TM 5-800-4

TECHNICAL MANUAL

PROGRAMMING COST ESTIMATES FOR MILITARY CONSTRUCTION

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HEADQUARTERS, DEPARTMENT OF THE ARMY

MAY 1994

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TECHNICAL MANUAL

No. 5-800-4

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, DC, *24 May 1994*

PROGRAMMING COST ESTIMATES FOR MILITARY CONSTRUCTION

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PROGRAMMING COST ESTIMATES FOR MILITARY CONSTRUCTION

1. Purpose.

This manual establishes criteria and standards for development and preparation of programming cost estimates for constructing military facilities.

2. Scope.

This manual addresses programming cost estimates for new construction and alteration projects, includes cost data (based on historic data and experience) and factors for adjusting facility costs to reflect project conditions.

3. Reference.

The following document forms a part of this manual to the extent referenced:

AR 415-15	Army Military Construction Program Development and Execution

4. Overview.

Programming cost estimates must be prepared as accurately as possible to reflect the budgetary cost of providing facilities. In order to do this, basic data must be accurate and it must be consistently applied. A basic cost model which reflects all applicable factors derived from accurate data forms the basis for determining the facility budgetary cost at a specific location and under specific conditions.

5. Use of Adjustment Factors.

Except for facilities subject to congressional statutory limitation, programming for repetitive type facilities will be adjusted by all applicable factors. Programming estimates will make proper allowances for all factors that may be reasonably expected to influence project cost through the expected construction period. However, deviations which are significantly above or below the factored unit cost must be explained in detail. For facilities subject to statutory limitations, (i.e. family housing), appropriate cost factors will be used. If the adjusted estimated construction cost is over the statutory limit, a waiver including complete substantiating data must be requested in accordance with AR 415-15.

6. Facility Unit Costs.

Appendix A contains a listing of expected facility unit costs for locations having a geographical location adjustment factor of 1.00. Unit prices reflect costs forecast on the basis of an assumed midpoint of construction date.

a. Building Cost. The prices for buildings are based on published criteria existing at the time appendix A was prepared, and they include the cost of installed building equipment, air conditioning, and fire protection systems authorized by existing regulations. The amounts for buildings exclude all supporting facilities outside the 5-foot line such as water, gas, electrical, and telephone service; sanitary and storm sewers; special foundations (piles, piers, rock excavation); fencing; site improvements (clearing, grading, seeding, and planting of trees and shrubs); and demolition.

(1) Building Size. The square-foot building areas indicated in appendix A are based on the average sizes from construction award data of facilities for individual category codes. The average sizes will be used as reference sizes to calculate appropriate size adjustment factors for proposed facilities.

(2) Installed Building Equipment. Normally, the cost of all items of equipment which are permanently built in or attached to the structure are included in the unit cost shown in appendix A. This includes items with fixed utility connections. A list of installed building equipment which forms part of the building cost is contained in AR 415-15.

b. Size Adjustment. Table 1 provides adjustment factors to be used when the gross square footage differs from a similar type building listed in appendix A.

c. Location Adjustment. Appendix B is a listing of factors for use in adjusting estimated costs to specific geographical areas. The location adjustment factors reflect the average statistical differences in normal labor, material, and equipment costs for similar facilities built m different geographical locations. The factors also make allowances for weather, seismic, climatic, normal labor availability, labor productivity, life support/mobilization, and contractor's overhead and profit conditions. The factors do not reflect abnormal differences due to unique site consideration, such as historical preservation.

d. Cost Escalation Adjustment. Appendix C provides data to be used to project cost escalation due to inflationary factors that apply to construction costs for projects scheduled differently than the assumed midpoint of construction used as the basis for preparing appendix A. The unit prices shown in appendix A reflect costs forecast on the basis of an assumed midpoint of construction date; therefore, projects having a midpoint of construction date other than the assumed date should have appropriate cost escalation added. The midpoint of construction for each facility should be determined based on a realistic judgment of the construction time schedule. The adjustment factor for adding appropriate escalation is obtained as follows: Divide the cost index for the assumed midpoint of construction date of the facility being programmed by the cost index of the assumed midpoint of construction date on which the prices in appendix A are based.

Table 1. Size Adjustment Factors

PART I

BUILDING (OTHER THAN FAMILY HOUSING)

SIZE RATIO	ADJUST FACTOR	SIZE RATIO	ADJUST FACTOR	SIZE RATIO	ADJUST FACTOR	SIZE RATIO	ADJUST FACTOR
0.0000	0.0000	0.9000	1.0150	1.8000	0.9567	2.7000	0.9360
0.0500	1.2750	0.9500	1.0100	1.8500	0.9550	2.7500	0.9350
0.1000	1.2550	1.0000	1.0000	1.9000	0.9533	2.8000	0.9340
0.1500	1.2250	1.0500	0.9550	1.9500	0.9516	2.8500	0.9330
0.2000	1.1900	1.1000	0.9900	2.0000	0.9500	2.9000	0.9320
0.2500	1.1700	1.1500	0.9850	2.0500	0.9490	2.9500	0.9310
0.3000	1.1500	1.2000	0.9800	2.1000	0.9480	3.0000	0.9300
0.3500	1.1300	1.2500	0.9780	2. 1500	0.9470	3.0500	0.9290
0.4000	1.1100	1.3000	0.9760	2.2000	0.9460	3.1000	0.9280
0.4500	1.1000	1.3500	0.9740	2.2500	0.9450	3.1500	0.9270
0.5000	1.0800	1.4000	0.9720	2.3000	0.9440	3.2000	0.9260
0.5500	1.0700	1.4500	0.9700	2.3500	0.9430	3.2500	0.9250
0.6000	1.0600	1.5000	0.9680	2.4000	0.9420	3.3000	0.9240
0.6500	1.0500	1.5500	0.9660	2.4500	0.9410	3.3500	0.9230
0.7000	1.0400	1.6000	0.9640	2.5000	0.9400	3.4000	0.9220
0.7500	1.0300	1.6500	0.9620	2.5500	0.9390	3.4500	0.9210
0.8000	1.0250	1.7000	0.9600	0.6000	0.9380	3.5000	0.9200
0.8500	1.0200	1.7500	0.9583	2.6500	0.9370		

NOTE:
Size ratio is determined by dividing the proposed building size by the building size shown in appendix A.

PART II

FAMILY HOUSING

SIZE (IN UNITS)	FACTOR	SIZE (IN SQ. FT.)	FACTOR
1 -9	1.15	600 - 749	1.05
10 - 19	1.10	750 - 849	1.03
20 - 49	1.05	850 - 949	1.01
50 - 99	1.02	950 - 1050	1.00
100-199	1.00	1051 - 1150	0.99
200 - 299	0.98	1151 - 1250	0.98
300 - 499	0.96	1251 - 1350	0.97
500 +	0.95	1351 +	0.96

e. Technological Updating Adjustment. Technological advances in equipment and operational techniques used in some specialized facilities are being developed rapidly; this often causes obsolescence to occur before design and construction are completed. Also, revisions in criteria to provide life cycle cost benefits may increase initial funding requirements before feedback data can reflect the added cost. An additional allowance for technological updating is appropriate for these conditions. Appendix D is a listing of technological updating factors by category codes of facilities.

f. Design Contingency. The facility cost estimate may include a design contingency allowance based on design data reliability. The design contingency allowance (DC) is to cover component items that cannot be analyzed or evaluated at the time the facility cost estimate is prepared; however, such items are susceptible to cost evaluation as engineering and design progresses. The DC depends on the reliability and refinement of the data on which the estimate is based; it therefore diminishes as design progresses from the predesign stage through the design completion stage. Although it lessens at each successive design stage, the initial magnitude of the DC at the predesign stage depends on the technical complexity of the project for which the facility cost estimate is being prepared. The level of technical complexity must first be established as a prerequisite for determining the magnitude of the DC. Technical complexity levels and design contingency factors are listed in table 2.

7. Supporting Facilities Costs.

Appendix A, Parts II and III, lists expected support facilities unit costs. Supporting facilities are described as items of construction directly related to the facility such as utilities, roads and parking, and site improvements.

8. Project Costs.

Project cost is defined as the sum total of construction costs including facility costs, supporting facilities costs, any other allowable costs, cost allowances for contingencies, and other allowances for supervision and administration.

a. Construction Contingencies. Each project cost estimate should include a separate item as a reserve for construction contingencies to cover construction requirements which cannot be foreseen before the contract is awarded. The contingency reserve is for some adverse or unexpected condition not susceptible to predetermination from the data at hand during engineering and design; it must be included in the project cost estimate. This reserve is usually for latent difficulties, such as unforeseeable relocations; unforeseeable foundation conditions; encountering utility lines in unforeseeable locations; or other unforeseen problems beyond interpretation at the time of contract award. The contingency reserve is not an allowance for omissions of work items which are known to be required, but for which quality or quantity has not yet been determined by specific design. Reasonable allowances for all foreseeable requirements should be made in the estimate or shown as an allowance for cost adjustment. Application for construction contingency reserves will be in accordance with AR 415-15 and/or Army latest guidance. The construction contingency reserve for Army military construction programs and Army family housing new or replacement construction will normally be *5* percent of the total estimated contract cost. However, 10 percent construction contingency will normally be authorized for projects where most of the work will not be visibly exposed before construction begins and the unseen conditions cannot be adequately defined (Examples: renovation/alteration projects, Army family housing

Table 2. Technical Complexity Levels and Design Contingency Factors

Technical Complexity Level	Description	Design Contingency Factor	
		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

revitalization improvement projects, underground utility projects, other projects that are unique in design, involving complex or innovative technology, and waterfront projects). Projects for which more than the normally authorized contingencies are considered necessary will be fully justified and supported by risk analysis.

b. Supervision and Administration. Each project estimate should include a separate item for supervision and administration (S&A). Application of S&A rate will be in accordance with AR 415-15 and/or latest Army guidance. The current approved uniform rate of 6 percent S&A will be used for all projects constructed within the contiguous United States (CONUS) and *6.5* percent for overseas (OCONUS) projects (including those in Alaska and Hawaii). The rates for operation and maintenance (O&M) funded projects are 8% CONUS and 8.5% OCONUS.

9. Programming Cost Estimate Preparation.

Estimates may be prepared using the DD Form 1391 processor system or latest approved software which uses this manual and other authorized cost and pricing sources. The DD Form 1391 processor provides assistance (such as currency exchange rates, building cost growth indices, location adjustment factors, and adjusted unit costs) for the specific location, timeframes, and types of construction involved. For family housing new construction, the DOD Family Housing Cost Model (Tri-Service Cost Model) will be used in programming or developing costs as described in appendix G.

a. Procedures. A unit cost for a facility which should reflect the cost under the basic model conditions for the facility can be obtained by using the following equation:

$Ab = $ExSaxLaxCEaxTUaxDCa

Where: $Ab is adjusted empirical cost, Basic Cost Model

$E is empirical cost unadjusted (from Appendix A)

Sa is size adjustment factor (from table 1)

La is location adjustment factor (from Appendix B)

CEa is cost escalation adjustment due to inflation factors (from appendix C)

TUa is technological updating adjustment factor (from Appendix D)

DCa is design contingency adjustment factor

b. A step-by-step example of procedures for developing the basic cost model is provided in paragraph 10.

10. Basic Cost Model Example.

The example calculations below show how to determine the facility cost estimate for an administration building general purpose, category code 61050, of 11,250 square feet to be built at Ft. Dix, NJ in the FY93 program. A construction start July 1993 and a construction completion date of 1 July 1994 are assumed. The equation for the basic cost model determination is:

$Ab = $E x Sa x La x CEa x TUa x DCa

Step 1 - Unadjusted Cost. In appendix A, find the unit cost for the applicable building type and building size closest to the size building being programmed. The 25,000 square foot Administration Building, category code 61050, is the comparable building size closest to the 11,250 square foot programmed size, and unit cost for the building is $87.00/SF.

Step 2 - Size Adjustment. Calculate a size relationship factor by dividing the programmed building size by the closest comparable building size obtained from table 1. The 11,250 square foot programmed building size divided by the 25,000 square foot comparable building size listed in appendix A gives a size ratio factor of 0.45. Using the size adjustment table (table 1), find the size ratio factor of 0.45 and obtain an adjustment factor of 1.100.

Step 3 - Location Adjustment. Determine the location adjustment factor from appendix B. For Ft. Dix, NJ, the factor of 1.19 applies.

Step 4 - Cost Growth Adjustment. Make allowance for cost growth due to economic factors expected to occur between the assumed midpoint of construction date on which the prices in appendix A are based and the expected midpoint of construction data for the project being programmed. Divide the cost growth index for the expected midpoint of construction date for the project being programmed (1880 for 1 January 1994 from appendix C) by the cost growth index for the assumed midpoint of construction date on which the prices in appendix A are based (1869 for October 1993 from appendix C) to obtain a cost growth factor of 1880/1869.

Step 5 - Technological Updating Adjustment. Make allowance for cost adjustment due to technological updating by using the technological updating factor from appendix D. This factor is found to be 1.00 for administrative facilities.

Step 6 - Design Contingency Adjustment. Determine the design contingency (DC) factor in accordance with paragraph 6. Since the proposed administration building is not unique and requires no special design, the DC factor is 1.050 (low complexity).

Step 7 - Adjusted Cost. Calculate adjusted cost using the equation for the basic cost model conditions. Results are as follows:

$Ab = $E x Sa x La x CEa x TUa x DCa

$Ab = $87/SF x 1.10 x 1.19 x 1880/1869 x 1.00 x 1.05

$Ab = $120.28/SF

Step 8 - Facility Cost Estimate. Determine the facility estimated cost by multiplying the size of the facility being programmed by the adjusted unit cost ($Ab) derived in step 7 and then round off the product to the nearest thousand dollars. The size of 11,250 square feet multiplied by $120.28/SF gives a facility cost estimate of $1,353,150 which when rounded off to the nearest thousand dollars is $1,353,000.

Step 9 - Project Cost Estimate. Determine the project estimate cost by adding contingency and supervision and administration factors to facility cost and supporting facilities cost. (Assume supporting facilities cost of $250,000) Since this project is new construction and location is CONUS, a contingency factor of 1.05 and supervision and administration factor of 1.06 should be applied as follows:

Project Cost Estimate = ($1,353,00 + $250,000) x 1.05 x 1.06

= $1,784,139

In accordance with the rounding rule given below the project cost is $1,800,000.

Congressional Rounding Rule

Amount	*Nearest*
Less Than or Equal to 1,000,000	10,000
1,000,001 to 5,000,000	50,000
5,000,001 to 10,000,000	100,000
10,000,001 to 15,000,000	200,000
15,000,001 to 20,000,000	500,000
20,000,001 or Greater	1,000,000

11. Determining and Using Other Cost Adjustment Factors.

In some cases other adjustment factors may apply. These are in addition to those set up in the basic cost model conditions. The special adjustment factors apply only in special individual cases. They are not to be confused with the basic model adjustment factor for size, location, and cost growth. These special cost factors will not be used unless justified on the basis that they reflect significant cost which would not be included in the adjustment factors used to establish basic cost model conditions.

a. Historical Requirements Adjustment. An allowance for unique architectural features to comply with historical requirements is permitted for facilities to be built at locations listed in the national register of historical landmarks. The factor for historical adjustment is 1.05. Deviation above the allowed factor must be explained in detail.

b. Risk Adjustment. Highly complex facilities involving complex technology or innovative technology will require cost adjustment due to risk. The level of risk factor varies on different facilities and can be determined using available commercial software programs. Risk adjustment factors will not be used unless properly supported.

c. Semipermanent Construction Adjustment. If the facility being considered is semipermanent instead of permanent type construction, an additional factor of 0.90 should be applied.

d. Site Sensitivity Adjustment. A site sensitivity adjustment may be necessary for those special cases where the unique nature of both the site and the project, in relation to one another will cause a significant impact on the cost. An analysis for site sensitivity adjustment should consider only those unique site conditions which will influence cost by virtue of the uniqueness of the conditions involved. The factor used in adjusting the total construction cost for such a set of unique conditions is referred to as the "Site Sensitivity Adjustment Factor." The method outlined below may be used to determine the cost impact caused by the influence of a project upon itself, resulting from an extremely large concentration of construction effort, or from extreme site limitations, or from both. Appendix B is a listing of example sensitivity considerations and computations with a range of values, where applicable, from above normal to substantially below normal. This sample listing of site sensitivity considerations is meant to indicate only and is not a complete and comprehensive list.

e. Technical Specialty Competition Adjustment. A technical specialty competition adjustment may be necessary m those special cases where competition for services of certain specialty craftsmen is created due to the increase in the type of work requiring their services; or because of the decrease in the number of craftsmen available in the workforce. An analysis for technical specialty adjustment should consider the total marketing area that may have an effect on competition for the services of the specialty craft under consideration. The factor used in adjusting the total construction cost for such a competitive market is referred to as the "Technical Specialty Competition Adjustment" factor. A method that may be used to determine the additional project costs caused by the competition for the services of specialty craftsmen is displayed for the labor availability item of appendix E. Factors considered for the labor portion of a "Site Sensitivity" analysis would be very similar to those considered for "Technical Specialty Competition." Therefore, this same methodology can be used. By determining the degree of labor availability (i.e., slightly below normal, substantially below normal, and extremely below normal) and making assumptions as to required inducements, the cost of such inducements in terms of a Technical Specialty Competition Adjustment factor can be computed.

f. Procedure. The equation for the basic cost model is then adjusted for other adjustment factors are as follows:

$AB = $E x Sa x La x CEa x TUa x DCa x Oca

Where: OCa is equal to any one of special adjustment factor or sum of all special factors

The following are step-by-step example calculations showing how to determine the program estimate for a new administration building category, code 61050, of 50,000 square feet to be built at Walter Reed Army Medical Center, Washington, DC in the FY93 program based on a midpoint of construction date of January 1994.

g. Example. Follow the procedures given in paragraph 10 steps 1 through 7 to determine the basic cost adjustment factors.

