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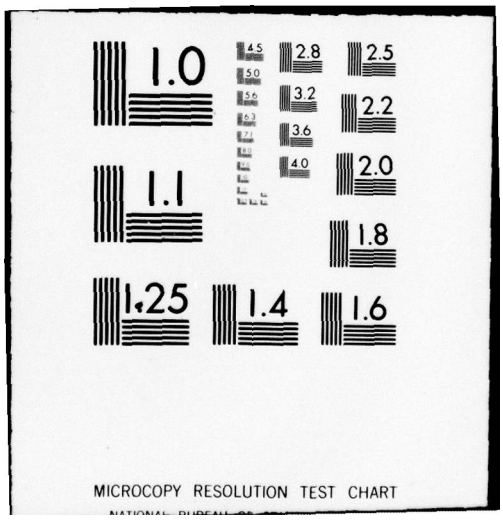
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# US ARMY, AIR FORCE, AND NAVY RPMA CONSOLIDATION IN PANAMA-- A COST-BENEFIT ANALYSIS

## VOLUME II

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VOL 1

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Washington, D. C. 20315

September 1979

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# US ARMY, AIR FORCE, AND NAVY RPMA CONSOLIDATION IN PANAMA

## A COST-BENEFIT ANALYSIS

## VOLUME II

Prepared by
US Army Engineer Studies Center
Corps of Engineers

(11) October 1979

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CONTENTS


| Volume II | Page |
|---|---|
| ANNEX C--CURRENT METHOD OF RPMA OPERATION | C-1 |
| APPENDIX C-1--ARMY, NAVY, AND AIR FORCE CURRENT METHOD OF OPERATION | C-1-1 |
| APPENDIX C-2--SUPPORT PROVIDED TO CURRENT RPMA ORGANIZATIONS | C-2-1 |
| APPENDIX C-3--REPORTING CONSIDERATIONS OF RPMA CONSOLIDATION | C-3-1 |
| ANNEX D--CONTRACTING AND INTERSERVICE SUPPORT AGREEMENTS | D-1 |
| ANNEX E--MAINTENANCE AND REPAIR OF ADMINISTRATIVE VEHICLES | E-1 |
| ANNEX F--FAMILY HOUSING MANAGEMENT | F-1 |
| ANNEX G--REVOLVING FUNDS | G-1 |
| ANNEX H--STUDY PROCEDURE AND ANALYSIS TRAIL | H-1 |
| APPENDIX H-1--STAFFING PROCEDURE | H-1-1 |
| APPENDIX H-2--DEVELOPMENT OF SUPPORT TO RPMA | H-2-1 |
| APPENDIX H-3--INTEGRATION OF FINDINGS BEARING ON THE FEASIBILITY AND DESIRABILITY OF RPMA CONSOLIDATION | H-3-1 |
| APPENDIX H-4--ONE-TIME COSTS AND SAVINGS | H-4-1 |
| ANNEX I--BIBLIOGRAPHY | I-1 |

Volume I

MAIN PAPER

ANNEX A--STUDY REQUESTS

ANNEX B--SUMMARY OF COMMENTS ON DRAFT REPORT--PANAMA RPMA CONSOLIDATION STUDY (JULY 1979)

APPENDIX B-1--DOD, SOUTHCOM, SERVICE, FORSCOM, AND ARMY STAFF COMMENTS ON DRAFT REPORT OF JULY 1979



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# ANNEX C

## CURRENT METHOD OF RPMA OPERATION

ANNEX C

CURRENT METHOD OF RPMA OPERATION


| Paragraph | | Page |
|---|---|---|
| 1 | Introduction | C-1 |
| 2 | Geography | C-2 |
| 3 | Installation Physical Characteristics | C-2 |
| 4 | Geographical Locations of Facilities | C-3 |

| Figure | | |
|---|---|---|
| C-1 | Major US Forces Installations--Panama | C-3 |
| C-2 | Canal Zone and Vicinity, Pacific Side | C-5 |
| C-3 | Canal Zone and Vicinity, Atlantic Side | C-6 |
| C-4 | One-way Travel Times and Distances | C-7 |
| C-5 | DOD Category Codes (US Installations--Panama) | C-8 |

APPENDIX C-1--ARMY, NAVY, AND AIR FORCE CURRENT METHOD OF OPERATION C-1-1

APPENDIX C-2--SUPPORT PROVIDED TO CURRENT RPMA ORGANIZATIONS C-2-1

APPENDIX C-3--REPORTING CONSIDERATIONS OF RPMA CONSOLIDATION C-3-1


1. Introduction. This annex and its appendixes provide background information about the Air Force, Army, and Navy and their current method of real property maintenance activity (RPMA) operation (CMO). The annex provides a geographical/physical perspective of the installations under consideration. Appendixes C-1 and C-2 discuss the services' current operations and workload and contain a discussion of the installation

support provided. Appendix C-3 presents an overview of the current RPMA reporting procedures and the necessary considerations for consolidation actions.

2. Geography. The Panama Canal Zone is approximately 10 miles wide and 50 miles long and lies some 1,150 miles due south of Miami, Florida. Most of the military installations (see Figure C-1) are concentrated around each end. This use of the word "concentrated" may come as a surprise to some people. Many would argue against describing the base at either end of the Canal as concentrated. Indeed, bases on the Atlantic side of the isthmus are separated by bays and the Canal itself. Similarly, the principal groups of bases on the Pacific side are divided by man-made and natural bodies of water. Yet, at either end of the Canal, bases are separated by a few miles at most (see Figures C-2 and C-3). Figure C-4 shows representative one-way travel times and distances. Given this clustering of installations on each end of the Canal and the natural barrier provided by the Canal, the entire area can be divided into three geographic regions--Atlantic, Pacific East, and Pacific West. These regions correspond to locations of the current RPMA work force.

3. Installation Physical Characteristics. The size of installations included in this analysis varied considerably. The United States Southern Command (USSOUTHCOM), headquartered at Quarry Heights, is located on approximately 146 acres while Fort Clayton occupies in excess of 8,000 acres. Figure C-5 shows facilities by DOD category codes. These measures

indicate that if all the services' RPMA organizations were combined, this organization would maintain 24 million square feet in 5,006 buildings and be responsible for 31.5 million square yards of pavement, 855 miles of utility distribution, and over 150,000 acres of land. (The 150,000 acres of DOD land equates to an area one-fifth the size of Rhode Island.)

MAJOR US FORCES INSTALLATIONS--PANAMA

| Installation | Service | |
|---|---|---|
| Albrook AFB | Air Force | Pacific |
| Howard AFB | Air Force | |
| Fort Clayton | Army | |
| Corozal | Army | |
| Quarry Heights | Army | |
| Fort Kobbe | Army-Navy | |
| Fort Amador | Army | |
| Rodman | Navy | |
| Farfan | Navy | |
| Summit | Navy | |
| Marine Barracks | Navy | |
| Fort Sherman | Army | Atlantic |
| Fort Gulick | Army | |
| Fort Davis | Army | |
| Galeta Island | Navy | |

Figure C-1

4. Geographical Locations of Facilities. The DOD category codes from Figure C-5 provided the basis for determining service representation by geographic areas. The Navy's facilities, however, were not separated by area. This required dividing their facilities into east-west components by proportioning approximate building square footages.

With the assistance of the Public Works Officer (PWO), ESC divided the Naval Station's facilities into 18 percent Pacific East and 82 percent Pacific West. The remaining percentages for Army and Air Force facilities were available by installation and, therefore, easily divided between the east and west.

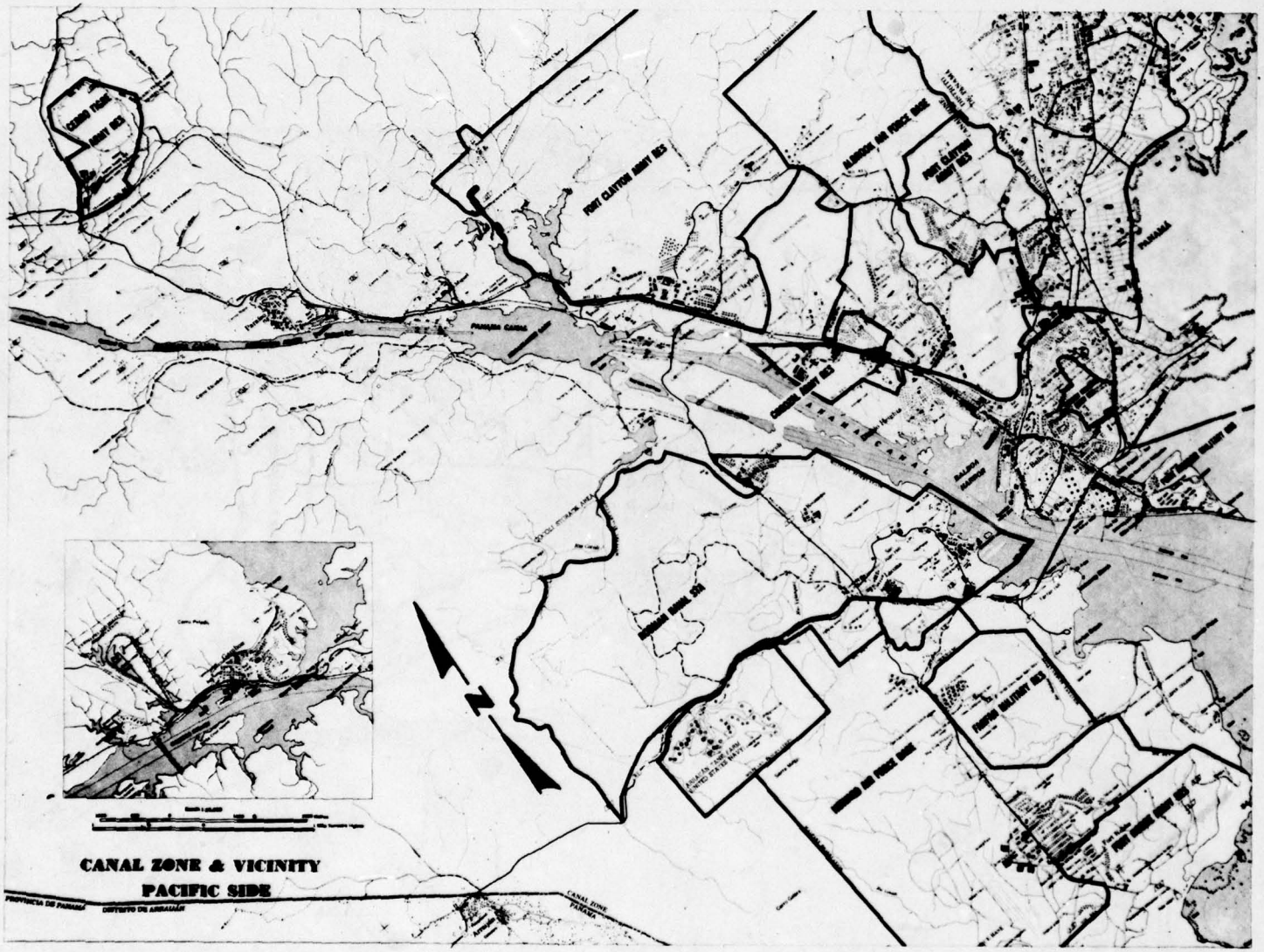


Figure C-2

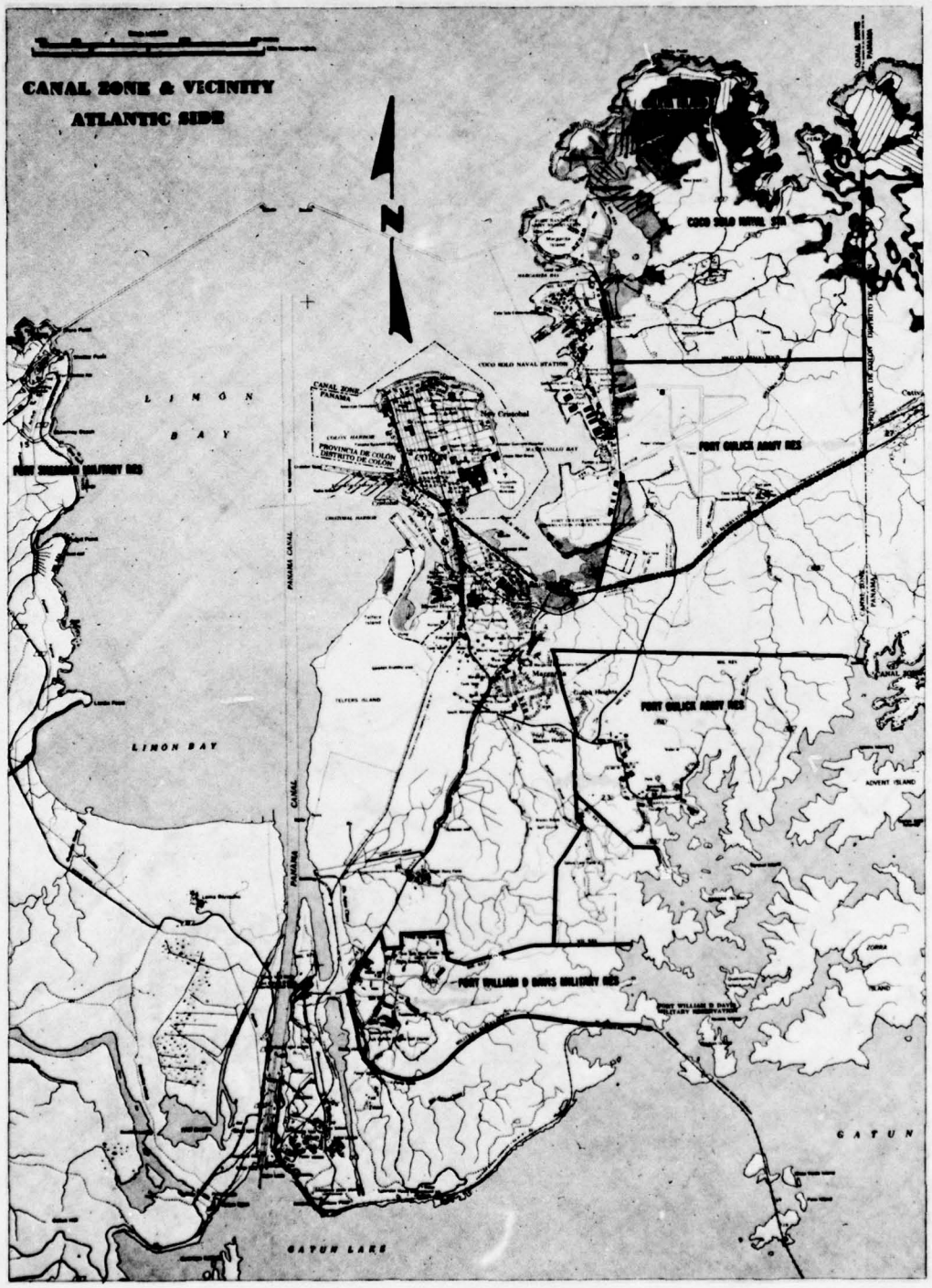
CANAL ZONE & VICINITY
ATLANTIC SIDE
N
LIMON BAY
LIMON BAY
PANAMA CANAL
FORT GULICK ARMY RES
FORT GULICK ARMY RES
FORT WILLIAM D DAVIS MILITARY RES
ADVENT ISLAND
GATUN
GATUN LAKE

Figure C-3

ONE-WAY TRAVEL TIMES AND DISTANCES

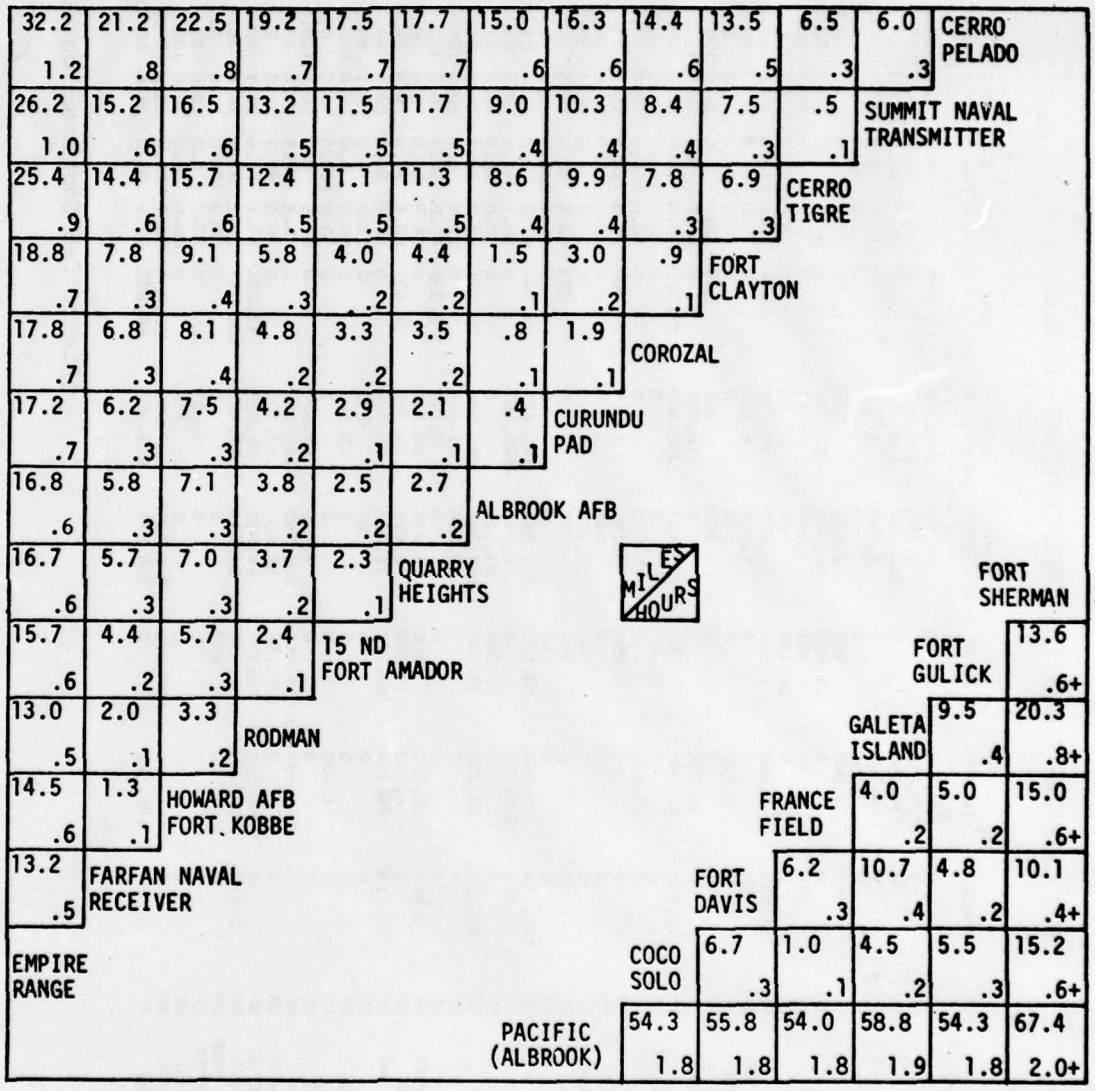


Figure C-4

## DOD CATEGORY CODES (US INSTALLATIONS--PANAMA)

| NO | CAT CODE | DESCRIPTION | UM | ALBROOK | HOWARD | NAVY | ARMY ATLANTIC | ARMY PACIFIC E | ARMY PACIFIC W | % PAC E | % PAC W | % ATL | % ARMY | % NAVY | % AF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 111 | RUNWAYS | SY | 0 | 182,834 | 0 | 34,197 | 190,980 | 229 | 46.7 | 44.8 | 8.3 | 55.2 | 0.0 | 44.7 |
| 2 | 112 | TAXIWAYS | SY | 0 | 217,214 | 0 | 7,400 | 198,537 | 0 | 46.9 | 51.3 | 1.7 | 48.6 | 0.0 | 51.3 |
| 3 | 113 | APRONS | SY | 0 | 274,987 | 0 | 160,444 | 151,052 | 0 | 25.7 | 46.8 | 27.3 | 53.1 | 0.0 | 46.8 |
| 4 | 116 | OTHER ARFLD PAV | SY | 1,110 | 16,329 | 0 | 2,916 | 1,777 | 0 | 13.0 | 73.7 | 13.1 | 21.2 | 0.0 | 78.7 |
| 5 | 121 | FUEL DISP/ACFT | SF | 0 | 3,262 | 0 | 0 | 320 | 0 | 8.9 | 91.0 | 0.0 | 8.9 | 0.0 | 91.0 |
| 6 | 123 | FUEL/DISP LAND | SF | 300 | 1,280 | 750 | 2,422 | 172 | 1,092 | 7.8 | 51.8 | 40.2 | 61.2 | 12.4 | 26.2 |
| 7 | 124 | OPER FUEL STOR | GA | 0 | 0 | 21,520 | 144,787 | 157,500 | 0 | 48.6 | 6.6 | 44.7 | 93.3 | 6.6 | 0.0 |
| 8 | 125 | FUEL POL LINES | MI | 218 | 11 | 221 | 3,945 | 11 | 0 | 5.1 | 5.2 | 89.5 | 89.7 | 5.0 | 5.1 |
| 9 | 126 | FUEL DISP/GTR | SF | 0 | 0 | 82,488 | 91 | 0 | 0 | 0.0 | 99.8 | 0.1 | 0.1 | 99.8 | 0.0 |
| 10 | 131 | COMMS BLDGS | SF | 13,859 | 5,262 | 1,994 | 16,872 | 70,571 | 7,684 | 72.6 | 12.8 | 14.5 | 81.8 | 1.7 | 16.4 |
| 11 | 133 | NAVTR AID/BLDGS | SF | 80 | 0 | 0 | 1,261 | 4,193 | 0 | 77.2 | 0.0 | 22.7 | 98.5 | 0.0 | 1.4 |
| 12 | 134 | NAVTR AID/OTHER | SF | 0 | 1,112 | 0 | 0 | 0 | 0 | 0.0 | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 |
| 13 | 135 | COMMS LINES | MI | 0 | 0 | 0 | 163 | 262 | 45 | 55.7 | 9.5 | 34.6 | 100.0 | 0.0 | 0.0 |
| 14 | 136 | AFLD PAVE LTING | LF | 0 | 18,235 | 0 | 0 | 18,327 | 0 | 50.1 | 49.8 | 0.0 | 50.1 | 0.0 | 49.8 |
| 15 | 141 | LD OP/BLDGS | SF | 13,482 | 61,044 | 387 | 109,423 | 332,389 | 29,523 | 63.3 | 16.6 | 20.0 | 86.2 | 0.0 | 13.6 |
| 16 | 143 | PETROL TEST BLDG | SF | 0 | 0 | 2,200 | 0 | 0 | 0 | 0.0 | 100.0 | 0.0 | 0.0 | 100.0 | 0.0 |
| 17 | 149 | LD OP/OTHER | SF | 0 | 1,626 | 0 | 0 | 0 | 0 | 0.0 | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 |
| 18 | 151 | PIERS | SY | 0 | 0 | 3,254 | 9,196 | 1,315 | 360 | 9.3 | 25.5 | 65.1 | 76.9 | 23.0 | 0.0 |
| 19 | 152 | WHARFS | SY | 0 | 0 | 0 | 469 | 0 | 0 | 0.0 | 0.0 | 100.0 | 100.0 | 0.0 | 0.0 |
| 20 | 154 | WTRFR OR/SEAWAL | LF | 0 | 0 | 562 | 10,970 | 0 | 0 | 0.0 | 4.8 | 95.1 | 95.1 | 4.8 | 0.0 |
| 21 | 155 | SM CRAFT BRTH | LF | 0 | 0 | 295 | 607 | 0 | 253 | 0.0 | 47.4 | 52.5 | 74.4 | 25.5 | 0.0 |
| 22 | 159 | OTHER WTRFR | LF | 0 | 0 | 60 | 0 | 0 | 0 | 0.0 | 100.0 | 0.0 | 0.0 | 100.0 | 0.0 |
| 23 | 171 | TRNG BLDGS | SF | 111,154 | 1,145 | 10,370 | 205,888 | 143,630 | 24,544 | 51.2 | 7.2 | 41.4 | 75.3 | 2.0 | 22.6 |
| 24 | 211 | MNT ACRFT | SF | 19,078 | 322,508 | 0 | 16,741 | 426,157 | 0 | 56.7 | 41.1 | 2.1 | 56.4 | 0.0 | 43.5 |
| 25 | 213 | MNT SHIPS | SF | 0 | 0 | 47,009 | 33,724 | 0 | 0 | 0.0 | 58.2 | 41.7 | 41.7 | 58.2 | 0.0 |
| 26 | 214 | MNT TNK/AUTO | SF | 12,159 | 36,301 | 39,909 | 117,374 | 245,824 | 32,144 | 53.3 | 22.4 | 24.2 | 81.7 | 8.2 | 10.0 |
| 27 | 215 | MNT WEAPONS | SF | 0 | 0 | 0 | 12,832 | 51,204 | 0 | 79.9 | 0.0 | 20.0 | 100.0 | 0.0 | 0.0 |
| 28 | 216 | MNT AMMO | SF | 0 | 0 | 0 | 0 | 5,176 | 5,338 | 49.2 | 50.7 | 0.0 | 100.0 | 0.0 | 0.0 |
| 29 | 217 | MNT ELEC/COMMS | SF | 3,811 | 20,230 | 900 | 2,436 | 64,127 | 0 | 74.2 | 23.0 | 2.6 | 72.7 | 0.9 | 26.2 |
| 30 | 218 | MNT MISC/PROC | SF | 0 | 4,333 | 13,392 | 6,914 | 84,789 | 14,431 | 68.4 | 25.9 | 5.5 | 85.6 | 10.8 | 3.4 |
| 31 | 219 | MNT INS REP OPN | SF | 50,817 | 45,154 | 88,317 | 76,105 | 79,109 | 0 | 38.2 | 39.3 | 22.4 | 45.7 | 26.0 | 28.2 |
| 32 | 226 | PROD/AMMO | SF | 0 | 2 | 0 | 59 | 893 | 0 | 93.5 | 0.2 | 6.1 | 99.7 | 0.0 | 0.2 |
| 33 | 228 | PROD/MISC PROC | SF | 0 | 0 | 0 | 0 | 18,803 | 0 | 100.0 | 0.0 | 0.0 | 100.0 | 0.0 | 0.0 |
| 34 | 229 | OXYGEN GEN PL | SF | 0 | 1,600 | 0 | 0 | 0 | 0 | 0.0 | 100.0 | 0.0 | 0.0 | 0.0 | 100.0 |
| 35 | 310 | RD TEST BLDGS | SF | 0 | 0 | 0 | 9,185 | 64,510 | 0 | 87.5 | 0.0 | 12.4 | 100.0 | 0.0 | 0.0 |
| 36 | 411 | LIQ FUEL STOR | BL | 0 | 334,997 | 2,119,466 | 334,393 | 185,562 | 0 | 6.2 | 82.5 | 11.2 | 17.4 | 71.2 | 11.2 |
| 37 | 412 | LIQ STOR O/TWFP | GA | 0 | 0 | 3,178,135 | 58,900 | 13,000 | 0 | 0.3 | 97.7 | 1.8 | 2.2 | 97.7 | 0.0 |
| 38 | 421 | AMMO STORE/DEPOT | SF | 0 | 0 | 2,177 | 68,295 | 94,089 | 19,284 | 51.1 | 11.6 | 37.1 | 98.8 | 1.1 | 0.0 |
| 39 | 422 | AMMO STORE INST | SF | 1,870 | 39,390 | 0 | 51,014 | 29,573 | 185,799 | 10.2 | 73.1 | 16.5 | 86.5 | 0.0 | 13.4 |
| 40 | 423 | AMMO STR/LIQ PROP | GM | 0 | 0 | 250 | 0 | 0 | 0 | 0.0 | 100.0 | 0.0 | 0.0 | 100.0 | 0.0 |
| 41 | 431 | COLD STORE/DEPOT | SF | 0 | 0 | 5,176 | 0 | 77,287 | 0 | 93.7 | 6.2 | 0.0 | 93.7 | 6.2 | 0.0 |
| 42 | 432 | COLD STORE/INST | SF | 0 | 0 | 0 | 0 | 278 | 0 | 100.0 | 0.0 | 0.0 | 100.0 | 0.0 | 0.0 |
| 43 | 441 | COV STORE/DEPOT | SF | 0 | 0 | 247,904 | 233,386 | 509,088 | 12,889 | 50.7 | 25.9 | 23.2 | 75.2 | 24.7 | 0.0 |
| 44 | 442 | COV STORE/INST | SF | 8,452 | 131,188 | 0 | 303,873 | 689,967 | 50,802 | 58.9 | 15.3 | 25.6 | 88.2 | 0.0 | 11.7 |

(Figure C-5 Continued on Next Page)

## DOD CATEGORY CODES (US INSTALLATIONS--PANAMA)--Continued

| NO | CAT CODE | DESCRIPTION | UM | ALBROOK | HOWARD | NAVY | ARMY ATLANTIC | ARMY PACIFIC E | ARMY PACIFIC W | % PAC E | % PAC W | % ATL | % ARMY | % NAVY | % AF |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 45 | 451 | OPEN STORE/DEPOT | SY | 0 | 0 | 3,235 | 0 | 2,626 | 0 | 44.8 | 55.1 | 0.0 | 44.8 | 55.1 | 0.0 |
| 46 | 452 | OPEN STORE/INST | SY | 912 | 92,771 | 2,000 | 27,884 | 38,093 | 112 | 24.1 | 58.6 | 17.2 | 40.8 | 1.2 | 57.9 |
| 47 | 530 | LABS | SF | 0 | 1,800 | 477 | 3,291 | 6,824 | 0 | 55.0 | 18.3 | 26.5 | 81.6 | 3.8 | 14.5 |
| 48 | 540 | DENTAL CLINICS | SF | 1,334 | 3,773 | 3,807 | 20,024 | 34,865 | 0 | 56.7 | 11.8 | 31.3 | 86.0 | 5.9 | 8.0 |
| 49 | 550 | DISPENSARIES | SF | 9,674 | 0 | 0 | 17,896 | 68,027 | 0 | 81.2 | 0.0 | 18.7 | 89.8 | 0.0 | 10.1 |
| 50 | 610 | ADMIN BLDGS | SF | 159,230 | 104,613 | 90,672 | 30,163 | 565,019 | 29,625 | 73.9 | 22.9 | 3.0 | 63.7 | 9.2 | 26.9 |
| 51 | 711 | FAM HSG/DWELLG | SF | 805,935 | 1,109,150 | 586,649 | 1,560,197 | 2,994,578 | 709,235 | 48.9 | 30.9 | 20.0 | 67.7 | 7.5 | 24.6 |
| 52 | 714 | FAM HSG/DET FAC | SF | 1,042 | 0 | 16,981 | 56,584 | 187,267 | 0 | 71.9 | 6.4 | 21.6 | 93.1 | 6.4 | 0.3 |
| 53 | 721 | BEQ | SF | 268,772 | 351,050 | 62,033 | 1,677,473 | 1,146,835 | 432,463 | 35.9 | 21.4 | 42.5 | 82.6 | 1.5 | 15.7 |
| 54 | 722 | BACH MESS FAC | SF | 0 | 0 | 8,294 | 10,870 | 14,400 | 3,060 | 39.3 | 31.0 | 29.6 | 77.3 | 22.6 | 0.0 |
| 55 | 723 | BACHSG/DET FAC | SF | 2,541 | 17,792 | 0 | 5,766 | 10,754 | 1,538 | 34.6 | 50.3 | 15.0 | 47.0 | 0.0 | 52.9 |
| 56 | 724 | BOQ | SF | 63,803 | 47,725 | 0 | 101,533 | 218,108 | 118,128 | 51.3 | 30.1 | 18.4 | 79.6 | 0.0 | 20.3 |
| 57 | 725 | CIVILIAN CAMP | SF | 34,540 | 0 | 0 | 0 | 0 | 0 | 100.0 | 0.0 | 0.0 | 0.0 | 0.0 | 100.0 |
| 58 | 730 | PERS SUPP/SVCS | SF | 13,746 | 87,412 | 26,858 | 12,992 | 64,671 | 20,328 | 34.6 | 59.5 | 5.7 | 43.3 | 11.8 | 44.7 |
| 59 | 740 | COMMMUNITY/INTER | SF | 142,050 | 272,877 | 258,020 | 364,524 | 980,750 | 52,466 | 54.2 | 28.1 | 17.6 | 67.5 | 12.4 | 20.0 |
| 60 | 750 | COMMUNITY/EXTER | | 10 | 205 | 4 | 700 | 1,853 | 1,180 | 47.1 | 35.1 | 17.7 | 94.4 | 0.1 | 5.4 |
| 61 | 811 | ELEC SOURCE | KW | 90 | 7,695 | 1,000 | 8,800 | 2,922 | 100 | 14.6 | 42.6 | 42.7 | 57.3 | 4.8 | 37.7 |
| 62 | 812 | ELEC TRMSN/DIST | LF | 272,316 | 487,170 | 125,671 | 665,743 | 801,308 | 163,360 | 42.6 | 30.8 | 26.4 | 64.8 | 4.9 | 30.1 |
| 63 | 813 | ELEC PWR STA | SF | 0 | 0 | 1,518 | 20,215 | 23,474 | 4,997 | 46.7 | 12.9 | 40.2 | 96.9 | 3.0 | 0.0 |
| 64 | 821 | HEAT SOURCE | MB | 0 | 0 | 414 | 0 | 2,973 | 0 | 87.7 | 12.2 | 0.0 | 87.7 | 12.2 | 0.0 |
| 65 | 822 | HEAT TRMSN | LF | 0 | 0 | 3,180 | 0 | 1,500 | 0 | 32.0 | 67.9 | 0.0 | 32.0 | 67.9 | 0.0 |
| 66 | 826 | REFR AC SOURCE | TN | 1,000 | 1,638 | 0 | 235 | 1,055 | 650 | 44.8 | 49.9 | 5.1 | 42.3 | 0.0 | 57.6 |
| 67 | 827 | AC-XMSN/DISTR | LF | 1,344 | 23,550 | 0 | 2,190 | 12,508 | 0 | 34.9 | 59.4 | 5.5 | 37.1 | 0.0 | 62.8 |
| 68 | 831 | SEWAGE TRMT/DISP | KG | 5,000 | 3,099 | 379 | 1,284 | 130 | 15 | 51.7 | 35.2 | 12.9 | 14.4 | 3.8 | 81.7 |
| 69 | 832 | SEWAGE COLLECT | LF | 72,833 | 98,307 | 53,752 | 167,057 | 305,405 | 39,182 | 51.3 | 25.9 | 22.6 | 69.4 | 7.2 | 23.2 |
| 70 | 833 | WASTE/REF GARB | SF | 130 | 1,036 | 48 | 0 | 2,287 | 0 | 69.0 | 30.9 | 0.0 | 65.3 | 1.3 | 33.3 |
| 71 | 841 | WS TRMT/STOR P | KG | 750 | 1,550 | 1,507 | 4,254 | 1,006 | 38 | 19.2 | 33.9 | 46.7 | 58.1 | 16.5 | 25.2 |
| 72 | 842 | WATER DISTR | LF | 101,191 | 175,977 | 112,968 | 349,726 | 415,054 | 66,618 | 42.2 | 29.1 | 28.6 | 68.0 | 9.2 | 22.6 |
| 73 | 843 | WATER FIRE PROT | GA | 0 | 0 | 25,000 | 0 | 0 | 0 | 0.0 | 100.0 | 0.0 | 0.0 | 100.0 | 0.0 |
| 74 | 844 | WATER SUP STORE | KG | 0 | 0 | 830 | 0 | 0 | 0 | 0.0 | 100.0 | 0.0 | 0.0 | 100.0 | 0.0 |
| 75 | 845 | NONPOT WATER DIS | LF | 0 | 0 | 42,454 | 0 | 0 | 0 | 0.0 | 100.0 | 0.0 | 0.0 | 100.0 | 0.0 |
| 76 | 851 | ROADS & BRIDGES | SY | 246,341 | 651,125 | 606,736 | 994,717 | 1,220,202 | 745,634 | 32.8 | 44.8 | 22.2 | 66.3 | 13.5 | 20.1 |
| 77 | 852 | WALKS/OTH PAVE | SY | 113,942 | 255,133 | 67,030 | 275,775 | 593,819 | 140,171 | 48.9 | 31.9 | 19.0 | 69.8 | 4.6 | 25.5 |
| 78 | 860 | RAILROADS | MI | 0 | 0 | 0 | 1 | 4 | 0 | 80.0 | 0.0 | 20.0 | 100.0 | 0.0 | 0.0 |
| 79 | 871 | GROUND DRAIN | LF | 278,560 | 263,035 | 160,289 | 137,871 | 451,031 | 127,343 | 51.4 | 38.8 | 9.7 | 50.5 | 11.3 | 38.1 |
| 80 | 872 | GROUND FENCE | LF | 26,068 | 36,766 | 42,239 | 84,709 | 133,310 | 43,467 | 43.4 | 33.4 | 23.1 | 71.3 | 11.5 | 17.1 |
| 81 | 880 | ALARM SYS | BX | 111 | 760 | 0 | 3 | 4 | 0 | 13.0 | 86.5 | 0.3 | 0.7 | 0.0 | 99.2 |
| 82 | 890 | UTIL MISC | SF | 8,107 | 1,210 | 433 | 200 | 27,601 | 0 | 95.0 | 4.3 | 0.5 | 74.0 | 1.1 | 24.8 |
| 83 | 913 | LAND TEMP USE | AC | 571 | 4,600 | 4,269 | 21,989 | 38,417 | 48,297 | 33.0 | 48.3 | 18.6 | 92.0 | 3.6 | 4.3 |
| 84 | 914 | LAND | AC | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 85 | 923 | LAND FOREIGN | AC | 0 | 0 | 2,869 | 19,128 | 9,362 | 8,385 | 23.5 | 28.3 | 48.1 | 92.7 | 7.2 | 0.0 |
| 86 | | BUILDINGS | EA | 406 | 850 | 430 | 1,071 | 1,794 | 455 | 43.9 | 34.6 | 21.3 | 66.3 | 8.5 | 25.0 |
| 87 | | BLDG AREA | SF | 1,760,428 | 4,417,509 | 1,598,770 | 5,149,623 | 9,337,609 | 1,755,370 | 46.2 | 32.3 | 21.4 | 67.6 | 6.6 | 25.7 |
| 88 | | PAVED AREA | SY | 2,122,733 | 6,107,902 | 2,281,025 | 6,662,621 | 11,736,010 | 2,641,876 | 43.9 | 34.9 | 21.1 | 66.6 | 7.2 | 26.0 |
| 89 | | UTILITY LINES | LF | 447,684 | 785,004 | 295,571 | 1,184,716 | 1,535,775 | 269,160 | 43.9 | 29.8 | 26.2 | 66.1 | 6.5 | 27.2 |

Figure C-5

APPENDIX C-1

ARMY, NAVY, AND AIR FORCE CURRENT METHOD OF OPERATION


| Paragraph | | Page |
|---|---|---|
| 1 | Purpose and Scope | C-1-2 |
| 2 | Background | C-1-2 |
| 3 | Study Data Collection | C-1-3 |
| 4 | Army CMO | C-1-4 |
| 5 | Air Force CMO | C-1-11 |
| 6 | Navy CMO | C-1-17 |
| 7 | Data Adjustment | C-1-31 |
| 8 | Data Verification | C-1-32 |

| Figure | | |
|---|---|---|
| C-1-1 | FE Organization Chart for 193d Infantry Brigade (C2) | C-1-5 |
| C-1-2 | Base Year Staffing--Army Pacific Side | C-1-6 |
| C-1-3 | Base Year Staffing--Army Atlantic Side | C-1-7 |
| C-1-4 | Base Year Man-hour Expenditures--Army Pacific Side | C-1-9 |
| C-1-5 | Base Year Man-hour Expenditures--Army Atlantic Side | C-1-10 |
| C-1-6 | BCE Organization Chart for 24th Composite Wing | C-1-12 |
| C-1-7 | Air Force Labor Utilization Codes | C-1-13 |
| C-1-8 | Army-Air Force Work Order Comparison | C-1-13 |
| C-1-9 | Base Year Man-hour Expenditures--Air Force | C-1-14 |
| C-1-10 | Base Year Staffing--Air Force | C-1-15 |
| C-1-11 | PWD Organization Chart for US Naval Station | C-1-19 |
| C-1-12 | PWD Organization Chart for Naval Security Group and Naval Communication Station | C-1-20 |
| C-1-13 | Navy Labor Class Codes | C-1-21 |
| C-1-14 | Army-Navy Work Order Comparison | C-1-21 |
| C-1-15 | Base Year Man-hour Expenditures--Navy | C-1-24 |
| C-1-16 | Base Year Staffing--Navy | C-1-25 |
| C-1-17 | Base Year Man-hour Expenditures--Naval Communications Station | C-1-26 |

| Figure | | Page |
|---|---|---|
| C-1-18 | Base Year Staffing--Naval Communications Station | C-1-27 |
| C-1-19 | Base Year Man-hour Expenditures--Naval Security Group | C-1-28 |
| C-1-20 | Base Year Staffing--Naval Security Group | C-1-29 |


1. Purpose and Scope. This appendix describes the current method of real property maintenance activity (RPMA) operations (CMO) for the Army, Air Force, and Navy installations in Panama. It discusses current organizations and FY 78 workloads and briefly describes and then summarizes the collection of study data. The CMO and FY 78 workload with some necessary adjustments provide the base case against which other organizational concepts are tested and compared (see Appendix H-1). Because retention of the CMO is a possible choice, the CMO is considered one of the major alternatives (Alternative 1).

2. Background.

a. Consider the following statement:

> A continuing objective of DOD policy is to consolidate RPMA geographically when such actions are cost effective and do not result in mission impairment.

The underlined words imply the need for careful comparison of the CMO and other alternatives. Even if the CMO were not itself a feasible RPMA approach, it and its corresponding workload would still have to be considered as the best source of data about RPMA requirements and capabilities. The analyst cannot escape the obligation to explore the CMO. Over the years, the services have developed their RPMA along somewhat different lines, included some different functions, applied special definitions,

and adopted differing management and reporting practices. The Panama CMO is then really three CMOs. Consideration of the CMO imposes a need to describe all the services in comparable terms.

b. Because the Army accounts for the largest part of total RPMA in Panama today, DOD declared the Army the lead service for determining the feasibility of RPMA consolidation in Panama. The Army in turn directed the Engineer Studies Center (ESC) to conduct the feasibility study. ESC and others have performed precedent studies of RPMA consolidation for a variety of areas. In 1978, ESC conducted a study of the possible consolidation of RPMA for nine installations in the National Capital Region (NCR). In that study, ESC applied and generalized methods developed by the Civil Engineering Research Laboratory (CERL) in its study Consolidation of RPMA at Fayetteville, NC. That latter study provided a sound basis for expressing Army and Air Force RPMA in comparable terms. For study of RPMA in Panama, the earlier framework had to be expanded to include the Navy's public works operations. With the assistance of the Navy's Public Works Officer (PWO) in Panama, the ESC study team was able to express Navy activity in basically Army terminology.

3. Study Data Collection. As already noted, a critical requirement of the study was the ability to express each services' CMO (actually the sum of three somewhat different CMOs) in comparable terms. The study team decided to express all current RPMA in Army terms and chose not to invent some new hybrid terminology because the Army accounts for the largest part of RPMA in Panama. Given the CERL framework and early

interaction with Navy staff, ESC requested that each service provide descriptions of their current (actually end FY 78) organizations in Army terms and how their RPMA production hours were distributed in FY 78. ESC also requested salary data, activity personnel strength, estimated installation support, equipment data, and contract data. All data were received in time for analysis and, with few exceptions, the data contained all the requested information. The following paragraphs discuss, in part, those data and how adjustments were made to compensate for incomplete data. An absence of comments indicates that all data were satisfactory.

4. Army CMO. The Facilities Engineer (FE) is charged with the Army's real property maintenance (RPM) responsibility. The following paragraphs present the organizational structure and other pertinent aspects of the operation.

a. Organization. Figure C-1-1 shows the FE's organizational structure. The headquarters element is located at Corozal on the Pacific East side of the Canal. Past and current actions have centralized their shop operations into two geographical areas--Corozal and Fort Davis on the Atlantic. All overhead functions are colocated with the headquarters except work reception, scheduling, and inspections. These Atlantic functions and shops are under the operational control of the Assistant Director for Atlantic operations but are under the command of their parent divisions on the Pacific. Figures C-1-2 and C-1-3 show current authorized and base-year on-board personnel strengths for 1 October 1977 through 30 September 1978.

## FE ORGANIZATION CHART FOR 193d INFANTRY BRIGADE (C2)

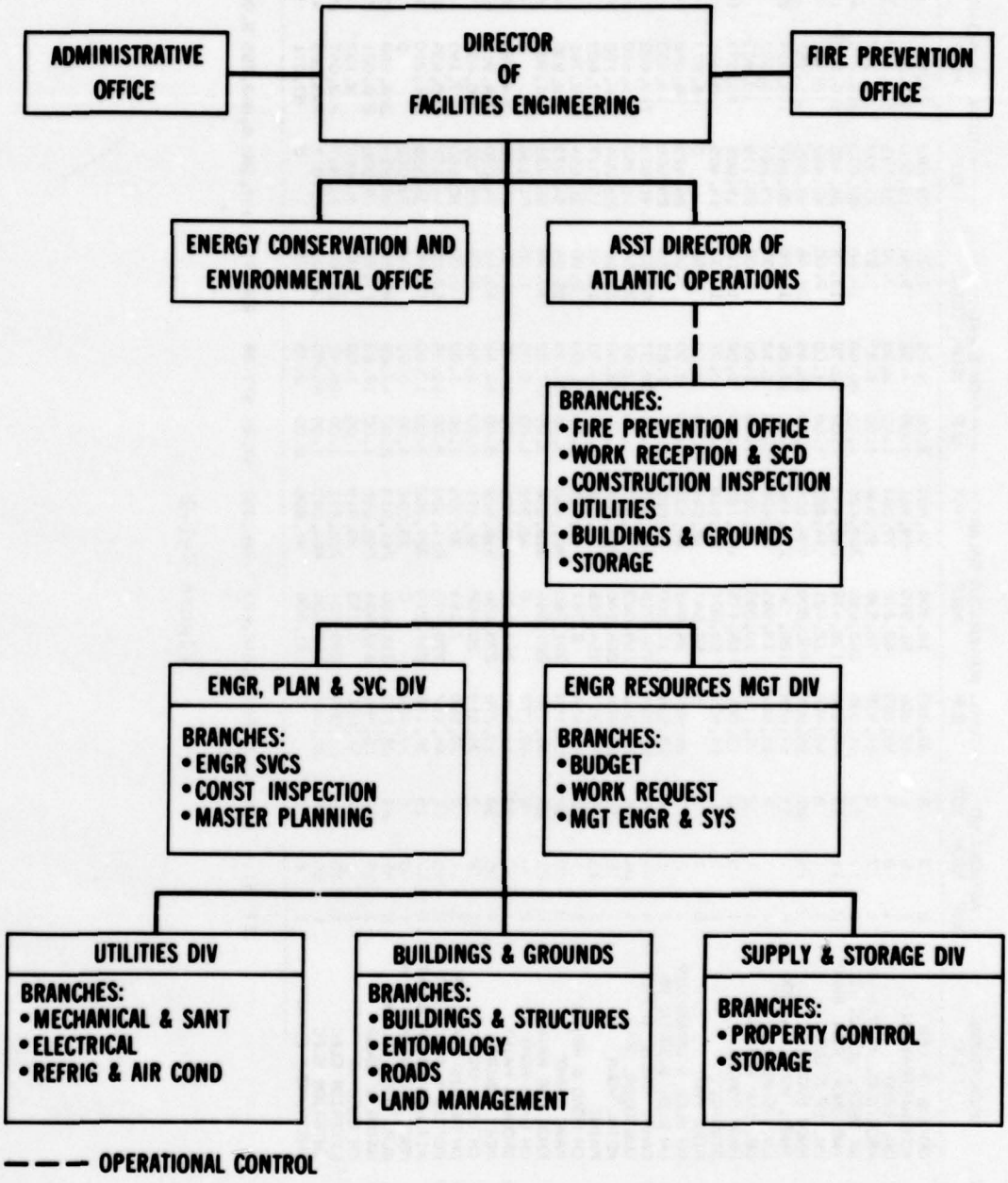


Figure C-1-1

# BASE YEAR STAFFING--ARMY
# PACIFIC SIDE

| YARDSTICK CODE | FUNCTIONAL TITLE | AUTHORIZED SUP | AUTHORIZED NSUP | AUTHORIZED TOT | --TOTAL AUTHORIZED SALARY-- SUP | NSUP | TOT | ON-BOARD SUP | ON-BOARD NSUP | ON-BOARD TOTAL | TOTAL SALARIES SUP | TOTAL SALARIES NSUP | TOTAL SALARIES TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 610 | OFFICE OF OFE | 2 | 3 | 5 | 39,283 | 12,398 | 51,681 | 2.00 | 5.25 | 7.25 | 39,283 | 21,697 | 60,980 |
| 611 | ADMINISTRATION | 1 | 5 | 6 | 18,006 | 51,815 | 69,821 | 1.00 | 4.92 | 5.92 | 18,006 | 50,986 | 68,992 |
| 612.1 | CH, ERMD | 1 | 2 | 3 | 33,789 | 43,272 | 77,061 | 1.00 | 2.00 | 3.00 | 33,789 | 43,272 | 77,061 |
| 612.2 | PROG/BUDG,ACCT,STAT | 1 | 7 | 8 | 21,398 | 76,538 | 97,936 | 1.00 | 6.87 | 7.87 | 21,398 | 75,117 | 96,515 |
| 612.3.4 | WK RECP, SCHED, EST | 2 | 17 | 19 | 41,036 | 262,650 | 303,686 | 4.00 | 20.60 | 24.60 | 82,072 | 318,270 | 400,342 |
| 612.5,6 | IND ENGR, REAL PROP | 2 | 11 | 13 | 48,960 | 138,478 | 187,438 | 1.00 | 12.78 | 13.78 | 24,480 | 160,887 | 185,367 |
| 613.1 | CH, EP & SD | 1 | 1 | 2 | 42,462 | 12,421 | 54,883 | 1.00 | 1.00 | 2.00 | 42,462 | 12,421 | 54,883 |
| 613.2 | ENGR SVCS | 3 | 24 | 27 | 95,805 | 400,800 | 496,605 | 3.00 | 25.46 | 28.46 | 95,805 | 425,182 | 520,987 |
| 613.3,4 | INSP, MSTR PL/PROG | 4 | 7 | 11 | 57,694 | 120,736 | 178,430 | 2.00 | 11.26 | 13.26 | 28,847 | 194,214 | 223,061 |
| 613.4A | ENVIRONMENTAL | 1 | 1 | 2 | 15,863 | 13,565 | 29,428 | 1.25 | 1.12 | 2.37 | 19,829 | 15,193 | 35,022 |
| 621 | CH, SUP & STOR | 1 | 1 | 2 | 25,119 | 10,905 | 36,024 | 1.00 | 1.00 | 2.00 | 25,119 | 10,905 | 36,024 |
| 622 | PROP CONTRL | 1 | 9 | 10 | 18,005 | 85,175 | 103,180 | 1.00 | 9.08 | 10.08 | 18,005 | 85,933 | 103,938 |
| 623 | STORAGE | 1 | 9 | 10 | 14,409 | 69,201 | 83,610 | 1.00 | 9.37 | 10.37 | 14,409 | 72,046 | 86,455 |
| 641 | FIRE PROT | 0 | 3 | 3 | 0 | 58,647 | 58,647 | 0.00 | 2.50 | 2.50 | 0 | 48,873 | 48,873 |
| 631 | CH BLDG & GRNDS DIV | 1 | 2 | 3 | 26,489 | 34,042 | 60,531 | 1.00 | 2.00 | 3.00 | 26,489 | 34,042 | 60,531 |
| 632.1 | CH BLDG & STRUC BR | 1 | 1 | 2 | 29,589 | 11,100 | 40,689 | 1.00 | 1.23 | 2.23 | 29,589 | 13,653 | 43,242 |
| 632.21,31 | CARP, MASON, & PM | 4 | 59 | 63 | 66,824 | 751,718 | 818,542 | 5.50 | 58.37 | 63.87 | 91,883 | 743,692 | 835,575 |
| 632.32 | CUSTODIAL SVCS | 1 | 24 | 25 | 11,350 | 159,023 | 170,373 | 1.00 | 32.54 | 33.54 | 11,350 | 215,610 | 226,960 |
| 632.4 | METAL WORK | 1 | 15 | 16 | 23,204 | 265,140 | 288,344 | 1.00 | 18.00 | 19.00 | 23,204 | 318,168 | 341,372 |
| 632.5 | PAINT | 1 | 13 | 14 | 15,317 | 154,765 | 170,082 | 1.00 | 14.92 | 15.92 | 15,317 | 177,623 | 192,940 |
| 633.1 | CH ROAD & RR BR | 1 | 1 | 2 | 31,654 | 8,761 | 40,415 | 1.00 | 1.00 | 2.00 | 31,654 | 8,761 | 40,415 |
| 633.21 | PAVE MAINT | 3 | 29 | 32 | 50,190 | 331,760 | 381,950 | 3.25 | 32.59 | 35.84 | 54,373 | 372,830 | 427,203 |
| 633.4 | ENGR ORG MAINT | 2 | 23 | 25 | 30,990 | 281,566 | 312,556 | 3.00 | 27.88 | 30.88 | 46,485 | 341,307 | 387,792 |
| 634.1 | CH LAND MGMT BR | 2 | 0 | 2 | 42,372 | 0 | 42,372 | 1.00 | 0.00 | 1.00 | 21,186 | 0 | 21,186 |
| 634.21,22 | GROUNDS MAINT | 1 | 37 | 38 | 11,328 | 247,678 | 259,006 | 1.00 | 54.38 | 55.38 | 11,328 | 364,020 | 375,348 |
| 634.5 | PEST CONTROL | 4 | 35 | 39 | 59,272 | 279,650 | 338,922 | 5.00 | 44.42 | 49.42 | 74,090 | 354,916 | 429,006 |
| 651 | CH UTIL DIV | 1 | 2 | 3 | 35,819 | 20,452 | 56,271 | 0.83 | 2.00 | 2.83 | 29,730 | 20,452 | 50,182 |
| 652.21,22 | CH REFRIG & A/C BR | 1 | 1 | 2 | 30,550 | 7,159 | 37,709 | 1.00 | 1.00 | 2.00 | 30,550 | 7,159 | 37,709 |
| 652.21,22 | REFRIG & AC OP/MNT | 2 | 49 | 51 | 44,157 | 770,772 | 814,929 | 2.00 | 50.25 | 52.25 | 44,157 | 790,435 | 834,592 |
| 652.22A | KITCHEN EQUIP MAINT | 2 | 17 | 19 | 36,152 | 291,210 | 327,362 | 2.00 | 17.00 | 19.00 | 36,152 | 291,210 | 327,362 |
| 652,53.1 | MECH & SANITATION BR | 1 | 0 | 1 | 33,052 | 0 | 33,052 | 1.00 | 0.00 | 1.00 | 33,052 | 0 | 33,052 |
| 652.3,4,5 | BLR, HTG, &PLUMB | 2 | 41 | 43 | 28,833 | 212,680 | 241,513 | 2.00 | 43.29 | 45.29 | 28,833 | 224,560 | 253,393 |
| 654.2,3,4 | WATER & SEWER | 1 | 15 | 16 | 16,986 | 238,634 | 255,620 | 1.00 | 13.83 | 14.83 | 16,986 | 220,021 | 237,007 |
| 653.1 | CH ELEC BR | 1 | 1 | 2 | 31,666 | 8,153 | 39,819 | 1.00 | 1.00 | 2.00 | 31,666 | 8,153 | 39,819 |
| 653.2 | EXTERIOR ELEC | 1 | 18 | 19 | 23,987 | 298,224 | 322,211 | 1.00 | 16.42 | 17.42 | 23,987 | 272,047 | 296,034 |
| 653.3 | INTERIOR ELEC | 1 | 26 | 27 | 22,017 | 442,026 | 464,043 | 1.00 | 29.00 | 30.00 | 22,017 | 493,029 | 515,046 |
| 654.3A | INSTRUMENT REPAIR | 1 | 2 | 3 | 0 | 41,506 | 41,506 | 0.00 | 2.75 | 2.75 | 0 | 57,071 | 57,071 |
| | | 57 | 511 | 568 | 1,173,627 | 6,212,629 | 7,386,257 | 57.83 | 577.08 | 634.91 | 1,197,582 | 6,863,755 | 8,061,337 |

Figure C-1-2

## BASE YEAR STAFFING--ARMY
## ATLANTIC SIDE

| YARDSTICK CODE | FUNCTIONAL TITLE | AUTHORIZED SUP | AUTHORIZED NSUP | AUTHORIZED TOT | --TOTAL AUTHORIZED SALARY-- SUP | NSUP | TOT | -------ON-BOARD------ SUP | NSUP | TOTAL | ------ TOTAL SALARIES------ SUP | NSUP | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 610 | OFFICE OF DFE | 1 | 0 | 1 | 25,988 | 0 | 25,988 | 1.00 | 0.00 | 1.00 | 25,988 | 0 | 25,988 |
| 611 | ADMINISTRATION | 0 | 3 | 3 | 0 | 27,759 | 27,759 | 0.00 | 2.92 | 2.92 | 0 | 27,019 | 27,019 |
| 612.3.4 | WK RECP, SCHED, EST | 1 | 9 | 10 | 27,915 | 142,695 | 170,610 | 1.00 | 6.92 | 7.92 | 27,915 | 109,717 | 137,632 |
| 623 | STORAGE | 1 | 3 | 4 | 14,409 | 22,446 | 36,855 | 0.00 | 1.95 | 1.95 | 0 | 14,590 | 14,590 |
| 641 | FIRE PROT | 0 | 1 | 1 | 0 | 20,218 | 20,218 | 0.00 | 0.50 | 0.50 | 0 | 10,109 | 10,109 |
| 632.1 | CH BLDG & STRUC BR | 1 | 1 | 2 | 22,781 | 8,235 | 31,016 | 1.00 | 1.00 | 2.00 | 22,781 | 8,235 | 31,016 |
| 632.21 | CARP, MASON, & PM | 2 | 29 | 31 | 43,506 | 324,510 | 368,016 | 2.00 | 30.00 | 32.00 | 43,506 | 335,700 | 379,206 |
| 632.32 | CUSTODIAL SVCS | 1 | 12 | 13 | 11,282 | 77,448 | 88,730 | 1.00 | 11.92 | 12.92 | 11,282 | 76,932 | 88,214 |
| 632.4 | METAL WORK | 1 | 6 | 7 | 20,327 | 105,053 | 125,380 | 0.92 | 5.83 | 6.75 | 18,701 | 102,077 | 120,778 |
| 633.1 | CH ROADS & GRNDS BR | 1 | 1 | 2 | 30,550 | 7,359 | 37,909 | 1.00 | 1.00 | 2.00 | 30,550 | 7,359 | 37,909 |
| 633.21 | PAVE MAINT | 1 | 17 | 18 | 25,840 | 170,119 | 195,959 | 1.00 | 17.85 | 18.85 | 25,840 | 178,625 | 204,465 |
| 633.4 | ENGR ORG MAINT | 2 | 10 | 12 | 24,739 | 114,470 | 139,209 | 2.83 | 11.00 | 13.83 | 35,007 | 125,917 | 160,924 |
| 634.21 | GROUNDS MAINT | 1 | 24 | 25 | 11,126 | 159,288 | 170,414 | 1.00 | 32.00 | 33.00 | 11,126 | 212,384 | 223,510 |
| 634.5 | PEST CONTROL | 3 | 29 | 32 | 31,496 | 231,362 | 262,858 | 2.58 | 33.33 | 35.91 | 27,087 | 265,907 | 292,994 |
| 651 | CH UTIL DIV | 1 | 1 | 2 | 20,816 | 8,234 | 29,050 | 1.00 | 0.83 | 1.83 | 20,816 | 6,835 | 27,651 |
| 652.21,22 | REFRIG & AC OP/MNT | 1 | 19 | 20 | 22,425 | 308,255 | 330,680 | 1.00 | 20.92 | 21.92 | 22,425 | 339,406 | 361,831 |
| 652.3,4,5 | BLR, HTG, & PLUMB | 1 | 18 | 19 | 23,204 | 303,780 | 326,984 | 1.00 | 19.83 | 20.83 | 23,204 | 334,665 | 357,869 |
| 654.2,3,4 | WATER & SEWER | 1 | 11 | 12 | 27,528 | 59,366 | 86,894 | 1.00 | 10.75 | 11.75 | 27,528 | 58,017 | 85,545 |
| 652.2 | EXTERIOR ELEC | 1 | 8 | 9 | 21,665 | 141,704 | 163,369 | 1.00 | 8.67 | 9.67 | 21,665 | 153,572 | 175,237 |
| 652.3 | INTERIOR ELEC | 0 | 14 | 14 | 0 | 242,060 | 242,060 | 0.00 | 15.92 | 15.92 | 0 | 275,257 | 275,257 |
| | | 21 | 216 | 237 | 405,598 | 2,474,366 | 2,879,964 | 21.33 | 234.14 | 255.47 | 395,421 | 2,642,323 | 3,037,744 |

Figure C-1-3

b. Workload. ESC requested the Army's shop workload data in order to determine the level of effort expended during the base year. Overhead hours (non-pipe twister hours) were also collected for each of the labor shops and estimated for each employee (2,080 hours) in the overhead functions. The following paragraphs describe the direct labor categories of work and Figures C-1-4 and C-1-5 show the reformatted Army submittals.

