Viewer Icon. The Contract Button Bar discussed above will appear on the screen. The difference between this and the CD-ROM is that the Contract Viewer on the CD automatically opens the solicitation that you want to view. You will have to specify the solicitation that you want to look at. Click on the Open Contract button of the bar. You will see several solicitations in the window to your right. Double click on the solicitation that you want to view. After you double click on your solicitation, you will notice that a solicitation file with the extension .con shows up on the left side of the window. Double click on the solicitation .con file. From this point forward, it is pretty much the same as the instructions for the CD above.

Netscape

To view the solicitation on the Internet, you will have to properly set up the two programs in your Netscape program as Helper Applications.

Enter Netscape
Select Options
Select General Preferences
Select Helpers
Select Create New Type
Type Graphical Viewer for Mime Type:
Type Adobe Acrobat for Mime Sub type:
Click OK
Enter pdf for the file extension.
Click on Launch the Application
Click on Browse
Find the Acroread directory on your c:\ drive, or the directory in which you downloaded the Acrobat Reader if you do not already have Adobe Acrobat Exchange installed on your computer.
Double Click on the Directory.
Click on the Acroexch.exe file or Acroread.exe file, whichever applies.
Click OK
Your Browser is now associated with Adobe Acrobat.
Do the same thing with MaxView.
You may have to download MaxView.
The Web Page for Electronic Solicitations gives good directions for this.

APPENDIX A AK District EN Standard Operating Procedures

File Preparation Responsibility

The following is a list of files used in an EBS for which Engineering has responsibility.
Drawing related files consist of:

(dwgs).cal	(provided to the Branch EBS Administrator by EN)
(bidnumber).txt	(provided to the Branch EBS Administrator by EN)
(bidnumber).MaxFR	(prepared by the Branch EBS Administrator for CT)
indexi.MaxFR	(prepared by the Branch EBS Administrator for CT)
dwginfo.txt	(provided to the Branch EBS Administrator by EN)

Specification related files consist of:

(specifications).sec	(provided to the Branch EBS Administrator by EN)
(specifications).doc	(provided to the Branch EBS Administrator by EN)
(specifications).tif	(provided to the Branch EBS Administrator by EN)
(specifications).pdf	(prepared by the Branch EBS Administrator for CT)
specs.txt	(prepared by the Branch EBS Administrator for CT)

All files shall meet the requirements of this appendix. Files that are found not to conform shall be returned to the originator for correction.

(DWGS).CAL File Conversion via Autocad 2000

Using the Autocad plot command performs conversion from Autocad 2000 drawing file to CAL. A plotter must be configured using the CALS Raster ADI 4.3 Printer Driver (version 1.01) by Autodesk. This driver can be used to convert Vector drawings into Raster images, or for black & white / Grayscale plotting to devices that support CALS Type 1 with CCITT Group 4 compression. (Most OCE, ENCAD, JDL and CALCOMP plotters support this format.) It includes README.TXT for installation instructions and other features. **Note: At this time, this method is not compatible with drawings using true type fonts or screening.**

Configure the plot as follows:
Set raster resolution to 300 dpi
Rotate raster output 0 degrees
Do trim raster output to fit plot
Do not remove hidden lines

Set pen table to obtain the desired line thickness, consistent with District and Tri-services drafting standards.

Size units to inches or millimeters, as applicable
Set plotting size to match full size drawing border dimensions:
Set plotting size to User, 841,594 for metric (verify)
Set plotting size to User, 42,30 for military English (verify)
Set plotting size to User, 42,30 for civil works English (verify)
Set scale as appropriate:
(Most drawings can be drawn so that the drawing can be plotted to "extents" or "limits" scale set to "fit". If plotting is by "window" or "display", be sure to use the Autocad "intersection of" function in defining the window, so border size matches plotting size exactly.

(DWGS).CAL File Conversion via Ghostscript

Ghostscript is a freeware product of MaxView that converts PostScript files to CAL. When drawings contain true type fonts or screened colors, Ghostscript must be used.

Configure a postscript plotter in Autocad 2000 as follows:

Select plotter 13, PostScript device ADI 4.3-by Autodesk, Inc
Select 300 dpi
Select color output
Do not append control z
Do not append control d
Select plot optimization level 1

Set all colors to be solid line to pen 7
Set lightest screen (magenta color 6 per Corps standard) to pen 2
Set next darkest screen (white color 7 per Corps standard) to pen 61
Set darkest screen (gray color 8 per Corps standard) to pen 9
(Pen 2 is may be too light for hardcopy full size, while pen 9 may be too dark for hardcopy half size, as screening is proportional to drawing size. It is recommended that pen 61 be used for all screening.)

Set thinnest line width (Blue color 5 per Corps standard) to .005
Set next thinnest line width (red color 1 per Corps standard), that used for regular size text, to .009
Set next thinnest line width (yellow color 2 per Corps standard) to .013
Set next thinnest line width (green color 3 per Corps standard) to .022
Set next thinnest line width (cyan color 4 per Corps standard) to .037
Set all other pen line widths to .014

Write plot to a file

Set units to inches or millimeters, as applicable
Set plotting size to match full size drawing border dimensions:
Set plotting size to User, 841,594 for metric (verify)
Set plotting size to User, 42,30 for military English (verify)
Set plotting size to User, 40,28 for civil works English (verify)
Set scale as appropriate:
(Most drawings can be drawn so that the drawing can be plotted to "extents" or "limits" scale set to "fit". If plotting is by "window" or "display", be sure to use the Autocad "intersection of" function in defining the window, so border size matches plotting size exactly.

Rotate plot to 0 degrees
Don't adjust area for pen width
Don't remove hidden lines

After plotting drawings to PostScript:
Run GhostScript GSM.exe
Click "GO"
Select input and output directories
Set resolution to 300 dpi
Set width and height to fit full size border dimensions
(It seems that a border line may be lost if the plotting size is set to match the full size border dimensions. To prevent border line loss, size to 34,24 for metric, to 43,31 for military English, and to 41,29 for civil works English) (verify border dimensions)

Do not set Portrait or Landscape, as they don't work with width and height designated
Do not select presets
Click "Add Files"
Set filter to "All Files"
Select desired .EPS files and click OK
Click OK.
Display window disappears when plot to CAL is complete.

(DWGS).CAL File Conversion via Scanner

Hardcopy drawings such as mylars (typically included into bids as exhibit drawings) shall be scanned into a 300dpi image that can be imported into an Autocad 2000 drawing. The image can then be plotted to an electronic CAL file. Conversion into CAL will be as described above. Presently, the map vault is the only in-house source for full size scanning. Refer to map vault personnel for scanning assistance. Uncompressed TIFF file scanning is known to be compatible with Autocad 2000 and is available via the map vault scanner. A new plotter with scanning capabilities is expected to be available by September 1998.

(Bidnumber).txt Files

The (bidnumber).txt file is used by the Branch EBS Administrator and Contracting Division. Refer to the applicable Appendix for file storage requirements. Save as a text file named similar to"A97B0008.txt". A typical (bidnumber).txt file is shown below. As one can see, the first column is the CAL plot file name, the second is the sheet number, the third is the reference number, and the fourth is the drawing title.

The use of upper and lower case text shall be as shown.
Items shall be arranged as columns, with one space separation between columns.
Font shall be New Courier 10.
The drawing reference number shall be used as the file name. Reference numbers shall be in accordance to District Drafting Standards.
Sequence of disciplines shall be as shown.
Sheet numbers shall match the drawing sheet number.
Title shall match the drawing title.

Note: This is how the file should look.

```
g01.cal  Sht 00  G-0   COVER SHEET
g02.cal  Sht 00  G-0   INDEX SHEET
lv1.cal  Sht 1   LV-1  LOCATION AND VICINITY MAP
d01.cal  Sht 1   D-1   DEMOLITION
dc1.cal  Sht 11  DC-1  DEMOLITION-CIVIL
da1.cal  Sht 21  DA-1  DEMOLITION-ARCHITECTURAL
ds1.cal  Sht 31  DS-1  DEMOLITION-STRUCTURAL
dm1.cal  Sht 41  DM-1  DEMOLITION-MECHANICAL
de1.cal  Sht 51  DE-1  DEMOLITION-ELECTRICAL
ha1.cal  Sht 61  HA-1  HAZARD ABATEMENT
c01.cal  Sht 71  C-1   CIVIL
a01.cal  Sht 111 A-1   ARCHITECTURAL
s01.cal  Sht 211 S-1   STRUCTURAL
m01.cal  Sht 311 M-1   MECHANICAL
fp1.cal  Sht 411 FP-1  FIRE PROTECTION
cp1.cal  Sht 421 CP-1  CATHODIC PROTECTION
e01.cal  Sht 431 E-1   ELECTRICAL
exa.cal  Sht 00  EX-0  EXHIBIT DRAWING A
exb.cal  Sht 00  EX-0  EXHIBIT DRAWING B
exc.cal  Sht 00  EX-0  EXHIBIT DRAWING C
```

When a drawing reference numbering system such as A1.234 is used, the (bidnumber).txt file would appear as:

```
a1234.cal  Sht 111 A1.234  ARCHITECTURAL
```

To simplify the creation of the (bidnumber).txt files, files shall be standardized. The file may be created in MaxView Author, but is not an efficient method. File content shall be as required by the Branch EBS Administrator. The (bidnumber).txt file can be made several ways. To keep key stroke errors to a minimum**, the use of a template is highly recommended**. An Excel spreadsheet (template.xls) is available for use as a template for editing the file contents. After editing the spreadsheet, "Save As" as a space delimited .PRN file. This will retain columns as shown above. Rename the file from a .PRN to a .TXT file and open the file in Wordpad to ensure the file views properly.

Alternatively, within CEPOA-EN a Network File Manager program is used to store Autocad drawings. This program has the capability of creating index files based on the library cards that are created for each drawing in the file manager. Drawing borders are available for Metric and English military projects that incorporate attributes compatible with the network file manager library card system. When these borders are "signed in" to the network file manager, the library card will be automatically updated. As long as the proper border is used, and the title block correctly filled out, the network file manager will create the library card for each drawing. The library card based index file can be pulled for use as the CAL index file. This method, which eliminates the duplication of effort between the Autocad drawing originator and the index file originator, should totally eliminate title block/index discrepancies.

(Bidnumber).MaxFR Files

The Branch EBS Administrator uses the (bidnumber).txt file to make the MaxView CAL (bidnumber).MaxFR file, which is required to view the CAL files.

To create the (bidnumber).MaxFR file:
Open the (bidnumber).txt file in worpad
Enter "SVDOC;VER3.20 (Project Name, Project Location)" as the first line in the list
(Note "VER3.20" is the MaxView version being used. Verify verbage if using a newer version. Also note that project name and title must not exceed 30 characters, including spaces)
Enter ";ENDOFBLOCK" as the last line in the list
Saveas (bidnumber).MaxFR, as opposed to .txt, selecting the text document option when prompted, and exit Wordpad.

Now the file must be converted to MaxView "Sendable":
Run MaxView Author.
Under File, select open.
Browse to the location of the (bidnumber).MaxFR created with the Wordpad, and select (bidnumber).MaxFR.
Click OK (The first CAL file listed in the index should appear on screen).
Under "Author", select "edit Document info".
Select "Sendable".
Click "OK".
Under File, select Save.
Exit MaxView Author.

Indexi.txt File

The third index file to create is the file used for using MaxView Author on the Contracting Division Solicitation Home Page:
Run a wordprocessor such as wordpad.
Enter "svdpt http://ebs.poa.usace.army.mil/a97b0008/(bidnumber).MaxFR" (bidnumber a97b0008 is used as a typical example).
"Save As" the document as a txt file named "indexi.MaxFR" in the directory that holds the CAL files.
Exit the word processor.

Dwginfo.txt File

The following is an example of a Dwginfo.txt file for an English size border. Adjust border dimensions to fit drawing border used.

```
*****************************************************************
*            Drawing File/Sheet Information                 *
*****************************************************************

1. Drawing sheets have 42" X 30" border sheets.
A full size print should print at 42" X 30"

2. The .cal drawing files provided on this CD are
300 dots per inch (dpi), CALS Group 4 raster files.

3. See the svread.txt for tips on using MaxView reader or the
help menu provided in MaxView reader.
```

Specifications Files

The Branch EBS Administrator will convert engineering originated specifications to PDF. Original file types for non-CEGS specifications shall be in a format that is compatible with Acrobat Exchange for conversion to PDF format. Original file types for CEGS specification files shall be in Specsintact format. All original documents routinely used for solicitations shall be in electronic form. Scanning hardcopy into electronic for use in an EBS shall be kept to an absolute minimum. When scanning is required, it shall be 300dpi, and shall be black and white to minimize file size.

Table of contents for individual technical specifications sections shall be part of the same file as the specification itself. The latest version of Specsintact contains the option for incorporating the table of contents into the specification file.

The Branch EBS Administrator shall import attachments and other files such as the REGISTER.PDF into the applicable specification.pdf file. Specsintact creates the REGISTER.PDF file when the Branch EBS Administrator prints to PDF. Each Branch shall establish a standard specifying where this file is to be placed in the specifications.

Original file names shall match those listed below, but shall have the appropriate file suffix, based on the original file format (.doc, .sec, or .tif). Files shall use the file names listed below.

Military and civil Works Invitations For Bid:
Cover.doc Cover Sheet
DA.pdf Design Authentication
BS.doc Bid Schedule
Scr.doc Special Clauses
Tstoc.sec Technical Specifications Table of Contents
01015.sec Technical Specification (section 01015 as example)
01015A1.doc First Appendix to Specification 01015
01015A2.tif Second Appendix to Specification 01015
01015p6.doc File to be inserted so that it begins on page 6 of 01015
REGISTER.pdf Submittal Register (made by Specsintact when printing to PDF)

Military Request for Proposal:
PS.doc

Military Small Business 8A:

Civil Works Request for Proposal:

Civil Works Small Business 8A:

(Specifications).tif conversion from Hardcopy

When specifications are available in hardcopy only, they must be scanned to an electronic file. The resultant file must be in TIF or PDF format. There are many scanners and scanner software available that can accomplish this task.

When scanning, be sure that the scanner and scanner software is set to 8.5x11, 300 dpi, black and white. If other settings are used, the scanned file may not print properly, or may result in an extremely large file size.

(Specifications).tif conversion to PDF

Conversion to PDF is via the Acrobat Exchange program. Typically, the scanned document is to be an appendix to a specifications section.
Open the specifications file to which the image is to be attached.
Click File
Click Insert
Click Image
Set Files to All
Browse to the desired tif file
Select tif file
Click OK
Click Append to Current Document

The tif has now been converted to pdf and attached to the end of the specifications .pdf file.

When the tif file is to be inserted at a point other than at the end of the .pdf file, select "Create New Document" instead of "Append to Current Document" to convert the .tif to a separate pdf file, and then use the "Insert Pages" command to insert the new file into the appropriate spot in the specifications file.

(Specifications).sec/doc Conversion to PDF via Adobe Writer

Conversion to pdf is accomplished by creating a system Acrobat PDF writer printer. The printer should have the following setting:
No separator files
Print to lpt1 (printer port)
Acrobat PDF writer driver
Standard Letter Size
Portrait
300dpi
100% scale
Compress text and line art
Acrobat 2.1 compatibility
Downsample Images
Compress color images with JPEG medium
Compress monochrome images using ccitt group 4

Convert files to PDF via the print function in the word processor or Specsintact as applicable. Remember to keep the table of contents for individual specifications sections as part of the specification file.

Once converted, ensure all PDF files are located in the correct sub-directory. Using Adobe Exchange, open each file to correct any erroneous file names and to set "document info" to “fit to view”, thus ensuring that when opened, the document is magnified a much as possible.

(Specifications).PDF Attachment Files

Run Acrobat Exchange
Under File, click Open.
Browse to the desired specification file, and highlight.
Click Open.
Under Document, select Insert Pages.
Browse to the attachment file to be inserted, and highlight.
Click Select.
Click Before of After as applicable.
Click First, Last, or enter page number as applicable.
(Select After and Last to insert attachment after the last page of the specification file).
Click OK to insert attachment.

(Specifications).pdf Fit to View on Open

Run Acrobat Exchange.
Under File, click Open.
Browse to the directory containing the specifications, and highlight the first pdf file.
Click Open.
Under file, scroll to Document Info, and click Open.
Set Initial View to Page Only.
Set magnification to fit visible.
Set page layout to default.
Do not select any window options.
Do not select any user interface options.
Click OK
Under File, click save.
Repeat the process until all files have been set to fit visible on open.
Exit Acrobat Exchange.

(Specifications).pdf Haziness Fix

Run Acrobat Exchange.
Under File, click Open.
Browse to the directory containing the specifications, and highlight the first pdf file.
Click Open.
Under file, click Preferences.
Click General.
Click on "Smooth text and Monochrome Images".
Click OK.
Verify Fit Visible is still selected under Document Info, Open.
Select File.
Select Save As.

Specs.txt File

To ensure that the pdf files are properly bookmarked by the Contracting EBS Administrator, the Branch EBS Administrator creates a “specs.txt”, listing the bookmarking information applicable to the EN pdf files. A typical specs.txt file is shown below:

Military IFB:

Cover.pdf COVER SHEET
DA.pdf DESIGN AUTHORIZATION
BS.pdf BIDDING SCHEDULE
scr.pdf SECTION H SPECIAL CONTRACT REQUIREMENTS
tstoc.pdf TECHNICAL SPECIFICATIONS

DIVISION 1 - GENERAL REQUIREMENTS

01015.pdf SECTION 01015 SPECIAL ITEMS
01025.pdf SECTION 01025 MEASUREMENT, PAYMENT AND CONTRACT COST BREAKDOWN
01100.pdf SECTION 01100 AIRFIELD OPERATIONS AND SAFETY REQUIREMENTS
01130.pdf SECTION 01130 ENVIRONMENTAL PROTECTION
01180.pdf SECTION 01180 RADIOACTIVE MATERIALS PROCEDURES
01300.pdf SECTION 01300 SUBMITTAL PROCEDURES
01400.pdf SECTION 01440 CONTRACTOR QUALITY CONTROL
01500.pdf SECTION 01500 TEMPORARY CONSTRUCTION FACILITIES
01582.pdf SECTION 01582 AIR FORCE PROJECT SIGN
01720.pdf SECTION 01720 AS-BUILT DRAWINGS

DIVISION 2 - SITEWORK

02050.pdf SECTION 02050 DEMOLITION
02066.pdf SECTION 02066 FIELD SCREEN TESTING OF SOILS FOR POL CONTAMINATION
02225.pdf SECTION 02225 EARTHWORK
02233.pdf SECTION 02233 GRADED-CRUSHED-AGGREGATE BASE COURSE
02272.pdf SECTION 02272 SEPARATION/FILTRATION GEOTEXTILE
02556.pdf SECTION 02556 ASPHALTIC BITUMINOUS HEAVY-DUTY PAVEMENT (CENTRAL-PLANT HOT MIX)
02558.pdf SECTION 02558 BITUMINOUS TACK COAT
02577.pdf SECTION 02577 PAVEMENT MARKINGS
02598.pdf SECTION 02598 COLD MILLING OF BITUMINOUS PAVEMENTS

DIVISIONS 3 THRU 16 -NOT USED-

-End of Technical Specifications Index—

Civil Works IFB:

Cover.pdf COVER SHEET
DA.pdf DESIGN AUTHENTICATION
BS.pdf BIDDING SCHEDULE
scrtoc.pdf SCR INDEX
scr.pdf SECTION H SPECIAL CONTRACT REQUIREMENTS
page 28 FISH HABITAT PERMIT FG 97-II-0649
tstoc.pdf TECHNICAL SPECIFICATIONS

DIVISION 1 - GENERAL REQUIREMENTS

01016.pdf SECTION 01016 SPECIAL ITEMS (CIVIL WORKS)
page 13 NPDES FORM
01026.pdf SECTION 01026 MEASUREMENT, PAYMENT AND CONTRACT COST BREAKDOWN
01090.pdf SECTION 01090 SOURCES FOR REFERENCE PUBLICATIONS
01130.pdf SECTION 01130 ENVIRONMENTAL PROTECTION
01330.pdf SECTION 01330 SUBMITTAL PROCEDURES
page 7 SUBMITTAL REGISTERS
page 9 ENG FORM 4025-R
01451.pdf SECTION 01451 CONTRACTOR QUALITY CONTROL
page 11 CQC REPORT
01500.pdf SECTION 01500 TEMPORARY CONSTRUCTION FACILITIES
01581.pdf SECTION 01581 PROJECT MARKER
page 4 PROJECT MARKER VERSION 2
01720.pdf SECTION 01720 AS-BUILT DRAWINGS

DIVISION 2 - SITEWORK

02200.pdf SECTION 02200 EARTHWORK
page 14 LETTER OF AGREEMENT AND QUARRY PLAN
02411.pdf SECTION 02411 METAL SHEET PILING AND DRIVEN ANCHOR PILES
02700.pdf SECTION 02700 STORM DRAIN / DRAINAGE SYSTEMS

DIVISIONS 3 AND 4 -NOT USED-

DIVISION 5 - METALS

05055.pdf SECTION 05055 STRUCTURAL WELDING
05120.pdf SECTION 05120 STRUCTURAL STEEL
05500.pdf SECTION 05500 MISCELLANEOUS METALS

DIVISIONS 6 THRU 8 -NOT USED-

DIVISION 9 - FINISHES

09900.pdf SECTION 09900 COAL TAR EPOXY COATINGS

DIVISIONS 10 THRU 15 -NOT USED-

DIVISION 16 - ELECTRICAL

16640.pdf SECTION 16640 CATHODIC PROTECTION SYSTEM (SACRIFICIAL ANODE)

--End of Technical Specifications Index--

The file titled page 7 following file 1330.pdf is an instruction to Contracting that a bookmark is needed at page 7 of file 1330.pdf, and needs to be titled "SUBMITTAL REGISTERS". Be sure that the page number used is the Adobe page number, and not the document page number. Each line item represents a bookmark to be prepared by CT EBS Administrator. The contents of this file will appear as the table of contents in the EBS for the specifications. The specs.txt file format and naming convention shall be as required by Contracting EBS Administrator. Note the use of upper and lower case lettering. Font shall be New Courier 10.

In-House Signature Requirements

The Branch EBS Administrator shall verify that all required signatures have been obtained prior to preparing an EBS.

A District Design Authentication sheet shall be signed by the responsible Branch Chief, Engineering Chief, and the Colonel. The District Design Authentication sheet shall be required for all EBS projects. The District Design Authentication Sheet shall be completed, scanned to PDF, and submitted to the Branch EBS Administrator as a specification file for inclusion with the EBS. Refer to the applicable EN Branch Appendix for additional Intra-branch signature requirements.

The following District Design Authentication Templates shall be used for military and civil works projects as applicable. For projects performed for non-DOD or non-civil works agencies, the template shall be modified to fit the project parameters.

DISTRICT DESIGN AUTHENTICATION

Signatures affixed below indicate the drawings and specifications included in this solicitation were prepared, reviewed, and certified in accordance with ER 1110-345-100, Design Policy for Military Construction.

Solicitation: FY98 FAMILY HOUSING REVITALIZATION
FORT WAINWRIGHT
DACA85-98-B-0017

_____ _____

COL Timothy J. Gallagher, **Date**
Corps of Engineers, District Engineer

_____

Olton Swanson, P.E.
Chief, Engineering Division

_____

LAURA A. WALKER, P.E.
Chief, Military Technical Engineering Branch

This project was designed by the Alaska District of the U.S. Army Corps of Engineers. The initials or signatures and registration designations of individuals appear on these project documents within the scope of their employment as required by ER 1110-1-8152.

DISTRICT DESIGN AUTHENTICATION

Signatures affixed below indicate the drawings and specifications included in this solicitation were prepared, reviewed, and certified in accordance with ER 1110-345-100, Design Policy for Military Construction.

Solicitation: FY98 FAMILY HOUSING REVITALIZATION
FORT WAINWRIGHT
DACA85-98-B-0017

_____ _____
COL Timothy J. Gallagher, **Date**
Corps of Engineers, District Engineer

_____
Olton Swanson, P.E.
Chief, Engineering Division

_____
Wayne Rowe
Acting Chief, Environmental Engineering Branch

This project was designed by the Alaska District of the U.S. Army Corps of Engineers. The initials or signatures and registration designations of individuals appear on these project documents within the scope of their employment as required by ER 1110-1-8152.

DISTRICT DESIGN AUTHENTICATION

Signatures affixed below indicate the drawings and specifications included in this solicitation were prepared, reviewed, and certified in accordance with ER ????-???-???, Design Policy for Civil Works Construction.

Solicitation: EMERGENCY BANK STABILIZATION
DILLINGHAM, ALASKA
DACW85-98-B-006

_____ _____

Timothy J. Gallagher, Colonel **Date**
Corps of Engineers
District Engineer

_____

Olton Swanson, P.E.
Chief, Engineering Division

_____

Dennis L. Hardy
Chief, Civil Works Branch

This project was designed by the Alaska District of the U.S. Army Corps of Engineers. The initials or signatures and registration designations of individuals appear on these project documents within the scope of their employment as required by ER 1110-1-8152.

AE Signature Requirements

For AE Projects, in addition to the District Design Authentication sheet, an AE Design Authentication sheet is required. The AE Design Authentication sheet is not required to be included in the EBS, but shall be kept on file. The AE Design Authentication sheet shall be an 8.5x11 paper(s) containing the phrase:

"The registrant, by affixing the registrant's seal to this document and signing it, certifies that the final drawings, specifications, surveys, plats, plates, reports, and other similar documents provided electronically for (PROJECT TITLE, BID NUMBER) under contract number (AE's CONTRACT NUMBER) were prepared by or under the registrant's direct supervision, unless the registrant certifies on the face of this document to the extent of the registrant's responsibility."

This wording mimics the State of Alaska wording found in statutes and regulations governing the use of seals.

All AE originated final bid documents shall be submitted on a CDROM by the AE. The CDROM shall have a permanent label stating the project title, "Submitted for bid", and shall be signed and dated by a representative of the AE, or may have a Company Name and Date Permanent Label in lieu of a signature.

The completion and submittal of the AE Design Authentication sheet and CDROM shall be the responsibility of the EN Section managing the AE project. The section shall ensure that these requirements are included in the AE contract. Refer to the applicable EN-branch Appendix for Intra-Branch requirements.

AE DESIGN AUTHENTICATION

Signatures affixed below indicate the drawings and specifications included in this solicitation were prepared, reviewed, and certified in accordance with ER 1110-345-100, Design Policy for Military Construction. The registrant, by affixing the registrant's seal to this document and signing it, certifies that the final drawings, specifications, surveys, plats, plates, reports, and other similar documents provided electronically for

Solicitation: FY98 FAMILY HOUSING REVITALIZATION
FORT WAINWRIGHT
DACA85-98-B-0017

under contract number

(AE's CONTRACT NUMBER)

were prepared by or under the registrant's direct supervision, unless the registrant certifies on the face of this document to the extent of the registrant's responsibility.

Drawing Number F-25-01-3211, Sheet 1
Drawing Number F-25-01-281, Sheets 1 through 8, and 12.
Specifications 02224, and 02226 thru 02935.

John Doe, P.E. **(PE Seal Here)** _____
Civil Engineer **Date**

_____
P.E. Serial #

Drawing Number F-25-01-281, Sheets 25 through 42.
Specifications 03224, and 03226 thru 03935.

John Doe, R.A. **(PE Seal Here)** _____
Architect **Date**

_____
R.A. Serial #

Solicitation: FY98 FAMILY HOUSING REVITALIZATION
FORT WAINWRIGHT
DACA85-98-B-0017

Drawing Number F-25-01-281, Sheets 1 through 8, and 12.
Specifications 02224, and 02226 thru 02935.

John Doe, P.E. **(PE Seal Here)** _____
Civil Engineer **Date**

_____
P.E. Serial #

Drawing Number F-25-01-281, Sheets 1 through 8, and 12.
Specifications 02224, and 02226 thru 02935.

John Doe, P.E. **(PE Seal Here)** _____
Mechanical Engineer **Date**

_____
P.E. Serial #

Drawing Number F-25-01-281, Sheets 1 through 8, and 12.
Specifications 02224, and 02226 thru 02935.

John Doe, P.E. **(PE Seal Here)** _____
Electrical Engineer **Date**

_____
P.E. Serial #

Engineering EBS Work Completion

When all files have been converted, indexed, and quality checked, the Branch EBS Administrator EBS work is complete. At this time, the files shall be deposited in the directories required by the Contracting EBS Administrator. The Contracting EBS Administrator shall be notified in person and by e-mail that the project is ready for pick-up.

Amendments

EBS amendments are prepared in the same manner as the original solicitation. Drawing and specifications are prepared for EBS by the originator and deposited for the Branch EBS Administrator. Specifications sections are replaced in their entirety. The Branch EBS Administrator prepares the EBS amendment as if it were a separate solicitation, including only amended files, and creating new .txt, .MaxFR, and .txt files to reflect the amended specifications and drawings. The completed EBS files are then deposited for the Contracting EBS Administrator.

(Dwg?).CAL Files
Drawings are amended by the drawing originator in the standard manner, adding revision flags and completing the drawing revision block, and plotted to CAL. The resultant files are renamed with an r? at the end of the CAL file name, where ? represents the amendment number.

Example: C01r1.cal represents drawing C-1, which is added or revised under Amendment 0001.

(AM000?).txt
A revised (bidnumber).txt file is prepared by the design team leader, which includes only the drawings included by the amendment, and named AM000?.txt, where "?" represents the amendment number.

(AM000?).MaxFR
A revised (bidnumber).MaxFR file is prepared, which includes only the drawings included by the amendment, and named AM000?.MaxFR, where "?" represents the amendment number.

(AM000?i).MaxFR
A revised (indexi).MaxFR file is prepared and named AM000?i.MaxFR, where "?" represents the amendment number.
Enter "svdpt http://ebs.poa.usace.army.mil/(bidnumber)/AM_000?.MaxFR

DWGINFR1.txt
Although this should be a rarity, if the DWGINFO.txt file must be issued in an amendment, prepare as indicated for a DWGINFO.txt file and name DWGINFR?.txt.