Step 8. Determine the need for special cost factors for further cost adjustment based on site and project conditions as described in paragraphs a, b, c, d and e above. Based on analysis of the site and project conditions other cost adjustment factors are identified as follows:

Historical Adjustment	0.05
Site Sensitivity Adjustment	0.089

The adjustment factors for each cost consideration are added together giving a total site sensitivity adjustment factor of 1.139. Appropriate site sensitivity considerations and example calculations are included in appendix E. Selection can then be made of the proper range of cost impacts.

Step 9. Using the adjusted basic cost model condition the cost is calculated as follows:

$Ab = $87 x 0.95 x 1.03x1880/1869x1.00x1.05x 1.139

= $102.41

Step 10. Determine the facility estimated cost by multiplying the size of the facility being programmed by the adjusted unit cost and round off to the nearest thousand dollar (the unit cost of $102.41 obtained in step 9 is multiplied by 50,000 square feet giving a total cost of $5,120,500).

Step 11. Determine project cost estimate in accordance with paragraph 10 step 9.

12. Estimating Alteration Projects.

Alteration is defined as a change to interior or exterior facility arrangements to improve or change its current purpose. This includes installed equipment made a part of the existing facility, but does not include additions, expansions, and extensions. The procedures described in this paragraph provide a step-by-step method for preparing programming or budgetary estimates for building alteration when current design data is not available. The procedures use a building systems work breakdown structure (WBS) and relates the alteration work to new facility requirements as a percentage of new work.

a. Figure 1 is an example of a completed DA Form 7307-R. Appendix F tabulates the ratio of WBS cost to facility cost from the USACE and DOD military construction historical cost data. Table 3 shows the percentage of installation cost required for removal and the percentage cost required for installation. Other sources for this data is available from private industries.

b. Consider a FY93 alteration project for an existing 40,000 SF barracks, category code 72111, at Fort Riley with midpoint of construction of July 1994. Step-by-step procedures using DA Form 7307-R are as follows:

Step 1. Identify the percentage of the building systems to be removed and enter in blocks 16a and 21a. The data for this block should be based on the scope of work (in many cases based on best judgment). A walk-through of the facility to be altered is the best way to obtain accurate data. Assume for this example that the substructure, superstructure, exterior closure are not affected; that 80% of the interior is to be replaced; and that 75% of the electrical, mechanical, and plumbing are to be replaced.

Step 2. Using data obtained from table 3 enter in block 16b the percentage of installation cost required for removal and in block 16c the percentage of cost required for installation.

Step 3. Obtain the ratio of WES systems cost to facility cost for barracks from appendix F and enter in blocks 16d and 21b.

Step 4. Block 16e is calculated by multiplying entries in blocks 16a, 16b, 16c, and 16d. Block 17, removal/demolition factor (RDF), is calculated by adding all entries in block 16e which is 10.2 percent of the cost to build the building new. To calculate the total removal/demolition cost (RDC) for the project use the following:

RDC = $ExSaxLaxCEaxTUaxDCaxRDF

Where: $E = Empirical cost (Cost/SF of new facility from appendix A)

Sa = Size adjustment factor
La = Location adjustment factor
Ea = Cost escalation adjustment factor
TUa = Technological updating adjustment factor
DCa = Design contingency adjustment factor
RDF = Removal/demolition factor

RDC = $83 x 1.00 x 0.98 x 1899/1869 x 1.00 x 1.05

x 0.102 = $8.85

Step 5. Determine replacement/new portion factor. The same method is used in the removal portion except the cost includes 100% labor material and equipment. Block 21c is calculated by multiplying entries in blocks 21a and 21b. Block 22, replacement new factor

Table 3. Cost of Removal Versus Cost of Installation

WBS#	DESCRIPTION	% OF INSTALLATION COST REQUIRED FOR REMOVAL	% OF COST REQUIRED FOR INSTALLATION
01	Substructure	50	35
02	Superstructure	50	35
03	Roofing	50	35
04	Exterior Closure	50	35
05	Interior Construction	50	35
06	Interior Finishes	50	35
07	Specialties	50	35
08	Plumbing	50	35
09	HVAC	50	35
10	Special Mechanical	50	35
11	Electrical	80	35
12	Special Electrical	80	35
13	Equipment	50	35
14	Conveying Systems	50	35

(RNF) is calculated by adding all entries in block 21c. Total RNF is *54.3%* (block 22) of the cost to build the facility new. The total new work cost (NWC) is calculated as follows:

NWC = $E x Sa x La x CGa x TUa x DCa x RNF

NCW = $83 x 1.00 x 0.98 x 1899/1869 x 1.00 x 1.05

x 0.54 = $46.86

Step 6. Special adjustment factor (SAF) due to construction limitations must be considered and added. Demolition/removal and replacement construction limitations allowed are as follows:

Dust protection for adjacent work areas	2-7%
Limited use of equipment (noise/power) limitations	1-6%
Limited storage of construction materials	1-6%
Protection of completed work	2-6%
Shift work	2-10%

Any other adjustment factors must be defined and justified. Special adjustment factor (SAF) due to construction limitations can either be applied to the total unit cost or to the total cost of the project. Using the special adjustment factor from (block 25 of the completed DA Form 7 307-R) the demolition and replacement costs are then adjusted as follows:

Adjusted Removal/Demolition Cost (RDC)

= RDCx(1+SAF%)

= 8.85 x 1.15 = $10.18/SF

Adjusted New Work Cost (NWC)

= NWCx(1+SAF%)

= $46.86 x 1.15 = $53.90/SF

Total Alteration Cost

= Adjusted Removal/Demolition Cost (RDCa)

+ Adjusted New Work Cost (NWCa)

= $10.18/SF + $53.90/SF

= $64.08/SF

Step 7. Determine the facility estimated alteration cost by multiplying the area of the facility being programmed for alteration by the total alteration cost as follows:

= $64.08/SF x 40,000/SF

= $2,563,200

Step 8. Determine the project cost estimate costs in accordance with step 9 of paragraph 10.

COST ESTIMATING WORKSHEET - FACILITY ALTERATION

For use of this form, see TM 5-800-4; the proponent agency is USACE

1. PROJECT NUMBER	2. PROJECT TITLE			3. FY
4. BUILDING NUMBER	5. LOCATION			6. HISTORICAL ☐ YES ☐ NO
7. FACILITY TYPE	8. CATEGORY CODE	9. FACILITY SIZE *(SF)*	10. AREA TO BE ALTERED *(SF)*	11. FUND TYPE *(MCA/OMA/AFH)*
12. ESTIMATOR/OFFICE/DATE	13. BASIS OF ESTIMATE		14. MONTHS	15. CONST START

16. REMOVAL/DEMOLITION PORTION OF PRIMARY FACILITY

BUILDING SYSTEM WORK BREAKDOWN	PERCENT OF SYSTEM ALTERED *a*	PERCENT OF LABOR TO REMOVE *b*	LABOR PERCENT TO INSTALL *c*	SYSTEM PERCENT OF TOTAL *d*	TOTAL PERCENT REMOVAL *e*
01 - SUBSTRUCTURE					
02 - SUPERSTRUCTURE					
03 - ROOFING					
04 - EXTERIOR CLOSURE					
05 - INTERIOR CONSTRUCTION					
06 - INTERIOR FINISHES					
07 - SPECIALTIES					
08 - PLUMBING					
09 - H.V.A.C.					
10 - SPECIAL MECHANICAL					
11 - ELECTRICAL					
12 - SPECIAL ELECTRICAL					
13 - EQUIPMENT					
14 - CONVEYING SYSTEMS					
				17. RDF	

18. FACILITY TYPE	19. CATEGORY CODE	20. AREA TO BE ALTERED *(SF)*

21. REPLACEMENT/NEW PORTION OF PRIMARY FACILITY

BUILDING SYSTEM WORK BREAKDOWN	PERCENT OF SYSTEM REPLACED *a*	SYSTEM PERCENT OF TOTAL *b*	TOTAL PERCENT REPLACED *c*
01 - SUBSTRUCTURE			
02 - SUPERSTRUCTURE			
03 - ROOFING			
04 - EXTERIOR CLOSURE			
05 - INTERIOR CONSTRUCTION			
06 - INTERIOR FINISHES			
07 - SPECIALTIES			
08 - PLUMBING			
09 - H.V.A.C.			
10 - SPECIAL MECHANICAL			
11 - ELECTRICAL			
12 - SPECIAL ELECTRICAL			
13 - EQUIPMENT			
14 - CONVEYING SYSTEMS			
		22. RNF	

23. CONSTRUCTION LIMITATION ADJUSTMENTS		24. PERCENT TO ADD
a.	DUST PROTECTION FOR ADJACENT WORK AREAS	
b	LIMITED USE OF EQUIPMENT *(NOISE/POWER LIMITATIONS)*	
c.	LIMITED STORAGE OF CONSTRUCTION MATERIALS	
d	PROTECTION OF COMPLETED WORK	
e.	SHIFT WORK	
		25. SAF

DA FORM 7307-R, APR 94

COST ESTIMATING WORKSHEET - FACILITY ALTERATION

For use of this form, see TM 5-800-4; the proponent agency is USACE

1. PROJECT NUMBER	2. PROJECT TITLE			3. FY
12345	Renovate Barracks			93
4. BUILDING NUMBER	**5. LOCATION**			**6. HISTORICAL**
401	Fort Riley, Kansas			☐ YES ☒ NO
7. FACILITY TYPE	**8. CATEGORY CODE**	**9. FACILITY SIZE (SF)**	**10. AREA TO BE ALTERED (SF)**	**11. FUND TYPE (MCA/OMA/AFH)**
Barracks	72111	40,000	40,000	MCA
12. ESTIMATOR/OFFICE/DATE	**13. BASIS OF ESTIMATE**		**14. MONTHS**	**15. CONST START**
J. Smith/AFEN-RMP/Jan 93	Walk-Through		12	2/93

16. REMOVAL/DEMOLITION PORTION OF PRIMARY FACILITY

BUILDING SYSTEM WORK BREAKDOWN	PERCENT OF SYSTEM ALTERED (a)	PERCENT OF LABOR TO REMOVE (b)	LABOR PERCENT TO INSTALL (c)	SYSTEM PERCENT OF TOTAL (d)	TOTAL PERCENT REMOVAL (e)
01 - SUBSTRUCTURE	0	50	35	4.5	0.0
02 - SUPERSTRUCTURE	0	50	35	12.7	0.0
03 - ROOFING	0	50	35	2.3	0.0
04 - EXTERIOR CLOSURE	0	50	35	10.7	0.0
05 - INTERIOR CONSTRUCTION	80	50	35	18.1	2.5
06 - INTERIOR FINISHES	80	50	35	18.6	2.6
07 - SPECIALTIES	80	50	35	0.0	0.0
08 - PLUMBING	75	50	35	17.3	2.3
09 - H.V.A.C.	75	50	35	5.2	0.7
10 - SPECIAL MECHANICAL	75	50	35	2.1	0.3
11 - ELECTRICAL	75	80	35	8.0	1.7
12 - SPECIAL ELECTRICAL	75	80	35	0.5	0.1
13 - EQUIPMENT	0	50	35	0.0	0.0
14 - CONVEYING SYSTEMS	0	50	35	0.0	0.0
				17. RDF	10.2

18. FACILITY TYPE	19. CATEGORY CODE	20. AREA TO BE ALTERED (SF)
Barracks	72111	40,000

21. REPLACEMENT/NEW PORTION OF PRIMARY FACILITY

BUILDING SYSTEM WORK BREAKDOWN	PERCENT OF SYSTEM REPLACED (a)	SYSTEM PERCENT OF TOTAL (b)	TOTAL PERCENT REPLACED (c)
01 - SUBSTRUCTURE	0	4.5	0.0
02 - SUPERSTRUCTURE	0	12.7	0.0
03 - ROOFING	0	2.3	0.0
04 - EXTERIOR CLOSURE	0	10.7	0.0
05 - INTERIOR CONSTRUCTION	80	18.1	14.5
06 - INTERIOR FINISHES	80	18.6	14.9
07 - SPECIALTIES	80	0.0	0.0
08 - PLUMBING	75	17.3	13.0
09 - H.V.A.C.	75	5.2	3.9
10 - SPECIAL MECHANICAL	75	2.1	1.6
11 - ELECTRICAL	75	8.0	6.0
12 - SPECIAL ELECTRICAL	75	0.5	0.4
13 - EQUIPMENT	0	0.0	0.0
14 - CONVEYING SYSTEMS	0	0.0	0.0
		22. RNF	54.3

23. CONSTRUCTION LIMITATION ADJUSTMENTS		24. PERCENT TO ADD
a.	DUST PROTECTION FOR ADJACENT WORK AREAS	5.0
b	LIMITED USE OF EQUIPMENT *(NOISE/POWER LIMITATIONS)*	5.0
c.	LIMITED STORAGE OF CONSTRUCTION MATERIALS	5.0
d	PROTECTION OF COMPLETED WORK	0.0
e.	SHIFT WORK	0.0
	25. SAF	15.0

DA FORM 7307-R, APR 94

Figure 1. Example of DA Form 7307-R , Cost Estimating Worksheet - Facility Alteration

APPENDIX A
FACILITY UNIT COST TABLE

NOTES:

- The table is arranged numerically by category codes from AR 415-28. Where prices span a group of subcategories, the category code digit which is from 0-9 is designated by an X: For example, 124XX includes category 12400 through 12499.

- Unit costs in this table are forecast on the basis of an assumed bid opening date of April 1993 (MCP INDEX 1843) and an assumed midpoint of construction date of 1 October 1993 (MCPINDEX = 1869). To calculate unit costs for anticipated midpoint of construction other than 1 October 1993 and to make other adjustments based on local conditions, the procedures provided in TM *5-800-4* must be applied.

- Part I of this appendix includes buildings and major facilities; Part II of this appendix includes support facilities and items; Part III of this appendix pertains to piping; and Part IV pertains to solar systems.

- Unit costs reflected herein do not include allowances for contingencies and S&A.

- Building size identified in Part I of this Appendix is based on the average size from awarded construction cost data, but not a standard size. This quantity should be used in conjunction with table 1 to determine the size adjustment factor.

- This appendix is updated annually and available through the PAX System (Newsletter 3.2.2) and EIRS Bulletin.

