# ENERGY ENGINEERING ANALYSIS PROGRAM EIGHTH US ARMY, KOREA

**VOLUME I** 

## **EXECUTIVE SUMMARY**

FINAL REPORT

**AUGUST 1981** 

19971023 092

PREPARED UNDER

CONTRACT NO. DACA 84-79-C-0182

WITH

# THE CORPS OF ENGINEERS PACIFIC OCEAN DIVISION



BY

PRC SYSTEMS SERVICES COMPANY

AND

M&E PACIFIC, INC.

### DEPARTMENT OF THE ARMY

# CONSTRUCTION ENGINEERING RESEARCH LABORATORIES, CORPS OF ENGINEERS P.O. BOX 9005 CHAMPAIGN, ILLINOIS 61826-9005

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## TABLE OF CONTENTS

Section	<u>Title</u>	Page
1.0	INTRODUCTION	. 1-1
1.1 1.2 1.3 1.3.1 1.3.2	Energy Engineering Analysis Program	. 1-1 . 1-1 . 1-1
2.0	SUMMARY	. 2-1
2.1 2.1.1 2.1.2 2.2 2.2.1 2.2.2	Energy Engineering Analysis Program	. 2-1 . 2-2 . 2-3 . 2-3
3.0	PROCEDURE	. 3-1
3.1 3.2 3.2.1 3.2.2 3.3 3.3.1 3.3.2 3.3.3	Data Gathering/Audit Phase Analysis Phase Preselection and Predesign of Modifications Calculating Savings, Costs, and Ratios Programming and Reports Project Definition Programming Reports Reports	. 3-1 . 3-1 . 3-2 . 3-2 . 3-2 . 3-3
4.0	MAJOR FINDINGS AND RESULTS	. 4-1
4.1 4.1.1 4.1.2 4.1.3 4.1.4 4.1.5 4.1.6 4.1.7 4.2 4.3 4.3.1 4.3.1.1 4.3.1.2 4.3.1.3 4.3.2 4.4.1 4.4.2 4.4.3	Description of Major ECIP Modifications  EMCS  Clock Thermostats with Outside Air Override  Insulation, Weather Stripping, and Caulking  Window Treatment  Lighting  Boiler Improvement  Project Data  Maintenance and Repair/Minor Construction  Utilities and Distribution Systems  Electrical  Transformers  Power Factor Correction  Motor/Load Matching  Water and Sewage Systems  Projects Investigated But Not Recommended  Conversion to Fuel Oil Heating in Relocatable Barracks  Waste Heat Recovery - 500-Man Mess Hall  Waste Heat Recovery - Diesel Generators	. 4-1 . 4-1 . 4-4 . 4-4 . 4-5 . 4-5 . 4-6 . 4-6 . 4-6 . 4-7 . 4-7

# TABLE OF CONTENTS (Continued)

Section	<u>Title</u>	Page
4.4.5 4.4.6 4.5 4.5.1 4.5.2 4.5.3	Hot Water Storage	4-8 4-9 4-10 4-10
	LIST OF ILLUSTRATIONS	
Figure	<u>Title</u>	<u>Page</u>
2-1 2-1-1 2-2 2-3 2-4 4-1 4-2 4-3	Total EUSA Energy Consumption and Projected Savings Total Saving Profile	2-2 2-3 2-4 2-5 4-2 4-3
	LIST OF TABLES	
Table	<u>Title</u>	Page
1-1	Report Format	1-2 4-9

### 1.0 INTRODUCTION

### 1.1 ENERGY ENGINEERING ANALYSIS PROGRAM

Executive Order 12003, dated 19 July 1977, set forth national goals in energy conservation and provided specific guidance to Federal agencies for reduction of energy consumption. The Army Energy Plan, published in February 1978, similarly set up goals for the Army. Succeeding publications and procedures established specific programs and the Energy Engineering Analysis Program (EEAP) evolved as the vehicle for generating documentation for energy conserving construction projects. In parallel, the Congress has authorized funds for such projects under the Energy Conservation Investment Program (ECIP).

### 1.2 CONSULTANTS' INVOLVEMENT

In September 1979, the Pacific Ocean Division (POD), Corps of Engineers, contracted with PRC Systems Services Company and M&E Pacific, Inc. (a joint venture) to perform Energy Engineering Analyses for 19 Eighth U.S. Army (EUSA) installations. The Final Report for the Program was submitted in April 1981.

### 1.3 EEAP REPORTS

### 1.3.1 Program Documents

The primary product of an EEAP is the preparation of Project Development Brochures (PDB's) and DD Forms 1391, Military Construction Project Data. These are the vehicles for processing budget requests for ECIP funding. Forty-five sets of PDB's and Forms 1391 have been submitted under this contract.

### 1.3.2 Study Reports

In addition to the budget documents, 10 volumes of technical reports have been published. This volume is the Executive Summary for the entire program. Table 1-1 lists all volumes in the report, arranged by facility engineer areas and covering the 19 individual installations.

## Table 1-1. Report Format

# ENERGY ENGINEERING ANALYSIS PROGRAM EIGHTH U.S. ARMY, KOREA

VOLUME NO.	TITLE
Ι .	EXECUTIVE SUMMARY
II	SEOUL Yongsan Garrison K-16 Airfield
III	UIJONGBU Camp Red Cloud Camp Stanley
ΙŅ	TONGDUCHON Camp Casey Camp Hovey H-220 Heliport
V	SONGSANDONG Camp Howze Camp Edwards Camp Pelham Camp Kittyhawk JSA MAC HQ Swiss-Swede Camp
VI	PYONGTAEK Camp Humphreys
VII	CHUNCHON Camp Long
VIII	TAEGU Camp Henry Camp Carroll Camp Walker
IX	PUSAN Hialeah
X	APPENDICES
	A Computer Programs B Cost Estimates C Unit IBOP Calculations D Audit Forms E Similar Building Lists F Waste in Operations G Utilities and Distribution Systems H Projects Investigated But Not Proposed I Solar Applications

### 2.1 ENERGY ENGINEERING ANALYSIS PROGRAM

The overall goal of the Army Facility Energy Plan is to reduce energy consumption at military installations by 25% of that consumed in FY75 as the base year. The results of the Energy Engineering Analysis Program, increments A & B, for 19 installations of the 8th Army in Korea show that 18.2% of the reduction could be achieved by maintaining existing energy conservation programs and implementing the Energy Conservation Investment Program (ECIP) developed to date.

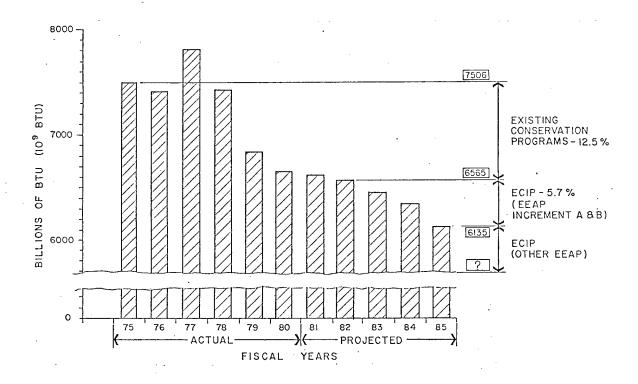


Figure 2-1. Total EUSA Energy Consumption and Projected Savings

The remaining reduction, as noted in Figure 2-1, would be achieved by the implementation of other energy conservation investments which would be identified after conducting other increments of the Energy Engineering Analysis Program.

### 2.1.1 Projected Energy Savings

The direct saving in Operation and Maintenance Costs due to ECIP projects will be \$9.9 million in the first year after construction of all projects. This saving is expected to increase thereafter as energy cost escalate.

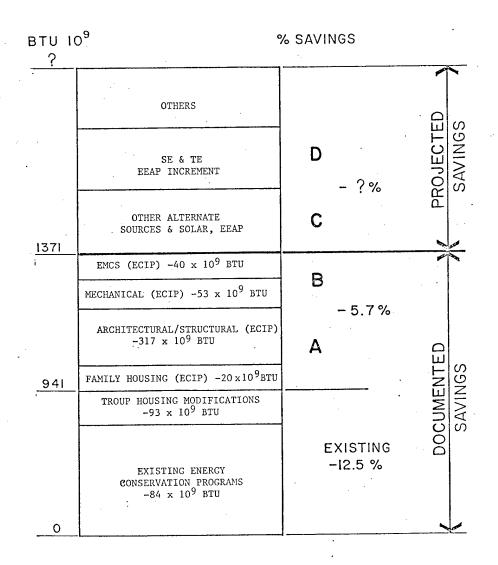


Figure 2-1-1. Total Saving Profile

As noted in Figure 2-1-1, a total of  $430 \times 10^9$  British Thermal Units (BTU) could be saved annually by implementing energy conservation investments identified for Family Housing (2 installations), Architectural/Structural (18 installations), Mechanical (6 installations), and EMCS (1 installation). These energy savings represent a reduction of 2,600,000 gallons of fuel oil and 9,000,000 Kilowatthours (Kwh) of electricity which would not be required or purchased by the 8th Army.

### 2.1.2 Programmed ECIP Construction

The total cost of all projects at the times of construction will be \$20.1 million.

Dollar costs of projects by FY are as follows (see also figure 2-2):

	Architectural/Structural	Mechanical		EMCS
FY 1982	\$ 663,000	\$ -0-	\$	-0-
FY 1983	8,662,000	175,000		-0-
FY 1984	7,062,000	1,875,000	1,0	591,000
	\$16,387,000	\$2,050,000	\$1,	691,000

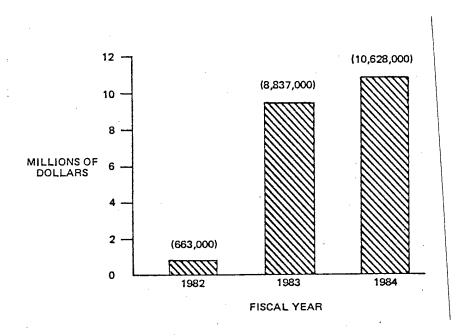


Figure 2-2. Project Submittals by Fiscal Year

### 2.2 AUDIT FINDINGS

### 2.2.1 Energy Savings Program in Progress

The Eighth Army has already implemented a spartan regimen of fuel oil allocations and turnoff and setback regulations, with impressive results (see figure 2-3).

The Troop Housing Upgrade Program, being pursued as an Eighth Army O&M project, includes many modifications that will contribute substantially to energy conservation. Annual savings of approximately 2 million kWh of electricity and 500,000 gallons of fuel oil can be expected.

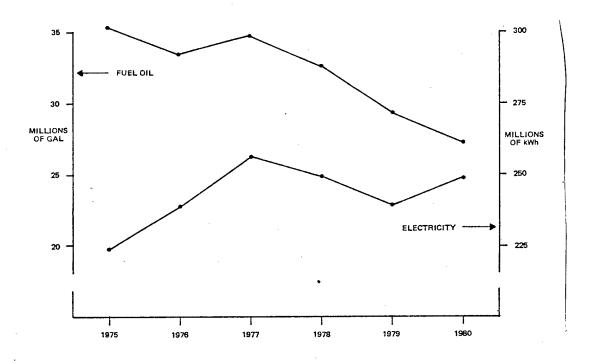


Figure 2-3. EUSA Energy Consumption

### 2.2.2 End-Use Analysis

Energy consumption by the entire EUSA can be broken down as follows: (All figures in thousands of MBtu.)