SPAM000?.txt
Since the program dictates the name of specification files generated in Specsintact, Amended specification files shall not be renamed. EN shall provide the Branch EBS Administrator a SPAM000?.txt file that lists all of the specification files to be included in the amendment. Location of files shall be as indicated in paragraph Amendment File Storage.

Example:

(File Name)
SPAM0001.txt
(File Contents)
01015.sec
16416A3.doc

16935p6.tif

Specsr?.txt
A revised specs.txt files is prepared, which includes only the specifications included in the amendment.

R000?.doc
The amendment to solicitation file is prepared

a. The following drawings are substituted for the superseded drawings. The identifier "AM #1" appears before and after revised drawings as listed in SCR-5.

Drawing No. F__-__-___, Sheet No.'s (Ref. No.'s).

b. The following revised documents are substituted for the superseded documents. The identifier "AM #1" appears before and after new and revised material, except as noted below.

SECTION H: SPECIAL CONTRACT REQUIREMENTS

PROJECT TABLE OF CONTENTS

TECHNICAL SPECIFICATIONS (including submittal registers):

SECTION _____	SECTION _____	SECTION _____
SECTION _____	SECTION _____	SECTION _____
SECTION _____	SECTION _____	SECTION _____
SECTION _____	SECTION _____	

NOTE: Revisions within the following documents do not contain the above referenced identifiers.

PROJECT TABLE OF CONTENTS
SUBMITTAL REGISTERS

c. The following section[s] (including submittal register[s]) [is] [are] deleted.

SECTION _____

d. The following section[s] (including submittal register[s]) [is] [are] added.

SECTION _____
SECTION _____

e. NOTICE TO BIDDERS [OFFERORS]: PLEASE MARK OUTSIDE OF ENVELOPE IN WHICH BID [OFFER] IS SUBMITTED TO SHOW AMENDMENTS RECEIVED. YOU ARE REQUIRED TO ACKNOWLEDGE RECEIPT OF THIS AMENDMENT ON THE REVERSE SIDE OF STANDARD FORM 1442.

SECTION TABLE OF CONTENTS

DIVISION 09 - FINISHES

SECTION 09250

GYPSUM WALLBOARD

PART 3 EXECUTION
3.1 INTERIOR WALL FRAMING
3.1.1 Wall Openings
3.1.2 Wall Control Joints
3.2 SUSPENDED CEILING FRAMING
3.2.1 Hangers
3.2.2 Main Runners
3.2.3 Furring Channels
3.2.4 Ceiling Openings
3.2.5 Light Fixtures
3.2.6 AM #1...Paragraph Deleted
3.2.6.1 Paragraph Deleted...AM #1

When a specifications section is amended, the entire specifications section is replaced in the amendment. The header of each page of the specifications section is modified by adding the amendment number and solicitation number so as not to be confused with an original specifications page. Where an entire specifications paragraph or series of paragraphs are added or deleted, the table of contents is amended to indicate the addition or deletion of the paragraph(s). The addition to, modification of, or deletion of a portion of a specifications paragraph shall be in complete sentences, as opposed to discrete words.

Below is a portion of a typical technical specifications section table of contents, indicating the deletion and addition of a paragraph. The section table of contents shall be amended to show added or deleted paragraphs only. Note the page header indicating the amendment and bid numbers. Note paragraph number 3.5.2, where the new paragraph title is identified by AM #1... and ...AM #1, not in bold, is the amendment indicator to be used for all amendments, where AM indicates an amendment to the text, and #1 indicating the amendment number. This permits a reader to perform and electronic word search for AM #1, thus identifying all amendments made to the document.

BARRACKS UPGRADE
FTW194
DACA85-98-B-0016, AMENDMENT R0001

SECTION TABLE OF CONTENTS
DIVISION 09 - FINISHES
SECTION 09250
GYPSUM WALLBOARD

PART 1 GENERAL
1.1 REFERENCES
1.2 SYSTEM DESCRIPTION
1.2.1 Fire-Rated Construction
1.3 SUBMITTALS
1.4 QUALIFICATIONS
1.5 DELIVERY, STORAGE AND HANDLING
1.6 ENVIRONMENTAL CONDITIONS
PART 2 MATERIALS
2.1 NON-LOADBEARING STUD WALLS
2.1.1 Studs
2.1.2 Runner Tracks
2.2 LOADBEARING STUD WALLS
2.2.1 Studs
2.2.2 Runner Tracks
2.2.3 Bridging
2.3 SUSPENDED CEILING FRAMING
2.4 GYPSUM BOARD
2.4.1 Fire-Rated Gypsum Board
2.4.2 Water-Resistant Gypsum Board
2.5 TRIM, MOLDINGS, AND ACCESSORIES
2.5.1 Taping and Embedding Compound
2.5.2 Finishing or Topping Compound
2.5.3 All-Purpose Compound
2.5.4 Joint Tape
2.5.5 Trim, Control Joints, Beads, and Nosings
2.6 FASTENINGS AND ADHESIVES
2.6.1 Screws
2.6.2 Adhesives
2.6.3 Hangers
2.6.4 Wire and Clip Type Fastenings
2.6.4.1 Tie Wire

2.6.4.2 Clips
PART 3 EXECUTION
3.1 INTERIOR WALL FRAMING
3.1.1 Wall Openings
3.1.2 Wall Control Joints
3.2 SUSPENDED CEILING FRAMING
3.2.1 Hangers
3.2.2 Main Runners
3.2.3 Furring Channels
3.2.4 Ceiling Openings
3.2.5 AM #1...Light Fixtures...AM #1
3.2.6 AM #1...Paragraph Deleted
3.2.6.1 Paragraph Deleted...AM #1

Below is a portion of a typical technical specifications amendment:

In paragraph 3.2.4, a sentence or group of sentences have been modified, and were replaced by **"AM #1...(new text)**....**AM #1**". A sentence or group of sentences was also deleted at the end of the paragraph, and were replaced by **"AM #1...Deleted text**....**AM #1".**

In paragraph 3.2.5, an entire paragraph was added, with amendment flags added to both the title and body.

In paragraph 3.2.6, an entire paragraph was deleted, with amendment flags added to both title and body.

Note that the text of the deleted paragraph is replaced by **"AM #1...** Deleted Paragraph**....AM #1**". This very clearly indicates the deletion of paragraph 1.5.1 by amendment #1

3.2.4 Ceiling Openings

Support members shall be provided as required at ceiling openings for access panels, recessed light fixtures, and air supply or exhaust. **AM #1...**Support members shall be not less than 1-1/2 inch main runner channels and vertically installed suspension wires shall be located to provide at least the minimum support specified herein for furring and wallboard attachment.**...AM #1 AM #1...**Deleted text**....AM #1**.

3.2.5 **AM #1...**Light Fixtures**...AM #1**

AM #1... Light fixtures shall not be supported directly from suspended ceiling runners. Hanger wires for recessed or surface mounted light fixtures shall be anchored to structure at four corners of light fixtures, and additional wires shall be provided at appropriate locations to carry the weight of light fixtures.**...AM #1**

3.2.6 **AM #1...**Paragraph Deleted

3.2.6.1 Paragraph Deleted**...AM #1**

If an entire technical specifications section is added or deleted by amendment, the technical specifications table of contents (tstoc) shall be amended to indicate the addition or deletion of the specifications section. All pages of the new specification shall have the amendment header.

File Naming Convention

CAL files, (dwgs).cal:
Refer to paragraph (Bidnumber).txt Files

CAL file index list, (bidnumber).txt:
Refer to paragraph (Bidnumber).txt Files

CAL file index list, (bidnumber).MaxFR:
Same as (bidnumber).txt file, but with .MaxFR extention.

CAL file Internet command, indexi.MaxFR:
indexi.MaxFR

Drawing CAL/scale info, dwginfo.txt:
dwginfo.txt

Specsintact specification file, (specifications).sec:
File name is Specsintact generated. Refer to paragraph Specifications Files.

Non-Specsintact file, (specifications).doc:
Refer to paragraph Specifications Files for specifications, and specifications attachments.

Specifications File converted to PDF, (specifications).pdf:
Same file names as pre-converted files. Refer to paragraph Specifications Files.

Specifications index file, specs.txt:
specs.txt

Amendment Files:
Refer to paragraph Amendments.

File Storage, Original Solicitation

Files to be delivered to the Branch EBS Administrator for the EBS shall be deposited in the following directories:

1) Drawing related files (CAL and (bidnumber.txt) shall be deposited in (drive:\\POA-FS-EN\Engineer)\EBS_Drop\(UPC)\CAL.

2) Non-Specsintact specifications files, including scans, attachments, etc., shall be deposited in (drive:\\POA-FS-EN\Engineer)\EBS_Drop\(upc)\SEC.

3) Specsintact files shall be remain in the directory used by Specsintact: (drive:\\POA-FS-EN\Engineer)\Working\EN-(branch)\Jobs\(upc)\pulldata.

Files to be delivered to the Contracting EBS Administrator shall be deposited in the following directories:

1) Drawing related files, including all CAL files, (bidnumber).txt, (bidnumber).MaxFR, indexi.MaxFR, and dwginfo.txt shall be deposited in (drive:\\POA-FS-EN\Engineer)\Working\EN-(branch)\Jobs\(upc)\CT\drawings.

2) Specifications files, including all Engineering originated PDF files and specs.txt shall be deposited in (drive:\\POA-FS-EN\Engineer)\Working\EN-(branch)\Jobs\(upc)\build.

File Storage, Amendments

Files to be delivered to the Branch EBS Administrator for the EBS shall be deposited in the following directories:

1) Drawing related files (CAL and (AM_000?.txt) shall be deposited in (drive:\\POA-FS-EN\Engineer)\EBS_Drop\EN-(branch)\(UPC)\R000?\CAL. Note: ? shall be 1 for amendment 0001, 2 for amendment 0002, etc.

2) Non-Specsintact specifications files, including scans, attachments, AM(?).txt, etc., shall be deposited in (drive:\\POA-FS-EN\Engineer)\EBS_Drop\EN-(branch)\(upc)\R000?\SEC.

3) Specsintact files shall be remain in the directory used by Specsintact: (drive:\\POA-FS-EN\Engineer)\Working\EN-(branch)\Jobs\(upc)\pulldata.

Files to be delivered to the Contracting EBS Administrator shall be deposited in the following directories:

1) Drawing related files, including all CAL files, (AM_000?).txt, (AM_000?).MaxFR, AM_000?i.MaxFR, and dwginf_?.txt (as needed) shall be deposited in (drive:\\POA-FS-EN\Engineer)\Working\EN-(branch)\Jobs\(upc)\R000?\CT\drawings.

2) Specifications files, including all Engineering originated PDF files and specs_(?).txt shall be deposited in (drive:\\POA-FS-EN\Engineer)\Working\EN-(branch)\Jobs\(upc)\R000?\build.

The build, CT, CT\drawings, and R000?\CT\drawings directories shall be considered the property of Contracting Division, and shall be accessed by the Branch EBS Administrator for the purpose of delivering files to CT for EBS only.

File Storage, Templates

As an aid in EBS preparation, templates are stored in (drive,\\POA-FS-EN\EBS)\EBS_Manual\Templates. As directory is read only, copies must be requested.

Advance Cal File Viewing

To allow advance quality checks and printing of CAL files, a "template.MaxFR" file is located in (drive,\\D21-700\En)\pubs\EBS\Read_Drop. CAL files that have names conforming to EBS standards may be copied to this directory for viewing. To view and print CAL files, doulble click on the svreader located in \pubs\ebs\svreader and open the "template.MaxFR file". Next, click on file, page list, and select the desired file name to view the CAL file.

Printing CAL Files

CAL files are easily printed to any windows printer form the MaxView Reader. After entering MaxView Reader and viewing the solicitation:

1) Click File.

2) Click Print.

3) Click Printer Setup.

4) Select the printer desired.

5) Select paper size and landscape or orientation, as applicable.

6) If permitted under options, select 300 dpi resolution.

7) Click OK to exit options.

8) Click OK to exit Printer Setup.

9) Click Select Pages.

10) Highlight the desired drawings, or select ALL.

11) Select Fit to page, 100%, or enter 50 in Custom Size for half size print.

12) Click Print.

APPENDIX B AK District EN-TE Standard Operating Procedures

Designation of Duties

For EN-TE, EN-ES-SP will function as the Branch EBS Administrator. Procedures will follow those indicated in Appendix A, except where indicated otherwise in this appendix. Since Appendix A represents Engineering Division policy, variations must be with and approved by the EBS committee.

File Preparation Responsibilities

The following is a list of files used in an EBS and designates the party responsible for file preparation.

Drawing related files consist of:

(dwgs).cal	(prepared by the drawing originator or AE firm)
(bidnumber).txt	(prepared by the design team leader/AE firm)
(bidnumber).MaxFR	(prepared by the TE EBS Administrator)
indexi.MaxFR	(prepared by the TE EBS Administrator)
dwginfo.txt	(prepared by the design team leader/AE firm)

Specification related files consist of:

(specifications).sec	(prepared by the specwriter/AE firm via Specsintact)
(specifications).doc	(prepared by the specwriter/AE firm)
(specifications).tif	(prepared by the specwriter/AE firm)
(specifications).pdf	(prepared by the TE EBS Administrator)
specs.txt	(prepared by the TE EBS Administrator)

All files shall meet the requirements of this appendix. Files that are found not to conform shall be returned to the originator for correction.

File Storage, TE EBS Administrator Working Area, Original Solicitation

1) Drawing related files, including all CAL files, (bidnumber).txt, (bidnumber).MaxFR, indexi.MaxFR, and dwginfo.txt shall be deposited in (drive:\\POA-FS-EN\Engineer)\Working\EN-TE\Jobs\(upc)\drawings.

2) Specifications files, including all Engineering originated PDF files and specs.txt shall be deposited in (drive:\\POA-FS-EN\Engineer)\Working\EN-TE\Jobs\(upc)\specs.

File Storage, TE EBS Administrator Working Area, Amendment

1) ererDrawing related files, including all CAL files, (bidnumber).txt, (bidnumber).MaxFR, indexi.MaxFR, and dwginfo.txt shall be deposited in (drive:\\POA-FS-EN\Engineer)\Working\EN-TE\Jobs\(upc)\R000?\drawings.

2) Specifications files, including all Engineering originated PDF files and specs.txt shall be deposited in (drive:\\POA-FS-EN\Engineer)\Working\EN-TE\Jobs\(upc)\R000?\specs.

Design Authentication

In addition to the District and AE Design Authentication sheets, the chief of each section in EN-TE responsible for preparation and/or review of the project shall sign a Section Design Authentication sheet. The sheet is required for all projects, both In-house and AE, in accordance with the EN-TE QMP. If a project does not include a particular discipline, or if the chief has some other reason for not signing, the chief of that discipline shall pen in "N/A" next to their name, and sign the document. The District and Section Design Authentication sheets shall be included in

the EBS package. The following is the template to be used for Section Design Authentication sheets:

SECTION DESIGN AUTHENTICATION

Signatures affixed below indicate the drawings and specifications included in this solicitation were prepared, reviewed, and certified in accordance with ER 1110-345-100, Design Policy for Military Construction.

Solicitation: FY98 FAMILY HOUSING REVITALIZATION
FORT WAINWRIGHT
DACA85-98-B-0017

Gordon D. Hansen, AIA **Chief, Architectural/Structural Section**	**Date**
Thomas L. Lubeck, PE **Chief, Civil Sanitary Section**	**Date**
Charles VonGunten **Chief, Mechanical/Electrical Section**	**Date**
James W. Pekar, PE **Chief, Materials and Instrumentation Section**	**Date**
Jamil Abu-Niaj, PE **Chief, Specifications Section**	**Date**

This project was designed by the Alaska District of the U.S. Army Corps of Engineers. The initials or signatures and registration designations of individuals appear on these project documents within the scope of their employment as required by ER 1110-1-8152.

Charrette, PD, or 35% Design Stage

Design and/or Project Manager:

Ensures that Quality Management Plan relative to EBS requirements for the project design stage are fulfilled. Verifies that the team is aware that the project is to be advertised as an Electronic Bid Set. Refer to the QMP for details.

TE EBS Administrator:

Creates the following directories:

1) All directories listed in Appendix A, paragraphs File Storage, Original Solicitation and File Storage, Amendments.

2) All directories listed in Appendix B, paragraphs File Storage, TE EBS Administrator Working Area, Original Solicitation and File Storage, TE EBS Administrator Working Area, Amendments for R0001.

95% Review Stage, In-House Designs

1) Each office plots their drawings to be included in the review set to CAL files, scans hardcopy specifications into TIF or PDF in accordance with Appendix A, and performs a quality control check of files.

2) The Design Manager provides Project Title Information for the District and Section Design Authentication sheets to EN-ES-SP.

3) EN-ES-SP prepares the District and Section Design Authentication sheets, and includes them unsigned in the 95% package.

4) Each office plots hardcopy drawings and specs and delivers the documents in accordance with the EN-TE SOP document. Hardcopies shall be produced from the electronic CAL and specifications files, not Autocad or unscanned hardcopy.

100% Review Stage, In-House Designs

1) EN-ES-SP prints out a hardcopy of the Section and District Design Authorization sheets.

2) Each office scans hardcopy specifications to TIF or PDF, and plots their drawings to be included in the review set to CAL files and performs quality control check of files.

3) Each office deposits their CAL files in (drive,\\POA-FS-EN\Engineer):\EBS_drop\EN-TE\(upc number)\CAL directory, when authorized by the section chief.

4) Each office deposits their **non-Specsintact** files to be included in the review set in (drive,\\POA-FS-EN\Engineer):\EBS_drop\EN-TE\(upc number)\SEC directory, when authorized by the section chief.

5) Each office plots hardcopy drawings and specs and delivers the documents in accordance with the EN-TE_SOP document. Hardcopies shall be produced from the electronic files (CAL, TIF, DOC, SEC, or PDF) to be included in the review set, not Autocad or unscanned hardcopy.

6) Chiefs perform 100% review, and comments are incorporated.

7) Chiefs authorize proceeding to Design Complete.

Design Complete Stage, In-House Designs

1) Steps 2 through 5 of 100% Review Stage, In-House Designs, are repeated as required to produce the design complete bid set files.

2) The design team leader prepares the (bidnumber).txt file, comparing the quantity and reference numbers of hardcopy drawings to the quantity and names of electronic files.

3) The design team leader deposits the (bidnumber).txt file in the directory (drive,\\POA-FS-EN\Engineer):\EBS_drop\EN-TE\(upc number)\CAL

4) Each Section chief goes to EN-ES-SP and signs the Section Design Authentication sheet. The sheet shall not leave EN-ES-SP, except as noted in the next item. The section chiefs shall not sign the sheet until all work to be performed by that section for the project is complete and has been deposited for EBS preparation.

5) When the Section Design Authentication is complete, the EN-TE-DM representative obtains signatures on the District Design Authentication sheet, presenting the Section Design Authentication Sheet to the Branch Chief as evidence or Section Chief authorization, and returns them to the EN-ES-SP.

6) EN-ES-SP scans the Design Authentication sheets to DA.pdf and deposits it to (drive,\\POA-FS-EN\Engineer):\EBS_drop\EN-TE\(upc number)\SEC.

7) EN-ES-SP notifies the TE EBS Administrator in person and via e-mail that the EBS process may proceed.

5) The TE EBS Administrator retains the e-mail message as a record of authorization to proceed.

6) The TE EBS Administrator verifies that all required signatures are on the DA.pdf before proceeding. The TE EBS Administrator shall not act until the DA.pdf is properly signed, scanned, and deposited.

7) The TE EBS Administrator verifies that all applicable directories are free of files from previous EBS actions.

8) The TE EBS Administrator **moves** all files from (drive,\\POA-FS-EN\Engineer):\EBS_drop\EN-TE\(upc number)\CAL to (drive,\\POA-FS-EN\Engineer):\Working\EN-TE\Jobs\(upc number)\Drawings.

9) The TE EBS Administrator **moves** all files from (drive,\\POA-FS-EN\Engineer):\EBS_drop\EN-TE\(upc number)\SEC to (drive,\\POA-FS-EN\Engineer):\Working\EN-TE\Jobs\(upc number)\Specs.

10) The TE EBS Administrator prepares the EBS drawing package, performing quality control check to verify that all files view properly, and that hardcopy checkprint agrees with files.

11) The TE EBS Administrator prepares the EBS specification package, performing quality control check to verify that all files view properly, and that hardcopy checkprint agrees with files.

12) The TE EBS Administrator moves the drawing package to (drive,\\POA-FS-EN\Engineer):\Working\EN-TE\Jobs\(upc number)\CT\drawings.

13) The TE EBS Administrator verifies that (drive,\\POA-FS-EN\Engineer):\Working\EN-TE\Jobs\(upc number)\Build is empty, and notifies the Contracting EBS Administrator for action if files are found in the directory.

14) The TE EBS Administrator moves the specifications package to (drive,\\POA-FS-EN\Engineer):\Working\EN-TE\Jobs\(upc number)\Build.

15) The TE EBS Administrator notifies the Contracting EBS Administrator in person and via e-mail that the EBS process may proceed.

95% Review Stage, AE Designs

1) The AE firm plots their drawings to be included in the review set to CAL files, scans original hardcopy specifications into TIF, DOC, or PDF in accordance with Appendix A, and performs a quality control check of files.

2) The AE firm plots/prints reproducible hardcopy of drawings and specifications. Hardcopies shall be produced from the electronic CAL and specifications files, not Autocad or unscanned hardcopy.

3) The AE firm submits reproducible hardcopy, and other items required by AE instructions.

100% Review Stage, AE Designs

1) The AE firm submits all drawings in CAL format.

2) The AE firm submits the (bidnumber).txt file.

3) The AE firm submits all non-specsintact specification files.

4) The AE firm submits all files associated with the Specsintact generated documents (all files in the Specsintact pulldata directory).

5) The AE firm submits hardcopy of drawings and specifications. Hardcopies shall be produced from the electronic CAL and specifications files, not Autocad or unscanned hardcopy.

6) EN-ES-SP prints a hardcopy of the Section Chief and District Design Authentication sheets.

7) The Design Team Leader deposits the drawing and (bidnumber).txt files into the EBS_drop\EN-TE\(UPC number)\CAL directory and performs the quality control check.

8) The Design Team Leader deposits the **non-Specsintact** specifications files into the EBS_drop\EN-TE\(UPC number)\SEC directory.

9) The Design Team Leader delivers the Specsintact files to EN-ES-SP who deposits them into the proper Specsintact pulldata directory to create the Specsintact project.

10) EN-ES-SP performs quality control check of Specification files.

11) Backcheck is performed, comments are incorporated.

12) Steps 1 through 11 are repeated as required.

Design Complete Stage, AE Designs

1) The AE submits the sealed and signed AE Design Authentication sheet and CDROM of electronic files as required.

2) EN-ES-SP and Design Team Leader section Chiefs sign Design Authorization sheet.

3) Steps 6 through 15 of the Design Complete, In-House Designs are performed. The AE Design Authorization sheet is scanned and combined in DA.pdf with In-House Design Authorization sheets.

AE Firm EBS Information Sheet

The following is an information sheet that may be used as a summary of the AE firm EBS process:

Electronic Bid Sets (EBS)

Architectural Engineering Firm

Submits drawing files in electronic CAL format.
Submits a drawing file list file, (bidnumber).txt.
Submits specifications files in electronic format.
Submits hardcopy check print of drawings and specifications.
Submits hardcopy "stamped" Design Authentication Sheet.

Corps of Engineers

Prepares Notice of Solicitation for FedBizOpps and Corps of Engineers web page.
Prepares MaxView SVD file, using the AE firm's (bidnumber).txt.
"Prints" specifications files to electronic PDF format via Acrobat Exchange.
Prepares specifications index file Specs.txt.
Prepares solicitation CON file, to be used with Contract.exe (solicitation tool bar).
Places all drawing and spec files, Contract.exe program, Acrobat PDF reader, and MaxView reader onto CDROM.
Mails CDROM to bidders, and places solicitation on the Corps of Engineers web page.

CAL File Standards

CAL files and (bidnumber).txt prepared and named in accordance with Corps standard.
CAL file prepared so 100% scale print results in full size hardcopy.
Autocad 2000 plots to CAL if not true type fonts or screened lines are used.
If true type fonts or screened lines are used, plot to post script and use Ghostscript (MaxView freeware) to convert to CAL.

Specification File Standards

Files prepared and named in accordance with Corps standard.
Submit all Specsintact files located in Specsintact "pulldata" directory.
Submit all non-Specsintact files in Word, TIF, or other format that can be converted to PDF via Acrobat Writer.
Submit specifications and spec attachments that are not available in electronic format as TIF format, scanned to 8.5x11, black and white, 300dpi.

Design Authentication Form

An 8.5x11 sheet(s), with signed PE seal, stating that the drawings represented on the submitted CDROM were prepared by, or their preparation was directly supervised by, the registrant.

On-Line Information

Alaska District Contracting Division Homepage, listing advertised solicitations, printer sources, bidders list info, Tri-Services link, Software link, etc.
http://ebs.poa.usace.army.mil/

CHAPTER 6
PERFORMANCE EVALUATION

6-1. Principles.

a. Accurate and timely performance evaluations support the USACE objective of continuously improving the quality of A-E services and products.

b. The performance of A-E firms shall be evaluated fairly and objectively. Ratings are ultimately the decision of the Government and are not subject to negotiation with A-E firms. However, overall ratings[1] of "marginal" and "unsatisfactory" may be rebutted by A-E firms in accordance with the procedures herein.

c. A-E firms shall be kept apprised of the quality of their work throughout contract performance and shall promptly be sent copies of completed performance evaluations.

6-2. Responsibilities.

a. The Chief of Engineering in each operating command[2] is responsible for the A-E performance evaluation process in the command.

b. Area engineers and resident engineers (AE/RE) are responsible for preparing A-E evaluations after the completion of USACE-managed construction projects.

6-3. Regulatory Background. This pamphlet implements[3]:

a. FAR 36.604, which requires that the performance of A-E contractors be evaluated and that files of performance evaluations be maintained for use in selecting firms for A-E contracts,

b. DFARS 236.604, which requires a separate performance evaluation after completion of construction and specifies that all DoD agencies forward completed evaluations to the “central data base” maintained by USACE (ACASS), and

c. EFARS 36.604, which amplifies certain requirements of the FAR and DFARS.

1 This pamphlet is based on the April 1999 edition of DD Form 2631, Performance Evaluation (Architect-Engineer), which replaced the November 1992 edition. The new overall ratings are “exceptional,” “very good,” “satisfactory,” “marginal” and “unsatisfactory.” The 1992 edition of the form had corresponding overall ratings of “excellent,” “above average,” “average,” “below average” and “poor.”

2 See definition in paragraph 2-2.a.

3 FAR Subpart 42.15, and the supplements thereto, addresses recording and maintaining contractor performance information, but, by its terms, does not apply to A-E services.

6-4. General Procedures.

a. Implementation. The Chief of Engineering will establish written procedures, including a tracking system, to ensure the timely preparation, approval and distribution of all required A-E evaluations in accordance with this pamphlet. (A recommended process is to coordinate completion of the performance evaluation with processing of the final payment.) A-E evaluations shall be scheduled events in the management plan for a project.

b. Contracts Requiring Performance Evaluation. Performance evaluations are required for all contracts[4] and task orders for A-E services in excess of $25,000, but may be prepared for lesser contracts (FAR 36.604 (a)). Design services provided under a design-build contract are not given an A-E performance evaluation and are not subject to this pamphlet. Instead, the quality of the design services in a design-build contract will be addressed in the remarks section on the construction performance evaluation form (DD Form 2626).

c. Preparation of Evaluations.

(1) A performance evaluation shall be prepared by the engineers, architects and other technical personnel who reviewed and accepted the A-E firm's work, as recommended by FAR 36.604 (a)(1). Sufficient effort must be devoted to this function so that thorough and fair evaluations are completed in a timely manner.

(2) Performance evaluations (except marginal or unsatisfactory) shall be prepared, reviewed, approved and distributed within 60 days of the designated milestones in paragraphs 6-7 and 6-8. Additional time will generally be required for evaluations with an overall rating of “marginal” or “unsatisfactory” if rebutted by the A-E firm (see paragraph 6-10).

d. Evaluation Form. Performance evaluations shall be prepared on DD Form 2631[5] (DFARS 236.604(a)) in accordance with the instructions in Appendix AA. The performance evaluation software provided by the Contractor Appraisal Information Center will be used instead of the actual form to facilitate the preparation and routing of evaluations, as well as the transmittal and entry into ACASS. A hard copy must be printed and signed by the rating and reviewing officials for inclusion in the contract file and for sending to the A-E firm.

e. Assignment of Overall Ratings. The overall rating is based on the ratings in the discipline and attribute matrices. While this is a matter of judgment, general guidance is given below to promote uniformity.

4 Exclusive of ID contracts, which are evaluated on the basis of individual task orders.

5 The ACASS software presently conforms to the November 1992 edition of DD Form 2631. This software will continue to be used until it is updated to reflect the current edition of the form

(1) "Exceptional." All or almost all of the significant disciplines and attributes are rated "exceptional." No discipline or attribute should be "marginal" or "unsatisfactory."

(2) "Very Good." A majority of the significant disciplines and attributes are rated "exceptional" or "very good." No significant discipline or attribute should be "marginal" or "unsatisfactory."

(3) "Satisfactory." No significant discipline or attribute should be "unsatisfactory." Quality of final work is acceptable in an overall sense; however, it may have been necessary to get the firm to correct some unacceptable work.

(4) "Marginal." One or two significant disciplines or attributes are rated "unsatisfactory," or all or almost disciplines or attributes are rated "marginal." An unusual amount of extra effort and follow-up on the part of the Government was required in order to get an acceptable product.