FACILITY UNIT COST TABLE - CONTINUED
Part I
Buildings and Major Facilities

CAT. CODE	ITEM	QUANTITY / UNIT		UNIT COST	REMARKS
111XX	AIRFIELD RUNWAYS				SEE CATEGORY CODE 851XX
112XX	AIRFIELD TAXIWAYS				
113XX	AIRFIELD APRONS				
116XX	AIRFIELD MISC PAVING				
12310	GASOLINE STATION	195	SF	169.00	ADD FOR PUMPS (2600 EA) AND STG TANK (SEE CATCODE 124XX) AND PAVING (SEE CATCODE 851XX)
124XX	FUEL STG (OPERATING)	1,000 5,000 10,000 20,000 30,000	GA GA GA GA GA	3.10 2.90 2.80 2.70 2.60	UNDERGRD STG - INCLUDES EXCAVATION,BACKFILL& MANHOLE EXCLUDES EXTERIOR PIPING AND PUMPING
13120	SATELLITE COMMO CTR	6,000	SF	266.00	
13310	FLIGHT CONTROL TOWER	5,000	SF	200.00	
14110	AIRFIELD OPS BLDG	10,000	SF	122.00	WITHOUT TOWER
14111	AIRFIELD FIRE & RESCUE	8,000	SF	129.00	
14112	AVIATION UNIT OPS BLDG	12,000	SF	116.00	SQUADRON
14114	CIDC FIELD OPS BLDG	16,000	SF	99.00	

FACILITY UNIT COST TABLE - CONTINUED
Part I
Buildings and Major Facilities

CAT. CODE	ITEM	QUANTITY / UNIT	UNIT COST	REMARKS
14125	RECEPTION STN PROCESSG FAC	85,000 SF	82.00	
14131	OPS BLDG - GEN PURP	22,000 SF	85.00	
14132	READY BUILDING	20,000 SF	137.00	
14182	BRIGADE HQS BLDG	11,000 SF	99.00	
14183	BATTALION HQS BLDG	11,000 SF	99.00	
14184	GROUP HQS BLDG	11,000 SF	99.00	
14185	COMPANY HQS BLDG	11,000 SF	99.00	
17110	AC INSTRUMENT TRAINER FAC	14,000 SF	124.00	
17112	FLIGHT SIMULATOR BLDG	32,000 SF	109.00	
17120	GENERAL INSTRUCTION BLDG	38,000 SF	85.00	
17121	INDOOR FIRING RANGE	5,600 SF	87.00	
17123	RANGE SUPPORT BLDG	2,000 SF	84.00	
17124	FIELD RANGE LATRINES	600 SF	148.00	
17130	APPLIED INSTRUCTION BLDG	25,000 SF	94.00	
17139	COVERED TRAINING AREA	6,000 SF	23.00	
17140	ARMY RESERVE CENTER BLDG	23,000 SF	79.00	
17150	BATTALION CLASSROOM	32,000 SF	100.00	

FACILITY UNIT COST TABLE - CONTINUED
Part I
Buildings and Major Facilities

CAT. CODE	ITEM	QUANTITY / UNIT	UNIT COST	REMARKS
17151	BN ADMIN/CLASSROOM BLDG	13,000 SF	87.00	
17160	TRAINING AIDS CENTER	800 SF	93.00	
17971	OBSERVATION TOWER	800 SF	54.00	COST EXCLUDE EQUIPMENT
21110	HANGERS			
	MAINT GEN PURPOSE	23,000 SF	93.00	
	HIGH BAY MAINTENANCE	35,000 SF	126.00	
	CORROSION CONTROL	35,000 SF	124.00	
21120	A/C COMPONENT SHOP	27,000 SF	93.00	
21130	A/C PAINT SHOP	35,000 SF	124.00	
21140	A/C ENGINE TEST CELL FAC	13,000 SF	126.00	
21210	GUIDED MISSILE MAINT FAC	10,300 SF	138.00	
21409	ARMY RESRV VEH MAINT SHOP	5,000 SF	88.00	
21410	VEHICLE MAINT SHOP - TRACK	25,000 SF	95.00	
	VEHICLE MAINT SHOP - WHEELED	30,000 SF	93.00	
21420	VEHICLE MAINT SHOP - DS	37,000 SF	89.00	
21430	VEHICLE MAINT SHOP - GS	28,000 SF	93.00	
21451	GREASE RACK	1 EA	41,500.00	2 VEHICLE

FACILITY UNIT COST TABLE - CONTINUED
Part I
Buildings and Major Facilities

CAT. CODE	ITEM	QUANTITY / UNIT		UNIT COST	REMARKS
21454	WASH PLATFORM	1	EA	53,200.00	2 VEHICLE - LOW PRESSURE WITH WASHWATER TREATMENT
21456	CENTRALIZED WASH FAC	1	EA	3,891,000.00	16 ISLAND WITH WASHWATER RECYCLING
21470	OIL STORAGE BLDG	700	SF	72.00	
21610	AMMO RENOVATION SHOP	6,500	SF	85.00	
21612	AMMUNITION SURVEILLANCE	4,500	SF	97.00	
21630	AMMUNITION DEMOLITION FAC	67,000	SF	195.00	AMMP DEMILITARIZA-TION FACILITY
21710	ELECTRONICS & ELEC MAIN	5,500	SF	89.00	
21740	AVIONICS MAINT SHOP	23,000	SF	96.00	
21810	PARACHUTE PACK & DRY FAC	8,000	SF	110.00	
21815	NON-TOE SPT MAINT SHOP				SEE CATEGORY CODE 21885
21850	BATTERY SHOP	5,000	SF	89.00	
21885	MAINT SHOP GEN PURP	26,000	SF	82.00	
21910	FAC ENGR MAINT SHOP	31,400	SF	85.00	
31010	CHEMISTRY LAB	9,300	SF	151.00	
31410	GEN TRANS EQUIP RESEARCH LAB	31,000	SF	118.00	

FACILITY UNIT COST TABLE - CONTINUED
Part I
Buildings and Major Facilities

CAT. CODE	ITEM	QUANTITY / UNIT	UNIT COST	REMARKS
411XX	FUEL STORAGE - BULK	2,500 BL	34.00	ABOVE GRD STEEL TANKS-
		5,000 BL	32.00	INCL FNDTN DIKE &
		10,000 BL	29.00	EXTERIOR COATINGS
		25,000 BL	24.00	(42 US GALS/BBL)
		50,000 BL	20.50	
		100,000 BL	15.50	
		250,000 BL	9.80	
		2,500 BL	37.40	ABOVE GRD STEEL TANKS
		5,000 BL	35.30	W/FLOAT PANS, INCLUDES
		10,000 BL	32.30	FNDTN DIKE, INTERIOR
		25,000 BL	24.60	EPOXY LINING AND
		50,000 BL	24.00	INTERIOR COATING
		100,000 BL	17.00	
		250,000 BL	11.00	UNDRGRD TNKS SEE CATCODE 124XX
42180	IGLOO STORAGE	3,000 SF	134.00	HIGH EXPLOSIVE, INCLUDES EARTH MOUNDING
42183	GENRAL PURPOSE MAGAZINE	10,000 SF	128.00	
42280	IGLOO STORAGE			SEE CATEGORY CODE 42180
42283	GENERAL PURPOSE MAGAZINE			SEE CATEGORY CODE 42183
43210	COLD STORAGE WAREHOUSE W/PROCESSING	11,000 SF	90.00	
	COLD STORAGE WAREHOUSE	6,000 SF	119.00	
44110	GENERAL PURPOSE WAREHOUSE			
	LOWBAY	40,000 SF	46.00	16 STACK HEIGHT
	HIGHBAY	60,000 SF	55.00	UP TO 26 FT STACK HEIGHT
44130	CONTROLLED HUMIDITY WHSE	40,000 SF	48.00	

FACILITY UNIT COST TABLE - CONTINUED
Part I
Buildings and Major Facilities

CAT. CODE	ITEM	QUANTITY / UNIT	UNIT COST	REMARKS
44150	FLAMMABLE MATERIAL STRHSE	8,200 SF	89.00	
44181	VEHICLE STORAGE FAC	16,000 SF 16,000 SF	31.00 48.00	OPEN ENCLOSED
44210	AC PARTS STORAGE BLDG	16,000 SF	61.00	
44220	GENERAL PURPOSE WAREHOUSE			SEE CATEGORY CODE 44110
44224	DEPLOYMENT EQUIP STG BLDG	3,400 SF	46.00	
44225	MEDICAL SUPPLY WAREHOUSE	44,000 SF	51.00	
44230	CONTROLLED HUMIDITY WHSE			SEE CATEGORY CODE 44130
44240	FLAMMABLE MATERIAL STRHSE			SEE CATEGORY CODE 44150
44245	A/C FLAMMABLE STG BLDG			SEE CATEGORY CODE 44150
44280	OPEN WAREHOUSE	24,000 SF	36.00	
451XX	OPEN STG - DEPOT			SEE CATEGORY CODE 851XX
452XX	OPEN STG - INST/ORG			SEE CATEGORY CODE 851XX
51010	HOSPITAL	SF	144.00 172.00	STATION HOSPITALS REGIONAL MEDICAL CENTERS
51020	HOSPITAL CLINIC	30,000 SF	117.00	
54010	DENTAL CLINIC	15,000 SF	153.00	28 CHAIRS
55010	CLINIC W/O BEDS	12,000 SF	120.00	

FACILITY UNIT COST TABLE - CONTINUED
Part I
Buildings and Major Facilities

CAT. CODE	ITEM	QUANTITY / UNIT	UNIT COST	REMARKS
55030	HEALTH/DENTAL CLINIC	50,000 SF	131.00	WITHOUT BEDS
61011	POST HQS BLDG	25,000 SF	115.00	
61012	DIVISION HQS BLDG			SEE CATEGORY CODE 61011
61018	ARMY HQS BLDG	355,450 SF	103.00	
61021	ENGINEER ADMIN BLDG	25,000 SF	87.00	
61023	SUPPLY SERVICE ADMIN BLDG			SEE CATEGORY CODE 61050
61027	FINANCE ADMIN BLDG	25,000 SF	87.00	
61028	PROVOST MARSHALL ADMIN			SEE CATEGORY CODE 61050
61031	ADP BLDG	21,000 SF	126.00	INCLUDES RAISED FLOOR WITH ADMIN & STORAGE
61040	PERSONNEL ADMIN BLDG	25,000 SF	87.00	AREAS FOR CIVILIAN
61041	PERSONNEL ADMIN BLDG			FOR MILITARY - SEE CATEGORY CODE 61040
61050	ADMIN BLDG GEN PURP	25,000 SF	87.00	
62010	UNDERGROUND ADMIN FAC	6,000 SF	123.00	HARDENED FACILITY
711XX	FAMILY HOUSING W/O SPRINKLER (NET S.F.)	SF	50.00 52.00	CONUS OCONUS
71410	DETACHED GARAGES	200 SF 480 SF	39.00 53.00	SINGLE CAR AMBULANCE GARAGE

FACILITY UNIT COST TABLE- CONTINUED
Part I
Buildings and Major Facilities

CAT. CODE	ITEM	QUANTITY / UNIT	UNIT COST	REMARKS
72111	UNACCOMPANIED ENLISTED PERSONNEL HOUSING	40,000 SF	83.00	WITHOUT DINING
72180	SENIOR ENLISTED QTRS			SEE CATEGORY CODE 72111
72181	TRAINEE BARRACKS	266,640 SF	80.00	COST APPLIES TO ENTIRE COMPLEX
72210	DINING FACILITY	16,000 SF	156.00	INCLUDES MCA FUNDED EQUIP MESS HALL, ENLISTED (INCLUDES KITCHEN EQUIP & INSTALLATION)
72330	ADMIN & SUPPLY BLDG	17,000 SF	74.00	
72335	BATTALION STG BLDG	3,000 SF	46.00	
724XX	UNACCOMPANIED OFFICER QTRS	SF	85.00	
73010	FIRE STATION	3,500 SF	113.00	
73016	POLICE STATION	4,200 SF	95.00	
73017	POST CHAPEL	9,000 SF	104.00	
73020	CHAPEL CENTER	15,000 SF	123.00	INCLUDES RELIGIOUS EDUCATION FACILITY
7304X	DEPENDENT SCHOOLS (OVERSEAS)			
	ELEMENTARY	SF	88.00	
	HIGH SCHOOL	SF	92.00	

FACILITY UNIT COST TABLE - CONTINUED
Part I
Buildings and Major Facilities

CAT. CODE	ITEM	QUANTITY / UNIT		UNIT COST	REMARKS
7304X	SECTION SIX SCHOOLS				
	ELEMENTARY		SF	77.00	
	JUNIOR HIGH SCHOOL		SF	79.00	
	HIGH SCHOOL		SF	87.00	
74010	AUDITORIUM GP	4,000	SF	104.00	
74011	BOWLING CENTER	7,800	SF	123.00	W/EQUIP - 8 LNS (PIN SPOTTING EQUIP & AUTO SCORING DEVICE)
74014	CHILD DEVELOPMENT CENTER	13,500	SF	116.00	
74021	COMMISSARY W/OPERATIONAL EQUIPMENT	85,000	SF	89.00	
74022	SKILL DEVELOPMENT CENTER	22,000	SF	89.00	GENERAL SKILL
74023	CREDIT UNION	3,000	SF	102.00	INCLUDES VAULT
74024	SKILL DEVELOPMENT CENTER	15,000	SF	89.00	AUTOMOTIVE CRAFTS
74025	EDUCATION CENTER	10,000	SF	102.00	ACES FACILITY
74026	ENTERTAINMENT WORHSHOP	4,000	SF	82.00	
74028	PHYSICAL FITNESS TRNG CTR	20,000	SF	108.00	DOES NOT INCLUDE POOL
74030	GOLF CLUB HOUSE	4,000	SF	97.00	TEMPORARY LODGING
74032	GUEST HOUSE		SF	84.00	

FACILITY UNIT COST TABLE - CONTINUED
Part I
Buildings and Major Facilities

CAT. CODE	ITEM	QUANTITY / UNIT		UNIT COST	REMARKS
74033	COMMUNITY CENTER	2,750	SF	85.00	
74034	GYMNASIUM				SEE CATEGORY CODE 74028
74041	MAIN LIBRARY	12,000	SF	89.00	
74046	OPEN DINING CONSOLIDATED				SEE CATEGORY CODE 74047
74047	NCO OPEN DINING	16,000	SF	133.00	
74048	OFFICE OPEN DINING				SEE CATEGORY CODE 74047
74053	MAIN EXCHANGE	12,000	SF	78.00	W/O CAFETERIA & SNACKBAR
74065	MORAL SPT OFFICE	5,000	SF	96.00	FAMILY SERVICES CENTER
74066	YOUTH CENTER	15,000	SF	95.00	
74068	RECREATION CENTER	20,000	SF	88.00	
74070	ROLLER SKATING RINK	20,000	SF	78.00	
74072	INDOOR SWIMMING POOL	6,000	SF	138.00	25 METER NATATORIUM
74076	THEATER	10,000	SF	113.00	WITH STAGE & DRESSING ROOM
74084	CLASS VI STORE	14,000	SF	76.00	
75022	FOOTBALL FIELD		EA	143,000	MULTI-PURPOSE - EXCL SITE AND ELECTRICAL LIGHTING

FACILITY UNIT COST TABLE- CONTINUED
Part I
Buildings and Major Facilities

CAT. CODE	ITEM	QUANTITY / UNIT		UNIT COST	REMARKS
75030	OUTDOOR SWIMMING POOL	11,325	SF	72.00	50 METER WITH CHANGE HOUSE
87220	WATCHTOWER	121	SF	154.00	OBSERVATION TOWER
87230	SENTRY STATION	280	SF	154.00	
87235	MOTOR POOL DISPATCH BLDG	195	SF	72.00	
90000	FOUNDATIONS, UNUSUAL		LF	18.50	PILING, WOOD 12" DIAMETER
			LF	35.00	PILING, CONC. 12" x 14" SQUARE
			LF	41.00	PILING, CONCRET E 16" DIAMETER
			LF	49.00	PILING, CONCRETE 18" DIAMETER