(1) Service orders (SOs). SOs are small jobs requiring less than 16 man-hours or $350. This category includes such tasks as leaky faucet repair, small road pothole repair, and appliance repair. The SOs account for 30 percent of the total direct man-hours with 75 percent on the Pacific and 25 percent on the Atlantic.

(2) Individual job orders (IJOs). IJOs exceed the 16 man-hour, $350 limit and are one-time, nonrecurring projects. Examples of this category are roof replacement, fire damage repair, complete facility painting, and minor construction. Generally, detailed estimates are made, and if the workload exceeds in-house capabilities, IJOs are contracted (e.g., the painting of a block of family housing units). The in-house percentage equals 23 percent of the Army's total direct man-hours with 38 percent and 62 percent on the Atlantic and Pacific, respectively.

(3) Standing operation orders (SOOs). SOOs are annual recurring maintenance jobs that are scheduled over a 1-year period.

## BASE YEAR MAN-HOUR EXPENDITURES--ARMY
## PACIFIC SIDE

| YARDSTICK CODE | FUNCTIONAL TITLE | SO | 1JO | SOO | TOTAL DIRECT | OVER-HEAD | TOTAL AVAIL | OVER-TIME | RECUR | NONREC |
|---|---|---|---|---|---|---|---|---|---|---|
| 610 | OFFICE OF DFE | 0 | 0 | 0 | 0 | 15,080 | 15,080 | 0 | 0 | 0 |
| 611 | ADMINISTRATION | 0 | 0 | 0 | 0 | 12,313 | 12,313 | 0 | 0 | 0 |
| 612.1 | CH, ERMD | 0 | 0 | 0 | 0 | 5,886 | 5,886 | 0 | 0 | 0 |
| 612.2 | PROG/BUDG,ACCT,STAT | 0 | 0 | 0 | 0 | 16,120 | 16,120 | 0 | 0 | 0 |
| 612.3.4 | WK RECP, SCHED, EST | 0 | 0 | 0 | 0 | 48,360 | 48,360 | 0 | 0 | 0 |
| 612.5,6 | IND ENGR, REAL PROP | 0 | 0 | 0 | 0 | 27,726 | 27,726 | 0 | 0 | 0 |
| 613.1 | CH, EP & SD | 0 | 0 | 0 | 0 | 4,160 | 4,160 | 0 | 0 | 0 |
| 613.2 | ENGR SVCS | 0 | 0 | 0 | 0 | 58,240 | 58,240 | 0 | 0 | 0 |
| 613.3,4 | INSP, MSTR PL/PROG | 0 | 0 | 0 | 0 | 24,960 | 24,960 | 0 | 0 | 0 |
| 613.4A | ENVIRONMENTAL | 0 | 0 | 0 | 0 | 6,760 | 6,760 | 0 | 0 | 0 |
| 621 | CH, SUP & STOR | 0 | 0 | 0 | 0 | 4,160 | 4,160 | 0 | 0 | 0 |
| 622 | PROP CONTRL | 0 | 0 | 0 | 0 | 19,760 | 19,760 | 0 | 0 | 0 |
| 623 | STORAGE | 0 | 0 | 0 | 0 | 19,926 | 19,926 | 0 | 0 | 0 |
| 641 | FIRE PROT | 0 | 0 | 0 | 0 | 5,200 | 5,200 | 0 | 0 | 0 |
| 631 | CH BLDG & GRNDS DIV | 0 | 0 | 0 | 0 | 6,240 | 6,240 | 0 | 0 | 0 |
| 632.1 | CH BLDG & STRUC BR | 0 | 0 | 0 | 0 | 4,372 | 4,372 | 0 | 0 | 0 |
| 632.21,31 | CARP, MASON, & PM | 48,160 | 32,173 | 0 | 80,333 | 51,307 | 131,640 | 337 | 48,160 | 32,173 |
| 632.32 | CUSTODIAL SVCS | 0 | 0 | 59,470 | 59,470 | 12,810 | 72,280 | 8 | 59,470 | 0 |
| 632.4 | METAL WORK | 16,514 | 7,115 | 0 | 23,629 | 13,798 | 37,427 | 147 | 16,514 | 7,115 |
| 632.5 | PAINT | 6,585 | 14,714 | 0 | 21,299 | 10,533 | 31,832 | 0 | 6,585 | 14,714 |
| 633.1 | CH ROAD & RR BR | 0 | 0 | 0 | 0 | 4,176 | 4,176 | 0 | 0 | 0 |
| 633.21 | PAVE MAINT | 9,159 | 31,180 | 5,620 | 45,959 | 24,015 | 69,974 | 82 | 14,779 | 31,180 |
| 633.4 | ENGR ORG MAINT | 618 | 101 | 39,992 | 40,711 | 17,947 | 58,658 | 42 | 40,610 | 101 |
| 634.1 | CH LAND MGMT BR | 0 | 0 | 0 | 0 | 2,088 | 2,088 | 0 | 0 | 0 |
| 634.21,22 | GROUNDS MAINT | 435 | 4,918 | 73,787 | 79,140 | 26,116 | 105,256 | 0 | 74,222 | 4,918 |
| 634.5 | PEST CONTROL | 14,413 | 306 | 53,209 | 67,928 | 34,687 | 102,615 | 5 | 67,622 | 306 |
| 651 | CH UTIL DIV | 0 | 0 | 0 | 0 | 5,886 | 5,886 | 0 | 0 | 0 |
| 652.21,22 | CH REFRIG & A/C BR | 0 | 0 | 0 | 0 | 4,160 | 4,160 | 0 | 0 | 0 |
| 652.21,22 | REFRIG & AC OP/MNT | 7,274 | 6,248 | 69,759 | 83,281 | 27,226 | 110,507 | 475 | 77,033 | 6,248 |
| 652.22A | KITCHEN EQUIP MAINT | 20,496 | 5,708 | 1,894 | 28,098 | 10,769 | 38,867 | 38 | 22,390 | 5,708 |
| 652,53.1 | MECH & SANITATION BR | 0 | 0 | 0 | 0 | 2,082 | 2,082 | 0 | 0 | 0 |
| 652.3,4,5 | BLR, HTG, &PLUMB | 44,452 | 8,293 | 14,262 | 67,007 | 25,097 | 92,104 | 766 | 58,714 | 8,293 |
| 654.2,3,4 | WATER & SEWER | 6,294 | 7,740 | 8,601 | 22,635 | 10,803 | 33,438 | 158 | 14,895 | 7,740 |
| 653.1 | CH ELEC BR | 0 | 0 | 0 | 0 | 4,162 | 4,162 | 0 | 0 | 0 |
| 653.2 | EXTERIOR ELEC | 13,593 | 11,432 | 440 | 25,465 | 10,698 | 36,163 | 803 | 14,033 | 11,432 |
| 653.3 | INTERIOR ELEC | 31,625 | 8,180 | 642 | 40,447 | 26,545 | 66,992 | 0 | 32,267 | 8,180 |
| | TOTALS | 219,618 | 138,108 | 327,676 | 685,402 | 604,169 | 1,289,571 | 2,861 | 547,294 | 138,108 |

Figure C-1-4

## BASE YEAR MAN-HOUR EXPENDITURES--ARMY
## ATLANTIC SIDE

| YARDSTICK CODE | FUNCTIONAL TITLE | SO | IJO | SOO | TOTAL DIRECT | OVER-HEAD | TOTAL AVAIL | OVER-TIME | RECUR | NONREC |
|---|---|---|---|---|---|---|---|---|---|---|
| 610 | OFFICE OF DFE | 0 | 0 | 0 | 0 | 2,080 | 2,080 | 0 | 0 | 0 |
| 611 | ADMINISTRATION | 0 | 0 | 0 | 0 | 6,073 | 6,073 | 0 | 0 | 0 |
| 612.3.4 | WK RECP, SCHED, EST | 0 | 0 | 0 | 0 | 16,473 | 16,473 | 0 | 0 | 0 |
| 622 | PROP CONTRL | 0 | 0 | 0 | 0 | 4,160 | 4,160 | 0 | 0 | 0 |
| 623 | STORAGE | 0 | 0 | 0 | 0 | 3,806 | 3,806 | 0 | 0 | 0 |
| 641 | FIRE PROT | 0 | 0 | 0 | 0 | 1,040 | 1,040 | 0 | 0 | 0 |
| 632.1 | CH BLDG & STRUC BR | 0 | 0 | 0 | 0 | 4,160 | 4,160 | 0 | 0 | 0 |
| 632.21 | CARP, MASON, & PM | 15,247 | 19,684 | 0 | 34,931 | 27,496 | 62,427 | 130 | 15,247 | 19,684 |
| 632.32 | CUSTODIAL SVCS | 0 | 0 | 19,070 | 19,070 | 8,410 | 27,480 | 0 | 19,070 | 0 |
| 632.4 | METAL WORK | 5,706 | 2,152 | 0 | 7,858 | 6,564 | 14,422 | 62 | 5,706 | 2,152 |
| 633.1 | CH ROADS & GRNDS BR | 0 | 0 | 0 | 0 | 4,177 | 4,177 | 0 | 0 | 0 |
| 633.21 | PAVE MAINT | 2,218 | 22,110 | 2,558 | 26,886 | 19,762 | 46,648 | 0 | 4,776 | 22,110 |
| 633.4 | ENGR ORG MAINT | 811 | 552 | 15,747 | 17,110 | 13,898 | 31,008 | 34 | 16,558 | 552 |
| 634.21 | GROUNDS MAINT | 781 | 5,710 | 33,899 | 40,390 | 21,930 | 62,320 | 0 | 34,680 | 5,710 |
| 634.5 | PEST CONTROL | 5,141 | 538 | 45,388 | 51,067 | 25,607 | 76,674 | 0 | 50,529 | 538 |
| 651 | CH UTIL DIV | 0 | 0 | 0 | 0 | 3,806 | 3,806 | 0 | 0 | 0 |
| 652.21,22 | REFRIG & AC OP/MNT | 9,055 | 16,307 | 385 | 25,747 | 14,758 | 40,505 | 185 | 9,440 | 16,307 |
| 652.3,4,5 | BLR, HTG, & PLUMB | 15,836 | 6,038 | 3,862 | 25,736 | 17,316 | 43,052 | 23 | 19,698 | 6,038 |
| 654.2,3,4 | WATER & SEWER | 4,077 | 1,782 | 9,429 | 15,288 | 8,957 | 24,245 | 245 | 13,506 | 1,782 |
| 652.2 | EXTERIOR ELEC | 2,859 | 4,850 | 2,050 | 9,759 | 8,974 | 18,733 | 413 | 4,909 | 4,850 |
| 652.3 | INTERIOR ELEC | 12,356 | 6,319 | 0 | 18,675 | 14,317 | 32,992 | 32 | 12,356 | 6,319 |
| | TOTALS | 74,087 | 86,042 | 132,388 | 292,517 | 233,765 | 526,282 | 1,124 | 206,475 | 86,042 |

Figure C-1-5

Included in this category are cold storage plant maintenance and operation, entomology services, and building preventive maintenance. Collectively, the total SOO workload accounts for 47 percent of all direct man-hours with the Atlantic and Pacific contributing 29 percent and 71 percent, respectively.

c. Data submission. The Army's data submittal contained all the information requested. Due to reporting procedures, it was impossible to split the Pacific workload between the east and west sides of the Canal. Therefore, ESC used other estimating techniques to describe geographical differences. (The procedures used are introduced in Annex C and more fully described in Annex H.)

5. Air Force CMO. The Base Civil Engineer (BCE) is charged with the RPM responsibility in the US Air Force. The following paragraphs present the Air Force's CMO.

a. Organization. The BCE is located at Howard Air Force Base on the Pacific West side of the Panama Canal. Albrook AFB, on the Pacific East, has an area office for work reception and a small labor shop with limited supply shop stock. Figure C-1-6 shows the organizational structure. Family housing and fire protection are two functions performed by the Air Force that are not in the Army FE operation. This study, therefore, leaves the fire crash rescue mission with the Air Force, and addresses family housing as a separate consolidation issue.

# BCE ORGANIZATION CHART FOR 24th COMPOSITE WING

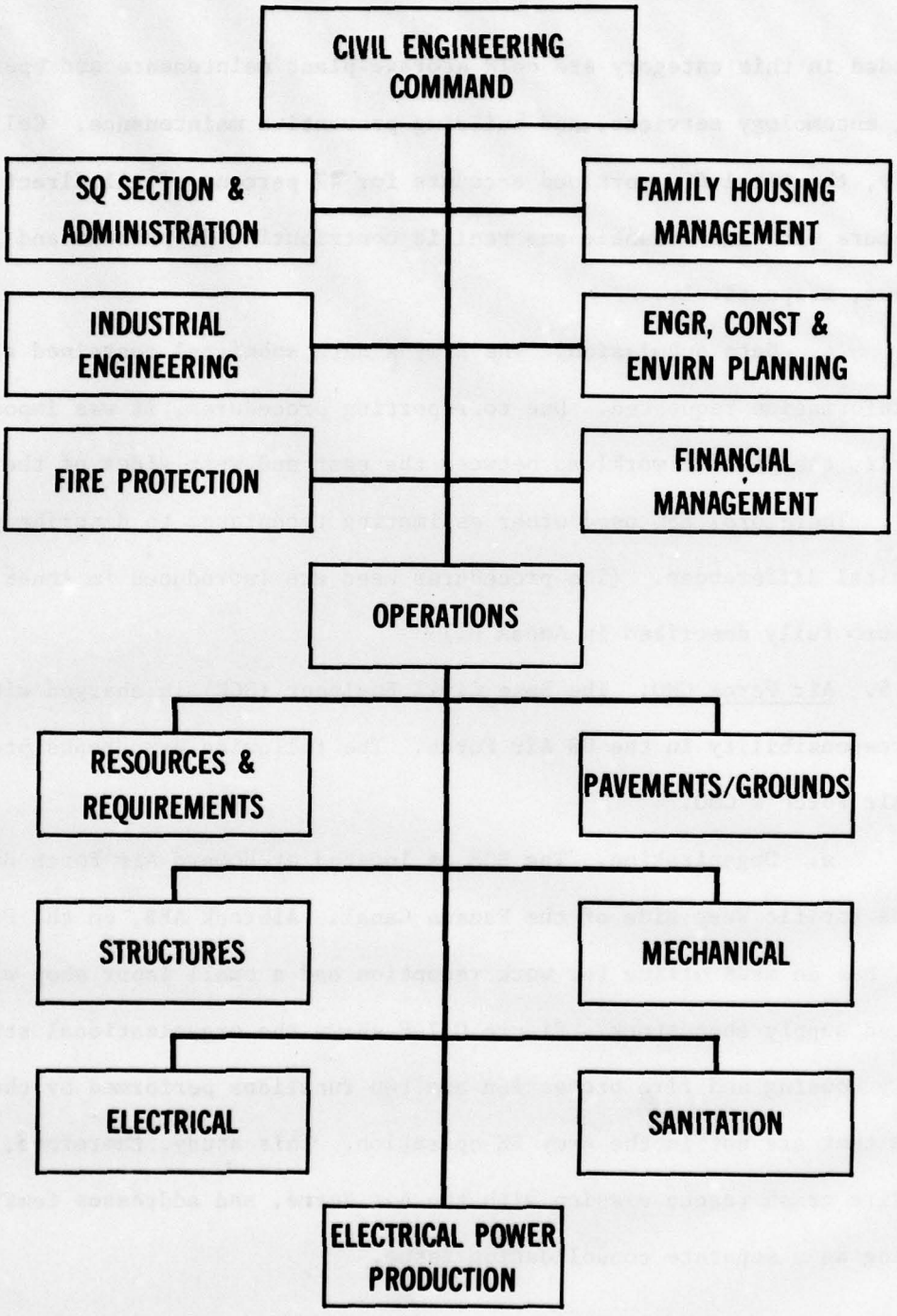


Figure C-1-6

b. Workload. The Air Force charges its man-hours by Labor Utilization Codes (LUC). These LUCs are totaled in the appropriate Responsibility Center/Cost Center (RC/CC). These data are recorded through the Base Engineer Automated Management System (BEAMS) and are readily available and relatable to the FE system. The Air Force submitted the data elements as shown in Figure C-1-7 and also in groupings by shop functions so that direct comparisons were possible. The LUC combinations appear in Figure C-1-8. Figure C-1-9 shows the Air Force input that ESC reformatted to reflect current Army operations and Figure C-1-10 shows base year personnel strength and salary data.

AIR FORCE LABOR UTILIZATION CODES

| |
|---|
| LUC 11--Equipment Maintenance |
| LUC 12--Unit Service Calls |
| LUC 13--MC Job Orders |
| LUC 14--Other Job Orders |
| LUC 15--MC Work Orders |
| LUC 16--Direct Schedule |
| LUC 18--Other Work Orders |
| LUC 19--Direct Operations |
| Total Direct Man-hours |
| LUC 22--Donated Self-help |
| Total Indirect (Overhead) |
| Total Hours |

Figure C-1-7

ARMY-AIR FORCE WORK ORDER COMPARISON

| Army | Air Force LUC |
|---|---|
| SO | 12 & 16 |
| IJO | 13,14,15,&18 |
| SOO | 11 & 19 |

Figure C-1-8

## BASE YEAR MAN-HOUR EXPENDITURES--AIR FORCE

| YARDSTICK CODE | FUNCTIONAL TITLE | SO | 1JO | SOO | TOTAL DIRECT | OVER-HEAD | TOTAL AVAIL | OVER-TIME | RECUR | NONREC |
|---|---|---|---|---|---|---|---|---|---|---|
| 610 | OFFICE OF DFE | 0 | 0 | 0 | 0 | 6,240 | 6,240 | 0 | 0 | 0 |
| 611 | ADMINISTRATION | 0 | 0 | 0 | 0 | 16,640 | 16,640 | 0 | 0 | 0 |
| 612.1 | CH, ERMD | 0 | 0 | 0 | 0 | 4,160 | 4,160 | 0 | 0 | 0 |
| 612.2 | PROG/BUDG,ACCT,STAT | 0 | 0 | 0 | 0 | 10,400 | 10,400 | 0 | 0 | 0 |
| 612.3.4 | WK RECP, SCHED, EST | 0 | 0 | 0 | 0 | 58,240 | 58,240 | 0 | 0 | 0 |
| 612.5,6 | IND ENGR, REAL PROP | 0 | 0 | 0 | 0 | 16,640 | 16,640 | 0 | 0 | 0 |
| 613.1 | CH, EP & SD | 0 | 0 | 0 | 0 | 8,320 | 8,320 | 0 | 0 | 0 |
| 613.2 | ENGR SVCS | 0 | 0 | 0 | 0 | 33,280 | 33,280 | 0 | 0 | 0 |
| 613.3,4 | INSP, MSTR PL/PROG | 0 | 0 | 0 | 0 | 24,960 | 24,960 | 0 | 0 | 0 |
| 613.4A | ENVIRONMENTAL | 0 | 0 | 0 | 0 | 2,080 | 2,080 | 0 | 0 | 0 |
| 621 | CH, SUP & STOR | 0 | 0 | 0 | 0 | 2,080 | 2,080 | 0 | 0 | 0 |
| 622 | PROP CONTRL | 0 | 0 | 0 | 0 | 10,400 | 10,400 | 0 | 0 | 0 |
| 623 | STORAGE | 0 | 0 | 0 | 0 | 8,320 | 8,320 | 0 | 0 | 0 |
| 641 | FIRE PROT | 0 | 0 | 0 | 0 | 106,080 | 106,080 | 0 | 0 | 0 |
| 631 | CH BLDG & GRNDS DIV | 0 | 0 | 0 | 0 | 8,320 | 8,320 | 0 | 0 | 0 |
| 632.1 | CH BLDG & STRUC BR | 0 | 0 | 0 | 0 | 8,230 | 8,230 | 0 | 0 | 0 |
| 632.21 | CARP, MASON, & PM | 23,718 | 20,888 | 143 | 44,749 | 20,056 | 64,806 | 208 | 23,861 | 20,888 |
| 632.4 | METAL WORK | 7,549 | 3,223 | 1,091 | 11,865 | 5,702 | 17,568 | 40 | 8,641 | 3,223 |
| 632.5 | PAINT | 6,569 | 7,821 | 356 | 14,747 | 6,320 | 21,067 | 208 | 6,926 | 7,821 |
| 633.1 | CH ROAD & RR BR | 0 | 0 | 0 | 0 | 4,160 | 4,160 | 0 | 0 | 0 |
| 633.21 | PAVE MAINT | 17,866 | 8,522 | 7,912 | 34,301 | 14,329 | 48,630 | 62 | 25,778 | 8,522 |
| 634.21,22 | GROUNDS MAINT | 6,734 | 4,053 | 76,558 | 87,346 | 29,636 | 116,982 | 36 | 83,293 | 4,053 |
| 634.5 | PEST CONTROL | 3,140 | 3 | 3,455 | 6,599 | 2,723 | 9,322 | 3 | 6,596 | 3 |
| 652.22,21 | REFRIG & AC OP/MNT | 20,088 | 1,889 | 30,398 | 52,377 | 18,624 | 71,001 | 26 | 50,487 | 1,889 |
| 652,53.1 | MECH & SANITATION BR | 0 | 0 | 0 | 0 | 6,240 | 6,240 | 0 | 0 | 0 |
| 652.3,4,5 | BLR, HTG, & PLUMB | 23,103 | 2,742 | 908 | 26,755 | 12,945 | 39,701 | 393 | 24,012 | 2,742 |
| 652.6 | FUEL STORE/ISSUE | 325 | 1,577 | 6,911 | 8,813 | 3,604 | 12,418 | 48 | 7,236 | 1,577 |
| 654.2,3 | WATER & SEWER | 97 | 264 | 27,658 | 28,020 | 8,159 | 36,179 | 8 | 27,755 | 264 |
| 653.1 | CH ELEC BR | 0 | 0 | 0 | 0 | 4,160 | 4,160 | 0 | 0 | 0 |
| 653.2 | EXTERIOR ELEC | 3,729 | 1,864 | 12,656 | 18,250 | 9,553 | 27,803 | 261 | 16,386 | 1,864 |
| 653.3 | INTERIOR ELEC | 28,340 | 6,927 | 26,490 | 61,758 | 20,205 | 81,964 | 1,191 | 54,831 | 6,927 |
| | TOTALS | 141,263 | 59,777 | 194,542 | 395,583 | 490,810 | 886,394 | 2,486 | 335,805 | 59,777 |

Figure C-1-9

## BASE YEAR STAFFING--AIR FORCE

| YARDSTICK CODE | FUNCTIONAL TITLE | AUTHORIZED SUP | AUTHORIZED NSUP | AUTHORIZED TOT | --TOTAL AUTHORIZED SALARY-- SUP | NSUP | TOT | -------ON-BOARD------ SUP | NSUP | TOTAL | ------ TOTAL SALARIES------ SUP | NSUP | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 610 | OFFICE OF DFE | 2 | 1 | 3 | 69,296 | 14,607 | 83,903 | 2.00 | 1.00 | 3.00 | 69,296 | 14,607 | 83,903 |
| 611 | ADMINISTRATION | 3 | 5 | 8 | 42,507 | 58,010 | 100,517 | 3.00 | 6.00 | 9.00 | 42,507 | 69,613 | 112,120 |
| 612.1 | CH, ERMD | 1 | 1 | 2 | 22,778 | 7,804 | 30,582 | 1.00 | 1.00 | 2.00 | 22,778 | 7,804 | 30,582 |
| 612.2 | PROG/BUDG,ACCT,STAT | 1 | 3 | 4 | 10,695 | 23,111 | 33,806 | 1.00 | 5.00 | 6.00 | 10,695 | 38,519 | 49,214 |
| 612.3.4 | WK RECP, SCHED, EST | 4 | 23 | 27 | 83,428 | 349,280 | 432,708 | 4.00 | 24.00 | 28.00 | 83,428 | 364,467 | 447,895 |
| 612.5,6 | IND ENGR, REAL PROP | 2 | 6 | 8 | 37,899 | 58,767 | 96,666 | 2.00 | 6.00 | 8.00 | 37,899 | 58,767 | 96,666 |
| 613.1 | CH, EP & SD | 1 | 3 | 4 | 36,866 | 58,653 | 95,519 | 1.00 | 2.00 | 3.00 | 36,866 | 39,102 | 75,968 |
| 613.2 | ENGR SVCS | 2 | 14 | 16 | 33,446 | 265,708 | 299,154 | 2.00 | 14.00 | 16.00 | 33,446 | 265,708 | 299,154 |
| 613.3,4 | INSP, MSTR PL/PROG | 2 | 9 | 11 | 47,033 | 179,666 | 226,699 | 2.00 | 10.00 | 12.00 | 47,033 | 199,629 | 246,662 |
| 613.4A | ENVIRONMENTAL | 0 | 1 | 1 | 0 | 0 | 0 | 0.00 | 1.00 | 1.00 | 0 | 0 | 0 |
| 621 | CH, SUP & STOR | 1 | 0 | 1 | 11,453 | 0 | 11,453 | 1.00 | 0.00 | 1.00 | 11,453 | 0 | 11,453 |
| 622 | PROP CONTRL | 0 | 5 | 5 | 0 | 48,942 | 48,942 | 0.00 | 5.00 | 5.00 | 0 | 48,942 | 48,942 |
| 623 | STORAGE | 0 | 4 | 4 | 0 | 48,201 | 48,201 | 0.00 | 4.00 | 4.00 | 0 | 48,201 | 48,201 |
| 641 | FIRE PROT | 4 | 48 | 52 | 49,748 | 452,317 | 502,065 | 4.00 | 47.00 | 51.00 | 49,748 | 442,894 | 492,642 |
| 631 | CH BLDG & GRNDS DIV | 2 | 2 | 4 | 59,443 | 38,313 | 97,756 | 2.00 | 2.00 | 4.00 | 59,443 | 38,313 | 97,756 |
| 632.1 | CH BLDG & STRUC BR | 2 | 2 | 4 | 49,238 | 11,366 | 60,604 | 2.00 | 2.00 | 4.00 | 49,238 | 11,366 | 60,604 |
| 632.21 | CARP, MASON, & PM | 4 | 56 | 60 | 60,532 | 559,655 | 620,187 | 5.00 | 57.00 | 62.00 | 75,666 | 569,649 | 645,315 |
| 632.4 | METAL WORK | 1 | 9 | 10 | 14,350 | 143,178 | 157,528 | 1.00 | 9.00 | 10.00 | 14,350 | 143,178 | 157,528 |
| 632.5 | PAINT | 1 | 12 | 13 | 16,936 | 152,175 | 169,111 | 1.00 | 11.00 | 12.00 | 16,936 | 139,494 | 156,430 |
| 633.1 | CH ROAD & RR BR | 1 | 1 | 2 | 15,608 | 13,358 | 28,966 | 1.00 | 1.00 | 2.00 | 15,608 | 13,358 | 28,966 |
| 633.21 | PAVE MAINT | 3 | 23 | 26 | 42,105 | 195,717 | 237,822 | 3.00 | 28.00 | 31.00 | 42,105 | 238,265 | 280,370 |
| 634.21,22 | GROUNDS MAINT | 3 | 39 | 42 | 40,185 | 312,234 | 352,419 | 4.00 | 59.00 | 63.00 | 53,580 | 472,355 | 525,935 |
| 634.5 | PEST CONTROL | 1 | 5 | 6 | 10,227 | 23,882 | 34,109 | 1.00 | 5.00 | 6.00 | 10,227 | 23,882 | 34,109 |
| 652.22,21 | REFRIG & AC OP/MNT | 2 | 34 | 36 | 36,355 | 463,279 | 499,634 | 2.00 | 34.00 | 36.00 | 36,355 | 463,279 | 499,634 |
| 652,53.1 | MECH & SANITATION BR | 2 | 1 | 3 | 51,265 | 25,358 | 76,623 | 2.00 | 1.00 | 3.00 | 51,265 | 25,358 | 76,623 |
| 652.3,4,5 | BLR, HTG, & PLUMB | 2 | 15 | 17 | 21,663 | 279,679 | 301,342 | 2.00 | 14.00 | 16.00 | 21,663 | 261,034 | 282,697 |
| 652.6 | FUEL STORE/ISSUE | 1 | 6 | 7 | 11,161 | 87,072 | 98,233 | 1.00 | 6.00 | 7.00 | 11,161 | 87,072 | 98,233 |
| 654.2,3 | WATER & SEWER | 3 | 15 | 18 | 31,120 | 180,758 | 211,879 | 4.00 | 14.00 | 18.00 | 41,494 | 168,708 | 210,202 |
| 653.1 | CH ELEC BR | 1 | 1 | 2 | 18,091 | 13,894 | 31,985 | 1.00 | 1.00 | 2.00 | 18,091 | 13,894 | 31,985 |
| 653.2 | EXTERIOR ELEC | 2 | 13 | 15 | 29,044 | 199,524 | 228,568 | 2.00 | 13.00 | 15.00 | 29,044 | 199,524 | 228,568 |
| 653.3 | INTERIOR ELEC | 5 | 42 | 47 | 85,793 | 534,823 | 620,616 | 5.00 | 42.00 | 47.00 | 85,793 | 534,823 | 620,616 |
| | | 59 | 399 | 458 | 1,038,266 | 4,799,336 | 5,837,602 | 62.00 | 425.00 | 487.00 | 1,077,168 | 5,001,805 | 6,078,973 |

Figure C-1-10

c. Data submission. The Air Force data provided a complete, comprehensive description of their CMO. Two minor discrepancies were noted, however, and are discussed below.

(1) Manpower. Two sets of data are interrelated--average on-board manpower strengths and base year salary data. The average on-board strength was 30 September 1978 data because no computer listings from previous months or other historical data were available. This 1-month snapshot of manning was not sufficient to determine a yearly, average, on-board strength. The Air Force computed salary data by using actual costs from the RC/CC and the same 30 September 1978 personnel computer listing. The personnel strength reflected in the salary submittal was 21 positions greater than the previous listing. Additionally, the military pay levels were reported at 94.5 percent of the 30 September 1978 listing to account for the pay raise that went into effect after the base year data cutoff.

(2) Equipment. ESC requested equipment data to determine savings in a consolidated organization. The data included the equipment nomenclature, shop assignment, date purchased, acquisition cost, hours available, and hours used. According to the Air Force submission, the Air Force no longer uses Form 1447 and, therefore, could not submit "unknown" data.

d. Special considerations. The Air Force has several functions that are not included in the Army Staffing Guide[1/] for FE activities.

(1) A military family housing shop provides maintenance for all Air Force housing. Because Army yardstick codes do not identify family housing maintenance as a single activity, this Air Force function was therefore prorated by ESC among the carpentry, electrical, and plumbing shops.

(2) The Air Force dedicates a special shop to golf course maintenance. Because the Army Staffing Guide does not identify that activity by a special yardstick, that manpower was simply added to grounds maintenance.

(3) The Air Force includes enlisted personnel in its BCE shops. These personnel perform the same work as their civilian counterparts and are included in authorized manning documents. The military are required to provide rapid response for maintaining essential base operations during emergency conditions. This study, therefore, treated them as an integral part of the organization under all consolidation alternatives.

6. Navy CMO. The Public Works Department (PWD) performs the US Navy's RPM. The Naval forces in Panama report to several separate commands. The operations of each PWD are presented as follows.

---

1/ DA, HQ, DA PAM 570-551, Staffing Guide for US Army Garrisons. Hereafter referrred to as Army Staffing Guide.

a. Organization. The PWD, US Naval Station is the lead public works activity in Panama and provides support over and above the capabilities of other Naval units in the area. It is located at Rodman Naval Station on the Pacific West. All three services and the Panama Canal Company (PCC) provide RPM and other related functions to the Naval Communications Station on the Pacific and the Security Group at Galeta Island on the Atlantic. Figures C-1-11 and C-1-12 are organization charts for each Naval unit. The Naval Station is the only Naval activity performing RPM functions as the Army usually defines RPMA; however, ESC recognized the broader Naval RPM definition and how it relates to overall mission accomplishment. Both the Communication Station and the Security Group maintain antenna networks for communications and other related functions for all DOD agencies in Panama. The unique nature of this maintenance plus the phasing out of the Naval Communications Station in 1982 prompted ESC to exclude these Naval units from consolidation consideration.

b. Work procedures. The Navy charges its man-hours by Labor Class Codes (LCCs) to the work center performing the work. Figure C-1-13 shows the LCCs and Figure C-1-14 shows the LCC-Army work order relationships.

(1) The Navy's emergency work center (LCC 02) is staffed with personnel from several functional disciplines. This team, therefore, is manned to perform any and all emergency work. If the estimated

# PWD ORGANIZATION CHART FOR US NAVAL STATION

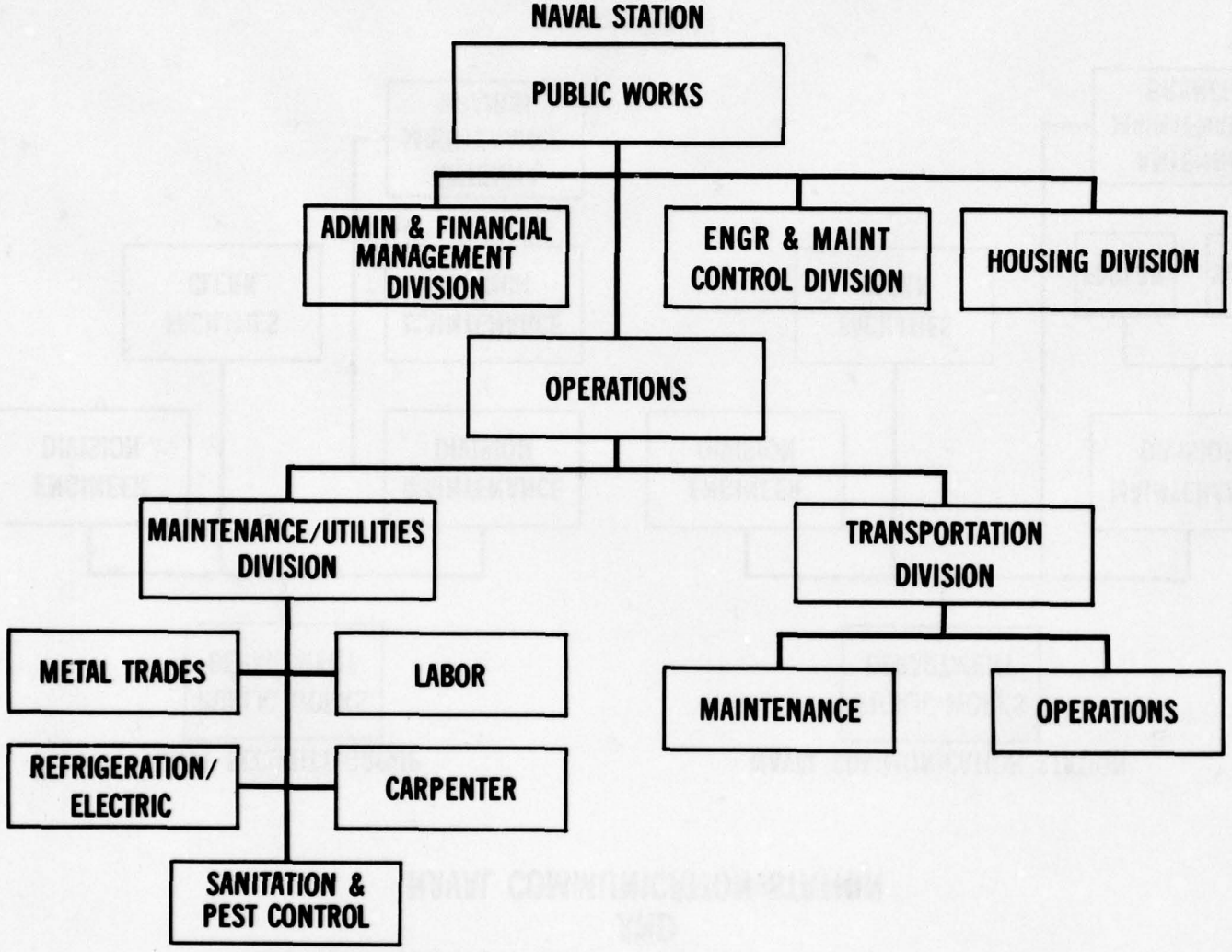


Figure C-1-11

# PWD ORGANIZATION CHART FOR NAVAL SECURITY GROUP AND NAVAL COMMUNICATION STATION

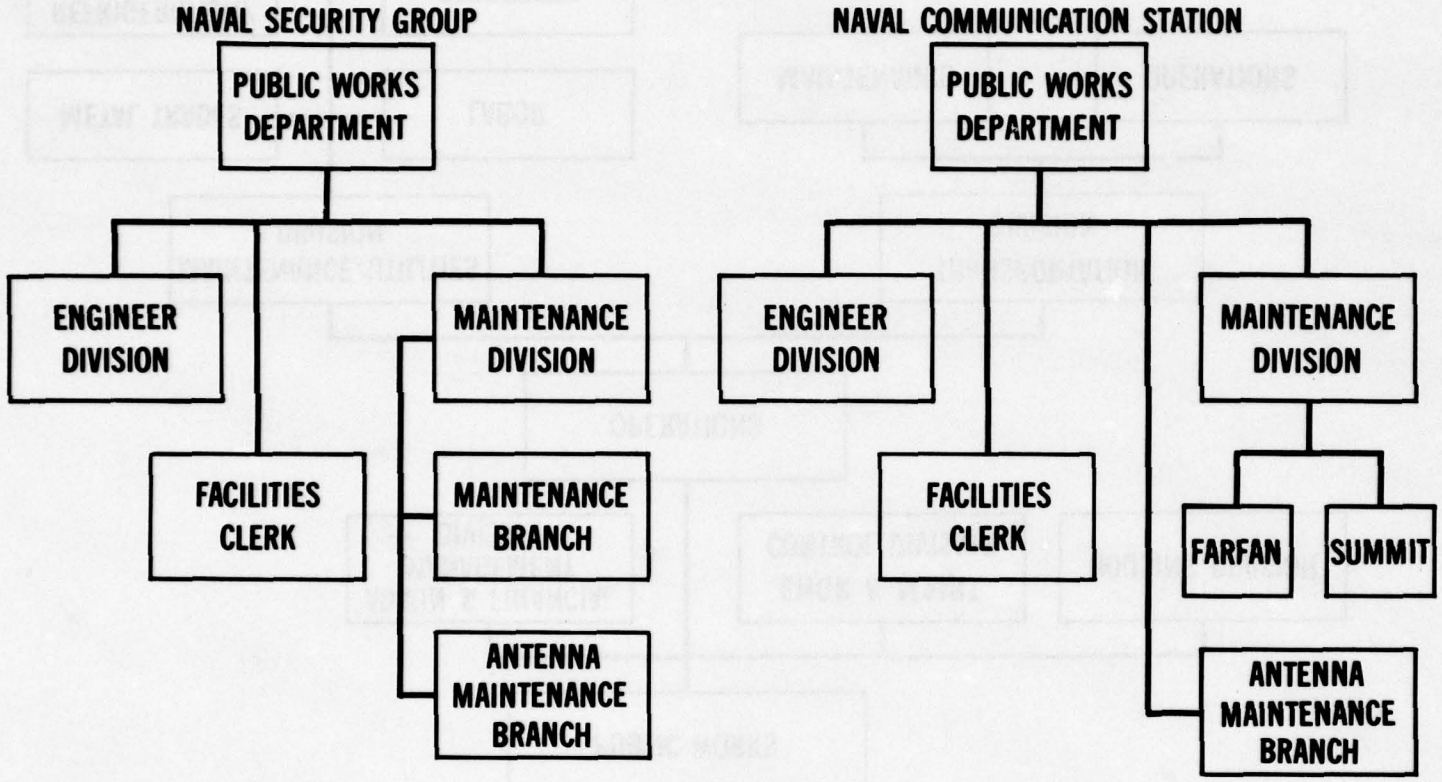


Figure C-1-12

NAVY LABOR CLASS CODES

| | |
|---|---|
| **Productive** | |
| 01 | Service Work |
| 02 | Emergency Work |
| 03 | Preventive Maintenance Inspection |
| 04 | Standing Job Orders--Not Estimated |
| 05 | Standing Job Orders--Estimated |
| 06 | Minor Work Authorization |
| 07 | Specific Job Orders |
| **Overhead** | |
| 40 | Rework |
| 41 | Supervision |
| 42 | Shop Indirect |
| 43 | Allowed Time |
| 44 | General Office and Clerical |
| 45 | Leave |

Figure C-1-13

ARMY-NAVY WORK ORDER COMPARISON

| Army | Navy LCC |
|---|---|
| SO | 1 & 2 |
| IJO | 6, 7, & 40 |
| SOO | 3, 4, & 5 |

Figure C-1-14

completion time exceeds 2 man-days, the emergency first is relieved and then it is assigned to another work center for completion. The man-hours, however, are charged to LCC 02. This contrasts with the Army operation in that emergency personnel from different functional shops are on call to perform emergency work and the resulting man-hours are charged as either an SO or IJO.

(2) In the past, the Navy reduced its RPMA work force as the result of consolidation actions and increased reliance on Inter-service Support Agreements (ISSAs). The Navy regards its current work force as "lean and mean."[2/] It believes that it has achieved practical economy through dependence on generalist rather than on specialist teams. For example, Navy electricians (generalists) perform all related electrical work in contrast to the Army's more specialized approach. (The Army operates an "interior electrical shop" and an "exterior electrical shop.") Within its public works and RPMA functions, the Navy includes fuel operations (including maintenance) for all fuels received in Panama. The Navy also includes waterfront operations within the public works concept. The generalist concept when applied to work centers creates groupings of related functions that are unlike those of their sister services. The problems associated with redefining their workload data are discussed in paragraph 6c following.

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2/ DN, Atlantic Fleet, US Naval Station Panama Canal, Comments on Panama RPMA Consolidation Alternatives Review.

c. Data submission. Each Naval activity submitted data relating their CMO to the Army's FE structure. These comprehensive submissions are discussed below.

(1) The Naval Station, as mentioned earlier, divides its PWD labor force into shops with related functional skills. The plumbing shop, for example, contains workload data for eight Army yardstick codes. This necessitated proportioning the Navy and Army workload based on the ratios of real property measures. One such measure compared the Navy's linear feet of water distribution lines to the Army's to estimate the number of hours and personnel that correspond to the Army's plumbing unit. ESC submitted the results of this iteration to the Naval Station PWO for verification. Figures C-1-15 and C-1-16 show the revised estimate of Navy workload and personnel staffing.

(2) The Communication Station and Security Group are supported by ISSAs for the accomplishment of their RPM workload. Their RPMA functions are restricted to high, vertical antennas, direction finding equipment, and other communications maintenance. Figures C-1-17 through C-1-20 show the workload data and personnel staffing for each organization.

(3) Equipment. The Navy's equipment data included all general and special purpose equipment owned by the US Navy in Panama. Their submission, like the Air Force's, did not include utilization hours, but its impact was minor in the consideration of consolidation alternatives.

## BASE YEAR MAN-HOUR EXPENDITURES--NAVY

| YARDSTICK CODE | FUNCTIONAL TITLE | SU | IJO | SOU | TOTAL DIRECT | OVER-HEAD | TOTAL AVAIL | OVER-TIME | RECUR | NONREC |
|---|---|---|---|---|---|---|---|---|---|---|
| 610 | OFFICE OF DIR | 0 | 0 | 0 | 0 | 4,160 | 4,160 | 0 | 0 | 0 |
| 611 | ADMINISTRATION | 0 | 0 | 0 | 0 | 4,160 | 4,160 | 0 | 0 | 0 |
| 612.2 | PROG/BUDG,ACCT,STAT | 0 | 0 | 0 | 0 | 10,400 | 10,400 | 0 | 0 | 0 |
| 612.3.4 | WK RECP, SCHED, EST | 0 | 0 | 0 | 0 | 14,560 | 14,560 | 0 | 0 | 0 |
| 612.5,6 | IND ENGR, REAL PROP | 0 | 0 | 0 | 0 | 4,160 | 4,160 | 0 | 0 | 0 |
| 613.2 | ENGR SVCS | 0 | 0 | 0 | 0 | 4,160 | 4,160 | 0 | 0 | 0 |
| 613.3,4 | INSP, MSTR PL/PROG | 0 | 0 | 0 | 0 | 10,400 | 10,400 | 0 | 0 | 0 |
| 631 | CH BLDG & GRNDS DIV | 0 | 0 | 0 | 0 | 2,080 | 2,080 | 0 | 0 | 0 |
| 632.1 | CH BLDG & STRUC BR | 0 | 0 | 0 | 0 | 8,320 | 8,320 | 0 | 0 | 0 |
| 632.21,31 | CARP, MASON, & PM | 6,732 | 19,032 | 76 | 25,840 | 5,208 | 31,048 | 8 | 6,808 | 19,032 |
| 632.4 | METAL WORK | 3,514 | 3,451 | 1,485 | 8,450 | 1,173 | 9,623 | 8 | 4,999 | 3,451 |
| 632.5 | PAINT | 4,261 | 3,696 | 110 | 8,067 | 288 | 8,355 | 0 | 4,371 | 3,696 |
| 633.21 | PAVE MAINT | 46 | 34 | 0 | 80 | 0 | 80 | 0 | 46 | 34 |
| 634.21,22 | GROUNDS MAINT | 509 | 2,901 | 6,780 | 10,190 | 2,076 | 12,266 | 0 | 7,289 | 2,901 |
| 634.5 | PEST CONTROL | 191 | 62 | 7,277 | 7,530 | 2,078 | 9,608 | 4 | 7,468 | 62 |
| 652.22 | REFRIG & A/C MAINT | 4,285 | 1,577 | 2,735 | 8,597 | 647 | 9,244 | 8 | 7,020 | 1,577 |
| 652.3,4,5 | BLR, HTG, &PLUMB | 5,315 | 1,912 | 2,122 | 9,349 | 409 | 9,758 | 10 | 7,437 | 1,912 |
| 652.6 | FUEL STORE/ISSUE | 0 | 0 | 21,574 | 21,574 | 1,293 | 22,867 | 0 | 21,574 | 0 |
| 654.2,3,4 | WATER & SEWER | 1,391 | 343 | 1,753 | 3,487 | 134 | 3,621 | 0 | 3,144 | 343 |
| 653.2 | EXTERIOR ELEC | 1,534 | 3,810 | 2,701 | 8,045 | 1,407 | 9,452 | 75 | 4,235 | 3,810 |
| 653.3 | INTERIOR ELEC | 2,939 | 5,065 | 851 | 8,855 | 2,135 | 10,990 | 123 | 3,790 | 5,065 |
| | TOTALS | 30,717 | 41,883 | 47,464 | 120,064 | 79,248 | 199,312 | 236 | 78,181 | 41,883 |

Figure C-1-15

## BASE YEAR STAFFING--NAVY

| YARDSTICK CODE | FUNCTIONAL TITLE | AUTHORIZED SUP | AUTHORIZED NSUP | AUTHORIZED TOT | --TOTAL AUTHORIZED SALARY-- SUP | NSUP | TOT | -------ON-BOARD------ SUP | NSUP | TOTAL | ------ TOTAL SALARIES------ SUP | NSUP | TOTAL |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 610 | OFFICE OF OFE | 2 | 0 | 2 | 63,500 | 0 | 63,500 | 2.00 | 0.00 | 2.00 | 63,500 | 0 | 63,500 |
| 611 | ADMINISTRATION | 0 | 2 | 2 | 0 | 15,620 | 15,620 | 0.00 | 2.00 | 2.00 | 0 | 15,620 | 15,620 |
| 612.2 | PROG/BUDG,ACCT,STAT | 1 | 4 | 5 | 21,138 | 58,755 | 79,893 | 1.00 | 4.00 | 5.00 | 21,138 | 58,755 | 79,893 |
| 612.3.4 | WK RECP, SCHED, EST | 0 | 9 | 9 | 0 | 217,054 | 217,054 | 1.00 | 5.00 | 6.00 | 33,127 | 120,586 | 153,713 |
| 612.5,6 | IND ENGR, REAL PROP | 0 | 2 | 2 | 0 | 29,282 | 29,282 | 1.00 | 1.00 | 2.00 | 20,206 | 14,641 | 34,847 |
| 613.2 | ENGR SVCS | 0 | 3 | 3 | 0 | 75,186 | 75,186 | 0.00 | 3.00 | 3.00 | 0 | 75,186 | 75,186 |
| 613.3,4 | INSP, MSTR PL/PROG | 1 | 4 | 5 | 37,570 | 66,768 | 104,338 | 1.00 | 4.00 | 5.00 | 37,570 | 66,768 | 104,338 |
| 621 | CH, SUP & STOR | 1 | 0 | 1 | 0 | 0 | 0 | 1.00 | 0.00 | 1.00 | 0 | 0 | 0 |
| 631 | CH BLDG & GRNDS DIV | 1 | 0 | 1 | 17,100 | 0 | 17,100 | 1.00 | 0.00 | 1.00 | 17,100 | 0 | 17,100 |
| 632.1 | CH BLDG & STRUC BR | 3 | 2 | 5 | 66,468 | 28,613 | 95,081 | 3.00 | 2.00 | 5.00 | 66,469 | 28,613 | 95,082 |
| 632.21,31 | CARP, MASON, & PM | 1 | 15 | 16 | 24,568 | 162,758 | 187,326 | 1.50 | 15.00 | 16.50 | 36,853 | 162,758 | 199,611 |
| 632.4 | METAL WORK | 0 | 5 | 5 | 0 | 72,248 | 72,248 | 0.00 | 5.00 | 5.00 | 0 | 72,248 | 72,248 |
| 632.5 | PAINT | 0 | 3 | 3 | 0 | 38,190 | 38,190 | 0.00 | 3.00 | 3.00 | 0 | 38,191 | 38,191 |
| 634.21,22 | GROUNDS MAINT | 1 | 5 | 6 | 13,829 | 41,715 | 55,544 | 1.00 | 5.00 | 6.00 | 13,829 | 41,715 | 55,544 |
| 634.5 | PEST CONTROL | 1 | 5 | 6 | 28,303 | 42,537 | 70,840 | 1.00 | 5.00 | 6.00 | 28,303 | 42,537 | 70,840 |
| 652.22 | REFRIG & A/C MAINT | 0 | 6 | 6 | 0 | 80,589 | 80,589 | 0.00 | 6.00 | 6.00 | 0 | 80,589 | 80,589 |
| 652.3,4,5 | BLR, HTG, &PLUMB | 0 | 6 | 6 | 0 | 74,257 | 74,257 | 0.00 | 6.00 | 6.00 | 0 | 74,258 | 74,258 |
| 652.6 | FUEL STORE/ISSUE | 1 | 11 | 12 | 30,784 | 127,798 | 158,582 | 1.00 | 12.50 | 13.50 | 30,784 | 145,225 | 176,009 |
| 654.2,3,4 | WATER & SEWER | 0 | 2 | 2 | 0 | 27,465 | 27,465 | 0.00 | 2.00 | 2.00 | 0 | 27,465 | 27,465 |
| 653.2 | EXTERIOR ELEC | 0 | 5 | 5 | 0 | 82,123 | 82,123 | 0.50 | 5.00 | 5.50 | 14,625 | 82,123 | 96,748 |
| 653.3 | INTERIOR ELEC | 1 | 9 | 10 | 28,390 | 117,178 | 145,568 | 1.00 | 8.00 | 9.00 | 28,390 | 104,159 | 132,549 |
| | | 14 | 98 | 112 | 331,651 | 1,358,139 | 1,689,791 | 17.00 | 93.50 | 110.50 | 411,894 | 1,251,766 | 1,663,660 |

Figure C-1-16

BASE YEAR MAN-HOUR EXPENDITURES--NAVAL COMMUNICATIONS STATION

| Functional Title | | SO | IJO | SOO | Total Direct | Over-head | Total Avail | Over-time | Recur | Non-Recur |
|---|---|---|---|---|---|---|---|---|---|---|
| 610.0 | Office of DFE | 0 | 0 | 0 | 0 | 2,080 | 2,080 | 0 | 0 | 0 |
| 612.1 | Ch, ERMD | 0 | 0 | 0 | 0 | 4,160 | 4,160 | 0 | 0 | 0 |
| 612.6 | Real Property | 0 | 0 | 0 | 0 | 2,080 | 2,080 | 0 | 0 | 0 |
| 613.2 | Ch, EP & SD | 0 | 0 | 0 | 0 | 2,080 | 2,080 | 0 | 0 | 0 |
| 613.2 | Engr Svcs | 0 | 0 | 0 | 0 | 2,080 | 2,080 | 0 | 0 | 0 |
| | Ant Maint Div | 3,188 | 350 | 5,038 | 8,576 | 3,904 | 12,480 | 0 | 8,226 | 350 |
| 634.21 | Grounds | 298 | 0 | 1,400 | 1,698 | 382 | 2,080 | 0 | 1,698 | 0 |
| | Maint Div | 750 | 250 | 600 | 1,600 | 480 | 2,080 | 0 | 1,350 | 250 |
| | Engineman | 480 | 150 | 1,050 | 1,680 | 400 | 2,080 | 0 | 1,530 | 150 |
| | A/C Maint | 750 | 0 | 850 | 1,600 | 480 | 2,080 | 0 | 1,600 | 0 |
| | Elect Equip | 500 | 50 | 1,050 | 1,600 | 480 | 2,080 | 0 | 1,550 | 50 |
| | | 5,966 | 800 | 9,988 | 16,754 | 18,606 | 35,360 | 0 | 15,954 | 800 |

Figure C-1-17

BASE YEAR STAFFING--NAVAL COMMUNICATIONS STATION

| Yard-stick Code | Functional Title | Recognized | | | On-Board | | | Salary | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Sup | N Sup | Total | Sup | N Sup | Total | Sup | N Sup | Total |
| 610 | Office of DFE | 1 | 0 | 1 | 1 | 0 | 1 | 20,950 | 0 | 20,950 |
| 612.1 | Ch, ERMD | 2 | 0 | 2 | 2 | 0 | 2 | 30,408 | 0 | 30,408 |
| 612.6 | Real Property | 2 | 1 | 1 | 0 | 1 | 1 | 9,017 | 0 | 9,017 |
| 613.1 | Ch, EP & SD | 1 | 0 | 1 | 1 | 0 | 1 | 26,582 | 0 | 26,582 |
| 613.2 | Engr Svcs | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 12,833 | 12,833 |
| | Ant Maint Div | 1 | 4 | 5 | 1 | 4 | 5 | 21,050 | 59,592 | 80,642 |
| 634.4 | Grounds Maint | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 6,760 | 6,760 |
| | Maint Div | 0 | 4 | 4 | 0 | 4 | 4 | 0 | 43,133 | 43,133 |
| | Engine Man | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 11,424 | 11,424 |
| | A/C Maint | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 8,362 | 8,362 |
| | Elect Equip | 0 | 1 | 1 | 0 | 1 | 1 | 0 | 20,530 | 20,530 |
| | Total | 7 | 14 | 19 | 5 | 14 | 19 | 108,007 | 162,634 | 270,641 |

Figure C-1-18

BASE YEAR MAN-HOUR EXPENDITURES--NAVAL SECURITY GROUP

| Yard-stick Code | Functional Title | SO | IJO | SOO | Total Direct | Over-head | Total Avail | Over-Time | Recur | Non-recur |
|---|---|---|---|---|---|---|---|---|---|---|
| 610.0 | Facilities Maint Ch | 0 | 0 | 0 | 0 | 2,080 | 2,080 | 0 | 0 | 0 |
| 612.4 | Facilities Plan/Est | 0 | 0 | 0 | 0 | 2,080 | 2,080 | 0 | 0 | 0 |
| 621.0 | Supply | 0 | 0 | 0 | 0 | 4,160 | 4,160 | 0 | 0 | 0 |
| | Antenna Maint | 0 | 0 | 2,624 | 2,624 | 800 | 3,424 | 0 | 2,624 | 0 |
| 632.32 | Custodial | 0 | 0 | 0 | 0 | 3,396 | 3,396 | 0 | 0 | 0 |
| | Total | 0 | 0 | 2,624 | 2,624 | 12,516 | 15,140 | 0 | 2,624 | 0 |

Figure C-1-19

BASE YEAR STAFFING--NAVAL SECURITY GROUP

| Yard-stick Code | Functional Title | Recognized | | | On-board | | | Salary | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Sup | N Sup | Total | Sup | N Sup | Total | Sup | N Sup | Total |
| 610 | Office of DFE | 1 | 0 | 1 | 1 | 0 | 1 | 16,512 | 0 | 16,512 |
| 612.4 | Facility Plan/Est | 1 | 0 | 1 | 1 | 0 | 1 | 13,896 | 0 | 13,896 |
| 621 | Supply | 1 | 1 | 2 | 1 | 1 | 2 | 15,600 | 13,896 | 29,496 |
| | Antenna Maint | 0 | 2 | 2 | 0 | 2 | 2 | 0 | 16,602 | 16,602 |
| 632.32 | Custodial | 0 | 2 | 2 | 0 | 2 | 2 | 0 | 19,488 | 19,488 |
| | Total | 3 | 5 | 8 | 3 | 5 | 8 | 46,008 | 49,986 | 95,944 |

Figure C-1-20

d. Special considerations. The Navy has several functions that are not included in the Army's FE activity. These differences are discussed below.