	Fuel Oil	Electricity
Space Heat	1,842	125
Space Cool	95	238
Domestic Hot Water	859	61
Lighting	-	1,055
Other, 19 bases	560	621
Other Installations	666	666
TOTAL .	4,022	2,760

The major uses of fuel oil are seen to be space heating (over 50 percent) and domestic hot water (DHW) (25 percent). Fifty percent of consumed electricity is used for lighting.

Figure 2-4 is a graphic representation of the end-use analysis.

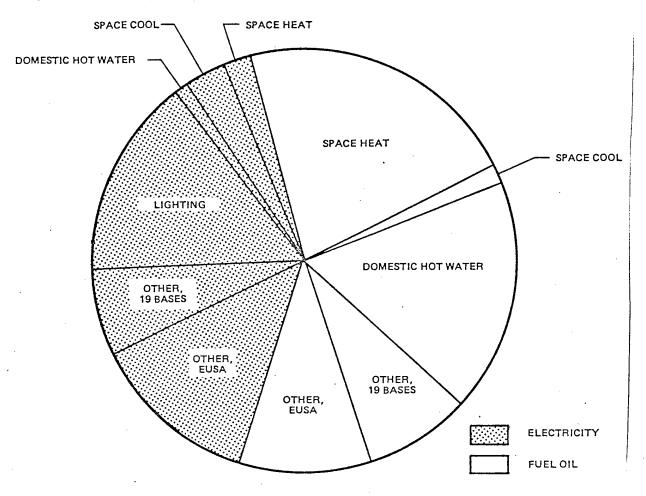


Figure 2-4. End-Use Analysis

In terms of gallons of fuel oil and kilowatthours of electricity, the same breakdown is as follows: (all figures in millions)

	Fuel Oil	Electricity
Space Heat	13.28	10.78
Space Cool	0.68	20.52
Domestic Hot Water	6.19	5.26
Lighting	-	90.95
Other, 19 bases	4.04	53.54
Other Installations	4.81	57.45
TOTAL	29.00	238.50

### 3.0 PROCEDURE

Performance of the contract fell into three phases - data gathering, analysis, and reporting.

### 3.1 DATA GATHERING/AUDIT PHASE

During the first phase, December 1979 to August 1980, the contractors spent in excess of 1,000 man-days in Korea examining drawings, recording energy consumption, and end-use data, performing detailed audits of individual buildings, and surveying individual items of equipment such as boilers, space heaters, and airconditioners. The contractors also met with local suppliers to establish costs for in-country procurement. Information and support from the Facility Engineer Activity, Korea (FEAK) and from the Far East District was most helpful.

### 3.2 ANALYSIS PHASE

This phase was initiated as data became available from the first phase and continued through computer programming, design, and iteration of options. It consisted of reducing the data, calculating current energy consumption, postulating modifications to reduce consumption, computing energy savings to be realized, and estimating costs.

### 3.2.1 Preselection and Predesign of Modifications

From previous experience, potential modifications were approached in the following priorities:

- a. Turnoff and setback are properly the first priority because of the potentially large savings that can result from small investments. Turnoff and setback can be mechanized with timeclocks or operated through an Energy Monitor and Control System (EMCS). Timeclocks are more costeffective in a situation with scattered and relatively few control points; EMCS is preferred for more numerous and denser applications.
- b. Ventilation, infiltration, and transmission are major causes of direct heat loss. Ventilation refers to intentional exhaust or intake of outside air, via fans, to provide essential fresh air in the building. Infiltration is the introduction of unconditioned air through cracks around doors and windows or through other apertures in the building envelope.

Insulating the walls and ceilings and installing double pane or storm windows will cut the rate at which heat is transferred through the building envelope. Cutting this rate by a third or a quarter is, in most cases, entirely practicable and this will be directly reflected in decreased fuel oil consumption.

c. The general term equipment efficiencies covers a wide range of investigations and modifications. All boilers over 75 hp and all airconditioning units over 30 tons on the 19 bases were analyzed for possible improvements. Projects such as feedwater preheat, waste heat recovery, combustion air preheat, and oxygen trim were examined and, where justifiable, recommended. The large, oil-energized, absorption chiller of Yongsan Hospital also was analyzed in depth. Package airconditioners, which constitute the majority of such units of Korea, seldom offer significant savings opportunities. Information on liquid pumps in water and sewage systems was collected for each base. Very substantial improvements in lighting efficiency (lumens per watt) have become available in the past few years and advantage was taken of opportunities to replace incandescent fixtures with fluorescent, vapor, or halide types.

### 3.2.2 Calculating Savings, Costs, and Ratios

Proprietary computer programs were used for heating and cooling load, energy conservation, and cost-effectiveness calculations. Manual calculations were performed to check computer results and to solve special problems. Selected modifications were then reviewed in detail for compliance with ECIP criteria and FEAK/POD guidelines, documented, and prepared as Forms 1391 and PDB's.

### 3.3 PROGRAMMING AND REPORTS

### 3.3.1 Project Definition

Much of the programming effort was devoted to aggregating conservation measures for individual buildings and equipment into total packages for the installation.

The model building approach was used, which selects a number of typical buildings, each of which represents a group of similar buildings in construction, mission, size, and configuration. The representative building is audited in detail and the results extrapolated to the group on the basis of conditioned floor area. (Unique buildings were audited individually.) The following table shows the extent of audit coverage (floor areas are in 1,000's of square feet).

	Base	Total	EEAP	Percen	tages
	Bldgs.	Area	Bldgs. Area	Bldgs.	Area
Yongsan Garrison Camp Humphreys Camp Walker Camp Henry Camp Carroll K-16 Airfield Camp Casey/H-220 Camp Hovey Hialeah Camp Red Cloud Camp Stanley Camp Howze Camp Pelham Camp Edwards KH/SS/JSA MAC HQ Camp Long	1364 689 212 266 186 33 1226 451 260 316 275 245 186 58 109 130	4530 1994 773 547 1424 135 2416 672 547 671 659 398 308 210 136 207	852 3698 425 1902 132 639 107 415 110 1207 26 127 753 1799 289 492 175 431 193 593 162 590 134 304 95 218 39 184 61 112 93 181	62 62 62 40 59 79 61 64 67 61 55 51 67	82 95 83 76 85 94 74 73 79 88 90 76 71 88 82 92
Total	6046	15601	3646 12892	60	83

### 3.3.2 Programming

For administrative and management convenience, documentation was "packaged" according to facility class/category code.

Preparation of 1391's and PDB's was programmed to conform with the following MCA program year submissions:

- a. <u>FY 1982</u>. Yongsan and Walker Family Housing (At the client's request, these submissions were accelerated to the earlier fiscal year.)
- b. <u>FY 1983</u>. Architectural/Structural and Central Heating (Mechanical) projects for the six bases in the original contract
- c. <u>FY 1984</u>. All other mechanical projects and all architectural/ structural projects for the 13 bases in the contract revision. (No projects for JSA/MAC HO met the criteria for the ECIP.)

### 3.3.3 Reports

This effort culminated in the recommendation of 45 projects. Forms 1391, "Military Construction Project Data," related PDB's, and 10 volumes of descriptive reports providing guidance to Area Facility Engineers (AFE's) and designers have been submitted.

### 4.0 MAJOR FINDINGS AND RESULTS

### 4.1 DESCRIPTION OF MAJOR ECIP MODIFICATIONS

### 4.1.1 EMCS

The EMCS recommended for Yongsan Garrison will control heating and cooling systems in 37 buildings and the boilers in the two central steam heating plants. 671 data points will be monitored.

The primary purpose of an EMCS is to control needed energy use and to eliminate unnecessary use. Secondly, an EMCS provides real time visibility of status and condition and furnishes hard copies of data for the record. It also provides a basis for planning, scheduling, and maintenance activities.

Figure 4-1 is a schematic presentation of the distributive hierarchy of Field Interface Devices (FID's), Multiplexers (MUX), and Central Control Unit (CCU) and lists the individual buildings in the system.

### 4.1.2 Clock Thermostats with Outside Air Override

Setting thermostatic controls back from 68°F to 58°F during periods of non-occupancy will save approximately 30 percent of the heating energy. Another step that can be accomplished with the timeclock installation is an override heating cutoff based on outside air temperature.

The project recommended here is a timer (figure 4-2) to be installed on warm-air furnaces. The installation should be secure, preferably in the utility room. An outside air temperature sensing thermostat overrides other controls to shut off all heating at outside air temperatures above some selected maximum. Individual temperatures for responses can be preset at any desired points and times.

## 4.1.3 Insulation, Weather Stripping, and Caulking

Fiberglass batts are most effective for ceiling insulation and can also be used in walls. Four inches of fiberglass batt insulation has an R value of 13.

Expanded polystyrene foam (and related chemical compounds) in the form of rigid boards or panels is also an excellent insulator. It does not sag or tear, has an R value of about 4 per inch, and is long-lived and easy to install, though

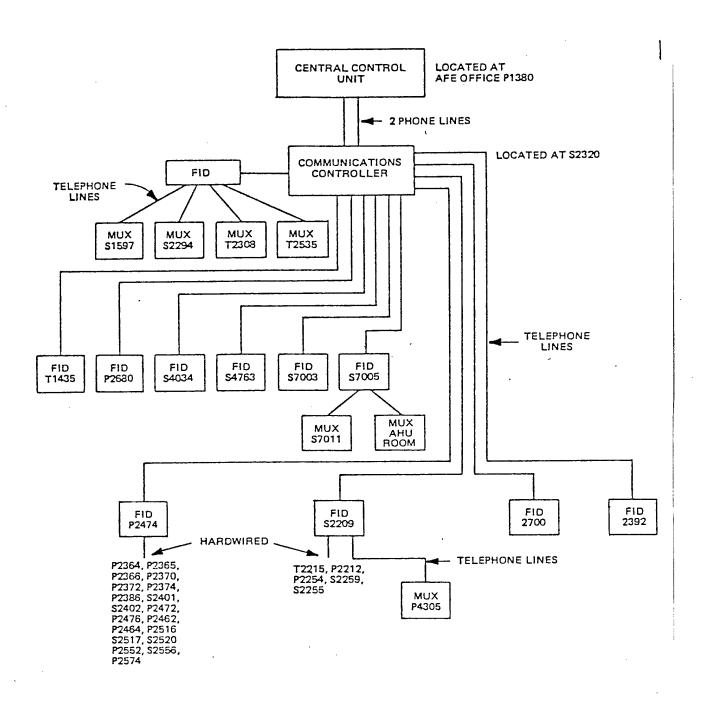


Figure 4-1. EMCS Hardware Layout.

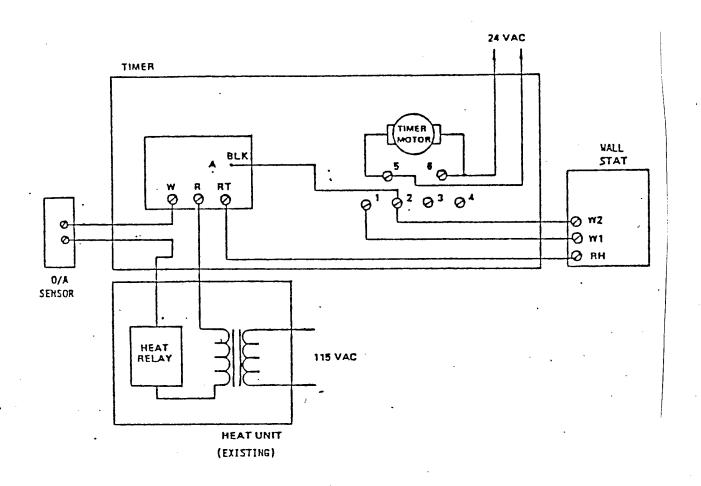


Figure 4-2. Clock Thermostat Diagram

more expensive than fiberglass. Projects in this analysis have recommended 2-inch panels applied to the outside of concrete masonry unit (CMU) walls. This practice avoids the loss of interior floor space, the expense of working around and replacing internal fixtures, and the disruption of indoor activities. A variety of finish textures, colors, and materials is available.