FACILITY UNIT COST TABLE - CONTINUED
Part II
Support Facilities and Items

CAT. CODE	ITEM		UNIT	UNIT COST	REMARKS
81117	PRIME POWER PLANT		KW	820.00	EQUIP ONLY - INCL SWITCHGEAR
81150	NO BREAK UNIT		KW	3,290.00	UNINTERRUPTIBLE POWER SYS(UPS) COST INCL STATIC SWITCHGEAR
81160	STANDBY GENERATOR PLANT		KW	529.00	COST INCL 500 SF BLDG, DEDUCT 180/KW FOR CLASS B OR C
81180	PRIME POWER PLANT		KW	904.00	CLASS A - INCLUDES BUILDING
81230	STREET LIGHTING		LF	23.00	UNDERGROUND DIRECT BURIAL W/500 WATT MV LAMINAR
81240	TRANSMISSION LINE	H-FRAME	MI	78,400.00	15 KV UP TO 69 KV SHORT LINES WOOD POLE, 3PH, 4 WIRE
		OVERHEAD	LF	11.00	BELOW 15 KV WOOD POLE, 3PH, 4 WIRE
81242	UNDERGRD ELECT DIRS	DIRECT BURIAL			COST INCL TRENCH, SAND BASE, TREATED BRD, BACKFILL & MARKER
		#1/0	LF	16.00	3/C - 600V DB
		#4/0	LF	24.00	3/C - 600V DB
		UG DUCTS			
		1-WAY-4"	LF	11.50	TYPE EB, PVC, CONC. ENCACSED
		2-WAY-4"	LF	17.00	3" EACH WAY, INCL EXCAVATION
		4-WAY-4"	LF	28.70	AND BACKFILL TO 3 FEET DEEP
		6-WAY-6"	LF	35.00	
81260	DIST TRANSFORMER	150	KVA	52.00	OIL-FILLED, PAD-MOUNTED,
		750	KVA	27.00	3-PHASE
		3,750	KVA	17.00	

FACILITY UNIT COST TABLE - CONTINUED
Part II
Support Facilities and Items

CAT. CODE	ITEM		UNIT	UNIT COST	REMARKS
81320	SUBSTATION		KVA	111.60	
82110	HEAT PLANT COAL-FIRED	STEAM			INCLUDES FUEL & ASH HANDLING
		50 MBTU/H	EA	3,011,000.00	FACILITIES
		100 MBTU/H	EA	5,440,000.00	
		150 MBTU/H	EA	7,754,000.00	
		200 MBTU/H	EA	9,960,000.00	
		HITEMP WATER			INCLUDES FUEL & ASH HANDLING
		50 MBTU/H	EA	2,819,000.00	FACILITIES
		100 MBTU/H	EA	4,536,000.00	
		150 MBTU/H	EA	6,066,000.00	
		200 MBTU/H	EA	7,759,000.00	
82120	HEAT PLANT OIL-FIRED	STEAM			INCL PLT EQUIP & OIL HANDLING
		10 MBTU/H	EA	535,000.00	FACILITY
		50 MBTU/H	EA	1,859,000.00	
		100 MBTU/H	EA	3,530,000.00	
		150 MBTU/H	EA	5,118,000.00	
		200 MBTU/H	EA	6,508,000.00	
		HITEMP WATER			INCL PLT EQUIP & OIL HANDLING
		10 MBTU/H	EA	481,000.00	FACILITIES
		50 MBTU/H	EA	1,707,000.00	
		100 MBTU/H	EA	3,187,000.00	
		150 MBTU/H	EA	4,550,000.00	
		200 MBTU/H	EA	5,916,000.00	
82190	BROILERS (MISC)				SELF-CONTAINED W/BURNERS AND ALL NORMAL CONTROLS
		MARINE TYPE			
		100 HP	EA	42,291.00	COMBINATION GAS/OIL BURNER
		200 HP	EA	65,494.00	STEAM/HW MAX

FACILITY UNIT COST TABLE - CONTINUED
Part II
Support Facilities and Items

CAT. CODE	ITEM		UNIT	UNIT COST	REMARKS
		400 HP	EA	85,600.00	
		600 HP	EA	112,100.00	
		STEEL FIRE BOX			
		100 HP	EA	45,500.00	STEAM & HOT WATER-INSTALLATION
		200 HP	EA	65,700.00	INCLUDED
		300 HP	EA	77,100.00	
		400 HP	EA	88,400.00	
		500 HP	EA	97,100.00	
		CAST IRON			SECTIONAL BOILERS
		60 HP	EA	34,700.00	
		100 HP	EA	44,100.00	
		150 HP	EA	57,800.00	
		200 HP	EA	69,100.00	
		PKG WATER TUBE			STEEL
		1,000 HP	EA	217,500.00	COMBINATION OIL/GAS, CRAFT FAN
		2,000 HP	EA	276,300.00	
		3,000 HP	EA	410,000.00	
82210	STEAM CONDENSATE LINES				INSUL, STEAM & CONDENS COST
		COMMON CONDUIT			INCL FITTINGS,ACCESSRIES, 3 FT EXCAVATION BACKFILL & TESTING
		11 - 1/4"	LF	93.70	STM: 2", RET: 1-1/2"
		10"	LF	86.00	STM: 1-1/2", RET: 1-1/2"
		10"	LF	70.60	STM: 1-1/4", RET: 1"
		10"	LF	66.20	STM: 1", RET: 1"
		SINGLE CONDUIT			STEAM OR HITEMP WATER, COST INCL FITTINGS,ACCESSRIES, 3 FT EXCAVATION BACKFILL & TESTING
		6"	LF	56.20	1-1/4" PIPE
		8"	LF	68.40	1-1/2" PIPE

FACILITY UNIT COST TABLE - CONTINUED
Part II
Support Facilities and Items

CAT. CODE	ITEM		UNIT	UNIT COST	REMARKS
82210	STEAM CONDENSATE LINES				
		8"	LF	68.40	2" PIPE
		10"	LF	87.20	2-1/2" PIPE
		10"	LF	91.60	3" PIPE
		11 -1/8"	LF	103.00	4" PIPE
		15"	LF	153.30	6" PIPE
82220	HOT WATER LINES	COMMON CONDUIT			INCLUDES FITTINGS,ACCESSRIES, 3 FT EXCAV'N,BCKFILL & TESTING
		12"	LF	98.00	HW: 1", RET: 1"
		12-7/8"	LF	110.00	HW: 1-1/2", RET: 1-1/2"
		15"	LF	120.00	HW: 2", RET: 2"
		18"	LF	151.00	HW: 3", RET: 3"
		21"	LF	181.00	HW 4:", RET: 4"
82290	STEAM DIST MANHOLE	PREFAB STEEL			INCL CORD, CNDUIT,VNT,MH VNT,
		8" X 6" HT	EA	13,900.00	NORMAL PIPING & INSTALLATION
		PRECST CONCRTE			
		6 D X 8" DEEP	EA	3,000.00	INCLUDE FRAME & COVER
82410	GAS PIPE LINE				SEE CHART A
82500	SOLAR				SEE SOLAR ENERGY CONVERSION CHART B
82610	AIR CONDITIONING PLANT				
		NEW BLDG	TON	2,900,00	
		EXISTING BLDG	TON	4,000.00	
83220	SANITARY SEWER LINE				SEE CHART A
83230	SEWER PUMPING STATION		EA	115,800.00	1,000 GPM

TABLE 1. FACILITY UNIT COST TABLE - CONTINUED
Part II
Support Facilities and Items

CAT. CODE	ITEM		UNIT	UNIT COST	REMARKS
83240	IND WASTE TRTMNT PLANT		EA	1,136,000.00	500,000 GPD
83290	SANITARY SEWER MANHOLES				
		CONCRETE, CIP			
		UP TO 8" DEEP	VLF	307.00	4 FT ID, INCLUDES FOOTING,
		OVER 8" DEEP	VLF	341.00	EXCAV'N,24" D COVER, & FRAME
		CONCRETE, PCST			
		UP TO 8" DEEP	VLF	256.00	
		OVER 8" DEEP	VLF	277.00	
		CATCH BASINS	EA	1,141.00	4 FT DEEP
		CATCH BASINS	EA	1,516.00	6 FT DEEP
		DROP INLETS	EA	1,211.00	
83310	INCINERATOR EQUIPMENT		EA	29,100.00	200 LB PER HR PER UNIT
84120	ELEVATED WATER STG TANK				
		50,000 GA	GA	260,100.00	INCLUDES STEEL WATER SG TANK
84120	ELEVATED WATER STG TANK				
		100,000 GA	EA	263,300.00	STNDPIPE, 125 FT TOWER, VALVES
		150,000 GA	EA	485,900.00	& STD FOUNDATIONS, DOES NOT
		250,000 GA	EA	609,900.00	INCLUDE PUMPHOUSE
		500,000 GA	EA	852,800.00	
		750,000 GA	EA	1,668,400.00	
		1,000,000 GA	EA	1,389,700.00	
84121	GROUND STG TANK (WATER)				
		100,000 GA	EA	189,130.00	INCLUDES CONCRETE TANK AND STD
		250,000 GA	EA	362,300.00	FOUNDATIONS, BUT DOES NOT INCL
		500,000 GA	EA	525,500.00	EXTERNAL PIPING & PUMPING
		1,000,000 GA	EA	566,400.00	

FACILITY UNIT COST TABLE - CONTINUED
Part II
Support Facilities and Items

CAT. CODE	ITEM		UNIT	UNIT COST	REMARKS
84140	RESERVOIR	250,000 GA	EA	363,900.00	INCL 6" CONCRETE FLOOR SLAB
		500,000 GA	EA	485,300.00	ORDINARY EXCAVATION &
		1,000,000 GA	EA	668,400.00	PUMPING WITHIN
		2,000,000 GA	EA	1,028,000.00	
84210	WATER PIPE LINE				SEE CHART A
84310	FIRE PUMPS	500 GPM	EA	63,000.00	INCL DIESEL DRVE,AUT
		1,000 GPM	EA	83,500.00	FILLINGS & ACCESSORIES, COMPL
		2,000 GPM	EA	94,000.00	WITH INSTALLATION COSTS.
		2,500 GPM	EA	97,100.00	
84311	FIRE HYDRANTS		EA	1,900.00	
851XX	PAVING				INCL EXCAVATION FOR DEPTH OF PAVEMENT ONLY
		A/C SURFACE			EXCL EARTHWORK BELOW
		1-1/2"	SY	6.40	SURFACE COURSE
		2"	SY	8.00	
		3"	SY	11.60	
		CONCRETE			EXCL EARTHWORK BELOW
		6"	SY	27.80	SURFACE COURSE
		8"	SY	35.20	
		10"	SY	41.20	
		12"	SY	48.50	
		BASE COURSE			UNCLASSIFIED MATERIAL
		4"	SY	2.45	INCLUDES MATERIAL, EQUIPMENT
		6"	SY	3.50	& COMPACTION
		8"	SY	5.20	
		12"	SY	7.30	

FACILITY UNIT COST TABLE - CONTINUED
Part II
Support Facilities and Items

CAT. CODE	ITEM		UNIT	UNIT COST	REMARKS
		SUB BASE			UNCLASSIFIED MATERIAL
		6"	SY	2.45	
		9"	SY	3.30	
		12"	SY	4.20	
851XX	PAVING	GRAVEL			UNTREATED
		4"	SY	2.20	
		CRUSHED STONE			OR GRAVEL
		6"	SY	3.90	
		CURB/GUTTER			CONCRETE
		6" X 8"	LF	14.90	
85220	SIDEWALKS	4"	SF	2.60	INCLUDES GRADING & FORMING
86010	RAILROAD TRACK		LF	120.00	100# RAIL, COMPLETE
87110	STORM SEWER LINE				SEE CHART A
87190	STORM SEWER MANHOLES				SEE CATEGORY CODE 83290
87210	FENCING	CHAIN LINK	LF		TYPE A (9GA)
		6 FT HIGH	LF	18.20	INCLUDES 3 STRAND BARRED WIRE
		8 FT HIGH	LF	22.30	
		10 FT HIGH	LF	26.70	
87210	FENCING	FENCE TOPPING BARRED TAPE	LF	6.60	STNLS STL, MIL-B-52775 TYPE II
87211	GUARD RAIL		LF	28.30	

FACILITY UNIT COST TABLE - CONTINUED
Part II
Support Facilities and Items

CAT. CODE	ITEM		UNIT	UNIT COST	REMARKS
87250	GATES	CHAIN LINK			8" HIGH - 9 GA
		4" WIDE	EA	119.10	
		12" SINGLE	EA	292.20	MOTOR OPER. (SWING) ADD $2,900
		24" PAIR	EA	584.50	MOTOR OPER. (SWING) ADD $4,400
		36" PAIR	EA	904.40	MOTOR OPER. (SLIDE) ADD $4,070
88050	SPRINKLER SYSTEMS	WET PIPE	SF	2.60	PROTECTED AREA ONLY
		DRY PIPE	SF	2.80	PROTECTED AREA ONLY
		DELUGE	SF	5.75	PROTCTD AREA ONLY, EXCL DELUGE VALVE, PUMPING ELEVATED WATER STORAGE, EXTERIOR PIPING
		DRAFT CURTAINS	SF	7.85	SQUARE FEET OF CURTAIN AREA SUPPORTED BY EXISTING TRUSSES (HANGERS)
93210	SITE PREPARATION	GRADING	SY		
		ROUGH	SY	3.75	
		FINE	SY	1.10	3 PASSES WITH ROLLER
		SITE CLEARING	AC	3,232.00	6" TREES
		BORROW	CY	9.70	UNCLASSIFIED, 5-MILE HAUL
93220	SITE IMPROVEMENT	TOPSOIL:			
		HAUL & SPREAD	CY	16.90	
		STRIP/ STOCKPILE	SY	0.60	6" DEEP
		MULCHING			
		WOOD CHIPS	SY	1.70	2" DEEP

FACILITY UNIT COST TABLE - CONTINUED
Part II
Support Facilities and Items

CAT. CODE	ITEM		UNIT	UNIT COST	REMARKS
		GRASS SEEDING	SY	0.60	HYD W/FERTILIZER
		SODDING	SY	6.25	BLUE GRASS
93310	DEMOLITION	BUILDING	SF	3.55	
		PAVEMENT	SY	5.30	6" CONCRETE
93419	EXCAVATION	EARTH			
		TRENCH-MACHINE	CY	5.10	
		TRENCH-HAND	CY	34.80	
		BACKFILL-MACHINE	CY	8.85	INCLUDES COMPACTION
		BACKFILL-HAND	CY	28.30	INCLUDES COMPACTION
		ROCK			
		ROCK, HARD	CY	69.30	BLASTING & MACHINE WORK
		SHALE, MEDIUM	CY	36.40	RIPPER DOZER
		TRENCH-HAND	CY	114.00	

FACILITY UNIT COST TABLE - CONTINUED
Part II
Support Facilities and Items
Chart A - Piping*

SIZE 1NCH	UNIT	BLACK STEEL $_____	CORRU-GATED $_____	CAST IRON $____	PVC $__	CONCRETE PLAIN $_____	REINF. $_____	VITRIFIED CLAY STANDARD $_____	VITRIFIED CLAY EXTRA STRENGTH $_____
1	LF	9.40							
2	LF	15.10			18.80				
3	LF	25.85			14.84				
4	LF	34.30		15.10	16.65			6.15	6.90
6	LF	76.30		21.25	23.00	9.50		7.95	9.20
10	LF	136.10	16.40	39.30	30.75	11.50		13.05	15.10
12	LF	169.20	20.50	53.80	40.00	14.60	15.60	14.40	17.65
18	LF		25.85	85.80	77.30	22.80	27.15	34.30	38.40
24	LF		38.65	121.10	136.20	32.75	38.15	63.00	74.50
36	LF		65.50	211.45	286.70		72.70	135.15	159.50
60	LF		124.70					173.05	

*MATERIALS:
1. Black steel, schedule 40, screwed.
2. Corrugated metal piping, galvanized 16 gage up to 18", 14 gage up to 48", 12 gage up to 84".
3. Cast iron, class 150, with fitting, mechanical joint.
4. PVC, class 150.

NOTE:
Cost includes: Furnishing and installing pipe only, excavation, bedding, backfill and compaction must be added to these costs.

FACILITY UNIT COST TABLE - CONTINUED
Part III
Solar Systems

BUILDING AREA *(SQ.FT.)	SOLAR SYSTEM COST ($)
UP TO 15000	$4.10 per sq. ft.** plus $29,800.00
15001 50000	$2.80 per sq. ft.** plus $43,400.00
50001 AND LARGER	$1.50 per sq. ft.** plus $120,200.00

*Include only heated and/or cooled portions of facilities.