(1) The military family housing management function, like the Air Force, is organic to the PWD. This study analyzes the management function as a separate entity.

(2) The Naval Station PWD supports the other naval activities for vehicular maintenance and supplies the Security Group with organic transportation. The transportation function is subject to a separate analysis of feasibility for consolidation of the maintenance and repair of all administrative-use vehicles.

(3) The Naval Station PWO must respond to two commanders. He is the lead PWO for Panama as well as the Resident Officer in Charge of Construction (ROICC) for the Atlantic Division, Naval Facilities Engineering Command. This latter mission places him in charge of all Military Construction Navy (MCN) dollars in Panama for contract/construction administration. The US Army Corps of Engineers Mobile District performs the similar functions for the Army and the Air Force.

(4) The Navy realizes that the advanced deterioration of its shore facilities threatens readiness. They maintain a rigid inspection program to identify, classify, and prioritize all real property to ensure that a dynamic maintenance program is followed. Similar programs exist in the other services but not to the same degree.

7. Data Adjustment. Some of the data received was not in a form readily usable for this study. This necessitated estimating or proportioning submitted data to achieve an equitable base to compare consolidation alternatives. The following paragraphs summarize the procedures used to adjust the submitted data.

a. Salaries. The Army and Navy submitted the total man-years and salaries expended during FY 78. The Air Force unfortunately submitted an estimated cost based on a 1-month snapshot of personnel manning. ESC produced average salaries for each of the supervisory and nonsupervisory positions in each yardstick. These computed salaries were then applied to the authorized personnel strengths to compute an adjusted cost for the CMO. This same salary was also used to cost each of the other consolidation alternatives. ESC realizes that analytically this method introduces perceptible errors, but given the volume of data and the time constraints, it was considered necessary.

b. Personnel. Personnel data for two-thirds of the RPMA work force was submitted as actual on-board strengths. Analytically, this presented severe restrictions on the true personnel strengths for base year comparisons. As with salaries, ESC opted to compare alternatives using the next best available method--authorized strengths.

c. Equipment. DOD memorandum entitled Consolidation of Real Property Maintenance Activities at Military Installations dated 8 June

1972 states that savings accrue from the pooling of high dollar, low utilization special purpose equipment. Equipment data received reflected utilization data for only one service. In order to estimate equipment excesses and therefore potential savings, ESC prorated utilization hours from Army submittals to each of the other services.

8. Data Verification. On 15 May 1979 the ESC study team briefed the RPMA consolidation alternatives to the local points of contact (POCs) and their representatives. At this briefing each RPMA manager was asked to consider several questions relevant to consolidation and to verify their data as reformatted by ESC. All three services corrected these data; however, the authorized personnel breakout by yardstick could not be validated by the Air Force. Their initial personnel submission was by Air Force functional codes (FC) with other backup data that related FCs or portions thereof to FE terminology. Air Force salary data except as noted previously was received in Army terminology. ESC, therefore, did its best to reconcile their submissions.

LAST PAGE OF APPENDIX C-1

APPENDIX C-2

SUPPORT PROVIDED TO CURRENT RPMA ORGANIZATIONS


| Paragraph | | Page |
|---|---|---|
| 1 | Purpose | C-2-1 |
| 2 | Scope | C-2-2 |
| 3 | Explanation of Installation Support to RPMA | C-2-2 |
| 4 | Reported Support for Current Method of Operation (CMO) | C-2-6 |
| 5 | Analysis of Support Manpower | C-2-7 |
| 6 | Costs | C-2-13 |
| 7 | Summary of Support Provided FE Organizations | C-2-15 |

| Figure | | |
|---|---|---|
| C-2-1 | CMO Installation Support, Estimated Man-years | C-2-8 |
| C-2-2 | Proportional Analysis of Reported Support During FY 78 | C-2-10 |
| C-2-3 | CMO Installation Support, Realizable Man-years | C-2-10 |
| C-2-4 | CMO Installation Support Ratios | C-2-12 |
| C-2-5 | CMO Installation Support, Estimated Cost Data | C-2-14 |
| C-2-6 | CMO Installation Support | C-2-16 |
| C-2-7 | Summary of Current Support Provided to RPMA Organizations | C-2-17 |


1. Purpose. This appendix presents the analysis of the support provided to the current real property maintenance activity (RPMA) organizations by the base operating support offices of the Army, Navy, and Air Force. Basic data used for the analysis were provided by the respective

services in Panama. The data supplied by the Army, Air Force, and Navy appear accurate and were submitted in a timely manner.

2. Scope. This appendix addresses the amounts of current installation support provided the RPMA in terms of man-years of effort, other costs, and total costs. FY 78 data are used in the analysis, since this period represents the latest full year for which data were available. The main offices which provided the RPMA support are the Comptroller, Adjutant General, Civilian Personnel, Supply, Procurement, Transportation, and Material Maintenance. This appendix addresses the sources of installation support listed in the preceding sentence.

3. Explanation of Installation Support to RPMA.

a. General. The Army, Air Force, and Navy generally handle installation support in a similar manner (i.e., the performance of services which are common to most activities are consolidated at the installation level). Support agencies generally perform services on an as required basis. They are funded with operation and maintenance monies and are normally not required to record the amount of effort expended for each supported directorate. The description of installation support in this section refers to the usual services provided by each supporting office and uses Army terminology.

b. Comptroller. The Comptroller provides installation financial support. Some of the financial services provided are:

(1) Budget and audit actions.

(2) Payment of compensation and travel pay to military and civilian personnel.

(3) Administration and management of financial records.

(4) Verification of and payment for goods and services received.

c. Adjutant General. The Adjutant General provides administrative services. Some of the more common services are:

(1) Military personnel.

(2) Operation of a printing plant.

(3) Serves as a distribution center for correspondence.

(4) Management and supply of required forms and publications.

d. Civilian personnel. The Civilian Personnel Office provides the civilian employees of the Army, Air Force, and Navy with the normal types of personnel office services. Some of the more common services provided are:

(1) Maintenance of personnel records.

(2) Training.

(3) Recruitment and placement.

(4) Processing of personnel actions.

(5) Employee relations.

e. Supply.

(1) Although there are some differences between the Army, Air Force, and Navy supply systems, the types of services are generally similar. The Supply Office provides support by issuing a variety of basic supplies and services such as:

(a) Operating the self-service center for office supplies, cleaning supplies, hand tools, and many others.

(b) Issuing supplies such as batteries, safety clothing, and equipment.

(c) Processes requirements for distributing heating oil for domestic hot water and heating systems (a minor function in Panama).

(2) These services and many others are provided to the Base Civil Engineer (BCE) and the Public Works Department (PWD) by the installation supply. All RPMA materials, equipment, and other supply requests/requirements are also processed through base supply. In the Army, however, 40 percent of Facilities Engineer (FE) supplies are processed through the installation while the remaining 60 percent are performed in-house.

f. Procurement. The Procurement Office handles all actions connected with government services and construction contracts (i.e., administration, issuance, and management). The Resident Officer in Charge of Construction (ROICC) administers Naval construction contracts.

g. Transportation. General purpose vehicles are vehicles which transport materials, tools, equipment, and personnel (sedans, vans, pickups, stake and platforms, etc.). Special purpose vehicles usually include welders, forklifts, riding lawnmowers, etc. The category also includes vehicles that are primarily used for construction such as tracked dozers (bulldozer), dump trucks, graders, etc. In the Army, the Director of Industrial Operations' transportation motor pool dispatches general purpose vehicles for FE use and also maintains these vehicles. However, special purpose equipment is generally owned and maintained by the FE. Unlike the FE, the BCE and PWD have no or limited capability for equipment maintenance. Some special purpose maintenance is provided by the Army through Interservice Support Agreements (ISSAs). All vehicle support to the Air Force is provided by the Base Transportation Squadron. Unlike the Army and Air Force, the PWD provides all vehicular support to Naval offices.

h. Material maintenance. The Material Maintenance Office provides support maintenance for all equipment. It provides repair/testing for:

(1) Furniture.

(2) Power tools.

(3) Canvas materials.

(4) Limited machine shop service.

(5) Hydrostatic testing of fire extinguishers and breathing apparatus.

(6) General purpose vehicles.

(7) Special purpose equipment.

i. Communications. Installation support for communications systems usually is not affected greatly by consolidation. One-time costs are incurred when a consolidation necessitates new equipment, numbers, etc. Communications personnel are responsible for ensuring proper use of the communications systems and monitoring costs.

j. Automatic data processing (ADP). The ADP Office provides computer services for the operation of automated systems. It also provides technical assistance on the proper use of automated products. The Air Force has the Base Engineer Automated Management System (BEAMS) on-line, and the Army and Navy have limited, if any, computer systems supporting RPMA.

4. Reported Support for Current Method of Operation (CMO).

a. General. Considerable differences exist in the way the Army, Air Force, and Navy record and handle installation support and in their basic organization. As an example, all of Navy's transportation is handled within the PWD while the other services use installation transportation. Despite these differences, each service was asked to estimate those portions of installation support that are providing

services in the RPMA. If support data were unavailable, as was the case for Naval transportation, ESC estimated the man-years of support provided.

b. Each of the services was requested to estimate the man-years, personnel costs, and other costs of installation support for its RPMA. It was also necessary to submit data that would identify that portion of installation support which could be given up or transferred if consolidation occurred and that portion of the estimated support that would be retained. The former portion is termed "realizable support." Usually the entire estimated installation support from a particular office cannot be realized in a consolidation because the total support usually includes some fractional spaces accumulated from various suboffices.

5. Analysis of Support Manpower.

a. Man-years of support provided.

(1) It is not easy to account for the exact amount of work accomplished by agencies in support of RPMA since the exact amount is generally not recorded. Figure C-2-1 shows the services' estimated CMO installation support to the engineer for the US Army, Air Force, and Navy in the Panama Canal Zone. The Comptroller supplied the most man-years (18.7) of support to the FE within the Army, followed by Civilian Personnel (15.0 man-years), Supply (13.5 man-years), and Transportation (11.6 man-years). Total installation support to the Army FE in Panama is 76.3 man-years. In the Air Force, Supply ranks first in

## CMO INSTALLATION SUPPORT
## ESTIMATED MAN-YEARS

| | ARMY EST | AIR FORCE EST | NAVY EST | TOTAL |
|---|---|---|---|---|
| AUTO DATA PROC | 4.0 | 0.2 | 0.0 | 4.2 |
| COMPTROLLER | 18.7 | 2.2 | 5.9 | 26.8 |
| AG / ADMIN | 1.0 | 1.1 | 0.4 | 2.5 |
| CIVILIAN PERSO | 15.0 | 6.7 | 3.0 | 24.7 |
| SUPPLY | 13.5 | 18.9 | 6.3 | 38.7 |
| PROCUREMENT | 8.0 | 6.3 | 2.8 | 17.1 |
| TRANSPORTATION | 11.6 | 7.2 | 1.8 | 20.6 |
| MOVEMENTS | 0.0 | 0.0 | 0.0 | 0.0 |
| MAT'L MAINT | 4.5 | 5.2 | 0.0 | 9.7 |
| TOTALS | 76.3 | 47.8 | 20.2 | 144.3 |

Figure C-2-1

support to BCE (18.9 man-years), followed by Transportation (7.2 man-years), Civilian Personnel (6.7 man-years), and Procurement (6.3 man-years). Total estimated support to the Air Force BCE is 47.8 man-years. In the Navy, Supply also ranks first in support to the RPMA (6.3 man-years). The Comptroller and Procurement Offices supply 5.9 man-years and 2.8 man-years of support to the Naval RPMA, respectively, with a total installation support of 20.2 man-years. Installation support for the three services totals 144.3 man-years of effort. The Navy showed no support to RPMA in Material Maintenance and Transportation; therefore, the Engineer Studies Center (ESC) made the computations (see Appendix H-2) and included them in the CMO figures.

(2) The support ratio (i.e., installation support in relation to engineer population) for the Army and Air Force are very similar--0.095 and 0.104, respectively (see Figure C-2-2). The Navy support ratio is somewhat higher at 0.180. The higher Navy support ratio is due in part to its higher percentage of contract labor (not included in the "FE population"), and the fact that smaller organizations tend to have a higher support ratio.

b. Realizable support (i.e., support reducible to transferable man-years) was estimated by the services in Panama. Figure C-2-3 shows these data. These estimates of the number of transferable man-years are essential in determining the potential savings under different

PROPORTIONAL ANALYSIS OF REPORTED SUPPORT DURING FY 78

| | Army | Air Force | Navy | Total |
|---|---|---|---|---|
| Total Man-years Support Reported | 76.3 | 47.8 | 20.2 | 144.3 |
| Size of CMO FE Organization | 805.0 | 458.0 | 112.0 | 1,375.0 |
| Ratio: Support to FE Org | .095 | .104 | .180 | .105 |

Figure C-2-2

CMO INSTALLATION SUPPORT
REALIZABLE MAN-YEARS

| | ARMY REAL | AIR FORCE REAL | NAVY REAL | TOTAL |
|---|---|---|---|---|
| AUTO DATA PROC | 3.0 | 0.0 | 0.0 | 3.0 |
| COMPTROLLER | 14.7 | 0.0 | 2.0 | 16.7 |
| AG / ADMIN | 1.0 | 1.0 | 0.0 | 2.0 |
| CIVILIAN PERSO | 9.0 | 3.7 | 1.0 | 13.7 |
| SUPPLY | 12.5 | 14.5 | 1.0 | 28.0 |
| PROCUREMENT | 6.0 | 4.0 | 2.0 | 12.0 |
| TRANSPORTATION | 5.6 | 6.1 | 0.0 | 11.7 |
| MOVEMENTS | 0.0 | 0.0 | 0.0 | 0.0 |
| MAT'L MAINT | 3.2 | 4.4 | 0.0 | 7.6 |
| TOTALS | 55.0 | 33.7 | 6.0 | 94.7 |

Figure C-2-3

options for consolidation. The realizable support, as would be expected, is usually considerably less than estimated support. Realizable support from the Adjutant General in the Army and Air Force and supply in the Army equals 90 percent or more of estimated support. The total realizable installation support to RPMA is 55 man-years, 33.7 man-years, and 6 man-years respectively for the Army, Air Force, and Navy. As an example, Figure C-2-3 shows that the Navy considers only 6 of its 20.2 man-years of annual installation support to RPMA as transferable if the Navy were to totally lose its public works mission. The other 14.2 man-years evidently cut across a larger number of spaces devoted to other duties and support of other functions. Only whole spaces are candidates for transfer (i.e., realizable). The realizable spaces do not identify the estimated savings from deletion of support to RPMA. The actual savings achievable may be something less than these realizable spaces. Note, too, that the installation support elements retained by the installation will be smaller than before, perhaps implying that economy of scale in support to RPMA is achieved at the expense of some diseconomy of scale in the surviving installation support elements. The advantages of RPMA must be balanced against the disadvantages of the residual fragmentation of other installation support.

c. Figure C-2-4 shows the ratio of realizable installation support to estimated installation support. The ratio for the Army

CMO INSTALLATION SUPPORT RATIOS
(In Man-years)

| | Army | | | Air Force | | | Navy | | | Total | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Est | Real | Ratio | Est | Real | Ratio | Est | Real | Ratio | Est | Real | Ratio |
| Auto Data Proc | 4.0 | 3.0 | 0.75 | 0.2 | 0.0 | 0.00 | 0.0 | 0.0 | 0.00 | 4.2 | 3.0 | 0.71 |
| Comptroller | 18.7 | 14.7 | 0.78 | 2.2 | 0.0 | 0.00 | 5.9 | 2.0 | 0.34 | 26.8 | 16.7 | 0.62 |
| Adjutant General | 1.0 | 1.0 | 1.00 | 1.1 | 1.0 | 0.90 | 0.4 | 0.0 | 0.00 | 2.5 | 2.0 | 0.80 |
| Civilian Personnel | 15.0 | 9.0 | 0.60 | 6.7 | 3.7 | 0.55 | 3.0 | 1.0 | 0.33 | 24.7 | 13.7 | 0.55 |
| Supply | 13.5 | 12.5 | 0.93 | 18.9 | 14.5 | 0.77 | 6.3 | 1.0 | 0.16 | 38.7 | 28.0 | 0.72 |
| Procurement | 8.0 | 6.0 | 0.75 | 6.3 | 4.0 | 0.63 | 2.8 | 2.0 | 0.71 | 17.1 | 12.0 | 0.70 |
| Transportation | 11.6 | 5.6 | 0.48 | 7.2 | 6.1 | 0.84 | 1.8 | 0.0 | 0.00 | 20.6 | 11.7 | 0.57 |
| Movements | 0.0 | 0.0 | 0.00 | 0.0 | 0.0 | 0.00 | 0.0 | 0.0 | 0.00 | 0.0 | 0.0 | 0.00 |
| Material Maint | 4.5 | 3.2 | 0.71 | 5.2 | 4.4 | 0.85 | 0.0 | 0.0 | 0.00 | 9.7 | 7.6 | 0.79 |
| Communications | 0.0 | 0.0 | 0.00 | 0.0 | 0.0 | 0.00 | 0.0 | 0.0 | 0.00 | 0.0 | 0.0 | 0.00 |
| Total | 76.3 | 55.0 | 0.72 | 47.8 | 33.7 | 0.71 | 20.2 | 6.0 | 0.30 | 144.3 | 94.7 | 0.66 |

Figure C-2-4

ranges from 0.48 in Transportation to 1.0 in the Adjutant General's Office; the Air Force ratios range from 0 in the Comptroller's to 0.90 in the Adjutant General's office; and the Navy ratios range from 0 in their Administration Office to 0.71 in Procurement. The ratios of total support are as follows: Army 0.72, Air Force 0.71, Navy 0.30, with a ratio of 0.66 for all services. The data show that the Navy consistently has a lower ratio of realized to estimated installation support than the Army or Air Force. This again is due to the smaller Naval population and the tendency for personnel to perform a variety of functions rather than specialize on one.

6. Costs.

a. Estimated costs. The services also reported personnel and other support costs. Figure C-2-5 presents the support costs by service by individual support functions. Total estimated support to the FE for all services amounted to $2,078,668 in personnel costs and $151,521 in other costs, for a grand total of $2,230,189.

b. Realizable costs. Only $1,486,155 of the total estimated support is realizable as a possible source of savings through consolidation. Net support savings in a consolidation would be considerably less. This figure represents only the grand total of the realizable (transferable) support that each service reported it would give up if its RPMA functions were lost. The total realizable support to FE in 1978 by service is as follows:

## CMO INSTALLATION SUPPORT
## ESTIMATED COST DATA

| | | ARMY | | | AIR FORCE | | | NAVY | | | TOTAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EST | REAL | RETAIN | EST | REAL | RETAIN | EST | REAL | RETAIN | EST | REAL | RETAIN |
| AUTO DATA PROC | | | | | | | | | | | | | |
| | PERSONNEL COSTS | 55600 | 41700 | 13900 | 1157 | 0 | 1157 | 0 | 0 | 0 | 56757 | 41700 | 15057 |
| | OTHER COSTS | 0 | 0 | 0 | 10540 | 10540 | 0 | 0 | 0 | 0 | 10540 | 10540 | 0 |
| | TOTAL | 55600 | 41700 | 13900 | 11697 | 10540 | 1157 | 0 | 0 | 0 | 67297 | 52240 | 15057 |
| COMPTROLLER | | | | | | | | | | | | | |
| | TOTAL(PERS'L COST) | 260625 | 205025 | 55600 | 32721 | 0 | 32721 | 99000 | 36000 | 63000 | 392346 | 241025 | 151321 |
| AG / ADMIN | | | | | | | | | | | | | |
| | PERSONNEL COST | 13900 | 13900 | 0 | 18196 | 15830 | 2366 | 6000 | 0 | 6000 | 38096 | 29730 | 8366 |
| | OTHER COST | 0 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 100 | 100 | 0 | 100 |
| | TOTAL | 13900 | 13900 | 0 | 18196 | 15830 | 2366 | 6100 | 0 | 6100 | 38196 | 29730 | 8466 |
| CIVILIAN PERSO | | | | | | | | | | | | | |
| | TOTAL PERS COST | 208500 | 125100 | 83400 | 132915 | 73400 | 59515 | 35000 | 8000 | 27000 | 376415 | 206500 | 169915 |
| SUPPLY | | | | | | | | | | | | | |
| | TOTAL PERS COST | 187650 | 173750 | 13900 | 222056 | 170360 | 51695 | 84100 | 12500 | 71600 | 493806 | 356610 | 137195 |
| PROCUREMENT | | | | | | | | | | | | | |
| | TOTAL PERS COST | 111200 | 83400 | 27800 | 82393 | 47100 | 35293 | 45500 | 28000 | 17500 | 239093 | 158500 | 80593 |
| TRANSPORTATION | | | | | | | | | | | | | |
| | PERSONNEL COST | 161240 | 77840 | 83400 | 128020 | 112315 | 15705 | 27025 | 0 | 27025 | 316285 | 190155 | 126130 |
| | OTHER COST | 0 | 0 | 0 | 68125 | 55886 | 12239 | 0 | 0 | 0 | 68125 | 55886 | 12239 |
| | TOTAL | 161240 | 77840 | 83400 | 196145 | 168201 | 27944 | 27025 | 0 | 27025 | 384410 | 246041 | 138369 |
| MOVEMENTS | | | | | | | | | | | | | |
| | TOTAL PERS COST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| MAT'L MAINT | | | | | | | | | | | | | |
| | PERSONNEL COST | 62550 | 44480 | 18070 | 103320 | 90512 | 12808 | 0 | 0 | 0 | 165870 | 134992 | 30878 |
| | OTHER COST | 0 | 0 | 0 | 68125 | 55886 | 12239 | 0 | 0 | 0 | 68125 | 55886 | 12239 |
| | TOTAL | 62550 | 44480 | 18070 | 171445 | 146398 | 25047 | 0 | 0 | 0 | 233995 | 190878 | 43117 |
| COMMUNICATIONS | TOTAL (OTHER COST) | 0 | 0 | 0 | 4631 | 4631 | 0 | 0 | 0 | 0 | 4631 | 4631 | 0 |
| TOTALS | | | | | | | | | | | | | |
| | PERSONNEL COST | 1061265 | 765195 | 296070 | 720778 | 509517 | 211260 | 296625 | 84500 | 212125 | 2078668 | 1359212 | 719455 |
| | OTHER COST | 0 | 0 | 0 | 151421 | 126943 | 24478 | 100 | 0 | 100 | 151521 | 126943 | 24578 |
| | TOTAL | 1061265 | 765195 | 296070 | 872199 | 636460 | 235738 | 296725 | 84500 | 212225 | 2230189 | 1486155 | 744033 |

Figure C-2-5

(1) Army--$765,195.

(2) Air Force--$636,460.

(3) Navy--$84,500.

7. Summary of Support Provided FE Organizations.

a. CMO installation support. Figure C-2-6 presents the data previously discussed in this appendix in one summary table for easy reference.

b. Summary of current support provided FE organizations. Figure C-2-7 shows realizable manpower and costs in summary form. These data reveal a pool of 94.7 support spaces that could be given up by all services should their FE organizations be given up in a consolidation. This manpower pool minus those spaces included in the consolidated FE organization becomes part of the potential manpower savings for a consolidation.

## CMO INSTALLATION SUPPORT

| | | ARMY | | | AIR FORCE | | | NAVY | | | TOTAL | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | EST | REAL | RETAIN | EST | REAL | RETAIN | EST | REAL | RETAIN | EST | REAL | RETAIN |
| 60 AUTO DATA PROC | MAN-YEARS | 4.0 | 3.0 | 1.0 | 0.2 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 4.2 | 3.0 | 1.2 |
| | PERSONNEL COSTS | 55600 | 41700 | 13900 | 1157 | 0 | 1157 | 0 | 0 | 0 | 56757 | 41700 | 15057 |
| | OTHER COSTS | 0 | 0 | 0 | 10540 | 10540 | 0 | 0 | 0 | 0 | 10540 | 10540 | 0 |
| | TOTAL | 55600 | 41700 | 13900 | 11697 | 10540 | 1157 | 0 | 0 | 0 | 67297 | 52240 | 15057 |
| 100 COMPTROLLER | MAN-YEARS | 18.7 | 14.7 | 4.0 | 2.2 | 0.0 | 2.2 | 5.9 | 2.0 | 3.9 | 26.8 | 16.7 | 10.1 |
| | TOTAL(PERS'L COST) | 260625 | 205025 | 55600 | 32721 | 0 | 32721 | 99000 | 36000 | 63000 | 392346 | 241025 | 151321 |
| 220 AG / ADMIN | MAN-YEARS | 1.0 | 1.0 | 0.0 | 1.1 | 1.0 | 0.1 | 0.4 | 0.0 | 0.4 | 2.5 | 2.0 | 0.5 |
| | PERSONNEL COST | 13900 | 13900 | 0 | 18196 | 15830 | 2366 | 6000 | 0 | 6000 | 38096 | 29730 | 8366 |
| | OTHER COST | 0 | 0 | 0 | 0 | 0 | 0 | 100 | 0 | 100 | 100 | 0 | 100 |
| | TOTAL | 13900 | 13900 | 0 | 18196 | 15830 | 2366 | 6100 | 0 | 6100 | 38196 | 29730 | 8466 |
| 270 CIVILIAN PERSO | MAN-YEARS | 15.0 | 9.0 | 6.0 | 6.7 | 3.7 | 3.0 | 3.0 | 1.0 | 2.0 | 24.7 | 13.7 | 11.0 |
| | TOTAL PERS COST | 208500 | 125100 | 83400 | 132915 | 73400 | 59515 | 35000 | 8000 | 27000 | 376415 | 206500 | 169915 |
| 520 SUPPLY | MAN-YEARS | 13.5 | 12.5 | 1.0 | 18.9 | 14.5 | 4.4 | 6.3 | 1.0 | 5.3 | 38.7 | 28.0 | 10.7 |
| | TOTAL PERS COST | 187650 | 173750 | 13900 | 222056 | 170360 | 51695 | 84100 | 12500 | 71600 | 493806 | 356610 | 137195 |
| 530 PROCUREMENT | MAN-YEARS | 8.0 | 6.0 | 2.0 | 6.3 | 4.0 | 2.3 | 2.8 | 2.0 | 0.8 | 17.1 | 12.0 | 5.1 |
| | TOTAL PERS COST | 111200 | 83400 | 27800 | 82393 | 47100 | 35293 | 45500 | 28000 | 17500 | 239093 | 158500 | 80593 |
| 560 TRANSPORTATION | MAN-YEARS | 11.6 | 5.6 | 6.0 | 7.2 | 6.1 | 1.0 | 1.8 | 0.0 | 1.8 | 20.6 | 11.7 | 8.8 |
| | PERSONNEL COST | 161240 | 77840 | 83400 | 128020 | 112315 | 15705 | 27025 | 0 | 27025 | 316285 | 190155 | 126130 |
| | OTHER COST | 0 | 0 | 0 | 68125 | 55886 | 12239 | 0 | 0 | 0 | 68125 | 55886 | 12239 |
| | TOTAL | 161240 | 77840 | 83400 | 196145 | 168201 | 27944 | 27025 | 0 | 27025 | 384410 | 246041 | 138369 |
| 562 MOVEMENTS | MAN-YEARS | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| | TOTAL PERS COST | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 570 MAT'L MAINT | MAN-YEARS | 4.5 | 3.2 | 1.3 | 5.2 | 4.4 | 0.8 | 0.0 | 0.0 | 0.0 | 9.7 | 7.6 | 2.1 |
| | PERSONNEL COST | 62550 | 44480 | 18070 | 103320 | 90512 | 12808 | 0 | 0 | 0 | 165870 | 134992 | 30878 |
| | OTHER COST | 0 | 0 | 0 | 68125 | 55886 | 12239 | 0 | 0 | 0 | 68125 | 55886 | 12239 |
| | TOTAL | 62550 | 44480 | 18070 | 171445 | 146398 | 25047 | 0 | 0 | 0 | 233995 | 190878 | 43117 |
| 700 COMMUNICATIONS | TOTAL (OTHER COST) | 0 | 0 | 0 | 4631 | 4631 | 0 | 0 | 0 | 0 | 4631 | 4631 | 0 |
| TOTALS | MAN-YEARS | 76.3 | 55.0 | 21.3 | 47.8 | 33.7 | 14.0 | 20.2 | 6.0 | 14.2 | 144.3 | 94.7 | 49.5 |
| | PERSONNEL COST | 1061265 | 765195 | 296070 | 720778 | 509517 | 211260 | 296625 | 84500 | 212125 | 2078668 | 1359212 | 719455 |
| | OTHER COST | 0 | 0 | 0 | 151421 | 126943 | 24478 | 100 | 0 | 100 | 151521 | 126943 | 24578 |
| | TOTAL | 1061265 | 765195 | 296070 | 872199 | 636460 | 235738 | 296725 | 84500 | 212225 | 2230189 | 1486155 | 744033 |

Figure C-2-6

## SUMMARY OF CURRENT SUPPORT PROVIDED TO RPMA ORGANIZATIONS

(FY78)

| SERVICE | ARMY | AIR FORCE | NAVY | TOTALS | COSTS (IN THOUSANDS) |
|---|---|---|---|---|---|
| RPMA POPULATION SERVED | 805 | 458 | 107 | 1,375 | -- |
| TOTAL MAN-YEARS PROVIDED | 76.3 | 47.8 | 20.8 | 144.3 | 2,078.7 |
| REALIZABLE | 55.0 | 33.7 | 6.0 | 94.7 | 1,359.2 |
| UNREALIZABLE (RETAINED) | 21.3 | 14.1 | 14.2 | 49.6 | 719.5 |

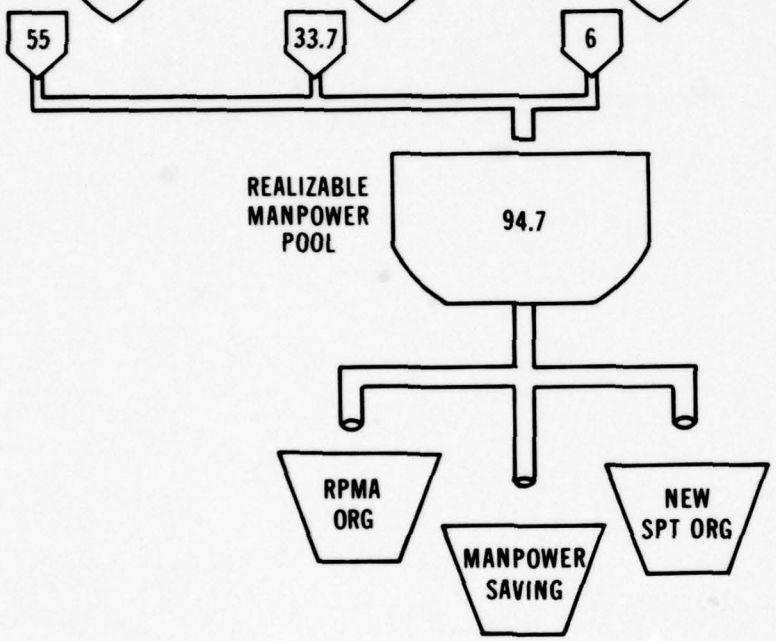


Figure C-2-7

APPENDIX C-3

REPORTING CONSIDERATIONS OF RPMA CONSOLIDATION


| Paragraph | | Page |
|---|---|---|
| 1 | Purpose | C-3-1 |
| 2 | Background | C-3-2 |
| 3 | Requirements | C-3-3 |
| 4 | Components' Systems | C-3-4 |
| 5 | Other Consolidations | C-3-5 |
| 6 | Practical Considerations | C-3-7 |
| 7 | Determining the Requirement | C-3-8 |
| 8 | The Staff Engineer Functions | C-3-11 |
| 9 | Suggested Approach | C-3-13 |
| 10 | Reporting Impact on Alternatives | C-3-15 |
| 11 | Conclusion | C-3-16 |
| 12 | Recommendations | C-3-17 |
| **Figure** | | |
| C-3-1 | Personnel Requirements | C-3-16 |


1. Purpose. This appendix addresses the implications of real property maintenance activity (RPMA) consolidation alternatives to the current method of operation (CMO) on the reporting functions of the services.

2. Background. Information is the raw material for the decision processes that govern the behavior of the organization. It is a necessary function of any organization to collect and distribute information. It is as true for the military as it is for any company in the private sector. It is also as important for an organization providing services as it is for one who manufactures products. In some ways the data requirements of the military components may be even more imperative because of the planning, programing and budgeting system (PPBS). This is the means by which financial management is conducted throughout the Department of Defense. Resources are programed based on the information that is reported into the PPBS. Real property maintenance (RPM) is just one category of the manpower, materiel, and installation needs which compete for a share of each budget dollar. It is vital for RPM to account for all present and forecasted costs; its ability to justify its budget depends on it. The best way to do this is to collect and record the most accurate information on workload and costs. In addition to satisfying financial management requirements, information is also necessary to effectively manage RPM. Customer requirements, work force capability, and equipment and supply availability must be firmly under control for efficient operation. Information and how it is reported is the basis on which decisions can be made that satisfy both internal and external needs. This is the situation that confronts all three military components in their civil engineering function in Panama. With the

dissolution of the Panama Canal Company (PCC) and the possibility of RPMA consolidation, this environment will be changing.

3. Requirements. No matter which consolidation alternative is chosen, there will still be certain reporting requirements for each of the three services. Title 10 U.S.C. 2701[1/] states that an inventory of real property will be maintained. While the Mobile District of the Corps of Engineers will assist in real property management, each component will retain responsibility (except in Alternative 2) for real property records maintenance in Panama. The rules governing Interservice Support Agreements (ISSAs), of which Alternatives 3 and 4 make extensive use, are found in DODI 4000.19.[2/] A significant policy made explicit in this document states that each component of the ISSA will be responsible for programing, budgeting, and funding. Therefore, although one component may receive RPM support in lieu of preserving its own capability, that component will still be required to perform the same fiscal planning and accounting functions. As an example, the program control system prescribed in DODI 4165.58[3/] will still apply to all parties of an ISSA. The regulations in AR 420-16,[4/] SECNAVINST 11014.11A,[5/] and AFR 85-10,[6/] much

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1/ Congress of the US, Title 10 United States Code, Section 2701 (U.S.C. 2701).

2/ DOD, ASD(I&L), DODI 4000.19, Principles of Interservice, Interdepartmental and Interagency Support.

3/ DOD, ASD(I&H), DODI 4165.58, Program Control System for Real Property Maintenance Activities.

4/ DA, HQ, AR 420-16, Facilities Engineering--Facilities Engineering Reports.

5/ DN, HQ, SECNAVINST 11014.11A, DOD Real Property Maintenance Activity Program.

6/ DAF, HQ, AFR 85-110, Operation and Maintenance of Real Property.

less the particular requirements of each component's fiscal management system, will remain even if the installation has divested itself of RPM capability.

4. Components' Systems.

a. The Department of Defense has adopted a DOD-wide program control system for RPMA. DODI 4165.58 and DODI 4165.3[7/] contain the policy that controls the format of RPMA information that is provided to DOD. While the information demands are explicit, DOD avoided any further guidance to the military departments that would have tampered with their internal information systems. The effects of inducing conformity among the components' RPM information systems were potentially great. It would mean that management and fiscal structure would have to be aligned causing internal problems that would far outweigh any conveniences that may accrue at the DOD level.

b. Consequently each department has taken a different approach to developing control systems for RPM. The last decade has seen the inevitable entrance of automation into the previously manual systems. The Integrated Facilities System (IFS), the Public Works Center Management System, and the Base Engineer Automated Management System (BEAMS) have been developed for the Army, Navy, and Air Force respectively. Despite the inherent similarities in the basic RPM activities, each

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7/ DOD, ASD(MRA&L), DODI 4165.3, Department of Defense Facility Classes and Construction Categories.

department has developed its own philosophy on how to perform this function. The automated systems naturally reflect these philosophies. The combination of different management philosophies, accounting structures, and control systems complicates the task of consolidating to achieve savings.

5. Other Consolidations.

a. The adoption of consolidations in areas where there are several installations within close proximity is a recent mandate. While there has been some guidance produced in establishing the requisites of consolidation, the primary assistance comes from the half-dozen studies that have thus far been conducted. In particular, the experiences in San Antonio, Texas (San Antonio Real Property Maintenance Activity (SARPMA)), Fayetteville, North Carolina (Pope-Bragg), Wheeler Field, Hawaii, and the National Captial Region (NCR) have been most useful. These actions, however, involved only the Army and Air Force. The Navy's experience has been principally in intraservice consolidations. To the extent permissible, the documentation was examined for possible precedent in gaining insight into the problems encountered and implementations adopted for the reporting requirements. The published material unfortunately shows very little that can be used to project any accurate costs. The implication seems to be that the reporting needs are real problems but they are not of a magnitude that would threaten the viability of the consolidation options. The experience thus far has not produced the

interfaces between the various component systems (i.e., BEAMS, IFS, and the Navy system) that would permit adaptation of one component's system to the reporting needs of another. There are, however, efforts underway in SARPMA to add an IFS interface to BEAMS. As part of that analysis, a review of BEAMS and Army requirements was made. The software to join systems and produce common reports is still being negotiated. In any event it will be at least 2 years before there is an operational link between the two systems. The situation at Fayetteville, North Carolina is less certain. Activity towards consolidation has been suspended for several years. Therefore, there is little chance of any valuable lessons forthcoming from that experience. Of more interest will be the implementation of IFS in the Hawaii consolidation. The Army is the lead service in Hawaii as it also is in Panama. The implementation in Hawaii may provide a template for a similar action in the Canal Zone. The position of the Navy in all the consolidation alternatives is substantially the same. Considering the relative size of its contingent, the cost to implement a reporting interface for the Navy for any alternative will not help discriminate between alternatives.

b. With any proposal adopted as a result of this feasibility study, there will be a period of time necessary to create an implementation plan. (This assumes that the CMO is not preserved.) When the actual Panama realignment begins, it may be far enough into the future to take advantage of the procedures used by the consolidation efforts already

underway in CONUS or Hawaii. There would not be sufficient justification to reanalyze the various accounting structures and report requirements where similar analysis is already underway. The Panama study, depending on which alternative proves best, should make use of the efforts at the other consolidations wherever they may be applicable.

6. Practical Considerations.

a. While this section may belabor the point, it may be worthwhile to reiterate the disposition of RPMA in Panama. The Army has been designated executive agent for the RPMA consolidation study. The geography of the Canal Zone partitions the area into three zones: Atlantic, Pacific East, and Pacific West. The Army predominates in the Atlantic and Pacific East; the Air Force accounts for most of the Pacific West requirements. Navy operations are primarily found in the Pacific West area. Since the Navy operations are small, relative to the other installations, it would be supported by the consolidated RPM organization either through ISSAs or a revolving fund. To the extent possible, the reports of the favored organization would supply the Navy with the information needed to administer its program.

b. The potential difficulty arises over the determination of which system, Army's or Air Force's, should be adopted for the RPMA. BEAMS is the Air Force standard. It is installed in Panama and is used to supply the Base Civil Engineer (BCE) with the means to better manage his work program as well as help satisfy most of his reporting

requirements to higher headquarters. On the other hand the Army's IFS is not implemented. The position of the Army in Alternative 2 argued for adoption of an Army system. Alternatives 3 and 4 permit a choice between the two. An additional factor to consider is the current inability of IFS to accommodate a revolving fund. Alternative 2 has the Army as lead service, but it is based on a revolving fund. If the implementation plan for consolidation had to be written now, and it was to be constrained to the available reporting systems within Panama, BEAMS would be used. If it was not used, considerable savings earned by designing a more austere overhead structure could evaporate under the burden of operating a manual information system. IFS can, however, be considered available. If it was established that US Army Forces Command (USAFORSCOM) accepts IFS, the system could be implemented in 6 to 9 months. This would be an unmodified version. Industrial funding and possible accommodations to the particular requirements of the other services are not considered in this time estimate. Collateral efforts at other consolidations could, however, provide the needed modifications to IFS.

7. Determining the Requirement.

a. In the time available to review the reporting needs, it seemed that an in-depth comparison of current reporting and cost accounting systems would be infeasible for several reasons: difficulty in obtaining documentation, unfamiliarity with accounting structures, and principally the time constraint argued against basing the review on such a

comparison. Performing a report by report, accounting code by accounting code matchup would be extremely time-consuming and better left to those more familiar with them. Moreover, it would be repeating efforts that have been or will be carried out at the other previously mentioned consolidations. Suffice it to say that while there are many similar requirements to which the systems must respond, there are also many incompatibilities. Some differences are not attributable to mere RPM philosophy. Such differences reflect the divergent approaches taken to managing resources.

b. The supported installations will still comply with their present planning and programing systems. If consolidation forced the use of a single component's RPM reporting system, the other components would not be relieved of existing reporting requirements. There is every reason to believe, however, that on a case-by-case basis relief from some of the reporting requirements can be anticipated, especially those dealing specifically with work force efficiency. Such relief will not be major and would induce only small savings. (It must be emphasized that these thoughts are made towards reorganizations, effecting no transfer of real property. If transfers were carried out and the Army or possibly DOD were to assume complete control, there would be concomitant savings. To satisfy even a small reporting system requires personnel. There are, however, very definite economies of scale if instead of three different PPB systems to satisfy there was only one.) The true cost of reporting

will occur in the redundant data requirements experienced at the supported installations. This is the legacy of having three different RPMA structures. The task is to determine what level of personnel will be necessary to fulfill the information needs.

c. The Staff Engineer can be viewed as the liaison between the local installation commander and the consolidated RPM organization. It coordinates the installation's RPM. What functions can be identified that will cover these responsibilities? Since the components must satisfy essentially the same type of work, the Army Staffing Guide was reviewed for functional needs. Those assignments of duties that fell in the areas that would impact a Staff Engineer were noted. The organizational elements necessary to manage RPM are rather small if there is no internal maintenance work force. In addition to identifying the requisite administering functions, any involved with reporting were also noted. This review produces three areas that are necessary for an effective Staff Engineer. The three were: real property; master plans and programs; and programing, budgeting, accounting, and statistics. (A similar finding as to the constitution of the Staff Engineer was found in the Civil Engineering Research Laboratory (CERL) estimate of the Residual Engineer for the Fayetteville, North Carolina consolidation.) The reporting duties appear to be within the responsibilities of the planners and budgeters. In that respect the concern that savings in spaces would be lost by additional Staff Engineer personnel being needed to accomplish data

compilation seems unfounded since this function would be filled in the RPMA organization.

8. The Staff Engineer Functions.

a. As stated above, the administration of an effective Staff Engineer is centered in three functions. The first is real property. By statute, the components must account for all real property on both quantitative and monetary bases. Transfers, acquisitions, improvements, disposals, and capital changes must be reflected in the data base to ensure currentness. The level of effort to accomplish this will be the same whether the installation has an RPM organization or receives support through other means.

b. The second function is master planning. The Panama Area Office of the Mobile District of the Corps of Engineers has been given the master planning responsibility for the Canal Zone. It would not be feasible, however, to completely remove master planning from the installation. This function is responsible for developing and implementing the projects that will ensure the effectiveness of the installation. Effectiveness applies to the present mission characterized by day-to-day activities and also applies to any contingency operations that are within the responsibility of the installation. As a practical consideration, the situation in Panama with treaty intricacies, time-phased transfers, and a shrinking military reservation make careful planning and coordination even more important. Thus, the study team considered that there was a requirement for one planner for each military service.

c. The third function deals primarily with financial management. Programing, budgeting, accounting, and statistics would be responsible for the budget operations. Even for those alternatives that have a component service receiving all its support, the same RPM will be performed at the installation. The change is that instead of funding an internal work force, the funding will be through reimbursables or revolving fund. Administering the accomplishment of RPM will require comparable cost justification and accounting in the supported organization. Similar interface with PPBS will remain. This function would also manage the operation of any support agreements or revolving funds. It would be extremely useful if the supporting RPM organization could supply its customers with the information necessary for them to fulfill their own reporting requirements. Since the systems are inconsistent in their data requirements, attention must be focused on what would mitigate the problems of joint use. First, any system used should be able to produce the information prescribed by DOD. Secondly, the supported installation, acting now without (or with a reduced) internal work force, would not need the extensive performance-related information necessary to effectively manage the RPM labor force and resources. A third factor might be the ability to tap interface measures developed in other consolidations, principally SARPMA. These factors all point to the probability that the eventual interface can be selective in the information it must tap to assist the supported organizations in their

reporting needs. It should be noted that while the supported installation will still need approximately the same sized budgeting staff, the activity may have to have its like function increased. Not only has its former workload remained untouched, but now it must reconcile the needs, estimates, and service agreements of newly supported installations. The budget function as a result may show an increase in the alternatives that advocate some form of consolidation. In effect some double counting may occur; the supported installation must still justify accomplishing RPM while the new RPMA organization has its original workload augmented by the responsibilities attendant with the service agreements.

9. Suggested Approach.

a. Adoption of one of the automated RPM systems appears to satisfy the short-term reporting objective with the least manpower costs. The experiences of other consolidations should be relied on to minimize costs in connection with this aspect of the implementation. These efforts involved the Army and the Air Force, so there should be material available in the future on commonalities and differences. In particular, SARPMA has already reviewed the BEAMS, Industrial Fund (IF), and Army requirement, as well as planning augmentations to interface with IFS and satisfy the requirements found in DODIs 4165.58, 4165.3, and 7500.1.[8/] This could amount to a considerable savings if adaptable to Panama. The Navy reporting requirements have not been addressed in any major consolidation

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8/ DOD, ASD (Comptroller), DODI 7500.1, Report on Real Personal Property.

with the other components. Since DOD reporting demands will be satisfied by the SARPMA BEAMS, modifications to enable the particular Navy budget and accounting formats to be satisfied may not be sizable. The potential short-term savings in using BEAMS as the basis for any consolidation alternative, as opposed to relying on IFS, seem to be greater.

b. Looking closer at the three consolidation alternatives, both Alternatives 3 and 4 organizationally have the Navy receiving support from the Air Force, designated Pacific West Manager. While there is theoretical parity between Pacific East (Army dominated) and West (Air Force dominated) organizations, the need for more ISSAs established the interdependence of the two. A single RPM data system would greatly facilitate their cooperation. The Navy and Army have minimal relations. They both have, however, significant contact with the Air Force. The utilization of BEAMS as the regional standard for these alternatives must be considered since the Air Force is a focal point. Alternative 2 is an Army organization supporting the other two components. Since the Army has not implemented IFS in Panama, it would have to learn the system and go through an adaptive stage before full benefits would be realized. Modifications for the revolving fund would be necessary. There would be associated costs to equip the installation with the system. If, instead of IFS, BEAMS was substituted, there would obviously be additional costs, primarily in adapting to a different management system. Many of the people, however, who would be in the

Alternative 2 organization would probably come from the disestablished BCE and thus be familiar with BEAMS. The cost of using a BEAMS system under Alternative 2 would be mitigated through the features of and familiarity with BEAMS when compared to the startup costs of bringing into the organization a new system, IFS, that is at the moment unequipped to handle the needed services. The Navy and Army personnel will have to get used to a new system under any consolidation. The Air Force personnel are familiar with BEAMS; rather than have them submit to a new indoctrination, it might be better to build on their experience by retaining BEAMS.

c. There would be no personnel savings to accrue by adopting BEAMS. Where the benefits would be expected to occur are in three principal areas: utilization of other consolidation experiences, reduction in the overall disruption to present information accounting, and familiarization with the system by the Air Force contingent. These benefits, however, may not accrue unless the services are exempted from duplicative, non-DOD standard reporting requirements.

10. Reporting Impact on Alternatives. The adoption of Alternative 1, the CMO, will leave reporting static. Each component will determine what, if any, changes will be made to their present procedures. For the other three alternatives the impact will be primarily in two functions. Real Property and Budget and Accounting Sections will be responsible for the production of the reports outside those concerned with day-to-day work

performance. Estimates of personnel requirements for the alternatives using the strict yardstick measures provided by the Army staffing guidelines are shown in Figure C-3-1.

PERSONNEL REQUIREMENTS

| | Real Property | | | Budget and Accounting | | |
|---|---|---|---|---|---|---|
| Altn | Army | Navy | Air Force | Army | Navy | Air Force |
| 1 | 7 | 2 | 4 | 8 | 5 | 4 |
| 2 | 6 | 0 | 0 | 7 | 4 | 5 |
| 3 | 4 | 1 | 2 | 7 | 4 | 6 |
| 4 | 4 | 1 | 2 | 7 | 4 | 6 |

Figure C-3-1

11. Conclusion. The effectivenss of RPMA in carrying out programing and planning depends largely on the information collected and the actions subsequently taken. There are Federal statutes as well as DOD and military department regulations that specify the data to be maintained and the reporting formats to be used. In any RPMA organization, those responsible for compliance with legal dictates are centered in the real property and budget and accounting functions. For the consolidation alternatives in Panama, the number of people who will staff these functions can be estimated by using the available staffing criteria. This manpower estimate relies on the development of an intra-zone information system that can provide the three services with either the prescribed reports

or the means to compile reports at the requisite level of detail. The implementation team would necessarily analyze possible changes to BEAMS since it is currently in operation. The circumstances in Panama and the precedents established in other consolidations support, at least, the short-term use of BEAMS. The investigations would be aimed at reaching an acceptable compromise between Navy requirements and BEAMS capabilities as well as possibly building on current Army-spawned changes to BEAMS and how they may be enhanced. There is no straight-forward means to to combine the reporting duties. Realizing this, and recognizing the present conditions within Panama, the best approach is one that enables the necessary information to be processed with the least manpower and cost impact. Since the Army and the Navy do not presently employ automated systems, and the single in-place system is adequate for most data requirements, adoption of that system must be given precedence. This holds unless there is demonstration of a better compromise (perhaps in the whole consolidation) or of practical problems that would appear during implementation planning. This applies to all three alternatives that implement some form of consolidation.

12. Recommendations. The information requirements for RPM are generated by United States Codes (U.S.C.) and DOD Instructions. Each service has adapted these guidelines to their own internally defined systems. Thus, the three services are performing the same RPM functions, but are using different reporting systems to accommodate the PPBS. BEAMS

provides more inducements than the other systems for the particular situation in Panama. Present considerations advocate its use. If DOD was to obtain further consolidation of the Base Operating Support (BOS) as part of a policy to achieve greater centralization without mission impairment, a more active participation by DOD in the standardization of definitions, procedures, and systems would be required. If standardization throughout DOD is promoted, then the responsibility would transcend Panama, and DOD would by necessity prescribe the dimensions and features of the system and coordinate its enactment. In the meantime, the services should get some relief from their duplicative, nonstandard reporting requirements.

LAST PACE OF APPENDIX C-3

# ANNEX D

## CONTRACTING AND INTERSERVICE SUPPORT AGREEMENTS

ANNEX D

CONTRACTING AND INTERSERVICE SUPPORT AGREEMENTS


| Paragraph | | Page |
|---|---|---|
| 1 | Purpose | D-1 |
| 2 | Contracting | D-2 |
| 3 | Interservice Support Agreements | D-19 |
| 4 | Overview | D-31 |

| Figure | | |
|---|---|---|
| D-1 | Number of Contracts Made in the Canal Zone, FY 78 | D-9 |
| D-2 | Value of Private Contracting in the Canal Zone, FY 78 | D-10 |
| D-3 | Support Supplied by the Army 193d Infantry Brigade, FY 78 | D-21 |
| D-4 | Support Supplied by the Naval Station--Panama Canal Zone, FY 78 | D-23 |
| D-5 | Support Supplied by the Air Force 24th Composite Wing, FY 78 | D-25 |
| D-6 | Support Supplied by the Panama Canal Company, FY 78 | D-26 |


1. Purpose. This annex examines the role that contracting and Interservice Support Agreements (ISSAs) play in the provision of real property maintenance activity (RPMA) support to the Army, Navy, and Air Force in the Panama Canal Zone. The current reliance on out-of-house sources of support, and the possibilities for its expansion, are examined. In addition, the effects of the Panama Canal Treaty and proposed RPMA consolidation on the ability to contract and utilize ISSAs will also be analyzed.

2. Contracting. In the past few years, Defense planners have stressed the use of contracting as a source of support for the military. The following paragraphs provide a brief historical perspective of contracting, an analysis of the service's interpretation of this policy, and the potential effects of treaty implementation and possible consolidation on RPMA service. This section also examines the impacts of contracting on the management structure.

a. Background.

(1) The emphasis placed on contracting by military planners is just one phase in a long search for methods that would maximize the use of diminishing Defense resources. In the last decade, this drive for economy led to "civilianization" of the work force. Faced with shortages of military manpower, planners attempted to put as many civilians as possible in spaces formerly held by soldiers. The employment of civilians not only allowed military personnel to spend more of their time on mission-essential tasks, but also helped reduce the high benefit and support costs associated with the maintenance of a large military work force.[1/]

(a) Unfortunately, civilianization did not produce the expected benefits. Attempts to make the pay of Federal workers comparable with those in the private sector brought the cost of hiring government

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1/ Rand Corp, Military Manpower and the All-Volunteer Force. Pages 291-293.

civilians close to that of military personnel.[2/] More importantly, Congress began to limit and later force reductions on the size of the Federal work force, thus creating a new labor shortage in the Defense establishment.[3/]

(b) The disappointing results of civilianization led to a search for new methods of maximizing the use of military resources. Eventually, planners saw private contracting as a solution to the military's problems. For the past several years the official policy has been to rely on private firms for supply and service needs. However, the military has only recently attempted to contract larger portions of its work requirements.[4/]

(c) The search for functions most easily done by contract led Defense planners to target those in base operations, with RPMA functions gaining particular attention. RPMA, because its functions tend to be relatively standard and are rarely directly tied to an installation's primary mission, has thus become the area most heavily affected by this drive to contract.[5/]

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2/ Brookings Inst, Shaping the Defense Civilian Work Force. Pages 10-11.

3/ Assoc of the US Army, Where Did All the People Go? The Army's Vanishing Civilian Work Force. Pages 3-5.

4/ DA, OCE, Army Study Gp, Real Property Management Activities--Issues and Options. Pages III-7-1 and III-7-3.

5/ DA, USAWC, Real Property Maintenance Activities: In-House or Contract? Pages 1-2.

(2) The proponents of RPMA contracting list a number of expected benefits.

(a) Among the economic advantages attributed to contracting, perhaps the most important was based on the assumption that the unit cost of contracted labor was less than government in-house labor. In fact, the method used to estimate the Federal Wage Board pay scale produces a somewhat higher wage than the local rate.[6/] Obviously, with the labor-intensive nature of RPMA, the possibility of contract labor being cheaper should be a major consideration in favor of contracting.

(b) More management-oriented arguments for contracting were also given. This policy would allow a military installation to concentrate more on its assigned Defense mission, rather than the day-to-day operation of RPMA. In addition, private contractors have the flexibility to change the size and structure of their management and labor force to maximize efficiency. Although it is a violation of government regulations, contracting also provides a means of offsetting the effects of various manpower limitations that have been imposed in recent years. This fact is particularly important to the military which has frequently found itself with enough money, but not enough men to do a job.[7/]

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6/ Brookings Inst, Shaping the Defense Civilian Work Force. Pages 11-14.

7/ Assoc of the US Army, Where Did All the People Go? The Army's Vanishing Civilian Work Force. Pages 3-5.

(3) Problems. Attempts to contract major portions of the military's workload have met with some resistance. Contracting has remained controversial because of problems inherent in relying on private sources of support and because of alleged deficiencies in the military's procedure for writing and supervising contracts.