Outdoor air infiltrates a building through cracks and openings around windows and doors and through other apertures. Sealing these openings by installing weather stripping and caulking along the cracks is both effective and economical. Extruded metal door weather stripping is to be applied to all four edges of the door or jamb, depending upon configuration, on all exterior doors that open to a conditioned space. Window weather stripping is to be applied so that the entire crack length is sealed when the window is closed properly.

Sealing service apertures and caulking around all door and window frames is to be specified in the modification contracts. Caulking exterior wall penetrations, along floor slabs, and on external metal sheeting is particularly important in Quonset huts, to keep water out of the insulation.

### 4.1.4 Window Treatment

Storm windows or double pane windows will reduce energy consumption in a building. Curtains or drapes will provide even further reduction in energy use. Storm windows reduce heat losses through conduction and infiltration. Because of lower cost, they are recommended where the existing single pane window and frame are in good condition. Storm windows are available in standard two- or three-track configuration with operable sashes. Double pane windows provide 40-to 60-percent reduction of heat loss and a slight reduction of solar heat gain as well. They are single hung aluminum frame and include screens. This type fenestration is applied where existing window frames are in poor condition and subject to replacement.

### 4.1.5 Lighting

Commercial developments in this area over the past several years offer a wide variety of energy conservation options. Essentially, this is accomplished by substituting lower wattage lamps of higher efficiency while maintaining or improving lumen value and footcandles.

The substitutions can be one of the following, depending on total wattage: (1) incandescent replaced by high-pressure sodium or by high-efficiency fluorescent; (2) fluorescent replaced by either mercury vapor or by high-pressure sodium; and

(3) mercury vapor replaced by high-pressure sodium.

### 4.1.6 Boiler Improvement

Oil burners typically require a greater percentage of air as the firing rate decreases to compensate for less effective mixing as airflow and velocity to the burner decreases. Energy savings can be achieved if the air/fuel ratio is modulated and maintained at the optimum ratio in response to an excess oxygen sensor. This control system will also modulate to correct for other variables that affect the combustion process, such as fuel temperature, fuel viscosity, combustion air temperature, and humidity. Major system components to be retrofitted are a sensor head, oxygen analyser/controller, modulating motor linkage,

and control panel with high-low fire set point adjustment. The  $\rm O_2$  trim retrofit is included in the EMCS package.

### 4.1.7 Project Data

Additional information on modifications and the specific recommendations made for each EUSA installation are given in the Forms 1391. Face sheets of these forms are included as appendix A to this volume for convenient reference.

### 4.2 MAINTENANCE AND REPAIR/MINOR CONSTRUCTION

The following items were recommended to FEAK during the course of this program. FY 1981 costs and FY 1982 savings are assumed.

	E/C	Annual MBtu	Savings \$	CWE \$1000
Buildings S2700 and S2392, Yongsan Garrison			,	
Replace 6,800 linear feet of underground steam supply and condensate return lines associated with building S2700, and 3,537 linear feet of lines associated with building S2392. Existing insulation has deteriorated so as to be virtually ineffective.	21.0	15,867	130,347	756.6
Building 666, Camp Carroll				
Replace 300 linear feet of uninsulated steam supply and condensate return lines with insulated lines.	15.5	339.9	4,939	22.0
Buildings S170 through S174, Camp Howze				
Replace deteriorated roof surfaces and water-soaked insulation.	23.5	1,127.4	16,383	47.4
Building S0114, Camp Edwards				
Replace nine deteriorated and warped doors.	14.5	227.4	3,305	15.7
Supply Point 48, Pusan				
Replace the 52 temporary refrigeration units. Insulation is deteriorated and water-soaked to the point of ineffectiveness.	37.2	4,974.0	55 <b>,</b> 609	133.7

### 4.3 UTILITIES AND DISTRIBUTION SYSTEMS

### 4.3.1 Electrical

There are substantial energy losses in the existing electrical distribution system contributed by direct and indirect causes. However, due to the high costs of material, equipment, and labor associated with electrical distribution work, no projects could be identified within ECIP criteria. The following maintenance activities for conservation are recommended.

### 4.3.1.1 Transformers

Deenergize transformers supply unused facilities.
Balance loading phases on secondary transformers.
Deenergize refrigeration and heating transformers during their off seasons.
Ventilate transformer vaults and shade outdoor transformer banks.
Utilize efficient dry-type transformers.

### 4.3.1.2 Power Factor Correction

Low power factor occurs in lightly loaded motors and its correction will contribute greatly to the energy economy of distribution systems.

Low power factor increases losses in electrical distribution and utilization equipment (such as wiring, motors, and transformers) and reduces the load handling capability and voltage regulation of the electrical system.

As indicated by survey, or as identified at known inductive load centers, install capacitors to correct power factors. Inductive loads associated with electric motors can readily be corrected to better than 90-percent power factor. Capacitors should be installed on individual motors 3 hp and larger in size.

### 4.3.1.3 Motor/Load Matching

Original motor load calculation estimates are usually conservative and, as loads are reduced through conservation measures, the mismatch becomes even greater. If the ratio of the motor's load to the motor's horsepower rating is small, the motor will operate inefficiently. Correcting the power factor will still leave a substantial inefficiency due to size mismatch. Motors that are not loaded to at least 60 percent of their potential should be replaced whenever practical and certainly at any time a change-out is called for. A control system should be

established in supply channels to verify actual loads before replacing electric motors on a size-for-size basis.

### 4.3.2 Water and Sewage Systems

Energy consumption in water and sewage systems is primarily by liquid pumps. Such pumps are inherently quite efficient, given proper system design and pump sizing. The survey revealed that all such pumps were operable, with no reported leaks or seal damage, even though virtually all had exceeded their design lifetimes. Replacement is recommended but cannot be justified as an energy conservation measure.

### 4.4 PROJECTS INVESTIGATED BUT NOT RECOMMENDED

### 4.4.1 Conversion to Fuel Oil Heating in Relocatable Barracks

Electric resistance space heating was provided in the one-story H-type and the two-story relocatable barracks in Korea at the time of construction. The question of converting from electric energy to fuel oil energy (using either warm air or hot water as the medium) was examined in this analysis. The study shows that a warm-air furnace would have been a better economic choice originally and that conversion now from electricity to warm-air would be only marginally advantageous. Conversion in 1983 in a two-story relocatable barracks would save 795 MBtu of source energy annually but the cost would be approximately \$75,000, for an E/C ratio of 10.6.

### 4.4.2 Waste Heat Recovery - 500-Man Mess Halls

An analysis of the potential for waste heat recovery from 500-man mess hall dishwashers was carried out. The waste heat available from the smaller units amounts to 110 MBtu per year or 826 gallons of fuel oil. The construction cost is \$7,800 and the E/C ratio is 14.0. (Waste heat recovery in 1,000-man mess halls is cost-effective.)

### 4.4.3 Waste Heat Recovery - Diesel Generators

Building S2323 at Yongsan Garrison houses two 300 kW generators that supply uninterruptible and carefully regulated power to the communication complex in adjacent buildings, producing 190 kW of power. Efficiency is approximately 30 percent, meaning that 2.2. x  $10^6$  Btu/hr is consumed in the form of fuel oil to produce 648,470 Btu/hr in the form of electricity.

Assuming that 90 percent of the water jacket and exhaust gas energy could be recovered and that it could be distributed with 10-percent losses, 833,000 Btu/hr would be available for other uses. If this could replace fuel oil burned elsewhere at 85-percent efficiency,  $8.6 \times 10^9$  Btu (equals 62,000 gallons or \$244,000 at 1985 prices) could be saved annually.

In order to take advantage of this very attractive conservation opportunity there must, of course, be a potential consumer within the limits of an economical distribution system. Because of the high values involved, extensive analyses were conducted in the attempt to define a cost-effective system. This attempt was unsuccessful and the project cannot be recommended.

### 4.4.4 Chilled Water Storage

Chilled water can be generated during off-peak hours and stored for use during periods of high demand. The presence of a storage tank does not reduce operating loads nor does it reduce the total energy consumption of the system. (In fact, there will be a slight increase in energy use because of pumping and heat gain in the tank.) The merit of chilled water storage lies in the ability to generate refrigeration without incurring or contributing to high demand charges. This is not an economic factor in Korea since the Eighth Army does not pay a demand fee.

### 4.4.5 Hot Water Storage

Considerations obtaining for hot water storage are similar to those for chilled water storage - storage allows a given demand to be met with a lower capacity generator. The same limitations also apply, the storage tank costs more than the saving from a smaller boiler.

### 4.4.6 Central Steam/Hot Water Boilers

Applications of feedwater economizers, combustion air preheaters, and blowdown heat recovery to 19 boilers at five central boiler installations at Yongsan were examined and found not to produce savings commensurate with their costs. As a general rule, such devices are cost-effective only on boilers of capacity greater than 500 hp. Table 4-1 summarizes the analysis.

Table 4-1. Boiler Improvements, Yongsan Garrison

Options	Annu Mega-Btu	al Saving Gal-Oil	S \$	Cost \$	Pay- Back Years	E/C
Feedwater Economizers	4,870	35,030	110,344	1,137,800	10.3	4.3
Combustion Air Heaters	8,186	58,909	185,563	2,047,716	11.0	4.0
Blowdown Heat Recovery	1,366	9,829	30,961	148,421	4.8	9.2

### 4.5 SOLAR APPLICATIONS

The total solar energy that might be received on an area of  $1 \, \mathrm{ft}^2$ , facing due south and tilted 47° above the local horizontal, at 37° north latitude would be approximately 508,000 Btu per year (figure 4-3). This energy can be used effectively to preheat water for either domestic or space heating use.

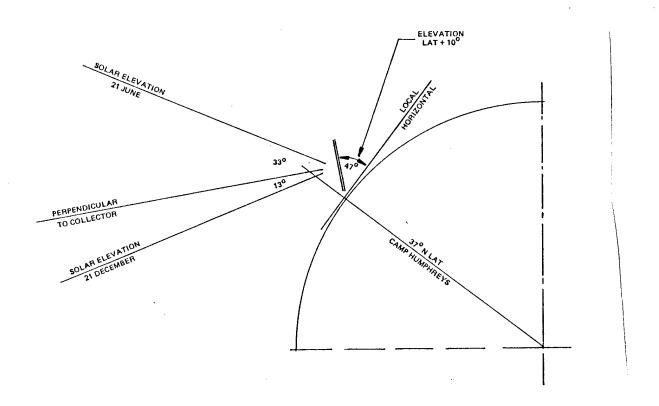


Figure 4-3. Solar Collector Geometry

To illustrate the energy and economic aspects of solar heat collectors in Korea, postulate a 1000 ft<sup>2</sup> collector adjacent to building S0758, an EM Barracks, at Camp Humphreys. A 25-year expected life will allow full amortization of the investment and the building already has a hot water space heating installation. Given minor additional plumbing to allow the application of solar energy for either space or domestic hot water heating, the full output of the collector could be used year round. The project is to be funded in the FY 1983 budget and will be operational in January 1984. Solar energy will replace fuel oil, whose price in that year is estimated to be \$3.15 per gallon.