**Resulting dollar figure rounded up to next thousand dollar figure.

APPENDIX B
LOCATION ADJUSTMENT FACTORS TABLE

PART I
CONUS LOCATIONS

STATE		LOCATION	ACF INDEX
ALABAMA		STATE AVERAGE	0.77
		MOBILE	0.80
		MONTGOMERY	0.74
	(A)	ANNISTON ARMY DEPOT	0.77
	(A)	FORT MCCLELLAN	0.76
	(A)	FORT RUCKER	0.78
	(AF)	MAXWELL AIR FORCE BASE	0.74
	(N)	MOBILE AREA	0.76
	(A)	REDSTONE ARSENAL	0.78
ALASKA		STATE AVERAGE	1.85
		ANCHORAGE	1.73
		FAIRBANKS	1.97
	(N)	ADAK NAVAL STATION	2.75
	(AF)	ELELSON AIR FORCE BASE	1.97
	(AF)	ELMENDORF AIR FORCE BASE	1.73
	(A)	FORT GREELY	2.17
	(A)	FORT RICHARDSON	1.73
	(A)	FORT WAINWRIGHT	1.97
	(AF)	SHEMYA AIR FORCE BASE	2.75
	(AF)	CLEAR AIR FORCE BASE	2.18
ARIZONA		STATE AVERAGE	0.95
		FLAGSTAFF	1.00
		TUCSON	0.90
	(AF)	DAVIS MONTHAN AIR FORCE BASE	0.96
	(AF)	LUKE AIR FORCE BASE	1.00
	(A)	FORT HUACHUCA	1.12
	(A)	NAVAJO ARMY DEPOT	1.00
	(N)	YUMA MARINE CORPS AIR STATION	1.11
	(A)	YUMA PROVING GROUND	1.11
ARKANSAS		STATE AVERAGE	0.85
		FORT SMITH	0.92
	(A)	FORT CHAFFEE	0.92
	(AF)	LITTLE ROCK AIR FORCE BASE	0.80
		PINE BLUFF	0.78
	(N)	PINE BLUFF ARSENAL	0.78

LOCATION ADJUSTMENT FACTORS - CONTINUED
PART I
CONUS LOCATIONS

STATE		LOCATION	ACF INDEX
CALIFORNIA		STATE AVERAGE	1.24
		SAN DIEGO	1.16
		SAN FRANCISCO	1.37
	(AF)	BEALE AIR FORCE BASE	1.24
	(N)	CAMP PENDLETON MARINE CORPS	1.18
	(N)	CENTER VILLE BEACH (SF)	1.37
	(N)	CHINA LAKE NAVAL WEAPONS CENTER	1.40
	(AF)	EDWARDS AIR FORCE BASE	1.38
	(N)	EL CENTRO NAVAL AIR FACILITY	1.21
	(N)	EL TORO MARINE CORPS AIR STATION	1.23
	(A)	FORT HUNTER LIGGETT	1.44
	(A)	FORT IRWIN	1.30
	(A)	FORT ORD	1.21
	(N)	LOS ANGELES AREA	1.24
	(AF)	MARCH AIR FORCE BASE	1.26
	(AF)	MATHER AIR FORCE BASE	1.14
	(AF)	MCCLELLAN AIR FORCE BASE	1.14
	(N)	MONTEREY AREA	1.20
	(A)	OAKLAND ARMY BASE	1.37
	(N)	PORT HUENEME AREA	1.18
	(A)	RIVERBANK ARMY AMMO PLANT	1.19
	(A)	SACRAMENTO ARMY DEPOT	1.12
	(A)	SHARPE ARMY DEPOT	1.16
	(A)	SIERRA ARMY DEPOT	1.43
	(N)	STOCKTON	1.14
	(AF)	VANDENBERG AIR FORCE BASE	1.36
	(N)	29 PALMS MARINE CORPS BASE	1.38
COLORADO		STATE AVERAGE	1.03
		COLORADO SPRINGS	1.05
		DENVER	1.00
	(AF)	AIR FORCE ACADEMY	1.06
	(AF)	CHEYENNE MOUNTAIN	1.11
	(AF)	FALCON AIR FORCE STATION	1.11
	(A)	FITZSIMONS ARMY MEDICAL CTR	1.08
	(A)	FORT CARSON	1.12
	(AF)	PETERSON AIR FORCE BASE	1.06
	(A)	PUEBLO ARMY DEPOT	0.92
	(A)	ROCKY MOUNTAIN ARSENAL	1.06

LOCATION ADJUSTMENT FACTORS - CONTINUED
PART I
CONUS LOCATIONS

STATE		LOCATION	ACF INDEX
CONNECTICUT		STATE AVERAGE	1.27
		BRIDGEPORT	1.31
		NEW LONDON	1.22
	(N)	NEW LONDON AREA	1.22
	(A)	STRATFORD ENGINEERING PLANT	1.24
DELAWARE		STATE AVERAGE	1.06
		DOVER	1.03
		WILMINGTON	1.08
	(AF)	DOVER AIR FORCE BASE	1.03
FLORIDA		STATE AVERAGE	0.82
		MIAMI	0.89
		PANAMA CITY	0.75
	(N)	CAPE CANAVERAL	0.98
	(AF)	EGLIN AIR FORCE BASE	0.73
	(AF)	HOMESTEAD AIR FORCE BASE	0.89
	(N)	JACKSONVILLE AREA	0.91
	(N)	KEY WEST NAVAL AIR STATION	1.05
	(AF)	MCDILL AIR FORCE BASE	0.80
	(N)	ORLANDO AREA	0.80
	(N)	PANAMA CITY AREA	0.78
	(N)	PENSACOLA AREA	0.80
	(AF)	TYNDALL AIR FORCE BASE	0.75
GEORGIA		STATE AVERAGE	0.85
		ALBANY	0.82
		ATLANTA	0.96
	(N)	ALBANY AREA	0.82
	(A)	FORT BENNING	0.76
	(A)	FORT GILLEM	0.97
	(A)	FORT GORDON	0.83
	(A)	FORT MCPHERSON	0.96
	(A)	FORT STEWART	0.81
	(N)	KINGS BAY	0.92
	(AF)	WARNER ROBBINS AIR FORCE BASE	0.95

LOCATION ADJUSTMENT FACTORS - CONTINUED
PART I
CONUS LOCATIONS

STATE		LOCATION	ACF INDEX
HAWAII		STATE AVERAGE	1.69
		HONOLULU	1.66
		KANEOHE BAY	1.72
	(N)	BARBERS POINT NAVAL AIR STN	1.73
	(N)	BARKING SANDS	1.80
	(N)	FORD ISLAND	1.70
	(A)	FORT DERUSSY	1.66
	(A)	FORT SHAFTER	1.66
	(AF)	HICKMAN AIR FORCE BASE	1.64
	(N)	KANEOHE MARINE CORPS AIR STN	1.72
	(N)	PEARL HARBOR	1.68
	(A)	POHAKULOA	1.69
	(A)	SCHOFIELD BARRACKS	1.73
	(A)	TRIPLER ARMY MEDICAL CENTER	1.66
	(AF)	WHEELER AIR FORCE BASE	1.73
IDAHO		STATE AVERAGE	1.17
		BOISE	1.19
		MOUNTAIN HOME	1.15
	(AF)	MOUNTAIN HOME AIR FORCE BASE	1.15
ILLINOIS		STATE AVERAGE	1.14
		BELLE VILLE	1.08
		CHICAGO	1.19
	(N)	FOREST PARK	1.19
	(N)	GLENVIEW	1.19
	(N)	GREAT LAKES NAVAL TRNG CTR	1.19
	(A)	ROCK ISLAND ARSENAL	1.11
	(A)	SAVANNAH ARMY DEPOT	1.08
	(AF)	SCOTT AIR FORCE BASE	1.14
INDIANA		STATE AVERAGE	0.99
		INDIANAPOLIS	0.97
		LOGANSPORT	1.00
		MADISON	0.96
	(N)	CRANE NAVAL WEAPONS SPT CTR	1.01
	(A)	FORT BENJAMIN HARRISON	1.02
	(AF)	GRISSOM AIR FORCE BASE	1.07
	(A)	JEFFERSON PROVING GROUND	0.93

LOCATION ADJUSTMENT FACTORS-CONTINUED
PART I
CONUS LOCATIONS

STATE		LOCATION	ACF INDEX
IOWA		STATE AVERAGE	0.99
		BURLINGTON	0.93
		DES MOINES	1.04
	(A)	IOWA ARMY AMMUNITION PLANT	0.95
KANSAS		STATE AVERAGE	0.96
		MANHATTAN	0.92
		WICHITA	0.99
	(A)	FORT LEAVENWORTH	1.06
	(A)	FORT RILEY	0.98
	(A)	KANSAS ARMY AMMUNITION PLANT	0.98
	(AF)	MCCONNELL AIR FORCE BASE	0.99
KENTUCKY		STATE AVERAGE	0.91
		LEXINGTON	0.89
		LOUISVILLE	0.92
	(A)	FORT CAMPBELL	0.99
	(A)	FORT KNOX	0.98
	(A)	LEXINGTON/BLUE GRASS AD	0.96
	(N)	LOUISVILLE NAVAL AIR STATION	0.92
LOUISIANA		STATE AVERAGE	0.93
		NEW ORLEANS	1.02
		SHREVEPORT	0.84
	(AF)	BARKSDALE AIR FORCE BASE	0.84
	(A)	FORT POLK	0.96
	(A)	LOUISIANA ARMY AMMO PLANT	0.84
	(A)	NEW ORLEANS ARMY BASE	1.02
MAINE		STATE AVERAGE	0.84
		BANGOR	0.79
		PORTLAND	0.89
	(N)	BRUNSWICK	0.89
	(N)	WINTER HARBOR	0.89

LOCATION ADJUSTMENT FACTORS-CONTINUED
PART I
CONUS LOCATIONS

STATE		LOCATION	ACF INDEX
MARYLAND		STATE AVERAGE	0.98
		BALTIMORE	0.92
		ANNAPOLIS	0.96
		LEXINGTON PARK	1.03
	(A)	ABERDEEN PROVING GROUND	0.92
	(AF)	ANDREWS AIR FORCE BASE	1.03
	(A)	FORT DETRICK	0.83
	(N)	BETHESDA	1.03
	(A)	FORT GEORGE G MEADE	1.03
	(A)	FORT RITCHIE	0.92
	(A)	HARRY DIAMOND LABORATORIES	1.03
	(N)	INDIAN HEAD	1.03
	(N)	CHELTENHAM	1.03
	(N)	CHESAPEAKE BEACH	0.85
	(N)	THURMONT	0.98
	(N)	PATUXENT RIVER AREA	1.03
MASSACHUSETTS		STATE AVERAGE	1.28
		BOSTON	1.29
		FITCHBURG	1.26
	(A)	ARMY MATERIAL & MECH LAB	1.27
	(A)	FORT DEVENS	1.34
	(AF)	HANSCOM AIR FORCE BASE	1.29
MICHIGAN		STATE AVERAGE	1.14
		DETROIT	1.21
		MARQUETTE	1.07
	(A)	DETROIT ARSENAL	1.22
	(AF)	K I SAWYER AIR FORCE BASE	1.07
MINNESOTA		STATE AVERAGE	1.32
		DULUTH	1.27
		MINNEAPOLIS	1.37
MISSISSIPPI		STATE AVERAGE	0.82
		BILOXI	0.84
		COLUMBUS	0.82
	(AF)	COLUMBUS AIR FORCE BASE	0.79
	(N)	GULFPORT	0.84
	(AF)	KEESLER AIR FORCE BASE	0.84
	(N)	MERIDIAN NAVAL AIR STATION	0.86

LOCATION ADJUSTMENT FACTORS-CONTINUED
PART I
CONUS LOCATIONS

STATE		LOCATION	ACF INDEX
MISSOURI		STATE AVERAGE	1.02
		KANSAS CITY	1.04
		SEDALIA	0.99
	(A)	FORT LEONARD WOOD	1.10
	(A)	LAKE CITY ARMY AMMO PLANT	1.03
	(A)	ST LOUIS ARMY AMMO PLANT	1.14
	(AF)	WHITEMAN AIR FORCE BASE	1.05
MONTANA		STATE AVERAGE	1.19
		BILLINGS	1.21
		GREAT FALLS	1.16
	(AF)	MALMSTROM AIR FORCE BASE	1.16
NEBRASKA		STATE AVERAGE	0.88
		GRAND ISLAND	0.78
		OMAHA	0.98
	(A)	CORNHUSKER ARMY AMMO PLANT	0.78
	(AF)	OFFUTT AIR FORCE BASE	0.98
NEVADA		STATE AVERAGE	1.19
		HAWTHORNE	1.26
		LAS VEGAS	1.11
	(N)	FALLON	1.28
	(A)	HAWTHORNE ARMY AMMO PLANT	1.26
	(AF)	NELLIS AIR FORCE BASE	1.11
NEW HAMPSHIRE		STATE AVERAGE	1.06
		CONCORD	1.05
		PORTSMOUTH	1.06
	AF)	NEW BOSTON AEB	1.06
NEW JERSEY		STATE AVERAGE	1.20
		NEWARK	1.21
		TRENTON	1.18
	(A)	BAYONNE MOT	1.21
	(N)	EARLE	1.19
	(A)	FORT DIX	1.19
	(A)	FORT MONMOUTH	1.19
	(AF)	MCGUIRE AIR FORCE BASE	1.19
	(A)	PICATINNY ARSENAL	1.29

LOCATION ADJUSTMENT FACTORS-CONTINUED
PART I
CONUS LOCATIONS

STATE		LOCATION	ACF INDEX
NEW MEXICO		STATE AVERAGE	0.99
		ALAMOGORDO	0.96
		ALBUQUERQUE	1.02
	(AF)	CANNON AIR FORCE BASE	0.95
	(AF)	HOLLOMAN AIR FORCE BASE	1.06
	(AF)	KIRTLAND AIR FORCE BASE	1.02
	(A)	WHITE SANDS MISSILE RANGE	1.06
NEW YORK		STATE AVERAGE	1.23
		ALBANY	1.10
		NEW YORK CITY	1.36
	(A)	FORT DRUM	1.19
	(AF)	GRIFFIS AFB	1.10
	(N)	NIAGARA	1.15
	(A)	SENECA ARMY DEPOT	1.19
	(N)	STATEN ISLAND	1.36
	(A)	U.S. MILITARY ACADEMY	1.23
	(A)	WATERVLIET ARSENAL	1.10
NORTH CAROLINA		STATE AVERAGE	0.75
		FAYETTEVILLE	0.79
		GREENSBORO	0.71
	(N)	CAMP LEJEUNE AREA	0.86
	(N)	CHERRY POINT	0.86
	(A)	FORT BRAGG	0.80
	(N)	NEW RIVER	0.86
	(AF)	POPE AIR FORCE BASE	0.80
	(AF)	SEYMOUR JOHNSON AEB	0.74
	(A)	SUNNY POINT	0.82
NORTH DAKOTA		STATE AVERAGE	1.04
		GRAND FORKS	0.98
		MINOT	1.10
OHIO		STATE AVERAGE	0.91
		DAYTON	0.89
		YOUNGSTOWN	0.92
	(A)	RAVENNA ARMY AMMO PLANT	0.92
	(AF)	WRIGHT-PATTERSON AFB	0.89