(a) Private firms include allowances for profit in all their ventures. This was enough to make some skeptical of the advantages of contracting. The possibility of making a valid cost comparison was doubted by some. Their belief was that cost estimates arising from the transfer of a function from in-house to contract and the supervision of contractor performance were not exact. The stability of the contractor work force was also called into question, since workers have the right to strike. In addition, the availability of contracted services in the event of an installation emergency could not always be assured.[8/]

(b) Once the military began making major efforts to contract its RPMA workload, new and apparently unanticipated problems began to appear. One was the preparation of contract documents. Even today, some procurement officers are not adequately skilled at preparing service contracting documents. Frequently military contracts do not

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8/ DA, USAWC, Real Property Maintenance Activities: In-House or Contract? Pages 28-54.

specify standards of performance, quality of the work force, the amount of installation support to the contractor, or other important details. There has also been a shortage of good inspectors to monitor contractor performance. This lack of adequate inspection capability has occasionally required in-house laborers to correct mistakes made by the contract work force.9/

(c) This lack of expertise is also evident in the assignment of contracts to private firms. There have been cases where there were no competitive bids. Instead they were awarded to favored firms in violation of government regulations. Other related practices have tailored specifications to specific firms. Thus, the present method of writing and advertising contracts does not necessarily ensure that the military is having its work done at the lowest possible price.10/

(4) Recent developments. Still, faced with constraints on the size of its in-house work force, Defense planners continue to see contracting as the only means of satisfying the military's work requirements. Emphasis, therefore, has been placed on improving the contracting process, rather than relying on private contractors for a major portion of the military's work requirements.

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9/ DA, OCE, FESA, Lessons Learned in Contracting RPMA and DAF, Air U., Leadership and Mgt Dev Ctr, Contract Administration at the Installation Level. Pages 8-11.

10/ DN, HQ, Naval Audit Svc, Western Region, Administration of Service Contracts. Pages 5-16.

(a) The drive to contract military work shows no signs of abating. Major attention has been given to the periodic review of commercial, industrial, and other type activities, known as CITA, which intends to find new areas for contracting.[11/] Attempts to expand the level of contracting have also led to the suggestion of awarding larger, multifunctional contracts. Not only would such contracts involve less administrative overhead than a series of single-function contracts, but the size would attract larger, more reputable firms.[12/] This has surfaced the possibility of having an entire installation's RPMA, or even base operations, handled by one contractor. Such single firm managerial contracts have been tried at selected installations, the most notable being Vance Air Force Base, with some modest success.[13/]

(b) It cannot be said with certainty that the Defense establishment will realize substantial benefits from RPMA contracting, but one can at least state that contracting is currently one of the more important concerns of military Facility Engineers (FEs).[14/] Thus, a look at contracting by the Army, Navy, and Air Force in the Panama Canal Zone becomes a vital part of any study of the RPMA situation in the region.

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11/ DA, OCE, Dir of Mil Prog, Agenda: First Worldwide Real Property Management System Conference (29 April-4 May 1979). "Major Subject: Operations and Maintenance, Topic #17: Contracting Out RPMA."

12/ DA, OCE, FESA, Lessons Learned in Contracting RPMA.

13/ For an analysis of the experience at Vance see: Rand Corp, An Analysis of Methods of Base Support: Contractor Operations Versus Standard Operations at Two Undergraduate Pilot Training Bases.

14/ An example of the FE view of contracting can be obtained from DA, OCE, Dir of Mil Prog, After Action Report of the First Worldwide RPMS Conference, New Orleans, 30 April-4 May 1979. "Summary After Actions Report, Topic #17--Contracting of RPMA."

b. Current contracting.

(1) Figures D-1 and D-2 show each service's contracts for RPMA during FY 78. Figure D-1 shows the number of contracts while Figure D-2 presents their monetary value. The contracts are split between those which can be easily compared among the services, and "special" contracts, which could distort an interservice comparison. The special contracts include those RPMA responsibilities unique to the Navy (antenna maintenance, transportation, school bus transport), and a series of one-time only contracts made by the 193d Army Brigade with the Army Corps of Engineers for planning services. Contracts made with the Panama Canal Company (PCC), a government corporation under the control of the Secretary of the Army, are excluded from this comparison and are put instead in the following section on interservice support.

(2) Compared with the levels of interservice support (shown in paragraph 3 below), the total amount of private contracting by the military seems modest. Presently, the degree of military contracting in Panama seems to be a function of RPMA workload. The Navy, with the smallest workload among the military services, is responsible for roughly 80 percent of the expenditures on private contracts. Looking at the array of comparable functions, the Air Force, even though its mission responsibilities preclude the replacement of large numbers of military personnel, still manages to spend twice as much on the contracting of its RPMA requirements than the Army.

NUMBER OF CONTRACTS MADE IN THE CANAL ZONE, FY 78

| Functional Branch | Army | Air Force | Navy | Total |
|---|---|---|---|---|
| Miscellaneous Contracts | 15 | a/ | 5 | 20 |
| Administrative | 3 | 0 | 1 | 4 |
| Buildings and Structures | 4 | a/ | 18 | 22 |
| Land Management | 0 | 1 | 3 | 4 |
| Refrigeration and Air Conditioning | 0 | 1 | 3 | 4 |
| Electrical | 1 | 0 | 1 | 2 |
| Special | 7 | 0 | 7 | 14 |
| Total | 30 | a/ | 38 | 70 |

a/ Available data did not specify this category of contracting.

Figure D-1

(3) Only limited possibilities appear for expanding the level of private RPMA support to the military under the present method of single function contracting. The functions which are most easily done by contract involving large-scale, relatively simple tasks, have already been contracted. The Army could still contract its custodial and grounds maintenance responsibilities; in fact, the Army is already drawing up specifications for such contracts. The Navy, on the other hand, may have reached the point where contracting of additional functions would either cease to be cost effective or actually could impair their service missions.

VALUE OF PRIVATE CONTRACTING IN THE CANAL ZONE, FY 78
(1978 Dollars)

| Functional Branch | Army | Air Force | Navy | Total |
|---|---|---|---|---|
| Miscellaneous Contracts | | | | |
| Elevator Maintenance | 42,597 | 1,908 | 12,200 | 56,705 |
| All Others | 30,981 | 17,914 | 11,900 | 60,795 |
| Administrative | | | | |
| Engineering Services | 17,865 | -- | 9,200 | 27,065 |
| Building and Structures | | | | |
| Carpentry and Masonry | 36,394 | 15,150 | 69,614 | 121,158 |
| Custodial Services | -- | 67,029 | 74,245 | 141,274 |
| Painting | -- | 142,713 | 109,121 | 251,834 |
| Land Management | | | | |
| Grounds Maintenance | -- | 29,832 | 476,486 | 506,318 |
| Refrigeration | | | | |
| Air Conditioning | -- | -- | 138,691 | 138,691 |
| Electrical Maintenance | | | | |
| Electrical | -- | -- | 228,112 | 228,112 |
| Total | 127,837 | 274,546 | 1,129,569 | 1,531,952 |
| Special Contracts | | | | |
| Corps of Engineers Plans | 172,384 | -- | -- | 172,384 |
| Antenna Maintenance | -- | -- | 127,000 | 127,000 |
| Transportation | -- | -- | 11,700 | 11,700 |
| School Transportation | -- | -- | 1,321,530 | 1,321,530 |
| Total FY 78 Contractings | 300,221 | 274,546 | 2,589,799 | 3,164,566 |

Figure D-2

(4) The possibility presents itself for obtaining private RPMA support through the use of a single manager contract. With a single contractor directing RPMA, or even all base operations, the administrative costs of handling a number of single function contracts could be avoided. Although there have been a number of military bases that have had satisfactory results writing and overseeing a single management contract, these trials have been limited to primarily noncombatant installations located within the Continental United States. Thus, the use of such contracts in Panama could reveal new problems not previously dealt with.

c. Contracting and the Panama Canal Treaty. Appendix H-3 summarizes the impact that implementation of the Panama Canal Treaty will have on the operation of RPMA in Panama. The Treaty will also influence the ability to contract RPMA services. Contracting after implementation could become important in minimizing the disruptions of RPMA operations that will arise from transfers of real property and the resulting quantitative manpower changes.

(1) On 1 October 1979, the current PCC will be replaced by the Panama Canal Commission. This US organization will continue to manage the Canal operations, but will no longer be responsible for several support functions. This entails the transfer of all medical facilities, dependent schools, cemetery maintenance, and refuse collection to Army control. Although it is anticipated that the new commission will

continue to provide many services, the future remains uncertain. Any future reduction of service would force the services to find alternate solutions. Contracting would therefore be the link to future shifts in RPM support.

(2) Contracting and Treaty transfers. As noted in Appendix H-3, the amount of real property under the responsibility of the Army will shift substantially between FY 80 and FY 85. After initially acquiring enough property to induce a 50 percent increase in the Army's FE work force, the total amount of building space will decrease to below FY 79 levels. In order to avoid the disruptive effects that this radical change in RPMA workload requirements could have on the in-house work force, some maintenance functions could be contracted. If the Army's plans for contracting out refuse collection and custodial services are successful, 170 of the 400 new in-house personnel spaces that it requested would no longer have to be filled. If grounds maintenance, which will show an 88-worker increase at the implementation of the Treaty, were also performed by contract, then over half of the total requested personnel increase could be avoided.

(3) Wage rate. In recent years, the Canal Zone has been subject to the US Fair Labor Standards Act, which required American installations to pay their workers a wage based on the US Minimum Wage. This created a situation where Panamanians working for the US in the Canal Zone were paid a higher wage than that prevailing in the Republic of Panama. Although the dissolution of the Canal Zone now places American

installations outside the jurisdiction of US labor laws, there will not be an immediate change in the pay situation in Panama. The Panama Canal Act of 1979, passed by the US Congress, stipulates that the pay structure for Panamanian workers newly employed by the US will start with a base wage of $2.90, increases being limited to only 2 percent per year until it becomes comparable to the Panamanian wage level. Thus, it seems that the unit cost of in-house labor at US installations in Panama will remain higher than that of contract labor for some time to come.

d. Contracting the consolidation alternatives. Regardless of any consolidation decision, contracting is potentially a source of savings. With interservice cooperation, contract documents can be written that differentiate levels of services among the services for buildings, grounds, and other repair categories. Such differentiation allows the incorporation of several contracts into one at reduced administrative costs. The Army's current effort to contract refuse collection for the services is an example of a single contract. Similiar contracts could be attempted for custodial and grounds maintenance services. Additionally, contracts can be written to provide services for specific geographic areas. This type of contracting may be more beneficial if consolidation were to proceed under a dual manager concept.

(1) Single manager. If Canal Zone RPMA responsibilities are merged into a single organization, broad new opportunities for contracting should present themselves. The most obvious would be the hiring of

a single managerial contractor. The size of such a contract would be large enough to even attract bidders from the United States, should few suitable contractors be found in Panama. Additionally, the consolidation of RPMA would make those functions with workloads too small to attract contractors in the past, now large enough to make them desirable targets for contracting.

(2) Dual manager.

(a) The effect that a dual manager organization would have on contracting is more difficult to determine. The major opportunity offered to contracting by the single manager organization, the large scale of RPMA work, is of lesser magnitude under the dual manager system.

(b) If consolidation took the form of a dual manager organization, there would have to be a revising of the contract alignment in the Canal Zone. Unlike the singular manager structure, the possibilities of contracting functions will have to build on the current system. Some contracts may simply be continued, while other newly consolidated functions will require new contracts. A decision could also be made to bring a contracted function back in-house if manpower authorization can be increased. This is conceivable since the service making the most use of contracting, the Navy, will have all of its RPMA requirements totally performed by the Army and Air Force.

(c) Although the dual manager alternatives create many different contracting options, this approach is least desirable.

Contracts should be written to incorporate single functions, thus reducing administrative overhead.

e. Effect of contracting on management structure. There are mixed guidelines for staffing positions involved in contract administration. The result is that it is difficult to estimate the changes in staffing that should correspond to changes in contracting. RPMA contracting in Panama could change in several ways. The total contracting dollar value might change. Or at some fixed total dollar volume, the sizes of contracts might change--in particular, fewer but larger contracts might arise. And finally, the functions contracted may differ.

(1) Army contracts are issued by the Procurement Division of the Directorate of Industrial Operations, with assistance and advice of plans and specifications provided by the Engineering Services Branch of the Directorate of Facilities Engineering (DFAE). Part of the problem arises from the definition of contracts. Some reports[15/] claim that the Army does not differentiate between regular procurement contracts and those made for RPMA services. The claims may be exaggerated, but the staffing approach may tend to underestimate the special requirements of

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15/ DN, HQ, Naval Audit Svc, Western Region, Administration of Service Contracts.

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US ARMY, AIR FORCE, AND NAVY RPMA CONSOLIDATION IN PANAMA. A CO--ETC(U)
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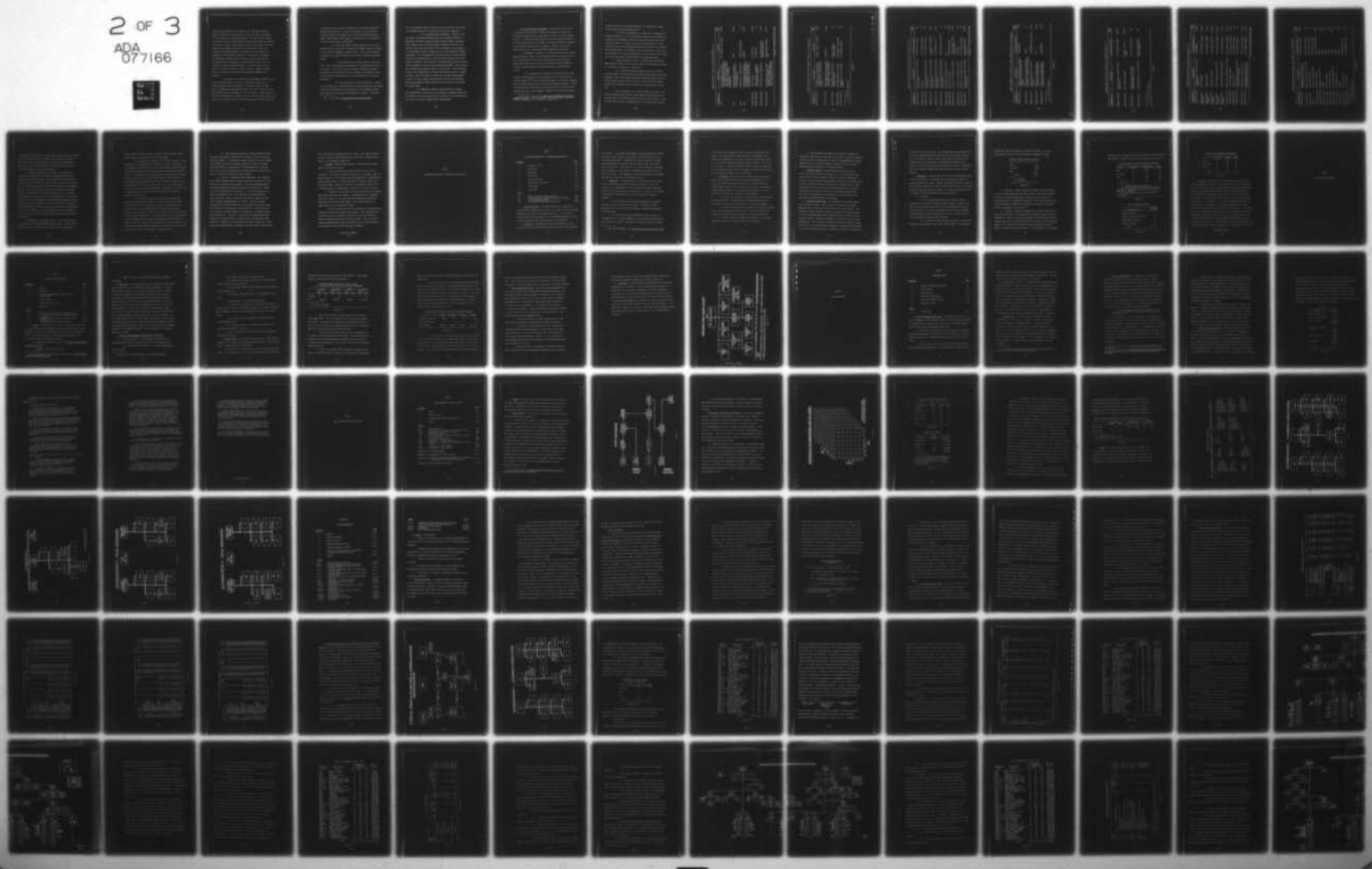

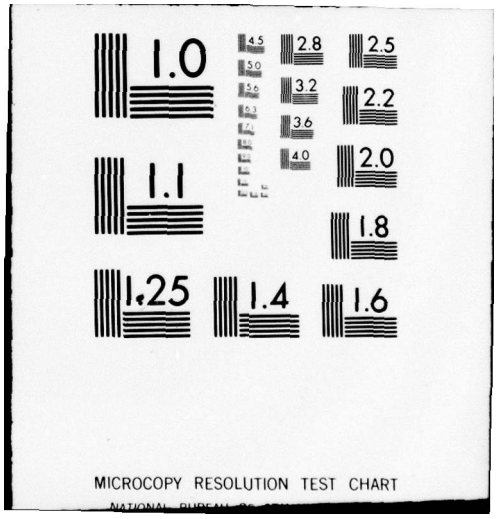
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MICROCOPY RESOLUTION TEST CHART

administering complex service contracts. The procurement staffing guideline expresses the requirement for people in terms of the number, not the difficulty of contracting actions. The related DFAE positions are staffed in accord with the dollar volume, not the number of contracting actions. Neither approach adjusts for the differences in difficulty among the same numbers of actions at the same dollar volume. The Construction Inspection Branch of the DFAE, as its name implies, is responsible for inspecting construction. That branch is responsible for inspection for RPMA services contracts. When the Construction Inspection Branch is overloaded, it may arrange for inspection to be performed by another competent element. The Construction Inspection Branch is staffed on the basis of dollar volume of completed projects without a clear distinction between construction and RPMA service contracts.

(2) Indeed, if one looks at the procurement staffing in the Canal Zone, there seems to be more of a qualitative evaluation of contract administration requirements. In the Army, there are eight people in procurement supporting the DFAE, rather than the nine that the Army Staffing Guide would suggest for its 30 contracts. Perhaps then, by looking at the procurement personnel levels in the Army (eight people), Air Force (six), and Navy (three), and comparing them with current Canal Zone

contracting, one may attempt an estimate of the staffing required for administering contracts. A guide to the number of on-site contract inspectors needed can be gained from the Army Facilities Engineering Support Agency (FESA), which suggests a ratio of one or two inspectors for every 100 contractor's laborers.16/

(3) Given these limited staffing guidelines for contract administration and inspection is possible to roughly estimate the effects of contracting on management personnel levels. Now one can determine the impact of the possible changes in Canal Zone contracting envisioned earlier.

(a) Contracting and the current method of operation (CMO). Most of the remaining opportunities for contracting exist only in the Army. If it were to contract custodial services and grounds maintenance on both sides of the Canal, probably one additional person would be needed in procurement, with two new inspectors of contractor performance.

(b) Contracting and the Panama Canal Treaty. Should the Army contract its expanded custodial, grounds maintenance, and refuse collection responsibilities, one addition to the Procurement Division and a total of four inspectors would probably be needed. If the RPMA

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16/ DA, OCE, FESA, Lessons Learned in Contracting RPMA.

work of the Hospital Support Division could be contracted, there would be an additional need for at least two more contract inspectors.

(c) Contracting and consolidation. Because of the wide range of contracting possibilities in a consolidated RPMA, the estimation of contract-induced personnel changes becomes a formidable task. However, since the single manager organization does have some qualities that can be anticipated, one can speculate to some degree on the relationship between its proposed uses of contracting and staffing requirements. If the organization continued the use of single function contracts, the consolidations of functions would initially reduce the number of contracts. This reduction in administrative workload, however, could be countered by many new contracting opportunities. Thus, procurement staffing would probably remain at current levels. This would also be true if all responsibility for Canal Zone RPMA was given to a single contractor, since the personnel required for the total administrative actions of a large, complex, multifunctional contract would probably counter any personnel savings derived from the reduction in the number of contracts made.

(4) Admittedly, these are rather imprecise estimates. This determination of the effect of contracting on management shows that wide shifts in the level of work done by contract will not vastly affect the size of the contract administration establishment.

3. Interservice Support Agreements. This section views the role of interservice RPMA support in Panama and examines FY 78 levels of interservice support among the Army, Navy, Air Force, and the government-owned PCC. In addition, future changes in the ISSA structure, whether by Treaty-induced factors or attempts to increase efficiency by encouraging functional specialization are explored. Finally, the part that ISSAs could play in a consolidated RPMA organization is assessed.

a. Background. Defined as the receipt of support from a fellow government agency, ISSAs, as an out-of-house source of support, have not been as controversial as the use of contracting. This is, perhaps, regrettable since the use of interservice support should be judged by the same cost-effectiveness criteria that private contracting must satisfy.

(1) Traditionally, the military's use of ISSAs was largely limited to agreements with local governments for fire protection and utilities support.[17/] With the search for methods of stretching resources, however, Defense planners saw a new role for interservice support. There was the possibility that military installations could tap excess service capacity from other Federal agencies. However, as the resource squeeze

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17/ DA, OCE, Army Study Gp, Real Property Management Activities--Issues and Options. "Contracting RPMA, Interservice Support Agreements (ISSAs), Consolidations" in Volume III, page III-7-5.

started to affect all government agencies, the likelihood of finding excess capacity became extremely remote.

(2) Another suggested use of ISSAs was to encourage functional specialization. If one installation became the sole supplier of a service to its neighbors, then some savings from economies of scale should be achieved. In order for functional specialization to work, especially in the case of maintenance and repair functions, the installations involved have to be relatively close to one another. Thus, with the situation of US military installations in Panama, the part that ISSAs can play in the delivery of RPMA services is potentially great.

b. Current alignment of ISSAs. The RPMA support agreements made between the Army, Navy, Air Force, and PCC in the Canal Zone during FY 78 are given in Figures D-3 through D-6.

(1) Interservice support among the military in Panama consists largely of facility rentals with maintenance support and utility purchases. Some trend towards functional specialization can be seen in the Air Force's provision of electricity to the Army, and the Army's provision of entomology support to American installations in the Canal Zone.

(2) By comparison, the support provided by the PCC to the military (see Figure D-6) covers a wider range of activities and is on a larger scale than the RPMA support given by the other services. Until 1 October 1979, the PCC is responsibile for fire protection and refuse

SUPPORT SUPPLIED BY ARMY 193d INFANTRY BRIGADE, FY 78

| Agreement No. | Description | Receiver | Cost ($) |
|---|---|---|---|
| 1-78 | Fire Protection, Utilities, Civil Engineering, Maintenance of Facilities, Minor Construction, Master Planning, Refuse, Entomology, Environment Construction | USA Tropical Test Center | 114,963 |
| 2-77 | Fire Protection, Custodial, Provide Repair and Utilities, Civil Engineering | USACC | 80,000 |
| 4-78 | Provide Secure Parking Space | Panama Area Engineer | a/ |
| 5-76 | Fire Protection, Utilities, Civil Engineering, Maintenance of Facilities, Entomology, Environmental Quality Control | USASAALA | 377,197 |
| WF6J42-76275-001 | Insect Control | US NAVSTA PC | 13,000 |
| WF6J42-76001-006 | Supply Support, Maintenance and Repair of Equipment | US NAVSTA PC | a/ |
| WF6J42-78213-008 | Utilities, Civil Engineering | Smithsonian Tropical Research Institute | 17,100 |
| WF6J42-75182-015 | Fire Protection, Civil Engineering, Maintenance of Facilities, Master Planning, Minor Construction, Entomology | Defense Mapping Agency, IAGS | 123,113 |

(Figure D-3 Continued on Next Page)

SUPPORT SUPPLIED BY ARMY 193d INFANTRY BRIGADE, FY 78--Continued

| Agreement No. | Description | Receiver | Cost ($) |
|---|---|---|---|
| WF6J42-76275-022 | Utilities, Civil Engineering, Building and Structure, Entomology, Refuse, Environmental Control | Defense Property Disposal | 6,333 |
| WF6J42-78182-032 | Galeta Island, Fire Protection, Civil Engineering, Maintenance and Repair, Trash Collection | USNAVSTA PC | 13,600 |
| WF6J42-77108-033 | Pump Station, Sewage Disposal (Common Service) | Federal Aviation Administration | a/ |
| WF6J42-76001-040 | Storage/Warehouse, Utilities | AF Geophysics Laboratory | a/ |
| WF6J42-77250-042 | Custodial, Utilities (Common Service) | 24th Composite Wing | a/ |

a/ Costs not submitted.

Figure D-3

SUPPORT SUPPLIED BY THE NAVAL STATION--PANAMA CANAL, FY 78

| Agreement No. | Description | Receiving Activity | Cost ($) |
|---|---|---|---|
| N66833-78269-215 | Facility use including maintenance and utilities | Panama Canal Company | a/ |
| N66833-75343-222 | Utilities | 193d Infantry Brigade | 100 |
| N66833-75350-223 | Facility use including maintenance and utilities | 193d Infantry Brigade | 300 |
| N66833-76245-229 | Facility use including maintenance and utilities | USA Program Development Group | 3,000 |
| N66833-78152-231 | Facility use including maintenance and utilities | 24th Composite Wing | 2,000 |
| N66833-76254-235 | Facility use including maintenance and utilities | USACC Agency--Canal Zone | a/ |
| N66833-77308-238 | Facility use including utilities | FAA | a/ |
| N66833-77347-239 | Motor Vehicle Repair | USMILGROUP Panama | 7,500 |
| N66833-78205-242 | Facility use including utilities | US Naval Branch Oceanographic Office | 2,200 |
| N66833-78261-243 | Facility use including utilities | US Embassy | a/ |
| N66833-78331-244 | Facility use including utilities | 193d Infantry Brigade | 680 |
| N66833-79005-01 | Facility use including maintenance and utilities | Naval Communications Station | 34,000 |

(Figure D-4 Continued on Next Page)

SUPPORT SUPPLIED BY THE NAVAL STATION--PANAMA CANAL, FY 78--Continued

| Agreement No. | Description | Receiving Activity | Cost ($) |
|---|---|---|---|
| N66833-79037-02 | Facility use including maintenance, utilities, motor vehicles, and housing | NAVFACENGCOM | 300 |
| N66833-79037-03 | Facility use including maintenance, utilities, and vehicle maintenance | NISRA | a/ |
| N66833-79037-04 | Facility maintenance and motor vehicles | NAVSECGRUAT Galeta Island | 19,600 |
| N66833-75329-221 | Facility use and maintenance, utilities, and motor vehicles | MSC | 5,000 |
| N66833-76120-227 | Facility use and maintenance, utilities, and motor vehicles | NAVFACENGCOM | 3,100 |

a/ Costs not submitted.

Figure D-4

SUPPORT SUPPLIED BY THE AIR FORCE 24th COMPOSITE WING, FY 78

| Agreement No. | Description | Receiving Activity | Cost ($) |
|---|---|---|---|
| FB4810-77334-406 | Utilities (Water, Sewage Disposal, Electricty) | 193d Infantry Brigade | 546,350 |
| FB4810-78187-433 | Golf Course Maintenance | US Naval Station--Panama | 88,135 |
| FB4810-76089-437 | Administrative Office Space, Housing/Lodging, Utilities | US Army Courier Service | a/ |
| FB4810-77308-405 | Housing/Lodging, Civil Engineering | Defense Mapping Agency, IAGS AF Elements | a/ |

a/ Costs not submitted.

Figure D-5

SUPPORT SUPPLIED BY THE PANAMA CANAL COMPANY, FY 78

| Agreement No. | Description | Receiving Activity | Cost ($) |
|---|---|---|---|
| 385680-77181-804 | Maintain Roads, Electrical Lines, Generators | NAVSECGRUACT | 72,000 |
| Memo of Understanding | Water Purchase | 193d Infantry Brigade | 431,342 |
| Memo of Understanding | Sewage Disposal | 193d Infantry Brigade | 18,217 |
| Memo of Understanding | Electricity Purchase | 193d Infantry Brigade | 5,753,972 |
| Memo of Understanding | Fire Prevention and Protection | 193d Infantry Brigade | 1,731,958 |
| Memo of Understanding | Refuse Collection and Disposal | 193d Infantry Brigade | 795,145 |
| License No. 5333 | Rental Space Building 1020 Cristobal | 193d Infantry Brigade | 1,298 |
| 385680-77255-801 | Pacific Sewage Disposal | 193d Infantry Brigade | 10,000 |
| 385680-77001-807 | Pollution Control | 193d Infantry Brigade | a/ |
| 385680-77039-803 | Firefighting/Crash Rescue Service (Canal Zone Government) | 193d Infantry Brigade | a/ |
| DAKF71-78-F-0214 | Hydrostatic Testing--Boilers | 193d Infantry Brigade | 1,440 |
| DAKF71-78-C-D105 | Maintenance and Repair of Air Conditioning for PDG Housing | 193d Infantry Brigade | 4,031 |

(Figure D-6 Continued on Next Page)

SUPPORT SUPPLIED BY THE PANAMA CANAL COMPANY, FY 78--Continued

| Agreement No. | Description | Receiving Activity | Cost ($) |
|---|---|---|---|
| DAKF71-78-M-2567 | Maintenance and Repair of Air Conditioning for PDG Housing | 193d Infantry Brigade | 1,251 |
| DAKF71-78-0513 | Chemical Analysis of Oil Samples | 193d Infantry Brigade | 200 |
| DAKF71-78-0513 | Repair Water Meters | 193d Infantry Brigade | 166 |
| A-0265 | Storage of Household Goods | 193d Infantry Brigade | 61 |
| DAKF-71-78-F-0109 | Railroad Maintenance | 193d Infantry Brigade | 22,812 |
| DAKF-71-78-F-0109 | Relamping Street Lights | NAVSTA | 500 |
| N62470-72-C-0937 | Garbage | NAVSTA | 96,000 |
| N62470-72-C-0937 | Visual Inspection | NAVSTA | 300 |
| N62470-72-C-0937 | Hydrostatic Testing | NAVSTA | 400 |
| N62470-72-C-0937 | Fire Prevention/Protection | NAVSTA | 261,200 |
| N62470-72-C-0937 | Intrastation Moves | NAVSTA | 500 |
| N62470-72-C-0937 | Malaria | NAVSTA | 3,200 |
| N62470-72-C-0937 | Refuse Collection | 24th Composite Wing | a/ |
| N62470-72-C-0937 | Fire Protection | 24th Composite Wing | a/ |

a/ Costs not submitted.

Figure D-6

collection in the Canal Zone. It also is the primary source of utilities for the military in the area. Finally, the PCC performs a number of smaller activities, like hydrostatic testing for US installations in the region. Thus, the PCC is clearly the greatest source of out-of-house RPMA support to the military in Panama.

c. ISSAs and the Panama Canal Treaty. When the PCC is dissolved on 1 October 1979, an important government source of RPMA support will potentially be lost. This support vacumm will be filled to some extent by the Republic of Panama, which will be paid to provide American installations with most of the services previously performed by the PCC. The PCC's sucessor, the Panama Canal Commission, will still provide fire protection to the military, while the Army will assume responsibility for refuse collection at US installations. Still, there are other forms of RPMA support, like inspections and chemical testing, which the military in Panama will have to receive from other sources. Since these support functions are on a small scale, and the military has little in-house capability to perform them, the loss will probably be made up by contracting, rather than by doing the activities in-house or through ISSAs.

d. Expansion of interservice support. This section looks at the possibility of expanding interservice RPMA support. The fact that RPMAs in Panama claim that ISSAs can be expanded to the point where

savings could be realized, similar to those arising from RPMA consolidation, makes such an analysis especially important.

(1) Looking at the current use of ISSAs in Panama, it seems unlikely that a large expansion of interservice support is possible. Fire protection and utilities, the functions typically provided by ISSAs, will still be obtained from sources outside of the military services in Panama. The possibility of encouraging functional specialization between the Army, Navy, and Air Force also seems limited; either some form of specialization has already occurred, with one service in the Canal Zone being responsible for a unique support function, or the in-house capability of the services has been weakened by contracting to the point that the support needs of the military in Panama could not possibly be satisfied by one service.

(2) There are, however, a few areas where functional specialization could be encouraged. The Army already provides some entomology support to the Navy and Air Force; it could expand this to the point where the two receiving services would no longer need to contract for pest control. Another function which the Army could specialize in is grounds maintenance. The low usage rates of the Army's grounds equipment suggests that the grounds maintenance shop only operates in short, intense work cycles, more so than forced by the rainy season. The provision of grounds maintenance support to the Navy and Air Force could ensure that the Army's shop operates at maximum capacity.

(3) Even the modest expansion of ISSAs outlined above may not prove more economic than the use of in-house or private contractor sources of support. If savings are actually realized from this expanded use of ISSAs, they could not possibly approach the level of savings anticipated from the consolidation of RPMA organizations in the long term. Thus, one must conclude that the opportunities for increasing the level of interservice support are rather limited.

e. ISSAs in a consolidated RPMA organization. The consolidation of RPMA responsibilities in Panama presents the problem of how the military will reimburse their supplier. This would be accomplished in the single manager RPMA organization proposed in Alternative 2 through the use of a revolving fund (see Annex G). In the dual manager structure of Alternatives 3 and 4, the best means of settling accounts involves the use of ISSAs. This would not radically change the interservice support responsibilities of the Army. The Army currently performs all of the direct RPMA work on the Atlantic side of the Canal, and 80 percent of the workload on the Pacific East. The Air Force, on the other hand, currently handles only 60 percent of the RPMA work done on the Pacific West. Therefore, if the Air Force assumes RPMA responsibility for the Pacific West, they would have to increase their RPMA capability. Similarly, the Army organization would be modified to accommodate the changed workload. Obviously, this would involve a much heavier

use of ISSAs than is presently the case. Still, on the whole, it seems that the increase in ISSAs brought about from an RPMA consolidation will prove to be of manageable proportions.

4. Overview. RPMA in Panama appears to be approaching the upper limits of out-of-house support.

a. Only the Army has any large functions that can still be contracted. The Navy has contracted as much as one can expect, while the special mission of the Air Force constrains expansion of contracting much beyond current levels. If private firms were to assume a larger share of military RPMA, a change in the method of contracting, namely the use of multifunctional or single manager contracts, will have to be made.

b. Because of the proximity of military installations in Panama, ISSAs have already been used heavily. The opportunities for expanding interservice support to encourage functional specialization among the Army, Navy, and Air Force seem limited. Only modest savings can be expected from the use of additional ISSAs.

c. Thus, one finds that most of the benefits of contracting and interservice support have already been realized. This conclusion gains credibility with the recognition that the drive to tap out-of-house sources of support has gone on for almost a decade. Thus, the time is rapidly approaching where either new methods of out-of-house support or other methods to stretch RPMA resources are required.

LAST PAGE OF ANNEX D

# ANNEX E

## MAINTENANCE AND REPAIR OF ADMINISTRATIVE VEHICLES

ANNEX E

MAINTENANCE AND REPAIR OF ADMINISTRATIVE VEHICLES


| Paragraph | | Page |
|---|---|---|
| 1 | Purpose and Scope | E-1 |
| 2 | Definition | E-1 |
| 3 | Background | E-2 |
| 4 | Constraints | E-3 |
| 5 | Ancillary Support | E-4 |
| 6 | Alternatives Considered | E-4 |
| 7 | Methodology | E-5 |
| 8 | Conclusion | E-8 |

| Figure | | |
|---|---|---|
| E-1 | Number of General Purpose Vehicles | E-6 |
| E-2 | CMO Administrative Vehicle Maintenance Personnel | E-7 |
| E-3 | Army Maintenance Division | E-7 |
| E-4 | Consolidated Maintenance Requirements | E-8 |


1. Purpose and Scope. This annex analyzes the feasibility of consolidating the maintenance and repair of all Army, Air Force, and Navy administrative vehicles in the Panama Canal area. It compares the current operations with estimates for a consolidated operation in order to gauge savings potential and feasibility of consolidation.

2. Definition. Maintenance and repair are defined to include those major actions requiring skills beyond those of the operator/motor

pool mechanic. The organizational mechanic (Army terminology) is limited to general vehicle tune-ups, lubrications, and other minor work (e.g., drive shaft replacement). Maintenance and repair, therefore, includes engine/transmission replacement, body and fender repair, and engine/power train rebuild. This phase does not include replacement programing, vehicle dispatch, or the transfer of administrative vehicles from one service to another. The management functions required beyond maintenance and repair are retained by the individual services.

3. Background. The general area of the Pacific Canal Zone operations is much smaller than many stateside installations. This has resulted in the implementation of many Interservice Support Agreements (ISSAs) that have reduced manpower requirements. In effect, the US forces in Panama have consolidated parts of their operations in order to economize.

a. The Army performs special purpose/construction equipment maintenance for both the Air Force and Navy. Although the savings generated from this consolidation are unknown, the benefits outweighed any disadvantages.

b. The US Southern Command (USSOUTHCOM) tasked the Army on 5 September 1978 to study the feasibility of consolidating administrative-use vehicle motor pools.[1/] This study concluded that it may be feasible

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1/ DOD, JCS, USSOUTHCOM, Ltr, Administrative Use Vehicle Motor Pools.

to consolidate and recommended further study by an independent study agency. The command wanted to have one service responsible for the organizational components (procurement, dispatch, maintenance, repair, etc.) of all administrative-use general purpose vehicles. Not all the services agreed. Opponents stated that functions would be fragmented, there would be underutilization of personnel, and the service's procurement and funding procedures were too dissimilar.

4. Constraints. The full scope of transportation consolidation actions was not considered when developing data requirements. As a result, ESC requested information only on real property maintenance activity (RPMA) vehicles rather than for the entire US forces administrative vehicle population. Several other data submittals, however, provided sufficient basis to estimate the missing data.

a. The Army data submittal included the Table of Distribution and Allowances (TDA). This provided the staffing authorizations for maintenance and repair and the entire list of authorized equipment.

b. The Air Force submitted a computerized listing that provided their current, on-board personnel manning. This list enabled ESC to compute the estimated man-years expended for maintenance and repair.

c. The Navy submittals provided the staffing for their Transportation Division and a complete listing of all equipment.

d. These documents and others, as discussed in Appendix C-2, provided the basic data for this phase of the study. Since all equipment-related data were not requested, the analysis of administrative vehicles depended in part on indirect evidence to estimate the total number of administrative-use vehicles and the repair workload.

5. Ancillary Support. Normal maintenance operations require several ancillary activities for support (i.e., tire and battery shops, bench stocks, and tools required to perform the overall maintenance mission). Tire and battery shops primarily support motor pool operations and may be operated by either the maintenance or supply offices. Bench stocks and tools are found at both the organizational level and above. The Engineer Studies Center (ESC) did not specifically address these functions, but maintains that consolidation of tire and battery shop operations provides another area for savings.

6. Alternatives Considered. ESC considered four different maintenance and repair options. These ranged from creating a new, single manager system to having each service perform the entire function. The preliminary results indicated that all alternatives would produce significant Base Operating Support (BOS) fragmentation and, therefore, reduce potential savings. Therefore, ESC sought the alternative with the least fragmentation. Since the Army's maintenance personnel strength is larger than either of the other services, fragmentation losses would be maximized if the Army's administrative vehicle maintenance mission were transferred

to either the Air Force or Navy. ESC concluded that consolidation under the Army's existing maintenance structure would be the better approach for the short term. Ideally a hybrid system should be developed that incorporates the best maintenance and management procedures of each service. This long-term optimization coupled with total BOS standardization would eliminate fragmentation and provide greater future savings DOD-wide.

7. Methodology. As noted above, ESC first underestimated the scope of this study phase and consequently did not specifically request all related equipment data needed. However, the general information requested and received provided most of the data directly and served as a sufficient basis for estimating the missing pieces. The sources and processes used to assemble the needed information are described below.

a. Vehicles.

(1) ESC reviewed detailed vehicle listings in order to determine the total number of general purpose vehicles in Panama. The Army's total administrative vehicle to Facility Engineer (FE) vehicle ratio was 6.2125. This ratio was assumed for the Air Force, yielding an estimated 232 Air Force administrative vehicles. Figure E-1 shows the total number of general purpose vehicles.

(2) The Army's current maintenance procedures use the same mechanics for administrative and combat vehicle repair. This requires

including the 548 combat vehicles in workload estimates. Thus, the overall vehicle total for this consolidation alternative is 1,468.

| NUMBER OF GENERAL PURPOSE VEHICLES | |
|---|---|
| Army | 476 |
| Air Force | 232[a/] |
| Navy | 212 |
| Total | 920 |

a/ Estimated.

Figure E-1

b. Personnel. Service submittals provided a postional breakout of the entire maintenance and repair mission. These data portrayed the number of laborers/supervisors in repair sections as well as the overhead personnel for command and management. ESC's analysis identified the total personnel involved in the maintenance and repair function as defined in paragraph 2 (see Figure E-2).

c. Staffing. ESC had to determine the increased workload from the Air Force and Navy's 444 vehicles with consolidation under the Army's organization. Based on current Army staffing, these additional vehicles indicate that, on the average, 85 additional job orders would be generated annually. This equates to an additional eight maintenance personnel. Similar calculations produce an increase of five personnel for the complete

overhaul section. Figure E-3 shows the increase in Army staffing for this scenario. Figure E-4 shows the net savings that would result.

CMO ADMINISTRATIVE VEHICLE MAINTENANCE PERSONNEL

| Service | Overhead | Laborers[a] | Total |
|---|---|---|---|
| Army | 24 | 20[b] | 44 |
| Air Force | 24 | 16 | 40 |
| Navy | 1 | 9[c] | 10 |
| Total | 49 | 45 | 94 |

a/ Includes first-line supervisors.
b/ Figure represents 46 percent of total Army mechanics. Remaining personnel are combat vehicle maintenance personnel.
c/ Personnel perform all required vehicle maintenance.

Figure E-2

ARMY MAINTENANCE DIVISION

| Branch/Section | Staffing Increase |
|---|---|
| Quality Assurance | 1 |
| Production Plans and Control | 2 |
| Combat/Wheeled Vehicle | 8 |
| Complete Overhaul | 5 |
| Total | 16 |

Figure E-3

CONSOLIDATED MAINTENANCE REQUIREMENTS

| | Current | Change | Total |
|---|---|---|---|
| Army | 44 | +16 | 60 |
| Air Force | 40 | -20 | 20 |
| Navy | 10 | - 3 | 7 |
| Total | 94 | -7 | 87 |

Figure E-4

8. Conclusion. With allowance for some uncertainty introduced in the data estimation process, ESC considers consolidation of maintenance, repair, and ancillary support of administrative-use vehicles as feasible and likely to produce enough savings to make consolidation desirable. Such consolidation is desirable as an adjunct to the current Army metho', as an adjunct to an RPMA consolidation based on the current Army method of execution, or as one part of a total BOS consolidation based on the Army method of a combination of the best BOS features from all three services. ESC favors the last alternative in the long run. In the short run, any of several steps can be taken to match the handling of vehicle maintenance and repair to what may become an orderly progression from the current RPMA-BOS system to first an RPMA consolidation and finally a total BOS consolidation. (Consolidations in the broader sense and their possible evolutionary courses are discussed in the Main Paper, Volume I.)

LAST PAGE OF ANNEX E

# ANNEX F

# FAMILY HOUSING MANAGEMENT

ANNEX F

FAMILY HOUSING MANAGEMENT


| Paragraph | | Page |
|---|---|---|
| 1 | Purpose | F-1 |
| 2 | Background | F-2 |
| 3 | Family Housing Management Consolidation Study (1977) | F-2 |
| 4 | Study Critique | F-3 |
| 5 | RPMA Consolidation Impact | F-6 |
| 6 | Conclusions | F-7 |

| Figure | | |
|---|---|---|
| F-1 | Current Personnel Strength and Annual Salary Cost for Canal Zone Military Family Housing Management | F-4 |
| F-2 | Savings from Consolidation of Family Housing Management | F-5 |
| F-3 | Consolidated Family Housing Division | F-8 |


1. Purpose. The purpose of this annex is to consider the need for including family housing management within a consolidated real property maintenance activity (RPMA) organization. The question of need is two-sided. Is inclusion necessary to family housing management? Is it necessary to RPMA? Specifically, this annex:

a. Summarizes the findings of the 1977 Family Housing Management Consolidation Study.1/

b. Comments on that study's findings.

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1/ DA, USAFORSCOM, 193d Inf Bde (CZ), Dir of Ind Op, Family Housing Management Consolidation Study.

c. Judges the need to incorporate family housing management within RPMA.

2. Background. The Army Audit Agency (AA) concluded in August 1976 that DOD family housing in Panama was a possible candidate for consolidation among the services. As a result, the Deputy Assistant Secretary of Defense (Installations and Housing) directed the Army to study the feasibility of consolidating all DOD family housing operations in the Panama Canal Zone. The Director of Industrial Operations, 193d Infantry Brigade was the lead study agent with members of both the Air Force and Navy participating. Despite Air Force and Navy participation, those services tend to regard the study's results as a unilateral Army declaration. This annex does nothing to resolve that interservice problem. It first summarizes the results of that study, then comments on those results, and finally judges the need for incorporating housing management within a consolidated RPMA organization. Note that the discussion is about housing management, not housing maintenance. Housing maintenance is an already agreed part of RPMA.

3. Family Housing Management Consolidation Study (1977).

a. Study conclusions. The referenced study concluded that consolidation was feasible. The study found that consolidation would:

(1) Save $129,291[2/] annually with a one-time implementation cost of $59,860.

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2/ Math error in original study. Corrected from $125,551.

(2) Reduce total personnel by eight spaces.

(3) Maximize utilization of personnel by better planning of work schedules and reducing travel.

(4) Standardize family housing eligibility and assignments for all DOD personnel.

(5) Decrease procurement costs in a consolidated organization.

b. Recommendations. The study recommended that:

(1) DOD direct the services to consolidate their Family Housing Offices and that a standardized eligibility criterion, eligibility date, assignment procedure, and organizational staffing plan be implemented.

(2) The Air Force be responsible for the Consolidated Family Housing Division.

(3) A study be made to investigate the feasibility of consolidating all RPMA in the Canal.

c. Figure F-1 displays the current salary cost and personnel distribution by service.

4. Study Critique. The referenced study provided a comprehensive analysis of the current family housing management systems. Several items, however, require additional clarification.

a. The Army is the only service to have an Organic Engineering Office. The requirement for this office is questionable since long-range

planning and project scoping should be an RPMA function. These duties should be transferred to the RPMA organization.

CURRENT PERSONNEL STRENGTH AND ANNUAL SALARY COST FOR CANAL ZONE MILITARY FAMILY HOUSING MANAGEMENT[a/]

| | Army | | Air Force | | Navy | | Total | |
|---|---|---|---|---|---|---|---|---|
| | Over-head | Direct | Over-head | Direct | Over-head | Direct | Over-head | Direct |
| Strength | 2 | 53 | 2 | 28 | 1 | 2 | 5 | 83 |
| Cost | $500,225 | | $288,322 | | $42,643 | | $831,194 | |

a/ In 1977 dollars.

Figure F-1

b. Each service received utilities support from the Panama Canal Company (PCC). The rates charged by each service are determined by the RPMA. The averages per residence vary considerably (electricity rates are within 3 percent, but sewage varies by as much as 450 percent). These rates should be reviewed and probably revised.

c. The Furnishing Management Office should be responsible for all aspects of housing furniture and appliances. This would require the transfer of all furnishings management (including bachelor housing) to a consolidated Housing Division. That office would provide the requisite budgeting services.

d. Pressures for family housing management consolidation seem driven by two primary motives. The first is to save money and personnel

spaces. The second is to assure "equitable housing," a quality of life (QOL) issue.

(1) Though subject to the usual uncertainties and disagreements, the projection of savings is a reasonably well-developed art and science with a quantified baseline. The 1977 study emphasizes the savings achievable and seems to have done a sound job in that regard. Just which spaces and faces would be saved (i.e., disappear) would be determined during implementation planning and at implementation time. However, if the savings were simply in proportion to current strengths, then the savings would be as shown in Figure F-2.

SAVINGS FROM CONSOLIDATION OF FAMILY HOUSING MANAGEMENT

| | Army | Air Force | Navy | Total |
|---|---|---|---|---|
| Current Percent CMO | 60.2 | 34.7 | 5.1 | 100 |
| Personnel Savings | 5 | 2 | 1 | 8 |
| Cost Savings | $77,833 | $44,864 | $6,594 | $129,291 |

Figure F-2

(2) The QOL issue is much less clear. The services and DOD seem to have different ideas about standards and equity. The Air Force seems proud of its housing program in Panama and claims to be achieving more with less. Some Army people do seem a little jealous of non-Army housing. It was obvious to the Engineer Studies Center (ESC) team that

there is some emotion involved and that ESC had not been asked to resolve that. It was clear too that the services might choose to define things differently. ESC's only comment here is that equity need not mean identity.

5. RPMA Consolidation Impact. The family housing management issue is at most incidental to the broader RPMA consolidation question. Consolidation of family housing management is feasible, but, if and when such consolidation does occur, it is not necessary that the element be incorporated within a consolidated single-manager RPMA organization, if and when that is implemented. It is feasible but not necessary to incorporate the element. Under a dual-manager consolidation of RPMA, it is not even clear what it would mean to incorporate a single, consolidated Family Housing Management Office.

a. The savings achievable from RPMA consolidation and from family housing maintenance consolidation seem largely independent.

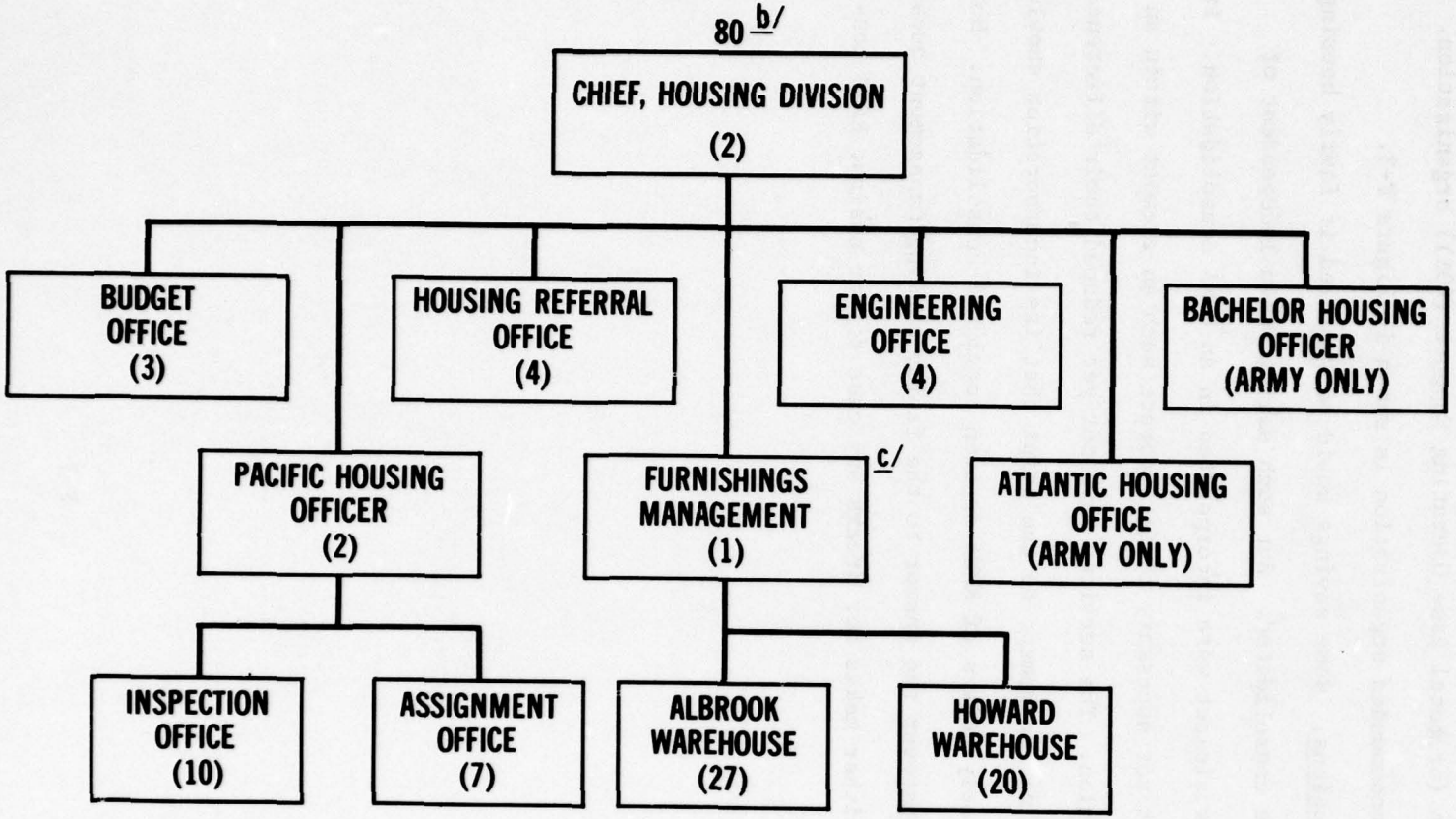
b. Most agencies, including DOD, feel that a prerequisite of consolidated family housing management is to have the services reduce their differences. As yet, such differences have not been reduced to the point that such consolidation is likely. It is not necessary to hold up RPMA consolidation until consolidation of family housing management is achieved, if at all.

c. On the other hand, if incorporation is directed sooner or later, then the 1977 study's recommended organization can be included

within the RPMA (or total Base Operating Support (BOS)) organization. That study's recommended organization is shown in Figure F-3.

6. Conclusions. Some savings would be realized if family housing management were consolidated. But such savings seem independent of whether the new element were incorporated in an RPMA consolidation. It is feasible but not necessary to incorporate such an element within an RPMA consolidation. The services have not yet reduced their differences in family housing management to the point that its incorporation should occur in the early phases of RPMA or even total BOS consolidation. Most importantly, whatever the answer to the family housing management question, such answer neither makes nor breaks any case for or against RPMS consolidation.

# CONSOLIDATED FAMILY HOUSING DIVISION [a/]




[a/] Extracted from: DA, USAFORSCOM, 193d Inf Bde (CZ), Dir of Ind Op, Family Housing Management Consolidation Study.

[b/] Does not include the bachelor or Atlantic housing offices. These are staffed according to the current method.

[c/] Chief, Furnishings Management located at Howard Air Force Base.

Figure F-3

# ANNEX G

# REVOLVING FUNDS

ANNEX G

REVOLVING FUNDS


| Paragraph | | Page |
|---|---|---|
| 1 | Types of Working Capital Funds | G-1 |
| 2 | How It Works | G-2 |
| 3 | Major Features | G-2 |
| 4 | Objectives and Benefits | G-3 |
| 5 | Spaces for Administering IF | G-4 |
| 6 | Objectives of IFs | G-6 |

| Figure | | |
|---|---|---|
| G-1 | IF Staffing | G-5 |


1. Types of Working Capital Funds. The National Security Act of 1947, as amended in 1949, provided authority for the Secretary of Defense to establish working capital funds. The two types of working capital funds are stock funds and industrial funds (IFs).

a. Stock funds are intended for the acquisition of consumable materials and supplies for resale to the military services. They also finance inventories of consumable material for use in case of mobilization.

b. IFs are used to finance activities performing commercial- and industrial-type functions on a reimbursable basis. These functions

generally produce a service as opposed to a specific commodity. IFs are the type that finance operation and maintenance of facilities. For this reason, IFs are of particular interest in this report.

2. How It Works. The IF is a "revolving fund" capitalized by a one-time appropriation.[1/] Theoretically, it has no loss or profit and is not subject to quarterly or annual limitations. IFs are intended to create a buyer-seller relationship for the transfer of a product or service at cost. It is basically an accounting system that tracks direct costs, operating overhead, and administrative overhead. It presently excludes costs of military pay, depreciation, and material classified as government furnished. Appropriated funds are used to reimburse the buyer of services. Statutory limitations or restrictions on expenditures of appropriated funds apply also to expenditures made under IF operations.

3. Major Feature. The major feature of industrial funding is identification of "true" cost of a product or service. This requires extensive budgeting and accounting control. The budgets normally required are: expense, capital items, procurement, production, and financial. It should be noted that "true" cost could also be identified under other funding. Appropriate accounting procedures must be established to support all of the budgets. This is in addition to the appropriation budgeting and accounting which ordering agencies still have to maintain.

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1/ In reality, additional appropriations are required from time-to-time due to imperfections or plant expansion.

4. Objectives and Benefits. Paragraph 6 lists IF objectives identified in DOD Directive 7410.4[2/] and AR 37-110.[3/] A careful study of the objectives reveals that most stem from the cost accounting procedures inherent in the system. Such objectives cannot be considered as benefits resulting from implementing the IF concept as they are not unique to industrial funding. The accounting procedures apply to any management framework such as that provided by appropriation funding. The cost accounting advantages, therefore, should not be considered as justification for the establishment of industrial funding. This fact is recognized in AR 37-110 by the following statement:

> ...The establishment of an improved accounting system is not itself a purpose justifying the installation of an industrial fund....

a. One benefit of industrial funding is the incentives it creates from splitting resource control between the IF manager and the installation commander. The IF manager has primary control of personnel and the resources for accomplishing work. The commander has control of funds and primary responsibility for determining work priorities. Thus, a buyer-seller relationship exists where the commander is motivated to prioritize work properly and the IF manager is motivated to use resources efficiently.

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2/ DOD Directive 7410.4, Regulations Governing Industrial Fund Operations.

3/ DA, HQ, AR 37-110, Financial Administration--Accounting, Reporting, and Responsibilities for Industrial Funded Installations and Activities.

b. Another benefit of industrial funding is the flexibility it gives the IF manager at the installation or IF activity level to trade off resources (i.e., in-house personnel and contractor personnel). It also affords flexibility to higher than operation-level IF managers to balance the personnel workload among IF activities. It should be noted, however, that flexibility in using personnel is restrained by manpower limitations and civilian personnel regulations just as other management alignments are similarly restrained.

c. Another benefit of industrial funding is its inherent capability for accommodating consolidation actions to bring about economies of scale. It lends itself to solving host-tenant problems by creating an independent activity that owes no more allegiance to one command than another. The consolidation benefit is not, however, automatic with industrial funding; it is also a function of the size and proximity of those entities (installations) under consideration for consolidation.