### 4.5.1 Savings

The University of Wisconsin FCHART program gives the following monthly maximum collection values for the configuration described above.

	Btu		Btu
Month	ft <sup>2</sup> mo	Month	ft <sup>2</sup> mo
January February March April May June	32,800 35,200 45,300 48,000 48,800 47,100	July August September October November December	46,500 46,800 44,400 43,600 38,100 31,700

The total for the year is 508,300 Btu/ft<sup>2</sup> or 508.3 MBtu for the 1000 ft<sup>2</sup> array. This must be reduced for a sky clearness factor (say 75 percent) and for collector efficiency (40 percent is a liberal value, using manufacturers' data).

$$508.3 \frac{MBtu}{year} \times 0.75 \times 0.40 = 152.49 \frac{MBtu}{year}$$

This available energy would replace fuel oil, which now heats water at 65 percent efficiency.

$$\frac{159.49}{0.1387 \times 0.65}$$
 = 1691.4 gal saved per year

1691.4 gal/yr X 3.15  $\frac{15}{3}$  = \$5328 saved in the first year

### 4.5.2 Costs

Solar collectors, insulated storage tanks, and piping are available in Korea. The following prices are estimated:

<u>Item</u>	Material	<u>Labor</u>	
Collector (1000 ft <sup>2</sup> ) Insulated tank (1200 gal) Piping (600 LF) Total	17,000 2,500 3,000	5,700 500 2,000	30,700

The several markups bring this total to \$43,700.

The monitoring and control devices required by ETL 1110-3-302, 14 March 1979, should be procured in the United States and are expected to have an installed cost of \$9,600.

These two figures, escalated to 1984, give a current working estimate of \$81,000 for the project.

Costs for maintenance, operations, and repairs are not included.

### 4.5.3 Evaluation

The E/C ratio for this project is 152.49 MBtu divided by \$81,000 or 1.88. The simple payback period is 15 years and the B/C ratio is 1.64.

In accordance with ETL 1110-3-302, the 25-year cost savings, exclusive of any maintenance and replacement costs, is greater than the original investment and the project is cost-effective.

The project does not, however, meet the criteria for ECIP funding and a Form 1391 is not being submitted.

The payback formula is:

$$p = \frac{\ln \left[1 + \frac{c}{s} \left(\frac{r}{1 + r}\right)\right]}{\ln \left(1 + r\right)}$$

$$= \frac{\ln \left[1 + \frac{81,000}{5328} \left(\frac{0.10}{1 + 0.10}\right)\right]}{\ln \left(1 + 0.10\right)}$$

$$= 9.1$$

The investment cost is recovered in less than the expected life of 25 years.

APPENDIX A

Executive Summary Final Report DD Form 1391

# FOR OFFICIAL USE ONLY (WHEN DATA IS ENTERED)

1982 6. P. ATION SECTIO	MILITARY CONSTRU	MILITARY CONSTRUCTION PROJECT DATA			•					
P.L	<b>-</b>			AKMY	YONGSAN GARRISON- FH -	KS 948				
P.L		7.CATEGORY CODE NUMBER	ER 8. PROGRAM ELEMENT		9. STATE/COUNTRY		,			
SECTIO	:				KOREA .					
SECTIO	11. BUDGET ACCOUNT NUMBER 6100		12. PROJECT NUMBER		13. PROJECT TITLE Architectural=8/Stnuctural Modifications	ural		WZ	CM	₹ ×
18.	SECTION A - DESCRIPTION OF PROJECT	)JECT			SECTION B - COST ESTIMATES	ST ESTIMA	TES			
TYPE OF CONSTRUCTION P	HYSICAL CHARACTERIST	PHYSICAL CHARACTERISTICS OF PRIMARY FACILITY		20. PRIMARY FACILITY	:	D W/n	41117	UNITCOST	COST (\$000)	(\$000)
8. PERMANENT A. NO. OF BLDGS100	SEE ATT	ACHED 1 TCT   a. v	d. WIDTH NA	A. WALL IN	A. WALL INSULATION BOARDS R=8	-	59096	2 516	400	
NENT	NA	SAREA NA		B. CEILING	61=	SF	1336	1.017	2 -	
	3. COOLING NA CAP.	. NA cost (* NA	~	C. DOOR WE		L.	1491	2.357	4	
¥	TO MORE TO SE DOINE		.=1.	D. WINDOW	WINDOW IKEAIMENI, DOUBLE PANE	-	1/030	12.400	117	
	onsist of the fol sulation, Boards,	Work will consist of the following modifications: 1. Wall insulation, Boards, R8 in 57 dwelling units.	ions: ig units.	21. SUPPO	SUPPORTING FACILITIES	+			0	
6. CONVERSION X 2. Ceiling d. CONVERSION 3 Mosthow	insulation, batt	is, R19 in 1 dwell	ling unit.			+				
. OTHER (Specify) 4. Double	Double pane windows in 5	n 56 dwelling units.	• 63 - 110 5:							
16. REPLACEMENT			<u> </u>			1				
17. TYPE OF DESIGN										
B. STANDARD DESIGN X										
c. DRAWING NO.					,					
				22. TOTAL PROJECT COST	OJECT COST				<b>\$</b> 616	
		SECTION C - BAS	SECTION C - BASIS OF REQUIREMENT	DUINEMENT						
(UM NA	< ~	25. REGOINEMENT FOR	Pigueci							
a, TOTAL REQUIREMENT		This project is	required to r	meet state	This project is required to meet stated goals of energy use reduction. It is submitted	luction	It is	submitte 13	<del>.</del> م	
b. EXISTING SUBSTANDARD		as part of the e	nergy conserv	vation inv	/estment program (ECIP).	ine ado	to notite	wall ar	ַ	
c. EXISTING ADEQUATE		celling insulati	ion, window to	reatment :	and weather stripping will	reduce	. winter	leat los	у <u>т</u>	
d. FUNDED, NOT IN INVENTORY	***************************************	and/or summer he	at gain, the	reby reduc	cing energy consumption.	d stul	roject wi	II resu	<b>ц</b>	
e. ADEQUATE ASSETS (c + d)		In 19.2 mega Blu	Lannua Leneri	gy savings	per thousand dollars cos	T, (1/	ratio,	and a		
-0.1	AUTHORIZED FUNDED	benetit-to-cost	ratio (B/C re	atio)of 8.	benefit-to-cost ratio (B/C ratio)of 8.3. lotal annual energy savings is estimated at	avings . Lliw.	1S estime	ated at a cimul	a	
AUTHO		o boinon doctor	.f 2 0 woarr	uoiiai sav If +hic	project is not offected	707070	will 201	לייווי לי מייהוד	ه م م	
9. INCLUDED IN FY		paybach perion o	ontrary	to nationa	project is not effected, energy with contribute to be	circi gy	reviewed	and it		heen
24. RELATED PROJECTS NA		determined that	an EIS, purst	uant to PL	determined that an EIS, pursuant to PL91-190 is not required.		) : : :		í	,
		<del></del>								
		•								
DD FORM 1391		EOB OFFICIAL LISE ONLY (WHEN DATA IS ENTERED)	HMI Y INC E	א האה היה	e Enteren		5	PAGE NO.		