LOCATION ADJUSTMENT FACTORS-CONTINUED
PART I
CONUS LOCATIONS

STATE		LOCATION	ACF INDEX
OKLAHOMA		STATE AVERAGE	0.90
		LAWTON	0.88
		OKLAHOMA CITY	0.92
	(AF)	ALTUS AIR FORCE BASE	0.92
	(A)	FORT SILL	0.88
	(A)	MCALESTER ARMY AMMO PLANT	0.85
	(AF)	TINKER AIR FORCE BASE	0.92
	(AF)	VANCE AFB	0.92
OREGON		STATE AVERAGE	1.14
		PENDLETON	1.18
		PORTLAND	1.09
	(A)	UMATILLA ARMY DEPOT	1.25
PENNSYLVANIA		STATE AVERAGE	1.10
		PHILADELPHIA	1.18
		PITTSBURGH	1.02
	(A)	CARLISLE BARRACKS	0.98
	(A)	INDIANTOWN GAP MISSILE RANGE	1.05
	(A)	LETTERKENNY ARMY DEPOT	1.02
	(N)	MECHANICSBURG AREA	0.98
	(A)	NEW CUMBERLAND ARMY DEPOT	0.98
	(N)	PHILADELPHIA AREA	1.18
	(A)	TOBYHANNA ARMY DEPOT	1.20
	(N)	WARMINSTER AREA	1.11
RHODE ISLAND		STATE AVERAGE	1.19
		NEWPORT	1.20
		PROVIDENCE	1.18
SOUTH CAROLINA		STATE AVERAGE	0.79
		CHARLESTON	0.85
		COLUMBIA	0.73
		MYRTLE BEACH	0.93
	(N)	BEAUFORT AREA	0.92
	AF)	CHARLESTON AIR FORCE BASE	0.85
	(N)	CHARLESTON AREA	0.91
	(A)	FORT JACKSON	0.73
	(AF)	SHAW AIR FORCE BASE	0.72

LOCATION ADJUSTMENT FACTORS-CONTINUED
PART I
CONUS LOCATIONS

STATE		LOCATION	ACF INDEX
SOUTH DAKOTA		STATE AVERAGE	1.04
		RAPID CITY	1.09
		SIOUX FALLS	0.98
	(AF)	ELLSWORTH AIR FORCE BASE	1.10
TENNESSEE		STATE AVERAGE	0.88
		CHATTANOOGA	0.84
		MEMPHIS	0.91
	(AF)	ARNOLD AFB	0.90
	(A)	VOLUNTEER ORDNANCE WORKS	0.90
TEXAS		STATE AVERAGE	0.84
		SAN ANGELO	0.80
		SAN ANTONIO	0.87
	(AF)	BROOKS AIR FORCE BASE	0.87
	(A)	CAMP BULLIS	0.87
	(N)	CORPUS CHRISTI AREA	0.90
	(N)	DALLAS	0.93
	(AF)	DYESS AIR FORCE BASE	0.92
	(A)	FORT BLISS	0.96
	(A)	FORT HOOD	0.90
	(A)	FORT SAM HOUSTON	0.87
	(AF)	GOODFELLOW AIR FORCE BASE	0.80
	(AF)	KELLY AIR FORCE BASE	0.87
	(N)	KINGS VILLE	0.95
	(AF)	LACKLAND AIR FORCE BASE	0.87
	(AF)	LAUGHLIN AIR FORCE BASE	1.15
	(A)	LONE STAR ARMY AMMO PLANT	0.94
	(A)	LONGHORN ARMY AMMO PLANT	0.81
	(AF)	RANDOLPH AIR FORCE BASE	0.87
	(A)	RED RIVER ARMY DEPOT	0.94
	(AF)	REESE AFB	0.95
	(AF)	SHEPPARD AIR FORCE BASE	0.90
UTAH		STATE AVERAGE	0.91
		OGDEN	0.92
		SALT LAKE CITY	0.91
	(A)	DUGWAY PROVING GROUND	0.97
	(A)	FORT DOUGLAS	0.91
	(AF)	HILL AIR FORCE BASE	0.99
	(A)	TOOELE ARMY DEPOT	1.00

LOCATION ADJUSTMENT FACTORS - CONTINUED
PART I
CONUS LOCATIONS

STATE		LOCATION	ACF INDEX
VERMONT		STATE AVERAGE	0.89
		BURLINGON	0.91
		MONTPELIER	0.87
VIRGINIA		STATE AVERAGE	0.83
		NORFOLK	0.86
		RICHMOND	0.80
	(N)	DAHLGREN	0.80
	(A)	FORT BELVOIR	1.03
	(A)	FORT EUSTIS	0.86
	(A)	FORT A. P. HILL	0.80
	(A)	FORT LEE	0.83
	(A)	FORT MONROE	0.86
	(A)	FORT MYER	1.03
	(A)	FORT PICKETT	0.92
	(A)	FORT STORY	0.86
	(N)	LANGLEY	0.83
	(N)	QUANTICO	0.83
	(A)	RADFORD ARMY AMMO PLANT	0.95
	(A)	VINT HILL FARMS	0.83
WASHINGTON		STATE AVERAGE	1.11
		SPOKANE	1.13
		TACOMA	1.08
	(N)	BREMERTON	1.17
	(N)	EVERETT	1.15
	(AF)	FAIRCHILD AIR FORCE BASE	1.11
	(A)	FORT LEWIS	1.08
	(N)	INDIAN ISLAND	1.20
	(AF)	MCCHORD AIR FORCE BASE	1.08
	(N)	SILVERDALE	1.11
	(N)	WHIDBEY ISLAND	1.10
	(A)	YAKIMA FIRING RANGE	1.15
WEST VIRGINIA		STATE AVERAGE	1.03
		BLUEFIELD	1.00
		CHARLESTON	1.06
WISCONSIN		STATE AVERAGE	1.08
		MADISON	1.00
		MILWAUKEE	1.16
	(A)	BADGER ARMY AMMO PLANT	1.03
	(A)	FORT MCCOY	1.33

LOCATION ADJUSTMENT FACTORS-CONTINUED
PART I
CONUS LOCATIONS

STATE		LOCATION	ACF INDEX
WYOMING		STATE AVERAGE	1.01
		CASPER	0.99
		CHEYENNE	1.02
	(AF)	F.E. WARREN AIR FORCE BASE	1.02
WASHINGTON D. C.		WASHINGTON D.C. AREA	1.03
	(AF)	BOLLING AIR FORCE BASE	1.03
	(A)	FORT MCNAIR	1.03
	(A)	WALTER REED ARMY MEDICAL CTR	1.03

LOCATION ADJUSTMENT FACTORS-CONTINUED
PART II
OCONUS LOCATION

COUNTRY	LOCATION	ACF INDEX	CURRENCY EXCHANGE	REMARKS
ANTIGUA	COUNTRY AVERAGE	1.73	2.78	
AUSTRALIA	COUNTRY AVERAGE	1.55	1.30	AUSTRALIAN
	SYDNEY	1.34		DOLLAR/U.S. DOLLAR
	DARWIN	1.90		
	PERTH	1.42		
AZORES	COUNTRY AVERAGE	1.04	168.00	PORTUGUESE
	LAJES	1.04		ESCUDO/U.S. DOLLAR
BAHAMAS	COUNTRY AVERAGE	1.79	0.995	
	ANDROS ISLAND	1.79		
BAHRAIN	COUNTRY AVERAGE	2.07	0.377	
BELGIUM	COUNTRY AVERAGE	1.60	33.16	BELGIUM FRANC/U.S.
	BRUSSELS	1.60		DOLLAR
BERMUDA	COUNTRY AVERAGE	1.61	0.997	
CANADA	COUNTRY AVERAGE	1.59	1.13	CANADIAN DOLLAR
	ARGENTIA, NEWFOUNDLAND	1.59		
CUBA	COUNTRY AVERAGE	1.60	1.00	U.S. DOLLARS
	GUANTANAMO	1.60		
DIEGO GARCIA	COUNTRY AVERAGE	3.00	1.00	U.S. DOLLARS
EYGPT	COUNTRY AVERAGE	1.32	2.65	EGYPTIAN
	CARlO	1.32		POUND/U.S. DOLLAR
GERMANY	COUNTRY AVERAGE	1.74	1.61	DEUTSCHE MARK
	FRANKFURT	1.94		/U.S. DOLLAR
	KAISERSLAUTERN	1.77		
	TRIER	1.51		
GREECE	COUNTRY AVERAGE	0.96	183.65	DRACHMA
	ATHENS	0.96		/U.S. DOLLAR
GREENLAND	COUNTRY AVERAGE	2.48	7.81	DANISH KRONER
	GODTI-IAAB (NUUK)	2.48		/U.S. DOLLAR

LOCATION ADJUSTMENT FACTORS-CONTINUED
PART II
OCONUS LOCATION

COUNTRY	LOCATION	ACF INDEX	CURRENCY EXCHANGE	REMARKS
GUAM	COUNTRY AVERAGE	2.24	1.00	U.S. DOLLAR
HONDURAS	COUNTRY AVERAGE	0.64	4.50	LEMPIRA/U.S. DOLLAR
	TEGUCIGALPA	0.64		
ICELAND	COUNTRY AVERAGE	3.38	62.50	KRONA/U.S. DOLLAR
	REYKJAVIK	3.38		
ISRAEL	COUNTRY AVERAGE	1.18	2.034	
	TEL AVIV	1.18		
ITALY	COUNTRY AVERAGE	1.74	1,201.20	LIRA/U.S. DOLLAR
	ISOLA DI CAPO RIZZUTO	1.73		
	LA MADDALENA	1.82		
	NAPLES	1.74		
	SIGONELLA	1.74		
	VENICE	1.68		
JAPAN	COUNTRY AVERAGE	1.83	130.11	YEN/U.S. DOLLAR
	TOKYO	1.90		
	MISAWA	1.80		
	OKINAWA	1.71		
	ATSUGI	1.90		
JOHNSTON ATOLL	COUNTRY AVERAGE	2.32	1.00	U.S. DOLLAR
KOREA	COUNTRY AVERAGE	1.12	753.98	WON/U.S. DOLLAR
	SEOUL	1.08		
	DMZ Area	1.18		
	CHINHAE	1.11		
	KUNSAN	1.12		
	OSAN	1.10		
KWAJALEIN	COUNTRY AVERAGE	2.54	1.00	U.S. DOLLAR
MIDWAY ISLAND	COUNTRY AVERAGE	2.07	1.00	U.S. DOLLAR
MOROCCO	COUNTRY AVERAGE	1.55	8.67	DIRHAM/U.S. DOLLAR
	CASABLANCA	1.55		

LOCATION ADJUSTMENT FACTORS-CONTINUED
PART II
OCONUS LOCATION

COUNTRY	LOCATION	ACE INDEX	CURRENCY EXCHANGE	REMARKS
NETHERLANDS	COUNTRY AVERAGE	1.55	1.82	GUILDER
	OSS	1.55		/U.S. DOLLAR
NEW ZEALAND	COUNTRY AVERAGE	2.07	1.82	NEW ZEALAND
	WELLINGTON	2.07		DOLLAR
				/U.S. DOLLAR
OMAN	COUNTRY AVERAGE	1.58	0.385	RILOMANI
	RUWI	1.58		/U.S. DOLLAR
PANAMA	COUNTRY AVERAGE	1.24	1.00	U.S. DOLLAR
	PANAMA CITY	1.24		
PHILIPPINES	COUNTRY AVERAGE	1.10	22.25	PHILIPPINE PESOS
	MANILA	1.08		/U.S. DOLLAR
	SUBIC BAY	1.11		
PUERTO RICO	COUNTRY AVERAGE	1.05	1.00	U.S. DOLLARS
	SAN JUAN	1.05		
SEYCHELLES ISLANDS	COUNTRY AVERAGE	2.50	1.00	U.S. DOLLARS
SPAIN	COUNTRY AVERAGE	1.42	101.60	PESETA
				/U.S. DOLLAR
	ROTA	1.42		
TURKEY	COUNTRY AVERAGE	0.96	5,010.02	LIRA/U.S. DOLLAR
	ANKARA	0.96		
	INCIRLICK	0.96		
UNITED KINGDOM				
	COUNTRY AVERAGE	1.59	1.56	BRITISH POUND
				/U.S. DOLLAR
	LONDON	1.62		
	MANCHESTER	1.62		
	ST. MAWGAN	1.59		
	EDZELL,SCOTLAND	1.62		

NOTES:
1. This appendix is updated annually and available through the PAX System Newsletters and EIRS Bulletins.
2. Area cost factors and currency exchange rates based on DOD memorandum dated August 20, 1993.
3. The factor of 1.00 is based on the national average index of 96 cities in CONUS.

APPENDIX C
TRI-SERVICE MILITARY CONSTRUCTION PROGRAM (MCP) INDEX FOR FY 94 THRU 99 PROGRAMS

DATE	INDEX	ESCALATION PERCENTAGE FOR FISCAL YEAR
1 OCT 1990	1727	
1 JAN 1991	1740	FY 91
1 APR 1991	1748	
1 JUL 1991	1764	3.1%
1 OCT 1991	1781	
1 JAN 1992	1792	FY 92
1 APR 1992	1798	
1 JUL 1992	1812	2.5%
1 OCT 1992	1825	
1 JAN 1993	1836	FY 93
1 APR 1993	1843	
1 JUL 1993	1856	2.4%
1 OCT 1993	1869	
1 JAN 1994	1880	FY 94
1 APR 1994	1886	
1 JUL 1994	1899	2.3%
1 OCT 1994	1912	
1 JAN 1995	1923	FY 95
1 APR 1995	1929	
1 JUL 1995	1943	2.3%
1 OCT 1995	1956	
1 JAN 1996	1967	FY 96
1 APR 1996	1973	
1 JUL 1996	1966	2.2%
1 OCT 1996	1999	
1 JAN 1997	2010	FY 97
1 APR 1997	2016	
1 JUL 1997	2030	2.2%
1 OCT 1997	2043	
1 JAN 1998	2054	FY 96
1 APR 1968	2061	
1 JUL 1988	2074	2.2%
1 OCT 1988	2088	
1 JAN 1999	2099	FY 99
1 APR 1999	2106	
1 JUL 1999	2120	2.2%
1 OCT 1999	2134	

NOTES:

1. Use 2.2% fiscal year for projection beyond 1999.
2. Tri--Service MCP Index (1,000) = October, 1979 ENR Historical Building Cost Index (1,900).
3. Used Price Escalation Indices (Annual Rates in Percentages) for Budget Authority in the Memorandum dated 3 March 1993, from the Comptroller of the Department of Defense, Subject Revised Inflation Guidance.
4. This appendix is updated annually and available through the PAX System Newsletters and EIRS Bulletins.

APPENDIX D
TECHNOLOGICAL UPDATING FACTORS TABLE

CATEGORY CODES	CATEGORY SERIES DESCRIPTION (See AR 415-28)	ADJUSTMENT FACTOR
110	Airfield pavements	1.00
120	Liquid Fueling and Dispensing Facilities	1.00
130	Communications and Navigation Aids	1.00
140	Land Operational Facilities	1.00
150	Waterfront Operational Facilities	1.00
160	Harbor and Coastal Facilities	1.00
170	Training Facilities (other than Army Reserve)	1.00
171	Army Reserve	1.00
200	Maintenance and Production Facilities	1.00
300	R&D and Test Facilities	1.10
400	Supply facilities	1.00
500	Hospital and Medical Facilities	1.05
600	Administrative Facilities	1.00
700	Housing and Community Facilities	1.00
810	Electric Power	1.01
820	Heat and Refrigeration	1.02
830	Sewage and Waste	1.05
840	Water	1.00
850	Road and Street	1.00
860	Railroad Tracks	1.00
870	Ground Improvement Structures	1.00
880	Fire and Other Alarm Systems	1.05
890	Misc Central Plant (Heat, Refrigeration & Electrical)	1.03
930	Site Improvements	1.00

APPENDIX E

SAMPLE SITE SENSITIVITY COST CONSIDERATIONS

NOTES:

- The method outlined in this Appendix may be used to determine the cost impact resulting from extremely large concentration of construction effort, or from extensive site limitations, or from both.

- Site sensitivity adjustment should be determined based on an analysis of site conditions which will influence cost.

SAMPLE SITE SENSITIVITY COST CONSIDERATIONS

No.	Impact Identifier	Condition	Adjustment Factor	Narrative Description of Condition with Resulting Assumptions and Computations
		PART I		
I.	Labor Availability	A. Above Normal	-0.014	Abundance of labor available in local area creating competition and high productivity resulting in negative cost impact. Assumptions: Assume 4% more productivity. Computations: Productivity Variation X (Labor Cost as a% of Total Project Cost as 100%/35%) = Productivity Adjustment Factor $-0.04 \times \frac{35\%}{100\%} = -0.014$
		B. Normal	0.000	Normal labor market and normal productivity. Assumptions: Assume no cost variation impact.
		C. Slightly Below	+0.040	Inadequate local labor force, however, labor is available within daily commuting distance. Assumptions: Assume that a travel allowance for supervisory personnel and limited overtime pay as travel inducement for journeymen will be required to recruit labor.