(5) "Unsatisfactory." Several significant disciplines and attributes are rated "unsatisfactory." This rating is appropriate for a firm that does not produce acceptable work despite extensive effort by the Government. This rating is required for all contracts terminated for default.

f. Remarks. The remarks in Item 20 of the DD Form 2631 should support and be compatible with the overall rating. A rating of "marginal" or "unsatisfactory" must be fully explained in the remarks. Also, the remarks should not suggest that the firm really did "marginal" work when the overall rating is "satisfactory."

g. Safeguarding Evaluations. Completed A-E performance evaluations are classified as "For Official Use Only" in accordance with AR 25-55. All pages of the evaluation shall be stamped or marked at the top and bottom "For Official Use Only" in accordance with the provisions of AR 25-55, Section 2, Markings. A firm's evaluations will only be given to proper representatives of the firm, to representatives of a Federal agency having a legitimate need for this information, and to ACASS.

h. Contract Negotiation. The performance evaluation form and procedures shall be discussed with an A-E firm during contract negotiation (EFARS 36.604(S-100) and paragraph 4-7.b). The Government will clearly describe its performance expectations, and stress the importance of the performance evaluation in future selections. The PNM will indicate that this discussion took place.

i. A-E Office Location. Enter in Item 6 of the DD Form 2631 the A-E office location that had the lead role in performing the work, which may not be the office that signed the contract. The evaluation will not be useful or relevant in future selections if it does not reflect the actual performing office.

k. Responsible Command. When more than one command is involved in the execution of a project, the command having KO authority for administration of the A-E contract is responsible for preparation of the A-E performance evaluation. The responsibility for the A-E performance evaluation will be included in the overall management plan for the project (see ER 5-1-11).

l. A-E Contracts Awarded for Installations.

(1) This chapter also applies to A-E contracts awarded by USACE for administration by Army installations or other activities. As required by paragraph 5-6.c, the USACE KO will issue instructions to the installation on the preparation of performance evaluations, including preparation of the A-E evaluation after completion of construction when the installation is responsible for managing the construction contract.

(2) If a person at the installation has COR authority for the A-E contract, this person may act as the rating official. Otherwise, the chief of the unit in the Directorate of Public Works or similar engineering office charged with the oversight responsibility for the A-E contract will act as the rating official. The reviewing official will be the Chief, or Assistant Chief, of Engineering of the supporting USACE district.

6-5. Monitoring Performance.

a. General. The quality of an A-E firm's products and services must be adequately documented throughout the performance of the contract and the firm kept apprised of the quality of its work (EFARS 36.604(S-100)). An A-E firm will be notified immediately upon recognition of marginal or unsatisfactory performance as outlined in paragraph 5-9.

b. Appraisals. Operating commands shall establish procedures to appraise the quality of each A-E submittal, using the discipline and attribute matrices on the DD Form 2631. The appraisals will be supplemented as appropriate with narrative that supports the rating and will assist the PM and COR in communications with the A-E on submittal quality. These appraisals will be made by each of the pertinent disciplines. It is particularly important to adequately document any area of unsatisfactory or exceptional performance. These appraisals constitute the basis for interim and final performance evaluations and shall be retained in the contract files.

6-6. Interim Evaluations.

a. General. An interim performance evaluation (FAR and EFARS 36.604(a)(3)) will be prepared under the following conditions, in accordance with the procedures in paragraph 6.7.c:

(1) A cumulative, interim evaluation will be prepared at least annually for a task order or a FP or CR contract with a performance period anticipated to exceed 12 months (EFARS 36.604(S-102))[6].

6 A change is pending to EFARS 36.604(S-102) to change 12 months to 18 months.

(2) An interim evaluation will be prepared whenever a project is deferred for more than 3 months if a substantial portion of the work has been completed.

(3) An interim evaluation will be prepared when a firm's performance is "marginal" or "unsatisfactory" (EFARS 36.604(a)(3)) after reasonable steps have been taken by the Government to improve the firm's performance (see paragraph 5-9). An interim evaluation formally puts a firm on notice that its performance is inadequate in order to encourage improvement and to make the information on the firm's performance available to other contracting offices in a timely manner. An interim "marginal" or "unsatisfactory" evaluation provides a very strong basis for a final "marginal" or "unsatisfactory" evaluation (see paragraph 6-10) if a firm's performance does not improve.

(4) At any other appropriate time.

b. Approval and Distribution. Interim evaluations will be approved and distributed in accordance with paragraph 6-9. The basis for an interim "marginal" or "unsatisfactory" evaluation must be well documented. An interim "marginal" or "unsatisfactory" evaluation is subject to the rebuttal process in paragraph 6-10, and will not be distributed until the rebuttal process is completed (EFARS 36.604(a)(4)). Interim evaluations that have been transmitted to ACASS will be replaced by the final evaluation. Fax a copy of the interim evaluation to the CAIC (503-808-4596), with a request that the evaluation be removed. Any interim "marginal" or "unsatisfactory" evaluations and a summary of any actions the firm took to remedy the deficiencies shall be recorded in Item 20, "Remarks" of the final evaluation.

6-7. Evaluation of A-E Performance after Completion of Design or Engineering Services.

a. General. A final evaluation will be prepared for each task order or FP or CR contract exceeding $25,000 (EFARS 36.604(S-101)). For engineering services not directly related to design, the evaluation shall be prepared after acceptance of the A-E products. For design services, the evaluation shall be prepared after the construction bid opening, provided the bid opening is scheduled to occur within 3 months of design completion. Otherwise, the evaluation will be prepared after completion of the design.

b. Preparation. The final performance evaluation will be based on the appraisals prepared by the technical reviewers and input received from the PM and customer, as well as any interim evaluations. The COR will assign the overall rating and sign the form as the rating official. A copy of the evaluation will be sent to the PM when the evaluation is forwarded for approval.

c. Contract Termination. A performance evaluation shall be prepared for a task order or a FP or CR contract terminated for any reason prior to completion of the work if the value of services completed at termination exceeds $25,000 or if the contract was terminated for default.

6-8. Evaluation of A-E Performance after Completion of Construction.

a. General. An evaluation (referred to herein as the A-E construction evaluation) shall be prepared after substantial physical completion of each construction project based on an A-E design where the price of the A-E services (performed by task order or FP or CR contract) exceeds $25,000 (EFARS 36.604(S-101)).

b. Preparation.

(1) During construction, the AE/RE is responsible for assessing the accuracy and completeness of the A-E firm's work and its responsiveness in resolving design problems that arise during construction. Sufficient documentation will be maintained by the AE/RE to support the A-E construction evaluation. Use of the discipline and attribute matrices on the DD Form 2631 can assist in documenting performance during construction and in communicating with the A-E firm on design problems. The AE/RE will coordinate the evaluation with the design COR and PM.

(2) The AE/RE will prepare the A-E construction evaluation, assign the overall rating, and sign the form as the rating official. The evaluation, with any supporting documentation, will be forwarded through the Chief of Construction to the Engineering Division.

c. Review and Approval. Engineering Division will promptly review and approve an A-E construction evaluation after receipt from the Construction Division. No changes will be made in the A-E construction evaluation without the concurrence of the AE/RE, design COR and PM.

(1) Any significant differences in assessment between the design and construction evaluations will be resolved. This may require reevaluation of some aspects of the design by the personnel who reviewed the A-E firm's work during the design phase. Particular attention should be given to discipline or attribute ratings that could possibly reflect a misunderstanding of the A-E firm's responsibility. Any questions of this nature should be discussed with the AE/RE and the construction modification file reviewed if necessary.

(2) As a consequence of the A-E construction evaluation, or other factors, Engineering Division may wish to change some of the ratings given for disciplines or attributes in the design evaluation. If so, the matrices on page 2 of the A-E construction evaluation, applying to design/engineering services, shall be completed and a statement made in Item 20, "Remarks," giving the reason for the change. If Engineering Division wishes to change the overall rating on the design evaluation, a revised evaluation will be prepared and faxed to the CAIC (503-808-4596) in accordance with paragraph 6-9.c(1). A statement shall be made in Item 20, "Remarks," giving the reason(s) for the revision.

e. Review of A-E Liability. The COR will obtain the A-E liability information for Item 11 of the DD Form 2631 from the A-E Responsibility Coordinator (AERC; see Chapter 7). Refer to the instructions in Appendix AA. An updated evaluation will be transmitted to ACASS as specified in paragraph 6-9.c(2) if there is a later change in the A-E liability information. Completion of an evaluation shall not be delayed because liability determinations have not been resolved.

6-9. Approval, Distribution and Revision of Evaluations.

a. Approval. The reviewing official for A-E performance evaluations shall be the Chief or Assistant Chief of Engineering, unless a proposed “marginal” or “unsatisfactory” evaluation is rebutted (see paragraph 6-10). The reviewing official will review the performance evaluation and the supporting documentation to assure that the overall rating is justified. The date of the reviewing official's signature is the official date of the evaluation.

b. Distribution.

(1) The original signed copy of each interim and final performance evaluation shall be placed in the A-E contract file. Performance evaluations will be promptly transmitted electronically to ACASS, except when rebutted by the A-E firm in accordance with paragraph 6-10.

(2) A copy of each interim and final performance evaluation will be promptly sent to the A-E firm. The cover correspondence may be signed by the COR, except for "marginal" or "unsatisfactory" ratings, which shall be signed by the KO.

c. Revisions and Corrections.

(1) A performance evaluation may be changed by the reviewing official, or successor, upon presentation of adequate evidence. However, no changes shall be made in an A-E construction evaluation without concurrence of the AE/RE. A statement must be included in Item 20, "Remarks," describing the change and explaining why it was made.

(2) The revised evaluation, highlighted in colored marker to show the changes, will be sent to the CAIC, accompanied by a memorandum signed by the reviewing official. The revised evaluation will also be sent to the A-E firm and included in the A-E contract file. The CAIC will make the requested changes.

(3) An evaluation may be updated to change factual information (such as Items 9, 10 or 11) or correct obvious clerical errors without the approval of the reviewing official. A copy of the evaluation will be marked-up to show the changes and sent to the CAIC. The updated or corrected evaluation will also be sent to the A-E firm and included in the A-E contract file. The CAIC will make the requested changes.

6-10. Marginal and Unsatisfactory Performance.

a. General. This section implements FAR and EFARS 36.604(a)(4).

b. Documentation. Documentation of marginal or unsatisfactory performance must be adequate to support the performance rating. It is very important to document the steps taken by the Government to get the A-E firm to improve performance (see paragraph 5-9), and the A-E firm's responses. Records should be made of all telephone conversations and meetings with the A-E firm concerning performance. Generally, a final “marginal” or “unsatisfactory evaluation” should have been preceded by an interim “marginal” or “unsatisfactory” evaluation.

c. Preparation and Notification.

(1) A performance evaluation will be prepared documenting the marginal or unsatisfactory performance, but not signed by the rating and reviewing officials. A summary of the deficiencies will be given in Item 20, "Remarks." The KO will send a letter to the A-E firm notifying it of the intended rating and enclosing the proposed evaluation and supporting documentation.

(2) The A-E firm will be advised in the letter that it has 30 days from receipt of the letter to rebut the rating. The A-E firm will be advised of its right to have comments entered in Item 20, "Remarks," of the evaluation form in accordance with FAR 36.604(a)(4). If the A-E firm does not respond in writing within the allotted time, the evaluation will be finalized and distributed.

d. Rebuttal Process.

(1) If an A-E firm rebuts a rating, a meeting will be scheduled with the District Commander or Deputy District Commander. The firm will be advised of the fact-finding nature of this meeting and provided with the evidence that will be submitted to the Commander for consideration. Every effort will be made to fully explore the major performance deficiencies in the meeting to enable the Commander to make a decision without the need for additional meetings or evidence. The firm will be given sufficient time to prepare for this meeting. The meeting with the Commander will be held within 30 days of the firm's rebuttal letter, to the maximum extent possible.

(2) Following the meeting with the A-E firm, the Commander will decide whether to support or change the proposed rating. If the Commander decides to change the rating, the contract file will be documented to show the reason(s). If the firm has submitted any written comments, they will be added to Item 20, "Remarks." The evaluation will be signed by the rating official, and the Commander shall sign as the reviewing official.

(3) The KO will send a letter to the A-E firm advising of the Commander’s decision and enclosing the signed evaluation. If the rating is "marginal," the letter will notify the firm that the decision is final. If the rating is "unsatisfactory," the firm will be advised that it can further rebut the evaluation to the MSC Commander, and, if so, that it must respond within 15 days of the date of receipt of the letter.

(4) If a firm rebuts an "unsatisfactory" rating, the MSC Commander will be briefed prior to the meeting with the A-E firm. The meeting between the MSC Commander and the A-E firm will be held within 30 days of the meeting with the District Commander, to the maximum extent possible.

(5) The MSC Commander will decide whether to support or change the "unsatisfactory" rating assigned by the District Commander. If the MSC Commander decides not to change the rating, the contract file will be documented to show the reason(s). The KO will send a letter to the A-E firm advising of the MSC Commander's decision and that the "unsatisfactory" evaluation is final.

(6) If the MSC Commander decides that the "unsatisfactory" rating should be changed, the performance evaluation will be revised and signed by the rating official. The MSC Commander will sign as the reviewing official. The KO will send a letter to the A-E firm with a copy of the final revised evaluation.

(7) For Centers, the role of the District Commander will be filled by the highest level person in the engineering functional area. Rebuttals of a "unsatisfactory" rating are made to the Center Commander.

(8) Performance evaluations that are rebutted by A-E firms will not be transmitted to ACASS until the above rebuttal process is completed (EFARS 36.604(a)(4)).

ESTIMATE OF ARCHITECT ENGINEER PROFESSIONAL SERVICES Date_____19_____

☐ Revised ☐ Original

...ject:_____ Location:_____

Estimated by:_____ Sheets of Drawing Required:_____

CONTRACT NO:_____ DO/MOD NO:_____

REMARKS:

Item a. Direct Labor Costs	Hours	Rate	Total
DISCIPLINE			
...UBTOTALS			

TOTAL DIRECT COST $_____

Item b. Overhead charge applicable to direct labor, _____ % of Item a. $_____

Item c. General and Administrative Overhead, _____ % of Item a. $_____

Item d. Materials and incidental reproduction:

_____

_____ $_____

Item f. Profit _____ % of subtotal of Items a, b, c, d, and e. (attach profit computations)

_____

_____ $_____

Item g. Subcontracts for this contract (attach breakdown for each subcontract):

ARCH_____ STRUC_____ ELEC_____

CIVIL_____ MECH_____ OTHER_____ SUBTOTAL $_____

_____ % Profit on subcontracts $_____

Item h. Travel expenses: (No labor - EXPLAIN)

PER DIEM:_____ man days at $_____ PER DAY $_____

GR TRANS:_____ days at $_____ PER DAY $_____

AIR FARE:_____ rd trips at $_____ PER ROUND TRIP $_____

PER DIEM:_____ rd trips at $_____ PER ROUND TRIP $_____

(round to the nearest dollar) TOTAL FEE $_____

...E SIGNATURE_____ DATE_____

...ILE_____

AEESTFRM.DOC

PROFIT EVALUATION SHEET
Weighted Guideline Method

RFP/Contract No. _____ Modification/DO No. _____

Title _____

Technical Complexity Factor	Length Factor	Support of Socioeconomic Programs Factor	Profit Objective
(0.05 - 0.10)	(0.02 - 0.04)	(0.00 - 0.02)	

Technical Complexity + Length + Support of Socioeconomic Programs = Profit Objective

EXPLANATION--

Technical Complexity Factor: _____

Length Factor: _____

Support of Socioeconomic Programs Factor: _____

.....

The prenegotiation profit objective for a firm-fixed-price architect-engineer (including surveying and mapping) contract, contract modification, or delivery order will be determined as described below. The profit objective for all other types of A-E contracts will be determined in accordance with DFARS 215.971.

Where:

(1) Cost is the total estimated costs, including general; and administrative costs, of the prime contractor and any subcontractors, exclusive of any profit. However, normal profit need not be deducted from the prices of commercial supplies and services (such as airfares, reproduction, lab tests, express mail, and materials) in developing the cost base.

(2) Technical complexity factor will vary from 0.05 for low complexity (design of simple road repaving or routine boundary survey verification) to 0.10 for high complexity (design of nuclear chemistry laboratory or the design of the remediation of a very unusual and complex hazardous waste site). Consider the nature of the work, degree of management involvement required, schedule constraints, amount of government assistance, and availability of design criteria.

(3) Length factor is 0.02 for a contract action of 1 month or less, and increases proportionately to 0.04 for a contract action of 21 months or longer. Consider the time necessary to complete the substantive portion of work, including option periods.

(4) Support of socioeconomic programs factor will vary from 0.00 for a prime contractor (including a small business prime contractor) who plans no subcontracting, to 0.02 for a contractor who demonstrates exceptional program support. Consider the contractor's past record as well as this contract action with regard to mentoring and subcontracting with small businesses, small disadvantaged businesses, and historically black colleges and universities and minority institutions.

When the facilities capital cost of money is proposed by the contractor and verified, reduce the profit objective as described in DFARS 215.973(b)(2).

UFC 1-200-01
31 JULY 2002

UNIFIED FACILITIES CRITERIA (UFC)

DESIGN: GENERAL BUILDING REQUIREMENTS

APPROVED FOR PUBLIC RELEASE; DISTRIBUTION UNLIMITED

UNIFIED FACILITIES CRITERIA (UFC)

DESIGN: GENERAL BUILDING REQUIREMENTS

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U.S. ARMY CORPS OF ENGINEERS

NAVAL FACILITIES ENGINEERING COMMAND (Preparing Activity)

AIR FORCE CIVIL ENGINEER SUPPORT AGENCY

Record of Changes (changes are indicated by **1**\ ... /**1**/)

Change No.	Date	Location

FOREWORD

The Unified Facilities Criteria (UFC) system as prescribed by MIL-STD 3007, provides planning, design, construction, sustainment, restoration, and modernization criteria, and applies to the Military Departments, the Defense Agencies, and the DoD Field Activities in accordance with USD(AT&L) Memorandum dated 29 May 2002. UFC will be used for all service projects and work for other customers where appropriate.

UFC are living documents and will be periodically reviewed, updated, and made available to users as part of the Services' responsibility for providing technical criteria for military construction. Headquarters, U.S. Army Corps of Engineers (HQUSACE), Naval Facilities Engineering Command (NAVFAC), and Air Force Civil Engineer Support Agency (AFCESA) are responsible for administration of the UFC system. Defense agencies should contact the preparing service for document interpretation and improvements. Technical content of UFC is the responsibility of the cognizant DoD working group. Recommended changes with supporting rationale should be sent to the respective service proponent office by the following electronic form: Criteria Change Request (CCR). The form is also accessible from the Internet sites listed below.

UFC are effective upon issuance. UFC are distributed only in electronic media from the following sources:

- Unified Facilities Criteria (UFC) Index http://65.204.17.188//report/doc ufc.html.
- USACE TECHINFO Internet site **http://www.hnd.usace.armv.mil/techinfo/index.htm.**
- NAVFAC Engineering Innovation and Criteria Office Internet site http://criteria.navfac.navymil.
- Construction Criteria Base (CCB) system maintained by the National Institute of Building Sciences at Internet site **http//www.nibs.org/ccb.**

Hard copies of UFC printed from electronic media should be checked against the current electronic version prior to use to ensure that they are current.

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INTRODUCTION

1-1 **PURPOSE.** This UFC provides guidance for the use of model building codes for design and construction of Department of Defense (DOD) facilities.

1-2 **AUTHORITY.** Public Law 104-113, *National Technology Transfer and Advancement Act of 1995,* requires Federal use of private sector consensus standards wherever practicable. The goal of the law is to reduce reliance on Federal standards by using industry standards when there is potential to simplify contracting, increase timeliness and cost effectiveness, and promote the safety and welfare of users.

1-3 **POLICY.** Model building codes must be used as a basis of future development of criteria, standards and guide specifications by all DOD components. This UFC will be revised to address new and updated industry standards as they become available. It is DOD policy to select the best model code provisions and industry standards for military use.

1-4 **IMPLEMENTATION.** This UFC is effective immediately.

1-5 **STRUCTURE OF THE UFC.** This UFC references IBC 2000 and other government and nongovernment standards and criteria. Paragraph 1-6 provides modifications to IBC 2000 and is structured around its format. The IBC has 35 chapters and 10 appendices that contain both technical and administrative provisions. The administrative portions of the code are not applicable to the military construction process. Technical portions of the code are applicable as modified herein.

1-6 **MODIFICATIONS.** The *IBC 2000* provisions are directed toward public health, safety, and general welfare, and represent minimum standards that must be met by the private-sector construction industry. The use of industry standards for DOD projects is intended to promote communication in the marketplace, improve competition, and result in cost savings. However, the military often requires higher standards to achieve more stringent life-cycle performance, or to construct facilities that do not exist in the private sector. Modifications to the model code provisions contained herein are based upon those unique military requirements. In the case of conflicts between the model code and military criteria, use military requirements.

1-6.1 **Fire Protection and Life Safety.** For fire protection and life safety requirements, refer to *MIL-HDBK-1008C, *Fire Protection for Facilities Engineering, Design and Construction*.

1-6.2 **Chapter 1 - ADMINISTRATION.** Delete.

1-6.3 **Chapter 2 - DEFINITIONS.** Definitions apply to terms used in the model codes and are not intended to replace definitions and terms in military documents.

1-6.4 **Chapter 3 - USE AND OCCUPANCY CLASSIFICATION.** Use Chapter 3 and *MIL-HDBK-1008/C.

1-6.5 **Chapter 4 - SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY.** Delete Sections 412.1, 412.2, 414 and 415. Refer to applicable DOD and individual military service standards.

1-6.6 **Chapter 5 - GENERAL BUILDING HEIGHTS AND AREAS.** Refer to *MIL-HDBK-1008/C for limitations on the use of Table 503. In Section 506.3, the area limitations in Table 503 may be increased by 300 percent for Air Force facilities when an approved automatic sprinkler system is installed, regardless of building height.

1-6.7 **Chapter 6 – TYPES OF CONSTRUCTION.** Use this chapter.

1-6.8 **Chapter 7 – FIRE-RESISTANCE-RATED CONSTRUCTION.** Use this chapter.

1-6.9 **Chapter 8 - INTERIOR FINISHES.** Use Chapter 8 and *MIL-HDBK-1008/C.

1-6.10 **Chapter 9 – FIRE PROTECTION SYSTEMS.** Use *MIL-HDBK-1008/C.

1-6.11 **Chapter 10 - MEANS OF EGRESS.** Use *MIL-HDBK-1008/C.

1-6.12 **Chapter 11 - ACCESSIBILITY.** Delete Chapter 11 and use the *Uniform Federal Accessibility Standards (UFAS)* and the *Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG).*

1-6.13 **Chapter 12 - INTERIOR ENVIRONMENT.**

1-6.13.1 **Paragraph 1202.2.1.** Delete the last sentence and substitute "Combustion air shall be obtained from attic areas only in accordance with Unified Facility Criteria documents, Unified Facility Guide Specifications and military criteria and guidance documents."

1-6.13.2 **Paragraph 1202.3.2, Subparagraph 4.** Delete "in accordance with the International Energy Conservation Code."

1-6.13.3 **Paragraph 1202.4.2.** Delete "the International Mechanical Code and the International Fire Code" and substitute "Unified Facility Criteria documents, Unified Facility Guide Specifications and military criteria and guidance documents."

1-6.13.4 **Paragraph 1203.1.** Delete, including the exception, and substitute "Temperature control shall be in accordance with Unified Facility Criteria documents, Unified Facility Guide Specifications and military criteria and guidance documents."

1-6.13.5 **Paragraphs 1206.2 and 1206.3.** Delete and replace with the following:

Table 1-1 Sound Transmission Standards for Party Walls and Floor/Ceiling Construction

Area	FSTC [1]	FIIC [2]
Party Walls (unit Separation)	52	-
Primary Habitable Areas (Living, Dining, Family Room, Bedrooms, Circulation)	52	65
Habitable Wet Areas (Kitchen, Bath, Utility, Laundry, Equipment)	52	57
Habitable Areas Over Garages	52	-
Note [1] Field Sound Transmission Class. See ASTM E336-97, Standard Test Method for Measurement of Airborne Sound Insulation in Buildings. Note [2] Field Impact Isolation Class. See ASTM E1007-97, Standard Test Method for Field Measurement of Tapping Machine Impact sound Through Floor-Ceiling Assemblies and Associated Support Structure.		

IBC- Air-borne Sound = 50 STC; 45 FSTC ASTM E 90-99, Standard Test Method for Laboratory Measurement of Sound Transmission Loss of Building Partition Elements.

IBC- Structure-borne Sound = 50 IIC; 45 FIIC ASTM E 492-90, Standard Test Method for Laboratory Measurement of Sound Transmission Through Floor-Ceiling Assemblies Using the Tapping Machine.

1-6.13.6 **Paragraph 1207.3.** Delete and replace with following: "Use the latest DoD approved minimum sizes for barracks and dormitory rooms."

1-6.13.7 **Paragraph 1207.4.** Delete. The services define their own parameters for dwelling units.

1-6.14 **Chapter 13 - ENERGY EFFICIENCY.** Delete Chapter 13 and replace with "Federal facilities are required to comply with Public Laws, Executive Orders, Federal Regulations and other mandates regarding energy use, conservation and efficiency standards. In addition, the military has other unique requirements to ensure the planning, design and construction of energy efficient, cost effective facilities that meet mission requirements. These requirements are reflected in criteria and standards used by each military service. Compliance with Unified Facility Criteria documents, Unified Facility Guide Specifications and military criteria documents will ensure that facilities meet all applicable mandates."

1-6.15 **Chapter 14 - EXTERIOR WALLS.** Use Army Technical Instruction 800-01, *Design Criteria* for guidance for air infiltration, glazing area, and moisture migration pertaining to exterior wall systems.

1-6.16 **Chapter 15 - ROOF ASSEMBLIES AND ROOFTOP STRUCTURES.** Use Chapter 15 for basic guidance and NRCA, *Roofing and Waterproofing Manual* and UFGS Division 7 Thermal and Moisture Protection for technical criteria. The use of any

asbestos containing materials in roofing products such as mastics, felts, etc. is prohibited.

1-6.17 **Chapter 16 – STRUCTURAL DESIGN.** Use Chapter 16 in its entirety with the following revisions:

1-6.17.1 **Paragraph 1616.2.3**. Buildings classified as Seismic Use Group III; as defined in Table 1604.5; and within Seismic Design Category D, E, or F; as defined by paragraph 1616.3, require enhanced performance objectives for earthquake response. These facilities will require, in addition to the requirements of Chapter 16, a linear elastic analysis utilizing 'm' factors in accordance with the requirements contained in the Technical Instruction TI 809-04 *Seismic Design for Buildings*. For this analysis, use the applicable ground motion and design procedures as defined in TI 809-04. In addition, nonlinear design procedures may be required for these facilities according to Paragraph 5-4.b of TI 809-04. (The classification of a building as Seismic Use Group III should only be used for essential facilities that are required for post-earthquake recovery, and/or house mission-essential functions, with no redundant back-up facility on- or off-site. Mission-essential functions are those absolutely critical to mission continuation of the activity.)

1-6.17.2 **Paragraph 1622.3.7**. Replace the second sentence with the following: "The seismic design of Navy piers and wharves will be according to the Technical Report TR-2069-SHR, *Design Criteria for Earthquake Hazard Mitigation of Navy Piers and Wharves*."

1-6.17.3 Use Appendices B and C for design at locations outside of CONUS.

1-6.17.4 All inhabited buildings must meet the requirements of **UFC 4-010-01, *DoD Minimum Antiterrorism Standards for Buildings*.

1-6.18 **Chapter 17 – STRUCTURAL TESTS AND INSPECTIONS.** Use Chapter 17 and the requirements in the Unified Facilities Guide Specifications.

1-6.19 **Chapter 18 – SOILS AND FOUNDATIONS.** Use Chapter 18 for basic guidance and ***DM 7.2, *Foundations and Earth Structures* for detailed requirements. For Section 1802.2, the foundation and soils investigation requirements are provided as a minimum. Additional requirements provided by the design agency will take precedence. Also use supplemental requirements in UFGS Division 2, Site Work.

1-6.20 **Chapter 19 – CONCRETE.** Use Chapter 19, and UFGS Division 3, Concrete. Chapter 19 supersedes MIL-HDBK 1002/4, *Concrete Structures*.

1-6.21 **Chapter 20 – ALUMINUM.** Use Chapter 20 and UFGS 05500 (Navy or Army as appropriate) *Miscellaneous Metals*. Chapter 20 supersedes MIL-HDBK-1002/6, *Aluminum Structures, Composite Structures, Structural Plastics, and Fiber-Reinforced Composites*.

1-6.22 **Chapter 21 – MASONRY.** Use Chapter 21 and UFGS Division 4, Masonry. Chapter 21 supercedes Army TM 5-809-3, NAVFAC DM-2.9, AFM 88-3,

Chapter 3, *Masonry Structural Design for Buildings*. Give special attention to control cracking in concrete masonry structures using the guidance contained in Tables 1-2 and Table 1-3. Because the Masonry Society has a waiver for use of metric products, brick and concrete masonry units (CMU) are normally not available in metric sizes.

Table 1-2 Recommended Joint Control Spacing[a]

Vertical Spacing Of Joint Reinforcement With 2-#9 Wires[b] (in)	Maximum Ratio Of Panel Length To Wall Height (L/H)[c]	Maximum Spacing Of Control Joints [d] (ft)
None [e]	2	18
16	3	24
8	4	30

[a] Based on moisture-controlled, type I, concrete masonry in intermediate humidity conditions (ASTM C 90). The designer should adjust the control joint spacing for local conditions. The recommended spacing may be increased 6 ft in humid climates and decreased 6 ft in arid climates.
[b] Joint reinforcement will be cold-drawn deformed wire with a minimum 9-gauge longitudinal wire size.
[c] L is the horizontal distance between control joints. H is generally the vertical distance between structural supports.
[d] The spacing will be reduced approximately 50% near masonry-bonded corners or other similar conditions where one end of the masonry panel is restrained.
[e] Not recommended for walls exposed to view where control of cracking is important.

Table 1-3 Maximum Spacing of Vertical Expansion Joints in Brick Walls, $\Delta T=100^0F$

EXP.JT Width (in)	W x in	Max. Spacing of BEJs [a]
3/8	3/16	22
1/2	1/4	30
3/4	3/8	44
1 (MAX)	1/2	60

[a] Provide expansion joints at 6 to 10 ft from corners.
Recommended vertical BEJ locations.

a. At regular intervals as noted in table above.
b. At changes in wall height or thickness
c. Near wall intersections in “L”, “T”, and “U”-shaped buildings at approximately 6 to 10 ft) from corners.
d. At other points of stress concentration.
e. At edges of openings.