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		יייי דיט אטז	FOR UPPICIAL USE UNLY IMPENDATIONS IS ENTERED.	IMHEN DATA IS	S CIVI ENELD)	-	-	
1. DATE 2. F	2. FISCAL VEAR	MILITARY CONSTRUCTION PROJECT DATA			RRISON - KS	948		
5. PROPOSED AUTHORIZATION		6. PRIOR AUTHORIZATION 7. CATEGORY CODE NUMBER	E NUMBER 8, PROGRAM ELEMENT		9. STATE/COUNTRY			
\$1,478,000	P.L.	442, 131,211,610,   141.214.217,441			KOREA			
10. PROPOSED APPROPRIATION	RIATION	11. BUDGET ACCOUNT NUMBER	12. PROJECT NUMBER		13. PROJECT TITLE (F) (11 (F))		Σχ	CM RM
\$ 1,478,000	•	6100		_	ARCHITECTURAL & STRUGTURAL	MODIFICATIONS		×
	SECTION A	SECTION A - DESCRIPTION OF PROJECT			SECTION B - COST ESTIMATES	TESTIMATES		
14. TYPE OF CONSTRUCTION	18.	PHYSICAL CHARACTERISTICS OF PRIMARY FACILITY	FACILITY	20. PRIMARY FACILITY		U/M QUANTITY	UNITCOST	1478.3
* PERMANENT	( NO. OF BLDGS.]0(	0) See Attached List	d. WIDTH NA		<del></del>	SF ( 267899.	2.894	775.2
b. SEMI PERMANENT	( . DESIGN CAPACITY	NA 1. GROSS AREA	NA	B. CEILIN	R=19	<u>]</u> .	1.169	304.8
c. TEMPORARY	9. COOLING		COST (\$ 147 )	ļ	DOOK WEALHER SIKIPPING	10/10/1	250	40.5
15. TYPE OF WORK	Mork will co	lowing	modifications:	1	TREATMENT DOUBLE PANE	CF 1 2043.	14 261	11 8
F ADDITION	1. Wall ins	Wall insulation, boards, R8 in 83 L	83 buildings.	MOON 1 M	TREATMENT STORM MINDOW	$\vdash$	6.782	183.8
c. ALTERATION		Ceiling insulation, batts, R19 in 39 buildings	39 buildings.	LIGHTI	LIGHTING MOD. INC. TO FLR	W 34299	0.921	21.6
d, CONVERSION		Weather stripping for doors in 80 buildings.	ouildings.	H. LIGHTING MOD	NG MOD. INC. TO HPS	W 117748.	0.742	87.3
e, OTHER (Specify)	4. Weather	Weather Stripping for Windows in 15 Double name windows in 4 buildings	o buttatngs.	21 STIPPUE	STIPPORTING FACTI TTIES			0
16. REPLACEMENT		Storm windows in 76 buildings.		-				,
17, TYPE OF DESIGN		Lighting modification, incandescent to flr. in	to flr. in 57					)
STANDARD DESIGN	X buildings.	35.						,
b. SPECIAL DESIGN	8. Lighting	Lighting modification, incandescent to HPS in	t to HPS in 5					7
C. DRAWING NO.	building	js.	-		,			( 6 071
			SECTION C - BASIS OF REQUIREMENT	22. TOTAL PROJECT COST	DECT COST			14/0.3
23.	AUANTITATIVE DATA	25	25. REQUIREMENT FOR PROJECT		·			
A. TOTAL REQUIREMENT	Į,	This proj	lect is required t	o meet stat	This project is required to meet stated goals of energy use reduction. It is submitted	duction. It i	is submit	ed
b. EXISTING SUBSTANDARD	DAND	as part o	of the energy cons	ervation in	ivestment program (ECIP).	The addition	of wall	רני
C. EXISTING ADEQUATE	E	ceiling	nsulation, window	/ treatment,	weather stripping and I	gnting modific	delons w	_
d. FUNDED, NOT IN INVENTORY	VENTORY	reduce wi	nter heat loss an	id/or summer	heat gain, thereby reduce	ing energy cor is now thousand	isumption 4 dollare	+ 0 0 0
ADEQUATE ASSETS (c + d)	(c + d)	Т	Ject Will result 1	n 24.2 meyo	1.blu ammal energy saving	John Chousant	onergy c	(1) (1) (1) (1) (1) (1) (1) (1) (1) (1)
		AUTHORIZED FUNDED (E/C MAT)	10), and a Denetic +64 a+ 35 722 8 m	- CO-COS C TO	1010 (b/c racio) of 12.1. 1 +otal dollar savings of	\$779.823 ner	rear will	result
1. UNFUNDED PRIOR AUTHORIZATION	UTHORIZATION	מייים כי יייים אייים איי	area ar 33,722.0 =	1 of 1 0 ve	ive If this project is a	ont effected.	onergy wi	
9. INCLUDED IN FY	рпоапам	TIL & SIIII	to be needlessly	thou pattern	one a simple payage, period of 1.7 years and payage. This project has been reviewed	This project !	nas been	reviewed
h. DEFICIENCY (1 1 - 9)	9	Jac 1+ has	to been determined	+ + ha + han F	S. pursuant to Pl 91-190	is not require	, pd	
24. RELATED PROJECTS	S IVA	5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5						
							1 04 20 4	
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1 DATE	2 FISCAL VEAD		FOR OFFICIAL	FOR OFFICIAL USE ONLY (WHEN DATA IS ENTERED)	EN DATA IS	. ENTERED)			-		
Ca	1093	MILITARY CONST	MILITARY CONSTRUCTION PROJECT DATA	<u>.                                    </u>	DEPARTMENT	4. INSTALLATION VONGCAN GARRISON - KS	876				
11-13-80				-		NT 2014 - NS	240				
5. PROPOSED AUTHORIZATION \$ 831,000		6. PRIOR AUTHORIZATION P.L.	7. CATEGORY CODE NUMBER 211, 610, 141, 171 214, 218, 310, 219	J71, NUMBER BLEMENT NUMBER 219		9. state/country KOREA					ĺ
10, PROPOSED APPROPRIATION	NOTION	11. BUDGET ACCO	JUNT NUMBER 12.	12. PROJECT NUMBER		13. PROJECT TITLE			MN	CM RM	Ţ
\$ 831,000		6100		٠.		ARCHITECTURAL REGERAL MODIFICATIONS	jar mol	DIFICATIONS			×
		SECTION A - DESCRIPTION OF PROJECT	полест			SECTION B - COST ESTIMATES	OST ESTI	MATES			T
14. TYPE OF CONSTRUCTION	ž	PHYSICAL CHARACTER	PHYSICAL CHARACTERISTICS OF PRIMARY FACILITY	ILITY	20. PRIMARY FACILITY	ACILITY	N/N	QUANTITY	UNITCOST	COST (\$000)	6
4. PERMANENT	A, NO. OF BLDGS. 38	SEE	ATTACHED LIST	d. WIDTH NA	A. WALL IN	INSULATION, BOARDS, R8	SF	23162	2.894	831.4	7
6. SEMIPERMANENT	. DESIGN CAPACITY	NA	C GROSS AREA	S		INSULATION, BATTS, R13	SF	121130	1.525	184.8	-
C. TEMPORARY A	19 DESCRIPT	19 DESCRIPTION OF WORK TO BE DOWN	CAP. NA COST (\$	(s NA )	C. CEILING	BAITS	SF	58788	1.169	68.8	
15. TYPE OF WORK	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	ill consist of the		1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1	CEILING INSULATION, BATTS, R19	SF	169386	1.393	1 235.9	_
T. NEW PACIFIER	WCry (	iii comsist oi une inculation boande	TIDONING MICOLICI	ications:	E DOOR WE	DOOR WEATHERSTRIPPING	Ш	32268	2,711	87.5	_
6. Accition		insulation, boards	, KG IN 5 DU1101	ngs.	J	WINDOW WEATHERSTRIPPING	<u>ا</u> ا	307	2.352	0.7	_
S. ALIERALION	2. Wall	2. Wali insulation, batts, Kis in 73 buliqings.	KIS 18 /3 DU16	ings.		WINDOW TREATMENT, DOUBLE PANE	SF	2355	14.261	33.6	_
a. CONVERSION		ng insulation, bat	cs, kiy in iy bu	n i dings.	H. WINDOW	WINDOW TREATMENT, STORM WINDOW	SF	12737	6.782	86.3	_
e. OTHER (Specify)	4. Ce1111	Celling insulation for	quonset huts, ba	tts, KI9 in	I LIGHTIN	INC. T	3	38635	0.921	35.6	
TA DECO OCCUACAT		itaings.	L**** 101 700	100	J. LIGHTING MOD	G MUD., INC. TO HPS	3	42018	0.742	31.2	-
17. TYPE OF DESIGN	5. Weathe	weather stripping for goors in 137 buildings. Weather stripping for windows in 2 buildings.	oors in 137 bull indows in 2 bull	dings.	200013 16	011111 ON 11111					
* STANDARD DESIGN X	7. Double	e pane windows in	15 buildings.	· · · · · · · · · · · · · · · · · · ·	1	SURFURILING FACILITIES					T
b. SPECIAL DESIGN		Storm windows in 121 buildings.	ildings.								7
c. DRAWING NO.	79. Lighti	ing modifications,	inc. to flr. in	. 33 buildings.							7
		Lighting modifications, inc. to HPS in 9 buildings.	inc. to HPS in	9 buildings.	22. TOTAL PROJECT COST	JECT COST				\$ 831 A	T
			SEC	SECTION C - BASIS OF REQUIREMENT						1	Τ
23.	QUANTITATIVE DATA	DATA	25. REQUIREMENT FOR PROJECT	OR PROJECT							T
)	tum NA	(									
. TOTAL REQUIREMENT	_		This project i	s required to r	meet stated	goals of energy use red	uction	11 15 5	uhmitte	•	
b. EXISTING SUBSTANDARD	טטע		las part of the	energy conserv	vation inve	stment program (FCIP)	The ac	Idition of	ne [[em	) TC	
C. EXISTING ADEQUATE			ceiling insula	tion, window to	reatment, w	ceiling insulation, window treatment, weather stripping and lighting modfications will reduce	ting	odfication	S will	reduce	_
d. FUNDED, NOT IN INVENTORY	ENTORY		_winter heat lo	iss and/or summe	er heat qai	n, thereby reducing ener	dv cor	Sumption.	This	roject	
. ADEQUATE ASSETS (c + d)	• 4)		will result in	1 30.0 mega BTU	annual ene	rgy savings per thousand	do] 2	irs cost (E	/C rati	,	
		AUTHORIZED FUNDED	and a benefit-	to-cost ratio	(B/C ratio)	and a benefit-to-cost ratio (B/C ratio) of 4.6. Total annual energy savings is estimated	neray	savinds is	estima	ted	
1. UNFUNDED PRIOR AUTHORIZATION	THORIZATION		🔄 at 24903.7 meg	la BTU. A tota	dollar sa	vinds of \$552,179 per vea	r w:]	result in	omis 6	<u> </u>	_
9. INCLUDED IN FY	РВООВАМ		payback period	of 1.5 years.	If this p	roject is not effected.	enerav	will cont	inite to	ا م	_
h. DEFICIENCY (a - a - f - g)	- q)		needlessly was	ted contrary to	o national	goals. This project has	been	reviewed a	nd it h	3 2	_
24. RELATED PROJECTS	NA		been determine	d that an EIS,	pursuant t	been determined that an EIS, pursuant to PL 91-190 is not required.	red.	5		?	
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1. DATE 2. FI	2. FISCAL YEAR			3.	DEPARTMENT	4. INSTALLATION					Г
11-13-80	1983	MILITARY CONSTR	MILITARY CONSTRUCTION PROJECT DATA	ATA .	ARMY	YONGSAN GARRISON - KS	948				
S. PROPOSED AUTHORIZATION		6. PRIOR AUTHORIZATION	7.CATEGORY CODE NUMBER		8. PROGRAM ELEMENT	9. STATE/COUNTRY					T
\$ 1,243,000		P.L.	/40,550,/30,51 Series		-	KOREA					
10. PROPOSED APPROPRIATION	ATION	11. BUDGET ACCOUNT NUMBER		12. PROJECT NUMBER	R	13. PROJECT TITLE			WN	CM DM	T
\$ 1,243,000		6100				ARCHITECTURAL हिंगुर्ही शिवे MODIFICATIONS	RAL MOD	)IFICATIONS		×	
		SECTION A - DESCRIPTION OF PR	PROJECT			SECTION B . COST ESTIMATES	COST EST	MATES			T
14. TYPE OF CONSTRUCTION		PHYSICAL CHARACTERISTICS OF PRIMARY FACILITY	TICS OF PRIMARY FAC	HLITY	20. PRIMARY FACILITY		N/O	QUANTITY	UNITCOST	COST (\$000)	
A. PERMANENT X	1. NO. OF BLDGS.106	SEE AT	TACHED LIST	д. МІОТН	11011	od Sedanog MOTTA HISMI	L	10001	*	1243	1
b. SEMI-PERMANENT X	-	NA	I. GROSS AREA	NA	MAIL	4	7 5	112272	1 525	172	7
c. TEMPORARY X		NA CAP.	NA COST (\$	7 (3 NA	1	ON RAT	+	800101	1 160	105	7-
15. TYPE OF WORK	19. DESCRIPT	19. DESCRIPTION OF WORK TO BE DONE			IJ	BATTS.	-	52597 1	1.393	73	7-
. NEW FACILITY	Work wi	Work will consist of the following modifications:	llowing modifi	cations:	- 1	DOOR WEATHER STRIPPING	17	12982	2.711	ر 35	T-
b. ADDITION	1. Wall	insulation, boards,	. K8 in 36 bull	dings.	- 1	띰	LF	5278	2,352	12	^
A CONVEDENCE	2. Wall	insulation, Datts,	KIS 10 3/ DU11	aings.	4	4	SF	1476	14.261	12	_
e. OTHER (Specify)	٥. دور ۱	ng insulation, part	S, KIY IN IO D	uilaings. 010 in 21 bla	<u>۔</u> إ,	٦	$\dashv$	25312	6.782	172	-
	7. CC. 1.	ing ills: 101 duoilse	one in 100 but	מום זכ טום ברום שליקות	MOUNTM - I Senia	MENT, IS	12	48	30,440		7
16. REPLACEMENT	6.50	er strinning for wi	indows in 20 bu	11.11.19s.		JNC.	3 :	70317	0.921	( 65	7
17. TYPE OF DESIGN	7. Doubl	Double pane windows in 14 buildings.	Hacks in 29 pu 14 buildings.	. cg	X-1-16H1	LIGHTING MOD., INC. TO HPS	3	86850	0.742	64	-1
. STANDARD DESIGN X		Storm windows in 54 buildings.	dings.		2.1	SUPPORTING FACTITATES					7
b. SPECIAL DESIGN		ranslucent sandwich fer	nestration (80%	) in 1 blda.		ייייי ייייי יייייי ייייייייייייייייייי	I			3	7
C. DRAWING NO.	10. Light	modification	, inc. to flr. in 21 buildings.	21 buildings.							7~
	111. Lighting	modification	nc. to HPS in	2 buildings.	22. TOTAL PROJECT COST	SJECT COST				\$ 1243	Τ
			SE	SECTION C - BASIS OF REQUIREMENT	REQUIREMENT						Γ
23.	OUNNTITATIVE DATA	DATA	25. REQUIREMENT FOR PROJECT	OR PROJECT							Т
. TOTAL REQUIREMENT			This projec	t is required	to meet sta	ted anals of energy use	redict	ion I+ io	rimquo o	+07	
b. EXISTING SUBSTANDARD	пD		as part of	the energy co	nservation i	as part of the energy conservation investment program (FCIP). The addition of wall and	The	addition	of wall	ירת אים	
c. EXISTING ADEQUATE			ceiling ins	ulation. wind	low treatment	. weather stripping and	liahti	na modific	ations		
d. FUNDED, NOT IN INVENTORY	NTORY		reduce_wint	er heat loss	and/or summe	r heat dain, thereby re	tucina	enerav con	sumption		
. ADEQUATE ASSETS (c + d)	(p 4		This projec	t will result	in 23.9 med	a. BTU annual energy say.	שנו אטנו	r thousand	יא בן רטף	+202	_
		AUTHORIZED FUNDED	(E/C ratio)	, and a benef	it-to-cost r	(E/C ratio), and a benefit-to-cost ratio (B/C ratio) of 9.6. Total annual energy savings	Tota	l annual e	nergy sa	vings	
C. UNFUNDED PRIOR AUTHORIZATION	HORIZATION		is estimate	d at 29,725.4	mega BTU.	A total dollar savings (	of \$628	,400 per ye	ear will	year will result	
9. INCLUDED IN FY	PROGRAM		in a simple	payback peri	od of 2.0 ye	ars. If this project is	s not e	ffected, en	nergy w	11	_
h, DEFICIENCY (* - + - f - 9)	(6)		] continue to	be needlessl	y wasted con	continue to be needlessly wasted contrary to national goals.	. This	project h	as been	reviewed	
24. RELATED PROJECTS	NA		and it has	been determin	ed that an E	it has been determined that an EIS, pursuant to PL 91-190 is not required.	30 is n	ot require	. p		
						•		-			
						,					_