5. Spaces for Administering IF. Extensive budgeting and accounting control in itself consumes resources. In general, implementing industrial funding may be expected to require additional comptroller spaces. The structure developed by the Civil Engineering Research Laboratory (CERL) and the Naval Facilities Engineering Command for possible real property maintenance activity (RPMA) consolidation at Fort Bragg-Pope Air Force Base added 19 spaces to the Comptroller's Office in order to administer industrial funding. CERL's data for the Fort Bragg-Pope Air Force Base

list show an annual total of 91,237 work authorization documents. The data submitted by the three services in Panama show 97,644 work authorization documents for FY 78. Assuming that such documents provide a satisfactory measure of part of the Comptroller workload, the Engineer Studies Center (ESC) estimates that nine spaces must be added to current Comptroller strength in Panama in order to administer an RPMA revolving fund under the single manager concept (Alternative 2). Figure G-1 includes these spaces in the staffing design for Alternative 2.

IF STAFFING

| Office | Staff |
|---|---|
| General Ledger Branch | 1 GS-09 |
| Plant Accounting Branch | 1 GS-05 |
| Accounts Payable | 1 GS-06<br>1 GS-05<br>2 GS-04 |
| Funds Control/Billing Branch | 1 GS-06<br>1 GS-05<br>2 GS-04 |
| Budget Division | 2 GS-09<br>1 GS-05 |
| Cost Division | 1 GS-11<br>5 GS-04 |
| Total | 19 |

Figure G-1

6. Objectives of IFs. DOD Directive 7410.4 shows the following objectives of IFs:

Industrial funds are designed to:

Provide a more effective means for controlling the costs of goods and services required to be produced or furnished by industrial and commercial-type activities, and a more effective and flexible means for financing, budgeting, and accounting for the costs thereof;

Create and recognize contractual relationships between industrial and commercial-type activities and those activities which budget for and order the end-products or services, in order to provide management advantages and incentives for efficiency and economy;

Provide to managers of industrial and commercial-type activities the financial authority and flexibility required to procure and use manpower, materials and other resources effectively;

Encourage more cross-servicing among the Military Departments and among their operating agencies, with the aim of obtaining more economical use of facilities;

Support the performance budgeting concept by facilitating budgeting and reporting for the costs of end-products, and thus underlining the cost consequences of decisionmaking, including choices between alternatives in such terms.

Specific objectives, when industrial funds are used, include the following:

To furnish managers of industrial and commercial-type activities with modern management tools comparable to those utilized by efficient private enterprises engaged in similar types of activities.

To provide an incentive for managers of industrial fund activities to improve cost estimating and cost control through use of cost standards by requiring a contractual relationship between producer and ordering agencies;

Require alert, forward-looking financial planning at industrial and commercial-type activities by making them dependent financially on reimbursements received for goods and services furnished in fulfilling orders from customers;

Impel producers of goods and services to coordinate labor force and inventories with workload generated. It is recognized that statutory and executive restrictions on the levels of employment and the additions or reductions of personnel frequently limit flexibility and make difficult effective control over employment in relation to workload. However, producers must avoid the tendency to maintain a labor force without regard to workload levels, taking into consideration the balancing of skills to meet the long term anticipated workload;

To coordinate the financial aspects of detailed estimating and planning for job performance in terms of material requirements and labor operations, production scheduling and control, and procurement and inventory control, with budgeting and cost control;

To establish and use realistic cost standards as targets rather than detailed cost limitations;

Require ordering agencies to budget, control and account for the cost of all goods and services ordered, rather than allow them to obtain goods and services free or at non-compensatory rates. This requirement is designed to instill in the officials of these agencies a greater sense of responsibility and self-restraint in limiting their orders, and balancing the cost specific goods and services to be ordered against the benefits and advantages of their procurement, especially in the light of alternative or competing demands;

To place ordering agencies in the position of critic of purchase prices (i.e., costs of performing activities) as well as quality and delivery-speed of the goods and services ordered in consideration of relative costs of similar performing activities and outside agencies;

Provide meaningful bills to ordering agencies, clearly relating the goods and services furnished by a performing activity to the charges rendered, causing the ordering agencies to assess their procurement practices and specifications in full awareness of the costs involved;

Enable ordering agencies to budget and account on an "end-product" basis (the same as when buying from commercial contractors), simplifying budget presentations, budgetary control, and accounting procedures for both producers and ordering agencies;

To establish, wherever feasible, predetermined prices (tariff schedules, price lists, fixed-price orders) for goods and services furnished by industrial fund activities, thus setting standard prices on performance and enabling ordering agencies to plan and budget more confidently;

To encourage management or ordering agencies to improve program planning and scheduling, in response to producers' efforts to negotiate for orders as far in advance as possible.

LAST PAGE OF ANNEX G

# ANNEX H

# STUDY PROCEDURE AND ANALYSIS TRAIL

ANNEX H

STUDY PROCEDURE AND ANALYSIS TRAIL


| Paragraph | | Page |
|---|---|---|
| 1 | Purpose | H-2 |
| 2 | Study Procedure | H-2 |
| 3 | Conceptual Consolidation Alternatives | H-4 |
| 4 | Summary | H-8 |

Figure

| | | |
|---|---|---|
| H-1 | Study Procedure | H-3 |
| H-2 | Opportunities for Nonrecurring Shops by Service | H-5 |
| H-3 | Percentage of Facilities by Service | H-6 |
| H-4 | Workload by Region | H-6 |
| H-5 | Annual Vehicular Transportation Hours Per Service to Cross Canal | H-8 |
| H-6 | Comparison of Alternatives | H-9 |
| H-7 | Alternative 1--Current Structure | H-10 |
| H-8 | Alternative 2--Shared Control Linked by Revolving Fund | H-11 |
| H-9 | Alternative 3--Dual Manager | H-12 |
| H-10 | Alternative 4--Dual Manager | H-13 |

APPENDIX H-1--STAFFING PROCEDURE H-1-1

APPENDIX H-2--DEVELOPMENT OF SUPPORT TO RPMA H-2-1

APPENDIX H-3--INTEGRATION OF FINDINGS BEARING ON THE FEASIBILITY AND DESIRABILITY OF RPMA CONSOLIDATION H-3-1

APPENDIX H-4--ONE-TIME COSTS AND SAVINGS H-4-1

1. Purpose. This annex and its appendixes describe in detail how the study team produced the consolidation alternatives and the criteria that led to the Engineer Studies Center's (ESC's) final conclusion on real property maintenance activity (RPMA) consolidation feasibility.

2. Study Procedure. The study was accomplished in two major phases with the tasks shown in Figure H-1.

a. The first phase consisted of identifying consolidation concepts and testing them to determine if any were applicable to RPMA consolidation in Panama. The tests were performed by applying appropriate staffing procedures to the organizational structures developed for this consolidation study. Two of the proposed alternatives have the standard structure as prescribed in AR 420-10[1/] and the Army Staffing Guide. Alternative 1, the current method of operation (CMO), reflects the current organizational structures of the three services now operating in Panama. The final structure considered in this study follows the current structure of each service proposed as an area RPMA manager. The CMO of each service was standardized to Army staffing levels to enable a comparison of the different personnel requirements among the services. These alternatives were compared to both the CMO and the standardized CMO to portray potential economic savings.

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1/ DA, HQ, AR 420-10, Facilities Engineering--General Provisions, Organization, Functions, and Personnel.

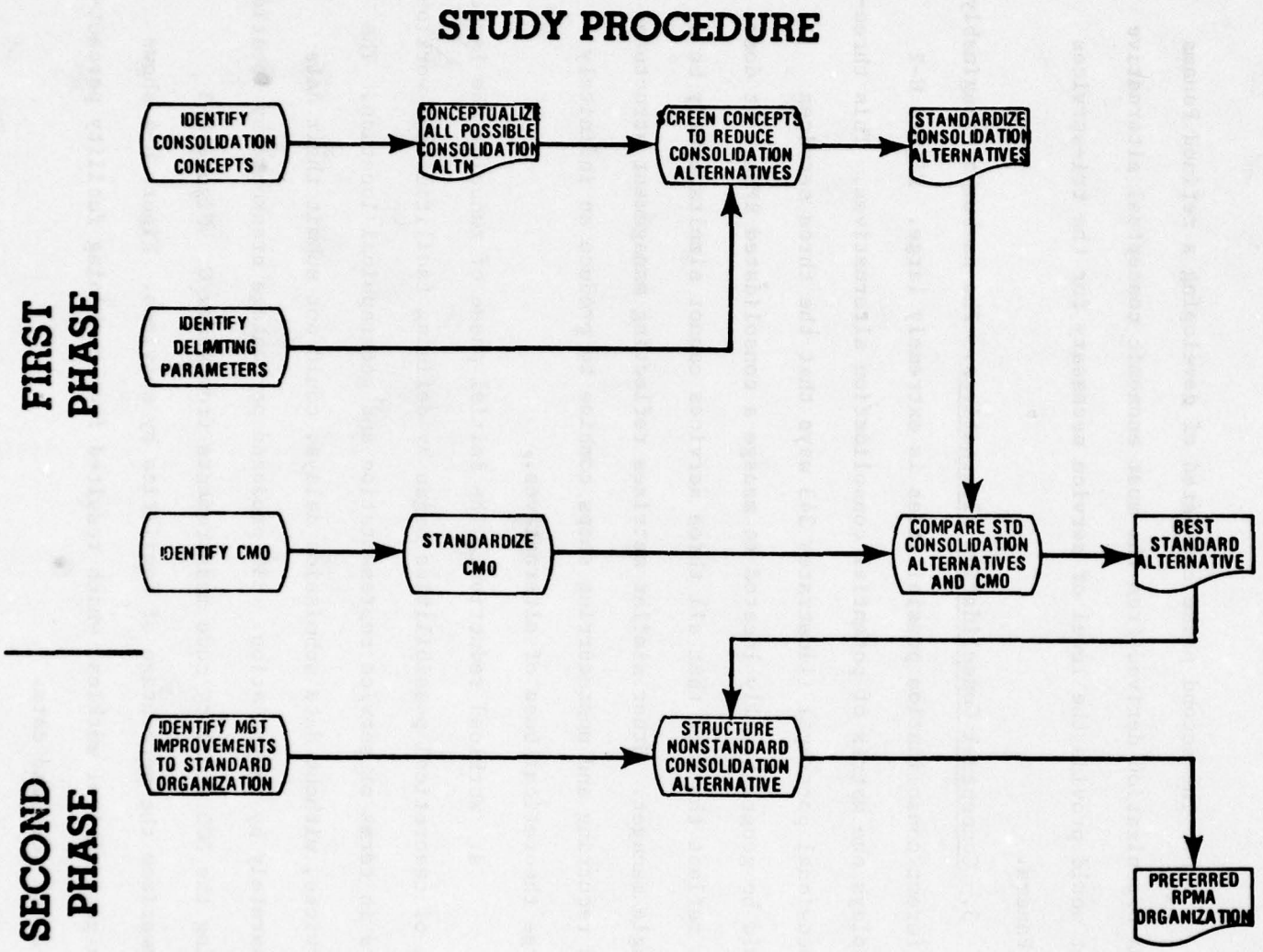

STUDY PROCEDURE
FIRST PHASE
IDENTIFY CONSOLIDATION CONCEPTS
CONCEPTUALIZE ALL POSSIBLE CONSOLIDATION ALTN
SCREEN CONCEPTS TO REDUCE CONSOLIDATION ALTERNATIVES
STANDARDIZE CONSOLIDATION ALTERNATIVES
IDENTIFY DELIMITING PARAMETERS
IDENTIFY CMO
STANDARDIZE CMO
COMPARE STD CONSOLIDATION ALTERNATIVES AND CMO
BEST STANDARD ALTERNATIVE
SECOND PHASE
IDENTIFY MGT IMPROVEMENTS TO STANDARD ORGANIZATION
STRUCTURE NONSTANDARD CONSOLIDATION ALTERNATIVE
PREFERRED RPMA ORGANIZATION

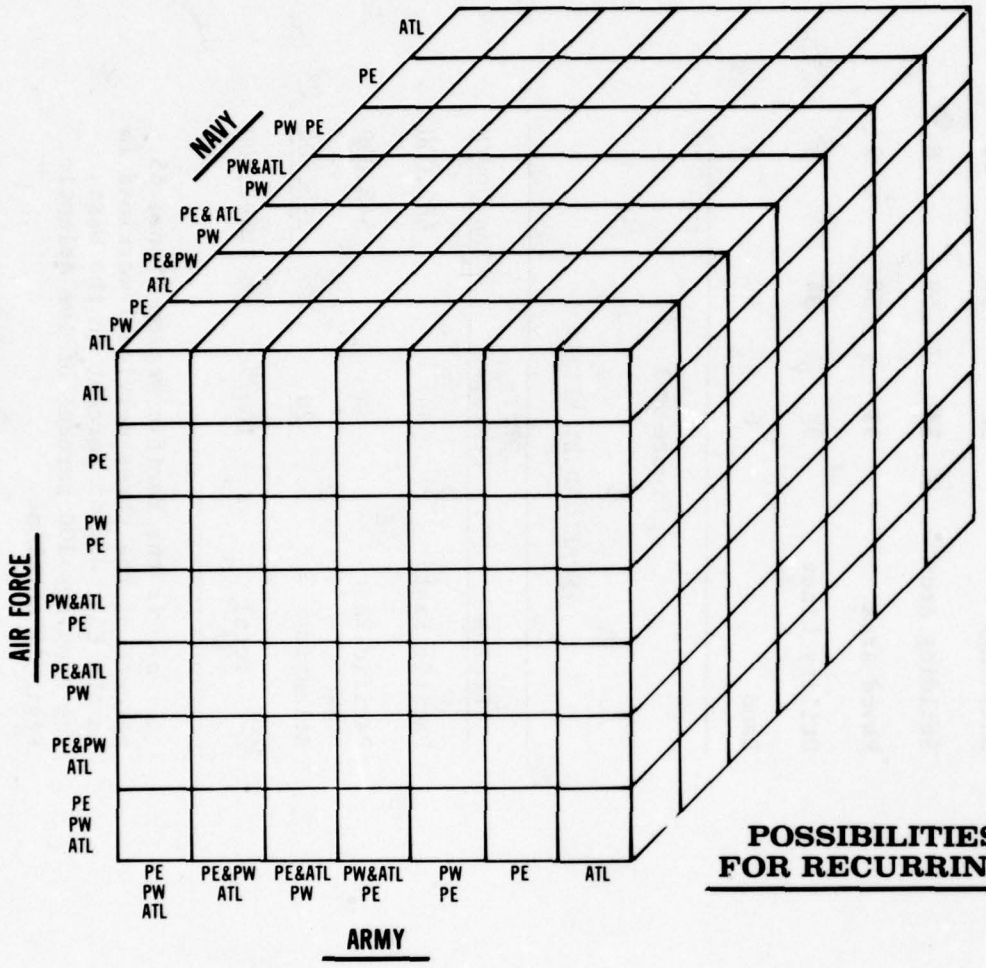
Figure H-1

b. The second phase consisted of developing a refined Panama RPMA organization derived from the most economic conceptual alternative that would provide the level of service necessary for the tri-services in Panama.

3. Conceptual Consolidation Alternatives. The number of imaginably different consolidation possibilities is extremely large. Figure H-2 displays one matrix of potential consolidation alternatives. This three-dimensional portrayal illustrates 343 ways that the three services could be geographically located to manage a consolidated RPMA. It does not reflect the fact that all three services cannot simultaneously be a single manager. Other similar matrixes reflecting management structures and recurring and nonrecurring shops combine to produce an infinitely large theoretical base of alternatives.

a. Workload reduction. The initial phase of reducing the large set of theoretical possibilities began by defining facilities and workload data in terms of service representation and geographical location. The services, without data submission delays, could not submit their data separately by installation. ESC produced percentage breakouts by location using the DOD facility code measurements from Annex C. Figure H-3 summarizes the percentage of facilities by services. Figure H-4 shows the geographical workload which resulted from combining facility percentages and workload data.

# OPPORTUNITIES FOR NONRECURRING SHOPS BY SERVICE




**POSSIBILITIES SAME FOR RECURRING SHOPS**

Figure H-2

PERCENTAGE OF FACILITIES BY SERVICE

| Facilities | Air Force | Army | Navy |
|---|---|---|---|
| Buildings | 32 | 57 | 11 |
| Building Area | 33 | 59 | 8 |
| Paved Area | 33 | 58 | 9 |
| Utility Lines | 37 | 54 | 9 |
| Land | 6 | 90 | 4 |

Figure H-3

WORKLOAD BY REGION[a/]

| Region | Percentage | Man-hours |
|---|---|---|
| Pacific East | 44 | 662,000 |
| Pacific West | 36 | 543,000 |
| Atlantic | 20 | 292,500 |
| Total | 100 | 1,497,500 |

a/ In the Pacific Region alone, 55 percent of the three services' workload is in the East and 45 percent in the West. The Army has 100 percent of the Atlantic Region's workload.

Figure H-4

b. Travel time. There is a short distance separating each installation on the Pacific (see the travel times from Figure C-4). Comments by service representatives in Panama indicated that substantial time and money could be saved if RPMA vehicles would not cross the Canal on the Pacific side. ESC analyzed the travel time required for the services to cross the Canal. Specifically, ESC estimated the hours the Air Force spent traveling from Howard Air Force Base to Albrook Air Force Base, the Army traveling from Corozal to Fort Kobbe, and the Navy traveling from Rodman to Amador using the estimated percentages and hours expended on categories of direct work. Figure H-5 displays the transportation hours by each service. ESC assumed that standard operation orders (SOOs) were plant operations and personnel reported directly to the site. If each service remained on one side of the Canal and performed RPM work in its geographic area, transportation round trip times could be reduced from .8 hour per day to .4 hour per day. This assumes, of course, that jobs are scheduled to preclude several trips back and forth by the same vehicle. The maximum time required, therefore, would be 7,343 hours instead of the current 14,685 hours, or less than 1 percent of the total direct hours. This potential for savings is incorporated into the consolidation alternatives presented below.

c. Using the information in the preceding paragraphs, ESC reduced the number of consolidation alternatives to four. The four ranged from no consolidation (Alternative 1), total consolidation under

a single manager with geographical labor shops (Alternative 2), and consolidations under dual managers by geographical area (Alternatives 3 and 4). Figure H-6 diagrams each alternative by major concepts of management, staffing, funding, and installation support. Figures H-7 through H-10 show each alternative with major functional requirements.

ANNUAL VEHICULAR TRANSPORTATION HOURS PER SERVICE TO CROSS CANAL

| | Army | | Air Force | | Navy | |
|---|---|---|---|---|---|---|
| | SO[a] | IJO[b] | SO | IJO | SO | IJO |
| Pacific East | -- | -- | 4,392 | 1,856 | 551 | 759 |
| Pacific West | 4,364 | 2,763 | -- | -- | -- | -- |

a/ Service order (SO).
b/ Individual job order (IJO).

Figure H-5

4. Summary. This RPMA consolidation study for the Panama Canal Zone produced four major alternatives. Alternatives 2 through 4 have characteristics that theoretically produce savings in both manpower and dollars. The appendixes to this annex fully develop the procedures for evaluating each alternative and the results of ESC's staffing exercises.

COMPARISON OF ALTERNATIVES

| Altn | RPMA Management | Staffing | Funding | Installation Spt | General |
|---|---|---|---|---|---|
| 1 | As Is | As Is | As Is | As Is | -- |
| 2 | Single Mgr (Army) + Pdn Mgr + Central Shop for Non-recurring Work | Augmented Staff Guide | Revolving Fund | Provided by Army; RPMA absorbs much of supply, procurement and contracting. | Staff Engr for Navy & Air Force; Fire protection retained under Air Force Staff control. |
| 3 | Dual Mgr (Army & Air Force) + Pdn Mgr | Augmented Staff Guide | More reliance on ISSAs | Provided by mgr's service; RPMA absorbs much of supply, procurement and contracting. | Navy supported by Pacific West Mgr (Air Force) thru Staff Engr. |
| 4 | Dual Mgr (Army & Air Force) | Augmented Staff Guide using current organization structure. | More reliance on ISSAs. | As Is | Navy supported by Pacific West Mgr (Air Force) thru Staff Engr. |

Figure H-6

# ALTERNATIVE 1 -- CURRENT STRUCTURE

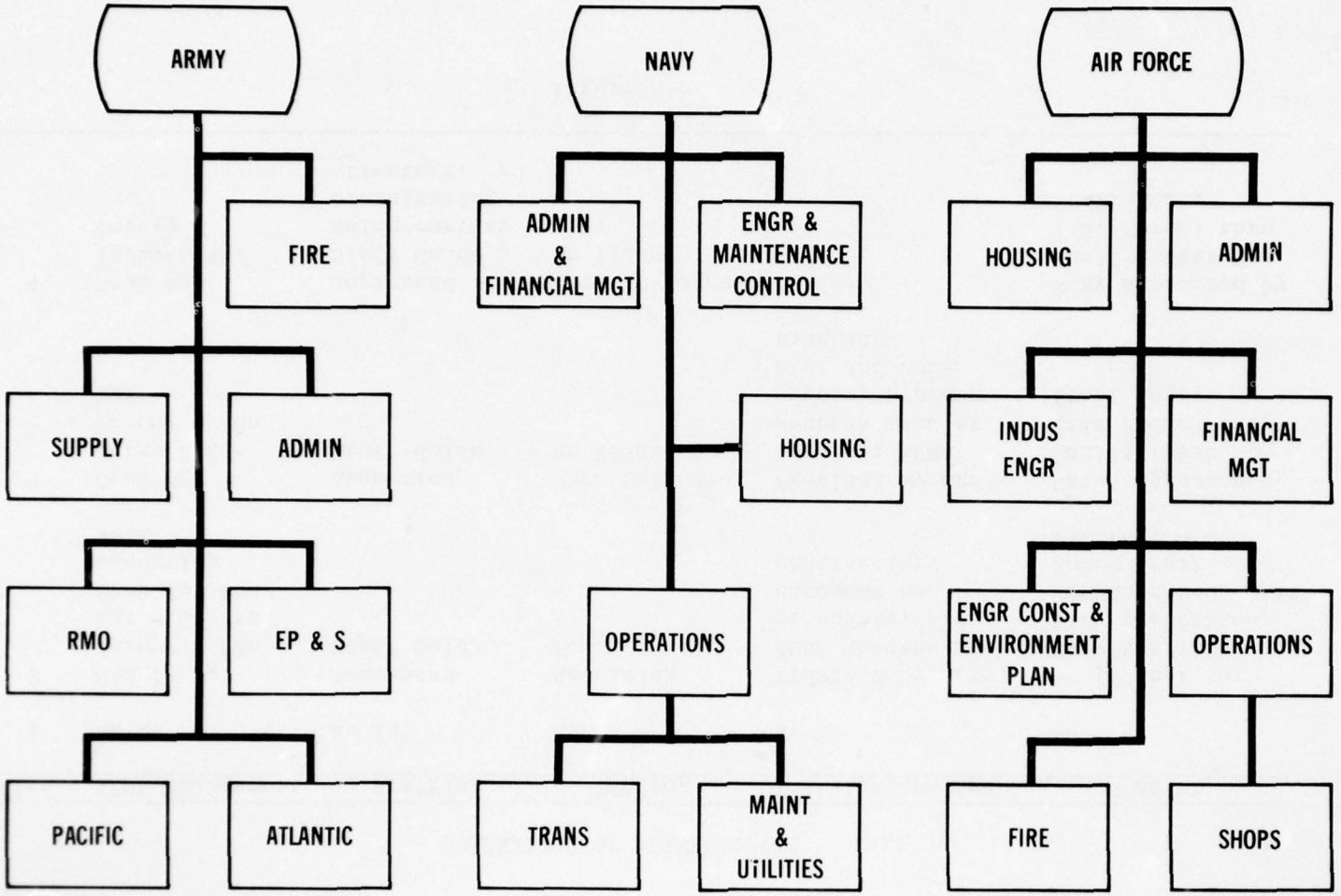



Figure H-7

# ALTERNATIVE 2--
# SHARED CONTROL LINKED BY REVOLVING FUND

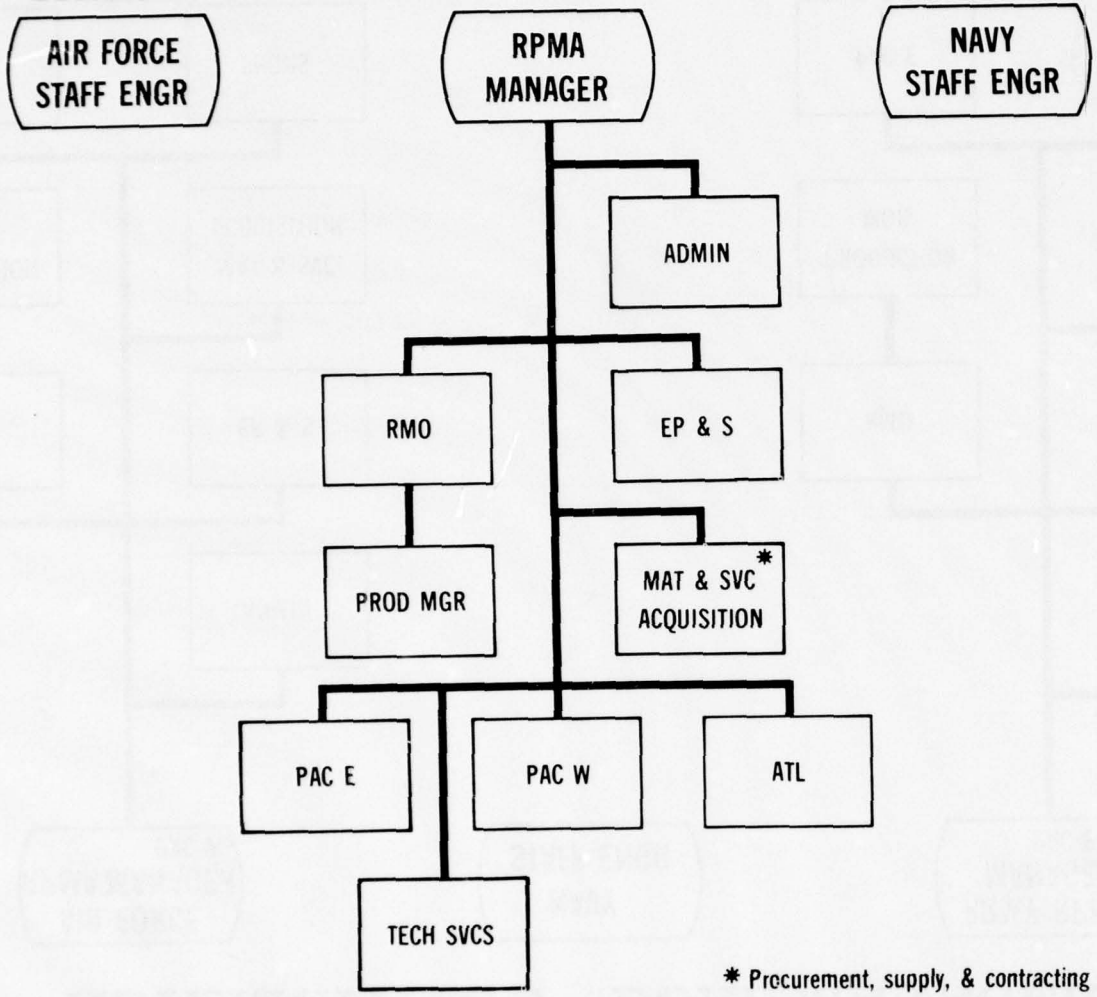



Figure H-8

# ALTERNATIVE 3 -- DUAL MANAGER

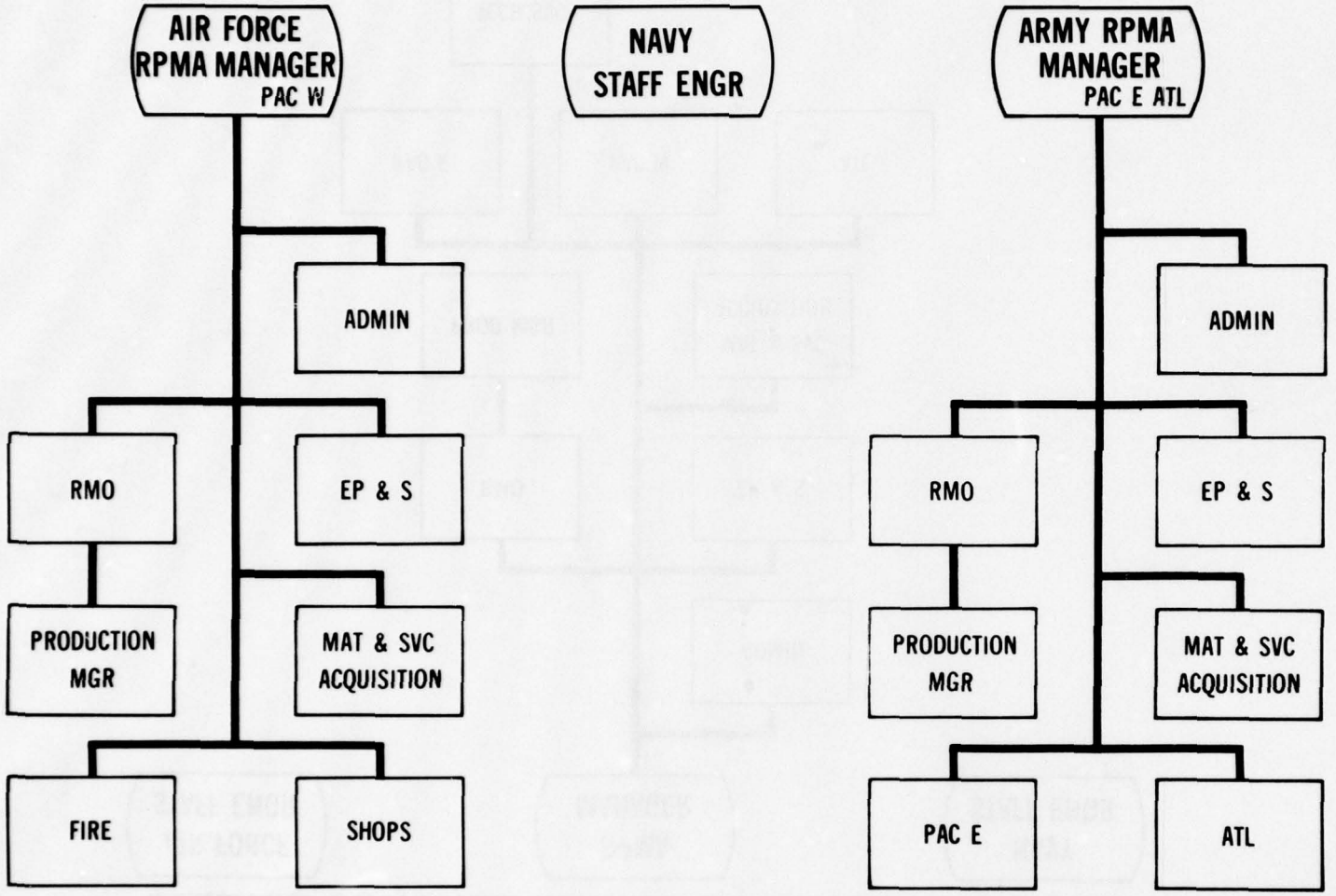



Figure H-9

# ALTERNATIVE 4 -- DUAL MANAGER

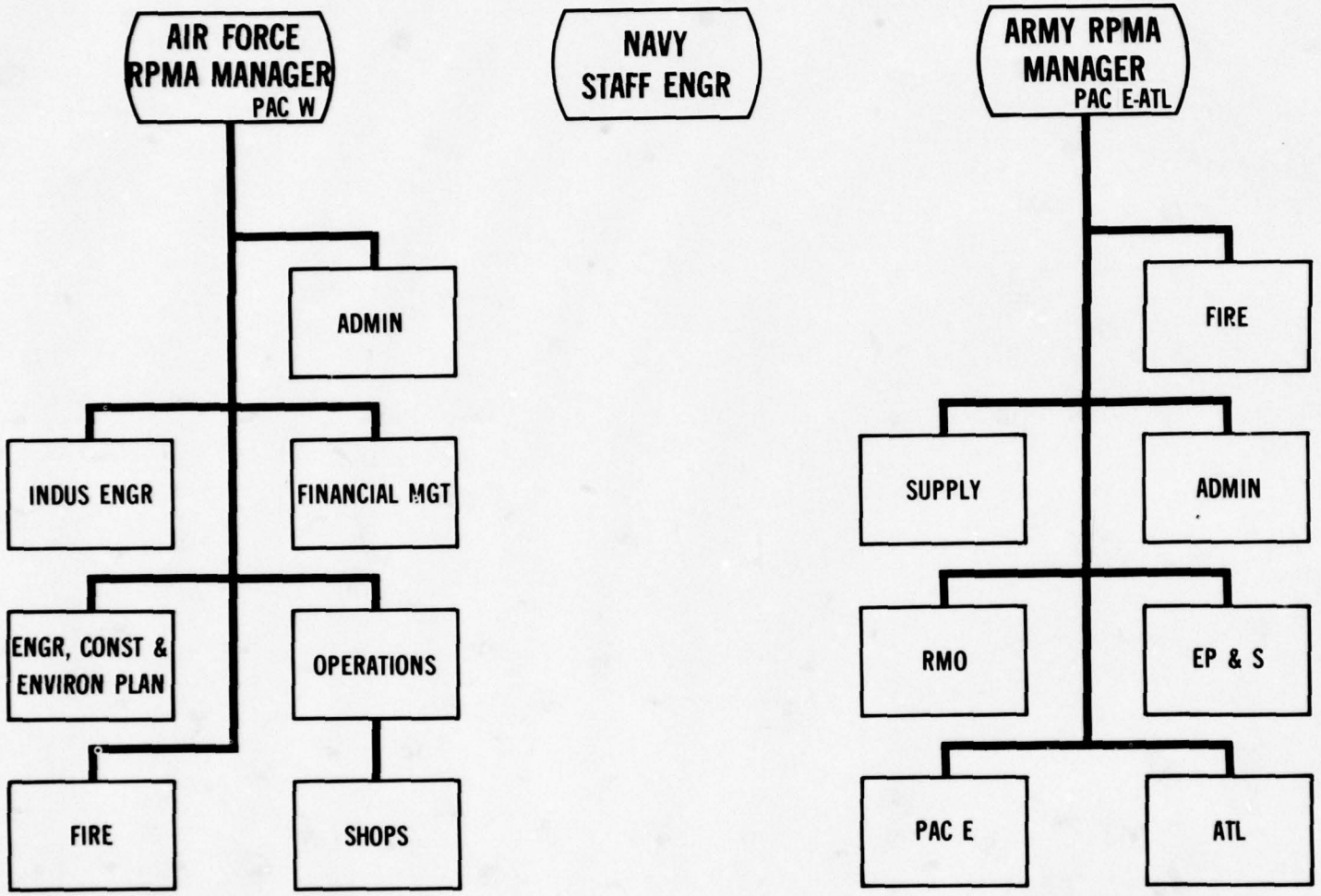



Figure H-10

APPENDIX H-1

STAFFING PROCEDURE


| Paragraph | | Page |
|---|---|---|
| 1 | Purpose | H-1-2 |
| 2 | Staffing Precedent | H-1-2 |
| 3 | Level of Service | H-1-4 |
| 4 | Determining Manpower Levels | H-1-7 |
| 5 | Overhead Management Staffing | H-1-10 |
| 6 | Results of Staffing the Four Alternatives Using the Army Staffing Guide | H-1-15 |
| 7 | Summary | H-1-38 |

| Figure | | |
|---|---|---|
| H-1-1 | Standard Manpower Equation | H-1-6 |
| H-1-2 | Overhead Management Staffing Yardsticks | H-1-11 |
| H-1-3 | Base Year Expenditures--Army, Air Force, Navy Atl & Pac | H-1-12 |
| H-1-4 | Base Year Expenditures--Army, Air Force, Navy Pacific East | H-1-13 |
| H-1-5 | Base Year Expenditures--Army, Air Force, Navy Pacific West | H-1-14 |
| H-1-6 | Typical People Flow for a Consolidated Organization | H-1-16 |
| H-1-7 | Alternative 1--Current Structure | H-1-17 |
| H-1-8 | Adjustments to Master Planning | H-1-18 |
| H-1-9 | Alternative 1 | H-1-19 |
| H-1-10 | CMO Vs Adjusted CMO Comparison of Overhead Functions | H-1-22 |
| H-1-11 | Alternative 1A | H-1-23 |
| H-1-12 | Alternative 2--Shared Control Linked by Revolving Fund | H-1-25 |
| H-1-13 | Alternative 2 | H-1-29 |
| H-1-14 | Staff Engineer Office | H-1-30 |
| H-1-15 | Alternative 3--Dual Manager | H-1-33 |
| H-1-16 | Alternative 3 | H-1-36 |

| Figure | | Page |
|---|---|---|
| H-1-17 | Management Overhead Functions Based on Current Air Force Service Ratio (Alternative 4) | H-1-37 |
| H-1-18 | Alternative 4--Dual Manager | H-1-39 |
| H-1-19 | Alternative 4 | H-1-41 |
| H-1-20 | Total Staffing Requirements | H-1-42 |


1. Purpose. This appendix:

a. Explains the procedure used in determining manpower levels for the four major real property maintenance activity (RPMA) alternatives considered.

b. Documents the data used in special application of the Army Staffing Guide to format the alternatives to a standard organization enabling the comparison of personnel requirements and costs.

c. Displays the alternatives generated via the staffing procedures.

d. Explains how the requirements for Staff Engineers were developed as adjustments to the Army Staffing Guide output.

e. Displays the full manpower requirements developed for all alternatives considered.

2. Staffing Precedent. The approach applied in this study is not precedent-setting. Rather, it follows previously developed, though admittedly imperfect, procedures for staffing conceptual organizations. The Engineer Studies Center (ESC) recognizes that no current approach for comparing service activities during a feasibility study is noncontroversial.

a. The state-of-the-art for regional consolidation studies has not yet progressed to the point where some given and universally accepted procedure automatically converts the differences among the services' definitions, terminology, and organizations into a new, optimized structure. Instead, this study, like its predecessors, accepts with only slight revision the staffing principles of a designated lead service. Because the Army was designated the lead service for RPMA in Panama, this study closely follows the Army staffing methods. The approach parallels, for example, the development of the San Antonio RPMA (SARPMA), where the Air Force was designated the lead service and predominantly Air Force staffing principles were applied.

b. It is important to recall a distinction between feasibility study and implementation planning. This feasibility study, again fully in accord with precedent, develops primarily relative measures of the differences between organization alternatives for a baseline workload (in this case 1978). It is not argued that the 1978 workload will necessarily recur. However, it is assumed that the relative order of the sizes of organizations tailored to the 1978 workload would be the same for similar organizations with their sizes tailored to another workload. It is the job of implementation planning (not this study) to develop the absolute staffing tailored to an initial future workload. Implementation planning must match real spaces and real faces against requirements. Following implementation, if it occurs at all, spaces and faces would

continue to change as workload changes from year to year and as workload and productivity data are accumulated and analyzed.

3. Level of Service.

a. Given the continuing DOD objective of consolidating RPMA geographically where such action is cost effective and does not result in mission impairment, a consolidation alternative, to be considered feasible, must provide "at least the same level of service" as the current method of operation (CMO). There is widespread agreement that this phrase verbally describes the single-most important constraint on consolidation. There is not widespread agreement about the appropriate quantitative expression of the verbal description. In earlier work, the ESC study team equated "level of service" with the size of the shop or direct labor force. As long as an alternative provided no reduction in the size of the shops, it was considered to be capable of providing the same or better level of service for all shop functions within rather wide limits on the size of the overhead force. The overhead force includes high-level management and administration. Admittedly, poor management and administration can reduce the level of service provided by a shop force, but poor management is considered to be avoided in implementation of RPMA alternatives. Similarly, complete neglect of the supply of materials would soon degrade the level of service, but again, it was assumed that supply-constrained alternatives would not be implemented.

b. For Army installations alone, there seems to be little dispute about equating same level of service with the same shop strengths. However, because the different services do apply different ratios of shop to overhead strengths, the Air Force (with the appearance of higher overhead) argues that level of service is highly sensitive to overhead. There probably is merit to this assertion in the multi-service sense. Therefore, the study team made some adjustments of overhead strengths for affected alternatives.

c. The main effect of imposing a requirement for equal shop strength in order to assure at least the same level of service is to exclude roughly 82 percent of the total RPMA strength from reductions. By default, reductions, if any, must be drawn from the overhead strength, constituting only 18 percent of total current strength.

d. Comments on the draft study indicated that additional savings would be generated if the shop strength were analyzed. ESC reviewed the available staffing criteria and found that the Army formula could not be used because of the lack of Engineered Performance Standards (EPS) estimates. There are, however, several spaces identified as travel positions which, if consolidation occurs, could be reduced or eliminated. Draft Air Force standards (see Bibliography, Annex I, for standards used) suggest that the direct labor force would provide extra savings. Unlike the Army standards, the Air Force uses a formula based on Real Property Category (RPC) code measures. The masonry shop, for example, is

represented by a linear relationship for converting thousands of square feet of floor space into required direct man-hours. The formula (see Figure H-1-1) is adjusted downward to account for contract labor man-hours and the result multiplied by an Indirect Adjustment Factor (IAF) to give the total in-service man-hours required. In order to test for theoretical savings, Alternatives 2 and 3 were staffed using the Army Staffing Guide. Alternative 4 was based on a ratio of existing personnel to building area for Air Force staffing and the staffing guide for Army staffing. The ratio method was used, not because the Air Force does not have manning standards, but because their standards are being revised and the old documents were not available.

STANDARD MANPOWER EQUATION
(AFMS 4455)[a/]

---

$Y_c$ = [(.7280 + .0893 X) - contract man-hours] * IAF

X = thousands of square feet of floor space by RPC codes

IAF = 1 + 22.99/MAF - 22.99

MAF = weighted man-hour availability factor for military, US, and local national civilians

$Y_c$ = total in-service man-hours required

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a/ DAF, HQ, AFMS 4455, Tab A to Appendix 1 to Annex B to APPLAN for Masonry/FC 4455.

---

Figure H-1-1

e. ESC agrees that there are potential savings in the direct labor force. These savings, however, should be explored during implementation and adjusted as the new organization (if consolidation occurs) gains operational experience. ESC does not indorse any one particular system but suggests that the Air Force's methods and standards personnel would provide a good starting point for the ultimate process of standardizing procedures and systems.

f. It is ESC's judgment that a consolidated organization would provide an outstanding position to accumulate and analyze workload and productivity data in order to make equitable adjustments to shop forces throughout an RPMA region. However, it is only fair to point out that some adjustments could be made without first consolidating. In other words, not all the advantages that accompany and follow a consolidation need be uniquely attributable to consolidation. (This is simply a reminder that an advantage of some one alternative may also be an advantage of another alternative while not being common to all alternatives. Thus, "credit" for real or potential savings may be difficult to assign.)

4. Determining Manpower Levels. The four consolidation alternatives that were presented in Annex H cover the range of practical opportunities considered to offer the best prospects for savings. Recall that the foci of this study are the feasibility and desirability of RPMA consolidation. The study team deliberately avoided any suggestion

that it was "optimizing" RPMA organization and execution. Although the study team followed precedent in depending heavily on Army staffing methods because the Army had already been designated the lead service for RPMA consolidation, no one felt that a basically Army-type consolidated organization would be optimal. In fact, during discussions about possibilities for the distant future, ESC and service representatives speculated that some special hybrid organization combining the best features from all the services might be optimal. However, ESC argued that this kind of optimality could not be discovered in the short run. ESC felt rather that consolidation, if it is to proceed further at all, should develop first primarily along lead service lines with any promise of optimization deferred until some years after admittedly sub-optimal implementation.

a. The four alternatives selected for consolidation consideration consisted of different blends of functions based on portions of workload accomplished. Manpower levels were determined, for the most part, by using the Army Staffing Guide. This guide identifies each function within a Facilities Engineer (FE) organization. Its staffing levels are determined by using the tables for each function (yardsticks) which convert various measures into personnel requirements. For consolidated functions, the combined requirement for all three services is applied to the yardstick. The Army Staffing Guide provided the means to model consolidation functions and to determine manpower levels in a

standardized way. The proportional method of Alternative 4 compared the CMO ratio of Air Force personnel per 1,000 square feet of building area to the total increased area due to consolidation.

b. The Army Staffing Guide can be viewed as consisting of two sections. One section determines direct labor levels with the associated first-line supervision, and the other determines management or overhead levels. Each service was structured using both sections.

(1) The direct labor section is divided into labor shops grouped within branches and divisions. Branch and division staffing are dependent on the size of subordinate units while the labor shops are staffed with a manpower formula. Each formula incorporates workload data that are collected from a base-year period. The individual terms of the formula require, as one element, the estimated job times based on EPS. Without these estimates, the formula is not applicable.

(2) The management section is slightly different from the direct labor section. Many of these functions depend on physical requirements criteria such as square feet of building space, man-hours spent on individual job orders (IJOs), or the dollar amount of contract effort. Others are dependent on the cumulative strengths of subordinate offices.

c. This study quantifies manpower requirements in order to define a feasible/desirable consolidation alternative. It does not perform the function of a complete manpower survey. Implementation planning matches the personnel to manpower spaces, modifies personnel requirements

for increased/decreased work, and determines the additional savings generated from possible direct labor reductions.

5. Overhead Management Staffing. The services were requested to submit data for each management function consistent with the criteria defined within the Army Staffing Guide. Figure H-1-2 shows the service responses. The manpower levels required for a particular management function then were determined by applying the data against that function's yardstick. The management functions of each service are additive under Alternative 2 and are proportionally divided for Alternatives 3 and 4. Figure H-1-3 shows the combined workload of the services as submitted to ESC. Figures H-1-4 and H-1-5 present the workload as proportionally divided between the Pacific East and West. With these guidelines, the management positions were staffed, compared with the current method, and adjusted where large variances existed between the Army Staffing Guide and present strengths. The assumption that workload levels (i.e., number of annual work authorization documents) would be additive under a consolidated organization may be a conservative statement of requirement. There is a good possibility that these workload levels may decrease slightly under a consolidated management organization. This would then result in a reduced staffing level for those functions driven directly by workload data (i.e., Chief, Engineering Resource Management Division (ERMD), Work Reception/Scheduling and Estimating/Facility Inspection). Like the direct labor staffing, the results of implementation and actual operation may reveal added potential for savings.

## OVERHEAD MANAGEMENT STAFFING YARDSTICKS

| YDSTK CODE | FUNCTION | YARDSTICK DESCRIPTION | ARMY PAC | ARMY ATL | ARMY TOT | AIR FORCE | NAVY | TOTAL |
|---|---|---|---|---|---|---|---|---|
| 610 | FE | NUMBER OF FMLY HSG UNITS | 2,201 | 959 | 3,160 | 1,182 | 297 | 4,639 |
| | | TROOP POPULATION ON POST | 4,742 | 1,934 | 6,676 | 1,875 | 434 | 8,985 |
| 612.1 | CH, ERMD | ANNUAL WORK AUTH DOCUMENTS | 37,667 | 20,217 | 57,884 | 34,091 | 5,669 | 97,644 |
| | | SERVICE ORDERS | 32,086 | 18,523 | 50,609 | 30,141 | 5,106 | 85,856 |
| | | INDIVIDUAL JOB ORDERS | 2,145 | 740 | 2,885 | 3,237 | 258 | 6,380 |
| | | JOB ORDER REQUESTS | 3,402 | 946 | 4,348 | 465 | 142 | 4,955 |
| | | STANDING OPERATION ORDERS | 34 | 8 | 42 | 248 | 163 | 453 |
| 612.3 | WK REC &SCHD | ANNUAL WORK AUTH DOCUMENTS | 37,667 | 20,217 | 57,884 | 34,091 | 5,669 | 97,644 |
| | | NUMBER OF INDIV JOB ORDERS | 2,145 | 740 | 2,885 | 3,237 | 258 | 6,380 |
| 612.4 | EST & INSPEC | ANNUAL MANHOURS SPENT ON IJO | 12,951 | 5,370 | 18,321 | 16,500 | 40,709 | 75,530 |
| | | FACILITY COUNTS: ROADS | 1,996 | 1,008 | 3,004 | 583 | 607 | 4,194 |
| | | RAILROADS | 5.4 | 1.0 | 6.4 | 0.0 | 0.0 | 6.4 |
| | | GROUNDS | 104,950 | 41,150 | 146,100 | 14,092 | 7,138 | 167,330 |
| | | PAVED AREAS | 734 | 276 | 1,010 | 473 | 67 | 1,550 |
| | | AIRFIELDS | 543 | 205 | 748 | 691 | 0 | 1,439 |
| | | UTIL DISTRIB | 2,404 | 1,327 | 3,731 | 1,758 | 359 | 5,848 |
| | | NO. OF BLDGS | 2,252 | 1,071 | 3,323 | 1,256 | 430 | 5,009 |
| 612.5 | IE & TEC AST | ANNUAL WORK AUTH DOCUMENTS | 37,667 | 20,217 | 57,884 | 34,338 | 5,669 | 97,891 |
| | | AUTH BASE YEAR STRENGTH | 572 | 275 | 847 | 483 | 140 | 1,470 |
| 612.6 | REAL PROP | SQUARE FEET MILLIONS | 11.1 | 5.3 | 16.4 | 6.2 | 2.2 | 24.8 |
| 613.2 | ENGR SVCS | COMPL IN-HOUSE DESIGN-$ | 7.1 | 0.0 | 7.1 | 2.9 | 1.8 | 11.8 |
| | | A-E DESIGNED-$ | 2.9 | 0.0 | 2.9 | 0.5 | 0.5 | 3.9 |
| | | INCOMPLETE DESIGN-$ | 0.0 | 0.0 | 0.0 | 1.1 | 0.3 | 1.5 |
| | | INFLATION FACTOR | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 | 1.3 |
| 613.3 | CONST INSP | COMPLETED PROJECTS-$ MILLIONS | 8.5 | 0.0 | 8.5 | 3.4 | 1.0 | 12.9 |
| | | CONTRACTED INSP-$ | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 613.4 | MSTR PL/PRG | AUTHORIZED INSTAL STRENGTH | 7,500 | 3,400 | 10,900 | 1,875 | 400 | 13,175 |
| 622 | PROP CNTRL | MONTHLY AVG LINE ITEMS | 3,200 | 0 | 3,200 | 2,340 | 2,800 | 8,340 |
| | STORAGE | MONTHLY AVG LINE ITEMS | 4,600 | 0 | 4,600 | 3,364 | 2,700 | 10,664 |
| 632.3 | CUST SVCS | SQ FT CLEANED BY CONTRACT | 0 | 0 | 0 | 435,062 | 298,725 | 733,787 |

Figure H-1-2

## BASE YEAR EXPENDITURES--ARMY, AIR FORCE, NAVY ATL & PAC

| YARDSTICK CODE | FUNCTIONAL TITLE | SO | IJO | SOO | TOTAL DIRECT | OVER-HEAD | TOTAL AVAIL | AUTHORIZED SUP | AUTHORIZED NSUP | ON-BOARD SUP | ON-BOARD NSUP | TOTAL SALARY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 610 | OFFICE OF DPE | 0 | 0 | 0 | 0 | 27,560 | 27,560 | 7 | 4 | 7.0 | 6.2 | 234,371 |
| 611 | ADMINISTRATION | 0 | 0 | 0 | 0 | 39,187 | 39,187 | 4 | 15 | 4.0 | 15.8 | 223,751 |
| 612.1 | CH, ERMD | 0 | 0 | 0 | 0 | 10,046 | 10,046 | 2 | 3 | 2.0 | 3.0 | 107,643 |
| 612.2 | PROG/BUDG,ACCT,STAT | 0 | 0 | 0 | 0 | 36,920 | 36,920 | 3 | 14 | 3.0 | 15.8 | 225,622 |
| 612.3.4 | WK RECH, SCHED, EST | 0 | 0 | 0 | 0 | 137,633 | 137,633 | 7 | 58 | 10.0 | 56.5 | 1,139,582 |
| 612.5,6 | IND ENGR, REAL PROP | 0 | 0 | 0 | 0 | 48,526 | 48,526 | 4 | 19 | 4.0 | 19.7 | 316,880 |
| 613.1 | CH, EP & SD | 0 | 0 | 0 | 0 | 12,480 | 12,480 | 2 | 4 | 2.0 | 3.0 | 130,851 |
| 613.2 | ENGR SVCS | 0 | 0 | 0 | 0 | 95,680 | 95,680 | 5 | 41 | 5.0 | 42.4 | 895,327 |
| 613.3,4 | INSP, MSTR PL/PROG | 0 | 0 | 0 | 0 | 60,320 | 60,320 | 7 | 20 | 5.0 | 25.2 | 574,061 |
| 613.4A | ENVIRONMENTAL | 0 | 0 | 0 | 0 | 8,840 | 8,840 | 1 | 2 | 1.2 | 2.1 | 35,022 |
| 621 | CH, SUP & STOR | 0 | 0 | 0 | 0 | 6,240 | 6,240 | 3 | 1 | 3.0 | 1.0 | 47,477 |
| 622 | PROP CONTRL | 0 | 0 | 0 | 0 | 34,320 | 34,320 | 1 | 14 | 2.0 | 15.0 | 152,880 |
| 623 | STORAGE | 0 | 0 | 0 | 0 | 32,052 | 32,052 | 2 | 16 | 1.0 | 15.3 | 149,246 |
| 641 | FIRE PROT | 0 | 0 | 0 | 0 | 112,320 | 112,320 | 4 | 52 | 4.0 | 50.0 | 551,624 |
| 631 | CH BLDG & GRNDS DIV | 0 | 0 | 0 | 0 | 16,640 | 16,640 | 4 | 4 | 4.0 | 4.0 | 175,387 |
| 632.1 | CH BLDG & STRUC BR | 0 | 0 | 0 | 0 | 25,082 | 25,082 | 7 | 6 | 7.0 | 6.2 | 229,944 |
| 632.21,31 | CARP, MASON, & PM | 93,857 | 91,777 | 219 | 185,853 | 104,067 | 289,921 | 11 | 159 | 14.0 | 160.3 | 2,059,707 |
| 632.32 | CUSTODIAL SVCS | 0 | 0 | 78,540 | 78,540 | 21,220 | 99,760 | 2 | 36 | 2.0 | 44.4 | 315,174 |
| 632.4 | METAL WORK | 33,283 | 15,941 | 2,576 | 51,802 | 27,237 | 79,040 | 3 | 35 | 2.9 | 37.8 | 691,926 |
| 632.5 | PAINT | 17,415 | 26,231 | 466 | 44,113 | 17,141 | 61,254 | 2 | 28 | 2.0 | 28.9 | 387,561 |
| 633.1 | CH ROAD & RR BR | 0 | 0 | 0 | 0 | 12,513 | 12,513 | 3 | 3 | 3.0 | 3.0 | 107,290 |
| 633.21 | PAVE MAINT | 29,289 | 61,846 | 16,090 | 107,226 | 58,106 | 165,332 | 7 | 69 | 7.2 | 78.4 | 912,367 |
| 633.4 | ENGR ORG MAINT | 1,429 | 653 | 55,739 | 57,821 | 31,845 | 89,666 | 4 | 33 | 5.8 | 38.8 | 548,716 |
| 634.1 | CH LAND MGMT BR | 0 | 0 | 0 | 0 | 2,088 | 2,088 | 2 | 0 | 1.0 | 0.0 | 21,186 |
| 634.21,22 | GROUNDS MAINT | 8,459 | 17,582 | 191,024 | 217,066 | 79,758 | 296,824 | 6 | 105 | 7.0 | 150.3 | 1,180,337 |
| 634.5 | PEST CONTROL | 22,885 | 909 | 109,329 | 133,124 | 65,095 | 198,219 | 9 | 74 | 9.5 | 87.7 | 826,949 |
| 651 | CH UTIL DIV | 0 | 0 | 0 | 0 | 9,692 | 9,692 | 2 | 3 | 1.8 | 2.8 | 77,833 |
| 652.21,22 | CH REFRIG & A/C BR | 0 | 0 | 0 | 0 | 4,160 | 4,160 | 1 | 1 | 1.0 | 1.0 | 37,709 |
| 652.21,22 | REFRIG & AC OP/MNT | 40,702 | 26,021 | 103,277 | 170,002 | 61,255 | 231,257 | 5 | 108 | 5.0 | 111.1 | 1,776,646 |
| 652.22A | KITCHEN EQUIP MAINT | 20,496 | 5,708 | 1,894 | 28,098 | 10,769 | 38,867 | 2 | 17 | 2.0 | 17.0 | 327,362 |
| 652,53.1 | MECH & SANITATION BR | 0 | 0 | 0 | 0 | 8,322 | 8,322 | 3 | 1 | 3.0 | 1.0 | 109,675 |
| 652.3,4,5 | BLR, HTG, &PLUMB | 88,706 | 18,985 | 21,154 | 128,847 | 55,767 | 184,615 | 5 | 80 | 5.0 | 83.1 | 968,217 |
| 652.6 | FUEL STORE/ISSUE | 325 | 1,577 | 28,485 | 30,387 | 4,897 | 35,285 | 2 | 17 | 2.0 | 18.5 | 274,242 |
| 654.2,3,4 | WATER & SEWER | 11,859 | 10,129 | 47,441 | 69,430 | 28,053 | 97,483 | 5 | 43 | 6.0 | 40.5 | 560,219 |
| 653.1 | CH ELEC BR | 0 | 0 | 0 | 0 | 8,322 | 8,322 | 2 | 2 | 2.0 | 2.0 | 71,804 |
| 653.2 | EXTERIOR ELEC | 21,715 | 21,956 | 17,847 | 61,519 | 30,632 | 92,151 | 4 | 44 | 4.5 | 43.0 | 796,587 |
| 653.3 | INTERIOR ELEC | 75,260 | 26,491 | 27,983 | 129,735 | 63,202 | 192,938 | 7 | 91 | 7.0 | 94.9 | 1,543,468 |
| 654.3A | INSTRUMENT REPAIR | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 2 | 0.0 | 2.7 | 57,071 |
| | TOTALS | 465,685 | 325,810 | 702,070 | 1,493,566 | 1,407,994 | 2,901,560 | 151 | 1,224 | 158.1 | 1,329.7 | 18,841,714 |