No.	Impact Identifier	Condition	Adjustment Factor	Narrative Description of Condition with Resulting Assumptions and Computations

PART I (Cont'd)

Computations: For supervisory personnel assuming a travel allowance of $150.00 mo.:

$$\frac{\text{Travel Allowance Per Month}}{\text{Average Per Month}} \times \text{Field Supervision as a \% of Total Project Cost as 100\%} = \text{Travel Allowance Factor}$$

$$\frac{\$150.00}{\$1850.00} \times \frac{3\%}{100\%} = 0.002$$

For craft journeymen assume 1 hr overtime pay per day as travel inducement.

$$\frac{\text{Travel inducement Allowance Per Week}}{\text{Hrs of Work Per Week}} \times \text{Labor Cost as a \% of Total Project Cost as 100\%} = \text{Travel inducement Factor}$$

$$\frac{5 \text{ Hrs}}{45 \text{ Hrs}} \times \frac{35\%}{100\%} = 0.038$$

Travel Allowance Factor + Travel Inducement Factor = Total Travel Adjustment Factor

$$0.002 + 0.038 = 0.040$$

SAMPLE SITE SENSITIVITY COST CONSIDERATIONS - CONTINUED

No.	Impact Identifier	Condition	Adjustment Factor	Narrative Description of Condition with Resulting Assumptions and Computations
		PART I (Cont'd)		
		D. Substantially Below Normal	0.059	Inadequate labor force within daily commuting distance. Recruitement from regional area required.

Assumptions: Housing and or subsistence allowance will be required for supervisory personnel. Assume limited overtime pay as travel inducement for journeymen will be required to recruit labor.

Computations: For supervisory personnel assume subsistence allowance of $300.00/ mo.

$$\frac{\text{Subsistence Allowance Per Month}}{\text{Average Salary Per Month}} \times \frac{\text{Field Supervision as a \% of Total Project Cost as 100\%}}{} = \text{Subsistence Factor}$$

$$\frac{\$\,300}{\$1850} \times \frac{3\%}{100\%} = 0.005$$

For draft journeymen assume: 1-1/2 hr overtime pay per day for travel inducement.

No.	Impact Identifier	Condition	Adjustment Factor	Narrative Description of Condition with Resulting Assumptions and Computations

PART I (Cont'd)

Travel Inducement: Allowance Per Week / Hrs of Work Per Week X Labor Cost as a % of Total Project Cost as 100% = Travel Inducement Factor

$$\frac{7.5}{47.5} \times \frac{35\%}{100\%} = 0.054$$

Subsistence Allowance Factor + Travel Inducement Factor = Total Subsistence Travel Factor

$$0.005 + 0.054 = 0.059$$

E. Extremely Below Normal — 0.076

Inadequate labor force available in local area or regional area. Recruitment from outside the regional area required.

Assumptions: Housing and/or subsistence allowance will be required for supervisory personnel and overtime pay as travel inducement for journeymen will be required to recruit labor.

Computations: For supervisory personnel assume subsistence allowance for $375.00/ mo.

SAMPLE SITE SENSITIVITY COST CONSIDERATIONS - CONTINUED

No.	Impact Identifier	Condition	Adjustment Factor	Narrative Description of Condition with Resulting Assumptions and Computations

PART I (Cont'd)

Subsistence Allowance Per Month / Average Salary Per Month X Field Supervision as a % of Total Project Cost as 100% = Subsistence Factor

$$\frac{\$375}{\$1850} \times \frac{3\%}{100\%} = 0.006$$

For craft journeyment assume 2-hrs overtime pay per day as travel inducement.

Travel Inducement Allowance Per Week / Hrs of Work Per Week X Labor Cost as a % of % of Total Project Cost as 100% = Travel Inducement Factor

$$\frac{10}{50} \times \frac{35}{100\%} = 0.07$$

Subsistence Allowance Factor + Travel Inducement Factor = Total Subsistence Travel Factor

$$0.006 + 0.07 = 0.076$$

SAMPLE SITE SENSITIVITY COST CONSIDERATIONS - CONTINUED

No.	Impact Identifier	Condition	Adjustment Factor	Narrative Description of Condition with Resulting Assumptions and Computations
		PART I (Cont'd)		
II.	Housing Availability	A. Normal	0	Adequate housing available in local area No cost impact.
		B. Slightly Below	+0.022	Adequate housing not available in local area: however, housing is available within commuting distance. Assumptions: Provide travel allowance to location of adequate housing for key personnel and critical crafts Computations: Assume a travel allowance of $100.00 mo. $\frac{\text{Travel Allowance Per Month}}{\text{Average Monthly Wages}} \times \frac{\text{Key Personnel and Critical Crafts Labor Costs as a \% of Total Project Cost as 100\%}}{} = \text{Adjustment Factor}$ $\frac{\$100}{\$1600} \times \frac{35\%}{100\%} = 0.022$
		C. Substantially Below Normal	+0.04	Inadequate housing in local area Housing not available within commuting distance.

SAMPLE SITE SENSITIVITY COST CONSIDERATIONS - CONTINUED

No.	Impact Identifier	Condition	Adjustment Factor	Narrative Description of Condition with Resulting Assumptions and Computations
				PART I (Cont'd)
				Assumptions: Provide trailer housing for majority of contractor personnel and skilled crafts. Computations: Assume rental of trailers and sale of used trailers will not offset all original cost. Land lease and site development cost to be included in project cost. Loss on Trailers Lease and Development Cost / Total Project Cost = Adjustment Factor $\frac{\$4,000,000}{\$100,000,000} = 0.04$
III.	Material Availability	A. Normal	0	Project requirements do not exceed the capabilities of the local area. Site is within normal delivery distance. No cost impact.
		B. Slightly Below	+0.01	Project requirements do not exceed the the local area but site is outside normal delivery range.

of

SAMPLE SITE SENSITIVITY COST CONSIDERATIONS - CONTINUED

No.	Impact Identifier	Condition	Adjustment Factor	Narrative Description of Condition with Resulting Assumptions and Computations

PART I (Cont'd)

Assumptions: Assume additional hauling allowance required.

Computations:

$$\frac{\text{Additional Cost for Hauling Beyond Normal Delivery Zone}}{\text{Total Normal Material Cost}} \times \frac{\text{Mat'l Cost as a \% of Total Project Cost as 100\%}}{} = \text{Adjustment Factor}$$

$$\frac{\$1{,}000{,}000}{\$50{,}000{,}000} \times 50\% = 0.01$$

C. Substantially Below Normal — +0.02

Project requirements exceed the capabilities of the area.

Assumptions: Assume additional hauling allowance and onsite facilities.

Computations:

$$\frac{\text{Additional Hauling Handling and Storage Allowance}}{\text{Total Material Cost (Normal)}} \times \frac{\text{Mat'l Cost as a \% of Total Project Cost as 100\%}}{} = \text{Adjustment Factor}$$

SAMPLE SITE SENSITIVITY COST CONSIDERATIONS - CONTINUED

No.	Impact Identifier	Condition	Adjustment Factor	Narrative Description of Condition with Resulting Assumptions and Computations
				PART I (Cont'd)
				$\frac{\$2,000,000}{\$50,000,000}$ X 50% = 0.02
				Individual cost model analysis as required to justify each cost consideration.
IV.	Local Site Peculiarities	Congested Work Area	+0.028	Loss of productivity caused by congested work area.
				Assumptions: 3 hrs of nonproductivity per week
				Computations:
				$\frac{\text{Unproductive Hrs Per Week}}{\text{Productive } 100\%}$ X $\frac{\text{Labor Cost as a \% of Total Project Cost}}{}$ = Adjustment Factor
				$\frac{3}{37}$ X $\frac{35\%}{100\%}$ = 0.028
		Inadequate	+0.021	Inadequate onsite parking for labor force.
				Assumption: $100.00 per month parking allowance will be required.

SAMPLE SITE SENSITIVITY COST CONSIDERATIONS - CONTINUED

No.	Impact Identifier	Condition	Adjustment Factor	Narrative Description of Condition with Resulting Assumption and Computation

PART I (Cont'd)

Computations:

$$\frac{\text{Parking Allowance Per Month}}{\text{Average Wage Per Month}} \times \frac{\text{Labor Cost as a \% of Total Project Cost as 100\%}}{} = \text{Adjustment Factor}$$

$$\frac{\$100}{\$1{,}600} \times \frac{35\%}{100\%} = 0.021$$

SAMPLE SITE SENSITITY COST CONSIDERATIONS - CONTINUED

No.	Impact Identifier	Condition	Adjustment Factor	Narrative Description of Condition with Resulting Assumption and Computation
		Part II		
		Sample Site Sensitivity Adjustment Factor Summary		
I	Labor Availability	Slightly Below Normal	+0.040	Inadequate local labor force travel allowance and overtime pay as travel inducement is required.
II	Housing Availability	Normal	0	Adequate housing available in local area.
III	Material Availability	Normal	0	Local area can meet all project requirements.
IV	Local Site Perculiarities	Individual analysis to justify each consideration:		
		Congested Work Area	+0.028	Small congested job site.
		Inadequate Parking	+0.021	No parking onsite. No free parking near site.
		Total =	+0.089	

Site Sensitivity Adjustment Factor = 1.00 + (+0.089) = 1.089

APPENDIX F

BUILDING SYSTEMS WORK BREAKDOWN STRUCTURE (WBS)

Ratio of WBS Systems Cost to Facility Cost (by Facility Type)*

WBS	DESCRIPTION	ADMIN	ADP	AIB	AVFAC	BARRCK	BRDGHQ	BTTNHQ	CHAPL
	CAT. CODE	(61050)	(61031)	(17130)	(21740)	(72111)	(61011)	(61012)	(73017)
01	Substructure	11.00	6.63	6.73	10.02	4.50	7.13	6.69	5.97
02	Superstructure	17.94	5.99	12.10	7.30	12.70	14.37	10.70	11.62
03	Roofing	4.06	4.99	5.23	4.82	2.30	3.20	2.83	7.49
04	Exterior Closure	11.78	10.36	13.30	15.08	10.70	19.26	22.20	23.33
05	Interior Constr'n	13.10	12.28	11.18	9.60	18.10	7.36	17.35	9.02
06	Interior Finishes	9.73	12.41	10.73	8.15	18.60	10.83	5.87	9.09
07	Specialties	0.89	1.47	0.38	0.56	0.00	1.03	2.39	2.45
08	Plumbing	3.10	3.27	3.30	4.95	17.30	5.41	3.31	6.29
09	HVAC	13.86	17.01	8.28	17.99	5.20	17.71	17.62	12.15
10	Special Mechanical	0.00	2.87	1.50	2.75	2.10	0.00	1.85	0.00
11	Electrical	9.46	17.72	23.98	17.70	8.00	6.73	8.46	9.08
12	Special Electrical	3.48	5.00	3.29	1.08	0.50	6.97	0.67	2.03
13	Equipment	1.60	0.00	0.00	0.00	0.00	0.00	0.00	1.48
14	Conveying Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	TOTAL	100%	100%	100%	100%	100%	100%	100%	100%

BUILDING SYSTEMS WORK BREAKDOWN STRUCTURE (WBS) - CONTINUED

Ratio of WBS Systems Cost to Facility Cost (by Facility Type)*

WBS	DESCRIPTION	CHILD	CIDC	CLSRM	COADM	COLDWH	CONFOR	FEADIM	FEMNT
	CAT. CODE	(74014)	(14114)	(17120)	(61028)	(43210)	(44130)	(61021)	(21910)
01	Substructure	5.46	7.73	7.89	6.47	15.16	15.16	8.60	6.93
02	Superstructure	13.90	13.25	12.91	5.03	4.23	7.63	11.37	7.86
03	Roofing	1.86	7.13	5.56	5.14	6.84	7.04	5.30	3.66
04	Exterior Closure	11.73	9.82	15.55	21.79	14.58	.00	29.10	39.65
05	Interior Constr'n	9.38	12.51	12.94	21.63	12.68	13.86	3.36	12.76
06	Interior Finishes	9.48	9.96	8.98	7.50	11.31	20.95	1.38	2.02
07	Specialties	5.60	1.29	4.06	2.45	1.97	2.61	4.73	2.30
08	Plumbing	11.39	3.98	3.43	4.79	4.19	1.60	17.17	3.08
09	HVAC	16.55	20.38	15.45	18.10	13.66	0.92	3.18	10.40
10	Special Mechanical	0.35	0.00	1.57	0.00	4.90	8.24	0.00	0.66
11	Electrical	11.93	11.10	9.73	5.97	8.46	4.23	14.35	9.38
12	Special Electrical	2.37	2.85	1.93	1.13	2.02	16.00	1.46	1.30
13	Equipment	0.00	0.00	0.00	0.00	0.00	1.76	0.00	0.00
14	Conveying Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	TOTAL	100%	100%	100%	100%	100%	100%	100%	100%

BUILDING SYSTEMS WORK BREAKDOWN STRUCTURE (WBS) - CONTINUED

Ratio of WBS Systems Cost to Facility Cost (by Facility Type)*

WBS	DESCRIPTION	FESTR	FIRES	FLTSM	GPWH	GYM	HANGR	KIT/DN	MEDCL
	CAT. CODE	(44220)	(73010)	(17112)	(44110)	(74034)	(21110)	(72210)	(55030)
01	Substructure	24.49	6.75	6.88	9.50	5.22	7.20	11.06	4.59
02	Superstructure	10.97	5.22	19.79	19.22	13.36	16.16	3.34	3.17
03	Roofing	3.34	3.17	13.84	12.10	5.49	13.88	3.63	2.28
04	Exterior Closure	23.95	24.61	13.41	16.46	21.20	15.84	5.59	4.96
05	Interior Constr'n	9.65	10.32	7.80	6.05	2.28	12.06	2.29	3.61
06	Interior Finishes	1.18	5.10	6.60	1.82	12.90	7.86	12.84	3.57
07	Specialties	0.00	4.97	1.68	1.81	3.90	1.44	0.61	1.13
08	Plumbing	5.25	6.43	6.42	1.52	3.57	3.64	22.15	5.59
09	HVAC	0.00	11.39	11.60	16.00	11.42	6.59	21.12	4.70
10	Special Mechanical	7.96	1.60	0.97	2.33	0.00	2.50	0.00	0.00
11	Electrical	3.21	13.20	9.66	12.08	9.84	8.76	16.38	62.30
12	Special Electrical	0.00	5.20	9.66	1.11	0.93	2.32	0.99	2.40
13	Equipment	0.00	0.00	0.00	0.00	9.89	1.75	0.00	1.70
14	Conveying Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	TOTAL	100%	100%	100%	100%	100%	100%	100%	100%

BUILDING SYSTEMS WORK BREAKDOWN STRUCTURE (WBS) - CONTINUED

Ratio of WBS Systems Cost to Facility Cost (by Facility Type)*

WBS	DESCRIPTION	POLIC	REC	RESREV	SATCOM	SHOPGS	SHOPDS	SKILLC	YOUTH
	CAT. CODE	(73016)	(74068)	(17140)	(13120)	(21430)	(21420)	(74024)	(74066)
01	Substructure	8.16	13.59	10.39	15.31	13.46	8.65	6.73	5.70
02	Superstructure	7.10	19.72	9.85	2.73	28.74	24.18	5.85	13.07
03	Roofing	4.63	6.04	10.19	2.25	5.75	5.06	5.81	6.34
04	Exterior Closure	14.59	18.38	13.90	10.14	14.39	20.02	19.28	17.84
05	Interior Constr'n	14.50	4.25	19.02	3.68	5.60	6.21	8.38	7.49
06	Interior Finishes	7.96	3.88	11.32	17.05	2.13	3.47	5.67	10.79
07	Specialties	0.56	1.24	1.14	0.08	3.31	5.57	5.48	2.65
08	Plumbing	4.19	4.54	10.98	1.40	3.22	3.45	5.25	5.20
09	HVAC	20.18	13.02	1.76	13.30	7.89	8.48	17.96	10.44
10	Special Mechanical	0.30	0.00	0.00	3.16	2.12	1.29	1.52	3.30
11	Electrical	11.17	12.64	10.14	22.25	9.25	11.89	16.98	9.84
12	Special Electrical	6.66	2.70	1.31	5.21	1.02	1.93	1.09	3.27
13	Equipment	0.00	0.00	0.00	3.44	3.12	0.00	0.00	4.07
14	Conveying Systems	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	TOTAL	100%	100%	100%	100%	100%	100%	100%	100%