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	2. FISCAL YEAR		, CT		3. DEPARTMENT	2				
11-13-80	1983	MILITARY	=			K-16 AIRFIELD - KS 508	~			
5. PROPOSED AUTHORIZATION \$ 86,000		6. PRIOR AUTHORIZATION	131, 211, 141, 218, 550, 610, 730, 740, 171	i, 218, number 1, 218, number 740, 171		9. state/country KOREA				
10. PROPOSED APPROPRIATION \$ 86,000	ATION	11. BUDGET	11. BUDGET ACCOUNT NUMBER 6100	12. PROJECT NUMBER		ARCHITECTURAL 8 ( ) ( ) HAN MODIFICATIONS	JAL MOD	IFICATIONS	Σ N	CM RM X
	SEC	SECTION A - DESCRIPTION OF PROJECT	N OF PROJECT			SECTION B - COST ESTIMATES	COST EST	IMATES		
14. TYPE OF CONSTRUCTION	1.0	PHYSICAL CHARACTE	ACTERISTICS OF PRIMARY FACILITY	FACILITY	20, PRIMARY FACILITY	ACILITY	M/U	QUANTITY	UNITCOST	COST (\$000)
. PERMANENT	*. NO. OF BLDGS.	DGS.17 SEE AT	ATTACHED LIST	d. WIDTH NA	A. WALL I	INSULATION: BOARDS, R8	SF	11920	2.892	34
b. SEMI-PERMANENT X	. DESIGN CAPACITY	APACITY NA	1. GROSS AREA	NA	MAA	ATTS.	SF	د 6176 )	1.525	, 6
C. TEMPORARY X	9. COOLING	NA	P. NA	cost (* NA	C. CEILING	LING INSULATÍON, BAŤTS, R19	9 SF	( 12881 )	1.169	15 )
15. TYPE OF WORK	19. DESCRIF	19. DESCRIPTION OF WORK TO BE DONE	11000	m di fi o o o o o o o o o o o o o o o o o o	D. CEILING	CEILING INSULATION, BATTS, R19	9 SF	4148 )	1,392	, 9
. NEW FACILITY		1 1 1000313151500	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	ilcacions.	DOOR W	DOOR WEATHER STRIPPING	<u>L</u>	4102	2.710	11
b. ADDITION		insulation,	1. Rall Historiacion, boards, no in o ballaings. O Wall inculation hatte 013 in 7 huildings	. 10111gs.	MOGNIM	WEATHER STRIPPING	7	240	2.351	1
c. ALTERATION X	7,0	1 the discious	Darres, A19 111 / Du	7 5.1.1.1.4.5.5.5	G. WINDOW	TREATMENT, DOUBLE PANE	SF	262	14.255	4
d. CONVERSION	; ; ;	Ting insulation	1, Datts, KIY III /	pio in 6 bidas	Ξ.	MENT, STORM		765	6.779	5
e. OTHER (Specify)	5. Weat	ing ins. iord ther stripping	Weather stripping for doors in 17 buildings.			IGHTING MOD., INC TO FLR	3	300	0.920	0
		ther stripping	for windows in 3	buildings.	21 CHDDA	CHIDDODTING EACTHITIES	-			C
16. REPLACEMENT		Double pane windows	vs in 2 buildings.	•	7 700 .17		+			
17. TYPE OF DESIGN	- 8. Stor	Storm windows in 10	10 buildings.				-			
A SPECIAL DESIGN	_	nting modifica	Lighting modification, inc. to flr. in 3 buildings.	in 3 buildings.			-			
C. DRAWING NO.	i-						<u> </u>			-
					22, TOTAL PROJECT COST	DJECT COST				98
				SECTION C - BASIS OF REQUIREMENT	REQUIREMENT					
23. a	QUANTITATIVE DATA	DATA	25. REQUIREME	25. REQUIREMENT FOR PROJECT						
	(U/M									
A. TOTAL REQUIREMENT			-			•		;		
b. EXISTING SUBSTANDARD	ותם		This pro	oject is required	d to meet si	tated goals of energy us	se redu	ction. It	is subm	tted
c. EXISTING ADEQUATE			as part	of the energy co	onservation	as part of the energy conservation investment program (ECIP). The addition of wall and	(P). T	he addition	of wal	and
d, FUNDED, NOT IN INVENTORY	NTORY		ceiling	insulation, wind	low treatmer	it, weather stripping ar	nd Ligh	ting modifi	cations	- L
. ADEQUATE ASSETS (c + d)	+ 4)		reduce	winter heat loss	and/or summ	ner heat gain, thereby n	reducir	g energy co	onsumpti	'n.
		AUTHORIZED FL	FUNDED This pr	oject will resul	t in 27.9 me	This project will result in 27.9 mega BTU annual energy savings per thousand dollars	avings	per thousan	nd dolla	'n
1. UNFUNDED PRIOR AUTHORIZATION	THORIZATION		cost (E	/C ratio), and a	benefit-to	-cost ratio (B/C ratio)	of 11.	3 Total ar	ınual en	rgy
9. INCLUDED IN FY	рпоапли	2	savings	is estimated at	2,388.7 meg	ga BTU. A total dollar	saving	s of \$53,63	30 per y	ar
h. DEFICIENCY (s - + - f - 9)	(6-		will re	sult in a simple	payback per	riod of 1.6 years. If	this pr	oject is no	ot effec	ed,
24. RELATED PROJECTS	NA		energy	will continue to	pe needles:	sly wasted, contrary to	nation	al goals.	inis pr	) Ject
			has bee	n reviewed and i	t has been o	has been reviewed and it has been determined that an ElS, pursuant to PL91-19U 1s not	pursug	nt to PL91-	-190 1s	lot
			redulred	•						

				<del></del>	
1. COMPONENT ARMY	FY 19 84 MILITARY CONSTRUC	CTION P	ROJECT D	ATA	<b>date</b> 11-19-80
3. INSTALLATION AND	DLOCATION	4. PROJEC	TTITLE	***********	AL MODIFICA
CAMP STANLEY	- KS 284, KOREA	TIONS (	INCLUDING	S MARN AI	AL MODIFICA- R FURNACES)
5. PROGRAM ELEMEN	T 6. CATEGORY CODE 7. PROJI 211,131,141,610,740, 171,214,218,442,540,	ECT NUMBE	R 8. Pf	ROJECT COS	
	550,730,219 9. COST ESTIMA	TES			
	Series ITEM	U/M	QUANTITY	UNIT	COST (\$000)
Wall Insula Ceiling Ins Ceiling Ins Door Weathe Window Weat Window Trea Window Trea Lighting Mo Lighting Mo Warm Air Fo	ation, Boards, R8 ation, Batts, R13 sulation, Batts, R19 sulation, Batts, R19 er Stripping ther Stripping atment, Double Pane atment, Storm Window atment, TSF 80% odification, inc. to flr. odification, inc. to HPS urnace (WAF) Timer Installat	SF SF SF LF SF SF W W PC	57428 85844 61753 52980 14714 125 1376 8903 34 11147 35188 88	2.840 1.498 1.147 1.368 2.661 2.310 13.999 6.657 29.882 0.904 0.728 860.511	665 (163) (129) (71) (72) (39) (0) (19) (59) (1) (10) (26) (76)
Subtotal Contingency (1	10%)				665 67

### 10. DESCRIPTION OF PROPOSED CONSTRUCTION

Total Contract Cost

Buildings at Camp Stanley are to be modified to achieve improved energy conservation.

Install wall and ceiling insulation to increase R value. Install double pane windows where windows need replacement due to age and deterioration and/or complete visibility is a requirement. Install translucent sandwich fenestration (TSF 80%) where windows need replacement and visibility is not a requirement. Install storm windows where existing windws are in good condition. Install door and window weather stripping in order to decrease infiltration. Replace existing lights with more efficient lighting to reduce electrical consumption. Install timers on warm air furnaces for a  $10^{\circ}$  setback during unoccupied hours for an approximate 30% savings of the heating energy consumed.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at Camp Stanley which are to receive each modification are attached to this form. Types of construction are indicated on the building lists.

732

1. COMPONENT ARMY	FY 19 84 MILITARY CONSTRUCTION PROJECT DAT	TA 2. DATE 11-19-80
3. INSTALLATION	AND LOCATION .	
	- KS 284, KOREA	
4. PROJECT TITLE ARCHITECTURA WARM AIR FUR	L STRUCTURAL MEDIT CALEDONS (INCLUDING	. PROJECT NUMBER
Supervisi Total Req Install	ed Equipment - Other Appropriations	-48 780 (0)
1. Wall in 2. Wall in 3. Ceiling 4. Ceiling 5. Door we 6. Window 7. Window 8. Window 9. Window 10. Lightin 11. Lightin	TION OF PROPOSED CONSTRUCTION (Continued) is ulation, boards, R8 will be installed in 27 be insulation, batts, R13 will be installed in 51 be insulation, batts, R19 will be installed in 2 insulation, batts, R19 will be installed in 4 eather stripping will be installed in 90 building weather stripping will be installed in 2 build treatment, double pane will be installed in 15 treatment, storm window will be installed in 7 treatment, TSF 80% will be installed in 1 builing modification, inc. to flr. will be installed in modification, inc. to HPS will be installed in 1 builing modification, inc. to HPS will be installed in will be installed in 84 buildings.	ouildings. 23 buildings. 49 buildings. ings. dings. 5 buildings. 74 buildings. lding. d in 8 buildings.
1		
and weather gain, thereby lights with will also sate REQUIREMENT: savings per ratio (B/C rat 15,963.6 result in a CURRENT SITUE energy use rinvestment penergy waste the situation measure.	ne addition of wall and ceiling insulation, win stripping will reduce winter heat loss and/or by reducing energy consumption, as will replacing more efficient lighting. Adding timers on war are on the heating energy consumed.  This project will result in 20.5 mega BTU and thousand dollar cost (E/C ratio), and a beneficatio) of 7.0. Total annual energy savings is mega BTU. A total dollar savings of \$420,366 simple payback period of 1.9 years.  JATION: This project is required to meet state reduction. It is submitted as part of the energy conform (ECIP). Present conditions permit very energy and that been performed on for each building involved and detailing spectures.	summer heat ing existing rm air furnaces nnual energy fit-to-cost   estimated   per year will ed goals of rgy conservation y substantial d, documenting ecific conser-
continue to project has	OT PROVIDED: If this project is not effected, be needlessly wasted, contrary to national goal been reviewed and it has been determined that PL91-190 is not required.	als. Ihis