1-6.23 **Chapter 22 – STEEL.** Use Chapter 22 and UFGS Division 5, Metals. Chapter 22 supersedes MIL-HDBK 1002/3, *Structural Engineering Steel Structures*.

1-6.24 **Chapter 23 – WOOD.** Use Chapter 23 and UFGS Division 6, Wood and Plastics. Chapter 23 supersedes MIL-HDBK 1002/5, *Timber Structures*.

1-6.25 **Chapter 24 - GLASS AND GLAZING.** Use Chapter 24 and MIL-HDBK-1013/12, *Evaluation and Selection Analysis of Security Glazing for Protection Against Ballistic, Bomb, and Forced Entry Tactics* for force protection.

1-6.26 **Chapter 25 – GYPSUM BOARD AND PLASTER.** Use this chapter and applicable UFGS.

1-6.27 **Chapter 26 – PLASTIC.** Use this chapter.

1-6.28 **Chapter 27 – ELECTRICAL.** Delete and use NFPA 70, *National Electrical Code.*

1-6.29 **Chapter 28 – MECHANICAL SYSTEMS.** Delete Section 2801 and substitute "Mechanical appliances, equipment and systems shall be planned, designed and constructed in accordance with Unified Facility Criteria documents, Unified Facility Guide Specifications and military criteria and guidance documents. This will ensure energy efficient, cost effective facilities are provided that meet mission requirements and are in compliance with Public Laws, Executive Orders, Federal Regulations and similar mandates. Also comply with NFPA 54, *National Fuel Gas Code.*"

1-6.30 **Chapter 29 – PLUMBING SYSTEMS.** Delete Paragraph 2901.1 and substitute "Plumbing appliances, equipment and systems shall be planned, designed and constructed in accordance with the Unified Facility Criteria documents, Unified Facility Guide Specifications and military criteria and guidance documents. This will ensure energy efficient, water conserving and cost effective facilities are provided that meet mission requirements and are in compliance with Public Laws, Executive Orders, Federal Regulations and similar mandates."

1-6.31 **Chapter 30 – ELEVATORS AND CONVEYING SYSTEMS.** ITG 01-01, *Interim Technical Guidance Elevator Design* supersedes Chapter 30 wherever applicable.

1-6.32 **Chapter 31 - SPECIAL CONSTRUCTION.** Use entire chapter except Sections 3107 and 3108.

1-6.33 **Chapter 32 - ENCROACHMENT INTO THE PUBLIC RIGHT-OF-WAY.** Delete.

1-6.34 **Chapter 33 - SAFEGUARDS DURING CONSTRUCTION.** Delete.

1-6.35 **Chapter 34 - EXISTING STRUCTURES.** Delete entire chapter and refer to *MIL-HDBK-1008/C and ASCE 11-99, *Guidelines for Structural Condition Assessment of Existing Buildings*. Use ASCE 11-99 to conduct structural condition assessment of existing buildings prior to major additions, alterations or repairs.

1-6.36 **Chapter 35 - REFERENCED STANDARDS.** Use the chapter.

1-6.37 **Appendixes A, B, D, E, G, and J.** Delete.

1-6.38 **Appendix H - SIGNS.** Delete Appendix H. Follow the requirements of ADAAG and individual signage publications for each military service.

APPENDIX A

REFERENCES

GOVERNMENT PUBLICATIONS:

1. Unified Facilities Criteria

http:/criteria.navfac.navy.mil/criteria

http:/www.hnd.usace.army.mil/techinfo/index.asp

**UFC 4-010-01, Minimum Antiterrorism Standards for Buildings. (This UFC is due to be published 1 Aug 2002. For questions, please contact the preparing activity.)

2. Naval Facilities Engineering Command (NAVFAC)
1510 Gilbert Street
Norfolk, VA 23511-2669

http://criteria.navfac.navy.mil/criteria
http://www.nfesc.navy.mil

ITG 01-01, Interim Technical Guidance Elevator Design

*MIL-HDBK-1008C, Fire Protection for Facilities Engineering, Design and Construction. (Will be replaced by UFC 3-600-01, Fire Protection for Facilities Engineering, Design and Construction, September 2002. For questions, please contact the preparing activity.)

MIL-HDBK-1013/12, Evaluation and Selection Analysis of Security Glazing for Protection Against Ballistic, Bomb, and Forced Entry Tactics. (Restricted access. Contact your government sponsor if required.)

***DM 7.2, Foundations and Earth Structures. (This Design Manual is due to be replaced by UFC 3-220-01, Geotechnical Engineering by the end of calendar year 2002. For questions, please contact the preparing activity.)

Technical Report, TR-2069-SHR, Design Criteria for Earthquake Hazard mitigation of Navy Piers and Wharves, February 1987.

3. U.S. Army Corps of Engineers (USACE)
4820 University Square,
Huntsville, Al, 35816

Technical Instruction 800-01, Design Criteria

Technical Instruction 809-04, Seismic

http://www.hnd.usace.army.mil/techinfo/index.asp	Design for Buildings Technical Instruction 809-29, Structural Considerations for Metal Roofing Technical Instruction 809-53, Commentary on Roofing Systems
4. National Archives and Records Administration (NARA) gpoaccess@gpo.gov Telephone (202) 512-1530 Toll Free (888) 293-6498 Fax (202) 512-1262	Public Law 104-113, National Technology Transfer and Advancement Act of 1995
5. http://www.access-board.gov/ufas/ufas-html/ufas.htm	Uniform Federal Accessibility Standards (UFAS)
6. http://www.access-board/adaag/html/adaag.htm	Americans with Disabilities Act Accessibility Guidelines for Building and Facilities (ADAAG)

NON-GOVERNMENT PUBLICATIONS:

1. International Code Council (ICC) 5203 Leesburg Pike, Suite 600 Falls Church, VA 22041 (703) 931-4533 (703) 379-1546 fax http://www.intlcode.org/	International Building Code (IBC) 2000
2. National Fire Protection Association (NFPA) 1 Batterymarch Park P.O. Box 9101 Quincy, MA 02269-9101 (617) 770-3000 www.nfpa.org	NFPA 70, National Electrical Code NFPA 54, National Fuel Gas Code
3. ASTM International 100 Barr Harbor Drive PO Box C700 West Conshohocken, PA 19428-2959	ASTM E336-97, Standard Test Method for Measurement of Airborne Sound Insulation in Buildings ASTM E1007-97, Standard Test Method

www.astm.org	for field Measurement of Tapping Machine Impact Sound Through Floor-Ceiling Assemblies and Associated Support Structure ASTM E90-99, Standard Test Method for Laboratory Measurement of Sound Transmission Loss of Building Partition Elements. ASTM E492-90, Standard Test Method for Laboratory Measurement of Sound Transmission Loss Through Floor-Ceiling Assemblies Using the Tapping Machine
4. American Society of Civil Engineers 1801 Alexander Bell Drive Reston, Virginia 20191-4400 1-800-548-2723 toll free (703) 295-6300 international (703) 295-6222 fax (703) 295-6444 faxback http://www.asce.org	ASCE 7, Minimum Design Loads for Buildings and Other Structures. ASCE 11-99, Guidelines for Structural Condition Assessment of Existing Buildings.
5. National Roofing Contractors Association (NRCA) 10255 W. Higgins Road, Suite 600, Rosemont, IL 60018 (847) 299-9070; fax (847) 299-1183; e-mail nrca@nrca.net http://www.nrca.net/	*Roofing and Waterproofing Manual*, 5th Edition, 2001

APPENDIX B

Wind Parameters (as published in ITG 01-2, *Minimum Design Loads for Buildings and Other Structures*)

ID	Name	Ground Snow Load (PSF)	Frost Penetration (in)	Basic Wind Speed (MPH)
1	Woomera, Australia	0	0	80
2	Chievres, Belgium	15	25	115
3	Manama, Bahrain	0	5	80
4	Guantanamo Bay, Cuba	0	5	90
5	Copenhagen, Denmark	25	35	90
6	Diego Garcia, Diego Garcia	0	5	105
7	Stuttgart, Germany	25	40	60
8	Heidelberg, Germany	25	30	60
9	Bad Kreuznach, Germany	25	30	60
10	Grefrath, Germany	25	20	60
11	Wuerzburg, Germany	25	35	60
12	Grafenwoehr, Germany	25	5	60
13	Hanau, Germany	25	25	60
14	Berchtesgaden, Germany	30	50	60
15	Landstuhl, Germany	25	40	60
16	Spangdahlem, Germany	25	35	60
17	Crete, Greece	5	5	85
18	Thule, Greenland	25	255	130
19	Agana Fleet Activities, Guam	0	5 (1)	155(2)
20	Agana Ship Repair, Guam	0	5(1)	155(2)
21	Agana Anderson AFB, Guam	0	5(1)	155(2)
22	Keflavik, Iceland	25	50	110
23	Vicenzia, Italy	35	25	80
24	Gaeta, Italy	20	5	80
25	La Maddalena, Italy	20	5	80
26	Naples, Italy	20	5	80
27	Sigonella, Italy	20	5	80
28	Pordenone, Italy	35	25	80
29	Atsugi, Japan	15	25(3)	120
30	Iwakuni, Japan	0	10(3)	120
31	Sagamihara, Japan	10	5(3)	110
32	Okinawa, Japan	0	5(3)	110
33	Naha, Japan	0	5(3)	110
34	Koza City, Japan	0	5(3)	110
35	Misawa, Japan	40	50(3)	110
36	Tokyo, Japan	10	5(3)	110
37	Sasebo, Japan	10	5(3)	100
38	Atsugi, Japan	20	25(3)	120

ID	Name	Ground Snow Load (PSF)	Frost Penetration (in)	Basic Wind Speed (MPH)
39	Yokosuka NCTC, Japan	20	5(3)	110
40	Yokosuka CFA, Japan	20	5(3)	110
41	Yokosuka Ship Repair, Japan	20	5(3)	110
42	Teague, Korea	20	40(4)	110
43	Pyongtaek, Korea	20	50(4)	100
44	Uijongbu, Korea	20	45(4)	105
45	Seoul, Korea	20	45(4)	105
46	Chinhae, Korea	20	15(4)	105
47	Kunsan, Korea	20	30(4)	100
48	Songtan, Korea	20	50(4)	95
49	Port Lyautey, Morocco	0	5	85
50	Schirmen, Netherlands	15	20	80
51	Antarctica	30	190	105
52	Balboa, Panama	0	5	110
53	Panama City, Panama	0	5	90
54	Colon, Panama	0	5	95
55	Galeta Island, Panama	0	5	90
56	Panama Canal, Panama	0	5	110
57	Terceira, Portugal-Azores	0	5	120
58	Guaynaba, Puerto Rico	0	5	120(5)
59	San Juan, Puerto Rico	0	5	120(5)
60	Sabana Seca, Puerto Rico	0	5	120(5)
61	Roosevelt Roads, Puerto Rico	0	5	140(5)
62	Rota, Spain	5	5	85
63	Adana, Turkey	0	5	70
64	Diyarbakir, Turkey	15	25	105
65	Southampton, England	15	10	85
66	London, England	15	15	100
67	Edzell, England	15	25	85
68	Croughton, England	15	15	100
69	Lakenheath, England	15	15	100
70	Mildenhall, England	15	15	100
71	Antigua, Virgin Islands	0	5	140(6)

Notes:
(1) No frost in Guam or Diego Garcia. Need to identify as minimum footing depth.
(2) ASCE 7 recommends 170 m.p.h. Use ASCE value.
(3) Need to confirm large variance in frost penetration for Japan.
(4) Need to confirm large variance in frost penetration for Korea.
(5) ASCE 7 recommends 145 m.p.h. Use ASCE value.
(6) ASCE 7 recommends 145 m.p.h. Use ASCE value.

APPENDIX C

Seismic Parameters

			S_s	S_1
AFRICA	ALGERIA	Alger	1.24	0.56
		Olan	1.24	0.56
	ANGOLA			
		Luanda	0.06	0.06
	BENIN			
		Cotonou	0.06	0.06
	BOTSWANA			
		Gaborone	0.06	0.06
	BURUNDI			
		Bujumbura	1.24	0.56
	CAMEROON			
		Douala	0.06	0.06
		Yaounde	0.06	0.06
	CAPE VERDE			
		Praia	0.06	0.06
	CENTRAL AFRICAN REPUBLIC			
		Bangui	0.06	0.06
	CHAD			
		Ndjamena	0.06	0.06
	CONGO			
		Brazzaville	0.06	0.06
	DJIBOUTI			
		Djibouti	1.24	0.56
	EGYPT			
		Alexandria	0.62	0.28
		Cairo	0.62	0.28
		Port Said	0.62	0.28
	EQUATORIAL GUINEA			
		Malabo	0.06	0.06
	ETHIOPIA			
		Addis Ababa	1.24	0.56
		Asmara	1.24	0.56
	GABON			
		Libreville	0.06	0.06
	GAMBIA			
		Banjul	0.06	0.06
	GHANA			
		Accra	1.24	0.56
	GUINEA			
		Bissau	0.31	0.14
		Conakry	0.06	0.06
	IVORY COAST			
		Abidijan	0.06	0.06
	KENYA			
		Nairobi	0.62	0.28

	LESOTHO			
		Maseru	0.62	0.28
	LIBERIA			
		Monrovia	0.31	0.14
	LIBYA			
		Tripoli	0.62	0.28
		Wheelus AFB	0.62	0.28
	MALAGASY REPUBLIC			
		Tananarive	0.06	0.06
	MALAWI			
		Blantyre	1.24	0.56
		Lilongwe	1.24	0.56
		Zomba	1.24	0.56
	MALI			
		Bamako	0.06	0.06
	MAURITANIA			
		Nouakchott	0.06	0.06
	MAURITIUS			
		Port Louis	0.06	0.06
	MOROCCO			
		Casablanca	0.62	0.28
		Port Lyautey	0.31	0.14
		Rabat	0.62	0.28
		Tangier	1.24	0.56
	MOZAMBIQUE			
		Maputo	0.62	0.28
	NIGER			
		Niamey	0.06	0.06
	NIGERIA			
		Ibadan	0.06	0.06
		Kaduna	0.06	0.06
		Lagos	0.06	0.06
	REPUBLIC OF RWANDA			
		Kigali	1.24	0.56
	SENEGAL			
		Dakar	0.06	0.06
	SEYCHELLES			
		Victoria	0.06	0.06
	SIERRA LEONE			
		Freetown	0.06	0.06
	SOMALIA			
		Mogadishu	0.06	0.06
	SOUTH AFRICA			
		Cape Town	1.24	0.56
		Durban	0.62	0.28
		Johannesburg	0.62	0.28
		Natal	0.31	0.14
		Pretoria	0.62	0.28
	SWAZILAND			
		Mbabane	0.62	0.28
	TANZANIA			
		Dar es Salaam	0.62	0.28

		Zanzibar	0.62	0.28
	TOGO			
		Lome	0.31	0.14
	TUNISIA			
		Tunis	1.24	0.56
	UGANDA			
		Kampala	0.62	0.28
	UPPER VOLTA			
		Ougadougou	0.06	0.06
	ZAIRE			
		Bukavu	1.24	0.56
		Kinshasa	0.06	0.06
		Lubumbashi	0.62	0.28
	ZAMBIA			
		Lusaka	0.62	0.28
	ZIMBABWE			
		Harare		
ASIA	AFGHANISTAN			
		Kabul	1.65	0.75
	BAHRAIN			
		Manama	0.25	0.10
	BANGLADESH			
		Dacca	1.24	0.56
	BRUNEI			
		Bandar Seri Begawan	0.31	0.14
	BURMA			
		Mandalay	1.24	0.56
		Rangoon	1.24	0.56
	CHINA			
		Canton	0.62	0.28
		Chengdu	1.24	0.56
		Nanking	0.62	0.28
		Peking	1.65	0.75
		Shanghai	0.62	0.28
		Shengyang	1.65	0.75
		Tibwa	1.65	0.75
		Tsingtao	1.24	0.56
		Wuhan	0.62	0.28
	CYPRUS			
		Nicosia	1.24	0.56
	HONG KONG			
		Hong Kong	0.62	0.28
	INDIA			
		Bombay	1.24	0.56
		Calcutta	0.62	0.28
		Madras	0.31	0.14
		New Delhi	1.24	0.56
	INDONESIA			
		Bandung	1.65	0.75
		Jakarta	1.65	0.75
		Medan	1.24	0.56

		Surabaya	1.65	0.75
	IRAN			
		Isfahan	1.24	0.56
		Shiraz	1.24	0.56
		Tabriz	1.65	0.75
		Tehran	1.65	0.75
	IRAQ			
		Baghdad	1.24	0.56
		Basra	0.31	0.14
	ISRAEL			
		Haifa	1.24	0.56
		Jerusalem	1.24	0.56
		Tel Aviv	1.24	0.56
	JAPAN			
		Fukuoka	1.24	0.56
		Itazuke AFB	1.24	0.56
		Misawa AFB	1.24	0.56
		Naha, Okinawa	1.65	0.75
		Osaka/Kobe	1.65	0.75
		Sapporo	1.24	0.56
		Tokyo	1.65	0.75
		Wakkanai	1.24	0.56
		Yokohama	1.65	0.75
		Yakota	1.65	0.75
	JORDAN			
		Amman	1.24	0.56
	KOREA			
		Kwangju	0.31	0.14
		Kimhae	0.31	0.14
		Pusan	0.31	0.14
		Seoul	0.06	0.06
	KUWAIT			
		Kuwait	0.31	0.14
	LAOS			
		Vientiane	0.31	0.14
	LEBANON			
		Beirut	1.24	0.56
	MALAYSIA			
		Kuala Lumpur	0.31	0.14
	NEPAL			
		Kathmandu	1.65	0.75
	OMAN			
		Muscat	0.62	0.28
	PAKISTAN			
		Islamabad	1.68	0.75
		Karachi	1.65	0.75
		Lahore	0.62	0.28
		Peshawar	1.65	0.75
	QUATAR			
		Doha	0.06	0.06
	SAUDI ARABIA			

		Al Batin	0.31	0.14
		Dhahran	0.31	0.14
		Jiddah	0.62	0.28
		Khamis Mushayf	0.310.14	
		Riyadh	0.06	0.06
	SINGAPORE			
		All	0.31	0.14
	SOUTH YEMEN			
		Aden City	1.24	0.56
	SRI LANKA			
		Colombo	0.06	0.06
	SYRIA			
		Allepo	1.24	0.56
		Damascus	1.24	0.56
	TAIWAN			
		All	1.65	0.75
	THAILAND			
		Bangkok	0.31	0.14
		Chinmg Mai	0.62	0.28
		Dongkhia	0.06	0.06
		Udorn	0.31	0.14
	TURKEY			
		Adana	0.62	0.28
		Ankara	0.62	0.28
		Istanbul	1.65	0.75
		Izmir	1.65	0.75
		Karamursel	1.24	0.56
	UNITED ARAB EMIRATES			
		Abu Dhabi	0.06	0.06
		Dubai	0l.06	0.06
	VIETNAM			
		Ho Chi Minh City		
		(Saigon)	0.06	0.06
	YEMEN ARAB REPUBLIC			
		Sanaa	1.24	0.56
ATLANTIC OCEAN AREA	AZOREA			
		All	0.62	0.28
	BURMUDA			
		All	0.31	0.14
CARIBBEAN SEA	BAHAMA ISLANDS			
		All	0.31	0.14
	CUBA			
		All	0.62	0.28
	DOMINICAN REPUBLIC			
		Santo Domingo	1.24	0.56
	FRENCH WEST INDIES			
		Martinique	1.24	0.56
	GRENADA			
		Saint Georges	1.24	0.56

	HAITI			
		Port au Prince	1.24	0.56
	JAMAICA			
		Kingston	1.24	0.56
	LEEWARD ISLANDS			
		All	1.24	0.56
	TRINADAD AND TOBAGO			
		All	1.24	0.56
CENTAL AMERICA	BELIZE			
		Beimopan	0.26	0.28
	CANAL ZONE			
		All	0.62	0.28
	COSTA RICA			
		San Jose	12.4	0.56
	EL SALVADORE			
		San Salvador	1.65	0.75
	GUATEMALA			
		Guatemala	1.65	0.75
	HONDURAS			
		Tegucigalpa	1.24	0.56
	NICARAGUA			
		Managua	1.65	0.75
	PANAMA			
		Colon	1.24	0.56
		Galeta	0.83	0.38
		Panama	1.24	0.56
	MEXICO			
		Ciudad Juarez	0.62	0.28
		Guadalajara	1.24	0.56
		Hermosillo	1.24	0.56
		Matamoros	0.06	0.06
		Mazatlan	0.60	0.28
		Merida	0.06	0.06
		Mexico City	1.24	0.56
		Monterrey	0.06	0.06
		Nuevo Laredo	0.06	0.06
		Tijuana	1.24	0.56
EUROPE	ALBANIA			
		Tirana	1.24	0.56
	AUSTRIA			
		Salzburg	0.62	0.28
		Vienna	0.62	0.28
	BELGIUM			
		Antwerp	0.31	0.14
		Brussels	0.62	0.28
	BULGARIA			
		Sofia	1.24	0.56
	CZECH REPUBLIC			
		Prague	0.31	0.14
	DENMARK			
		Copenhagen	0.31	0.14

	FINLAND			
		Helsinki	0.31	0.14
	FRANCE			
		Bordeaux	0.62	0.28
		Lyon	0.31	0.14
		Marseille	1.24	0.56
		Nice	1.24	0.56
		Strasbourg	0.62	0.28
	GERMANY, FEDERAL REPUBLIC			
		Berlin	0.06	0.06
		Bonn	0.62	0.28
		Bremen	0.06	0.06
		Dusseldorf	0.31	0.14
		Frankfurt	0.62	0.28
		Hamburg	0.06	0.06
		Munich	0.31	0.14
		Stuttgart	0.62	0.28
		Vaihigen	0.62	0.28
	GREECE			
		Athens	1.24	0.56
		Kavalla	1.65	0.75
		Makri	1.65	0.75
		Rhodes	1.24	0.56
		Souda Bay	1.65	0.75
		Thessaloniki	1.65	0.75
	HUNGARY			
		Budapest	0.62	0.28
	ICELAND			
		Keflavik	1.0	0.40
		Reykjavik	1.65	0.75
	IRELAND			
		Dublin	0.06	0.06
	ITALY			
		Aviano AFG	1.24	0.56
		Brindisi	0.06	0.06
		Florence	1.24	0.56
		Gaeta	0.50	0.21
		Genoa	1.24	0.56
		La Maddalena	0.22	0.09
		Milan	0.62	0.28
		Naples	0.67	0.27
		Palermo	1.24	0.56
		Rome	0.62	0.28
		Sicily	1.20	0.31
		Trieste	1.24	0.56
		Turin	0.62	0.28
	LUXEMBOURG			
		Luxembourg	0.31	0.14
	MALTA			
		Valletta	0.62	0.28
	NETHERLANDS			
		All	0.06	0.06

	NORWAY			
		Oslo	0.62	0.28
	POLAND			
		Krakow	0.62	0.28
		Poznan	0.31	0.14
		Waraszawa	0.31	0.14
	PORTUGAL			
		Lisbon	1.65	0.75
		Oporto	1.24	0.56
	ROMANIA			
		Bucharest	1.24	0.56
	SLOVAK REPUBLIC			
		Bratislava	0.62	0.28
	SPAIN			
		Barcelona	0.62	0.28
		Bilbao	0.62	0.28
		Madrid	0.06	0.06
		Rota	0.75	0.30
		Sevilla	0.62	0.28
	SWEDEN			
		Goteborg	0.62	0.28
		Stockholm	0.31	0.14
	SWITZERLAND			
		Bern	0.62	0.28
		Geneva	0.31	0.14
		Zurich	0.62	0.28
	UNITED KINGDOM			
		Belfast	0.06	0.06
		Edinburgh	0.31	0.14
		Edzell	0.31	0.14
		Glasgow/Renfrew	0.31	0.14
		Hamilton	0.31	0.14
		Liverpool	0.31	0.14
		London	0.125	0.025
		Londonderry	0.31	0.14
		St. Mawgan	0.20	0.04
		Thurso	0.31	0.14
	USSR			
		Kiev	0.06	0.06
		Leningrad	0.06	0.06
		Moscow	0.06	0.06
	YUGOSLAVIA			
		Belgrade	0.62	0.28
		Zagreb	1.24	0.56
NORTH AMERICA	GREENLAND			
		All	0.31	0.14
	CANADA			
		Argentina NAS	0.62	0.28
		Calgary, Alb	0.31	0.14
		Churchill, Man	0.06	0.06

		Cold Lake, Alb	0.31	0.14
		Edmonton, Alb	0.31	0.14
		E. Harmon, AFB	0.62	0.28
		Fort Williams, Ont	0.06	0.06
		Frobisher N.W. Ter	0.06	0.06
		Goose Airport	0.31	0.14
		Halifax	0.31	0.14
		Montreal, Quebec	1.24	0.56
		Ottawa, Ont	0.62	0.28
		St. Johns Nfld	1.24	0.56
		Toronto, Ont	0.31	0.14
		Vancouver	1.24	0.56
		Winnepeg, Man	0.31	0.14
SOUTH AMERICA	ARGENTINA			
		Buenos Aires	0.25	0.10
	BRAZIL			
		Belem	0.06	0.06
		Belo Horizonte	0.06	0.06
		Brasilia	0.06	0.06
		Manaus	0.06	0.06
		Porto Allegre	0.06	0.06
		Recife	0.06	0.06
		Rio de Janeiro	0.06	0.06
		Salvador	0.06	0.06
		San Paulo	0.31	0.14
	BOLIVIA			
		La Paz	1.24	0.56
		Santa Cruz	0.31	0.14
	CHILE			
		Santiago	1.65	0.75
		Valparaiso	1.65	0.75
	COLOMBIA			
		Bogotá	1.24	0.56
	ECUADOR			
		Quito	1.65	0.75
		Guayaquil	1.24	0.56
	PARAQUAY			
		Asuncion	0.06	0.06
	PERU			
		Lima	1.65	0.75
		Plura	1.65	0.75
	URUGUAY			
		Montevideo	0.06	0.06
	VENEZUELA			
		Maracaibo	0.62	0.28
		Caracas	1.65	0.75
PACIFIC OCEAN AREA	AUSTRALIA			
		Brisbane	0.31	0.14
		Canberra	0.31	0.14
		Melbourne	0.31	0.14

		Perth	0.31	0.14
		Sydney	0.31	0.14
	CAROLINE ISLANDS			
		Koror, Paulau Is	0.62	0.28
		Ponape	0.06	0.06
	FIJI			
		Suva	1.24	0.56
	JOHNSON ISLAND			
		All	0.31	0.14
	MARIANA ISLANDS			
		Saipan	1.24	0.56
		Tinian	1.24	0.56
	MARSHAL ISLANDS			
		All	0.31	0.14
	NEW ZEALAND			
		Auckland	1.24	0.56
		Wellington	1.65	0.75
	PAPAU NEW GUINEA			
		Port Moresby	1.24	0.56
	PHILLIPINE ISLANDS			
		Cebu	1.65	0.75
		Manila	1.65	0.75
		Baguio	1.24	0.56
	SAMOA			
		All	1.24	0.56
	WAKE ISLAND			
		All	0.06	0.06

Alaska Department of Environmental Conservation (ADEC) Coordination

Contact Information

ADEC Website – http://www.state.ak.us/dec/

Water/Wastewater - Fairbanks

Lee Johnson
State of Alaska
Department of Environmental Conservation
Northern Drinking Water/Wastewater Program
610 University Avenue
Fairbanks, Alaska 99709-3643
(907) 451-2179

Water/Wastewater - Anchorage

William Rieth
State of Alaska
Department of Environmental Conservation
Drinking Water and Wastewater Program
555 Cordova Street
Anchorage, Alaska 99501
(907) 269-7519

Storm Water – Statewide

Greg Drzewiecki
State of Alaska
Department of Environmental Conservation
Division of Air and Water Quality
555 Cordova Street
Anchorage, Alaska 99501
(907) 269-7692

Wastewater (Submitted in accordance with 18 AAC 72.205)

- In house designs are submitted to ADEC by the Civil/Sanitary Section. Prior to package submittal the Civil Engineer provides the PM with an Owner's Statement. Fill in the Project No. (UPC) and Project Name. The PM is to get the User to sign the statement and provide the copy to the Civil Engineer to include in the submittal to ADEC. Submit the 95% package for review. Expect 30 days for ADEC review.

- AE designs are submitted to ADEC by the AE firm. The PM is to provide a signed Owner's Statement to the AE to include in the submittal to ADEC.

- Note: ADEC does not require package submittal for single service line connections. Any change to the distribution line or a new system must be submitted for approval.

- This first step is to get the Approval to Construct Certificate. This certificate is valid for 90 days beyond project completion. For Operational Approval, the Contractor must submit:
  1. A set of record drawings showing any changes made during construction.
  2. A completed Certification of Construction Form.
  3. A copy of the Operation and Maintenance manuals.
  4. Verification that onsite personnel have been training in O&M procedures.
  5. A copy of the percolation test conducted for the domestic wastewater drain field, if applicable.
  6. Verification that sand in the sand bed meets the requirements of 18 AAC 72.260(a)(4)(D), if applicable.

<u>Domestic Water</u> (Submitted in accordance with 18 AAC 80.200)

- In house designs are submitted to ADEC by the Civil/Sanitary Section. Submit the 95% package for review. Expect 30 days for ADEC review.
  1. A completed New Class A Public Water Systems Plan Approval Checklist for Engineering Plans must be filled out and submitted with the plans, if applicable.
  2. A completed Inventory and Source Registration Form for Class C Public Water Systems must be filled out and submitted with the plans, if applicable.

- AE designs have the same submittal requirements as in house.

- This first step is to get the Approval to Construct Certificate. This certificate is valid for 90 days beyond project completion. For Operational Approval the Contractor must submit:
  1. A set of record drawings showing any changes made during construction.
  2. A completed Certification of Construction Form.
  3. A copy of the Operation and Maintenance manuals.
  4. Verification that onsite personnel have been training in O&M procedures.
  5. A copy of all pressure testing and bacteriological sample results confirming all lines altered during construction were properly disinfected and flushed prior to being put into use.