BUILDING SYSTEMS WORK BREAKDOWN STRUCTURE (WBS) - CONTINUED

SYSTEM	DESCRIPTION OF BUILDING FUNCTIONAL COMPONENTS
01 Substructure	This systems includes all work below floor construction (usually slab on grade) and the enclosing horizontal and vertical elements required to form a basement, together with the necessary mass excavation and backfill. - Standard Foundations - Slab of Grade - Basement Excavation - Basement Walls
02 Superstructure	This system includes all structural slabs, and decks and supports within basements and above grade. Structural work include both horizontal items (slabs, decks, etc.) and vertical structure components (columns and interior structural walls). Exterior load bearing walls are not included in the system. - Floor Construction - Roof Construction - Stair Construction
03 Roofing	This system includes all waterproof roof coverings and insulation, together with skylights, hatches, ventillators and all required trim. In addition to roof coverings, the system includes all waterproof membrane and traffic toppings over below-grade enclosed areas, balconies, and the like.
04 Exterior Closure	This system consists of the exterior facing of the facility which includes all vertical and horizontal exterior closure features excluding roof. - Exterior Walls - Exterior Windows and Doors
05 Interior Construction	Construction which takes place inside the exterior wall or exterior skin. The system does not include interior structural walls. - Interior Partitions - Interior Doors and Windows - Specialties and Casework

BUILDING SYSTEMS WORK BREAKDOWN STRUCTURE (WBS) - CINTINUED

SYSTEM	DESCRIPTION OF BUILDING FUNCTIONAL COMPONENTS
06 Interior Finishes	Finishes which are applied to interior surfaces, including the interior skin of exterior walls. - Wall Finishes - Flooring and Wall Finishes - Ceiling and Ceiling Finishes
07 Specialties	Specialty items that are permanently fixed in-place. - Cabinetry - Shelvings - Counters
08 Plumbing	This system includes all water supply and waste items within the building. - Plumbing Fixtures - Domestic Water Supply - Sanitary Waste and Vent System
09 HVAC	This system includes all equipment, distribution systems, controls, and energy supply systems required by heating, ventillating, and air conditioning system. - Heat and Cooling Generating Systems - Controls and Instrumentation - Systems Testing and Balancing
10 Special Mechanical	This system includes standard fire protection and suppression systems. - Water Supply (Fire Protection) - Sprinklers - Standpipe Systems - Fire Extinguishers

BUILDING SYSTEMS WORK BREAKDOWN STRUCTURE (WBS) - CONTINUED

SYSTEM	DESCRIPTION OF BUILDING FUNCTIONAL COMPONENTS
11 Electrical	This systems includes electric power and lighting. - Service and Distribution - Lighting and Branch Wiring
12 Special Electrical	This system includes provisions for communication, security, and alarm systems.
13 Equipment	This system refers to fixed and moveable equipment. - Built-in Maintenance Equipment - Window Treatment - Food Service Equipment
14 Conveying Systems	This system includes elevators, escalators, pneumatic tube systems, conveyors, chutes, and others.

*FACILITY TYPES

ADMIN	Division Administration Facility
ADP	Automated Data Processing Building
AIB	Applied Instruction Building
AVFAC	Avionics Facility
BARRCK	2 + 2 Enlisted Barracks
BRGDHQ	Brigade Headquarters
BTTNHQ	Battalion Headquarters
CHAPL	Unit Chapel
CHILD	Child Care Center
CIDC	Criminal Investigation Division Command
CLSRM	General Instruction Building
COADM	Company Administration and Supply
COLDWH	Cold Storage Warehouse
CONFOR	Conforming Storage
FEADMI	Facility Engineer Administration
FEMNT	Facility Engineer Maintenance Shop
FESTR	Facility Engineer Storage
FIREST	Fire Station
FLTSM	Flight Simulator Building
GPWH	General purpose Warehouse
GYM	Consolidated Recreation Facility
HANGR	Aircraft Maintenance Hangar
KIT/DN	Kitchen/Dining Facility
MEDCL	Health Clinic W/O Bed
POLIC	Security Police Center
REC	Recreation Center
RESREV	Reserve Center
SATCOM	Satcom Ground Terminal
SHOPGS	Vehicle Maintenance Shop, GS
SHOPDS	Vehicle Maintenance Shop, DS
SKILLC	Skill Development Center W/Auto
YOUTH	Youth Center

APPENDIX G
FAMILY HOUSING

To calculate cost estimates for the construction of new and replacement family housing, the DOD Family Housing Cost Model (Tri-Service Cost Model) is used. This is the only approved method of estimating costs for family housing construction or replacement projects. A completed example of the Tri-Service Cost Model is shown in figure G-1. Specific instructions to complete the Tri-Service cost model are as follows:

1. FY - The fiscal year in which the project is proposed to be included in the AH-I budget.

2. Location - The installation and state in which the proposed construction will take place.

3. # Units - The number of family housing dwelling units which will be constructed in this project. Note that for replacement projects, the number of units maybe equal to or less than the number of units to be demolished.

4. ANSF - The average net square feet of the units proposed for construction. Note that family housing is based on net square footage (NSF), not gross square footage (GSF). Size of dwelling units will be based on the statutory size limit authorized in Section 2826, Title 10, USC for category of soldier and size of family. See Table 1.1 of TRI 210-50, AFH Whole Neighborhood Revitalization Planning Guide, for present statutory size limits.

5. $/NSF - The cost to construct family housing per net square foot. The cost will correspond to the fiscal year of the project. Cost includes only the primary facility, including carport and bulk storage, not the supporting infrastructure, demolition, supporting amenities or special construction requirements. Presently, the cost to construct family housing per net square foot is as follows:

	FY 94	**FY 95**	**FY 96**	**FY 97**
CONUS	**$53**	**$57**	**$60**	**$61**
OCONUS*	***$55***	***$59***	**$62**	**$63**

* includes Alaska and Hawaii.

Note: Cost per NSF is based on a townhouse style construction. Where garden style housing is being considered, the addition of an automatic fire sprinkler system should be included using the prescribed unit cost (currently $3.00/NSF addition).

6. 5' Line Cost - The *5* foot line cost is the cost just for the dwelling unit and equals the number of units times the average net square feet times the cost per net square foot.

7. ACF - The area cost factor adjusts the prescribed costs to the location of the proposed project. The area cost factors are listed in Appendix B, Location Adjustment Factors Table, of this TM and are updated annually based on actual construction costs of the prior year.

8. Project Size - The project size factor allows for economies of scale which is dependent upon the project size. The prescribed unit cost ($NSF) is based on an average project size. Projects which propose constructing a large number of units will realize economies of scale resulting in a smaller project size factor. The project size factor table is listed on Table 1, Size Adjustment Factors, Part II, Family Housing, of this TM.

9. Unit Size - The unit size factor (based on ANSF) also quantifies economies of scale. Dwelling units with more NSF will capture additional economies of scale and will thus have a smaller unit size factor. The unit size factor table is listed on Table 1, Size Adjustment Factors, Part II, Family Housing, of this TM.

10. Project Factor - The project factor equals the area cost factor times the project size factor times the unit size factor. One project factor applies to all units being constructed in a given project. Do not calculate a separate factor for each type of unit, i.e., two, three and four bedroom junior noncommissioned officers.

11. Housing Unit Cost - The housing unit cost equals the *5* foot line cost times the project factor.

12. Solar Cost and Information System Cost - These are additional costs and were not captured in the 5 foot building line cost. If project is to include solar energy features, multiply the estimated solar cost times the area cost factor times the number of dwelling units to arrive at the total project solar cost. Note that such features must be justified based on a life cycle cost analysis. The information system cost must be added to every AFH construction project. This cost represents telephone and cable television connections and wiring inside the buildings *5* foot line. Presently, $300 per dwelling unit is used; however, this may change in the future as uniform communication and cable television requirements are resolved. Narrations from this cost must be explained and justified. To arrive at the information system cost, multiply $300 times the area cost factor times the number of dwelling units.

13. Other - In some instances, site conditions may require additional costs for the primary facility (inside the 5 foot building line). Examples include rock excavation, special foundation requirements, soil stabilization, basements, special architectural features, or garages. Note that the basic $/NSF included a carport. If a garage can be justified as an exception to policy, the additional cost required may be included here.

14. Average Unit Cost - The average unit cost is derived by adding the housing unit cost, the solar cost, (if any), the information system cost and any "other" cost, and dividing by the number of units.

15. Supporting Cost - This considers all work outside the *5* foot building line, and includes site preparation, roads, utilities, recreation, landscaping, demolition, etc. Where support cost estimates can be documented, show the unit cost and how derived. Often, support cost for AFH are difficult to identity for various reasons. The proposed units may be sited on the same site as some existing units which are planned for demolition or

an undeveloped site. When difficult to document the support cost, a percentage of the housing unit cost can be used until detailed analysis is completed. Demolition of existing units should be a separate cost breakout. The environmental conditions and individual State regulations must be considered when determining the demolition cost. When using a "generic" for support cost and demolition, the area cost factor must be considered to arrive at the total support cost.

16. Subtotal - The summary subtotal consists of the - housing unit cost, solar cost, if any, information system cost, other cost, if any, and the support cost.

17. Project Total - The project total equals the summary subtotal times the contingency times the supervision, inspection and overhead (SIOH). The contingency for new and replacement construction is *5* percent. The SIOH for CONUS locations is 6 percent. For OCONUS locations, the SIOH is *6.5* percent.

18. Rounded Project Cost - The rounded project cost is the project total rounded in accordance with the Congressional rounding rule (located in Chapter 10 of this TM).

19. Project Cost/SF - The project cost per square foot equals the project rounded cost divided by the product of the number of units times the average net square footage times the cost factor.

FY 95 TRI-SERVICE FAMILY HOUSING COST MODEL

SERVICE: ARMY LOC ATION: Fort Example, CONUS

BASELINE:

(	116	)(	1125	)(	57.00	) = $7,438,500
(	# UNITS	)(	ANSF	)(	$/NSF	) = 5' Line Cost

PROJECT FACTORS:

(	1.18	)(	1.0	)(	0.99	) = 1.17
(	ACF	)(	Project Size	)(	Unit Size	) = Project Factor

HOUSING UNIT COST:

(	7,438,500	)(	1.17	)		= $8,703,045
(	5' Line Cost	)(	Project Factor	)		= Housing Unit Cost
(	3,225	)(	1.18	)(	116	) = $441,438
(	Solar Cost	)(	ACF	)(	Units	) = Total Project Solar Cost
(	300	)(	1.18	)(	116	) = $41,064
(	Info Syst Cost	)(	ACF	)(	Units	) = Info System Cost
(	-	)(		)(		) = $
(	Other	)(	ACF	)(	Units	) = Other Cost

((	8,703,045	)+(	441,438	)+(	41,064	)+(	-	))/(	116	) = $79,186
((	Housing	)+(	Solar	)+(	Info	)+(	Other	))/(	#Units	) = Average Unit Cost

SUPPORTING COST:

Site Preparation	688,000
Roads and Paving	451,000
Utilities	1,821,000
Landscaping	40,000
Demolition	58,000
Other (Specify)	31,000
Total Support Cost	3,089,000

SUMMARY:

(	8,703,045	)+(	441,438	)+(	41,064	)+(	-	)+(	3,089,000	) =	$12,274,547
(	Housing	)+(	Sola	)+(	Info	)+(	Other	)+(	Support	) =	Subtotal

(	12,274,547	)(	1.05	)(	1.06	) = $13,661,571
(	Subtotal	)(	Contingency	)(	SIOH	) = Project Total

Rounded Project Cost = $13,600,000

(	13,600,000	)/((	116	)(	1125	)(	1.18	)) = $88.32
(	Project Cost	)/((	# of Units	)(	ANSF	)(	ACF	)) = Project Cost/SF

PROJECT SIZE FACTOR - (# OF UNITS)

1 - 9	UNITS =	1.15
10 - 19	UNITS =	1.10
20 - 49	UNITS =	1.05
50 - 99	UNITS =	1.02
100 - 199	UNITS =	1.00
200 - 299	UNITS =	0.98
300 - 499	UNITS =	0.96
500 +	UNITS =	0.95

UNIT SIZE - (AVG NET SF)

600 - 749	= 1.05
750 - 849	= 1.03
850 - 949	= 1.01
950 - 1050	= 1.00
1051 - 1150	= 0.99
1151 - 1250	= 0.98
1251 - 1350	= 0.97
1351 +	= 0.96

Figure G-1. Example Tri-Service Cost Model. Sheet 1 of 2

ANSF CALCULATION

GRADE	NUMBER OF BEDROOMS	AUTHORIZED NSF	NUMBER OF UNITS	TOTAL NSF
JRENL	2	950	50	47,500
JRENL	3	1,200	41	49,200
JRENL	4	1,350	25	33,750
			116	130,450

130,450 TOTAL NSF / 116 UNITS = 1,125 AVERAGE NSF PER UNIT.

Figure G-1. Example Tri-Service Cost Model. Sheet 2 of 2

COST ESTIMATING WORKSHEET - FACILITY ALTERATION

For use of this form, see TM 5-800-4; the proponent agency is USACE

1. PROJECT NUMBER	2. PROJECT TITLE			3. FY
4. BUILDING NUMBER	5. LOCATION			6. HISTORICAL ☐ YES ☐ NO
7. FACILITY TYPE	8. CATEGORY CODE	9. FACILITY SIZE *(SF)*	10. AREA TO BE ALTERED *(SF)*	11. FUND TYPE *(MCA/OMA/AFH)*
12. ESTIMATOR/OFFICE/DATE	13. BASIS OF ESTIMATE		14. MONTHS	15. CONST START

16. REMOVAL/DEMOLITION PORTION OF PRIMARY FACILITY

BUILDING SYSTEM WORK BREAKDOWN	PERCENT OF SYSTEM ALTERED *a*	PERCENT OF LABOR TO REMOVE *b*	LABOR PERCENT TO INSTALL *c*	SYSTEM PERCENT OF TOTAL *d*	TOTAL PERCENT REMOVAL *e*
01 - SUBSTRUCTURE					
02 - SUPERSTRUCTURE					
03 - ROOFING					
04 - EXTERIOR CLOSURE					
05 - INTERIOR CONSTRUCTION					
06 - INTERIOR FINISHES					
07 - SPECIALTIES					
08 - PLUMBING					
09 - H.V.A.C.					
10 - SPECIAL MECHANICAL					
11 - ELECTRICAL					
12 - SPECIAL ELECTRICAL					
13 - EQUIPMENT					
14 - CONVEYING SYSTEMS					
				17. RDF	

18. FACILITY TYPE	19. CATEGORY CODE	20. AREA TO BE ALTERED *(SF)*

21. REPLACEMENT/NEW PORTION OF PRIMARY FACILITY

BUILDING SYSTEM WORK BREAKDOWN	PERCENT OF SYSTEM REPLACED *a*	SYSTEM PERCENT OF TOTAL *b*	TOTAL PERCENT REPLACED *c*
01 - SUBSTRUCTURE			
02 - SUPERSTRUCTURE			
03 - ROOFING			
04 - EXTERIOR CLOSURE			
05 - INTERIOR CONSTRUCTION			
06 - INTERIOR FINISHES			
07 - SPECIALTIES			
08 - PLUMBING			
09 - H.V.A.C.			
10 - SPECIAL MECHANICAL			
11 - ELECTRICAL			
12 - SPECIAL ELECTRICAL			
13 - EQUIPMENT			
14 - CONVEYING SYSTEMS			
		22. RNF	

23. CONSTRUCTION LIMITATION ADJUSTMENTS		24. PERCENT TO ADD
a.	DUST PROTECTION FOR ADJACENT WORK AREAS	
b	LIMITED USE OF EQUIPMENT *(NOISE/POWER LIMITATIONS)*	
c.	LIMITED STORAGE OF CONSTRUCTION MATERIALS	
d	PROTECTION OF COMPLETED WORK	
e.	SHIFT WORK	
		25. SAF

DA FORM 7307-R, APR 94

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To be distributed in accordance with DA Form 12-34-E, Block 4519, requirements for TM 5-800—4.

* U.S. G.P.O.:1994-300-723:80140