1. COMPONENT	FY	19_84 MILITARY COI	NSTRU	CTION PROJEC	TDATA	2. DATE
ARMY	•	10MILITARI 901	101110			11-19-80
3. INSTALLATION A	ND LC	CATION		4. PROJECT TITL	E ARCHITE	CTURAL AND
				STRUCTURAL	MQ FIF([CAT	I∰AS (INCLUDING
CAMP RED CLOUD - KS 256, KOREA WARM AIR FURNACES					u	
5. PROGRAM ELEM	ENT	6, CATEGORY CODE	7. PROJ	ECT NUMBER	8. PROJECT	COST (\$000)
		171,218,442,550, 610,730 Series				881
		<u> </u>	T ESTIM	ATES		

Primary Facility					
Wall Insulation, Boards, R8       SF       37407       2.840       106         Wall Insulation, Batts, R13       SF       112822       1.498       169         Ceiling Insulation, Batts, R19       SF       82626       1.147       95         Ceiling Insulation, Batts, R19       SF       85404       1.368       117         Door Weather Stripping       LF       11218       2.661       30         Window Weather Stripping       LF       302       2.310       1         Window Treatment, Double Pane       SF       2607       13.999       37         Window Treatment, Storm Window       SF       10709       6.657       71         Window Treatment, TSF       80%       SF       434       29.882       13	ITEM	U/M	QUANTITY		
Lighting Modification, inc. to flr.   W   5778   0.904   5 Lighting Modification, inc. to HPS   W   9833   0.728   7	Wall Insulation, Boards, R8 Wall Insulation, Batts, R13 Ceiling Insulation, Batts, R19 Ceiling Insulation, Batts, R19 Door Weather Stripping Window Weather Stripping Window Treatment, Double Pane Window Treatment, Storm Window Window Treatment, TSF 80% Lighting Modification, inc. to flr.	SF	112822 82626 85404 11218 302 2607 10709 434 5778	2.840 1.498 1.147 1.368 2.661 2.310 13.999 6.657 29.882 0.904	752 106 169 95 117 30 1 37
Warm Air Furnace (WAF) Timer Installation PC 118 860.511 102 Supporting Facilities 0		PC	118	860.511	102

### 10. DESCRIPTION OF PROPOSED CONSTRUCTION

Subtotal

Contingency (10%)

Buildings at Camp Red Cloud are to be modified to achieve improved energy conservation.

Install wall and ceiling insulation to increase R value. Install double pane windows where windows need replacement due to age and deterioration and/or complete visibility is a requirement. Install translucent sandwich fenestration (TSF 80%) where windows need replacement and visibility is not a requirement. Install storm windows where existing windows are in good condition. Install door and window weather stripping in order to decrease infiltration. Replace existing lights with more efficient lighting to reduce electrical consumption. Install timers on warm air furnaces for a  $10^{0}$  setback during unoccupied hours for an approximate 30% savings of the heating energy consumed.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at Camp Red Cloud which are to receive each modification are attached to this form. Types of construction are indicated on the building lists.

1. Wall insulation, boards, R8, will be installed in 19 buildings.

752 75

1. COMPONENT ARMY FY 19 84 MILITARY CONSTRUCTION PROJ	ECT DATA	2. DATE 11-19-80
3. INSTALLATION AND LOCATION  CAMP RED CLOUD - KS 256	-	
4. PROJECT TITLE  ARCHITECTURAL & STRUCTURAL TOUR PATIONS (INCLUDING AIR FURNACES)	G WARM	OJECT NUMBER
9. COST ESTIMATES (Continued) Total Contract Cost Supervision, Inspection and Overhead (6.5%) Total Request Installed Equipment - Other Appropriations	·	827 54 881 (0)

10. DESCRIPTION OF PROPOSED CONSTRUCTION (Continued)

- 2. Wall insulation, batts, R13, will be installed in 59 buildings.
- 3. Ceiling insulation, batts, R19, will be installed in 29 buildings.
- 4. Ceiling insulation, batts, R19, will be installed in 55 buildings.
- Door weather stripping will be installed in 98 buildings.
   Window weather stripping will be installed in 3 buildings.
- 7. Window treatment, double pane will be installed in 14 buildings.
- 8. Window treatment, storm windows will be installed in 77 buildings.
- 9. Window treatment, TSF 80% will be installed in 2 buildings.
- 10. Lighting modification, inc. to flr. will be installed in 7 buildings.
- 11. Lighting modification, inc. to HPS will be installed in 2 buildings.
- 12. WAF timer installation in 107 buildings.

11. REQUIREMENT:

PROJECT: The addition of wall and ceiling insulation, window treatment and weather stripping will reduce winter heat loss and/or summer heat gain, thereby reducing energy consumption, as will replacing existing lights with more efficient lighting. Adding timers on warm air furnaces will also save on the heating energy consumed.

REQUIREMENT: This project will result in 22.4 mega BTU annual energy savings per thousand dollars cost, (E/C ratio) and a benefit-to-cost ratio (B/C ratio) of 6.5. Total annual energy savings is estimated at 19,705.3 mega BTU. A total dollar savings of \$520,925 per year will result in a simple payback period of 1.7 years.

CURRENT SITUATION: This project is required to meet stated goals of energy use reduction. It is submitted as part of the energy conservation investment program (ECIP). Present conditions permit very substantial energy waste. A base-wide energy audit has been performed, documenting the situation for each building involved and detailing specific conservation

IMPACT IF NOT PROVIDED: If this project is not effected, energy will continue to be needlessly wasted, contrary to national goals. This project has been reviewed and it has been determined that an EIS,

pursuant to PL91-190 is not required.

1. COMPONENT ARMY	FY 19 84 MILITARY C	ONSTRUCTION PROJECT DATA 2. DATE 11-19-80
3. INSTALLATION A CAMP CASEY -	AND LOCATION - KS 124, KOREA	4. PROJECT TITLE  ARCHITECTURAL STRUTTURAL MODIFI- CATIONS (INCLUDING WARM AIR FURNACES
5. PROGRAM ELEM	ENT 6. CATEGORY CODE	7. PROJECT NUMBER 8. PROJECT COST (\$000)

1,216

211,131,141,214,452

1112 610 171 210 coloine

9. COST ESTIMATES						
QUANTITY	UNIT COST	COST (\$000)				
	2.661 2.310 13.999 6.657 29.882 0.904 0.728	1,038 (156) (230) (92) (171) (50) (69) (68) (13) (4) (24) (162) 0 1,038 104 1,142				
	4928 10248 424 4475 32396	4928   13.999 10248   6.657 424   29.882 4475   0.904 32396   0.728				

## 10. DESCRIPTION OF PROPOSED CONSTRUCTION

Buildings at Camp Casey are to be modified to achieve improved energy conservation.

Install wall and ceiling insulation to increase R value. Install double pane windows where windows need replacement due to age and deterioration and/or complete visibility is a requirement. Install translucent sandwich fenestration (TSF 80%) where windows need replacement and visibility is not a require Install storm windows where existing windows are in good condition. Install door and window weather stripping in order to decrease infiltration. Replace existing lights with more efficient lighting to reduce electrical consumption. Install timers on warm air furnaces for a 100 setback during unoccupied hours for an approximate 30% savings of the heating energy consumed.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at Camp Casey which are to receive each modification are attached to this form. Types of construction are indicated on the building lists.

2. DATE 1. COMPONENT FY 19 84 MILITARY CONSTRUCTION PROJECT DATA 11-19-80 ARMY 3. INSTALLATION AND LOCATION CAMP CASEY - KS 124 4. PROJECT TITLE 5. PROJECT NUMBER ARCHITECTURAL & STRUCTURAL MODIFICATIONS (INCLUDING. WARM AIR FURNACES) COST ESTIMATES (Continued) Supervision, Inspection & Overhead (6.5%) Total Request (0)Installed Equipment - Other Appropriates 10. DESCRIPTION OF PROPOSED CONSTRUCTION (Continued) Wall insulation, boards, R8 will be installed in 29 buildings. Wall insulation, batts, R13 will be installed in 113 buildings. Ceiling insulation, batts, R19 will be installed in 31 buildings. Ceiling insulation, batts, R19 will be installed in 113 buildings. Door weather stripping will be installed in 153 buildings. Window weather stripping will be installed in 2 buildings. Window treatment, double pane will be installed in 25 buildings. 7. Window treatment, storm windows will be installed in 123 buildings. Window treatment, TSF 80% will be installed in 1 building. Lighting Modification, Inc. to FLR will be installed in 9 buildings. 10. Lighting Modification, Inc. to HPS will be installed in 8 buildings. 11. WAF timer installation will be installed in 167 buildings. 11. REQUIREMENT: PROJECT: The addition of wall and ceiling insulatin, window treatment and weather stripping will reduce winter heat loss and/or summer heat gain, thereby reducing energy consumption, as will replacing existing lights with more efficient lighting. Adding timers on warm air furnaces will also save on the heating energy consumed. REQUIREMENT: This project will result in 19.5 mega BTU annual energy savings per thousand dollars cost, (E/C ratio), and a benefit-to-cost ratio (B/C ratio) of 5.7. Total annual energy savings is estimated at 23,707.5 mega BTU. A total dollar savings of \$628,096 per year will result in a simple payback period of 1.9 years. CURRENT SITUATION: This project is required to meet stated goals of

specific conservation measures.

IMPACT IF NOT PROVIDED: If this project is not effected, energy will continue to be needlessly wasted, contrary to national goals.

energy use reduction. It is submitted as part of the energy conservation investment program (ECIP). Present conditions permit very substantial energy waste. A base-wide energy audit has been performed, documenting the situation for each building involved and detailing

1. COMPONENT  ARMY	FY	FY 19_84 MILITARY CONSTRUCTION PROJECT DATA					Å,
3. INSTALLATION CAMP CASEY -				4. PROJECT TIT ARCHITECT CATIONS (	URAL SERVE	FURAD MODIFI- ARM AIR FURNAC	(S)
5. PROGRAM ELEM	MENT	6. CATEGORY CODE 740,510,550,730	7. PROJ	ECT NUMBER	8. PROJECT	COST (\$000)	

760,721,540 Series

1195

9. COST ESTIMATES						
ITEM	U <b>/</b> M	QUANTITY	UNIT COST	COST (\$000)		
Primary Facility  Wall Insulation, Boards, R8  Wall Insulation, Batts, R13  Ceiling Insulation, Batts, R19  Ceiling Insulation, Batts, R19  Door Weather Stripping  Window Weather Stripping  Window Treatment, Double Pane  Window Treatment, Storm Window  Window Treatment, TSF 80%  Lighting Modification, inc. to flr.  Lighting Modification, inc. to HPS.  Warm Air Furnaces (WAF) Timer Installation  Supporting Facilities  Subtotal  Contingency (10%)	SF SF SF LF SF SF W PC	141764 88835 142512 72965 4985 296 1448 8003 1762 10400 36000	2.840 1.498 1.147 1.368 2.661 2.310 13.999 6.657 29.882 0.904 0.728 860.511	684 (403) (133) (163) (100) (13) (1) (20) (53) (53) (53) (9) (26) (65) 0		
		ļ				

### 10. DESCRIPTION OF PROPOSED CONSTRUCTION

Buildings at Camp Casey are to be modified to achieve improved energy conservation.