<u>Storm Water</u> (Submitted in accordance with 18 AAC 72)

- If the site is less than 1 acre, no special review is required.

- If the site is between 1 and 5 acres, a review is required, but no special specification if the drainage pattern is not being substantially changed. Submit the 95% package for review. Expect 30 days for ADEC review.

- If the site is over one acre and the drainage is being substantially changed a National Pollutant Discharge Elimination System (NPDES) form is required. The Civil Engineer must fill out Sections B and C of EPA Form 3510-9 – Notice of Intent (NOI) for Storm Water Discharge Associated with Industrial or Construction Activity Under the Multi-sector NPDES General Permit. The form is attached to Spec Section 01356 Storm Water Pollution Prevention Measures. Have Specifications Section delete the paragraph in 01015 SPECIAL ITEMS on NPDES. The Civil Engineer must edit specification 01356 STORM WATER POLLUTION PREVENTION MEASURES, by adding the following.

    1. The Contractor prepares a Storm Water Pollution Prevention Plan (SWPPP) and submits to the Contracting Officer.
    2. The Contractor completes the Sections of the Form 3510-9 and submits to the Contracting Officer with SWPPP, one page description of the project, a copy of the civil drawings, and prepaid mailing envelopes, for the whole package, to the Contracting Officer for approval.
    3. Upon receipt of satisfactory submittal from the Contractor, the Resident Engineer will promptly complete a separate Form 3510-9, for the Government, and forward both the Contractor-prepared and Resident Engineer-prepared forms to the NPDES Program Director. In accordance with applicable requirements, no onsite work shall be performed until two days after the documents have been post marked, notwithstanding any other provisions of the contract.
    4. The Government will forward copies of both Form 3510-9's, along with the SWPPP, the one-page project description, and civil drawings to ADEC. The Contractor shall pay all fees required for review.
    5. Upon completion of work at the project site, the Contractor shall prepare Form 3510-13, Notice of Termination of Coverage Under the NPDES General Permit for Storm Water Discharges Associated with Industrial Activity. The completed form and prepaid mailing envelopes shall be submitted to the Contracting Officer within 10 days after the earliest date that final site conditions meet filing requirements. The Resident Engineer will promptly complete a separate Form 3510-13, for the Government. The Government will forward both forms to the NPDES Program Director.

The text that I used in my last project requiring NPDES looked like this:

1.5 NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
Work shall comply with EPA NPDES General Permit. Reference website at

http://cfpub.epa.gov/npdes/stormwater/cgp.cfm for permit, required forms, and guidance documents.

1.5.1 Storm Water Pollution Prevention Plan (SWPPP) Storm Water Pollution Prevention Plan (SWPPP) in accordance with the Environmental Protection Agency's NPDES General Permits for Storm Water Discharge from Construction Activities published in the Federal Register July 1, 2003, pages 39087 - 39091. The Contractor is also responsible for compliance with any updates and changes to this permit. The Contracting Officer will retain authority assigned therein to the State. The SWPP shall be submitted to the Contracting Officer for review and approval.

1.5.2 Notice of Intent for Storm Water Discharge (NOI) The Contractor shall complete EPA Form 3510-9, Notice of Intent for Storm Water Discharges Associated with Construction Activity Under a NPDES General Permit, in accordance with EPA instructions and requirements. The contractor shall be responsible for determining the proper coordinates to use on Form 3510-9 and entering those coordinates in the right format. The Contractor shall complete the form, and submit it, along with the SWPPP, a one page description of the project, a copy of the Civil Drawings, and prepaid mailing envelopes for the whole package, one addressed to the NPDES Program Director and the other addressed to the Alaska Department of Environmental Conservation, to the Contracting Officer for review

1.5.3 Filing Upon receipt of satisfactory submittal from the Contractor, the Resident Engineer will promptly complete a separate 3510-9, for the Government, and forward both the Contractor-prepared and Resident Engineer-prepared forms to the NPDES Program Director. In accordance with applicable requirements, no onsite work shall be performed until two days after the documents have been post marked, notwithstanding any other provisions of the contract. The Government will forward copies of both Form 3510-9's, along with the SWPPP, the one-page project description, and civil drawings to the Alaska Department of Environmental Conservation (ADEC) in accordance with State of Alaska regulations. The Contractor shall pay all fees required for review in accordance with 18 AAC 72.

1.5.4 Notice of Termination of Coverage (NOT) Upon completion of work at the project site, the Contractor shall prepare EPA Form 3510-13, Notice of Termination of Coverage Under the NPDES General Permit for Storm Water Discharges Associated with Industrial Activity, in accordance with the regulations stated on the form. The completed form and prepaid mailing envelopes shall be submitted to the Contracting Officer within 10 days after the earliest date that final site conditions meet filing requirements. The Resident Engineer will promptly complete a separate 3510-13 for the Government. The Government will forward both forms to the NPDES Program Director.

Attached Forms:

- Owner’s Statement

- New Class A Public Water Systems Plan Approval Checklist for Engineering Plans
- Inventory and Source Registration Form for Class C Public Water Systems
- EPA Form 3510-9, Notice of Intent (NOI) for Storm Water Discharge Associated with Construction or Industrial Activity Under the Multi-sector NPDES General Permit
- EPA Form 3510-13, Notice of Termination of Coverage Under the NPDES General Permit for Storm Water Discharges Associated with Industrial Activity

This Form Replaces Form 3510-9 (8-98)
Refer to the Following Pages for Instructions

Form Approved OMB Nos. 2040-0188 and 2040-0211

NPDES Form

United States Environmental Protection Agency
Washington, DC 20460

Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity Under an NPDES General Permit

Submission of this Notice of Intent (NOI) constitutes notice that the party identified in Section II of this form requests authorization to discharge pursuant to the NPDES Construction General Permit (CGP) permit number identified in Section I of this form. Submission of this NOI also constitutes notice that the party identified in Section II of this form meets the eligibility requirements of the CGP for the project identified in Section III of this form. Permit coverage is required prior to commencement of construction activity until you are eligible to terminate coverage as detailed in the CGP. To obtain authorization, you must submit a complete and accurate NOI form. Refer to the instructions at the end of this form.

I. Permit Number

II. Operator Information

Name:

IRS Employer Identification Number (EIN): -

Mailing Address:

Street:

City: State: Zip Code: -

Phone: - - Fax (optional): - -

E-mail (optional):

III. Project/Site Information

Project/Site Name:

Project Street/Location:

City: State: Zip Code: -

County or similar government subdivision:

Latitude/Longitude (Use one of three possible formats, and specify method)

Latitude
1. _ _° _ _ ´ _ _ ´´ N (degrees, minutes, seconds)
2. _ _° _ _ . _ _ ´ N (degrees, minutes, decimal)
3. _ _ . _ _ _ _° N (decimal)

Longitude
1. _ _ _° _ _ ´ _ _ ´´ W (degrees, minutes, seconds)
2. _ _ _° _ _ . _ _ ´ W (degrees, minutes, decimal)
3. _ _ _ . _ _ _ _° W (decimal)

Method: ☐ U.S.G.S. topographic map ☐ EPA web site ☐ GPS ☐ Other:
• If you used a U.S.G.S. topographic map, what was the scale: _____

Project Located in Indian country? ☐ Yes ☐ No
If so, name of Reservation or if not part of a Reservation, put "Not Applicable": _____

Estimated Project Start Date: / / (Month Date Year)

Estimated Project Completion Date: / / (Month Date Year)

Estimated Area to be Disturbed (to the nearest quarter acre): .

IV. SWPPP Information

Has the SWPPP been prepared in advance of filing this NOI? ☐ Yes ☐ No

Location of SWPPP for viewing: ☐ Address in Section II ☐ Address in Section III ☐ Other

If Other:

SWPPP Street: _____

City: _____

State: _____ Zip Code: _____ - _____

SWPPP Contact Information (if different than that in Section II):

Name: _____

Phone: _____ - _____ - _____ Fax (optional): _____ - _____ - _____

E-mail (optional): _____

V. Discharge Information

Identify the name(s) of waterbodies to which you discharge. _____

_____

Is this discharge consistent with the assumptions and requirements of applicable EPA approved or established TMDL(s)?

☐ Yes ☐ No

VI. Endangered Species Information

Under which criterion of the permit have you satisfied your ESA eligibility obligations?

☐ A ☐ B ☐ C ☐ D ☐ E ☐ F

- If you select criterion F, provide permit tracking number of operator under which you are certifying eligibility:

_____

VII. Certification Information

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name: _____

Print Title: _____

Signature: _____

Date: _____

Instructions for Completing EPA Form 3510-9

Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity Under an NPDES General Permit

NPDES Form This Form Replaces Form 3510-9 (8/98) Form Approved OMB Nos. 2040-0188 and 2040-0211

Who Must File an NOI Form

Under the provisions of the Clean Water Act, as amended (33 U.S.C. 1251 et.seq.; the Act), federal law prohibits storm water discharges from certain construction activities to waters of the U.S. unless that discharge is covered under a National Pollutant Discharge Elimination System (NPDES) Permit. Operator(s) of construction sites where one or more acres are disturbed, smaller sites that are part of a larger common plan of development or sale where there is a cumulative disturbance of at least one acre, or any other site specifically designated by the Director, must submit an NOI to obtain coverage under an NPDES general permit. Each person, firm, public organization, or any other entity that meets either of the following criteria must file this form: (1) they have operational control over construction plans and specifications, including the ability to make modifications to those plans and specifications; or (2) they have day-to-day operational control of those activities at the project necessary to ensure compliance with SWPPP requirements or other permit conditions. If you have questions about whether you need an NPDES storm water permit, or if you need information to determine whether EPA or your state agency is the permitting authority, refer to *www.epa.gov/npdes/stormwater/cgp* or telephone the Storm Water Notice Processing Center at (866) 352-7755.

Where to File NOI Form

See the applicable CGP for information on where to send your completed NOI form.

Completing the Form

Obtain and read a copy of the appropriate EPA Storm Water Construction General Permit for your area. To complete this form, type or print, using uppercase letters, in the appropriate areas only. Please place each character between the marks (abbreviate if necessary to stay within the number of characters allowed for each item). Use one space for breaks between words, but not for punctuation marks unless they are needed to clarify your response. If you have any questions on this form, refer to *www.epa.gov/npdes/stormwater/cgp* or telephone the Storm Water Notice Processing Center at (866) 352-7755. Please submit original document with signature in ink - do not send a photocopied signature.

Section I. Permit Number

Provide the number of the permit under which you are applying for coverage (see Appendix B of the general permit for the list of eligible permit numbers).

Section II. Operator Information

Provide the legal name of the person, firm, public organization, or any other entity that operates the project described in this application. An operator of a project is a legal entity that controls at least a portion of site operations and is not necessarily the site manager. Provide the employer identification number (EIN from the Internal Revenue Service; IRS), also commonly referred to as your taxpayer ID. If the applicant does not have an EIN enter "NA" in the space provided. Also provide the operator's mailing address, telephone number, fax number (optional) and e-mail address (if you would like to be notified via e-mail of NOI approval when available). Correspondence for the NOI will be sent to this address.

Section III. Project/Site Information

Enter the official or legal name and complete street address, including city, state, zip code, and county or similar government subdivision of the project or site. If the project or site lacks a street address, indicate the general location of the site (e.g., Intersection of State Highways 61 and 34). Complete site information must be provided for permit coverage to be granted.

The applicant must also provide the latitude and longitude of the facility either in degrees, minutes, seconds; degrees, minutes, decimal; or decimal format. The latitude and longitude of your facility can be determined in several different ways, including through the use of global positioning system (GPS) receivers, U.S. Geological Survey (U.S.G.S.) topographic or quadrangle maps, and EPA's web-based siting tools, among others. Refer to *www.epa.gov/npdes/stormwater/cgp* for further guidance on the use of these methodologies. For consistency, EPA requests that measurements be taken from the approximate center of the construction site. Applicants must specify which method they used to determine latitude and longitude. If a U.S.G.S. topographic map is used, applicants are required to specify the scale of the map used.

Indicate whether the project is in Indian country, and if so, provide the name of the Reservation. If the project is in Indian Country Lands that are not part of a Reservation, indicate "not applicable" in the space provided.

Enter the estimated construction start and completion dates using four digits for the year (i.e., 05/27/1998). Enter the estimated area to be disturbed including but not limited to: grubbing, excavation, grading, and utilities and infrastructure installation. Indicate to the nearest quarter acre. Note: 1 acre = 43,560 sq. ft.

Section IV. SWPPP Information

Indicate whether or not the SWPPP was prepared in advance of filing the NOI form. Check the appropriate box for the location where the SWPPP may be viewed. Provide the name,

Notice of Intent (NOI) for Storm Water Discharges Associated with Construction Activity Under an NPDES General Permit

NPDES Form This Form Replaces Form 3510-9 (8/98) Form Approved OMB Nos. 2040-0188 and 2040-0211

fax number (optional), and e-mail address (optional) of the contact person if different than that listed in Section II of the NOI form.

Section V. Discharge Information

Enter the name(s) of receiving waterbodies to which the project's storm water will discharge. These should be the first bodies of water that the discharge will reach. (Note: If you discharge to more than one waterbody, please indicate all such waters in the space provided and attach a separate sheet if necessary.) For example, if the discharge leaves your site and travels through a roadside swale or a storm sewer and then enters a stream that flows to a river, the stream would be the receiving waterbody. Waters of the U.S. include lakes, streams, creeks, rivers, wetlands, impoundments, estuaries, bays, oceans, and other surface bodies of water within the confines of the U.S. and U.S. coastal waters. Waters of the U.S. do not include man-made structures created solely for the purpose of wastewater treatment. U.S. Geological Survey topographical maps may be used to make this determination. If the map does not provide a name, use a format such as "unnamed tributary to Cross Creek". If you discharge into a municipal separate storm sewer system (MS4), you must identify the waterbody into which that portion of the storm sewer discharges. That information should be readily available from the operator of the MS4.

Indicate whether your storm water discharges from construction activities will be consistent with the assumptions and requirements of applicable EPA approved or established TMDL(s). To answer this question, refer to *www.epa.gov/npdes/stormwater/cgp* for state- and regional-specific TMDL information related to the construction general permit. You may also have to contact your EPA regional office or state agency. If there are no applicable TMDLs or no related requirements, please check the "yes" box in the NOI form.

Section VI. Endangered Species Information

Indicate for which criterion (i.e., A, B, C, D, E, or F) of the permit the applicant is eligible with regard to protection of federally listed endangered and threatened species, and designated critical habitat. See Part 1.3.C.6 and Appendix C of the permit. If you select criterion F, provide the permit tracking number of the operator under which you are certifying eligibility. The permit tracking number is the number assigned to the operator by the Storm Water Notice Processing Center after EPA acceptance of a complete NOI.

Section VII. Certification Information

All applications, including NOIs, must be signed as follows:

For a corporation: By a responsible corporate officer. For the purpose of this Section, a responsible corporate officer means: (i) a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long-term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.

For a partnership or sole proprietorship: By a general partner or the proprietor, respectively; or

For a municipality, state, federal, or other public agency: By either a principal executive officer or ranking elected official. For purposes of this Part, a principal executive officer of a federal agency includes (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrator of EPA).

Include the name and title of the person signing the form and the date of signing. An unsigned or undated NOI form will not be considered eligible for permit coverage.

Paperwork Reduction Act Notice

Public reporting burden for this application is estimated to average 3.7 hours. This estimate includes time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding the burden estimate, any other aspect of the collection of information, or suggestions for improving this form, including any suggestions which may increase or reduce this burden to: Chief, Information Policy Branch 2136, U.S. Environmental Protection, Agency, 1200 Pennsylvania Avenue, NW, Washington, D.C. 20460. Include the OMB control number on any correspondence. Do not send the completed form to this address.

DATE SUBMITTED: _____
PLAN REVIEW NUMBER: _____
FEE PAID: _____

NEW CLASS A PUBLIC WATER SYSTEM MANAGEMENT AND FINANCIAL ASSESSMENT APPLICATION

PART I GENERAL INFORMATION

A. Applicant: _____
(Water System or Utility Name)

Business Address: _____
(Street Address or Post Office Box)

_____
(City/State/Zip Code)

Business Telephone: _____
(Area Code/Telephone Number)

Facsimile: _____

B. Person to Be Contacted with Respect to this Application:

_____
(Name and Title)

_____
(Street Address or Post Office Box)

_____
(City/State/Zip Code)

_____
(Daytime Telephone Number – Area Code/Telephone Number)

_____
(Facsimile Number)

C. List any utilities or other entities, that you are aware are currently providing the same type of service in the area sought by this application.[1]

(1)_____	(2)_____
(Name)	(Name)
_____	_____
(Address)	(Address)
_____	_____
(Competing Service)	(Competing Service)
_____	_____
(Competing Service Area)	(Competing Service Area)

[1]Competing entities are those entities providing, or intending to provide, the same, or substantially the same, service or facility to any part of the requested service area.

D. Applicant is:

[ ]	Cooperative	[ ]	Privately-owned Corporation
[ ]	Individual	[ ]	Municipally-owned Utility
[ ]	Partnership	[ ]	Political Subdivision of the State
[ ]	Limited		
[ ]	General		
[ ]	Other: _____		

Date of Organization (if applicable): _____

E. List the owners of five percent (5%) or more of the applicant's equity:

_____ _____
(Name) % Ownership

_____
(Street Address/Post Office Box/City/State/Zip Code)

_____ _____
(Name) % Ownership

_____
(Street Address/Post Office Box/City/State/Zip Code)

_____ _____
(Name) % Ownership

_____
(Street Address/Post Office Box/City/State/Zip Code)

F. List all persons or entities which are affiliated interests of the applicant as defined in AS 42.05.990(1)(A)-(I):

_____
(Name)

_____
(Street Address/Post Office Box)

_____
(City/State/Zip Code)

_____
(Name)

_____
(Street Address/Post Office Box)

_____
(City/State/Zip Code)

G. The location of where the company books will be kept:

_____
(Street Address/Post Office Box)

_____
(City/State/Zip Code)

PART II GENERAL DOCUMENTS

Applicants must provide the following information in attachments numbered to correspond to the items below.

A. Key Management

List the names, titles, and responsibilities of all key management now employed, or to be employed, in the utility operation. Submit a resume for each person, including all prior background, education, and any other qualifications that may be useful to the operation of the utility.

If accurate, up-to-date resumes are on file with the Alaska Department of Environmental Conservation (ADEC), an applicant requesting a second construction or operation approval may satisfy this information requirement by submitting a statement to this effect.

B. Corporate or Partnership Documents

If the applicant is a corporation, enclose the following:

(1) Certificate of Incorporation
(2) Articles of Incorporation
(3) Bylaws

If the applicant is a partnership, enclose a copy of the partnership agreement.

If accurate, up-to-date corporate or partnership documents are on file with the ADEC, an applicant requesting a second construction or operation approval may satisfy this information requirement by submitting a statement to this effect.

C. Benefit to the Public

Explain in detail why the new or additional utility service is, or may be, required for managerial and financial capacity and state why any existing, similar service is insufficient or why overlapping approval is otherwise appropriate. Also, include the number and type of customers by geographic location that the applicant expects to serve. Explain how the customer estimates were derived.

D. Service Area Map

Attach a map clearly showing the boundary of the applicant's proposed service area using a U.S.G.S. topographical map, scale 1:63,360 (or 1:24,000 if available). In cases where

the proposed service area is less than one square mile, contact the ADEC staff to determine the appropriate map scale. Include a description of the area using townships and ranges. Location of all water sources will need to be clearly noted on the map.

E. Utility Practices and Procedures

Attach the proposed tariff or practices and procedures of the applicant, showing all of the rates, deposits, and charges associated with providing the proposed service to the general public and including the standard practices the applicant will follow when dealing with its customers (such as billing practices, conditions of disconnection, etc.). Applicants can refer to 3 AAC 48.200 – 3 AAC 48.420 for tariff requirements adopted by the Regulatory Commission of Alaska (RCA) or may contact the RCA or ADEC staff for samples of approved tariffs.

PART III TECHNICAL DOCUMENTS/INFORMATION

At a minimum, an applicant for a construction approval must provide the information required in Section A. Technical Capacity of the new Class A public water system plan review check list. This information must be submitted under the stamp of a registered engineer.

PART IV FINANCIAL INFORMATION

At a minimum, applicants must provide the following:

A. Financial Status

The applicant must provide the following historical financial information:

(1) if the applicant is an existing business which previously has not operated as a utility or has not been certificated to operate as a utility, copies of the most recent year's balance sheet and income statement for the existing business (preferably audited); or

(2) if the applicant is a new business which proposes to operate as a utility, copies of the most recent year's balance sheet and income statement for the principal owners of the business.

In addition, applicants must provide the following pro forma financial schedules:

(a) schedule of operating revenues (see attached Schedule 1);

(b) schedule of operating expenses (see attached Schedule 2);

(c) plant-in-service and depreciation schedule (see attached Schedule 3);

(d) computation of the utility's weighted cost of capital (see attached Schedule 4);

(e) computation of the utility's rate base and return (see attached Schedule 5);

(f) tax computation (see attached Schedule 6); and

(g) revenue requirement and calculation of proposed rates (see attached Schedule 7).

B. Sources of Financing

List the sources of the financing for the proposed utility or expansion of an existing utility. Include documentation showing that the sources listed will provide the applicant with the required funds. Include the terms and conditions of all loans and equipment contracts that may be relevant. If a portion or all of the plant is contributed, list the sources and conditions of all on-site and off-site assessments, grants, or other sources of funding.

PART V AUTHORIZATION

Verification of Application and Authorization of Notice

The undersigned hereby verifies the application and requests the ADEC to grant to the applicant a construction and/or operation approval for the proposed new Class A public water system.

DATED AT _____, Alaska, the _____ day of _____, 19___.

_____
Name of Applicant

By: _____
Principal Officer, Partner, or Owner

_____
Name and Title

_____
Address of Applicant

_____
City, State, Zip Code

SCHEDULES FOR FINANCIAL DATA

Schedules 1-3 refer to account numbers as defined by the Uniform System of Accounts (USOA) for utilities. Copies of the USOA applicable to the type and size of utility proposed in this application are set out in the Alaska Regulatory Commission's regulations at 3 AAC 48.277 and may be obtained from the Alaska Regulatory Commission. If possible, submit these schedules on an IBM PC compatible "Lotus 123" floppy disc. A pre-formatted "Lotus 123" floppy disc containing these schedules may be obtained from the Alaska Regulatory Commission.

	Instructions for Applicants Seeking Initial Certification for an Already Operating Utility	Instructions for Applicants Seeking Certification for a New Utility	Instructions for Applicants Seeking an Amendment to the Service Area of a Certificated Utility
SCHEDULE 1	List in Column III actual attained revenues for the most recent 12 month accounting period.	Leave Columns III and IV blank.	Leave Columns III and IV blank.
	List in Column IV an estimate for expected increases or decreases in revenues during the next 12 month accounting period. Provide an explanation for your estimates on a separate sheet.	List in Column V an estimate for total revenues expected during the next 12 month accounting period. Provide an explanation for your estimates on a separate sheet.	List in Column V an estimate for an increase (or decrease) in revenues caused by the proposed amendment at the end of the first normalized year of operation. Include figures for the amendment only, i.e., do not include revenue estimates for the already existing service area.
	List in Column V an estimate for total revenues expected during the next 12 month accounting period. Column V should be the sum of Columns III and IV.		
SCHEDULE 2	Repeat procedure described for Schedule 1 for expenses.	Repeat procedure described for Schedule 1 for expenses.	Repeat procedure described for Schedule 1 for expenses.
SCHEDULE 3	List plant that has been in service for the most recent 12 month accounting period. Columns IV, V, and VI should include the total plant figures, i.e., contributed and non-contributed. Columns VII, VIII, and IX should list figures for contributed plant only.	List plant that is expected to be in service at the end of the first normalized year of operation. Columns IV, V, and VI should include total plant figures, i.e., contributed and non-contributed. Columns VII, VIII, and IX should list figures for contributed plant only.	List plant that is expected to be added (or retired) as a result of the proposed amendment of certificate. Columns IV, V, and VI should include dollar figures for total plant additions or deletions, i.e., contributed and non-contributed, at the end of the first normalized year of operation. Columns VII, VIII and IX should list figures for contributed plant only.
SCHEDULE 4	Compute weighted costs of capital for utility. Leave Line 2A blank. Attach supplementary schedule listing all long-term debt obligations. Include all terms of each obligation, date it was incurred, interest rate, and repayment obligations.	Compute weighted costs of capital for each utility. Leave Line 2A blank. Attach supplementary schedule listing all long-term debt obligations. Include all terms of each obligation, date it was incurred, interest rate, and repayment obligations.	Compute weighted cost of capital for utility. Include on Line 2 all long-term debt prior to financing the proposed addition. Include on Line 2A any additional long-term debt incurred to finance the proposed addition. Attach supplementary schedule explaining all debt obligations included in Line 2A, their terms, dates incurred, interest rates, and repayment obligations. If applicable, explain any increases in equity related to financing the proposed addition.
SCHEDULES 5-7	Follow occupational instructions given on schedules.		

Department of Environmental Conservation
Division of Environmental Health
Drinking Water and Wastewater Program
555 Cordova St., Anchorage, AK 99501
Phone: (907) 269-7623

Alaska Public Water Systems Latitude/Longitude Data

Public Water System Name:	PWS ID #:
Name Of Person Determining Lat/Long:	**Phone:**
Water Source Name:	Date:

1) Facility Type. *(Check one)*

Well ☐ Intake of Surface Water or Spring Source ☐ Admin. Building (Use for haulers of purchased water **only**) ☐

2) The date the latitude and longitude were researched or collected. Example: 06/30/1999

☐☐ / ☐☐ / ☐☐☐☐

3) Latitude in decimal degrees. For Alaska, latitudes are between 51 and 80 North. Give data to available accuracy. *Example: +56.234230*

+ ☐☐ . ☐☐☐☐☐☐

4) Any Comments on Latitude/Longitude. (Optional)

5) Longitude in decimal degrees. For Alaska, longitudes are generally -126 to -180 West. The minus sign means "West." Use + for "East." *Example: -136.23423*

— ☐☐☐ . ☐☐☐☐☐☐

6) Method Of Determining Latitude & Longitude. *(Check one)*

GPS *Go to question #7* ☐ Map (Interpolation from a Topographical map) *Go to question #8* ☐

7) Lat/Long Accuracy In Meters. GPS accuracy is typically encoded in the unit's display. Estimated accuracy is acceptable. The assumed datum is WGS 84. If another datum is used, please specify. *Example: 30. (meters)*

☐☐☐☐☐ . Meters

8) Scale Of Topographical Map Used. *(Pick one from scales below)* ☐

If GPS Used

U: Scale Not Applicable To GPS

Ranges for Map Scale

1: >= 1:500
2: 1:501- 1:5,000
3: 1:5,001 - 1:10,000
4: 1:10,001 - 1:15,000
5: 1:15,001 - 1:20,000
6: 1:20,001 - 1:25,000
7: 1:25,001 - 1:50,000
8: 1:50,001 - 1:100,000
9: > 1:100,000

Discrete Map Scales

A:	1:10,000	**H:**	1:62,500
B:	1:12,000	**I:**	1:63,360
C:	1:15,840	**J:**	1:100,000
D:	1:20,000	**K:**	1:125,000
E:	1:24,000	**L:**	1:250,000
F:	1:25,000	**M:**	1:500,000
G:	1:50,000		

Providing Information Below Is Optional

9) Vertical Measure In Meters. The vertical component of measured point, in meters.
If no vertical component, leave blank. If you answer question 9, answer 10,11,& 12 also.

☐ ☐ ☐ ☐ ☐ . ☐ ☐

10) Vertical Measure Method Of Collection

GPS ☐ Topographic Map Interpolation ☐ Other ☐ Unspecified ☐

11) Accuracy Of Vertical Measure In Meters. (+/-)

☐ ☐ ☐ ☐ ☐ . Meters

12) Reference Datum For Vertical Measure. *(Pick one)*

1: NAVD88: North American Vertical Datum of 1988
2: NGVD29: National Geodetic Vertical Datum of 1929
3: Elevation from Mean Sea Level
U: Unkown

☐

DEC Will Complete The Following Information

13) Information Source For Latitude/Longitude. *(Check one box)*

The State of Alaska ☐ Regulated Entity (Health Corp, Community, etc.) ☐ Contractor (San Surveyors, inspector, etc) ☐ Other ☐ Unknown ☐

14) Latitude/Longitude Verification Code. Indicates whether the latitude and longitute have been verified by EPA staff, grantees or contractors, and the process for verification. *(Check one box)*

Verified Relative To Map Features (1:100k Or Tiger) ☐ Ground Truth Conducted ☐ Not Verified ☐

Verified Relative To Map Features (1:24K) ☐ Verified, Unknown Method ☐ Verified Relative To Map Features (Other) ☐

STATE OF ALASKA
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL HEALTH
DRINKING WATER AND WASTEWATER PROGRAM

PLAN APPROVAL CHECKLIST
FOR ENGINEERING PLANS
NEW
CLASS A PUBLIC WATER SYSTEMS

18 AAC 80.200, .205,
.207, & .210

This checklist is based upon Drinking Water Regulations, effective October 1, 1999.

Contact the office in the project area:

Anchorage:	269-7517
Bethel:	543-3215
Fairbanks:	451-2179
Juneau:	465-5317
Kenai:	262-5210
Ketchikan:	225-6200
Wasilla:	376-5038

This checklist applies to new construction, which will supply or have an effect on drinking water quality and quantity. **This checklist applies to only new Class A public water systems**.

A new Class A public water system is a Class A public water system that is constructed after October 1, 1999; a Class A public water system that has not received a public water system identification number as of October 1, 1999; or an existing water system other than a Class A public water system, if, as a result of expanding its infrastructure, falls within the definition of a Class A public water system. ***18 AAC 80.1990(84)***

The agency encourages applicants, engineers, and system owners and operators to contact local plan review staff to discuss this checklist. It will be used to evaluate the completeness of submitted plans. If the submittal is not complete, the submittal may be returned to the applicant or held until contact is made with the applicant. The department may not accept incomplete submittals at the counter or determine a plan review fee until the submittal is complete. Formal review may not begin until the department determines the plan submittal is complete. Fee payment must be included for the submittal to be complete.