Figure H-1-3

## BASE YEAR EXPENDITURES--ARMY, AIR FORCE, NAVY
## PACIFIC EAST

| YARDSTICK CODE | FUNCTIONAL TITLE | SO | IJO | SOO | TOTAL DIRECT | OVER-HEAD | TOTAL AVAIL | AUTHORIZED SUP | AUTHORIZED NSUP | ON-BOARD SUP | ON-BOARD NSUP | TOTAL SALARY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 610 | OFFICE OF DFE | 0 | 0 | 0 | 0 | 14,309 | 14,309 | 3 | 2 | 3.3 | 3.5 | 117,023 |
| 611 | ADMINISTRATION | 0 | 0 | 0 | 0 | 18,595 | 18,595 | 2 | 6 | 2.2 | 7.2 | 110,480 |
| 612.1 | CH, ERMD | 0 | 0 | 0 | 0 | 5,641 | 5,641 | 1 | 1 | 1.1 | 1.6 | 60,450 |
| 612.2 | PROG/BUDG,ACCT,STAT | 0 | 0 | 0 | 0 | 20,733 | 20,733 | 1 | 7 | 1.6 | 8.9 | 126,704 |
| 612.3.4 | WK RECP, SCHED, EST | 0 | 0 | 0 | 0 | 68,041 | 68,041 | 3 | 27 | 5.0 | 27.8 | 562,675 |
| 612.5,6 | IND ENGR, REAL PROP | 0 | 0 | 0 | 0 | 27,251 | 27,251 | 2 | 10 | 2.2 | 11.1 | 177,353 |
| 613.1 | CH, EP & SD | 0 | 0 | 0 | 0 | 7,008 | 7,008 | 1 | 2 | 1.1 | 1.6 | 73,483 |
| 613.2 | ENGR SVCS | 0 | 0 | 0 | 0 | 53,731 | 53,731 | 2 | 23 | 2.8 | 23.8 | 502,797 |
| 613.3,4 | INSP, MSTR PL/PROG | 0 | 0 | 0 | 0 | 33,874 | 33,874 | 3 | 11 | 2.8 | 14.1 | 322,381 |
| 613.4A | ENVIRONMENTAL | 0 | 0 | 0 | 0 | 4,964 | 4,964 | 0 | 1 | 0.7 | 1.1 | 19,667 |
| 621 | CH, SUP & STOR | 0 | 0 | 0 | 0 | 3,504 | 3,504 | 1 | 0 | 1.6 | 0.5 | 26,662 |
| 622 | PROP CONTRL | 0 | 0 | 0 | 0 | 16,937 | 16,937 | 0 | 7 | 0.5 | 7.9 | 85,854 |
| 623 | STORAGE | 0 | 0 | 0 | 0 | 15,862 | 15,862 | 0 | 7 | 0.5 | 7.5 | 75,620 |
| 641 | FIRE PROT | 0 | 0 | 0 | 0 | 62,492 | 62,492 | 2 | 28 | 2.2 | 27.7 | 304,103 |
| 631 | CH BLDG & GRNDS DIV | 0 | 0 | 0 | 0 | 9,344 | 9,344 | 2 | 2 | 2.2 | 2.2 | 98,493 |
| 632.1 | CH BLDG & STRUC BR | 0 | 0 | 0 | 0 | 11,749 | 11,749 | 3 | 2 | 3.3 | 2.9 | 111,713 |
| 632.21,31 | CARP, MASON, & PM | 44,145 | 40,486 | 122 | 84,755 | 43,001 | 127,756 | 5 | 73 | 6.7 | 73.2 | 943,735 |
| 632.32 | CUSTODIAL SVCS | 0 | 0 | 33,397 | 33,397 | 7,193 | 40,591 | 0 | 13 | 0.5 | 18.2 | 127,456 |
| 632.4 | METAL WORK | 15,487 | 7,744 | 1,446 | 24,678 | 11,610 | 36,288 | 1 | 16 | 1.1 | 17.9 | 320,745 |
| 632.5 | PAINT | 9,780 | 14,730 | 262 | 24,773 | 9,626 | 34,399 | 1 | 15 | 1.1 | 16.2 | 217,646 |
| 633.1 | CH ROAD & RR BR | 0 | 0 | 0 | 0 | 4,668 | 4,668 | 1 | 1 | 1.1 | 1.1 | 38,853 |
| 633.21 | PAVE MAINT | 15,153 | 22,252 | 7,578 | 44,990 | 21,472 | 66,463 | 3 | 29 | 3.5 | 33.9 | 396,425 |
| 633.4 | ENGR ORG MAINT | 346 | 56 | 22,395 | 22,798 | 10,050 | 32,848 | 1 | 12 | 1.6 | 15.6 | 217,163 |
| 634.1 | CH LAND MGMT BR | 0 | 0 | 0 | 0 | 856 | 856 | 0 | 0 | 0.4 | 0.0 | 8,686 |
| 634.21,22 | GROUNDS MAINT | 3,148 | 4,867 | 64,421 | 72,437 | 23,709 | 96,147 | 2 | 33 | 2.4 | 48.5 | 392,293 |
| 634.5 | PEST CONTROL | 9,936 | 207 | 35,807 | 45,951 | 22,113 | 68,065 | 3 | 25 | 3.9 | 30.4 | 293,014 |
| 651 | CH UTIL DIV | 0 | 0 | 0 | 0 | 3,296 | 3,296 | 0 | 1 | 0.4 | 1.1 | 28,101 |
| 652.21,22 | CH REFRIG & A/C BR | 0 | 0 | 0 | 0 | 2,329 | 2,329 | 0 | 0 | 0.5 | 0.5 | 21,117 |
| 652.21,22 | REFRIG & AC OP/MNT | 17,722 | 5,440 | 57,620 | 80,782 | 26,038 | 106,821 | 2 | 49 | 2.2 | 50.5 | 792,296 |
| 652.22A | KITCHEN EQUIP MAINT | 11,477 | 3,196 | 1,060 | 15,734 | 6,030 | 21,765 | 1 | 9 | 1.1 | 9.5 | 183,322 |
| 652,53.1 | MECH & SANITATION BR | 0 | 0 | 0 | 0 | 4,993 | 4,993 | 1 | 0 | 1.8 | 0.6 | 65,805 |
| 652.3,4,5 | BLR, HTG, &PLUMB | 43,722 | 7,768 | 10,375 | 61,866 | 23,071 | 84,937 | 2 | 37 | 2.4 | 37.9 | 366,208 |
| 652.6 | FUEL STORE/ISSUE | 195 | 946 | 17,091 | 18,232 | 2,938 | 21,171 | 1 | 10 | 1.2 | 11.1 | 164,545 |
| 654.2,3,4 | WATER & SEWER | 4,669 | 5,008 | 22,807 | 32,485 | 11,457 | 43,943 | 2 | 19 | 3.0 | 17.8 | 284,804 |
| 653.1 | CH ELEC BR | 0 | 0 | 0 | 0 | 4,993 | 4,993 | 1 | 1 | 1.2 | 1.2 | 43,082 |
| 653.2 | EXTERIOR ELEC | 11,313 | 10,263 | 9,478 | 31,056 | 12,994 | 44,050 | 1 | 21 | 2.1 | 20.6 | 372,810 |
| 653.3 | INTERIOR ELEC | 37,742 | 12,103 | 16,790 | 66,636 | 29,331 | 95,967 | 4 | 46 | 4.2 | 47.4 | 760,926 |
| 654.3A | INSTRUMENT REPAIR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0.0 | 1.6 | 34,242 |
| | TOTALS | 224,848 | 135,072 | 300,655 | 660,576 | 655,819 | 1,316,395 | 72 | 562 | 76.7 | 605.7 | 8,855,365 |

Figure H-1-4

## BASE YEAR EXPENDITURES--ARMY, AIR FORCE, NAVY
## PACIFIC WEST

| YARDSTICK CODE | FUNCTIONAL TITLE | SO | IJO | SOO | TOTAL DIRECT | OVER-HEAD | TOTAL AVAIL | AUTHORIZED SUP | AUTHORIZED NSUP | ON-BOARD SUP | ON-BOARD NSUP | TOTAL SALARY |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 610 | OFFICE OF DFE | 0 | 0 | 0 | 0 | 11,170 | 11,170 | 2 | 1 | 2.6 | 2.7 | 91,359 |
| 611 | ADMINISTRATION | 0 | 0 | 0 | 0 | 14,517 | 14,517 | 1 | 5 | 1.7 | 5.6 | 86,251 |
| 612.1 | CH, ERMD | 0 | 0 | 0 | 0 | 4,404 | 4,404 | 0 | 1 | 0.8 | 1.3 | 47,192 |
| 612.2 | PROG/BUDG,ACCT,STAT | 0 | 0 | 0 | 0 | 16,186 | 16,186 | 1 | 6 | 1.3 | 6.9 | 98,917 |
| 612.3,4 | WK RECP, SCHED, EST | 0 | 0 | 0 | 0 | 53,118 | 53,118 | 2 | 21 | 3.9 | 21.7 | 439,274 |
| 612.5,6 | IND ENGR, REAL PROP | 0 | 0 | 0 | 0 | 21,274 | 21,274 | 1 | 8 | 1.7 | 8.6 | 138,926 |
| 613.1 | CH, EP & SD | 0 | 0 | 0 | 0 | 5,471 | 5,471 | 0 | 1 | 0.8 | 1.3 | 57,367 |
| 613.2 | ENGR SVCS | 0 | 0 | 0 | 0 | 41,948 | 41,948 | 2 | 17 | 2.1 | 18.6 | 392,529 |
| 613.3,4 | INSP, MSTR PL/PROG | 0 | 0 | 0 | 0 | 26,445 | 26,445 | 3 | 8 | 2.1 | 11.0 | 251,679 |
| 613.4A | ENVIRONMENTAL | 0 | 0 | 0 | 0 | 3,875 | 3,875 | 0 | 0 | 0.5 | 0.9 | 15,354 |
| 621 | CH, SUP & STOR | 0 | 0 | 0 | 0 | 2,735 | 2,735 | 1 | 0 | 1.3 | 0.4 | 20,814 |
| 622 | PROP CONTRL | 0 | 0 | 0 | 0 | 13,222 | 13,222 | 0 | 6 | 0.4 | 6.1 | 67,025 |
| 623 | STORAGE | 0 | 0 | 0 | 0 | 12,383 | 12,383 | 0 | 5 | 0.4 | 5.8 | 59,035 |
| 641 | FIRE PROT | 0 | 0 | 0 | 0 | 48,787 | 48,787 | 1 | 22 | 1.7 | 21.7 | 237,411 |
| 631 | CH BLDG & GRNDS DIV | 0 | 0 | 0 | 0 | 7,295 | 7,295 | 1 | 1 | 1.7 | 1.7 | 76,893 |
| 632.1 | CH BLDG & STRUC BR | 0 | 0 | 0 | 0 | 9,172 | 9,172 | 2 | 2 | 2.6 | 2.2 | 87,214 |
| 632.21,31 | CARP, MASON, & PM | 34,464 | 31,607 | 96 | 66,167 | 33,570 | 99,738 | 3 | 56 | 5.2 | 57.1 | 736,765 |
| 632.32 | CUSTODIAL SVCS | 0 | 0 | 26,072 | 26,072 | 5,616 | 31,688 | 0 | 10 | 0.4 | 14.2 | 99,503 |
| 632.4 | METAL WORK | 12,090 | 6,045 | 1,129 | 19,265 | 9,063 | 28,329 | 0 | 12 | 0.8 | 14.0 | 250,402 |
| 632.5 | PAINT | 7,635 | 11,500 | 204 | 19,340 | 7,514 | 26,855 | 0 | 12 | 0.8 | 12.6 | 169,914 |
| 633.1 | CH ROAD & RR BR | 0 | 0 | 0 | 0 | 3,667 | 3,667 | 0 | 0 | 0.8 | 0.8 | 30,527 |
| 633.21 | PAVE MAINT | 11,911 | 17,484 | 5,954 | 35,349 | 16,871 | 52,221 | 2 | 22 | 2.7 | 26.6 | 311,476 |
| 633.4 | ENGR ORG MAINT | 271 | 44 | 17,596 | 17,912 | 7,896 | 25,809 | 0 | 10 | 1.3 | 12.2 | 170,628 |
| 634.1 | CH LAND MGMT BR | 0 | 0 | 0 | 0 | 1,231 | 1,231 | 1 | 0 | 0.5 | 0.0 | 12,499 |
| 634.21,22 | GROUNDS MAINT | 4,530 | 7,004 | 92,704 | 104,239 | 34,118 | 138,357 | 2 | 47 | 3.5 | 69.8 | 564,527 |
| 634.5 | PEST CONTROL | 7,807 | 163 | 28,134 | 36,105 | 17,374 | 53,479 | 2 | 19 | 3.0 | 23.9 | 234,340 |
| 651 | CH UTIL DIV | 0 | 0 | 0 | 0 | 2,589 | 2,589 | 0 | 0 | 0.3 | 0.8 | 22,080 |
| 652.21,22 | CH REFRIG & A/C BR | 0 | 0 | 0 | 0 | 1,830 | 1,830 | 0 | 0 | 0.4 | 0.4 | 16,591 |
| 652.21,22 | REFRIG & AC OP/MNT | 13,925 | 4,274 | 45,272 | 63,472 | 20,458 | 83,931 | 1 | 39 | 1.7 | 39.7 | 622,518 |
| 652.22A | KITCHEN EQUIP MAINT | 9,018 | 2,511 | 833 | 12,363 | 4,738 | 17,101 | 0 | 7 | 0.8 | 7.4 | 144,039 |
| 652,53.1 | MECH & SANITATION BR | 0 | 0 | 0 | 0 | 3,328 | 3,328 | 1 | 0 | 1.2 | 0.4 | 43,870 |
| 652.3,4,5 | BLR, HTG, &PLUMB | 29,148 | 5,179 | 6,917 | 41,244 | 15,380 | 56,625 | 1 | 24 | 1.6 | 25.3 | 244,139 |
| 652.6 | FUEL STORE/ISSUE | 130 | 630 | 11,394 | 12,154 | 1,959 | 14,114 | 0 | 6 | 0.8 | 7.4 | 109,696 |
| 654.2,3,4 | WATER & SEWER | 3,112 | 3,339 | 15,204 | 21,656 | 7,638 | 29,295 | 1 | 12 | 2.0 | 11.9 | 189,869 |
| 653.1 | CH ELEC BR | 0 | 0 | 0 | 0 | 3,328 | 3,328 | 0 | 0 | 0.8 | 0.8 | 28,721 |
| 653.2 | EXTERIOR ELEC | 7,542 | 6,842 | 6,319 | 20,704 | 8,663 | 29,367 | 1 | 14 | 1.4 | 13.7 | 248,540 |
| 653.3 | INTERIOR ELEC | 25,161 | 8,069 | 11,193 | 44,424 | 19,554 | 63,978 | 2 | 30 | 2.8 | 31.6 | 507,284 |
| 654.3A | INSTRUMENT REPAIR | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0 | 1.1 | 22,828 |
| | TOTALS | 166,750 | 104,695 | 269,027 | 540,473 | 518,409 | 1,058,882 | 57 | 445 | 60.0 | 489.8 | 6,948,614 |

Figure H-1-5

6. Results of Staffing the Four Alternatives Using the Army Staffing Guide. Each alternative was structured and evaluated using the criteria described above. The savings generated from consolidation come mainly from the advantages of reduced overhead and support requirements under one or two managers. Figure H-1-6 shows a typical flow of personnel savings for a consolidated organization. The integral functions of housing management (in the Air Force and Navy) and transportation (in the Navy) were considered separately from RPMA consolidation in all alternatives. ESC decided, after reconsidering the Navy's comments and responsibilities, to remove fuel issue and storage from any consolidation consideration. The salary data presented for each alternative are based on average salaries (produced from FY 78 data) for supervisory and nonsupervisory personnel for each yardstick code.

a. Alternative 1. This alternative is each service's current CMO (see Figure H-1-7 for major functional areas). No organizational changes were made with the exception of housing, transportation, fuel issue, and storage. The CMO, unadjusted at this point, is staffed with 1,369 personnel.

(1) The Assistant Secretary of Defense for Manpower, Reserve Affairs, and Logistics decided that the US Army Corps of Engineers Mobile District should be designated the DOD executive agent for technical real estate services. This has effectively eliminated the services' technical real property responsibility. The Mobile District would then

# TYPICAL PEOPLE FLOW FOR A CONSOLIDATED ORGANIZATION

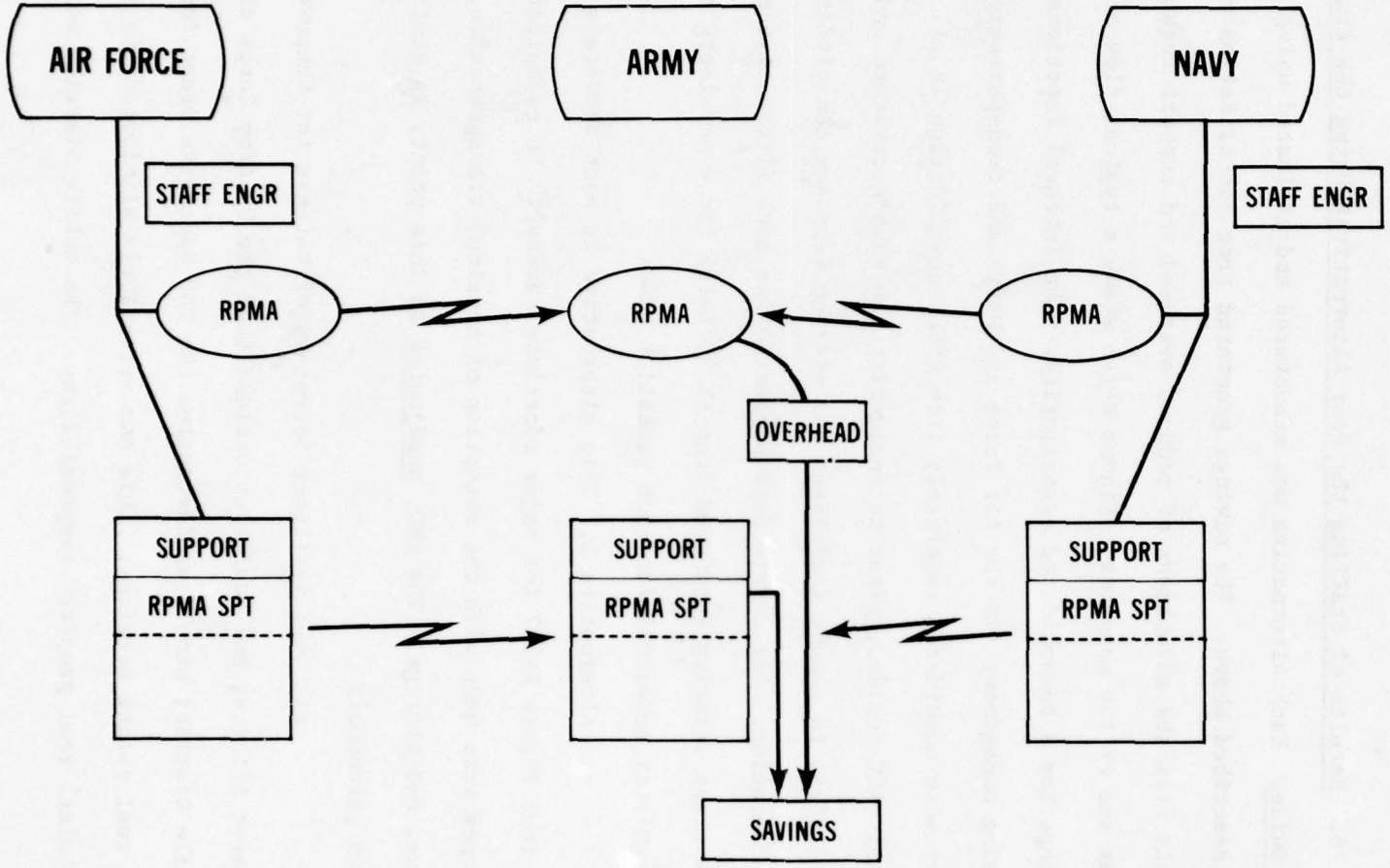



Figure H-1-6

# ALTERNATIVE 1 -- CURRENT STRUCTURE

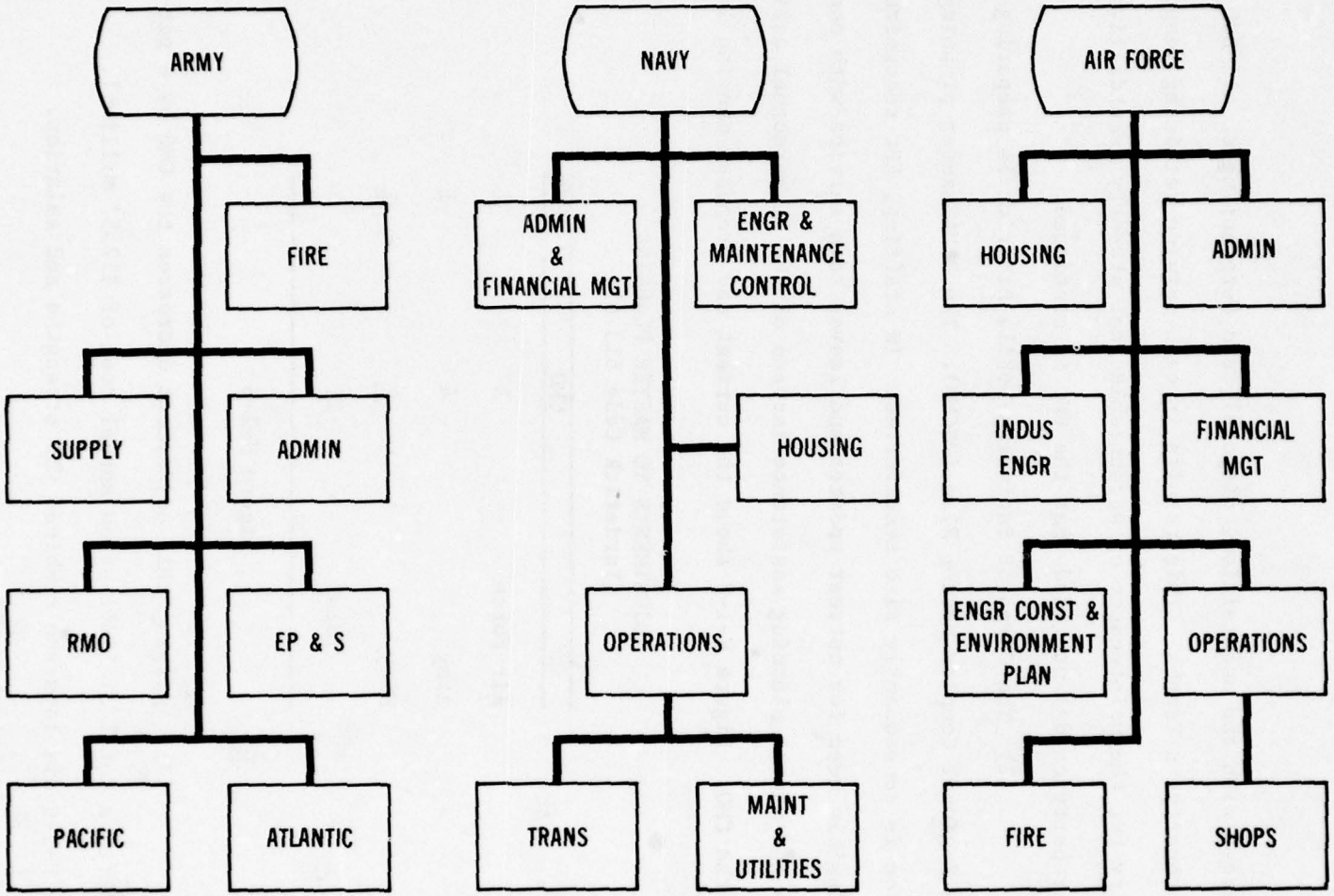



Figure H-1-7

be charged with the acquisition, disposal, and outgranting of all DOD real property in Panama. This results in each service retaining responsibility for the maintenance of accountable real property records (i.e., real property cards) provided that the CMO is continued.

(2) The Corps of Engineers Mobile District is preparing the Panama Regional Complex Master Plan (PRCMP). The RPMA master planning function is consequently also transferred. In staffing, ESC recognizes the possible need for outyear updates and leaves each service with one person for master planning assistance instead of the 11 personnel assigned under the CMO. Figure H-1-8 shows the current and proposed manning levels.

ADJUSTMENTS TO MASTER PLANNING
(Yardstick Code 613.4)

| | CMO | RPMA |
|---|---|---|
| Air Force | 5 | 1 |
| Army | 4 | 1 |
| Navy | 2 | 1 |
| Total | 11 | 3 |

Figure H-1-8

(3) Applying this adjustment decreases the CMO by 8 personnel (to a total of 1,361 at an annual cost of $17.57 million). Figure H-1-9 displays the combined CMO strengths and salaries.

b. Alternative 1A.

(1) Early in the data collection phase, several differences in RPMA definition and procedure among the services were noted. The Air

## ALTERNATIVE 1

| YARDSTICK CODE | FUNCTIONAL TITLE | RECOMMENDED STRENGTH SUP | NSUP | TOT | OFFICE SALARY |
|---|---|---|---|---|---|
| 610 | RPMA MANAGER | 7 | 5 | 12 | 227,070 |
| 611 | ADMINISTRATION | 4 | 15 | 19 | 331,148 |
| 612.1 | CH,ERMD | 2 | 3 | 5 | 107,641 |
| 612.2 | PROG/BUDG,ACCT,STAT | 3 | 14 | 17 | 205,297 |
| 612.3,4 | WK RECP, SCHED, EST | 7 | 58 | 65 | 1,095,510 |
| 612.5,6 | IND ENGR, REAL PROP | 4 | 24 | 28 | 366,864 |
| 613.1 | CH, EP & SD | 2 | 4 | 6 | 148,024 |
| 613.2 | ENGR SVCS | 5 | 41 | 46 | 868,972 |
| 613.3,4 | INSP, MSTR PL/PROG | 7 | 12 | 19 | 377,638 |
| 613.4A | ENVIRONMENTAL | 1 | 2 | 3 | 30,195 |
| 621 | CH, SUPPLY & STORE | 3 | 1 | 4 | 65,763 |
| 622 | PROP CONTROL | 1 | 14 | 15 | 134,204 |
| 623 | STORAGE | 2 | 16 | 18 | 169,634 |
| 641 | FIRE PROT | 4 | 48 | 52 | 502,052 |
| 641A | FIRE PREV | 0 | 4 | 4 | 38,568 |
| 631 | CH BLDG & GRNDS DIV | 4 | 4 | 8 | 175,384 |
| 632.1 | CH, BLDG & STRUC BR | 7 | 6 | 13 | 227,657 |
| 632.21,31 | CARP, MASON, & PM | 11 | 159 | 170 | 1,991,000 |
| 632.32 | CUSTODIAL SVCS | 2 | 36 | 38 | 259,476 |
| 632.4 | METAL WORK | 3 | 35 | 38 | 645,900 |
| 632.5 | PAINT | 2 | 28 | 30 | 376,232 |
| 633.1 | CH, ROAD & RR BR | 3 | 3 | 6 | 107,289 |
| 633.21 | PAVE MAINT | 7 | 69 | 76 | 813,065 |
| 634.21,22 | ENGR ORG MAINT | 4 | 33 | 37 | 452,473 |
| 634.1 | CH, LAND MGT BR | 2 | 0 | 2 | 42,372 |
| 634.21,22 | GROUNDS MAINT | 6 | 105 | 111 | 838,377 |
| 634.5 | PEST CONTROL | 9 | 74 | 83 | 710,741 |
| 651 | CH UTIL DIV | 2 | 3 | 5 | 84,166 |
| 652.21 | REFRIG & AC OP/MNT | 6 | 109 | 115 | 1,764,517 |
| 652.22 | KITCHEN EQUIP | 2 | 17 | 19 | 327,362 |
| 652 | MECH & SANITATION BR | 3 | 1 | 4 | 109,673 |
| 652.3,4,5 | BLR, HTG, & PLUMB | 5 | 80 | 85 | 934,580 |
| 652.6 | FUEL STORE/ISSUE | 1 | 6 | 7 | 96,308 |
| 654.2,3,4 | WATER & SEWER | 5 | 43 | 48 | 574,125 |
| 653.1 | CH ELEC BR | 2 | 2 | 4 | 71,802 |
| 653.2 | EXTERIOR ELEC | 4 | 44 | 48 | 801,568 |
| 653.3 | INTERIOR ELEC | 7 | 91 | 98 | 1,436,134 |
| 654.3A | INSTRUMENT REPAIR | 0 | 3 | 3 | 62,259 |
| | TOTAL | 149 | 1,212 | 1,361 | 17,571,040 |

Figure H-1-9

Force, for example, has a dedicated military family housing maintenance shop while the other services do not. Other shop and overhead variations were also found. This alternative was, therefore, developed to provide a means of consistent comparison. Alternative 1A was developed for a special purpose. As noted earlier, some of the major alternatives considered involve different degrees of consolidation primarily along Army lines. Thus, gross changes in personnel strength between the pure CMO and a consolidation alternative are partly the result of consolidation and partly the result of adoption of the Army-like method of operations. It would be misleading to attribute a gross difference entirely to consolidation. Alternative 1A provides an intermediate step between the pure CMO and the other alternatives. Alternative 1A is intended to reveal the effect of adopting Army methods to the CMO. Thus, the difference between the pure CMO (Alternative 1) and the Army-standardized CMO (Alternative 1A) provides an estimate of that part of the differences between the CMO and other major alternatives <u>not</u> attributable to consolidation. For example:

| (Altn 1 - Altn 2) | - | (Altn 1 - Altn 1A) | = | net change due to Altn 2 |
|---|---|---|---|---|
| gross change | | change due to applying Army method | | consolidation |

As noted earlier, application of Army principles to the other services' RPMA involves an element of judgment and, hence, some uncertainty--probably affecting very few spaces. The key point is to recognize the

Alternative 1A step as necessary to avoid overestimating personnel changes attributable purely to consolidation. Figure H-1-10 shows the comparison of the CMO with an adjusted staffing that follows Army guidelines. This staffing step implies that "savings" are possible without consolidation. Service comments take exception to the introduction of this alternative even though it is needed to prevent overestimating changes attributable to consolidations. Alternative 1A alone should not be interpreted to mean that all services should perform their mission with Army staffing. Inclusion of Alternative 1A does highlight the differences among the services and point to potential DOD savings if all services had one standard definition and procedures for doing the same work. Figure H-1-11 displays the staffing of Alternative 1A for all RPMA functions.

(2) Alternative 1A would result in a reduced force of 1,317 personnel (1,369 - 52). Figure H-1-11 is a listing of these strengths and corresponding salaries.

c. Alternative 2. The workload by service indicated that the Army's portion amounted to 65 percent across all regions and more specifically, 80 percent of the Pacific East and 100 percent of the Atlantic. This, in addition to the designation of the Army as lead service, led to the decision to model the single manager with Army procedures. The Navy and Air Force retain Staff Engineer functions. (The Staff Engineer organization will be discussed later in this appendix.) Figure H-1-12

CMO VS ADJUSTED CMO COMPARISON OF OVERHEAD FUNCTIONS

| Yardstick Code | Air Force CMO | Air Force Adj CMO | Army CMO | Army Adj CMO | Navy CMO | Navy Adj CMO | Total (All Services) CMO | Total (All Services) Adj CMO | Difference |
|---|---|---|---|---|---|---|---|---|---|
| 610 | 3 | 5 | 7 | 11 | 2 | 4 | 12 | 20 | -8 |
| 611 | 8 | 4 | 9 | 8 | 2 | 3 | 19 | 15 | +4 |
| 612.1 | 2 | 3 | 3 | 5 | 0 | 0 | 5 | 8 | -3 |
| 612.2 | 4 | 6 | 8 | 7 | 5 | 3 | 17 | 16 | +1 |
| 612.3/4 | 27 | 12 | 29 | 20 | 9 | 4 | 65 | 36 | +29 |
| 612.5 | 4 | 6 | 11 | 10 | 0 | 2 | 15 | 18 | -3 |
| 612.6 | 4 | 2 | 7 | 4 | 2 | 1 | 13 | 7 | +6 |
| 613.1 | 4 | 2 | 2 | 4 | 0 | 0 | 6 | 6 | 0 |
| 613.2 | 16 | 15 | 27 | 28 | 3 | 10 | 46 | 53 | -7 |
| 613.3 | 6 | 5 | 7 | 8 | 3 | 2 | 16 | 15 | +1 |
| 613.4[a/] | 5 | 1 | 4 | 1 | 2 | 1 | 11 | 3 | +8 |
| 613.4a | 1 | 1 | 2 | 2 | 0 | 0 | 3 | 3 | 0 |
| 621 | 1 | 1 | 2 | 1 | 1 | 0 | 4 | 2 | +2 |
| 622 | 5 | 4 | 10 | 6 | 0 | 0 | 15 | 10 | +5 |
| 623 | 4 | 2 | 14 | 9 | 0 | 0 | 18 | 11 | +7 |
| 631 | 4 | 3 | 3 | 3 | 1 | 2 | 8 | 8 | 0 |
| 632.1 | 4 | 1 | 4 | 2 | 5 | 1 | 13 | 4 | +9 |
| 633.1 | 2 | 1 | 4 | 2 | 0 | 0 | 6 | 3 | +3 |
| 634.1 | 0 | 0 | 2 | 2 | 0 | 0 | 2 | 2 | 0 |
| 651 | 0 | 0 | 5 | 6 | 0 | 0 | 5 | 6 | -1 |
| 652/54.1 | 3 | 2 | 1 | 4 | 0 | 0 | 4 | 6 | -2 |
| 653.1 | 2 | 1 | 2 | 2 | 0 | 0 | 4 | 3 | +1 |
| Total | 109 | 77 | 163 | 145 | 35 | 33 | 307 | 255 | +52 |

a/ Master planning--see text paragraph 5a(2) for explanation.

Figure H-1-10

# ALTERNATIVE 1A

| YARDSTICK CODE | FUNCTIONAL TITLE | RECOMMENDED STRENGTH SUP | NSUP | TOT | OFFICE SALARY |
|---|---|---|---|---|---|
| 610 | RPMA MANAGER | 7 | 13 | 20 | 273,534 |
| 611 | ADMINISTRATION | 4 | 11 | 15 | 267,468 |
| 612.1 | CH,ERMD | 2 | 6 | 8 | 158,716 |
| 612.2 | PROG/BUDG,ACCT,STAT | 3 | 13 | 16 | 194,435 |
| 612.3,4 | WK RECP, SCHED, EST | 2 | 34 | 36 | 594,544 |
| 612.5,6 | IND ENGR, REAL PROP | 4 | 21 | 25 | 331,329 |
| 613.1 | CH, EP & SD | 3 | 3 | 6 | 170,514 |
| 613.2 | ENGR SVCS | 3 | 50 | 53 | 979,650 |
| 613.3,4 | INSP, MSTR PL/PROG | 3 | 15 | 18 | 341,580 |
| 613.4A | ENVIRONMENTAL | 3 | 0 | 3 | 47,589 |
| 621 | CH, SUPPLY & STORE | 2 | 0 | 2 | 36,572 |
| 622 | PROP CONTROL | 1 | 9 | 10 | 89,489 |
| 623 | STORAGE | 1 | 10 | 11 | 102,419 |
| 641 | FIRE PROT | 4 | 48 | 52 | 502,052 |
| 641A | FIRE PREV | 0 | 4 | 4 | 38,568 |
| 631 | CH BLDG & GRNDS DIV | 3 | 5 | 8 | 167,714 |
| 632.1 | CH, BLDG & STRUC BR | 4 | 0 | 4 | 96,044 |
| 632.21,31 | CARP, MASON, & PM | 11 | 159 | 170 | 1,991,000 |
| 632.32 | CUSTODIAL SVCS | 2 | 36 | 38 | 259,476 |
| 632.4 | METAL WORK | 3 | 35 | 38 | 645,900 |
| 632.5 | PAINT | 2 | 28 | 30 | 376,232 |
| 633.1 | CH, ROAD & RR BR | 3 | 0 | 3 | 77,811 |
| 633.21 | PAVE MAINT | 7 | 69 | 76 | 813,065 |
| 634.21,22 | ENGR ORG MAINT | 4 | 33 | 37 | 452,473 |
| 634.1 | CH, LAND MGT BR | 2 | 0 | 2 | 42,372 |
| 634.21,22 | GROUNDS MAINT | 6 | 105 | 111 | 838,377 |
| 634.5 | PEST CONTROL | 9 | 74 | 83 | 710,741 |
| 651 | CH UTIL DIV | 2 | 4 | 6 | 93,808 |
| 652.21 | REFRIG & AC OP/MNT | 6 | 109 | 115 | 1,764,517 |
| 652.22 | KITCHEN EQUIP | 2 | 17 | 19 | 327,362 |
| 652 | MECH & SANITATION BR | 6 | 0 | 6 | 168,630 |
| 652.3,4,5 | BLR, HTG, & PLUMB | 5 | 80 | 85 | 934,580 |
| 652.6 | FUEL STORE/ISSUE | 1 | 6 | 7 | 96,308 |
| 654.2,3,4 | WATER & SEWER | 5 | 43 | 48 | 574,125 |
| 653.1 | CH ELEC BR | 3 | 0 | 3 | 74,634 |
| 653.2 | EXTERIOR ELEC | 4 | 44 | 48 | 801,568 |
| 653.3 | INTERIOR ELEC | 7 | 91 | 98 | 1,436,134 |
| 654.3A | INSTRUMENT REPAIR | 0 | 3 | 3 | 62,259 |
| | TOTAL | 139 | 1,178 | 1,317 | 16,933,589 |

Figure H-1-11

shows the organization characterized by a revolving fund; separate Technical Services Division for nonrecurring work; regional managers in the Pacific East, Pacific West, and Atlantic; a production manager in the Resource Management Office; and the procurement, contracting, and supply functions as integral parts of the organization. Workloads for these functions were distributed in accordance with the percentages of workload developed in Annex H.

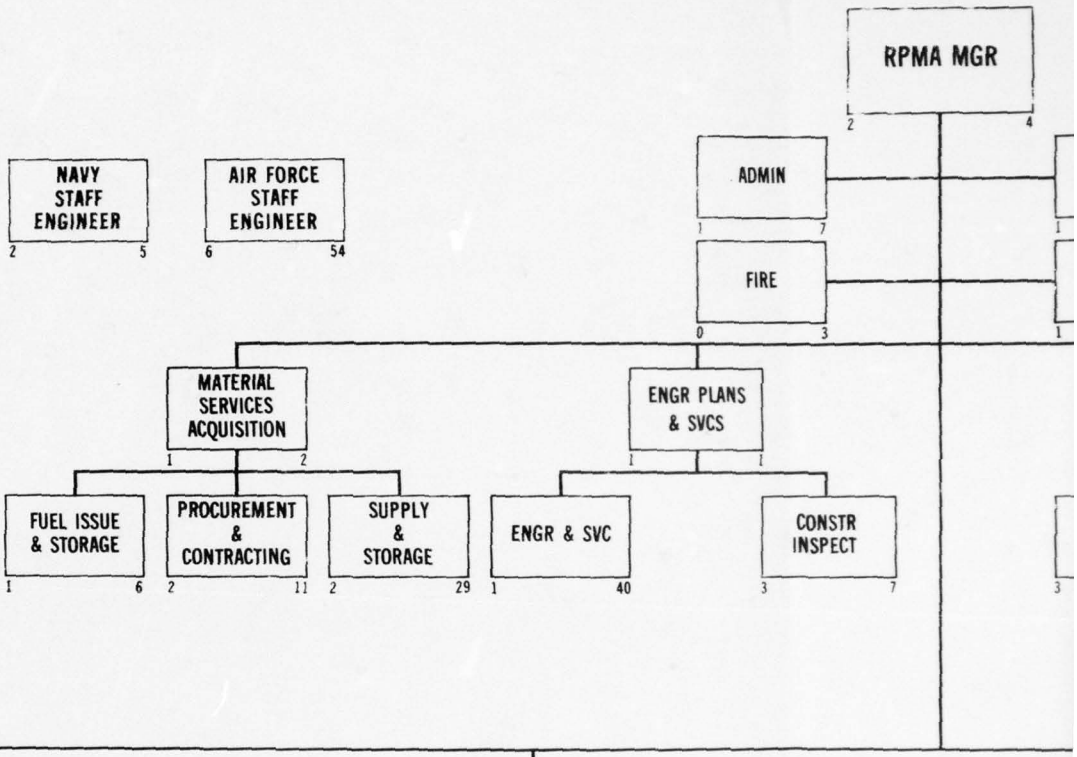
(1) The nonrecurring shop in the Technical Services Division was developed using some of the same shops in each geographic area. This arrangement centrally pools resources to more efficiently perform larger projects and provides a labor source to smooth workload fluctuations in the other area shops. The regional shops would perform all recurring work amounting to 80 percent of the total workload in the Pacific. The nonrecurring shops on the Pacific side were staffing with 20 percent of the manpower within each function.

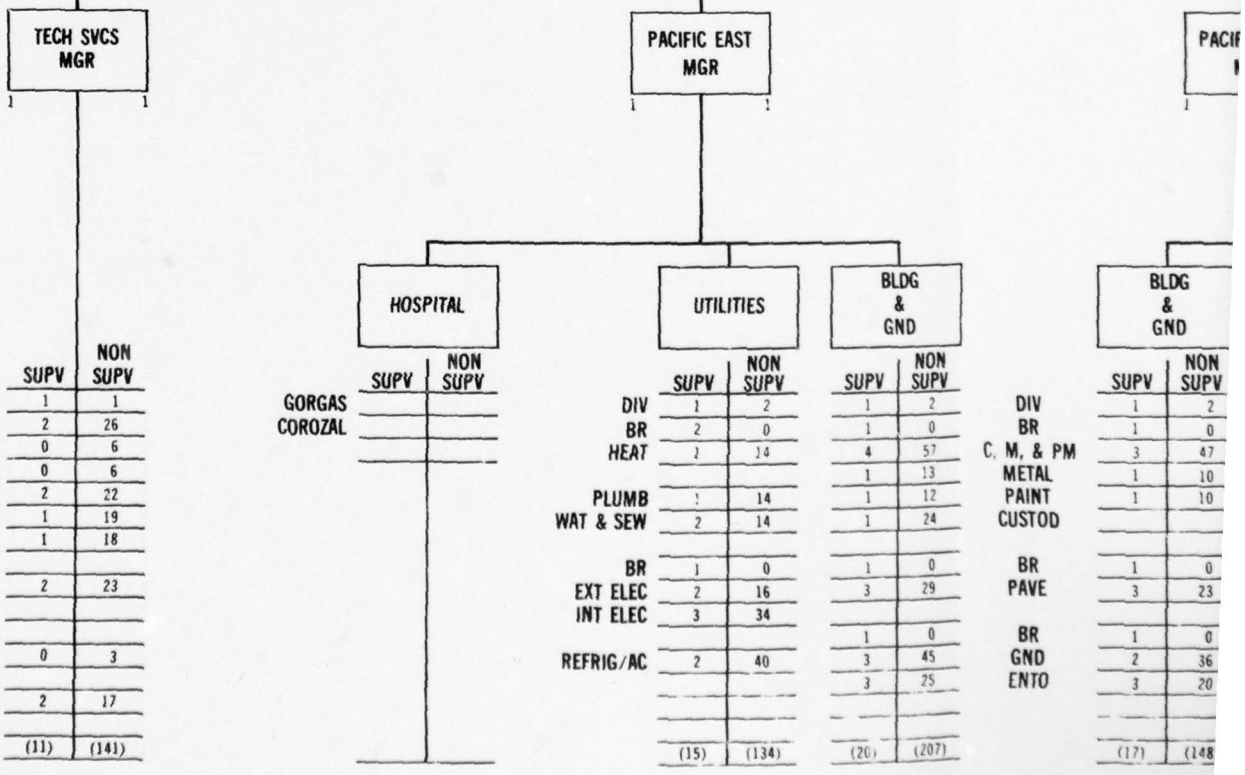
(2) The remaining personnel were divided between Pacific East (55 percent) and Pacific West (45 percent).

(3) The Atlantic workload was considered too small for a separate nonrecurring shop and was geographically to far removed for adequate service from the Technical Services Division.

(4) The work force at the shop level was distributed according to regional workloads with the division or branch overhead staffed on the basis of the strengths of the shops in that function.

# ALTERNATIVE 2--SHARED CONTROL LIN




| | TECH SVCS MGR SUPV | TECH SVCS MGR NON SUPV |
|---|---|---|
| NON-RECUR | 1 | 1 |
| C, M, & PM | 2 | 26 |
| METAL | 0 | 6 |
| PAINT | 0 | 6 |
| ELEC | 2 | 22 |
| MECH | 1 | 19 |
| REFRIG/AC | 1 | 18 |
| ORG MAINT | 2 | 23 |
| REFUSE COL | | |
| INSTR REP | 0 | 3 |
| KIT EQUIP | 2 | 17 |
| SUBTOTAL | (11) | (141) |
| AREA TOTAL | (154) | |

| | HOSPITAL SUPV | HOSPITAL NON SUPV |
|---|---|---|
| GORGAS | | |
| COROZAL | | |

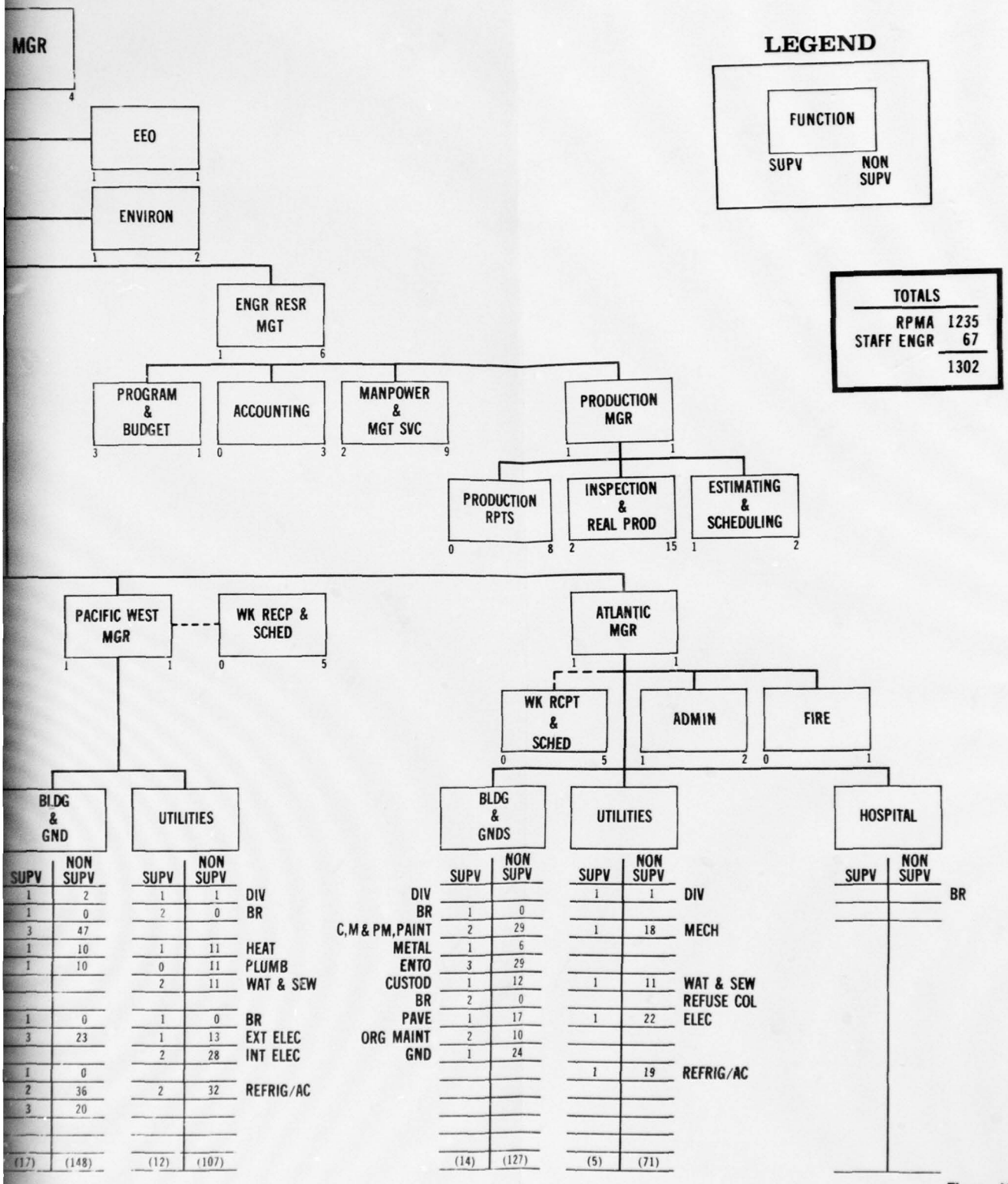
| | UTILITIES SUPV | UTILITIES NON SUPV |
|---|---|---|
| DIV | 1 | 2 |
| BR | 2 | 0 |
| HEAT | 2 | 14 |
| PLUMB | 1 | 14 |
| WAT & SEW | 2 | 14 |
| BR | 1 | 0 |
| EXT ELEC | 2 | 16 |
| INT ELEC | 3 | 34 |
| REFRIG/AC | 2 | 40 |
| | (15) | (134) |

| | BLDG & GND SUPV | BLDG & GND NON SUPV |
|---|---|---|
| | 1 | 2 |
| | 1 | 0 |
| | 4 | 57 |
| | 1 | 13 |
| | 1 | 12 |
| | 1 | 24 |
| | 1 | 0 |
| | 3 | 29 |
| | 1 | 0 |
| | 3 | 45 |
| | 3 | 25 |
| | (20) | (207) |

| | BLDG & GND SUPV | BLDG & GND NON SUPV |
|---|---|---|
| DIV | 1 | 2 |
| BR | 1 | 0 |
| C, M, & PM | 3 | 47 |
| METAL | 1 | 10 |
| PAINT | 1 | 10 |
| CUSTOD | | |
| BR | 1 | 0 |
| PAVE | 3 | 23 |
| BR | 1 | 0 |
| GND | 2 | 36 |
| ENTO | 3 | 20 |
| | (17) | (148 |

(378)

# OL LINKED BY REVOLVING FUND




(291)

(228)

Figure H-1-12

The staffing proceeded via the Army Staffing Guide using the overhead management staffing yardsticks from Figure H-1-1.

(5) All real property accountable records (real property cards) will be maintained by the consolidated office. This office is charged with the responsibility of providing all services with the required reports for meeting DOD objectives and provides a single point of contact for the Mobile District which performs all other real estate functions. The Army Staffing Guide requires five people for this yardstick code (612.6). However, the added reporting responsibility requires an additional person. The consolidated office is therefore staffed with six personnel.

(6) Procurement and contracting as well as some to all supply support were functions that each service's installation or base support provided to the RPMA. Under Alternative 2, these functions would be consolidated and placed in the Materials and Services Acquisition Branch. An additional procurement officer was added. In supply, the Army Director of Facilities Engineering (DFAE) was operating an integral Supply and Storage Branch handling 60 percent of its requirements. Under Alternative 2, the remaining 40 percent would be assumed by the RPMA Supply and Storage Branches. In addition, the total number of line items would increase to approximately 10,000 when considering all three services' RPMA supply and storage requirements.

(7) The RPMA work force for Alternative 2 is shown in Figure H-1-13, indicating a reduced requirement of 1,235 personnel at an annual cost of $15.71 million for salaries and benefits.

(8) The staffing levels for the Air Force and Navy Staff Engineer must be added to this RPMA work force.

(a) The Staff Engineer represents each major commander on all engineering matters. A Staff Engineer Office is provided for the Air Force and Navy in Alternative 2 while the consolidated organization provides this function for the Army.

(b) The role that the Staff Engineer plays is vital to the overall accomplishment of the RPMA function. As visualized, the Staff Engineer is responsible for determining the annual budget requirements; evaluating industrial fund (IF) support; assisting in the updating of the PRCMP; setting priorities for the accomplishment of RPMA work; and approving work requests, estimates, completed work, and fund reimbursements. The Air Force retains its organic fire protection capability under the Staff Engineer due to their crash/rescue mission.

(c) Figure H-1-14 displays the personnel staffing for each Staff Engineer Office. Functions were staffed by the Army Staffing Guide based on anticipated workload for each yardstick. The intent of the RPMA consolidated organization is to provide information to each supported service. The Staff Engineer is, therefore, considered adequate for the residual remaining functions. Implementation planning could

# ALTERNATIVE 2

| YARDSTICK CODE | FUNCTIONAL TITLE | RECOMMENDED STRENGTH SUP | NSUP | TOT | OFFICE SALARY |
|---|---|---|---|---|---|
| 610 | RPMA MANAGER | 2 | 4 | 6 | 79,812 |
| 610A | EEO | 1 | 1 | 2 | 39,007 |
| 611 | ADMINISTRATION | 2 | 9 | 11 | 189,454 |
| 612.1 | CH,ERMD | 1 | 6 | 7 | 130,433 |
| 612.2 | PROG/BUDG,ACCT,STAT | 1 | 6 | 7 | 82,915 |
| 612.3,4 | WK RECP, SCHED, EST | 2 | 31 | 33 | 546,082 |
| 612.5,6 | IND ENGR, REAL PROP | 3 | 14 | 17 | 227,768 |
| 613.1 | CH, EP & SD | 1 | 1 | 2 | 56,838 |
| 613.2 | ENGR SVCS | 1 | 40 | 41 | 747,530 |
| 613.3,4 | INSP, MSTR PL/PROG | 3 | 7 | 10 | 195,708 |
| 613.4A | ENVIRONMENTAL | 1 | 2 | 3 | 30,195 |
| 621 | CH, MAT & SVCS AQUIS | 1 | 2 | 3 | 40,096 |
| 621A | PROC & CONTRACT | 2 | 11 | 13 | 125,942 |
| 622 | SUPPLY | 1 | 13 | 14 | 125,261 |
| 623 | STORAGE | 1 | 16 | 17 | 155,225 |
| 641A | FIRE PREV | 0 | 4 | 4 | 38,568 |
| 630 | AREA/TECH SVC MGR | 4 | 4 | 8 | 149,048 |
| 631 | CH BLDG & GRNDS DIV | 2 | 4 | 6 | 123,868 |
| 632.1 | CH, BLDG & STRUC BR | 3 | 0 | 3 | 72,033 |
| 632.21,31 | CARP, MASON, & PM | 11 | 159 | 170 | 1,991,000 |
| 632.32 | CUSTODIAL SVCS | 3 | 36 | 39 | 270,792 |
| 632.4 | METAL WORK | 3 | 35 | 38 | 645,900 |
| 632.5 | PAINT | 2 | 28 | 30 | 376,232 |
| 633.1 | CH, ROAD & RR BR | 3 | 0 | 3 | 77,811 |
| 633.21 | PAVE MAINT | 7 | 69 | 76 | 813,065 |
| 634.21,22 | ENGR ORG MAINT | 4 | 33 | 37 | 452,473 |
| 634.1 | CH, LAND MGT BR | 3 | 0 | 3 | 63,558 |
| 634.21,22 | GROUNDS MAINT | 6 | 105 | 111 | 838,377 |
| 634.5 | PEST CONTROL | 9 | 74 | 83 | 710,741 |
| 651 | CH UTIL DIV | 4 | 5 | 9 | 158,690 |
| 652.21 | REFRIG & AC OP/MNT | 6 | 109 | 115 | 1,764,517 |
| 652.22 | KITCHEN EQUIP | 2 | 17 | 19 | 327,362 |
| 652 | MECH & SANITATION BR | 4 | 0 | 4 | 112,420 |
| 652.3,4,5 | BLR, HTG, & PLUMB | 5 | 80 | 85 | 934,580 |
| 652.6 | FUEL STORE/ISSUE | 1 | 6 | 7 | 96,308 |
| 654.2,3,4 | WATER & SEWER | 5 | 43 | 48 | 574,125 |
| 653.1 | CH ELEC BR | 2 | 0 | 2 | 49,756 |
| 653.2 | EXTERIOR ELEC | 4 | 44 | 48 | 801,568 |
| 653.3 | INTERIOR ELEC | 7 | 91 | 98 | 1,436,134 |
| 654.3A | INSTRUMENT REPAIR | 0 | 3 | 3 | 62,259 |
| | TOTAL | 123 | 1,112 | 1,235 | 15,713,451 |

Figure H-1-13

STAFF ENGINEER OFFICE

| Equiv Yard-stick Code | | Navy | | | | Air Force | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | Supv | Non-supv | To-tal | Salaries | Supv | Non-supv | To-tal | Salaries |
| 610 | Staff Engineer | 1 | 1 | 2 | $34,099 | 1 | 1 | 2 | $34,099 |
| 612.2 | Prog, Bud, Acct | 1 | 3 | 4 | $50,329 | 1 | 4 | 5 | $61,191 |
| 613.4 | Master Planning | -- | 1 | 1 | $18,234 | -- | 1 | 1 | $18,234 |
| | Subtotal | 2 | 5 | 7 | $102,662 | 2 | 6 | 8 | $113,524 |
| 641 | Fire Protection | -- | -- | -- | -- | 4 | 48 | 52 | $502,052 |
| | Total | 2 | 5 | 7 | $102,662 | 6 | 54 | 60 | $615,576 |

Figure H-1-14

identify increased requirements, but staff increases should be viewed very carefully in light of other consolidation experiences that increased residual functions twofold.