As required by the Alaska Drinking Water Regulations: "Subject to the availability of appropriations from the legislature and the staffing needs of other projects, the department will issue its approval or denial to construct a Class A or Class B public water system within 30 days after the department receives all of the plans and information required by this chapter. If the submittals are deficient, the department will notify the owner or operator that additional information is needed. Failure of the department to issue an approval or denial to construct within 30 days does not constitute automatic approval of the plans." ***18 AAC 80.210(a) and (b)***

GENERAL INFORMATION:

1. Subject to (c), (d), (f) and (g) of 18 AAC 80.200(b), in order to construct, install, alter, renovate, operate, or improve a Class A or B public water system, or any part of one, the owner or operator must have prior written approval of engineering plans that comply with the requirements of 18 AAC 80.205. ***18 AAC 80.200(b)***

2. Written approval under this section is not required for an emergency repair or routine maintenance of a public water system or for a single-service line installation or modification. ***18 AAC 80.200(c)***

3. Engineering drawings and calculations for new Class A public water systems must be submitted under the seal and signature of a registered engineer. ***18 AAC 80.200(d)(1)***

4. After meeting with the plan review engineer, other information may be determined necessary to assess compliance with this chapter. ***18 AAC 80.205(b)(9)***

The plan review and approval process consists of two major stages:

I. Approval to Construct
II. Approval to Operate

I. Approval to Construct

To obtain an "Approval to Construct Certificate," the Department will require that the owner(s) of the proposed Class A public water system demonstrate they have the overall capability to consistently produce and deliver water meeting Alaska's drinking water regulations. Capability encompasses the technical, managerial, and financial capacity of the water system to plan for, achieve, and maintain compliance with Alaska drinking water regulations given available water resources and the characteristics of the service population.

Technical capacity refers to the physical infrastructure of the water system, including but not limited to the adequacy of the source water, infrastructure (source, treatment, storage, and distribution), and the ability of system personnel to adequately operate and maintain the system and to otherwise implement technical knowledge.
18 AAC 80.207(b)

Financial capacity refers to the capability of the financial resources of the water system, including but not limited to revenue sufficiency, credit worthiness, and fiscal controls.
18 AAC 80.207(c)

Managerial capacity refers to the management structure of the water system, including but not limited to ownership accountability, staffing and organization, and effective linkages to customers and regulatory agencies. ***18 AAC 80.207(d)***

This stage is divided into two phases. In the first phase, the registered engineer submits a request to install the source. Then during the second phase, the registered engineer and owner will submit information that will allow the department to make a determination that the proposed Class A public water system will meet technical, financial, and managerial capacity. *If this information is not provided, a construction approval will not be issued.*

II. Approval to Operate

This stage is been divided into two phases.

The **first phase** occurs upon the completion of the project. The department issues a temporary 90-day operation certificate for the public water system if the following criteria are met:

1) Verification that construction is complete; ***18 AAC 80.210(g)(1)***

2) The finished water analyses for coliform bacteria and for any raw water contaminant that exceeded an MCL are complete and approved; ***18 AAC 80.210(g)(2)*** and,

3) The terms and conditions set by the department regarding financial and managerial capacity have been met. ***18 AAC 80.210(g)(4)***

The **second phase** occurs prior to the end of the 90-day temporary approval period, the following items are submitted for review:

1) Record drawings, signed and sealed by a registered engineer, ***18 AAC 80.210(j)(1)***

2) The record drawings confirm that the public water system meets the requirements of this chapter and provides public health protection, ***18 AAC 80.210(j)(2)*** and

3) All written terms and conditions set by the department for the construction (technical capacity) of the public water system are met. ***18 AAC 80.210(j)(3) and (4)***

I. APPROVAL TO CONSTRUCT:

Phase 1: Approval to install source

A. <u>TECHNICAL CAPACITY</u>

Indicate status of each item:

(S) Indicates information has been submitted.
(NS) Indicates the information has not been submitted.

- *Please note where the information can be located in the submittal to assist the plan review engineer.*

_____1. Appropriate plan approval fee submitted as required by ***18 AAC 80.1910(c)*.**

_____2. Population served and number of service connections. ***18 AAC 80.200(a)***

_____3. The name, address, telephone number, and facsimile number of the owner or operator. ***18 AAC 80.205(b)(6)***

_____4. Construction drawings and specifications for the water source. ***18 AAC 80.205(a)(1)***

_____5. The location, stated as the horizontal position and elevation, of each proposed or existing wastewater treatment and disposal system, sewage pump station, sewer line manhole and cleanout, petroleum storage tank and line, and potential or actual source of pollution or contamination, including the sources listed in Table A in 18 AAC 80.020(a), within 200 feet of a proposed water source, regardless of property lines or ownership. ***18 AAC 80.205(b)(3)****;*

_____6. Statement by the registered engineer that there are no known sources of contamination within the protective radius of the proposed source.

II. APPROVAL TO CONSTRUCT/APPROVED CHANGE ORDER:

Phase 2, Approval for the treatment, storage, and distribution

A. <u>TECHNICAL CAPACITY Continued</u>

_____1. Engineering report – applicable portions of Section 1.1 of the Recommended Standards for Water Works should be followed. **18 AAC 80.010(d)**

_____2. Construction drawings and specifications for the storage, distribution, and treatment systems and related structures. ***18 AAC 80.205(a)(1)***

_____3. Plans and profiles of the water mains. ***18 AAC 80.205(a)(2)***

_____4. Design criteria, calculations, and flow analysis computations for water demand, storage tank sizing, distribution main sizing and other components of the new public water system if requested by the department to ensure that the design is adequate. ***18 AAC 80.205(a)(3)***

_____5. Verification that at least 20 psi of service pressure at the highest elevation or pressure zone of a distribution main can be maintained under peak design demand. ***18 AAC 80.205(a)(4)***

_____6. Data showing the capability of the public water system source to meet minimum water consumption needs, criteria for water demand calculations, and the production capability of the water plant. ***18 AAC 80.205(b)(2)***

The following are examples of the information that should be included in the submittal in sufficient detail to allow evaluation.

- Design according to the *Suggested Practice for Small Water Systems* and other references located in 18 AAC 80.010 (b), (c) and (d).
- Minimum water consumption needs established.
- Manufacturers' specifications and performance curves for all pumps.
- Production capability of the water treatment plant.
- Freeze protection of all mains and services.
- Backflow/Cross Connection Prevention ***18 AAC 80.025.***

_____1. The location, in longitude and latitude to the closest second, of each well and surface water intake and the method used to determine longitude and latitude on a form provided by the department. ***18 AAC 80.205(b)(4)*** *Departmental form can be found in Appendix A of this checklist.*

_____2. The overall treatment scheme, including calculations, if required under 18 AAC 80.600 - .699, for disinfection and how *Giardia lamblia* and viruses will be removed or inactivated. ***18 AAC 80.205(b)(5)***

_____3. Verification that only lead-free pipe, flux, and solder will be used, as required by 18 AAC 80.500. ***18 AAC 80.205(b)(7)***

_____4. For a public water system that uses compressed air to pressurize hydropnuematic tanks, information proving that air quality will not contribute contaminants to the water. ***18 AAC 80.205(b)(8)***

_____5. Well log(s) and well yield test data. ***18 AAC 80.210(h)***

_____6. Chemical Additives And Materials. Direct additives for water treatment and materials in contact with potable water may be used on a public water system only if they are approved for that use by the National Sanitation Foundation (NSF), Underwriter Laboratories, or an equivalent organization that evaluates products using NSF Standards 60 and 61, adopted by reference in 18 AAC 80.010(b). ***18 AAC 80.030***

_____7. A copy of the Water Rights Application submitted to the Alaska Department of Natural Resources.

_____8. A written plan sealed by a registered engineer for the operation and maintenance of all components for the proposed system. ***18 AAC 80.207(b)(1)***

_____9. This section applies to all surface water and groundwater under the direct influence of surface water sources as specified in 18 AAC 80.600. A design report will need to be included the following information:

- The characteristics of watershed, physical condition of water source, ground water source distance(s) from any nearby bodies of surface water, influence of surface water on a ground water source, hydrogeology, and results of laboratory analyses of untreated water for biological quality & turbidity. **18 AAC 80.605;**

- Explain how the proposed treatment plant will to achieve three log removal/inactivation of Giardia lamblia. Filtration must achieve at least two log removal and disinfection must achieve at least 0.5 log inactivation. **18 AAC 80.615(b)(2), 18 AAC 80.645;**

- Identify and justify the type(s) of proposed filtration processes to reduce turbidity. Filtration processes may include, slow sand filtration, diatomaceous earth filtration, rapid sand filtration, direct filtration, alternative filtration (cartridge and bag), and/or any pretreatment such as coagulation, flocculation, and sedimentation. Design calculations covering loading rates, back washing rates, volume of back wash water, and other items necessary to determine efficiency of proposed filtration process will need to be provided. Please note that the design for finished water turbidity performance is 0.5 NTU and 1.0 NTU. **18 AAC 80.650;**

- Identify and justify the disinfection parameters/assumptions such as pH, temperature, disinfectant dosage, disinfectant demand, residual disinfectant concentration, design log inactivation criteria, design flow rate, hydraulic efficiency factor, and contact time used in the proposed design. Design calculations for such items as contact time and justifications for hydraulic efficiency factor will need to be included in the report. The location of the first user will also need to be included. **18 AAC 80.645, 18 AAC 80.660, CT Tables 'J' through 'R'.**

B. FINANCIAL CAPACITY

_____1. For a proposed Class A public water system that is a public water utility and is not exempt from Alaska Statute 42.05 as determined with assistance from the Regulatory Commission of Alaska (RCA) staff, a copy of the application for the certificate of public convenience and necessity that has been submitted to the RCA and written verification from the RCA that an application for a certificate of public convenience and necessity has been submitted. ***18 AAC 80.207(c)(1)*** *Information on*

how to obtain a copy of this application and to obtain the necessary assistance from RCA staff can be found in Appendix B of this checklist.

_____2. For a proposed Class A public water system that is a public water utility but is exempt from Alaska Statute 42.05 as determined with assistance from the RCA staff, including a municipally-owned system, a completed application on a form provided by the department, describing the owner's revenue sufficiency, credit worthiness, and fiscal controls. ***18 AAC 80.207(c)(2)*** *Departmental form can be found in Appendix C of this checklist.*

_____3. For a proposed Class A public water system that is not a public utility, a proposed financial plan and annual budget showing estimated system income and operation costs; and, a completed financial capability assessment, on a form provided by the department and as described in 18 AAC 76.225(b)(7); or, on the forms used by the Department of Community and Economic Development to assist communities in dealing with sanitation utility issues. ***18 AAC 80.207(c)(3)*** Forms can be found in Appendixes D and E of this checklist.

_____4. Other information that the owner believes will demonstrate financial capacity. ***18 AAC 80.207(c)(4)***

_____5. Other information that the department considers necessary to assess the financial capacity of the proposed Class A public water system. ***18 AAC 80.207(c)(5)***

C. MANAGERIAL CAPACITY

_____1. For a proposed Class A public water system that is a public water utility and is not exempt from Alaska Statute 42.05 as determined with assistance from RCA staff, a copy of the application for the certificate of public convenience and necessity that has been submitted to the RCA and written verification from the RCA that an application for a certificate of public convenience and necessity has been submitted. ***18 AAC 80.207(d)(1)*** *Information on how to obtain a copy of this application and to obtain the necessary assistance from RCA staff can be found in Appendix B of this checklist.*

_____2. For a proposed Class A public water system that is a public water utility but is exempt from Alaska Statute 42.05 as determined with assistance from the RCA staff, including a municipally-owned system, a completed application on a form provided by the department, describing the owner's revenue sufficiency, credit worthiness, and fiscal controls. ***18 AAC***

80.207(d)(2) *Departmental form can be found in Appendix C of this checklist.*

_____3. For a proposed Class A public water system that is not a public water utility:

_____ Documentation showing ownership and plans, if any, for transfer of that ownership on completion of construction or after a period of operation.

_____ A description of the management structure of the proposed system, including the duties of each position; in providing this information, the owner may include by-laws, ordinances, articles of incorporation, or procedures and policy manuals that describe the management organization structure.

_____ A description of the proposed staffing, including training, experience, certification or licensing, and continuing education completed the proposed system staff.

_____ An explanation of how the proposed system will establish and maintain effective communications and relationships between the public water system management, its customers, professional service providers, and regulatory agencies. ***18 AAC 80.207(d)(3)***

_____4. A written contingency plan showing that the owner is able to provide water in compliance with Alaska's drinking water regulations to each customer within 24 hours after an event that has the potential to cause contamination of the water system above applicable MCLs as described in 18 AAC 80.300 or a lack of water pressure or supply. ***18 AAC 80.207(d)(4)***

_____5. The name, address, telephone number, and facsimile number of each individual operator and verification that each individual operator is qualified under 18 AAC 74, if required. ***18 AAC 80.207(d)(5)***

_____6. Other information that the owner believes will demonstrate managerial capacity. ***18 AAC 80.207(d)(6)***

_____7. Other information that the department considers necessary to assess the managerial capacity of the proposed Class A public water system. ***18 AAC 80.207(d)(7)***

III. APPROVAL TO OPERATE: Phase 1, Temporary 90-day Operation Certificate

_____1. Verification that construction has been completed. *The submittal of results of the pressure testing of mains and the disinfection method can*

be used to confirm construction has been completed. **18 AAC 80.210(g)(1)**

_____2. The finished water analysis for coliform bacteria and for any raw water contaminant that exceeded an MCL under 18 AAC 80.300 is complete and approved. **18 AAC 80.210(g)(2)**

_____3. The terms and conditions set by the department regarding financial and managerial capacity have been meet. ***18 AAC 80.210(g)(4)***

III. APPROVAL TO OPERATE: Phase 2, Final Operation Certificate

_____1. Record drawings, signed and sealed by a registered engineer, that confirm the system meets the requirements of Alaska's drinking water regulations and protects the interest of public health. The source of record information should be indicated on each sheet as well as items or points verified by the engineer. The use of contractor's notes and measurements may be acceptable subject to the department's engineer's prior approval and if confirmed or verified through the engineer's representative and daily field notes. The department has approved several record drawing blocks and examples can be found at each plan review office. ***18 AAC 80.210(i)(1) and (2)***

_____2. Resolution of all written terms and conditions set by the department for the construction (technical capacity) of the public water system in question. ***18 AAC 80.210(i)(3)***

_____3. Confirmation that the public water system was constructed with the use of lead-free pipe, solder, and flux. ***18 AAC 80.205(b)(7)***

_____4. Well log(s) for a well that serves a public water system must be submitted to the department within 30 days after construction of a production, fire, standby, or emergency well. ***18 AAC 80.210(h)***

_____5. Coliform sampling plan submitted for review for compliance with the Total Coliform Rule (TCR). ***18 AAC 80.410***

_____6 Verification that all provisions of 18 AAC 80.015(a) and (b) have been met. The following is an outline of items that will need to be covered in the submittal.

_____ Sanitary Seal
_____ Well is one foot above finished grade for protection from contamination.

_____ At least 10 feet of the upper 20 feet of upper casing has been grouted.
_____ Surface contoured away from casing for proper drainage.

IV. SAMPLING

Analysis of raw water is required to assess the treatment characteristics and compliance with all contaminants regulated by a Maximum Contaminant Level or that may be of a health risk. Refer to 18 AAC 80.205(c)(2) Table B and 18 AAC 80.310 for application. The following list is an outline of analysis by source type that will be required.

Table B. Minimum Raw Water Testing Requirements for a System Proposing to Use a New Water Source

	Class A		**Class B**		**Class C**	
	Ground water	Surface Water	Ground water	Surface Water	Ground water	Surface Water
Total Coliform Bacteria	Yes	Yes	Yes	Yes	Yes	Yes
Inorganic Chemicals (not including asbestos)	Yes	Yes	No	No	No	No
Nitrate	Yes	Yes	Yes	Yes	Yes	Yes
Volatile Organic Chemicals	Yes	Yes	No	No	No	No
Secondary Contaminants	Yes	Yes	No	No	No	No

_____1. For a Class A public water system proposing to make a change in the water treatment process that could change water quality, such as adding new chemicals, changing the filtration process, or changing the disinfection process water quality test results for raw water and treated water that identify the contaminants listed in 18 AAC 80.300 and important to the design of the treatment process. ***18 AAC 80.205(c)(1)***

_____2. For a Class A public water system that has a new water source that is:

_____ A groundwater source, raw water quality data sufficient for the department to determine whether the source is groundwater under the direct influence of surface water (GWUDISW).
18 AAC 80.205(c)(3)(A)

_____ A surface water or GWUDISW, raw water quality sufficient to allow the department to determine whether the proposed water treatment

equipment complies with 18 AAC 80.600 – 18 AAC 80.680. ***18 AAC 80.205(c)(3)(B)***

_____3 For a Class A public water system that will serve a resident population of 10,000 or more individuals and whose owner or operator plans to add a disinfectant to the water in any part of the drinking water treatment process, raw water quality data sufficient for the department to determine whether the public water system will comply with 18 AAC 80.300(b)(2)(C). ***18 AAC 80.205(c)(4)***

_____4. For a Class A public water system, raw water quality data sufficient to allow the department to determine whether the proposed water treatment equipment will control the corrosivity of the water. **18 AAC 80.205(c)(5)**

_____5. For Class A public water system, raw water quality data for a potential contaminant, if the department determines that the data serves the interest of public health. ***18 AAC 80.205(c)(6)***

V. OPERATION AND MAINTENANCE

_____1. Public water systems that serve more than 500 individuals, or have more than 100 service connections must have a certified operator. ***18 AAC 74***

_____2. Public water systems that fluoridate but serve less than 500 individuals, or less than 100 service connections must have a qualified operator. ***18 AAC 80.230***

_____3. The owner or operator of a Class A or Class B public water system with a surface water source or with a GWUDISW source, or the owner or operator of a new system shall ensure that the system is operated by a qualified operator by the date on which the department signs the final approval to operate the portion of the construction and operation certificate for the system under 18 AAC 80.210(k) for a new system; and within 18 months after the department determines that the groundwater source is a GWUDISW source. ***18 AAC 80.615(c)***

I verify that all of the above listed items have been addressed in my submittal. An explanation is attached for any item that was not addressed or submitted.

Applicant's Name (Please print or type) :_____

Applicant's Signature :_____

Address: _____

City: _____ State:_____ Zip: _____

If submitted by a registered engineer:

Registration Number:_____

STATE OF ALASKA
DEPARTMENT OF ENVIRONMENTAL CONSERVATION
DIVISION OF ENVIRONMENTAL HEALTH
DRINKING WATER AND WASTEWATER PROGRAM

CHECKLIST
TO OBTAIN FINAL OPERATION APPROVAL FOR
EXISTING CLASS A and B PUBLIC WATER SYSTEMS
SEEKING APPROVAL FOR ALTERNATE DESIGN

18 AAC 80.200, .205, & .210

This checklist based upon Drinking Water Regulations, effective October 1, 1999.

Contact the office in the project area:

Anchorage:	269-7517
Bethel:	543-3215
Fairbanks:	451-2179
Juneau:	465-5317
Kenai:	262-5210
Ketchikan:	225-6200
Wasilla:	376-5038

This checklist applies to Class A and B public water systems that are in existence on or before October 1, 1999 and do not have a valid operation certificate or operational approval letter. These public water systems must conform to standard sanitary engineering principles and practices and adequately protect the public health. If the existing public water system received construction approval, conforms to standard sanitary engineering principles and practices and adequately protects the public health, owner or operator must either follow the conditions of construction approval letter or meet the requirements of 18 AAC 80.210.

However, if the public water system does not conform to standard sanitary engineering principles and practices noted in the Alaska drinking water regulations (18 AAC 80.005 and 18 AAC 80.010) or does not have an approval to construct, the owner or operator may seek department approval for an alternate design for the system by submitting a report that justifies the alternate design.

The agency encourages applicants, engineers, and system owners and operators to contact local plan review staff to discuss this checklist. It will be used to evaluate the completeness of submitted plans. If the submittal is not complete, the submittal may be returned to the applicant or held until contact is made with the applicant. The department may not accept incomplete submittals at the counter or determine a plan review fee until the submittal is complete. Formal review may not begin until the department determines the plan submittal is complete. Fee payment must be included for the submittal to be complete.

GENERAL INFORMATION:

Subject to (c), (d), (f) and (g) of this section (18 AAC 80.200(b)), in order to construct, install, alter, renovate, operate, or improve a Class A or B public water system, or any part of one, the owner or operator must have prior written approval of engineering plans that comply with 18 AAC 80.205. ***18 AAC 80.200(b)***

Written approval under this section is not required for an emergency repair or routine maintenance of a public water system or for a single-service line installation or modification. ***18 AAC 80.200(c)***

A Class A public water system means a public water system that is expected to serve, year-round, at least 25 individuals, is expected to serve, year-round, at least 15 residential service connections, or regularly serves the same 25 or more individuals for at least six months of the year. ***18 AAC 80.1990 (a)(12)***

A Class B public water system means a public water system that is not a Class A public water system, and that regularly serves at least 25 individuals each day for at least 60 days of the year. ***18 AAC 80.1990(a)(13)***

If the existing public water system is determined to be a Class A Public Water System and did not have a Public Water System Identification Number assigned to it prior to October 1, 1999, it is not classified as an existing system. ***Public water system classified as a New Class A public water system must meet all the requirements of 18 AAC 80.205 and 18 AAC 80.207(b), (c) and (d). There is a separate checklist for New Class A public water systems.***

Submitted reports for existing Class A and B public water systems must be signed and sealed by a registered engineer. ***18 AAC 80.200(d)(1)***

A. REPORT

The report will need to include the following items:

_____ 1 Appropriate plan approval fee submitted as required by 18 AAC 80.1910. The owner or operator can determine fee, but department staff will make the final determination on the amount of fee.

_____ 2 A set of engineering plans of the existing system with an accurate description, including the number and location, of potential sources of contamination, water bodies, water sources in the area, and service connections. ***18 AAC 80.200(d)(3)***

_____ 3 The name, address, telephone number, and facsimile number of the owner or operator (Owner's statement provided by the Department.) ***18 AAC 80.200(d)(4)***

_____ 4 Considerations of soil type, surface water influence, groundwater, surface topography, geological conditions. This will need to include all information required to complete a groundwater under the direct influence of surface determination (GWUDISW). ***18 AAC 80.200(d)(2)***

_____5 Data showing the capability of the water system source to meet minimum water consumption needs, storage capacity, the production capability of the water treatment plant. ***18 AAC 80.200(d)(2)*** *The following is an example of the questions and information that should be addressed in sufficient detail in the report to allow evaluation.*

- Design according to a published design reference during the time the public water system was installed.
- How minimum water consumption needs (peak water demands) were established.

- Based on the determined or calculated peak water demands, are the water source and the storage facilities sufficient? Calculations will need to be provided.

- Is there sufficient pressure at the highest service elevation to prevent backflow problems within the public water system?

- If there a water treatment plant, is the production capability of the plant sufficient to meet peak water demands? Plan review staff realize that that most water treatment plants can not meet peak water demands without the use of water storage tanks.

- Is there a history of mains/services freezing? If so, what steps will be taken to resolve the problem?

_____ 7 Verification that the existing public water system has not been modified since June 14, 1991. If it has been modified after June 14, 1991, verification that the modifications were completed with the use of lead-free pipe, solder, and flux.

_____ 8 A copy of the well log. If a well log can not be located, the well will need to be probed to determine depth of well pump and static water level. If possible, the total depth of the well should be determined if there any concerns with the quality of water being provided to the public. If video equipment can be located in the area, the well should be video taped to determine the location of the well screens or perforations.

_____ 9 Well yield test results. If copies of the original well yield test can not be located, either a minimum of a 24 hour well yield test will need to be completed or history of the existing source well meeting peak demand will need to be provided.

_____ 10 The location, in longitude and latitude, to the closest second, of each well and surface water intake and the method used to determine longitude and latitude on a form provided by the department. 18 AAC 80.205(b)(4)

_____ 11 The location, stated as the horizontal position and elevation, of each proposed or existing wastewater treatment and disposal system, sewage pump station, sewer line manhole and cleanout, petroleum storage tank and line, and potential or actual source of pollution or contamination, including the sources listed in Table A in 18 AAC 80.020(a), within 200 feet of a proposed water source, regardless of property lines or ownership. ***18 AAC 80.205(b)(3)***

_____ 12 Documentation showing the existence of a local government organization, a homeowner's association, a private utility, a commercial entity, or other entity whose purpose is to operate and maintain the public water system. ***18 AAC 80.205(b)(10)***

_____ 13 Verification that all provisions of **18 AAC 80.015(b)** have been met. *The following is an outline of items that will need to be covered in the report.*

- Sanitary seal
- Well casing terminates at least one foot above ground level or at least one foot above the well house floor, whichever offers the most protection from contamination.
- A cased well must be grouted with a watertight cement grout, sealing clay, bentonite, or an equivalent material at least 10 feet of continuous grouting within the first 20 feet below the ground surface; or an alternate method of grouting, if the department determines that the alternate method serves the interest of public health;
- The ground surface for at least 10 feet in all directions around the well is sloped or contoured to drain away from the well

_____ 14 Coliform sampling plan as found in 18 AAC 80.410.

B. SAMPLING

If the existing public water system has not been monitoring water quality, raw water analysis is required to assess treatment characteristics and compliance with all contaminants regulated by a Maximum Contaminant Level or that may be a health risk. The following list is an outline of analysis by source type and system classification that will be required. ***Please note that if the existing public water system is a Class A public water system and did not have an assigned public water system identification number by October 1, 1999, the system is classified as a new system. This will require the use of the checklist for "new Class A public water systems."***

Table B. Minimum Raw Water Testing Requirements for a System Proposing to Use a New Water Source

	Class A		**Class B**		**Class C**	
	Ground water	Surface Water	**Ground water**	**Surface Water**	Ground water	Surface Water
Total Coliform Bacteria	Yes	Yes	**Yes**	**Yes**	Yes	Yes
Inorganic Chemicals (not including asbestos)	Yes	Yes	**No**	**No**	No	No
Nitrate	Yes	Yes	**Yes**	**Yes**	Yes	Yes
Volatile Organic Chemicals	Yes	Yes	**No**	**No**	No	No
Secondary Contaminants	Yes	Yes	**No**	**No**	No	No

_____ 1 For a Class A or B public water system proposing to make a change in the water treatment process that could change water quality, such as adding new chemicals, changing the filtration process, or changing the disinfection process water quality test results for raw water and treated water that identify the contaminants listed in 18 AAC 80.300 and important to the design of the treatment process. **18 AAC 80.205(c)(1)**

_____ 2 For a Class A or B public water system that has a new water source that is:

_____ A groundwater source, raw water quality data sufficient for the department to determine whether the source is

groundwater under the direct influence of surface water (GWUDISW). ***18 AAC 80.205(c)(3)(A)***

_____ A surface water or GWUDISW, raw water quality sufficient to allow the department to determine whether the proposed water treatment equipment complies with 18 AAC 80.600 – 18 AAC 80.680. ***18 AAC 80.205(c)(3)(B)***

_____ 3 For a Class A public water system that will serve a resident population of 10,000 or more individuals and whose owner or operator plans to add a disinfectant to the water in any part of the drinking water treatment process, raw water quality data sufficient for the department to determine whether the public water system will comply with 18 AAC 80.300(b)(2)(C). ***18 AAC 80.205(c)(4)***

_____ 4 For a Class A public water system, raw water quality data sufficient to allow the department to determine whether the proposed water treatment equipment will control the corrosivity of the water. **18 AAC 80.205(c)(5)**

_____ 5 For all public water system, raw water quality data for a potential contaminant, if the department determines that the data serves the interest of public health. ***18 AAC 80.205(c)(6)***

C. OPERATION AND MAINTENANCE

_____ 1 Public water systems that serve more than 500 individuals, or have more than 100 service connections must have a certified operator. **18 AAC 74**

_____ 2 Public water systems that fluoridate but serve less than 500 individuals, or less than 100 service connections must have a qualified operator. **18 AAC 80.230**

_____ 3 The owner or operator of a Class A or Class B public water system with a surface water source or with a GWUDISW source, or the owner or operator of a new system shall ensure that the system is operated by a qualified operator by the date on which the department signs the final approval to operate the portion of the construction and operation certificate for the system under 18 AAC 80.210(k) for a new system; and within 18 months after the department determines that the groundwater source is a GWUDISW source. ***18 AAC 80.615(c)***

Please provide information to address this concern in the submitted report.

D. ADVISEMENTS FOR PUBLIC WATER SYSTEMS

Owners of all public water systems in the State of Alaska are required to obtain Water Rights from the Alaska Department Natural Resources. A copy of the water right application or permit should be included in the submitted report. At this time, it is for information only and is not required as part of the report.

If providing services to 10 or more service connects for compensation, you are required to file for a "Certificate of Public Convenience and Necessity" with the Regulatory Commission of Alaska (RCA). This notice is provided to advise the applicant of this requirement. In addition, it could also assist the applicant in providing documentation of an entity whose purpose is to operate and maintain the existing public water system.

I verify that all of the above listed items have been addressed in the submitted report. An explanation is attached for any item that was not addressed or submitted.

Applicant's Name (Please print or type):_____
Applicant's Signature:_____

Address: _____

City: _____ State:_____ Zip: _____

If submitted by a registered engineer, please provide stamp or registration number: _____

State of Alaska

DEPARTMENT OF ENVIRONMENTAL CONSERVATION

STATEWIDE PUBLIC SERVICE AREA

DRINKING WATER PLAN REVIEW

OWNER'S STATEMENT

This information required by 18 AAC 80.310(8) and 18 AAC 80.355.

DEC Office Submitted to: _____ Date:_____

Public Water System Name: _____

Public Water System Location: _____

Owner's Name: _____

Project Name: _____

Describe type of work proposed: _____

_____

_____

These plans submitted by: [ ] Owner [ ] Representative of Owner

_____ _____

Signature of Owner or Representative Date

_____

Name/Official Title (please print clearly)

Address for all correspondence concerning this project:

_____

_____

New Class A Public Water Systems Plan Approval Checklist

for Engineering Plans

This checklist is provided by ADEC to use when developing plans for new, Class A Public Water Systems. It is best used as a tool for applicants, engineers, and system owners and operators to discuss plans as they're developed. If your are submitting changes to previously approved Class A Public Water System plans, you will use the checklist for an existing Class A System. It explains the details ADEC engineers will be looking for when they review submittals. All plans must be approved by ADEC. Also, only engineers registered in Alaska can submit plans.