(9) The Staff Engineer functions of the Navy and Air Force including fire protection (see Figure H-1-14) were then costed against average salaries of the equivalent yardstick codes. The final work force totals 1,302 (1,235 plus 67 from Staff Engineer) and costs an estimated $16.43 million in salaries (see Figures H-1-13 and H-1-14).

d. Alternative 3. In this alternative, a dual manager structure was organized and staffed by the Army Staffing Guide. Based on percentage of workload, the Air Force is the lead service and subsequent RPMA Manager in the Pacific West while the Army is the lead service and manager in the Pacific East and Atlantic.

(1) Figure H-1-15 shows the organizational structure for Alternative 3.

(a) The Atlantic is provided with a responsive area manager to coordinate the RPMA activities.

(b) Since only three percent of the Navy workload is on the Pacific East, the majority of their workload will be performed by the Pacific West Manager (Air Force). The residual Navy RPMA responsibility would rest with the Staff Engineer.

(c) Fire protection remains under the Air Force RPMA Manager in the Pacific West to reflect service needs/responsibilities.

(d) A Production Manager is staffed in each RPMA organization.

(e) One Master Planner is provided for each RPMA Manager for PRCMP changes.

(f) Procurement, contracting, and supply are structured as integral parts of each organization, staffed similar to Alternative 2 except that each manager is provided with a Procurement Officer.

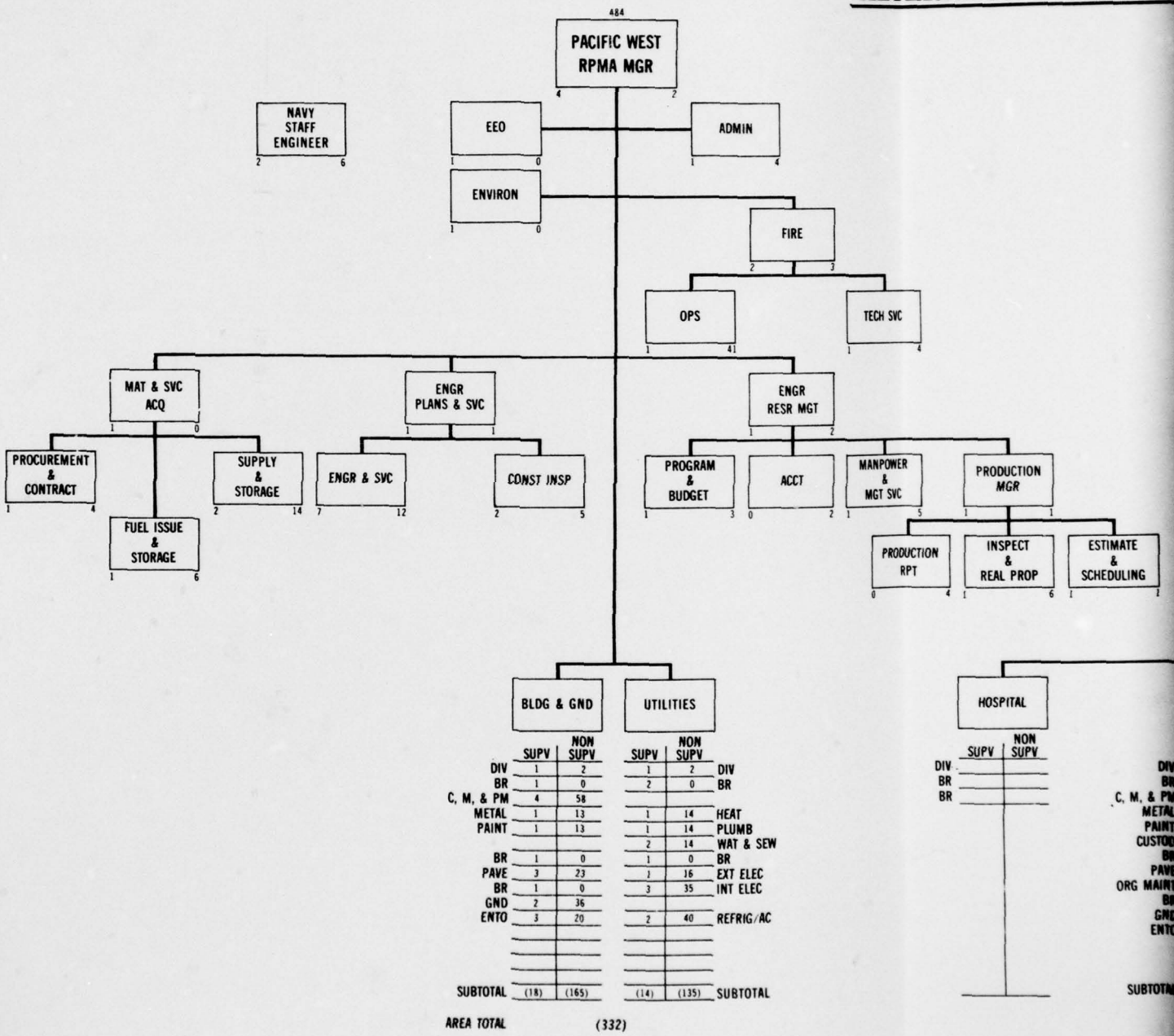
(g) Each RPMA is funded as in the CMO. The workload, however, is divided geographically with each manager performing the other services' work via Interservice Support Agreements (ISSAs).

(2) Using the workload factors for each region, the direct work force was distributed with the Pacific East and Atlantic requiring approximately 64 percent of the force, and the Pacific West the remaining 36 percent. No central nonrecurring shop was structured as each RPMA Manager must have his own geographic shops to accomplish both recurring and nonrecurring work.

(3) The real property accountable records maintenance responsibility remains with each service. ESC concluded that there would be fewer communication difficulties if the services retained the function. Personnel requirements are four, two, and one for the Army, Air Force, and Navy, respectively.

(4) The Navy Staff Engineer is structured like Alternative 2 except that it requires a real property records clerk. The total cost for this office is $114,507.

## ALTERNATIVE 3--DUAL




AREA TOTAL (332)

## TERNATIVE 3--DUAL MANAGER

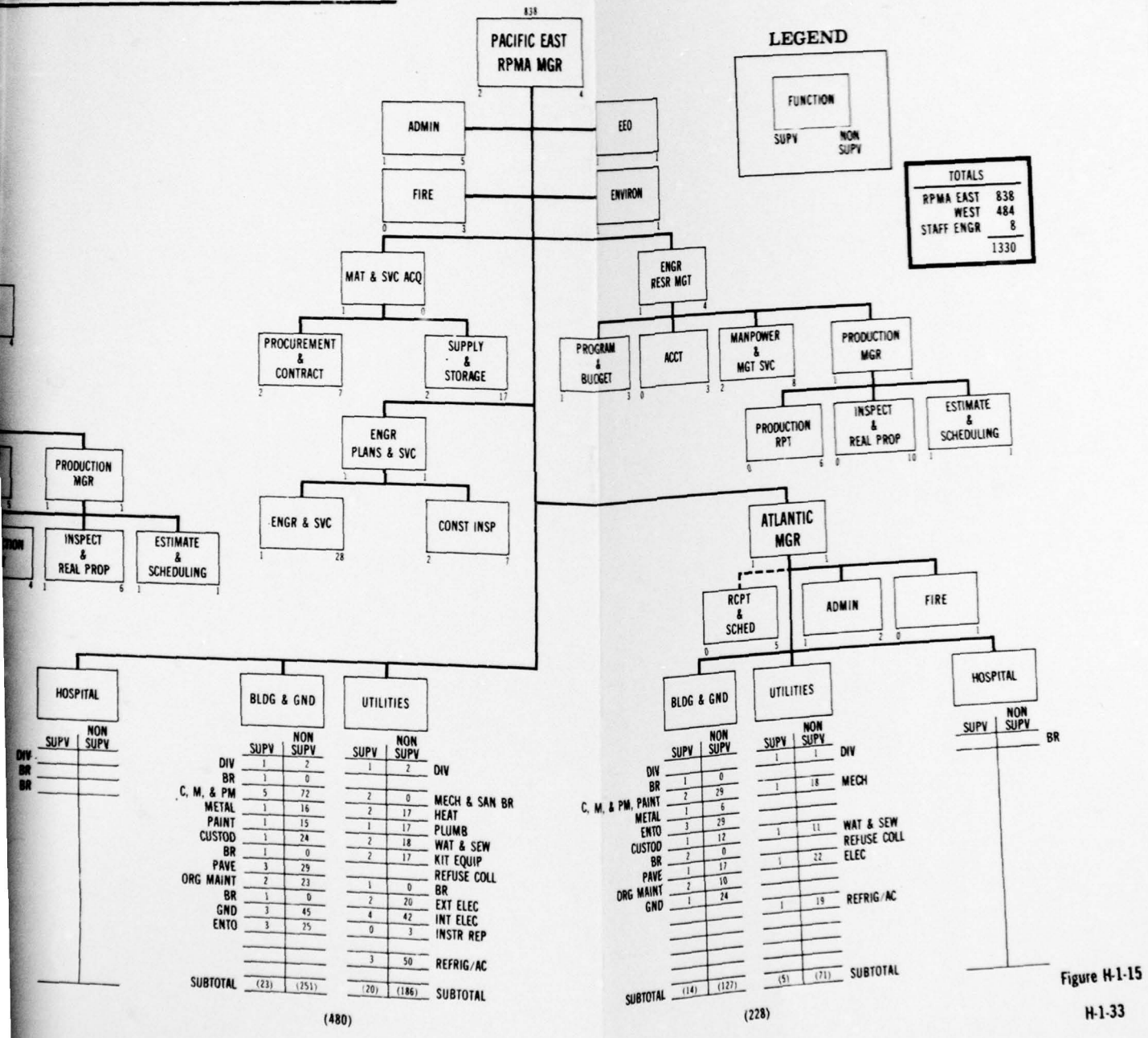



Figure H-1-15

(5) The total RPMA work force is staffed as shown in Figure H-1-16 and costs, with Staff Engineer, $16.92 million annually for the 1,330 assigned personnel.

e. Alternative 4. In this final alternative, a dual manager structure was staffed using the existing organizational structure of the Army and Air Force structure. However, the Air Force RPMA organization on the Pacific West was staffed according to a derived Air Force ratio of personnel to a single but significant yardstick--total square footage of building area. This alternative was an attempt at modeling their organization. The Army RPMA organization (Pacific East) continued to be staffed using the Army Staffing Guide.

(1) By applying the Air Force CMO staffing level to their total square footage of building area, ratios of personnel per 1,000 square feet were developed. These ratios were then applied to the management overhead functions shown in Figure H-1-17 based on 7,438,870 square feet of building area in the Pacific West. This resulted in an increased work force over the same functions staffed by the Army Staffing Guide in Alternative 3. However, this increase aligns the Air Force work force more closely to the current method (Alternative 1).

(2) Figure H-1-18 shows the organizational structure.

(a) Again, the Atlantic is provided with an Area Manager.

(b) The Navy workload is performed by the Pacific West Manager (Air Force).

# ALTERNATIVE 3

| YARDSTICK CODE | FUNCTIONAL TITLE | RECOMMENDED STRENGTH SUP | NSUP | TOT | OFFICE SALARY |
|---|---|---|---|---|---|
| 610 | RPMA MANAGER | 4 | 8 | 12 | 159,624 |
| 610A | EEO | 2 | 1 | 3 | 62,094 |
| 611 | ADMINISTRATION | 3 | 11 | 14 | 244,381 |
| 612.1 | CH,ERMD | 2 | 6 | 8 | 158,716 |
| 612.2 | PROG/BUDG,ACCT,STAT | 2 | 11 | 13 | 154,968 |
| 612.3,4 | WK RECP, SCHED, EST | 4 | 29 | 33 | 559,082 |
| 612.5,6 | IND ENGR, REAL PROP | 3 | 19 | 22 | 286,993 |
| 613.1 | CH, EP & SD | 2 | 2 | 4 | 113,676 |
| 613.2 | ENGR SVCS | 2 | 46 | 48 | 881,632 |
| 613.3,4 | INSP, MSTR PL/PROG | 4 | 12 | 16 | 309,568 |
| 613.4A | ENVIRONMENTAL | 2 | 1 | 3 | 38,892 |
| 621 | CH, MAT & SVCS AQUIS | 2 | 0 | 2 | 36,572 |
| 621A | PROC & CONTRACT | 3 | 11 | 14 | 147,773 |
| 622 | SUPPLY | 2 | 15 | 17 | 152,149 |
| 623 | STORAGE | 2 | 16 | 18 | 169,634 |
| 641 | FIRE PROT | 4 | 48 | 52 | 502,052 |
| 641A | FIRE PREV | 0 | 4 | 4 | 38,568 |
| 630 | AREA/TECH SVC MGR | 1 | 1 | 2 | 37,262 |
| 631 | CH BLDG & GRNDS DIV | 2 | 4 | 6 | 123,868 |
| 632.1 | CH, BLDG & STRUC BR | 3 | 0 | 3 | 72,033 |
| 632.21,31 | CARP, MASON, & PM | 11 | 159 | 170 | 1,991,000 |
| 632.32 | CUSTODIAL SVCS | 3 | 36 | 39 | 270,792 |
| 632.4 | METAL WORK | 3 | 35 | 38 | 645,900 |
| 632.5 | PAINT | 2 | 28 | 30 | 376,232 |
| 633.1 | CH, ROAD & RR BR | 3 | 0 | 3 | 77,811 |
| 633.21 | PAVE MAINT | 7 | 69 | 76 | 813,065 |
| 634.21,22 | ENGR ORG MAINT | 4 | 33 | 37 | 452,473 |
| 634.1 | CH, LAND MGT BR | 3 | 0 | 3 | 63,558 |
| 634.21,22 | GROUNDS MAINT | 6 | 105 | 111 | 838,377 |
| 634.5 | PEST CONTROL | 9 | 74 | 83 | 710,741 |
| 651 | CH UTIL DIV | 3 | 5 | 8 | 131,070 |
| 652.21 | REFRIG & AC OP/MNT | 6 | 109 | 115 | 1,764,517 |
| 652.22 | KITCHEN EQUIP | 2 | 17 | 19 | 327,362 |
| 652 | MECH & SANITATION BR | 4 | 0 | 4 | 112,420 |
| 652.3,4,5 | BLR, HTG, & PLUMB | 6 | 80 | 86 | 949,320 |
| 652.6 | FUEL STORE/ISSUE | 1 | 6 | 7 | 96,308 |
| 654.2,3,4 | WATER & SEWER | 5 | 43 | 48 | 574,125 |
| 653.1 | CH ELEC BR | 2 | 0 | 2 | 49,756 |
| 653.2 | EXTERIOR ELEC | 4 | 44 | 48 | 801,568 |
| 653.3 | INTERIOR ELEC | 7 | 91 | 98 | 1,436,134 |
| 654.3A | INSTRUMENT REPAIR | 0 | 3 | 3 | 62,259 |
| | TOTAL | 140 | 1,182 | 1,322 | 16,794,325 |

Figure H-1-16

MANAGEMENT OVERHEAD FUNCTIONS BASED ON CURRENT
AIR FORCE SERVICE RATIO (ALTERNATIVE 4)[a]

| Yard-stick Code | Functional Title | Recognized | | | Pers |
|---|---|---|---|---|---|
| | | Supv | Non-supv | Total | 1,000 Sq Ft |
| 610 | Office of Director of Facilities Engineering | 3 | 1 | 4 | .000485 |
| 611 | Administration | 4 | 6 | 10 | .001294 |
| 612.1 | Chief, Engineer Resource Management Division | 1 | 1 | 2 | .000323 |
| 612.2 | Programing, Budgeting, Accounting, and Statistics | 2 | 3 | 5 | .000647 |
| 612.3,4 | Work Reception, Scheduling, Estimating | 5 | 28 | 33 | .004370 |
| 612.5,6 | Industrial Engineer, Real Property | 3 | 7 | 10 | .001294 |
| 613.1 | Chief, Engineer Plans and Service Division | 1 | 4 | 5 | .000647 |
| 613.2 | Engineer Services | 2 | 17 | 19 | .002589 |
| 613.3,4 | Inspection, Master Plans and Programs | 2 | 11 | 13 | .001780 |
| 613.4A | Environmental | 0 | 1 | 1 | .000161 |
| 621 | Chief, Supply and Storage | 1 | 0 | 1 | .000161 |
| 622 | Property Control | 0 | 6 | 6 | .000809 |
| 623 | Storage | 0 | 5 | 5 | .000647 |
| | Total | 24 | 90 | 114 | .015207 |

a/ Yardstick: Personnel per 1,000 square feet of building area.
Value: 7,438,870 square feet.

Figure H-1-17

(c) Fire protection remains under the Air Force RPMA Manager.

(d) The real property recordkeeping function remains unchanged from Alternative 3.

(e) Procurement and contracting function would remain a part of the installation support organization of each RPMA Manager's parent service.

(f) Supply and storage function is staffed only to the current work force level (i.e., the CMO). The remaining supply and storage needs of each RPMA would also come from their installation support.

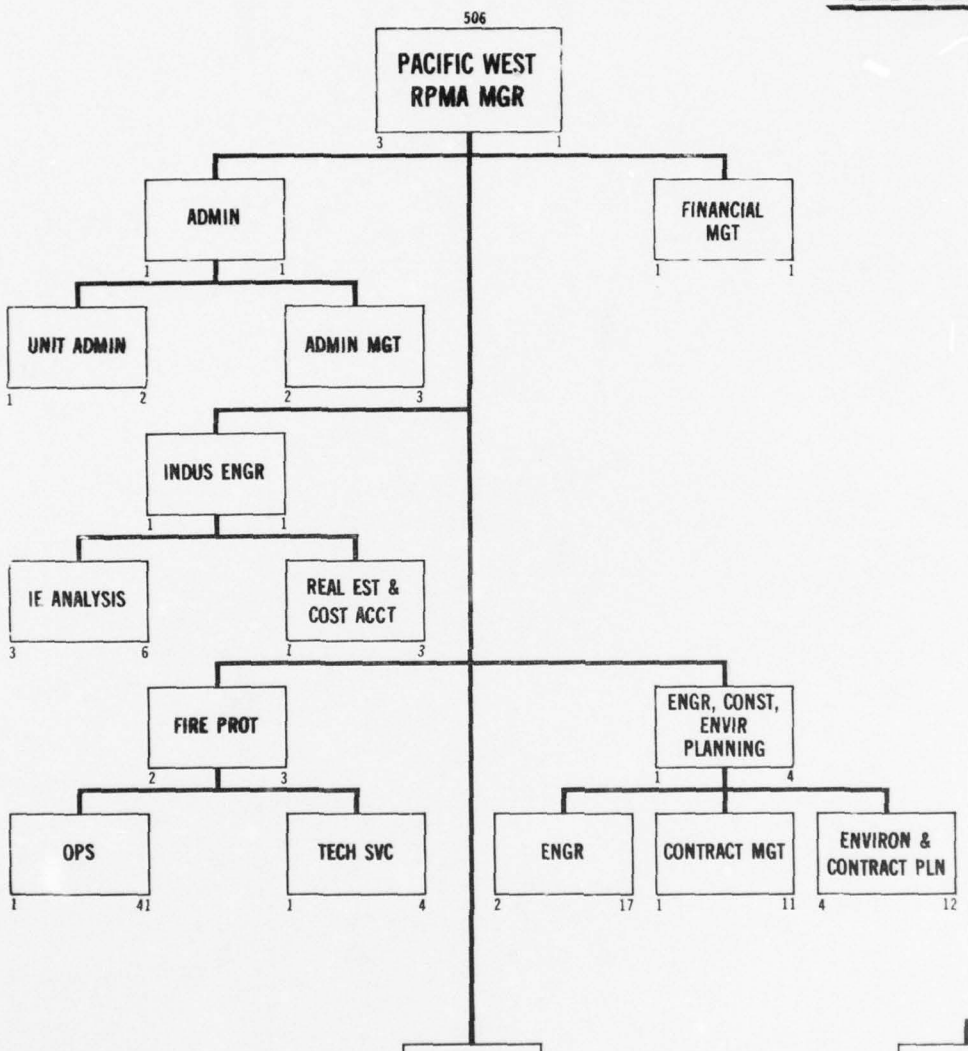
(g) Equal Employment Opportunity (EEO) Office support is provided by the installation and not staffed as in Alternatives 2 and 3.

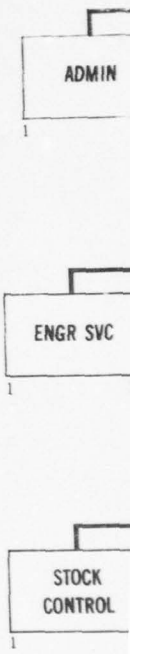
(h) Funding is accomplished through normal command channels with ISSAs for work outside a manager's geographical area.

(3) Figure H-1-19 shows the resulting staff levels amounting to 1,339 personnel. Adding eight people for the Navy Staff Engineer, a total of 1,347 personnel, is required at an annual cost of $17.37 million. While representing an increase in the RPMA force, Alternative 4 seems more attractive to each service because it follows the CMO staffing.

7. Summary. The preceding paragraphs describe the staffing procedure for each alternative. The total RPMA work force, including the Staff Engineer, ranged from a low of 1,302 to a high of 1,361 in the CMO. Figure H-1-20 summarizes the RPMA staffing results for each alternative.

# ALTERNATIVE 4--DUAL M




## OPERATIONS

| | SUPV | NON SUPV |
|---|---|---|
| DIV | 2 | 4 |
| RESOURCES & RQMT | 4 | 28 |
| STRUCTURES | 7 | 84 |
| ELEC | 2 | 32 |
| PAVE & GND | 10 | 79 |
| MECH | 5 | 68 |
| SANITATION | 3 | 14 |
| ELEC PWR PROD | 3 | 19 |
| FUEL ISSUE & STORAGE | 1 | 6 |
| SUBTOTAL | 37 | (334) |

AREA TOTAL (371)

## HOSPITAL

| | SUPV | NON SUPV |
|---|---|---|
| DIV | | |
| BR | | |
| BR | | |

## BLDG & GND

| | SUPV | NON SUPV |
|---|---|---|
| DIV | 1 | 2 |
| BR | 1 | 0 |
| C, M, & PM | 5 | 72 |
| METAL | 1 | 16 |
| PAINT | 1 | 15 |
| CUSTOD | 1 | 24 |
| BR | 1 | 0 |
| PAVE | 3 | 29 |
| ORG MAINT | 2 | 23 |
| BR | 1 | 0 |
| GND | 3 | 45 |
| ENTO | 3 | 25 |
| SUBTOTAL | (23) | (251) |

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AD-A077 166 ARMY ENGINEER STUDIES CENTER WASHINGTON DC F/G 15/5
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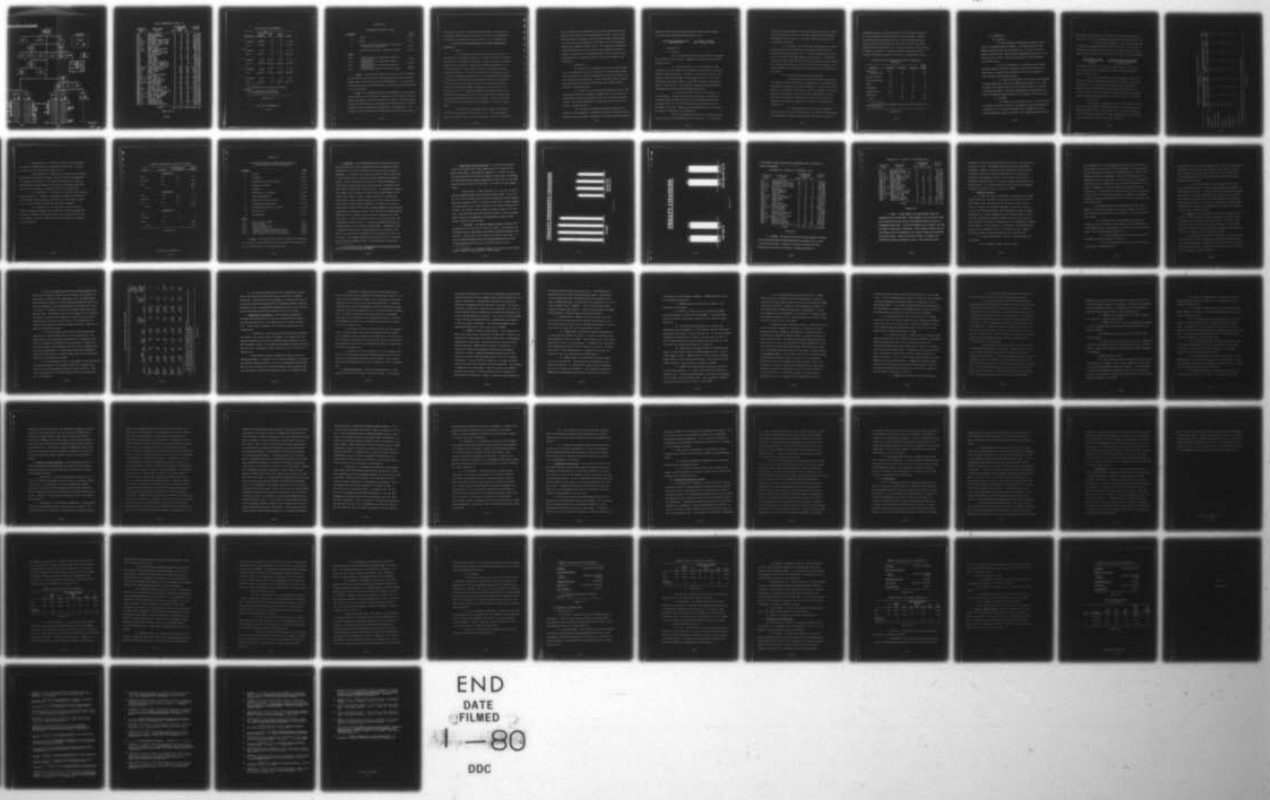

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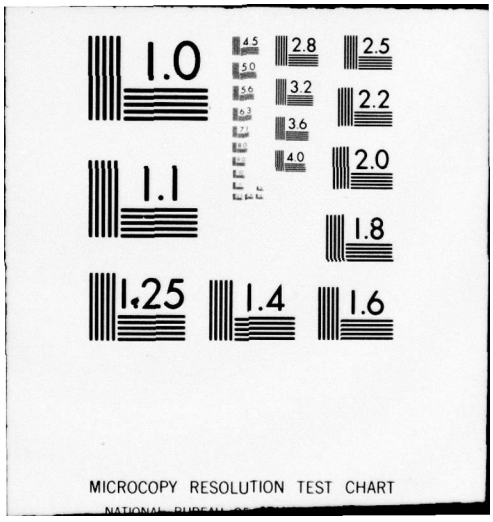
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MICROCOPY RESOLUTION TEST CHART

# TIVE 4--DUAL MANAGER

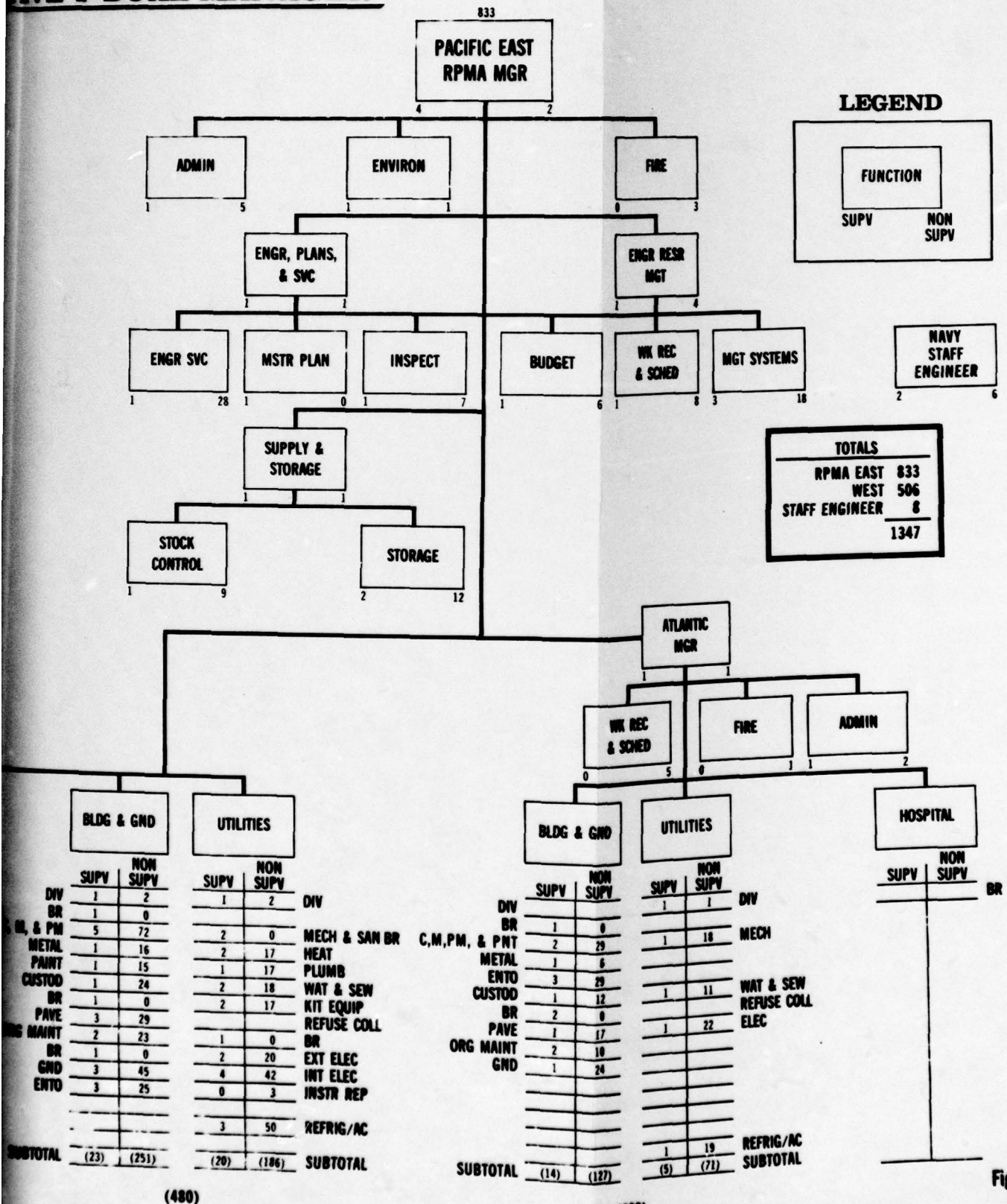


Figure H-1-18



2

# ALTERNATIVE 4

| YARDSTICK CODE | FUNCTIONAL TITLE | RECOMMENDED STRENGTH SUP | NSUP | TOT | OFFICE SALARY |
|---|---|---|---|---|---|
| 610 | RPMA MANAGER | 5 | 5 | 10 | 170,490 |
| 611 | ADMINISTRATION | 6 | 13 | 19 | 345,482 |
| 612.1 | CH,ERMD | 2 | 5 | 7 | 141,691 |
| 612.2 | PROG/BUDG,ACCT,STAT | 3 | 9 | 12 | 150,987 |
| 612.3,4 | WK RECP, SCHED, EST | 7 | 47 | 54 | 917,816 |
| 612.5,6 | IND ENGR, REAL PROP | 5 | 19 | 24 | 328,285 |
| 613.1 | CH, EP & SD | 2 | 5 | 7 | 165,198 |
| 613.2 | ENGR SVCS | 3 | 45 | 48 | 889,440 |
| 613.3,4 | INSP, MSTR PL/PROG | 4 | 18 | 22 | 418,972 |
| 613.4A | ENVIRONMENTAL | 1 | 2 | 3 | 30,195 |
| 621 | CH, SUPPLY & STORE | 2 | 1 | 3 | 47,477 |
| 622 | PROP CONTROL | 1 | 15 | 16 | 143,147 |
| 623 | STORAGE | 2 | 17 | 19 | 178,435 |
| 641 | FIRE PROT | 4 | 48 | 52 | 502,052 |
| 641A | FIRE PREV | 0 | 4 | 4 | 38,568 |
| 630 | AREA/TECH SVC MGR | 1 | 1 | 2 | 37,262 |
| 631 | CH BLDG & GRNDS DIV | 2 | 4 | 6 | 123,868 |
| 632.1 | CH, BLDG & STRUC BR | 3 | 0 | 3 | 72,033 |
| 632.21,31 | CARP, MASON, & PM | 11 | 159 | 170 | 1,991,000 |
| 632.32 | CUSTODIAL SVCS | 3 | 36 | 39 | 270,792 |
| 632.4 | METAL WORK | 3 | 35 | 38 | 645,900 |
| 632.5 | PAINT | 2 | 28 | 30 | 376,232 |
| 633.1 | CH, ROAD & RR BR | 3 | 0 | 3 | 77,811 |
| 633.21 | PAVE MAINT | 7 | 69 | 76 | 813,065 |
| 634.21,22 | ENGR ORG MAINT | 4 | 33 | 37 | 452,473 |
| 634.1 | CH, LAND MGT BR | 3 | 0 | 3 | 63,558 |
| 634.21,22 | GROUNDS MAINT | 6 | 105 | 111 | 838,377 |
| 634.5 | PEST CONTROL | 9 | 74 | 83 | 710,741 |
| 651 | CH UTIL DIV | 3 | 5 | 8 | 131,070 |
| 652.21 | REFRIG & AC OP/MNT | 6 | 109 | 115 | 1,764,517 |
| 652.22 | KITCHEN EQUIP | 2 | 17 | 19 | 327,362 |
| 652 | MECH & SANITATION BR | 4 | 0 | 4 | 112,420 |
| 652.3,4,5 | BLR, HTG, & PLUMB | 6 | 80 | 86 | 949,320 |
| 652.6 | FUEL STORE/ISSUE | 1 | 6 | 7 | 96,308 |
| 654.2,3,4 | WATER & SEWER | 5 | 43 | 48 | 574,125 |
| 653.1 | CH ELEC BR | 2 | 0 | 2 | 49,756 |
| 653.2 | EXTERIOR ELEC | 4 | 44 | 48 | 801,568 |
| 653.3 | INTERIOR ELEC | 7 | 91 | 98 | 1,436,134 |
| 654.3A | INSTRUMENT REPAIR | 0 | 3 | 3 | 62,259 |
| | TOTAL | 144 | 1,195 | 1,339 | 17,246,186 |

Figure H-1-19

TOTAL STAFFING REQUIREMENTS

| Alternative | RPMA Facility Engineer | RPMA Base Op | RPMA Staff Engr | Total |
|---|---|---|---|---|
| 1 | | | | |
| Strength | 1,361[a] | NA | NA | 1,361 |
| Cost | $17.56M | NA | NA | $17.57M |
| 1A | | | | |
| Strength | 1,317 | NA | NA | 1,317 |
| Cost | $16.93M | NA | NA | $16.93M |
| 2 | | | | |
| Strength | 1,222 | 13.0[b] | 67[c] | 1,302 |
| Cost | $15.58M | $0.13M | $0.72M | $16.43M |
| 3 | | | | |
| Strength | 1,308 | 14.0[b] | 8.0 | 1,330 |
| Cost | $16.65M | $0.15M | $0.12M | $16.92M |
| 4 | | | | |
| Strength | 1,339 | NA | 8.0 | 1,347 |
| Cost | $17.25M | NA | $0.12M | $17.37M |

a/ Adjusted for real property and master planning.
b/ Procurement and contracting.
c/ Includes fire protection (52).

Figure H-1-20

LAST PAGE OF APPENDIX H-1

APPENDIX H-2

DEVELOPMENT OF SUPPORT TO RPMA


| Paragraph | | Page |
|---|---|---|
| 1 | Purpose | H-2-1 |
| 2 | Scope | H-2-1 |
| 3 | Procedure for Developing Support for Selected Consolidation Alternatives | H-2-2 |
| 4 | Retained (Unrealizable) Installation Support | H-2-10 |

| Figure | | |
|---|---|---|
| H-2-1 | Changes/Savings for Installation Support--Alternative 2 | H-2-6 |
| H-2-2 | Changes/Savings for Installation Support--Alternative 3 | H-2-9 |
| H-2-3 | Changes/Savings for Installation Support--Alternative 4 | H-2-11 |
| H-2-4 | Retained (Unrealizable) Installation Support | H-2-13 |


1. Purpose. This appendix explains the procedure used for developing installation support for the consolidation alternatives the Engineer Studies Center (ESC) selected for final consideration. It also displays the resulting changes (savings/additions) in staffing installation support for each alternative.

2. Scope. This appendix addresses the development of installation support required for real property maintenance activity (RPMA) under each selected alternative for RPMA consolidation in Panama. The offices that provide most RPMA support are the Comptroller, Adjutant General, Civilian Personnel, Supply, Procurement, Transportation, and Maintenance. The Automatic Data Processing (ADP) and Communications Offices also provide

RPMA support. However, that support remains similar to current method of operations (CMO) under all alternatives and will not be addressed in the process of developing installation support for the alternatives.

3. Procedure for Developing Support for Selected Consolidation Alternatives.

a. General.

(1) The general approach used to determine the effect of consolidation on installation support is to develop the amount of support required under each suggested alternative. Some of the support functions (supply and procurement) are moved within the RPMA organization in two of the alternatives. This reduces the amount of installation support in those alternatives. ESC used the Army Staffing Guide (Alternative 2, 3, and 4) to establish staffing levels for the consolidation alternatives in conjunction with CMO data (TDA authorized strength, etc.) submitted by the armed services in Panama. An Air Force Staffing Guide was not available for developing manpower requirements for the Air Force in Alternatives 3 and 4. Therefore, mathematical proportions were used to obtain the estimated support level. These proportions are based on CMO and projected consolidated alternative strengths. Similar methods were also used when data were missing or not adaptable to the Army Staffing Guide.

(2) Reductions in required man-year support reflected as a result of consolidation Alternatives 2, 3, or 4 do not necessarily equal net savings. This is true for two reasons. Some of the projected

man-year savings are an accumulation of fractional savings within each office (not true when the Army Staffing Guide is used). Also, the net savings should not be greater than the realized support (see Appendix C-2) which each service reported it could give up if its RPMA responsibilities were assumed by another service. Net savings were obtained by comparing projected man-year savings/increases against CMO realized savings. The man-years of installation support that are retained (not realizable) must, of necessity, reduce the potential savings of each alternative.

b. Alternative 1.

(1) Alternative 1 represents each service's CMO in Panama (i.e., the alternative to retain the status quo if significant savings are not projected as a result of developing the support required for the other consolidation alternatives). Each of the other selected alternatives was compared with the CMO to determine what change (savings/increase) is realized by each.

(2) Figure C-2-6 shows installation support for CMO. (CMO installation support is explained in Appendix C-2.) The services provided currently authorized personnel levels for the various supporting offices. The Facilities Engineer (FE) base force for the CMO for all services in Panama is 1,418.

(3) The Navy's transportation support to RPMA was not apparent in CMO submissions. Therefore, ESC estimated the Navy's transportation support by using a proportion of total Navy vehicle maintenance

personnel and the total Navy general purpose vehicles (GPVs) compared to the Navy GPVs supporting RPMA (see Figure C-2-6).

$$\frac{\text{Total Navy Maintenance Force}}{\text{Total Navy GPVs}} = \frac{\text{X (Support to RPMA)}}{\text{GPVs in Support of RPMA}}$$

c. Alternative 2.

(1) General.

(a) This consolidation alternative proposes one manager for all RPMA activity in Panama. Appendix H-1 explains this alternative concept in detail.

(b) Under Alternative 2 (also Alternative 3), RPMA functions include the supply and procurement functions which are normally provided by the installation. Therefore, this alternative does not show support to RPMA from the Supply and Procurement Offices. As a result, this reduced requirement reflects a significant savings in installation support. However, much of the savings is negated by increased manpower requirements within the consolidated RPMA organization.

(c) The total civilian FE force for Alternative 2 is 1,235 people. A second iteration under Alternative 2 proposes that the RPMA military/civilian mix for the Air Force RPMA workload remain the same as CMO. The total civilian population under this version of Alternative 2 is 1,095. However, the resulting differences in installation support requirements are insignificant.

(d) A revolving fund is projected as the type of funding best suited for RPMA operations under Alternative 2. This funding

requires a personnel increase of 19 in the Comptroller's Office to administer the industrial fund (IF). This additional personnel requirement is separate from any changes in the normal requirements projected for the Comptroller's Office.

(2) Staffing. ESC used the Army Staffing Guide in conjunction with the TDA for staffing the consolidated organization in all areas covered by Alternatives 2 and 3. The Army Staffing Guide was also used for the Pacific East RPMA manager in Alternative 4. Proportional increases in support functions for the Pacific West manager were required due to the nonavailability of current Air Force manning documents. (The current standard is no longer in print and there were none available for this study.)

(3) Installation support--increases/savings.

(a) Figure H-2-1 presents the increase, savings, and net change for each of the offices providing support to the RPMA (excluding ADP and communications as explained earlier). The total increase in support to Army RPMA is 30 man-years, and the total savings is 17, which projects a net increase of only 13 over Army's CMO support to the FE. This increase in the Army's strength above the CMO is the result of increased total personnel requirements to support this consolidation alternative.

(b) The Comptroller will be used as an example of how ESC arrived at the data in Figure H-2-1. The amount of normal support by the Comptroller remained almost constant with only an increase of

2 man-years because of increased workloads in the Civilian Pay Section of the Pay Examination Branch and in the Accounting Branch. However, the Navy would save 2 man-years from its realizable support from the Comptroller which could be given up if the Army took over their RPMA responsibilities (see Figure C-2-6). Therefore, there is no net increase in support to the RPMA. As explained earlier, administering the IF requires 19 additional man-years of effort in the Comptroller's Office.

CHANGES/SAVINGS FOR INSTALLATION SUPPORT--ALTERNATIVE 2
(Man-years)

| Function | Army CMO | Increase | Savings | Net Change |
|---|---|---|---|---|
| Comptroller | 18.7 | 2 | 2 | 0 |
| Industrial Fund | 0 | 19 | 0 | +19 |
| Adjutant General | 1.0 | 0 | 1 | -1 |
| Civilian Personnel | 15.0 | 2 | 4 | -2 |
| Supply | 13.5 | a/ | a/ | a/ |
| Procurement | 8.0 | a/ | a/ | a/ |
| Transportation | 11.6 | 5 | 6 | -1 |
| Maintenance | 4.5 | 2 | 4 | -2 |
| Total | | 30 | 17 | +13 |

a/ CMO installation support function is included within the RPMA organization.

Figure H-2-1

d. Alternative 3.

(1) General.

(a) This alternative fundamentally proposes two managers for consolidating RPMA in Panama. It is proposed that the Army manage the Atlantic Coast and the Pacific East. The Air Force would manage the Pacific West. Most Navy RPMA responsibilities would be transferred to the Air Force as these Navy functions are located primarily on the Pacific West.

(b) As in Alternative 2, the supply and procurement functions normally provided by installation support are included as an RPMA function. Therefore, this alternative does not show support to RPMA from Supply and Procurment Offices.

(c) Under this alternative, the Army FE force increased by 33 above CMO, while the Air Force RPMA force increased by 26. These increases in FE personnel were not large enough to require an increase in installation support. Most Navy transportation and maintenance functions for GPVs which support RPMA are also transferred to the Air Force.

(2) Staffing.

(a) Pacific East and Atlantic (Army). The same method of staffing was used for the Army in Alternative 3 as that described for Alternative 2 (i.e., the Army Staffing Guide in conjunction with the current authorized strength in the TDA). The increased workload for the

Army under this alternative is so slight that no increased staffing is required for any of the installation support functions (see Figure H-2-2).

(b) Pacific West (Air Force). The Air Force's manning documents are being revised and the current standard is not available. Therefore, the following proportion/ratio was used to estimate the additional staffing required for each function of the West Bank consolidation:

$$\frac{\text{CMO Support to RPMA}}{\text{CMO Population/Vehicles Served}} = \frac{\text{X (Support to RPMA Consolidation)}}{\text{Total Consolidated Population/ Vehicles Served}}$$

This staffing procedure is believed to produce results on an accuracy level equal to the data submitted and therefore acceptable for this study (see Figure H-2-2).

(3) Installation support--increase/savings. Figure H-2-2 shows the increase in installation support and the savings projected for Alternative 3. A total increase of 9 man-years was required which reflects extra RPMA responsibilities transferred from the Navy to the Air Force. There is also a savings of 3 man-years (from Navy realizable support), which reduces the RPMA force increase to a net of 6 man-years.

e. Alternative 4.

(1) General. Alternatives 3 and 4 are very similar because they use the dual manager concept with the Army on the Pacific East and Atlantic and the Air Force on the Pacific West. The primary difference is that each service maintains its current organizational structure with personnel changes to account for different workloads.

CHANGES/SAVINGS FOR INSTALLATION SUPPORT--ALTERNATIVE 3
(Man-years)

| Function | Pacific East and Atlantic (Army) | | | | Pacific West (Air Force) | | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | Army CMO | Increase | Savings | Net Change | Air Force CMO | Increase | Savings | Net Change | Net Change |
| Comptroller | 18.7 | 0 | 0 | 0 | 2.2 | 0 | 2 | -2 | -2 |
| Adjutant General | 1.0 | 0 | 0 | 0 | 1.1 | 0 | 0 | 0 | 0 |
| Civilian Personnel | 15.0 | 0 | 0 | 0 | 6.7 | 1 | 1 | 0 | 0 |
| Supply | 13.5 | a/ | a/ | a/ | 18.9 | a/ | a/ | a/ | a/ |
| Procurement | 8.0 | a/ | a/ | a/ | 6.3 | a/ | a/ | a/ | a/ |
| Transportation | 11.6 | 0 | 0 | 0 | 7.2 | 5 | 0 | 5 | 5 |
| Maintenance | 4.5 | 0 | 0 | 0 | 5.2 | 3 | 0 | 3 | 3 |
| Total | | 0 | 0 | 0 | | 9 | 3 | 6 | 6 |

a/ CMO installation support function is included with RPMA organization.

Figure H-2-2

(a) In this alternative, supply and procurement are considered installation support functions instead of being included within the RPMA organization as in Alternatives 2 and 3.

(b) Under this alternative, the Army FE force increases by 28 (over CMO) and the Air Force Base Civil Engineer (BCE) force increases by 48.

(2) Staffing. The staffing levels remain the same as in Alternative 3 because of the similar workload in each alternative. Only supply and procurement support changed for reasons previously mentioned.

(3) Installation support--increase/savings. Figure H-2-3 shows the results of staffing the consolidated organization under Alternative 4. The net change remained at six as in Alternative 2, even though supply and procurement were included as installation support.

4. Retained (Unrealizable) Installation Support.

a. General. Installation support that can not be given up (i.e., retained (unrealizable) by a service during any consolidation) must be considered as part of the overall RPMA total effort. This is necessary before there can be an accurate comparison of total manpower between alternatives (see Appendix H-3). Including CMO-retained support as part of the total RPMA effort under Alternatives 2, 3, and 4 is not necessary because it represents that part of CMO RPMA support that cannot be given up under any consolidation. Fractional parts of realizable support also must be considered as retained because only whole spaces can be given up or saved.

CHANGES/SAVINGS FOR INSTALLATION SUPPORT--ALTERNATIVE 4
(Man-years)

| Function | Pacific East and Atlantic (Army) | | | | Pacific West (Air Force) | | | | Total |
|---|---|---|---|---|---|---|---|---|---|
| | Army CMO | Increase | Savings | Net Change | Air Force CMO | Increase | Savings | Net Change | Net Change |
| Comptroller | 18.7 | 0 | 0 | 0 | 2.2 | 0 | 2 | -2 | -2 |
| Adjutant General | 1.0 | 0 | 0 | 0 | 1.1 | 0 | 0 | 0 | 0 |
| Civilian Personnel | 15.0 | 0 | 0 | 0 | 6.7 | 1 | 1 | 0 | 0 |
| Supply | 13.5 | 0 | 0 | 0 | 18.9 | 2 | 1 | 1 | 1 |
| Procurement | 8.0 | 0 | 0 | 0 | 6.3 | 1 | 2 | -1 | -1 |
| Transportation | 11.6 | 0 | 0 | 0 | 7.2 | 5 | 0 | 5 | 5 |
| Maintenance | 4.5 | 0 | 0 | 0 | 5.2 | 3 | 0 | 3 | 3 |
| Total | | 0 | 0 | 0 | | 12 | 6 | 6 | 6 |

Figure H-2-3

b. Retained support. Figure H-2-4 shows for each alternative the support to RPMA which must be retained by each service. The data for this chart were obtained from Figure C-2-6.

(1) Alternative 2. Figure H-2-4 includes only the retained man-years for procurement and supply since the Army is the managing service under this alternative. The Army-retained support for these two functions were included because the functions are included within RPMA. There are 33.5 man-years of support retained in this alternative.

(2) Alternative 3. The Army and Air Force are both managers under Alternative 3. Therefore, procurement and supply are handled for both services in this alternative as they were for the Army in Alternative 2. This alternative retains 24.9 man-years of support.

(3) Alternative 4. The Army and Air Force do not have retained installation support under Alternative 4 since procurement and supply are retained as installation support and since both services are area managers. The total retained installation support, all from Navy, is 14.2 man-years.

RETAINED (UNREALIZABLE) INSTALLATION SUPPORT

| Service | Retained | Fractional Loss in Realizable | Total Retained |
|---|---|---|---|
| | Alternative 2 | | |
| Army | 3.0 | 0.5 | 3.5 |
| Air Force | 14.1 | 1.7 | 15.8 |
| Navy | 14.2 | 0 | 14.2 |
| Total | | | 33.5 |
| | Alternative 3 | | |
| Army | 3.0 | 0.5 | 3.5 |
| Air Force | 6.7 | 0.5 | 7.2 |
| Navy | 14.2 | 0.0 | 14.2 |
| Total | | | 24.9 |
| | Alternative 4 | | |
| Army | 0 | 0 | 0 |
| Air Force | 0 | 0 | 0 |
| Navy | 14.2 | 0 | 14.2 |
| Total | | | 14.2 |

Figure H-2-4

LAST PAGE OF APPENDIX H-2

APPENDIX H-3

# INTEGRATION OF FINDINGS BEARING ON THE FEASIBILITY AND DESIRABILITY OF RPMA CONSOLIDATION


| Paragraph | | Page |
|---|---|---|
| 1 | Purpose | H-3-1 |
| 2 | Background | H-3-2 |
| 3 | Panama Canal Treaty Implications | H-3-2 |
| 4 | Comparative Analysis | H-3-8 |
| 5 | Equipment | H-3-10 |
| 6 | Comparison of Alternatives | H-3-15 |
| 7 | Other Consolidations | H-3-16 |
| 8 | Answers to the Main Questions | H-3-27 |
| 9 | Broadening the Perspective | H-3-32 |
| 10 | Consolidation Analysis in General | H-3-33 |
| 11 | The Final Step | H-3-35 |
| 12 | Recommendation | H-3-37 |

| Figure | | |
|---|---|---|
| H-3-1 | Treaty Property Changes | H-3-4 |
| H-3-2 | Treaty Changes | H-3-5 |
| H-3-3 | Treaty Additions--Pac | H-3-6 |
| H-3-4 | Treaty Additions--Atl | H-3-7 |
| H-3-5 | Equipment Utilization/Estimated Excess | H-3-11 |
| H-3-6 | Estimated Equipment Excesses and Costs | H-3-12 |
| H-3-7 | Total Manpower and Annual Cost Comparison | H-3-14 |


1. Purpose. This appendix describes the rationale in determining the feasibility and desirability of consolidating real property maintenance activities (RPMA) in the Panama Canal area.

2. Background. The continuing objective of DOD policy and guidance has been that military installations in given geographic areas be consolidated if it is cost effective and does not result in mission impairment. The Panama current method of operation (CMO) reflects many of these positive results from past analyses of RPMA and installation support. These consolidations (joined into a single organization) or centralizations (merged into one location) portray a progressive attitude toward reducing overall operating costs. The interservice (Panama Canal Company (PCC) included) cooperation has benefitted RPMA, and the services have pursued actions to further advance the consolidation/centralization theme, though admittedly not without outside pressures. United States Southern Command (SOUTHCOM), for example, has directed consolidation studies of RPMA, family housing management, transportation, procurement, and custodial services. This study and the Panama Regional Complex Master Plan (PRCMP), both DOD directed, expanded this notion even further. In fact, the DOD directive[1/] for this study states that consideration should be given to a complete, self-sufficient RPMA that includes elements of base operating support (BOS). DOD guidance makes it clear that consideration of RPMA consolidation is simply an early phase of a program that will consider full consolidation of BOS as its next phase. This appendix combines this rationale and other considerations to develop an RPMA conclusion on feasibility and desirability.

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1/ DOD, DASD(I&H), Memo, Implementation of DOD Planning Relevant to U.S. Military Installations in Panama.

3. Panama Canal Treaty Implications. The current real property assets of the services will change significantly as a result of the Panama Canal Treaty. Implementation commences on 1 October 1979 and quantitatively affects the services through 1 October 1984. As planned, the real property assets remain unchanged after 1984 until the year 2000 when US forces may leave the Canal area. The effects of these changes follow.

a. Real property. Treaty transfers will occur over the next 5 years and primarily affect the Army's real property assets. On 1 October 1979, the PCC transfers all operation and maintenance (O&M) responsibility for dependent schools (1.49 million square feet), hospital support (.6 million square feet), refuse collection, and cemetery maintenance to the Army. The effects of these changes are shown in Figures H-3-1 and H-3-2. Both the quantitative and qualitative aspects of these transfers impact heavily at the beginning, but quantitatively, square footage returns to present levels in 1984.

b. Personnel. The manpower changes required by Schedule X[2/] increase the Army's work force by nearly 50 percent. These changes, by functional area, for the Atlantic and Pacific are shown in Figures H-3-3 and H-3-4. Current Army actions, however, may reduce these totals. A refuse collection/disposal contract is being advertised and the Army is developing specifications for a custodial services contract.

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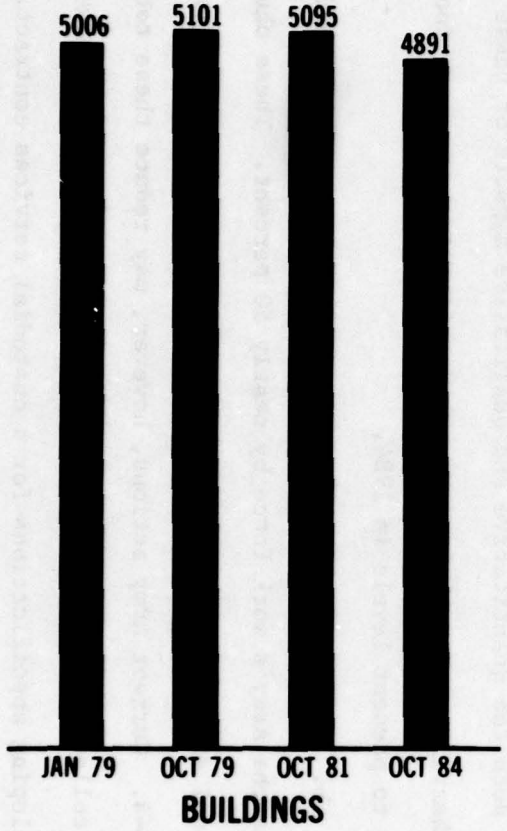
2/ A Schedule X is a manpower document that requests, with justification, changes to existing manpower authorizations.

# TREATY PROPERTY CHANGES



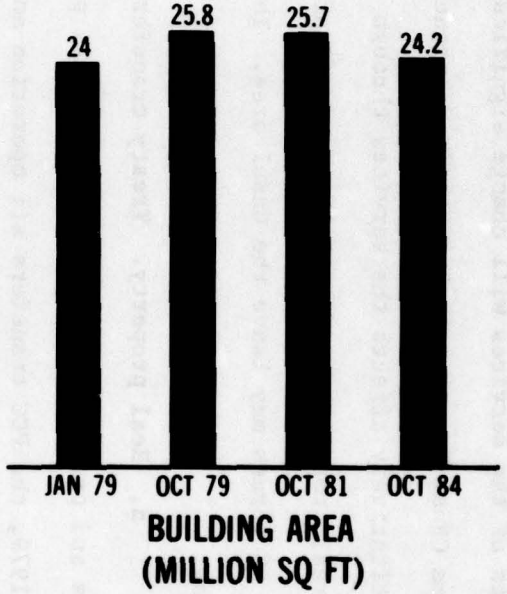




Figure H-3-1

# TREATY CHANGES

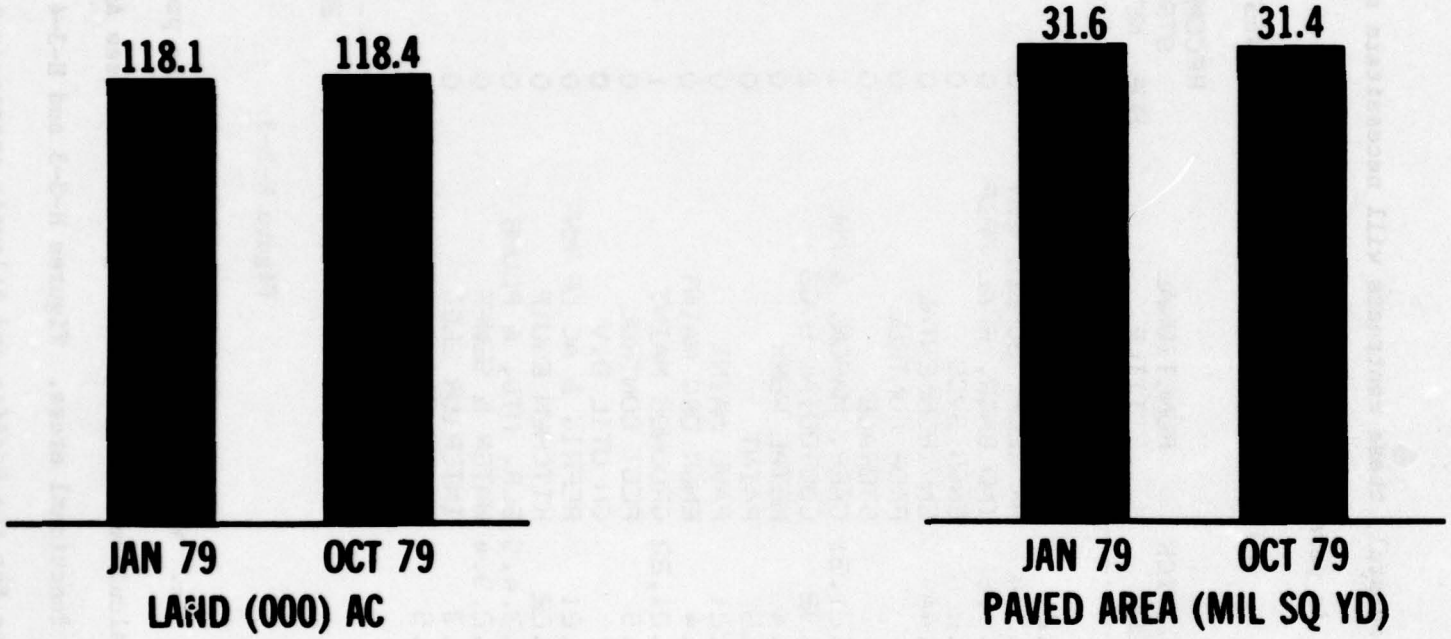



Figure H-3-2

If successful, these contracts will necessitate only a 20 percent increase in personnel.