Subject to staff availablity, once submitted plans are considered complete, it will be approved or denied within 30 days. Incomplete plans may be returned or held pending contact with the applicant. Please note that if 30 days have passed and you haven't heard from us, your plans are not automatically approved. A complete plan includes this checklist and a fee payment.

Drinking Water Regulations: 18 AAC 80.200, .205, .207, & .210 (effective October 1, 1999)

A Class A Public Water System (PWS) is:
- System that expects to serve, year-round, at least 25 individuals or,
- Expects to serve, 15 year-round residential connectious or,
- Regularly serves the same 25 individuals for at least six months a year. 18 AAC 80. 1990(a)(12)

A New Class A Public Water System (PWS) is:
- A Class A public water system that is constructed after October 1, 1999;
- A Class A public water system that has not received a public water system identification number under 18 AAC 80.210(c)(3) as of October 1, 1999; or
- An existing water system other than a Class A public water system, if as a result of expanding its infrastructure, the system falls within the definition of a Class A public water system.

Contact numbers for Drinking Water Offices:		
Anchorage: 269-7517	Juneau: 465-5317	Wasilla: 376-5038
Bethel: 543-3215	Kenai: 262-5210	Fairbanks: 451-2179
Ketchikan: 225-6200		

Brought to you by:
State of Alaska, Department of Environmental Conservation
Division of Environmental Health, Drinking Water and Wastewater Program
http://www.state.ak.us/dec
(02/02)

How Plan Approval Works

The Department issues three types of approval. The approval to contsruct, interim approval to operate, and final approval to operate.

- The applicant submits engineering plans, all the information specified in the checklist, and the fee to the local ADEC office

- Department reviews the proposed plans (30 days or more)

- Deparment denies or approves construction

- When approved, construction begins

- Once construction is complete, PWS applies for an interim approval to operate

- Within 90 days after interim approval was granted the PWS applies for a final approval

- If denied at any of the three approval stages, work with ADEC engineers to rectify the situation

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Approval to Construct

When approvals to construct are sought , the department will determine whether it will have the technical, financial, and managerial capacity to consistently produce and deliver water that meets Alaska's drinking water regulations. The available water resources and the characteristics of the population served are considered. *Unless this information is provided, construction approval cannot be issued.*

Technical capacity means the physical infrastructure of the water system, including but not limited to the adequacy of the source water, infrastructure (source, treatment, storage, and distribution), and the system personnel's ability to adequately operate and maintain the system and to implement technical knowledge. *18 AAC 80.207(b)*

Financial capacity means the capability of the financial resources of the water system, including but not limited to revenue sufficiency, credit worthiness, and fiscal controls. *18 AAC 80.207(c)*

Managerial capacity refers to the management of the water system, including but not limited to ownership accountability, staffing and organization, and effective linkages to customers and regulatory agencies. *18 AAC 80.207(d)*

Sometimes systems are built in steps. If your system will be built in phases, you can obtain plan approvals at each step of the process. For example, some engineers submit requests to install the source and later submit a request to build the system.To accomodate this, the sections within this checklist are divided between: 1) source installation and, 2) treatment, storage, and distribution. Approval for each of these two phases can be given separately.

Interim Approval to Operate

When construction is completed, and the water system is ready to serve customers, the Department issues a temporary 90-day operation certificate called an Interim Approval to Operate if the applicant demonstrates the following:

- That construction is complete; *18 AAC 80.210(g)(1)*

- Water analysis for coliform bacteria and for any raw water contaminant that exceeded an MCL taken from the completed system, that confirms finished water quality meets the requirements of this chapter; *18 AAC 80.210(g)(2)* and,

- Any terms and conditions set by the department regarding financial and managerial capacity have been met. *18 AAC 80.210(g)(4)*

Final Approval to Operate

Before the 90-day interim approval period ends, the applicant submits these items to request final approval to operate:

- Record drawings, signed and sealed by a registered engineer, *18 AAC 80.210(j)(1)*

- The record drawings confirm that the PWS meets the requirements of this chapter and provides public health protection, *18 AAC 80.210(j)(2)* and

- All written terms and conditions set by the department for the construction (technical capacity) of the PWS are met. *18 AAC 80.210(j)(3) and (4)*

- A Complete and signed set of Sanitary Survey Forms. *18 AAC 80.200(j)(3)*

Information you need to know before completing the checklist

- Emergency Situations: Written approval is not required for an emergency repair or routine maintenance of a PWS or for a single-service line installation or modification. *18 AAC 80.200(c)*

- Registered Engineer seal and signature: Engineering drawings and calculations for new Class A PWSs must be submitted under the seal and signature of an engineer registered in Alaska. *18 AAC 80.200(d)(1)*

- The Drinking Water Regulations, 18 AAC 80, were updated on October 1, 1999: The current regulation is available on the internet at: http://www.state.ak.us/dec/ This checklist provides guidance to operators, engineers, owners, and developers on DEC's current interpretation of the Drinking Water Regulations. This document does not, however, substitute for DEC's regulations, nor is it a regulation itself. Thus, it cannot impose legally binding requirements on DEC, the state, or applicants, and may not apply to a particular situation based on the circumstances.

- Additional Information: After meeting with the plan review engineer, other information may be determined necessary by the department. *18 AAC 80.205(b)(9)*

1) Indicate status of each item in the box provided:
Y = information has been submitted
N = information has not been submitted. If this is the case, please provide an explanation why.

2) Identify where the information can be located in the submittal on the line

Approval to Construct

Phase 1: Approval to install source

TECHNICAL CAPACITY

☐ _____ 1. Correct plan approval fee submitted, as required by *18 AAC 80.1910(c)*.

☐ _____ 2. Population served and number of service connections. *18 AAC 80.200(a)*

☐ _____ 3. The name, address, telephone number, and facsimile number of the owner or operator. *18 AAC 80.205(b)(6)*

☐ _____ 4. Construction drawings and specifications for the water source. *18 AAC 80.205(a)(1)*

☐ _____ 5. The location, stated as the horizontal position and elevation of each proposed potential or existing sources of contamination within 200 feet of a proposed water source, regardless of property lines or ownership. A listing of contaminant sources is available in Table A, 18 AAC 80.020

☐ _____ 6. Owner's authorization allowing the engineer to address the Departments' concerns. *18 AAC 15*.

Phase II: APPROVAL FOR TREATMENT, STORAGE, AND DISTRIBUTION

TECHNICAL CAPACITY

☐ _____ 1. Engineering report – applicable portions of Section 1.1 of the Recommended Standards for Water Works should be followed. 18 AAC 80.010(d)

☐ _____ 2. Construction drawings and specifications for the storage, distribution, and treatment systems and related structures. *18 AAC 80.205(a)(1)*

☐ _____ 3. Plans and profiles of the water mains. *18 AAC 80.205(a)(2)*

☐ _____ 4. Design criteria, calculations, and flow analysis computations for water demand, storage tank sizing, distribution main sizing (and other components of the new PWS if requested by the department) to ensure that the design is adequate. *18 AAC 80.205(a)(3)*

☐ _____ 5. Demonstration that at least 20 psi of service pressure at the highest elevation or pressure zone of a distribution main can be maintained under peak design demand. *18 AAC 80.205(a)(4)*

☐ _____ 6. Data showing the capability of the PWS source to meet minimum water consumption needs, criteria for water demand calculations, and the production capability of the water plant. *18 AAC 80.205(b)(2)*

Here are some examples of the information that should be included:

- Design according to the *Suggested Practice for Small Water Systems* and other references located in 18 AAC 80.010 (b), (c) and (d)
- Minimum water consumption needs established
- Production capability of the water treatment plan
- Backflow/cross connection prevention 18 AAC 80.025
- Manufacturer's specifications and performance curves for all pumps
- Freeze protection of all mains and services

☐ _____ 8. Using the form provided in Appendix A, the longitude and latitude to the closest second to locate each well and surface water intake, and the method used to determine latitude and longitude. *18 AAC 80.205(b)(4)*

☐ _____ 9. The overall treatment scheme including Surface Water Treatment Rule calculations, if required under 18 AAC 80.600 - .699 for disinfection and how *Giardia lamblia* and viruses will be removed or inactivated. *18 AAC 80.205(b)(5)*

☐ _____ 10. Statement that only lead-free pipe, flux, and solder will be used, as required by 18 AAC 80.500. *18 AAC 80.205(b)(7)*

☐ _____ 11. For a PWS that uses compressed air to pressurize hydropnuematic tanks, evidence that air quality will not contribute contaminants to the water. *18 AAC 80.205(b)(8)*

☐ _____ 12. Well log(s) and well yield test data. *18 AAC 80.210(h)*

☐ _____ 13. Chemical Additives and Materials. Direct additives for water treatment and materials in contact with potable water may be used on a PWS only if they are approved for that use by the National Sanitation Foundation (NSF), Underwriter Laboratories, or an equivalent organization that evaluates products using NSF Standards 60 and 61, adopted by reference in 18 AAC 80.010(b). *18 AAC 80.030*

☐ _____ 14. Verification that a water rights application has been submitted to the Alaska Department of Natural Resources.

☐ _____ 15. A written plan sealed by a registered engineer for the operation and maintenance of all components for the proposed system. *18 AAC 80.207(b)(1)*

☐ _____ 16. If the source is surface water or groundwater under the direct influence of surface water (as specified in 18 AAC 80.600), submit a design report which:

- Describes the characteristics of watershed, physical condition of water source, ground water source distance(s) from any nearby bodies of surface water, influence of surface water on a ground water source, hydrogeology, and results of laboratory analyses of untreated water for biological quality & turbidity. 18 AAC 80.605;

- Explains how the proposed treatment plant will be designed and operated to achieve three log removal/inactivation of Giardia lamblia. Filtration must achieve at least two log removal and disinfection must achieve at least 0.5 log inactivation. 18 AAC 80.615(b)(2), 18 AAC 80.645;

- Identifies and justifies the type(s) of proposed filtration processes to reduce turbidity. Filtration processes may include: slow sand filtration, diatomaceous earth filtration, rapid sand filtration, direct filtration, alternative filtration (cartridge and/or bag), and/or any pretreatment such as coagulation, flocculation, and sedimentation. Design calculations covering loading rates, back washing rates, volume of back wash water, and other items necessary to determine efficiency of proposed filtration process will need to be provided. Please note that the design for finished water turbidity performance is 0.5 NTU and 1.0 NTU. 18 AAC 80.650;

- Identify and justify the disinfection parameters/assumptions such as pH, temperature, disinfectant dosage, disinfectant demand, residual disinfectant concentration, design log inactivation criteria, design flow rate, hydraulic efficiency factor, and contact time used in the proposed design. Design calculations for such items as contact time and justifications for hydraulic efficiency factor will need to be included in the report. The location of the first user will also need to be included. 18 AAC 80.645, 18 AAC 80.660, CT Tables 'J' through 'R'.

☐ _____ 17. If the proposed new public water system will use a surface water source and avoid filtration, a meeting with the Statewide Drinking Water Engineering Coordinator and the local review engineer is required before plan review can start.

FINANCIAL CAPACITY

☐ _____ 1. Proposed public water utility, not exempt from Alaska Statute 42.05, will need to submit a copy of the date stamped application that has been submitted to The Regulatory Commission of Alaska (RCA) for a certificate of Public Convenience and Necessity. Information on how to obtain a copy of the RCA application can be found in Appendix B. *18 AAC 80.207 (c)(1)*

☐ _____ 2. Proposed public water utility, exempt from Alaska Statute 42.05 including a municipally-owned system, attach completed form in Appendix C describing the owner's revenue sufficiency, credit worthiness, and fiscal controls. *18 AAC 80.207(c)(2)*

☐ _____ 3. For a proposed Class A PWS that is not a public utility, a financial plan and annual budget showing estimated system income and operation costs; and a completed financial assessment, on a form provided by the Department (see Appendix D) or on the forms used by the Department of Community and Economic Development to assist communities in dealing with sanitation utility issues (see Appendix E). *18 AAC 80.207(c)(3*)

☐ _____ 4. Other information that the owner believes will demonstrate financial capacity. *18 AAC 80.207(c)(4)*

☐ _____ 5. Other information that the department considers necessary to assess the financial capacity of the proposed Class A PWS. *18 AAC 80.207(c)(5)*

MANAGERIAL CAPACITY

☐ _____ 1. Proposed public water utility, not exempt from Alaska Statute 42.05, will need to submit a copy of the date stamped application that has been submitted to The Regulatory Commission of Alaska (RCA) for a certificate of Public Convenience and Necessity. Information on how to obtain a copy of the RCA applicationcan be found in Appendix B. *18 AAC 80.207 (c)(1)*

☐ _____ 2. If proposed system would be a public water utility, but is exempt from Alaska Statute 42.05 including a municipally-owned system, complete the form in Appendix C describing the owner's revenue sufficiency, credit worthiness, and fiscal controls. *18 AAC 80.207(d)(2)*

☐ _____ 3. If proposed system would not be a public water utility:

_____ Documentation showing ownership and plans, if any, for transfer of that ownership on completion of construction or after a period of operation.

_____ A description of the management structure of the proposed system, including the duties of each position; in providing this information, the owner may include by-laws, ordinances, articles of incorporation, or procedures and policy manuals that describe the management organization structure.

_____ A description of the proposed staffing, including training, experience, certification or licensing, and continuing education completed the proposed system staff.

_____ An explanation of how the proposed system will establish and maintain effective communications and relationships between the PWS management, its customers, professional service providers, and regulatory agencies. *18 AAC 80.207(d)(3)*

☐ _____ 4. A written contingency plan showing that the owner is able to provide water in compliance with Alaska's drinking water regulations to each customer within 24 hours after an event that has the potential to cause contamination of the water system above applicable MCLs as described in 18 AAC 80.300 or a lack of water pressure or supply.
18 AAC 80.207(d)(4)

☐ _____ 5. The name, address, telephone number, and facsimile number of each individual operator and verification that each individual operator is qualified under 18 AAC 74, if required. *18 AAC 80.207(d)(5)*

☐ _____ 6. Other information that the owner believes will demonstrate managerial capacity. *18 AAC 80.207(d)(6)*

☐ _____ 7. Other information that the department considers necessary to assess the managerial capacity of the proposed Class A PWS. *18 AAC 80.207(d)(7)*

INTERIM APPROVAL TO OPERATE

☐ _____ 1. Confirmation that construction has been completed. *The submittal of results of the pressure testing of mains and the disinfection method can be used to confirm construction has been completed.* 18 AAC 80.210(g)(1)

☐ _____ 2. Water analysis for coliform bacteria and for any raw water contaminant that exceeded an MCL taken from the completed system, that confirms finished water quality meets the requirements of this chapter. 18 AAC 80.210(g)(2)

☐ _____ 3. The terms and conditions set by the department regarding financial and managerial capacity have been meet. *18 AAC 80.210(g)(4)*

FINAL APPROVAL TO OPERATE

☐ _____ 1. Record drawings, signed and sealed by a registered engineer, confirming that the system meets 18 AAC 80 and protects the interest of public health. The source of record information should be indicated on each sheet, as well as any items or points verified by the engineer. The use of contractor's notes and measurements may be acceptable subject to the department engineer's prior approval and if confirmed or verified through the engineer's representative and daily field notes. The department has approved several record drawing blocks and examples can be found at each plan review office. *18 AAC 80.210(j)(1) and (2)*

☐ _____ 2. Resolution of all written terms and conditions set by the department for the construction (technical capacity) of the PWS in question. *18 AAC 80.210(j)(3)*

☐ _____ 3. Confirmation that the PWS was constructed with the use of lead-free pipe, solder, and flux. *18 AAC 80.205(b)(7)*

☐ _____ 4. Well log(s) for a well that serves a PWS must be submitted to the department within 30 days after construction of a production, fire, standby, or emergency well. *18 AAC 80.210(h)*

☐ _____ 5. Coliform sampling plan submitted for review for compliance with the Total Coliform Rule (TCR). *18 AAC 80.410*

☐ _____ 6. Verification that all provisions of 18 AAC 80.015(a) and (b) have been met. The following is an outline of items to be covered in the submittal.

___ Sanitary Seal
___ Well casing is one foot or more above finished grade for protection from contamination
___ The well casing is grouted at least 10 continuous feet of the upper 20 feet, or approved alternative.
___ Surface contoured away from casing for proper drainage

☐ _____ 7. Sanitary survey forms, provided by the Department and completed by the registered engineer doing the record drawing inspection. The Department emphasizes that the owner of the PWS can either have the reigstered engineer, who is completing the record drawing, or someone approved by the Department do the Sanitary Survey. As long as the registered engineer has been contracted to complete the record drawings, he/she does not have to be additionally approved by the Department to do Sanitary Surveys. *18 AAC 80.210(j)(3)*

RAW WATER SAMPLING

Raw water analysis is required in order to assess the treatment characteristics and compliance with all contaminants regulated by a Maximum Contaminant Level. Refer to 18 AAC 80.205(c)(2) Table B and 18 AAC 80.310 for application. The following types of tests must be performed by a certified drinking water laboratory for Class A groundwater and surface water systems.

- Total Coliform Bacteria
- Inorganic Chemicals (not including asbestos)
- Nitrate
- Volatile Organic Chemicals
- Secondary Contaminants

☐ _____ 1. A system proposing to alter the water treatment process in a way that could change water quality (such as using new chemicals, changing the filtration process, or changing the disinfection process): Water quality test results for raw water and treated water that identify the contaminants listed in 18 AAC 80.300 and important to the design of the treatment process. *18 AAC 80.205(c)(1)*

☐ _____ 2. A system that has a new water source that is:

____ Groundwater: Raw water quality data sufficient for the department to determine whether the source is groundwater under the direct influence of surface water (GWUDISW). *18 AAC 80.205(c)(3)(A)*

____ Surface Water or GWUDISW, Raw water quality sufficient to allow the department to determine whether the proposed water treatment equipment complies with 18 AAC 80.600 – 18 AAC 80.680. *18 AAC 80.205(c)(3)(B)*

☐ _____ 3. System will serve a resident population of 10,000 or more individuals and whose owner or operator plans to add a disinfectant to the water in any part of the drinking water treatment process: Raw water quality data sufficient for the department to determine whether the PWS will comply with 18 AAC 80.300(b)(2)(C). *18 AAC 80.205(c)(4)*

☐ _____ 4. Raw water quality data sufficient to allow the department to determine whether the proposed water treatment equipment will control the corrosivity of the water. 18 AAC 80.205(c)(5)

☐ _____ 5. Raw water quality data for a potential contaminant, if the department determines that the data serves the interest of public health. *18 AAC 80.205(c)(6)*

OPERATION AND MAINTENANCE

☐ _____ 1. Verification that the PWS serve more than 500 individuals, or have more than 100 service connections has the required number and level of certified operator(s). *18 AAC 74*

☐ _____ 2. Verification that the PWS serve less than 500 individuals, or has less than 100 service connections and is using either a surface water or a ground water under the direct influence of surface water and has a qualified operator. *18 AAC 80.230*

☐ _____ 3.Verification that the PWS fluoridates, serves less than 500 individuals, or has less than 100 service connections and has a qualified operator. *18 AAC 80.230*

I verify that all of the above listed items have been addressed in my submittal. An explanation is attached for any item that was not addressed or submitted.

Applicant's Name (Please print or type): _____

Applicant's Signature: _____

Address: _____

City: _____ State: _____ Zip: _____

If submitted by a registered engineer; registration number: _____

(The signature and seal of anengineer registered in Alaska is required for the submittal, regardless of whether the applicant is a registered engineer.)

Plan Approval Checklist for Engineering Plans

NEW Class A

Public Water Systems

Appendix A Thru E

- **Appendix A:** Latitude and Longitude Form

- **Appendix B:** Cover letter, The Regulatory Commission of Alaska's Application for New Certificate of Public Convenience and Necessity.

- **Appendix C:** ADEC New Class A Public Water system Management and Financial Assessment Application.

- **Appendix D:** Alaska Drinking Water Fund Application Form ADEC/FC&O/MG&L

- **Appendix E:** Utility Management Assessment from the Department of Community and Economic Development.

STATE OF ALASKA
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

INVENTORY AND SOURCE REGISTRATION FORM
FOR
CLASS C PUBLIC WATER SYSTEM

A. 1. Public Water System Name and Location: _____

_____

Legal description of property: _____

Number of people served daily: _____

Number of service connections: _____

Public Water System Owner: _____

Owner Address: _____

_____

Owner Phone: _____

A. 2. Required Check List:

- ☐ $75.00 registration fee as required by 18 AAC 80.1910.
- ☐ Results of nitrate and coliform water samples do not exceed the MCL set at 18 AAC 80.300. (attach reports from certified laboratory)
- ☐ Source water protection requirements of 18 AAC 80.015 have been met. (see section B. page 2 for details)
- ☐ Minimum separation distance requirements of 18 AAC 80.020 have been met. (see section B. page 2 for details)
- ☐ Cross-connection provisions of 18 AAC 80.025 have been met. (see section B. page 2 for details)

A. 3. Public Water System Source:

(circle yes or no)

YES	NO	Well depth is less than 30 feet to the first opening for water collection.
YES	NO	Well is located less than 50 horizontal feet to a surface water source.
YES	NO	Source uses an infiltration gallery, spring, rain catchment, or surface water.
YES	NO	Source requires treatment to meet an MCL set at 18 AAC 80.300.

If answer YES to any of the above Public Water System Source, then complete section C. on page 2.

For Department Use Only

This water system is hereby granted department approval to operate. The following public water system identification number is being assigned to this public water system:_____

BY	TITLE	DATE
ADEC Staff Signature		

Public Water System Name: _____

B. 1. Source Water Protection Requirements 18 AAC 80.015: ***Applies to wells only***

Check box if complete

- ☐ Well casing extends a minimum of one foot above ground level or above level of well house floor.
- ☐ Well casing is grouted with a watertight cement grout, sealing clay, bentonite, or an equivalent material. The well must have at least 10 feet of continuous grouting within the first 20 feet below ground surface or another method approved by the Department.
- ☐ Well is provided with a suitable well cap or sanitary seal.
- ☐ For at least 10 feet in all directions, the ground surface around the well is sloped or contoured to drain water away from the well.
- ☐ Copy of well log is attached.
- ☐ The well is adequately protected against flooding.
- ☐ Before use, a newly constructed or reworked well must be flushed of sediment and disinfected.

B. 2. Minimum Separation Distance Requirements 18 AAC 80.020: ***Applies to all water systems***

Check box if complete

- ☐ Source is located a minimum of 150 feet from a wastewater treatment works, wastewater disposal system, pit privy, sewer manhole, lift-station, sewer cleanout.
- ☐ Source is located a minimum of 100 feet from a community sewer line, holding tank, other potential source of contamination including sanitary landfills, domestic animal and agricultural waste and industrial discharge lines.
- ☐ Source is located a minimum of 75 feet from a private sewer line, petroleum lines, and drinking water treatment waste.
- ☐ A letter from ADEC granting the necessary waiver(s) needs to be attached if a system does not meet the requirements of 18 AAC 80.020.

B. 3. Cross-Connection Provisions 18 AAC 80.025: ***Applies to all water systems***

Check box if complete

- ☐ This water system is not connected directly or indirectly, with any unapproved water system, sewer, drain, conduit, pool, storage reservoir, plumbing fixture, glycol loop, or other device that contains, or might contain, wastewater or other substances of unknown or unsafe quality that might be capable of contaminating the water supply through backflow (loss of pressure), without an approved backflow prevention device or assembly.

B. 4. I certify that:

The source water protection requirements of 18 AAC 80.015, the minimum separation requirements of 18 AAC 80.020, and the cross-connection provisions of 18 AAC 80.025 are met.

BY	TITLE	DATE

Must be signed by owner or operator.

Public Water System Name:

C. Public Water System Source

This Section must be completed (if answered YES to any question in section A.3 Public Water System Source)

☐ The water treatment is designed to consistently achieve 99.9 percent removal and inactivation of Giardia lambia cysts and have one NTU or less of treated water turbidity.

☐ The water treatment is designed to consistently meet the MCL set 18 AAC 80.300.

☐ Design plans and calculations have been completed by a registered engineer for this system and are attached with this registration form.

The following signature blocks need to be completed by the owner or operator, the person who constructed the water system, and the engineer who monitored the system's construction, certifying that:

This water system was constructed in accordance with the provisions of 18 AAC 80 and provides public health protection.

BY	signature	OWNER OR OPERATOR	DATE
BY	signature	INSTALLER	DATE
BY	signature	ENGINEER	DATE

D. Alaska Public Water System Latitude/Longitude Data ***(Optional)***

1) **Facility Type.** *(Check One)*

☐ Well ☐ Intake of Surface Water or Spring Source

2) **The date the latitude and longitude were researched or collected.**

___ ___ / ___ ___ / ___ ___ ___ ___
m m d d y y y y

3) **Latitude in decimal degrees.** For Alaska, latitudes are between 51 and 80 North. Give data to available accuracy. Example: + 56.234230

+ ___ ___ . ___ ___ ___ ___ ___ ___

4) **Longitude in decimal degrees**. For Alaska, longitudes are generally -126 to -180 West. The minus sign means "West". Use + for "East". Example: -136.23423

- ___ ___ ___ . ___ ___ ___ ___ ___ ___

5) **Method of determining latitude and longitude.** *(Check one)*

GPS ☐ Map (interpolation from a topographical map) ☐ Survey ☐

6) **Any comments on latitude/longitude.** *(Optional)*

_____

_____

7) **Latitude/longitude accuracy in meters.** GPS accuracy is typically encoded in the unit's display. Estimated accuracy is acceptable if the assumed datum is WGS 84. If another datum is used, please specify. Example: 30 (meters)

____ ____ ____ ____ ____ . Meters

Public Water System Name:

E. Diagram of Public Water System (Optional)

In a plan view, locate and identify each of the following, including distance from well and system in feet.

a) System source: well, infiltration gallery, spring, rain catchment area, or surface water source and intake structure.
b) All buildings and structures.
c) Water and sewer lines to each building.
d) Wastewater Treatment and Disposal Systems.
f) Storage tanks including size, content and type of construction.
g) Property lines, adjacent roads, and driveways.
h) Sources of contamination within 150 feet of system source.

e) Water pumps with type and maximum flow rate listed.

STATE OF ALASKA
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

CLASS C PUBLIC WATER SYSTEM APPROVAL PROCESS

Approval of a Class C Public Water System is required by the State of Alaska Drinking Water Regulations, 18 AAC 80. The Department of Environmental Conservation has developed this form to provide water system owners and/or operators with a streamlined approval process. Construction approval is no longer required for Class C Public Water Systems. Approval to Operate is now issued on page 1 of this form. Approval is based on the owner or operator certifying that the system meets the minimum source water protection, minimum separation distance, and minimum cross-connection provisions as described on 18 AAC 80. The water system must demonstrate satisfactory water quality of nitrate and coliform bacteria for this approval.

This form is not intended to cover every requirement of the State Drinking Water Regulations. The owner and/or operator are responsible to provide safe water to the public and comply with 18 AAC 80. This approval process relies on the owner and/or operator. They must insure that minimum construction standards for such items as pumps, storage and construction materials are met.

If a system uses a surface water source or a groundwater source that is or may be under the direct influence of surface water, then the system is required to have treatment and be designed and inspected by a registered engineer. Pages 2 and 3 of this form outline when an engineer is required for the system design.

The Department recommends that all Class C public water systems be designed and inspected by a registered engineer. The Department will accept an engineer's certification of the requirements found in 18 AAC 80 for a Class C system, in lieu of the owner or operation certification. The Department's approval is based on a limited review, and a engineer can insure that all aspects of the water system construction conform to industry standards.

A construction manual will be developed by the Department to assist owners and operators with the proper construction of Class C public water systems. This manual will be available in February 2000.

A Class C public water system is defined as a public water system that is not a Class A public water system, a Class B public water system or a private water system. Generally, Class C drinking water systems serve no more than 24 individuals daily and have 14 or fewer service connections. A potable water system serving a single family residence or one duplex is not a Class C system.

This registration form and all required attachments should be submitted to your local office of the Department of Environmental Conservation Office, the addresses are listed below:

Anchorage Office
555 Cordova Street
Anchorage, Alaska 99501-2617
(907) 269-7517

Juneau Office
410 Willoughby Ave. Ste. 105
Juneau, Alaska 99801-1795
(907) 465- 5350

Wasilla Office
PO Box 871064
Wasilla, Alaska 99687
(907) 376-5038

Bethel Office
PO Box 557
Bethel, Alaska 99559
(907) 543-3215

Ketchikan Office
540 Water Street
Ketchikan, Alaska 99901
(907) 225-6200

Fairbanks Office
610 University Avenue
Fairbanks, Alaska 99709
(907) 451-2360

Kenai Office
43335 Kalifornsky Beach Rd. Ste. 11
Soldotna, Alaska 99669
(907) 262-5210

Please see our web page for more information: **http://www.state.ak.us/dec/deh**

(rev 12/99)

The owner, operator or engineer will need to complete sections **A.1, A.2, A.3, B.4** and **C** depending on the source type. Please remember that the noted sections and test results are required by the State Drinking Water Regulations (18 AAC 80.200 (h), (i), (j)).

To assist the owner, operator or engineer in determining if the Class C public water system is in compliance with the State Drinking Water Regulations, the department recommends that sections **B.1, B.2, B.3, D** and **E** also be completed and the requested information be provided.

For Class C public water systems using a source that is either an infiltration gallery, spring, rain catchment or surface water, section **B.1** does not apply. Please remember that sections **B.2, B.3** and **B.4** are still valid.

Definitions

"MCL" - Maximum Contaminant Level - Means the maximum permissible level of a contaminant in water that is delivered to any user of a public water system.

Class "A" Public Water System - Means a public water system that (A) is expected to serve, year-round, at least 25 individuals; (B) is expected to serve, year-round, at least 15 residential service connections; or (C) regularly serves the same 25 or more individuals for at least six months of the year.