TREATY ADDITIONS—PAC

| YARDSTICK CODE | FUNCTIONAL TITLE | RECOMMENDED STRENGTH SUP | NSUP | TOT | OFFICE SALARY |
|---|---|---|---|---|---|
| 611 | ADMINISTRATION | 0 | 1 | 1 | 15,920 |
| 612.2 | PROG/BUDG.ACCT,STAT | 0 | 1 | 1 | 10,862 |
| 612.3,4 | WK RECP, SCHED, EST | 0 | 2 | 2 | 32,308 |
| 612.5,6 | IND ENGR, REAL PROP | 0 | 2 | 2 | 23,090 |
| 613.2 | ENGR SVCS | 0 | 5 | 5 | 90,210 |
| 613.4A | ENVIRONMENTAL | 0 | 1 | 1 | 7,166 |
| 622 | PROP CONTROL | 0 | 3 | 3 | 26,829 |
| 623 | STORAGE | 0 | 2 | 2 | 17,602 |
| 632.21,31 | CARP, MASON, & PM | 1 | 11 | 12 | 141,974 |
| 632.32 | CUSTODIAL SVCS | 2 | 62 | 64 | 430,530 |
| 632.4 | METAL WORK | 0 | 5 | 5 | 84,015 |
| 632.5 | PAINT | 0 | 6 | 6 | 73,710 |
| 633.21 | PAVE MAINT | 0 | 4 | 4 | 40,288 |
| 633.4 | ENGR ORG MAINT | 0 | 11 | 11 | 132,187 |
| 634.21,22 | GROUNDS MAINT | 1 | 27 | 28 | 208,014 |
| 634.5 | PEST CONTROL | 0 | 3 | 3 | 23,493 |
| 651 | CH UTIL DIV | 0 | 1 | 1 | 9,642 |
| 652.21 | REFRIG & AC OP/MNT | 0 | 9 | 9 | 135,495 |
| 652.22 | KITCHEN EQUIP | 0 | 3 | 3 | 51,390 |
| 652.3,4,5 | BLR, HTG, & PLUMB | 0 | 16 | 16 | 172,176 |
| 654.2,3,4 | WATER & SEWER | 0 | 2 | 2 | 23,370 |
| 653.3 | INTERIOR ELEC | 0 | 2 | 2 | 28,570 |
| 654.5 | REFUSE COL/DISP | 1 | 47 | 48 | 339,267 |
| 661 | HOSPITAL SUP DIV | 3 | 31 | 34 | 474,088 |
| | TOTAL | 8 | 257 | 265 | 2,593,396 |

Figure H-3-3

c. Salaries. The total cost for the proposed manpower increases were calculated using the average salaries (see Appendix H-1) for each of the functional areas. Figures H-3-3 and H-3-4 present the total salaries for the Pacific and Atlantic increases respectively.

## TREATY ADDITIONS-ATL

| YARDSTICK CODE | FUNCTIONAL TITLE | RECOMMENDED STRENGTH SUP | NSUP | TOT | OFFICE SALARY |
|---|---|---|---|---|---|
| 611 | ADMINISTRATION | 0 | 1 | 1 | 15,920 |
| 612.3.4 | WK RECP. SCHED, EST | 0 | 1 | 1 | 16,154 |
| 613.2 | ENGR SVCS | 0 | 1 | 1 | 18,042 |
| 613.3,4 | INSP, MSTR PL/PROG | 0 | 1 | 1 | 18,234 |
| 632.21,31 | CARP, MASON. & PM | 0 | 15 | 15 | 169,455 |
| 632.32 | CUSTODIAL SVCS | 1 | 23 | 24 | 162,633 |
| 632.4 | METAL WORK | 0 | 2 | 2 | 33,606 |
| 633.21 | PAVE MAINT | 0 | 2 | 2 | 20,144 |
| 633.4 | ENGR ORG MAINT | 0 | 5 | 5 | 60,085 |
| 634.21,22 | GROUNDS MAINT | 0 | 8 | 8 | 58,008 |
| 634.5 | PEST CONTROL | 0 | 2 | 2 | 15,062 |
| 652.21 | REFRIG & AC OP/MNT | 0 | 6 | 6 | 90,330 |
| 652.3,4,5 | BLR, HTG, & PLUMB | 0 | 2 | 2 | 21,522 |
| 654.2,3,4 | WATER & SEWER | 0 | 1 | 1 | 11,085 |
| 653.3 | INTERIOR ELEC | 0 | 1 | 1 | 14,285 |
| 654.5 | REFUSE COL/DISP | 2 | 28 | 30 | 234,084 |
| 661 | HOSPITAL SUP DIV | 1 | 19 | 20 | 269,214 |
| | TOTAL | 4 | 118 | 122 | 1,229,663 |

**Figure H-3-4**

**d. Impact. Treaty changes will significantly change the composition of the Army's RPMA. These changes are in the form of transfers of function with the current PCC employees having the option of accompanying these jobs. If the PCC personnel do not transfer, the Army can expect a great deal of turbulence. This turbulence should occur in areas where there are differences in the types of rules and regulations that govern repair. Hospital electrical outlets, for example, are different from normal residential outlets. This necessitates new**

procedures to ensure that proper materials are used, but the basic labor skills are the same. The Engineer Studies Center (ESC) acknowledges respondent's comments on the large impact generated by these transfers, but reminds readers that initial increases are more than offset by transfers to the Republic of Panama in later years. Once the early qualitative changes are made, the remaining changes are diminishing real property assets. This decrease should necessitate good prior planning to minimize turbulence and force reductions in 1984.

4. Comparative Analysis.

a. Ideally the analyst would prefer to compare the work forces required under two organizations (the CMO and an alternative) over the period 1980 to 1999, and always provide the same or better "level of service." However, the workload would almost certainly vary from year to year. The CMO and alternative (ALT) organizations would be adjusted accordingly; i.e., their strengths would vary, perhaps subject to some time lag. The difference between the CMO and any ALT ($D_{ij}$) would provide a measure of the absolute differences in the organizational strengths over the years. In this notation, "i" represents a consolidation alternative and "j" represents the year. For example, $D_{2,1980}$ = absolute difference between the CMO and Alternative 2 for the year 1980.

b. If instead we consider a relative, fractional measure of differences:

$$d_{ij} = D_{ij}/CMO_{ij} = (CMO_{ij} - ALT_{ij}) \; / \; CMO_{ij}$$

We can assume that for a well-managed CMO and ALT, the differences $d_{ij}$ are the same for each year for a fixed alternative. Our big problem is that the workloads for 1980-1999 are largely uncertain. However, 1978 workload data (W78) are available. Thus, if our assumption that the differences ($d_{ij}$) are indeed equal (or very nearly so), we can directly compute $d_{i,78}$ as our estimate for $d_{ij}$ over the period 1980-1999. We use 1978 as a "snapshot" of historical workload to estimate the future values of $d_{ij}$. In doing this, we use the historical CMO 78 and construct an $ALT_{i,78}$. We do not argue that the $ALT_{i,78}$ strength is necessarily equal to all $ALT_{ij}$ from 1980 through 1999. In fact, it may differ from all the later $ALT_{ij}$.

c. The assumption and the method obviously are not perfect. However, ESC believed the approach was no more imperfect than any in which the later $W_{ij}$ would have to be estimated. Yet there are significant hazards.

(1) Although we have never explained the approach in exactly the terms used above, we had thought our other explanations to be sufficiently clear. Yet regrettably we appear to have been misunderstood. Some readers variously thought that:

(a) We were arguing that $ALT_{i,78}$ would always have sufficient strength to satisfy all later $W_{ij}$.

(b) We were arguing that $ALT_{i,78}$ or any other $ALT_{ij}$ would always be less than CMO 78.

Such readers then criticized the approach on the basis of their misinterpretations; they and we must share blame for this. What we thought we were writing and saying was that, whatever the future workload, the relative differences (the fractional differences) between the CMO and the ALT would be the same.

(2) The greater hazard is that higher authority might direct implementation at the $ALT_{i,78}$ strength permanently regardless of later changes in workload. A lesser hazard is that implementation might be forced with a premature commitment to some $ALT_{ij}$ without allowance for turbulence, especially some of the extra demands of implementation planning and execution. In particular, an implementing authority might disregard ESC's warning that an implementation team should be augmented with staff from outside the theater.

5. Equipment. Data on equipment usage were not submitted for all services. This necessitated estimating equipment utilization based on shop workload ratios and the Army's utilizations. Figure H-3-5 shows the results of this process. The Atlantic equipment is not included because of the geographic separation and the transportation difficulties inherent in crossing the Canal on the Atlantic side.

a. Large pieces of construction equipment show low utilization rates (Figure H-3-6), and therefore, more O&M costs than necessary if inventories were reduced. ESC recognized that some equipment is required for emergency operations at Howard Air Force Base, and tried to ensure that such equipment would be available.

## EQUIPMENT UTILIZATION/ESTIMATED EXCESS[a/]

| | Current Usage | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Army | | | Air Force | | | Navy | | | | | |
| | Qty | Hrs Aval | Hrs Excess | Qty | Hrs Aval | Hrs[b/] Excess | Qty | Hrs Aval | Hrs[b/] Excess | Total Equip | Total Excess Hrs | Est Excess Equip |
| Metal Work--632.4 | | | | | | | | | | | | |
| Welding Machine | 4 | 8,000 | 4,800 | 2 | 4,000 | 2,760 | 2 | 4,000 | 2,740 | 8 | 10,300 | 5.2 |
| Painting--632.5 | | | | | | | | | | | | |
| Traffic Marker | 1 | 2,000 | 1,200 | -- | -- | -- | 1 | 2,000 | 1,700 | 2 | 2,900 | 1.5 |
| Pavement Maintenance--633.21 | | | | | | | | | | | | |
| Compressor | 3 | 6,000 | 3,700 | 1 | 2,000 | 1,430 | 3 | 6,000 | 5,670 | 7 | 10,800 | 5.4 |
| Grader | 6 | 12,000 | 6,000 | 2 | 4,000 | 2,520 | 2 | 4,000 | 3,710 | 10 | 12,230 | 6.1 |
| Kettle | 1 | 2,000 | 1,900 | 1 | 2,000 | 1,900 | -- | -- | -- | 2 | 3,800 | 1.9 |
| Scoop Loader | 3 | 6,000 | 4,500 | 2 | 4,000 | 3,230 | 1 | 2,000 | 1,930 | 6 | 9,660 | 4.8 |
| Road Roller | 5 | 10,000 | 5,030 | 1 | 2,000 | 1,610 | 1 | 2,000 | 1,920 | 7 | 8,560 | 4.3 |
| Magnet Sweeper | 1 | 2,000 | 1,200 | 1 | 2,000 | 1,420 | -- | -- | -- | 2 | 2,620 | 1.3 |
| Rotary (Street) Sweeper | 2 | 4,000 | 1,850 | 4 | 8,000 | 4,790 | -- | -- | -- | 6 | 6,640 | 3.3 |
| Full-tracked Tractor | 4 | 8,000 | 7,000 | 2 | 4,000 | 3,660 | 1 | 2,000 | 1,960 | 7 | 12,620 | 6.3 |
| Cranes | 4 | 8,000 | 6,330 | 3 | 6,000 | 4,750 | 2 | 4,000 | 3,840 | 9 | 14,920 | 7.5 |
| Grounds Maintenance--634.2, .22 | | | | | | | | | | | | |
| Ind Wheeled Tractor | 32 | 64,000 | 55,400 | 17 | 34,000 | 28,980 | 2 | 4,000 | 3,910 | 51 | 88,290 | 44.1 |
| Entomology--634.5 | | | | | | | | | | | | |
| Sprayer | 5 | 10,000 | 7,700 | 1 | 2,000 | 1,960 | 4 | 8,000 | 7,800 | 10 | 17,460 | 8.7 |
| Exterior Electric--653.2 | | | | | | | | | | | | |
| Generator | 1 | 2,000 | 1,700 | -- | -- | -- | 1 | 2,000 | 1,930 | 2 | 3,630 | 1.8 |
| Cable/Reel Trailer | 2 | 4,000 | 3,300 | 1 | 2,000 | 1,750 | 1 | 2,000 | 1,920 | 4 | 6,970 | 3.5 |
| Water and Sewer--654.2,3,4 | | | | | | | | | | | | |
| Auger | 1 | 2,000 | 1,480 | 1 | 2,000 | 1,360 | -- | -- | -- | 2 | 2,840 | 1.4 |

a/ Pacific equipment only.
b/ Hours estimated from Army utilization.

Figure H-3-5

ESTIMATED EQUIPMENT EXCESSES AND COSTS[a/]

| Description | Excess Qty | Annual Cost ($) | Purchase Price ($) |
|---|---|---|---|
| Auger | 1 | 122 | 1,523 |
| Compressor | 4 | 3,348 | 31,875 |
| Crane | 4 | 20,064 | 181,894 |
| Full-tracked Tractor | 4 | 12,768 | 88,249 |
| Generator | 1 | 316 | 2,125 |
| Grader | 2 | 7,164 | 45,011 |
| Kettle | 1 | 240 | 2,347 |
| Magnet Sweeper | 1 | 480 | 6,250 |
| Road Roller | 4 | 5,760 | 21,950 |
| Rotary (Street) Sweeper | 3 | 4,599 | 71,583 |
| Scoop Loader | 3 | 7,308 | 54,304 |
| Sprayer | 6 | 1,026 | 16,682 |
| Traffic Marker | 1 | 235 | 2,940 |
| Welding Machine | 5 | 2,175 | 14,783 |
| Wheeled Tractor | 29 | 34,188 | 245,314 |
| Total Costs | 69 | 99,793 | 786,830 |

a/ Costs are based on original purchase price. No attempt was made to convert to FY 78 dollars.

Figure H-3-6

b. The cost savings associated with lowering equipment inventories accrue primarily through the cost avoidances by decreasing the requirement to purchase as many replacement items. The identifiable excess equipment (based on 2,000 available hours annually) totals to 97 pieces of equipment and cost avoidance based on purchase price of over $1.2 million. According to the services in Panama, these figures are extremely high. They maintain that the short length of the dry season (4 months) necessitates extra equipment to ensure that their work is complete before the onset of the wet season. ESC concurs with the services and recomputed the excess equipment quantities. Figure H-3-6 shows the recomputation results.

c. The costs normally calculated for excess equipment are classified as a cost avoidance based on total purchase price. ESC agrees that the long-term benefits generated by not replacing as many pieces of equipment would approach the purchase price. However, the short-term savings are substantially less since not all equipment would be replaced simultaneously. Instead yearly costs were determined by using the original price, 20 percent salvage value, and a 10-year life. Figure H-3-6 also shows these results.

d. The Army appears to have a large number of wheeled tractors in grounds maintenance. The estimated excess (29), however, may be offset by the new requirements generated by treaty transfers. These added requirements will increase utilization hours, but excesses may still be recognized.

TOTAL MANPOWER AND ANNUAL COST COMPARISON[a/]

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| | RPMA | | | | | | Gross[b/] Ch | Net Change Attributable to Consol[c/] |
| Altn | FE | BOS | Staff Engr | Instl Spt | Unrealizable Instl Spt | Total | Rel % Ch | Rel % Ch |
| 1 | | | | | | | | |
| Strength | 1,361 | NA | NA | 144.3 | NA | 1,505.3 | -- | -- |
| Cost | $17.57M | NA | NA | $2.08M | NA | $19.65M | -- | -- |
| 1A | | | | | | | | |
| Strength | 1,317 | NA | NA | 144.3 | NA | 1,461.3 | -2.9 | -- |
| Cost | $16.93M | NA | NA | $2.08M | NA | $19.01M | -3.3 | -- |
| 2 | | | | | | | | |
| Strength | 1,222 | 13 | 67 | 88.3 | 33.5 | 1,423.8 | -5.4 | -2.6[b/] |
| Cost | $15.58M | $.13M | $.72M | $1.21M | $.5M | $18.41M | -7.7 | -4.6 |
| 3 | | | | | | | | |
| Strength | 1,308 | 14 | 8 | 97.1 | 24.9 | 1,452 | -3.5 | -0.6 |
| Cost | $16.65M | $.15M | $.12M | $1.49M | $.35M | $18.76M | -4.5 | -1.3 |
| 4 | | | | | | | | |
| Strength | 1,339 | NA | 8 | 135.8 | 14.2 | 1,497 | -0.6 | +2.4 |
| Cost | $17.25M | NA | $.12M | $1.99M | $.21M | $19.57M | -0.4 | +2.9 |

a/ Estimates based on FY 78 manpower and salary data.

b/ Figures represent total change attributable to consolidation and to the use of Army procedures as compared with three separate procedures.

c/ Change attributable only to consolidation.

Figure H-3-7

e. The overall savings generated from consolidation indicate that the services could reduce their current construction equipment inventories. Through the effective management of resources each service can meet its mission requirements with the remaining equipment inventory. Regardless of the forthcoming RPMA consolidation decision, this reduction will net DOD substantial savings through the life of the treaty.

6. Comparison of Alternatives. The preceding two appendixes discussed the procedures used to staff each consolidation alternative and their associated costs. The combined results are shown in Figure H-3-7. These results, expressed in FY 78 man-years and dollars, are recapped below.

a. Alternative 1, CMO, reflects the RPMA workload and installation support for the three services in Panama. The original total was adjusted downward to account for the PRCMP function transferred to the Mobile Engineer District. The composite organization's salary cost $19.65 million in FY 78 and required 1,505.3 man-years of effort for the FY 78 exemplar year.

b. Alternative 1A shows the differences among the service's staffing procedures. Although it is not a major alternative, it portrays the potential savings accruable to one type of standardized organization. That is, if all services were staffed according to Army procedures, DOD could save nearly 3 percent in personnel and costs for Panama-only RPMA.

c. Alternative 2 combined the entire Panama RPMA workload under a modified Facilities Engineer (FE) organizational structure. Two BOS functions--procurement and supply--were incorporated to allow more command and control over these critical RPMA operations. In addition, this alternative centralized management functions, provided three major geographic shops for recurring work, and a centralized technical services shop. ESC adjusted the overhead staffing to account for geographic dispersion, service differences, and multiservice dialects. The total RPMA organization requires 1,423.8 man-years and costs $18.41 million for the FY 78 exemplar year.

d. Alternative 3 divided the RPMA functions into two organizations. Both were staffed using the Army Staffing Guide and included the installation support functions from Alternative 2. The Army and Air Force provide the leadership on the Pacific East and West, respectively. This organization would cost $18.76 million and require 1,452 man-years for the FY 78 exemplar year.

e. Alternative 4, like Alternative 3, is a dual manager structure, but it maintains the services' existing organizational structure. There are no installation support functions included. This structure required 1,497 man-years and costs $19.57 million for the FY 78 exemplar year.

7. Other Consolidations. Past and current approaches to other regional RPMA consolidations were considered relevant. In particular,

the practical experiences of the recently established San Antonio Real Property Maintenance Activity (SARPMA) added valuable perspective to the inherent requirements of implementation planning, the duration and intensity of organizational and operational "turbulence," and service differences in RPMA scope, resolution, and terminology. As a result of previous OCE/ESC visits to SARPMA, ESC had substantial knowledge of the entire study/implementation procedures. ESC's latest visit was designed to gain additional knowledge relevant to implementation and operation in this dual service environment. The following paragraphs present impressions/observations on this latest visit to SARPMA.

a. SARPMA is notable in many respects. The consolidation of RPMA there had been under consideration for many years. Studies of the feasibility of consolidation had produced mixed results. Nevertheless, implementation was directed. Extensive effort was devoted to implementation planning. SARPMA came into being on 1 October 1978. As expected, the change was accompanied by personnel and procedural turbulence. Members of SARPMA acknowledge numerous start-up difficulties but feel that they have matters well in hand for so young an organization. They are the first to admit that, as usual, hindsight reveals that some things could have been done differently. The customers of SARPMA seem less enthusiastic. They are convinced that SARPMA is making a sincere effort to provide support, and they recognize the inevitability of disruptions. However, customers do seem disappointed

and believe support should and could be better. Both SARPMA and its customers believe they have learned important lessons. ESC believes that any contemplated RPMA consolidation should be considered in the light of SARPMA experience. As important as this experience is, it cannot be considered free of ambiguity. First, the San Antonio region certainly possesses unique aspects. Second, different members of SARPMA and the supported installations have differing perceptions.

b. Responsiveness. SARPMA itself freely admits that it has been criticized for having been less responsive than desirable. And the installations are openly critical of SARPMA responsiveness. The ESC team tried to pin down just what "responsiveness" involved.

(1) SARPMA seems to be meeting installation expectations for recurring work and small job orders. Such work is performed by the field engineering elements of SARPMA. These elements are the shop forces stationed full time at the installations. Of SARPMA's total shop force, field engineering accounts for over 80 percent of the force. The implication here is that "responsiveness" is satisfactory for perhaps 80 percent or more of all work performed by SARPMA workers.

(2) SARPMA includes a centralized Major Projects Branch with a staff of about 220. Major projects are accomplished by this branch or by contract. It turns out that "major project" performance is the area criticized as unresponsive. The installations argue that SARPMA is not accomplishing major projects as quickly as desired by

installation (and hence mission) commanders. SARPMA agrees but points to extenuating circumstances.

(3) SARPMA has been in business only 9 months. Some disruption was unavoidable.

(4) Before its formal start on 1 October 1978, SARPMA asked installations to project their requirements. The installations, partly as a result of pretransfer turbulence, did not develop requirements early.

(5) Air Force and Army differences in procedure have complicated project development. The Army permits open-end architectural engineering (AE) contracts; the Air Force does not. The Air Force permits commitment of funds earlier in a project cycle than does the Army. In both of these examples, the services operate under DOD rules, but each has arrived at a different interpretation of legality.

(6) SARPMA argues that many projects are delayed awaiting supplies. They claim that many are blaming SARPMA for what is really beyond SARPMA's control. SARPMA depends on the San Antonio Contracting Center (SACC) for contracting and procurement. SACC services more than SARPMA, evidently at some sacrifice in response to SARPMA.

(7) SARPMA has suffered delays in manning its positions with full-time employees. To a degree, the shortfall has been met by temporary hires. Civilian personnel support is provided by the Lackland Air Force Base Civilian Personnel Office. Hence, solution of SARPMA's staffing problems depends on an office outside SARPMA.

(8) The installations raise some other points. SARPMA does not operate an informative project tracking system. Evidently installation inquiries about project status cannot be answered by SARPMA quickly and confidently. Apparently untracked projects contribute to the assumed image of SARPMA mismanagement or nonmanagement. Installation commanders and Staff Engineers, in the absence of information about extenuating circumstances (e.g., awaiting materials), may tend to assume that project delays are not justifiable.

c. Regrowth of staff engineering offices. Installations insist that the creation of SARPMA left them with too few people to conduct necessary planning, programing, and budgeting. The trend has been for installations, supported by manpower surveys, to regain lost spaces in those functional areas. The trend has been especially puzzling to ESC. Based on its own study of the feasibility of RPMA consolidation at nine installations in the National Capital Region (NCR), ESC had concluded that a consolidated RPMA agency should itself include a strong planning and programing element. ESC foresaw the need for the consolidated agency to perform such services in order to develop not just installation programs but also the well-integrated regional program. Indeed, the projections of economy of scale through consolidation are very heavily dependent on region-wide programing...in order to smooth workloads, to reconcile priorities, to save through larger scale purchasing and contracting, and so on. Farming out such responsibilities to the

installations cannot achieve the necessary integration...or so it seems to ESC. If the consolidated agency is left to function in ad hoc response to largely independent installation demands, economy and/or level of service may suffer. If the original consolidation plans underestimated the requirements for planning and programing staff, the errors should be corrected quickly, but the spaces should become part of SARPMA.

d. Speculations by ESC. ESC's most recent visit to SARPMA lasted only 1 day. The possible impacts of some remarks made during the visit did not hit ESC until days later. ESC has not checked its after-the-fact speculations with SARPMA because ESC's first concern is with ideas relevant to Panama consolidation of RPMA.

(1) Work prioritization. Unless there is a mutually agreed program (as agreed among the installations and with SARPMA), installations inevitably suspect that they are not getting their "fair share." "Contractually" SARPMA must perform agreed work. However, the timing of work is obviously now under dispute. SARPMA does not possess the knowledge to determine the order of work relative to general regional nor national priorities. First, no one has stated such priorities. Second, SARPMA cannot develop such priorities. SARPMA has been manned largely with people who have come from the supported installations. Those in planning and programing positions must have a much broader perspective than ever before. There may be two flaws.

(a) SARPMA does not include enough such positions.

(b) The people who have filled or are available to fill such positions may not yet have the necessary perspective.

(2) Despite the numerous studies done everywhere about military requirements (whether for hardware, facilities, or people), the casual observer cannot help but feel that very much of any specific determination is heavily arbitrary. Yet work gets done because so much authority has been decentralized. The local authority, though subject to many laws and checks, can issue very much unquestioned work for his subordinates. These subordinates probably have accumulated vast and useful experience in working from given requirements with given priorities affixed by local command. That local command serves the useful function of breaking ties. Local commanders are accustomed to exercising decentralized responsibility and authority...admittedly with an occasional element of arbitrariness.

(3) What happens under consolidation? Some of the lines of responsibility and authority are redrawn. Operation under a revolving or industrial fund (IF) is designed to minimize separation of responsibility and authority. Such funding preserves much of the local commanders' authority in support of their responsibilities. Yet the local commanders find control of "pursestrings" less than they feel they need. Part of the difficulty may lie in the inability of the consolidated serving organization to construct widely agreed work prioritizations. Even though 80 percent or more of all work accomplished by

SARPMA does not seem to involve any conflict of priorities, the other work (mainly major projects) is troublesome. Collectively the installations with SARPMA must agree to the priorities, and then SARPMA must meet them observed under a highly visible tracking system.

(4) SARPMA and the installations do not seem to have set up a system for collective prioritization.

(5) SARPMA may need more staff for planning and programing in the full program staff (not simply planning and programing in the single job sense).

(6) SARPMA must develop and operate a "highly visible tracking system."

(7) Even if all the above were being done now, SARPMA would still be in a turbulent mode, and installations would still be discontented. Indeed, some annoying level of discontent is likely regardless of performance.

e. Related points for Panama.

(1) There should be more effort and hence one-time expense for implementation planning. Since so many implementers usually come from the affected commands, there may be a paradox. As greater effort is devoted to implementation planning in order to reduce turbulence, there is a greater risk of taking so many people away from their regular jobs that turbulence is increased.

(2) There is a requirement for a high-level, collective work prioritization system or committee. The tie-breaker may have to transcend in-theater rank.

(3) A project tracking system for real-time status information needs to be developed. This adds worthwhile expense and spaces to the consolidated agency.

(4) A strong planning and programing element (in the full program, not single project sense) is required in the consolidated agency. The organization must maintain strict discipline to prevent regrowth of independent functions beyond the minimum installation requirements. Additional planners/programers may work at the installations, but they must belong to the ccnsolidated agency.

(5) The consolidated agency must have sufficient authority to match its responsibilities for timely contracting and procurement. Do not give it the excuse that outside contracting and procurement account for all the significant project delays.

(6) The consolidated agency must have sufficient civilian personnel clout for early recruiting and other related actions. It must have sufficient resources during implementation planning to do a thorough job on writing and classifying job descriptions.

(7) During implementation planning and then during operation include a staff that is accustomed to reconciling larger scale

priorities rather than those that are typical of a single installation experience.

(8) ESC dislikes deferred, prolonged turbulences. However, compression of turbulence into too narrow a time window can become the straw that breaks the camel's back. Panama seems potentially much more turbulent than any other consolidation considered to date. Other consolidations have not involved simultaneous treaty changes involving altered responsibilities for facilities and functions. Some procrastination on Panama consolidation may be justified (i.e., the suggestion by some to let most of the treaty chips fall where they may before attempting full consolidation may have some merit).

(9) SARPMA appears to suffer somewhat from Base Operating System (BASOPS) fragmentation; e.g., in civilian personnel, contracting, procurement, and project prioritization. This may be an indication that full installation management can provide a better long-term solution. The full problem seems so complicated that no solution is likely to be perfect. Even if a solution were perfect, the level of discontent would probably remain high.

(10) No one service seems clearly superior to the other in all RPMA respects. Yet the "practical" approach to consolidation has been to let a lead service impose its approach. Ideally, a consolidation should adopt the best from each service, but no one seems to have

achieved this in practice. Practically, consolidation should start with a lead service approach with later evolutionary improvement.

(11) Again, the consolidated RPMA agency must apply a regional outlook to satisfy customers in some best individual and collective sense. People from individual installations may have too much of a local view. The detailed view required to make the most of a regional agency must include "global" and "generalist" outlooks. Panama may have an edge over some other areas inasmuch as each service had already achieved some degree of regionalism. The need for the regional agency to balance local/global, special/general, and project/program cannot be overlooked in the selection of key faces to fill the agency's critical roles.

f. SARPMA, again in relation to Panama. There are strong theoretical grounds for arguing that, in the long run, consolidation of RPMA in Panama would provide equal or better service at some saving in spaces and other resources. In the short run, however, it seems that the turbulence of transition would result in some reduction in the level of services. A larger and/or longer commitment to implementation planning would probably not completely eliminate turbulence. Even if part of the implementation planning team included people from outside Panama, it would be necessary to have many people from within the current in-country RPMA structure devote considerable time and energy to implementation planning. Such effort in itself would induce some amount of

turbulence in current operations. The experience of SARPMA, in particular, was that job uncertainties prior to activation of SARPMA led to difficulties in maintaining the same level of services even before activation of SARPMA. Apart from any impact on the morale of people on board, there were difficulties in recruiting to fill vacancies created by normal attrition. The upcoming creation of SARPMA was common knowledge in the San Antonio area, but prospective employees were reluctant to accept positions that might disappear as part of the activation of SARPMA.

8. Answers to the Main Questions. This paragraph addresses the issues of feasibility and desirability for each of the four original major alternatives and introduces important variations to the CMO and single manager approaches.

a. Alternative 1. The CMO under separate managers for each service has clearly been feasible in the past and is a feasible approach for the future. As suggested by the services themselves, expanded reliance on Interservice Support Agreements (ISSAs) would enhance the CMO with minimum turbulence and would provide a desirable alternative to the CMO. However, in the long run this approach is not the most desirable alternative.

b. Alternative 2. Consolidation of RPMA under a single manager (Army) with reimbursement through a revolving fund is feasible. The original Alternative 2, which would incorporate some necessary other BOS

support, was envisaged primarily as an RPMA-only consolidation in the belief that the desirability of consolidation could be settled largely from an RPMA-only perspective. From that limited perspective, the desirability of Alterantive 2 is only marginal. Although Alternative 2 does offer relative savings, these tend to be smaller than have typified other regions. The reason for this is that Panama RPMA had already become partially consolidated and centralized, mainly in the intraservice sense. In effect, an almost 5 percent relative saving often attributable to consolidation had already been exploited. Exploitation of the few remaining percent available in management and overhead elements would not be undesirable, but given the range of uncertainty, the few percent identified do not justify a rating of clearly desirable. In other words, with allowance for uncertainties, the issue for or against RPMA consolidation under a single manager cannot be decided entirely on the basis of the RPMA management and overhead spaces. RPMA-only consolidation under this concept is self-limiting in several important respects. Despite bringing some needed parts of BOS under RPMA, the concept does leave troublesome fragmentation between RPMA and other BOS elements. This effect is judged to be more serious for interservice than for intraservice RPMA consolidation. Another interservice problem of the original Alternative 2 is that it would impose a requirement for consolidated reporting without relieving any of the separate service reporting obligations. There are some theoretical advantages to consolidation. Other

feasibility studies typically have not had to address these other advantages because the relative savings in management and overhead spaces were sufficient to justify consolidation. The other advantages are much harder to quantify. There is the promise of some relative saving in shop spaces. Some of these would be achievable without consolidation, but consolidation-attributable savings would occur through workload smoothing and scheduling. Some economies of scale may be achievable in contracting administration. And although 1999 is still 20 years away, a consolidated organization could better participate in the planning, programing, budgeting, and execution of whatever changes occur toward the turn of the century at the end of the treaty period. Furthermore, although the original Alternative 2 follows largely the Army approach to RPMA, nowhere has it been argued that the Army way is optimal in the broad sense. An optimal approach combining the best features from all the services, other government, and industry though unknown today is easily imaginable. The optimal organization will not spring full grown from some new study. Rather, it can only be achieved through consolidated experience and evolution; an early live start is superior to indefinite study. Such matters go far beyond the immediately quantifiable present and past. In the context of rapidly changing relative values of manpower, hardware, energy, and real property, the status quo and rearward-looking approaches seem doomed. In the broadest forward-looking context, single manager approaches to real property management

seem best suited to reconcile the upcoming economic strains. For the reasons noted, the original Alternative 2 seems too limited in the long run. A later paragraph includes an important generalization of Alternative 2, one leading directly to the study's major recommendation. In terms of the possible outcomes of analysis listed in paragraph 1b, Main Paper, Volume I, RPMA consolidation strictly in accord with the original Alternative 2 concept is "feasible but neither clearly desirable nor clearly undesirable." Although there is a need for follow-on detailed implementation study to resolve the question of desirability, this study suggests that such study be devoted not to the original Alternative 2 but rather to the Alternative 2 generalization.

c. Alternative 3. Consolidation of RPMA under dual managers (Army and Air Force both applying primarily the Army approach to RPMA) with strengthened production management elements and with extensive ISSAs is feasible. However, the alternative is not desirable because the relative savings attributable to consolidation are negligible. Even if this approach did offer greater potential for relative savings, it would suffer from a paradoxical aspect. It would have both the Army and Air Force managing Army-like RPMA organizations. Army-like RPMA management and overhead elements tend to have fewer spaces than their Air Force counterparts. Thus, if Alternative 3 had the Army managing an Army-like share and the Air Force managing an Air Force-like share of the total RPMA structure, the relative savings would vanish completely.

Though feasible, Alternative 3 is clearly undesirable. In terms of the possible outcomes of analysis listed in paragraph 1b, Main Paper, Volume I: RPMA consolidation in accord with the Alternative 3 concept is "feasible but clearly undesirable."

d. Alternative 4. Consolidation of RPMA under dual managers (Army applying Army approach and Air Force applying Air Force approach) with extensive ISSAs is feasible. However, this approach would lead to a relative increase in spaces and annual salary costs. These increases outweigh any advantages of the concept. In terms of the possible outcomes of analysis listed in paragraph 1b, Main Paper, Volume I, RPMA consolidation in accord with the Alternative 4 concept is "feasible but clearly undesirable."

e. Two variations. As already noted, the original major alternatives have all been found wanting in some critical respects. The original single manager concept is clearly superior to the dual manager concepts but is not clearly superior to the CMO in the light of the limited relative savings probably achievable in management and overhead spaces, but that quantitative evidence is not sufficient to settle the choice between the CMO and single manager RPMA. Before that choice is made, it is necessary to look again at the CMO and the single manager concept. Hindsight shows that both the CMO and the single manager approaches are improvable though the improvements are not readily quantifiable.

(1) A better CMO can be achieved by greater reliance on ISSAs. This affords the easiest short-term approach and minimizes turbulence but does retain some unneeded duplication in management and overhead.

(2) A better single manager approach can be achieved in the long run by tying RPMA consolidation to a total consolidation of BOS; by standardizing more RPMA terminology, reporting, and funding; and evolving toward a combination of the best features from each service, other government, and industry.

9. Broadening the Perspective. To this point, this study of four major RPMA alternatives has generated much new information about the feasibility and desirability of further RPMA consolidation in Panama. It has, however, left the decisionmaker with more uncertainty than some people may have expected. In fact, decisionmakers often have less information available at this stage of the analytic process than they would like to have. Though ESC stands behind the quantitative results presented, it too is disappointed that none of the original alternatives emerged as clearly superior to all the rest.

a. Most people assume that sharper information will accrue through detailed implementation analysis and planning. But the improvement in information between early cost-benefit analysis and later implementation analysis and planning is often slight. The decisionmaker still has to rely heavily on experience, judgment, principle, and

theoretical insights fo fill the gaps in the quantitative analysis. When, as is often the case, the quantitative evidence is not overwhelming, qualitative matters gain importance. Many of these have already been noted whenever the quantitative evidence and reasoning led to an impasse or only a marginal difference.

b. Given that the decisionmaker's uncertainties and risks probably will not diminish even after more analysis, the remaining paragraphs:

(1) Offer some additional comments about the limitations and promise of consolidation analysis.

(2) Go beyond the usual limits of pure analysis with an appeal to other experience and principle in order to make an RPMA recommendation in the total BOS context.

10. Consolidation Analysis in General.

a. Consolidation is intended to serve the future not the past. The state-of-the-art for predicting future workload when that workload will differ from the past remains primitive--especially with regard to the level of service. The available quantitative data are always limited. Installations are not required routinely to keep all the data relevant to consolidation. Implementation analysis and planning also suffer from limited data. Furthermore, the quantitative methods are limited, not just in the sense that output cannot be better than the data input, but also in a more general vein. The assumption of interservice comparability

is a strong one and acceptable only in gross terms. Comparison of multi-service RPMA along Army Staffing Guide lines appears to underestimate a consolidated organization's effort required to resolve interservice differences. The post-Staffing Guide adjustments, as applied in this study, seem insufficient. The method applied here seems to work much better for the consideration of several Army installations than for a multiservice mix. It seems to underestimate the advantages achievable in the long run for single manager approaches.

b. This and similar studies have been hampered by another gap: there are as yet no sound empirical bases on which to alter shop strength in the interservice sense although interservice productivity analysis has progressed. The target of opportunity in this consolidation study was only management and overhead strength. Yet, overhead strength accounts for only 18 percent of the total RPMA and RPMA-related strength in Panama today. Because so little is known about productivity potential of the shop force in the general sense, the shop force was preserved almost intact in order to assure "at least the same level of service." And yet, the greatest potential for RPMA savings and/or improvement in the level of service may lie in that untouched 82 percent of the work force. Remarkably little is known about that 82 percent for comparing the productivity among the services, between military and civilian spaces, and between US and foreign national employees. If more were known, major improvements might be made with or without consolidation. An argument

is sometimes offered to the effect that the best way to learn more about the performance of the shop force is to consolidate. This study has offered but not emphasized that argument in favor of consolidation because it may not be true and because the accumulation and analysis of appropriate work performance data would obviously be expensive, with or without consolidation. And as already suggested, the promise of more forward-looking data of any sort is limited.

c. At much greater time and effort, a somewhat better multi-service method may be achievable. But this team cannot visualize any new study method (and the data to feed it) that will really do much to reduce the decisionmaker's risks. After completion of modest cost-benefit analysis, the analysts and decisionmakers are already pretty far along the curve of diminishing the study returns.

11. The Final Step.

a. If, as suggested, the mine of empirical, quantitative evidence is already nearly exhausted and if the problem has not gone away, the decisionmaker must close the gap on principle and appeal to theoretical evidence. The analysts and decisionmakers alike are taxpayers and should be influenced by the obvious as well as by subtleties. The differences among the ways the services conduct RPMA are greater than justified by differences in their missions and facilities. Thinking about RPMA reaches one impasse because the Army tries to treat RPMA as support to mission without including any mission activities in its RPMA,

whereas the Air Force treats its RPMA as more critical and goes as far as to regard much of RPMA as mission. The nation has wasted time, money, and energy in having allowed separate approaches and attitudes to develop.

b. The differences that have evolved are not cited by some people as a principal reason for averting RPMA consolidations. Certainly it is true that consolidation now would be more difficult than it would if the different services had applied common systems to start. But it is fundamentally objectionable to allow past laxity to justify present actions. This is not to say that the services are guilty of carelessness and mistakes. To be sure, it would have been desirable if the services, on their own, had applied better coordinated initiatives in RPMA developments. The fault, if any, lies with DOD for having condoned far too much service liberty in the past. The services now are paying the price of past benign neglect, though that price is usually hidden. An inkling of that price is implied in this study. If the differences did not exist, costly adjustments for the differences would not have to be made part of consolidation. What has made consolidation marginal in this analysis is that the consolidation alternatives preserve those differences.

c. Some Army analysis managers believe, or so they say, that study agencies should collect data, process data, and display alternatives with all identifiable strengths and weaknesses but refrain from recommending any one alternative even when the accumulated evidence is extremely

favorable to one above all the rest. ESC does not follow nor hold that belief, especially when the evidence is mixed or favors no particular alternative clearly. ESC feels obliged to declare what it would do if it were the decisionmaker--to make the choice despite the risk. ESC often does this in full recognition that it does not possess all the decisionmaker's background, sensitivities, and wisdom. This final step, whether appreciated or not, does have the merit of tying everything together to make clear just what ESC thinks it all means--in particular, to choose between an enhanced CMO and a generalized version of the original, single manager concept.

12. Recommendation. As part of a firm long-term commitment to full, standardized BOS consolidation, implement RPMA consolidation under a single (Army) manager in Panama with reimbursement for services through a revolving fund. Implement the RPMA phase of total BOS consolidation in 1 to 2 years at the earliest thereby allowing much-needed reconciliation of current treaty-related uncertainties. Augment the usual in-theater implementation planning staff with about 10 outside experts with skills in planning in general and personnel, funding, and reporting in particular. Implement primarily along Army RPMA lines with the target of later integration within an evolving, standardized, optimized BOS. As standardized reporting and funding are developed and implemented, the services in Panama should be exempted from duplicative, nonstandard reporting requirements.

Note: In terms of the possible outcomes of analysis listed in paragraph 1b, Main Paper, Volume I, further RPMA consolidation under the generalized single manager concept is "feasible and clearly desirable...with implementation study and implementation to follow." The recommendation does grant up to 2 years' delay in implementation. Further RPMA consolidation is not recommended unless the special conditions noted above are met.

LAST PAGE OF APPENDIX H-3

APPENDIX H-4

ONE-TIME COSTS AND SAVINGS


| Paragraph | | Page |
|---|---|---|
| 1 | Purpose | H-4-1 |
| 2 | Data | H-4-1 |
| 3 | Alternative 2, One-time Costs | H-4-2 |
| 4 | Alternative 3, One-time Costs | H-4-8 |
| 5 | Alternative 4, One-time Costs | H-4-10 |
| 6 | Summary of One-time Costs | H-4-12 |

| Figure | | |
|---|---|---|
| H-4-1 | Manpower Impacts of CMO Versus Alternative 2 | H-4-3 |
| H-4-2 | Summary of One-time Costs for Alternative 2 | H-4-8 |
| H-4-3 | Manpower Impacts of CMO Versus Alternative 3 | H-4-9 |
| H-4-4 | Summary of One-time Costs for Alternative 3 | H-4-11 |
| H-4-5 | Manpower Impacts of CMO Versus Alternative 4 | H-4-11 |
| H-4-6 | Summary of One-time Costs for Alternative 3 | H-4-13 |
| H-4-7 | Summary of One-time Costs | H-4-13 |


1. Purpose. The purpose of this annex is to provide the one-time costs and savings associated with the implementation of the proposed consolidation alternatives. Within this annex, personnel, space and relocation, implementation team, and equipment savings are addressed separately for Alternatives 2, 3, and 4.

2. Data. The estimates in this annex are based in part on the Engineer Studies Center's (ESC's) experience with personnel actions

postulated in the National Capital Region (NCR) study.[1/] Discussions with in-theater personnel aided in narrowing and refining these original Continental United States (CONUS) based statistics. Although estimates of individual categories were required, ESC believes that the combined results (see Figure H-4-8) are reasonable approximations of costs associated with the implementation of the consolidation alternatives. Even though this annex does not address the potential turbulence related to treaty implementation, recent information suggests that substantial turnover can be expected. Informed sources see vacancies as high as 600 positions across the 193d Infantry Brigade. Beyond any treaty-related actions, the personnel situation in the Army's real property maintenance activity (RPMA) is already turbulent. There are now over 100 positions vacant.

3. Alternative 2, One-time Costs.

a. Personnel costs.

(1) Attrition. US citizens working in Panama rotate every 5 years which produces an average yearly turnover rate of 20 percent. This implies, provided no extensions of foreign service are granted, that six positions would be affected in an average year. The turnover among Panamanian employees, on the other hand, would probably be smaller due to the approximately 30 percent unemployment rate on the local economy.

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1/ DA, USAESC, Army and DMATC RPMA Consolidation in the National Capital Region.

ESC assumed a turnover rate of 7 percent to estimate attrition losses due to consolidation. (Recall that NCR estimates were first considered and then adapted to Panama. The figures ranged from 6 to 25 percent attrition.) Based on the current method of operation (CMO), the number of personnel electing to seek other employment could approach 105 (1,505 x .07). These actions alone could account for the 81-position reduction assumed in Alternative 2 (see Figure H-4-1).

MANPOWER IMPACTS OF CMO VERSUS ALTERNATIVE 2

| | RPMA | | | Installation Support | | | | |
|---|---|---|---|---|---|---|---|---|
| | Spt | Non-spt | Total | Spt | Unrealizable Spt | Total | Staff Engr | Grand Total |
| CMO | 149 | 1,212 | 1,361 | 144 | -- | 144 | 0 | 1,505 |
| Altn 2 | 123 | 1,112 | 1,235 | 88 | 34 | 122 | 67 | 1,424 |
| Reduction/ (Increase) | 26 | 100 | 126 | -- | -- | 22 | (-67) | 81 |

Figure H-4-1

(2) Early retirement. It is unlikely that consolidation would cause significant early retirements among the local Panamanian employees. The US employees would also probably remain with the government, or at least they would exhibit smaller rates than similar historical data suggest for CONUS. Therefore, ESC assumed that a range of 2 to 4 percent is applicable to early retirement in Panama. This yields an

additional 28 to 56 personnel who would choose early retirement (1,505 - 105 = 1,400; 1,400 x .02 = 28).

(3) The preceding two paragraphs suggest future vacancies may exceed the reductions generated under Alternative 2 for an FY 78-like workload. Probably few of the vacant positions would match the specific spaces to be eliminated or converted. This would result in higher costs associated with keeping the excess personnel in the organization and force large recruiting actions to fill the vacancies.

(4) Permanent Change of Station (PCS) costs. Any premature departure of US civilians due to consolidation actions must be considered; e.g., early retirement versus normal attrition. If the existing ratio of supervisors to the total RPMA elect to retire (149 ÷ 1,361 = .11), then PCS costs would be required for three to six people (28 to 56 early retirements x 11 percent). If these vacancies occur in excess positions, it would forego a replacement and eliminate the associated costs to PCS another person into Panama. Barring this action, ESC assumed that from three to six personnel would PCS. Military Traffic Management Command estimates that the total relocation costs--travel, household goods, etc.--are $10,000 per move. This results in expenditures of $30,000 to $60,000.

(5) Downgrade costs. In the event that attrition does not reduce the supervisory force (see Figure H-4-1), some downgrading to non-supervisory positions would ensue. Persons affected by adverse action

are entitled to continue at current salaries for 2 years even though they are placed in a lower paying position. This would result in additional salary costs to the RPMA. The difference between the approximate average supervisor salary ($15,000) and the nonsupervisor salary ($12,000) is $3,000 per year. It is estimated that a one-time cost of 26 x $3,000 x 2 years = $156,000 could result from the downgrading of 26 supervisory positions. These costs, however, are delayed savings. After the 2-year period the affected individuals would no longer receive the higher salary.

b. Space and relocation costs.

(1) Space. The adoption of a consolidated RPMA organization under Alternative 2 would result in facility savings on the Pacific side. These facilities offer the prospect of future savings in that new construction and/or remodeling may not be required. The dollar amount associated with this action could not be determined but should become apparent during implementation planning.

(a) The Navy Public Works Center facility at Rodman Naval Station would only be needed for the Navy Staff Engineer, the shop areas becoming excess under this alternative. All RPMA activities would be collocated at Howard Air Force Base (Pacific West).

(b) The Air Force Base Civil Engineer (BCE) facilities at Albrook Air Force Base (Pacific East) would also be excess. All RPMA would be collocated at Corozal, but the current warehouse collocated in the facility may have to be retained for storage of family housing appliances.

(c) An augmentation or remodeling of the Corozal facilities would be required to support the single manager of Alternative 2. ESC estimates this may cost from $100,000 to $200,000. This would cover such items as telephone relocations, office remodeling, minor floor space expansion, and probably some new office equipment.

(2) Movement. The movement of direct labor and overhead personnel to new work locations would take an estimated 2 working days for approximately 260 personnel at an average salary of $12,000 or approximately $46 per day ($12,000 ÷ 2,080 hour/year = $5.77/hour x 8 hours/day = $46/day). Movement actually is a reduction in service, but for convenience was assumed to be an incrementation cost. This would amount to a one-time cost of about $24,000 in salaries for these workers to move to new locations with equipment, personnel processing, individual clothing and tools, desks, etc.

c. Implementation team costs. ESC considers that implementation planning should be accomplished with a 10-person noncommand, full-time team supplemented by 20 persons working up to one-fourth time for 24 months. Additional help would be needed from the Comptroller's Office (five people) in establishing an industrial fund (IF) from the Civilian Personnel Office (five people) in writing new job descriptions. The relatively long implementation period is required to provide early resolution to service differences and initial development of a system for eventually incorporating all Base Operating Support (BOS) and finally

optimization of all BOS. For an average annual salary of current managerial employees of $20,000, the estimated implementation cost in salaries would be approximately $1 million.

d. Cost avoidance.

(1) Savings are expected to accrue to the services from the pooling of underutilized, high-dollar construction equipment (see Appendix H-3). The excess equipment generated under all alternatives originally cost $786,830. This cost, currently considered an avoidance by most analysts, would not be realized in the short run. Benefits would accrue in the long term in that not as many pieces of replacement equipment need be purchased. The actual realizable benefit would be on the order of $99,793 per year since the inventory requires fewer replacements (see Appendix H-3).

(2) All consolidation alternatives transfer Navy personnel and equipment to the new organization. This negates the requirement for most of the Navy shop equipment and results in an original purchase price of $200,000. Annual savings would approach $10,000 per year if a 20-year life and zero salvage value were used.

e. Figure H-4-2 shows the total estimate one-time costs and associated cost avoidances for Alternative 2.

SUMMARY OF ONE-TIME COSTS FOR ALTERNATIVE 2

| | |
|---|---|
| Personnel | $120,000 to $156,000[a/] |
| Space and Relocation | |
| Space | $100,000 to $200,000 |
| Movement | $24,000 |
| Implementation Team | $1,000,000 |
| Total Costs | $1,244,000 to $1,380,000 |
| Cost Avoidance | $109,793 |

a/ Minimum-maximum range of projected personnel costs.

Figure H-4-2

4. Alternative 3, One-time Costs.

a. Personnel costs.

(1) Attrition. Figure H-4-3 shows the manpower impacts of Alternative 3. Given the same attrition factors as in Alternative 2, 105 positions would be expected to become vacant within 2 years or less. This adequately covers the 53-space reduction.

(2) Early retirement. The net reduction of 53 spaces would be covered by normal attrition of approximately 105 positions. Early retirements, as shown for Alternative 2, could result in another 28 to 56 more vacancies. The combination of both would account for no severance pay costs.

MANPOWER IMPACTS OF CMO VERSUS ALTERNATIVE 3

| | RPMA | | | Installation Support | | | | |
|---|---|---|---|---|---|---|---|---|
| | Spt | Non-spt | Total | Spt | Unreal-izable Spt | Total | Staff Engr | Grand Total |
| CMO | 149 | 1,212 | 1,361 | 144 | -- | 144 | 0 | 1,505 |
| Altn 3 | 140 | 1,182 | 1,322 | 97 | 25 | 122 | 8 | 1,452 |
| Reduction/ (Increase) | 9 | 30 | 39 | -- | -- | 22 | (-8) | 53 |

Figure H-4-3

(3) PCS costs. Calculation of PCS costs is the same as in Alternative 2 and are approximately $30,000 to $60,000.

(4) Downgrading. In a manner similar to the previous alternative, Alternative 3 could result in downgrading nine supervisory to nonsupervisory positions (see Figure H-4-3). The average salary differences for this alternative are approximately $2,000 ($14,000 - $12,000) per year. This would result in a one-time cost of 9 x $2,000 x 2 years = $36,000 if the nine "excess" supervisors were not attrited.

b. Space and relocation costs.

(1) Space. The same excess shop facilities would result in Alternative 3 as in Alternative 2. Only at Howard Air Force Base could there be a need for additional office space to support the dual manager in the Pacific West. This increased space may involve expenditures of $50,000 to $100,000 for communications, refurbishing, etc.

(2) Movement. Alternative 3 requires the redistribution of direct labor personnel to align the area direct labor shops, and requires little equipment movement. It is anticipated that approximately 100 personnel would be moved over the period of 1 working day at a cost of $4,600 (same cost per day as Alternative 2).

c. Implementation costs. Unlike Alternative 2, this alternative requires revising/preparing Interservice Support Agreements (ISSAs) to accomplish a service's work order in another service's area of operation. For example, an ISSA is required for the Army to accomplish the Air Force's workload at Albrook on the Pacific East. It is estimated that 15 people will be required for 6 months. The total cost would be $150,000 (15 people for 6 months at $20,000 per person).

d. Cost avoidance. The total costs avoided through consolidation are the same as in Alternative 2 and total $99,973.

e. Figure H-4-4 summarizes the costs for Alternative 3.

5. Alternative 4, One-time Costs.

a. Personnel costs. Figure H-4-5 shows the manpower impacts of Alternative 4. Although similar to Alternative 3 in that it is dual managed, its organizational structure is different.

(1) Attrition. As previously indicated, the effect of normal estimated attrition (105) plus possible early retirements due to organizational/treaty turmoil (28 to 56 spaces) could result in approximately 133 to 161 vacancies. With only eight personnel reductions expected in Alternative 4, no severance pay costs are anticipated.

SUMMARY OF ONE-TIME COSTS FOR ALTERNATIVE 3

| | |
|---|---|
| Personnel | $36,000 to $72,000 |
| Space and Relocation | |
| Space | $50,000 to $100,000 |
| Movement | $4,600 |
| Implementation Team | $150,000 |
| Total Costs | $240,600 to $326,600 |
| Cost Avoidance | $109,793 |

Figure H-4-4

MANPOWER IMPACTS OF CMO VERSUS ALTERNATIVE 4

| | RPMA | | | Installation Support | | | | |
|---|---|---|---|---|---|---|---|---|
| | Spt | Non-spt | Total | Spt | Unreal-izable Spt | Total | Staff Engr | Grand Total |
| CMO | 149 | 1,212 | 1,361 | 144 | -- | 144 | 0 | 1,505 |
| Altn 4 | 144 | 1,195 | 1,339 | 136 | 14 | 150 | 8 | 1,497 |
| Reduction/ (Increase) | 5 | 17 | 22 | -- | -- | (-6) | (-8) | 8 |

Figure H-4-5

(2) PCS costs. The potential PCS costs are the same as Alternative 2 ($30,000 to $60,000).

(3) Downgrading. The possible downgrading of five supervisors to nonsupervisors (assuming that they have not been previously

attrited or decide to take early retirement) at an average salary difference of $3,000 ($15,000 - $12,000) per year would result in a one-time cost of $30,000 for 2 years.

b. Space and relocation costs.

(1) Alternative 4 requires the same space as Alternative 3 and remodeling costs amount to $50,000 to $100,000.

(2) Movement. Movement costs are the same as Alternative 3 ($4,600).

c. Implementation team costs. As in Alternative 3, this alternative requires extensive rewriting of ISSAs and would cost $50,000.

d. Cost avoidance. Estimated as before at $98,138.

e. Figure H-4-6 summarizes the one-time costs of Alternative 4.

6. Summary of One-time Costs. Figure H-4-7 displays the combined results of the one-time costs presented in this annex. Alternative 2 requires the greatest organizational change and consequently the largest cost. Alternatives 3 and 4 realign the work force into geographical areas with major organizational changes. Therefore, the resulting implementation costs are lower than Alternative 2.

SUMMARY OF ONE-TIME COSTS FOR ALTERNATIVE 4

| | |
|---|---|
| Personnel | $30,000 to $60,000 |
| Space and Relocation | |
| Space | $50,000 to $100,000 |
| Movement | $4,600 |
| Implementation Team | $150,000 |
| Total Costs | $234,600 to $314,600 |
| Cost Avoidance | $109,793 |

Figure H-4-6

SUMMARY OF ONE-TIME COSTS
(In $ million)

| Altn | (1) Personnel | (2) Space Altn | (3) Relo-cate | (4) Impl Team | (5) Total Cost (Est) Range | (6) Equip Savings/ Year |
|---|---|---|---|---|---|---|
| 2 | .12-.156 | .1-.2 | .024 | 1.0 | 1.24-1.38 | .11 |
| 3 | .036-.072 | .05-.1 | .005 | .15 | .24-.33 | .11 |
| 4 | .03-.06 | .05-.1 | .005 | .15 | .23-31 | .11 |

Figure H-4-7

LAST PAGE OF APPENDIX H-4

# ANNEX I

# BIBLIOGRAPHY

ANNEX I

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LAST PAGE OF VOLUME II