Class "B" Public Water System - Means a public water system that is not a Class A public water system, and that regularly serves at least 25 individuals each day for at least 60 days of the year.

ALASKA DRINKING WATER FUND

Application Form

GENERAL INFORMATION

Name of Municipality/City: _____

Address: _____

_____

Telephone: (907) _____

CONTACT PERSON

Name: _____ Title: _____

Telephone: (907) _____

PROJECT TYPE (Check One)

_____ Water Treatment Facility _____ Replacement _____ Rehabilitation _____ Storage Facility

_____ Distribution System _____ TransmissionLine _____ Source Development

ASSISTANCE AMOUNT

This application is for $_____ in loan monies from the Alaska Drinking Water Fund.

What loan pay back period would you prefer?

___ 2 year ___ 5 year ___ 20 year Other (please specify) ___ year

NOTE: The loan pay back period may not exceed 20 years.

DESCRIPTION OF PROJECT; _____

_____

_____

_____

PROJECT COSTS

Administration	$ _____
Legal	$ _____
Preliminary Studies/Reports	$ _____
Engineering Design	$ _____
Inspection/Surveying/Construction Management	$ _____
Construction	$ _____
Equipment	$ _____
Contingencies	$ _____
Other _____	$ _____
Total Project Costs	$ _____

ESTIMATED PROJECT SCHEDULE

	Estimated Completion Date
Loan Agreement Signed	_____
Preliminary Engineering Report	_____
Design Engineering	_____
Preparation of Bid Documents	_____
Award of Construction Contract	_____
Construction Initiation	_____
Construction Completion	_____
Initiation of Operation	_____

OTHER FUNDING

What funds, other than Alaska Drinking Water Fund monies, are committed for this project?

Federal Funds from: _____ Amount: $ _____

Other State Funds from: _____ Amount: $ _____

Other (identify source): _____ Amount: $ _____

A separate account will be established within the municipality's accounting sytem through which financial assistance received from the Alaska Drinking Water Fund will be administered.

I certify the above information is current and correct.

_____ _____

Name **Title**

_____ _____

Signature **Date**

CHECKLIST

DOCUMENTS TO BE SUBMITTED AS PART OF THIS APPLICATION:

____ **Financial Capability Information Document**

____ **Facility Plan**

____ **Environmental Information Documentation**

____ **Application for Force Account Charge Rate Approval and Equipment Rate Approval (if work related to this project will be done by force account)**

____ **Certification from your City Attorney stating that the Municipality has sufficient legal authority to incur the debt for an Alaska Drinking Water Fund loan**

EITHER:

____ **A resolution from your city council authorizing this loan application and designating an official authorized to accept and manage an Alaska Drinking Water Fund Loan; or**

____ **A resolution from your city council authorizing this loan application and specifying that an additional resolution will be issued to authorize the acceptance of a loan offer from the Alaska Drinking Water Fund.**

Submit Completed Application to:

Alaska Department of Environmental Conservation
Facility Construction and Operation
410 Willoughby Avenue, Suite 303
Juneau, AK 99811

ALASKA DRINKING WATER FUND

Financial Information Form

GENERAL INFORMATION

The following information is intended to show whether your community can afford to repay the proposed loan from the Alaska Drinking Water Fund.

Loan Amount: $_____

Repayment Term in years: _____
(Loan repayment term may not exceed 20 years)

Estimated Interest Rate: _____
(We will provide an estimate if you wish)

Estimated Annual Payment: $_____
(Given the above information, we will provide this if you wish)

Please describe the sources of funding that will be used to repay the loan:

General Funds	amount	$_____
Capital Reserves	amount	$_____
User Fees	amount	$_____
Assessments, LIDs	amount	$_____
Taxes (identify type)	_____ amount	$_____
Other (identify)	_____ amount	$_____

Describe whether any of these sources of funding or revenue have been previously pledged and, if so, please indicate the type of pledge or encumbrance (such as a previous bond sale, special assessment, legal or judicial settlement, etc.), amount pledged and any balance remaining: _____

_____

_____

_____

Please describe any litigation that could affect your communities ability to repay this loan: _____

_____

_____

_____

CURRENT DEBT INFORMATION

Does your community have a debt ceiling? If so, what is it? $_____

How much remains available? $_____

What is your current level of bonded indebtedness? $_____

Please indicate the date, rating and amount of your last bond sale.

Date: _____ Rating: _____ Amount: $_____

CURRENT DRINKING WATER FINANCING

Please provide the following information regarding your current annual water utilities budget.

Operating revenues: $ _____ Operating expenses: $ _____

User fees collected: $ _____ Annual debt service: $ _____

TOTAL Revenues: $ _____ Other non-operating expenses: $ _____

TOTAL Expenses: $ _____

Reserves: $ _____

USER FEES

If User Fees are intended to repay any portion of this loan, please submit:

_____ Existing ordinance that authorizes the collection of user fee
_____ Current fee structure
_____ Pertinent portions of your budget documents
_____ Most recent State single audit
_____ Most recent rate study or rate analysis

Also, please complete the following:

Number of existing residential and commercial users: _____

Number of proposed residential and commercial users: _____

How much will this loan repayment increase user fees? For example, how much will the average residential users monthly fee increase? _____

_____

I certify the above information is correct and current.

_____ _____

Name Title

_____ _____

Signature Date

STATE OF ALASKA
ALASKA DRINKING WATER FUND

FORCE ACCOUNT LABOR RATE WORKSHEET

This worksheet is provided to assist communities in obtaining approval of force account labor rates for loan reimbursement. You are under no obligation to claim all costs or to fill out the entire form. For basic hourly rates, Sections A, B, G and H should be completed for each job classification. Sections C, D, E and F are provided to assist you in computing straight labor rates. If reimbursement for city owned equipment is also desired, please provide a list of equipment and charge rates along with the appropriate Force Account Labor Rate Worksheets for ADEC review and approval.

Job Classification: _____ Project Loan/Name_____

A. **Calculate Monthly Workhours**

Working Hours Per Month = _____
(work hours per week x 52 weeks per year divided by months per year)

B. **Calculate Hourly Pay Rate**

Monthly Pay Rate Ranges from $ _____ to $ _____

Hourly Pay Rate Ranges From $ _____ to $ _____
(monthly pay rate divided by working hours per month = Pay Rate Per Hour)

C. **Calculate Hourly Benefit Rate**

Social Security (FICA)	_____ %
Workers Compensation (W/C)	_____ %
Retirement Contribution (PERS)	_____ %
Unemployment Insurance (SUI)	_____ %
Total Benefits Percentage	**_____ %**

Hourly Benefit Rate Ranges from $ _____ to $ _____
(hourly pay rate x total benefits percentage = Hourly Benefit Rate)

D. **Calculate Hourly Insurance Rate**

Health and Dental Ranges from	$ _____ to $ _____
Accidental Death	$ _____ to $ _____
Basic Life or Other:_____	$ _____ to $ _____
Total Insurance Benefits	**$ _____ to $ _____**

Hourly Insurance Rate from $ _____ to $ _____
(total insurance benefits divided by working hours per month = Insurance Rate Per Hour)

E. **Calculate Hourly Leave Rate**

Vacation Leave days per month ranges from _____ days to _____ days

Sick Leave days per month ranges from _____ days to _____ days

Leave Hours Per Month Ranges From _____ hours to _____ hours
(vacation plus sick leave days per month x working hours per day = Leave Hours Per Month)

Leave Rate Per Hour Ranges from $_____ to $_____ hours
(pay rate per hour x leave hours per month divided by working hours per month = Leave Rate Per Hour)

F. **Calculate Hourly Holiday Rate**

Paid Holidays Per Year = _____ days

Holiday Rate Per Hour Ranges from $ _____ to $ _____
(paid holidays per year divided by 12 months divided by working hours per month x working hours per day x pay per hour = Holiday Rate Per Hour)

G. **Calculate Hourly Charge Rate**

	Hourly Low Rate	Hourly High Rate
Pay Rate	$ _____	$ _____
Benefit Rate	$ _____	$ _____
Insurance Rate	$ _____	$ _____
Leave Rate	$ _____	$ _____
Holiday Rate	$ _____	$ _____
Total:	$ _____	$ _____

H. **Certification**

Based on the details shown above for the _____ job classification, we request approval of a low rate of $_____ per hour, and a high rate of $ _____ per hour inclusive for all employees in this job classification engaged in force account work.

_____	_____	_____
Signature	Title	Date

ALASKA DRINKING WATER FUND

Model Resolution

Resolution No. _____ Date: _____

WHEREAS, _____ (the Municipality) seeks to obtain the necessary financial assistance to construct water system improvements; and

WHEREAS, the State of Alaska, Department of Environmental Conservation (the Department) is able to offer funding through the Alaska Drinking Water Fund; and

WHEREAS the Municipality wishes to apply for a loan from the Alaska Drinking Water Fund;

THEREFORE BE IT RESOLVED that the Municipality is authorized to apply to the Department for a loan from the Alaska Drinking Water Fund for water system improvements. _____ (specify name and title) is authorized to execute any and all documents that may be required by the Department to reflect the indebtedness, the terms of its repayment, and any security therefore, including but not limited to an agreement for the loan and a promissory note.

In place of the above sentence, the Municipality may instead specify that an additional resolution will be issued to authorize the acceptance of a loan offer from the Alaska Drinking Water Fund.

_____
Mayor

Attested by: _____
City Clerk

ALASKA DRINKING WATER FUND

Payment Request

Date: _____

Payment Number: _____

Project Number: _____

Loan Recipient

Name: _____

Address: _____

City, State, Zip: _____

Project Title: _____

Payee (where check should be sent if different from above)

Name: _____

Address: _____

City, State, Zip: _____

Cost Breakdown

	Total Loan Amount	Previous Payments	Amount of this Request	Total Payment
Administrative	$_____	$_____	$_____	$_____
Engineering/Design	$_____	$_____	$_____	$_____
Inspection/Surveying	$_____	$_____	$_____	$_____
Construction	$_____	$_____	$_____	$_____
Equipment	$_____	$_____	$_____	$_____
Other (_____)	$_____	$_____	$_____	$_____

Total Loan Amount: $_____

Previous Payments: $_____

This Payment: $_____

Balance Remaining: $_____

Certification

I certify to the best of my knowledge and belief that the amount of funds I am requesting is in accordance with the terms of the loan offer and this request for payment represents the correct loan share due which has not been previously paid. The project is now approximately _____% complete.

_____
Signature

_____
Printed Name

_____
Title

STATE OF ALASKA
DEPARTMENT OF ENVIRONMENTAL CONSERVATION

GENERAL WASTEWATER DISPOSAL PERMIT NO. 9940-DB002

Excavation Dewatering

Permit Expiration Date: November 30, 2003

This general wastewater disposal permit is issued for the disposal of wastewater from excavations within the South Central and Northern Regions of the State of Alaska. This general permit applies to any volume of wastewater disposal from excavations which take place during construction or earthwork activities for projects such as culvert placement, gravel extraction, pipeline installation, inspection or repair, bridge construction, building construction and other similar projects. This general permit does not apply to wastewater disposal from coal, placer, hard rock or most other types of mining activities, although it may apply to some construction activities that take place at a mine. This permit is not applicable to waters listed by the state as impaired, where the impairment is wholly or partially caused by a pollutant contained within the proposed discharge.

This permit is subject to the conditions and stipulations contained in Appendices A and B, which are incorporated herein by reference. All disposals made under the authority of this permit, regardless of size, are subject to the conditions and stipulations contained herein. Approval to operate under this permit shall be valid for not longer than 12 months. This permit does not relieve the permittee of the responsibility of obtaining other required permits.

The Department will require a person to apply for an individual disposal permit when it determines that the proposed disposal does not meet the conditions of this general permit, contributes to significant pollution, causes an adverse impact on public health or water quality, or a change occurs in the availability of technology or practices for the control or abatement of pollutants contained in the disposal. Issues that the Department may consider when deciding whether to require an individual permit for a particular disposal include, but are not limited to: proximity of contaminated sites, proximity of drinking water wells, separation distance waivers for drinking water wells in the vicinity of the proposed activity, potential for reversal in the direction of surface water or groundwater flow, and potential changes in drinking water and ground water quality. Dewatering projects at contaminated sites may not be conducted under this permit. Issuance of an individual disposal permit requires a 30 day public notice period and additional time for processing the application.

This permit is issued under provisions of Alaska Statutes 46.03, the Alaska Administrative Code as amended or revised, and other applicable State laws and regulations, including standards of the Alaska Coastal Management Program under 6 AAC 80 for activities in the coastal zone.

This permit is effective on issuance and expires November 30, 2003, unless superseded before that time by a state certified U.S. Environmental Protection Agency National Pollutant Discharge Elimination System permit or upon issuance of an amended general permit. This permit may be terminated or modified in accordance with AS 46.03.120.

April 15, 1999
Date Issued

SIGNATURE ON FILE
Timothy J. Wingerter
Watershed Management and Development
Division of Air and Water Quality

APPENDIX A – OPERATION

I. NOTICE OF DISPOSAL

A. Applicants wishing to conduct disposal activities under this permit and whose estimated total discharge volume is greater than 500,000 gallons, must submit a Notice of Disposal (as defined in Section I.C), to the appropriate office of the Alaska Department of Environmental Conservation (listed in Section VI), at least thirty days prior to the disposal activity. Shorter notice and verbal notification (followed by written confirmation) may be used for emergency situations.

B. A Notice of Disposal is not required if the total discharge is less than 500,000 gallons and the Alaska Water Quality Standards (18 AAC 70) are not violated. Dischargers must operate under the provisions and requirements of this general permit even if they are not required to submit a Notice of Disposal.

C. Each Notice of Disposal submitted under Section I.A must include the following information:

1. Applicant's name, position, company address and telephone number.

2. Site map showing the location of the discharge, (latitude and longitude) and any receiving waters.

3. Topographic map or aerial photograph of at least a scale of 1:6,300, showing the exact location of the discharge and the direction and ultimate termination of the flow after discharge.

4. Date of initial discharge, expected duration of discharge, rate of pumping, and average and maximum daily flow rates in gallons per day.

5. Method of dewatering, including typical design schematics.

6. Method and design of the proposed treatment system if required to meet permit limitations, and design of all wastewater conveyances, constructed or natural, for this dewatering operation demonstrating that the conveyances can handle the flow.

7. A brief description of monitoring methods, including, but not limited to, commercial laboratories to be used, sampling methods, in situ analytical methods, equipment to be used, and location of sampling and measurement points.

D. Applicants must receive written approval from the Department before conducting disposal activities under this permit. Written approval from the Department is not required for discharges of less than 500,000 gallons. The Department will, in its discretion, deny use of this permit, or attach or waive conditions as appropriate for specific disposal activities.

E. A fee of $200.00 must be paid for each Notice of Disposal submitted to the department. The department will bill the applicant when approval to operate under this general permit has been granted. A plan review fee of $400.00 may also be charged, depending on the complexity of the project.

F. The applicant must contact the Department of Fish and Game, Habitat and Restoration Division, two weeks prior to any discharge, if the discharged water will enter a fish bearing stream.

G. The applicant must contact the Department of Natural Resources, Division of Water, for any dewatering operation that exceeds 30,000 gallons of water per day in volume to determine whether a temporary water use permit is required pursuant to 11 AAC 93.

II. CONTAMINATED SITES

A. For dewatering projects greater than 500,000 gallons within three miles of a known contaminated site(s) that meet the inclusion criteria for the Department's contaminated site database, the permittee shall, in addition to the Notice of Disposal required in Section I.A, provide the following information:

1. Data about the contaminated site(s) including the type and concentration of contaminants, whether the contaminant(s) are solid, liquid, or dissolved, and the size and location of any contamination plumes.

2. A detailed geohydrologic report by a geologist or engineer professionally licensed to practice in the State of Alaska. This report must specifically address the impact of the proposed dewatering activity on adjacent contaminated sites and drinking water wells.

3. Proposed and / or existing monitoring well locations which are capable of providing information on ground water elevations, whether contaminants are being smeared below the natural minimum groundwater elevation, whether the contaminant plume is being diverted and whether contaminant migration rates are increasing.

4. How contaminants that are entrained in the dewatering effluent will be treated, and the contaminant discharge concentrations. Treatment plans must be designed and stamped by an engineer registered in the State of Alaska.

B. The information described in Section II.A is not required if the applicant can demonstrate that the contaminated site(s) within three miles of the dewatering site do not affect the groundwater.

C. The information described in Sections II.A.2 and II.A.3 is not required if the proposed dewatering will not drop the groundwater level below the natural minimum groundwater elevation as recorded by the U.S. Geological Survey or another reliable source. Daily measurements of ground water elevations in monitoring wells may be required to prove that ground water elevations are not being lowered beyond natural low elevations that would occur naturally.

D. When the dewatering project may adversely affect a contaminated site by moving or smearing contamination, the applicant is encouraged to use construction practices such as cofferdams to eliminate or reduce the volume of groundwater to be discharged.

E. An individual permit may be required, the disposal application may be denied or the Department may impose additional conditions to its approval based on the effects of the proposed operation on a contaminated site.

III. LIMITATIONS

A. During the period beginning on the effective date of this permit and lasting through the expiration or termination date, the permittee is authorized to discharge wastewater as specified in this section.

B. Wastewater discharged from dewatering operations shall not exceed the following limitations:

Effluent Limitations	Maximum Value
Turbidity	5 NTU's above background [1]
Total Aqueous Hydrocarbons	15 µg/l, (micrograms per liter)
Total Aromatic Hydrocarbons	10 µg/l, (micrograms per liter)
Settleable Solids	0.2 ml/l[2], (milliliter per liter)
Total Iron	2 mg/l, (milligrams per liter)

C. The effluent pH shall be between 6.5 and 8.5 pH units and within 0.2 units, (marine water), or 0.5 units, (fresh water), of the receiving water pH.

1 Applies to discharges to the waters of the state only. Not applicable to disposals which freeze upon discharge. Shall not have more than 10% increase in turbidity when the natural condition is more than 50 NTU, not to exceed a maximum increase of 15 NTU. Shall not exceed 5 NTU over natural conditions for all lake waters.

2 When the discharge flow is greater than the receiving water flow, settleable solids shall have a maximum limitation of 0.1 ml/l.

D. The Department will, in its discretion, attach terms and conditions to its written approval of a discharge as appropriate for each specific disposal.

E. The discharge shall not cause thermal or physical erosion.

F. The disposal shall not cause a change in established flow patterns of the receiving water nor shall it cause flooding resulting in property damage.

G. Waivers of the minimum separation distance between a drinking water source and a potential source of contamination are sometimes based on the direction of flow of the groundwater. The dewatering operation cannot cause a drinking water source with such a waiver to be threatened with contamination by changing the direction of flow of the groundwater.

H. The discharge shall not cause destruction of vegetation.

I. The discharge shall not create a thermal barrier to fish movement.

J. The discharge shall not result in the exclusion of fish from aquatic habitat.

K. The discharge shall not cause re-suspension of sediments upon discharge into receiving waters.

L. The discharge shall be free of any additives such as antifreeze solutions, methanol, solvents, corrosion inhibitors; garbage; toxic substances; grease and oils which produce a sheen; foam in other than trace amounts; and other contaminants.

M. The discharge shall not cause a violation of the Alaska Water Quality Standards (18 AAC 70).

N. Groundwater elevations may not be affected in a manner that reduces the quantity or quality of the water drawn from wells owned by other area well owners, unless arrangements have been made to either provide suitable water to those users, or those wells are modified (with the owners permission) in a manner so that the quantity and quality will not be affected. Well owners may have additional legal rights and the applicant is encouraged to discuss the mater with the affected property owners prior to submission of the Notice of Intent to the Department.

IV. MONITORING

A. Permittees discharging more than 500,000 gallons of wastewater shall monitor the wastewater stream in the following manner and frequency while the discharge is occurring:

Effluent Characteristic	Sample Location	Minimum Frequency	Sample Type
Total Flow	Effluent	Daily	NA
Turbidity (NTU)	Effluent & Background[4]	Weekly[3]	Grab
Total Aqueous Hydrocarbons	Effluent	Monthly[3]	Grab
Total Aromatic Hydrocarbons	Effluent	Monthly[3]	Grab
Settleable Solids	Effluent	Daily	Grab
Total Iron	Effluent	Weekly	Grab

B. Permittees with discharges estimated to be less than a total of 500,000 gallons of wastewater shall monitor total flow. The data generated from this monitoring will only need to be reported to the Department if the actual flow monitored is more than a total of 500,000 gallons.

C. Iron precipitation from iron concentrations found in some ground waters has the potential to cause limits for settleable solids to exceed those in the permit. The Department recommends that the applicant determine the iron concentration in the groundwater to be dewatered prior to submittal of the Notice of Disposal. In areas of known high concentrations of iron, the Department will require that this information be submitted.

D. Test procedures used for sample analysis shall conform to methods cited in 18 AAC 70.020(c), or as such regulations may be amended. The permittee may substitute alternative methods of monitoring or analysis upon receipt of prior written approval from the Department.

3 A Minimum of one sample shall be taken, unless the department has waived the requirement.

4 Turbidity values of effluent and receiving water shall be determined. One sample shall be taken at a point representative of the discharge prior to its entering the receiving water. A second sample shall be taken of the receiving water upstream of the discharge point, or in the case of receiving waters with low or no flow, prior to discharge, at a location representative of the receiving water. Both samples shall be taken during the same day within a reasonable time frame (i.e., within 20 minutes to one-half hour).

E. Some monitoring may be waived by the department and / or additional monitoring may be required and will be established on a case by case basis.

F. Samples and measurements taken as required shall be representative of the volume and nature of the monitored activity.

G. If the permittee monitors any influent, effluent, or surface water characteristic identified in this permit more frequently than required, the results of such monitoring shall be reported to the Department in the monitoring report required under Section IV of this Appendix.

V. MANAGEMENT PRACTICES

A. The operator shall take whatever steps are appropriate to maintain the dewatering operation in such a manner that the terms and conditions of this permit are met. This includes leaving the dewatering site, including any settling ponds, in a condition that will not cause additional degradation to the receiving waters over those resulting from natural causes.

B. The operator, when using an earthen channel to transport wastewater from a dewatering operation to the receiving water, shall not drive construction equipment in the channel in such a manner as to re-suspend sediment.

C. The operator shall maintain fuel handling and storage facilities in a manner that prevents the discharge of petroleum products into receiving waters.

VI. REPORTING

Monitoring results shall be summarized, reported to the Department and postmarked no later than the 14th day of the month following the month that each sampling occurs. Reporting shall begin at the commencement of discharge. Signed copies of these, and all other reports required herein, shall be submitted to the appropriate regional office at the following addresses:

State of Alaska
Department of Environmental Conservation
Division of Air and Water Quality
610 University Avenue
Fairbanks, Alaska 99709-3643
Telephone (907) 451-2360
Fax (907) 451-2187

State of Alaska
Department of Environmental Conservation
Division of Air and Water Quality
555 Cordova Street
Anchorage, Alaska 99501
Telephone (907) 269-7500
Fax (907) 269-7652

Knowingly making a false statement, by the permittee, the operator, or other employees, including contractors, on any such report may result in the imposition of criminal penalties as provided for under AS 46.03.790.

VII. RECORDS RETENTION

All records and information resulting from the monitoring activities required by this permit, including all records of analyses performed, and calibration and maintenance of instrumentation, and recordings from continuous monitoring instrumentation shall be retained in Alaska for observation by the Department for three years. Upon request from the Department, the permittee shall submit certified copies of such records.

VIII. CHANGE IN DISCHARGE

All discharges authorized herein shall be consistent with the terms and conditions of this permit. The discharge of any pollutant or toxic material, (including oil, grease, or solvents) more frequently than specified, or at a concentration or limit not authorized, shall constitute noncompliance with the permit. Any anticipated construction changes, flow increases, or process modifications which will result in new, different, or increased discharges of pollutants causing a violation of this permit's limitations are not allowed under this permit and must be reported by submission of an individual waste disposal permit application or revision of the Notice of Disposal. Physical changes may also be subject to plan review by the Department.

IX. TOXIC POLLUTANTS

If a toxic pollutant (including oil, grease, or solvents) concentration standard is established in accordance with 18 AAC 70 for a pollutant present in this discharge, and such standard is more stringent than the limitation in this permit, this permit is considered to be modified in accordance with the toxic pollutant concentration standard.

X. ACCIDENTAL DISCHARGES

The permittee shall provide protection from accidental discharges not in compliance with the provisions of this permit. Facilities to prevent such discharges shall be maintained in good working condition at all times.

XI. NONCOMPLIANCE NOTIFICATION

A. If, for any reason, the permittee does not comply with or will be unable to comply with any terms or conditions specified in this permit, the permittee shall report the noncompliance to the Department within 72 hours of becoming aware of such conditions. This report shall be by telephone, fax, or in the absence of both, by mail.

B. A written follow-up report shall be sent to the Department within seven (7) days of the noncompliance event. The written report shall contain, but not be limited to:

1. Times and dates on which the event occurred, and if not corrected, the anticipated time the noncompliance is expected to continue.

2. A detailed description of the event, including quantities and types of materials involved.

3. Details of any actual or potential impact on the receiving environment or public health.

4. Details of actions taken or to be taken to correct the causes of the event.

5. Details of actions taken or to be taken to correct the cause(s) of the event and any damage resulting from the event.

XII. RESTRICTION OF PERMIT USE

The Department may prohibit or restrict use of this permit by a permittee because of noncompliance within this permit.

XIII. TRANSFER OF OWNERSHIP

In the event of any change in control or ownership of facilities from which the authorized discharges emanate, the permittee shall notify the succeeding owner or controller of the existence of this permit by letter, a copy of which shall be forwarded to the Department of Environmental Conservation at the appropriate office listed in Appendix A, Section VI of this permit.

APPENDIX B - GENERAL PERMIT CONDITIONS

I. ACCESS AND INSPECTION

The permittee shall allow the Commissioner or his/her representative access to the permitted facilities at reasonable times to conduct scheduled or unscheduled inspections or tests to determine compliance with this permit, State laws, and regulations.

II. INFORMATION ACCESS

Except where protected from disclosure by applicable state or federal law, all records and reports submitted in accordance with the terms of this permit shall be available for public inspection at the appropriate State of Alaska Department of Environmental Conservation Regional Office.

III. CIVIL AND CRIMINAL LIABILITY

Nothing in this permit shall relieve the permittee from any potential civil or criminal liability for noncompliance with the permit or with applicable law.

IV. AVAILABILITY

The permittee shall post or maintain a copy of this permit available to the public at the disposal facility.

V. ADVERSE IMPACT

The permittee shall take all necessary means to minimize any adverse impacts to the receiving waters or lands resulting from noncompliance with any limitation specified in this permit, including any additional monitoring needed to determine the nature and impact of the noncomplying activity. The permittee shall clean up and restore all areas adversely impacted by the noncompliance.

VI. CULTURAL OR PALEONTOLOGICAL RESOURCES

Should cultural or paleontological resources be discovered as a result of this activity, work which would disturb such resources is to be stopped, and the State Historic Preservation Office, Division of Parks and Outdoor Recreation, Department of Natural Resources (907) 762-2622, is to be notified immediately.

VII. OTHER LEGAL OBLIGATIONS

This permit does not relieve the permittee from the duty to obtain any other necessary permits from the Department or from other local, state or federal agencies, and to comply with the requirements contained in any such permits. All activities conducted and all plans implemented by the permittee pursuant to the terms of this permit shall comply with all applicable local, state, and federal laws and regulations.

VIII. POLLUTION PREVENTION

In order to prevent and minimize present and future pollution, when making management decisions that effect waste generation, the permittee shall consider the following order of priority options as outlined in AS 46.06.021:

* waste source reduction,
* recycling of waste,
* waste treatment, and
* waste disposal.

State of Alaska
Department of Environmental Conservation
610 University Avenue
Fairbanks, AK 99709-3643

CERTIFICATION OF CONSTRUCTION FOR DOMESTIC WASTEWATER SYSTEMS

Instructions:

1. Within 30 days after the construction, installation, or modification of a project is completed, the owner, the contractor(s) responsible for constructing the project, and a registered engineer responsible for construction inspection, must complete and sign this form declaring that the project was constructed in accordance with the most recent Department-approved plans, or in accordance with the attached as-built drawings.

2. If a project is being completed in phased construction, a map shall be attached showing that portion of the project being declared completed on the date stated in the Owner's Section. Completion of each phase of a project must be declared as it is completed. Additional Certification of Construction forms are available from any Department of Environmental Conservation office.

Please type or print, except for signature: **SECTION A-** Owner's Section

Name and brief description of project: _____

_____

Name of Owner: _____ ADEC Project No. _____

Address: _____ Date Project Completed: ____/____/____

_____

_____

I certify that I am the owner of the above-referenced project. I further certify that this project was constructed in accordance with the latest plans submitted to and approved by the Alaska Department of Environmental Conservation (ADEC), or in accordance with the attached as-built drawings. I understand that I may be required to take remedial measures to correct any construction which was completed without prior ADEC approval, which departs from the approved plans, and which is found to be inconsistent with the applicable requirements of ADEC wastewater disposal regulations (18 AAC 72).

_____

Signature of Owner (Please Sign in Ink) **Date**

SECTION B- Contractor's Section

I certify that I (or an individual under my direct supervision) have conducted an inspection of the project referenced in Section A, or portions of the project which I had the responsibility for constructing, and that to the best of my knowledge and information, the project, or those portions, was or were constructed in accordance with the latest plans submitted to and approved by the Alaska Department of Environmental Conservation, or in accordance with the attached as-built drawings.

Name of Contractor	**Signature of Contractor** (please sign in ink)	**Date**

For multiple contractors, if applicable:

Name of Contractor	**Signature of Contractor** (please sign in ink)	**Date**

Name of Contractor	**Signature of Contractor** (please sign in ink)	**Date**

SECTION C- Engineer's Section

I certify that I (or any individual under my direct supervision) have conducted an inspection of the above referenced project, and that to the best of my knowledge and information, the project was constructed in accordance with: (check one of the following)

☐ the latest plans submitted to and approved by the Alaska Department of Environmental Conservation

or

☐ in accordance with the attached as-built drawings.

Signature of Professional Engineer Responsible for Construction Inspection (Please Sign in Ink)	State of Alaska Professional Engineer Registration Number	Date

Typed or Printed Name of Professional Engineer