Install wall and ceiling insulation to increase R value. Install double pane windows where windows need replacement due to age and deterioration and/or complete visibility is a requirement. Install translucent sandwich fenestration (TSF 80%) where windows need replacement and visibility is not a requirement. Install storm windows where existing windows are in good condition. Install door and window weather stripping in order to decrease infiltration. Replace existing lights with more efficient lighting to reduce electrical consumption. Install timers on warm air furnaces for a 10° setback during unoccupied hours for an approximate 30% savings of the heating energy consumed.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at Camp Casey which are to receive each modification are attached to this form. Types of construction are indicated on the building lists.

2. DATE . COMPONENT FY 19 84 MILITARY CONSTRUCTION PROJECT DATA 11-19-80 ARMY 3. INSTALLATION AND LOCATION CAMP CASEY - KS 124 4. PROJECT TITLE 5. PROJECT NUMBER ARCHITECTURAL STRUCTURAL POPPICATIONS (INCLUDING WARM AIR FURNACES) WARM AIR FURNACES) COST ESTIMATES (Continued) 1143 Total Contract Cost 74 Supervision, Inspection & Overhead (6.5%) 1195 Total Request (0)Installed Equipment - Other Appropriations DESCRIPTION OF PROPOSED CONSTRUCTION (Continued) 10. Wall insulation, boards, R8 will be installed in 26 buildings. 1. Wall insulation, batts, R13 will be installed in 41 buildings. Ceiling insulation, batts, R19 will be installed in 21 buildings. 3. Ceiling insulation, batts, R19 will be installed in 33 buildings. 4. Door weather stripping will be installed in 75 buildings. 5. Window weather stripping will be installed in 2 buildings. Window treatment, double pane will be installed in 15 buildings. Window treatment, storm window will be installed in 57 buildings. Window treatment, TSF 80% will be installed in 4 buildings. 9. Lighting modification, inc. to flr. will be installed in 8 buildings Lighting modification, inc. to HPS will be installed in 1 building. 11. WAF timer will be installed in 61 buildings. 12. REQUIREMENT: PROJECT: The addition of wall and ceiling insulation, window treatment and weather stripping will reduce winter heat loss and/or summer heat gain, thereby reducing energy consumption, as will replacing existing lights with more efficient lighting. Adding timers on warm air furnaces will also save on the heating energy consumed. REQUIREMENT: This project will result in 24.0 mega BTU annual energy savings per thousand dollars cost (E/C ratio), and a benefit-to-cost (B/C ratio) of 9.7. Total annual energy savings is estimated at 28,678.8 mega BTU. A total dollar savings of \$775,308 per year will result in a simple payback period of 1.5 years. CURRENT SITUATION: This project is required to meet stated goals of energy use reduction. It is submitted as part of the energy conservation investment program (ECIP). Present conditions permit very substantial energy waste. A base-wide energy audit has been performed, documenting the situation for each building involved and detailing specific conservation measures. IMPACT IF NOT PROVIDED: If this project is not effected, energy will

pursuant to PL91-190 is not required.

continue to be needlessly wasted, contrary to national goals. This project has been reviewed and it has been determined that an EIS,

1. COMPONENT ARMY	FY 19 84 MILITARY COM	2. DATE 11-19-80	
3. INSTALLATION A CAMP HOVEY -	RAE (STRUCTURAL MODIFICA- LUDING WARM AIR FURNACES)		
5. PROGRAM ELEM	ENT 6 CATEGORY CODE 211,740,610,141, 171,214,218,442,550		8. PROJECT COST (\$000) 513

9. COST ESTIMATES

ITEM	U/M	QUANTITY	UNIT COST	COST (\$000)
Primary Facility Wall insulation, boards, R=8 Wall insulation, batts, R=13 Ceiling insulation, batts, R=19 Ceiling insulation, batts, R=19 Door weather stripping Window weather stripping Window treatment, double pane Window treatment, storm window Window treatment, TSF 80% Lighting Modification, Inc. to flr. Lighting Modification, Inc. to HPS Warm air furnace (WAF) timer installation Supporting Facilities Subtotal Contingency (10%) Total Contract Cost	SF SF SF LF SF SF W PC	9152 87789 8997 82824 6774 198 1445 5611 38 4799 20768 70	2.840 1.498 1.147 1.368 2.661 2.310 13.999 6.657 29.882 0.904 0.728 860.511	(132) (10)
	·	<u> </u>	<u>.                                    </u>	

## 10. DESCRIPTION OF PROPOSED CONSTRUCTION

Buildings at Camp Hovey are to be modified to achieve improved energy conservation.

Install wall and ceiling insulation to increase R value. Install double pane windows where windows need replacement due to age and deterioration and/or complete visibility is a requirement. Install translucent sandwich fenestration (TSF 80%) where windows need replacement and visibility is not a requirement. Install storm windows where existing windows are in good condition. Install door and window weather stripping in order to decrease infiltration. Replace existing lights with more efficient lighting to reduce electrical consumption. Install timers on warm air furnaces for a  $10^{\circ}$  setback during unoccupied hours for an approximate 30% savings of the heating energy consumed.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at Camp Hovey which are to receive each modification are attached to this form. Types of construction are indicated on the buildings lists.

1. COMPONENT ARMY FY 19 84 MILITARY CONSTRUCTION PROJECT DATA 11-19-80						
3. INSTALLATION AND LOCATION CAMP HOVEY - KS 168						
4. PROJECT TITLE ARCHITECTURAL & STREET RALEDODIFICATIONS (INCLUDING WARM AIR FURNACES)  5. PROJECT NUMBER						
Supervision, Total Reques	IMATES (Continued) Inspection & Overhead (6.5%) t Equipment - Other Appropriations	<u>31</u>				

- 10. DESCRIPTION OF PROPOSED CONSTRUCTION (Continued)
- 1. Wall insulation, boards, R=8 will be installed in 4 buildings.
- 2. Wall insulation, batts, R=13 will be installed in 51 buildings.
- 3. Ceiling insulation, batts, R=19 will be installed in 4 buildings.
- 4. Ceiling insulation, batts, R=19 will be installed in 49 buildings.
- 5. Door weather stripping will be installed in 70 buildings.
- Window weather stripping will be installed in 2 buildings.
- 7. Window treatment, double pane will be installed in 8 buildings:
- 8. Window treatment, storm window will be installed in 60 buildings.
- 9. Window treatment, TSF 80% will be installed in 1 building.
- 10. Lighting Modification, Inc. to flr. will be installed in 10 buildings.
- 11. Lighting Modification, Inc. to HPS will be installed in 5 buildings.
- 12. WAF timer installation will be installed in 61 buildings.

## 11. REQUIREMENT:

PROJECT: The addition of wall and ceiling insulation, window treatment and weather stripping will reduce winter heat loss and/or summer heat gain, thereby reducing energy consumption, as will replacing existing lights with more efficient lighting. Adding timers on warm air furnaces will also save on the heating energy consumed. REQUIREMENT: This project will result in 17.1 mega BTU annual energy savings per thousand dollars cost, (E/C ratio), and a benefit-to-cost ratio (B/C ratio) of 4.0. Total annual energy savings is estimated at 8,750.5 mega BTU. A total dollar savings of \$226,246 per year will result in a simple payback period of 2.3 years. CURRENT SITUATION: This project is required to meet stated goals of energy use reduction. It is submitted as part of the energy conservation investment program (ECIP). Present conditions permit very substantial energy waste. A base-wide energy audit has been performed, documenting the situation for each building involved and detailing specific conservation measures.

1. COMPONENT ARMY	FY 19 84 MILITARY CONSTR	2. DATE 11-19-80	
3. INSTALLATION A	T - KS 971, KOREA	4. PROJECT TITLE  ARCHITECTURAL STRU  CATIONS (INCLUDING	ĴŒRAL MODIFI- JARM FURNACE)
5. PROGRAM ELEM	ENT 6. CATEGORY CODE 7. PF 141,171,610,730, 740,211,550,Series	ROJECT NUMBER 8. PROJECT	

9. COST ESTIMATES					
ITEM	U/M	QUANTITY	UNIT COST	COST (\$000)	
Primary Facility Wall Insulation, Boards R8 Wall Insulation, Batts, R13 Ceiling Insulation, Batts, R19 Door Weather Stripping Window Treatment, Double Pane Window Treatment, Storm Window Warm Air Furnace (WAF) Timer Installation Supporting Facilities Subtotal Contingency (10%) Total Contract Cost Supervision, Inspection & Overhead (6.5%) Total Request Installed Equipment - Other Appropriations	SF SF LF SF SF PC	805 16992 19655 2321 951 529 26	2.840 1.498 1.368 2.661 13.999 6.657 860.511	100 (2) (25) (27) (6) (13) (4) (22) 0 100 10 110 7	

Buildings at H-220 Heliport are to be modified to achieve improved energy conservation.

Install wall and ceiling insulation to increase R value. Install double pane windows where windows need replacement due to age and deterioration and/or complete visibility is a requirement. Install storm windows where existing windows are in good condition. Install door weather stripping in order to decrease infiltration. Install timers on warm air furnaces for a  $10^{\circ}$  setback during unoccupied hours for an approximate 30% savings of the heating energy consumed.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at H-220 Heliport which are to receive each modification are attached to this form. Types of construction are indicated on the building lists.

Wall insulation, boards, R8 will be installed in 1 building. Wall insulation, batts, R13 will be installed in 14 buildings. Ceiling insulation, batts, R19 will be installed in 14 buildings. Door weather stripping will be installed in 16 buildings.

1. COMPONENT ARMY	FY 19 84 MILITARY	2. DATE 11-19-80	
3. INSTALLATION A	STRUCTURAL MODIFICA- ING WARM AIR FURNACES)		
5. PROGRAM ELEM	6. CATEGORY CODE 131,141,211,7 214,610,550	-   /, / / / / / / / / / / / / / / / / /	8. PROJECT COST (\$000)  368

9. COST ESTIMATES					
ITEM	U/M	QUANTITY	UNIT COST	COST (\$000)	
Primary Facility Wall Insulation, Boards, R8 Wall Insulation, Batts, R13 Ceiling Insulation, Batts, R19 Ceiling Insulation, Batts, R19 Door Weather Stripping Window Weather Stripping Window Treatment, Double Pane Window Treatment, Storm Window Lighting Modification, inc. to flr. Warm Air Furnace (WAF) Timer Supporting Facilities Subtotal Contingency (10%) Total Contract Cost Supervision, Inspection & Overhead (6.5%) Total Request Installed Equipment - Other Appropriations	SF SF SF LF SF W C	1704 3490 17048	2.840 1.498 1.147 1.368 2.661 2.310 13.999 6.657 0.904 60.511	314 (76) (60) (35) (36) (9) (1) (24) (23) (15) (34) 0 314 31 345 23 368 (0)	

Buildings at Camp Howze are to be modified to achieve improved energy conservation.

Install wall and ceiling insulation to increase R value. Install double pane windows where windows need replacement due to age and deterioration and/or complete visibility is a requirement. Install storm windows where existing windows are in good condition. Install door and window weather stripping in order to decrease infiltration. Replace existing lights with more efficient lighting to reduce electrical consumption. Install timers on warm air furnaces for a  $10^{\circ}$  setback during unoccupied hours for an approximate 30% savings of the heating energy consumed.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at Camp Howze which are to receive each modification are attached to this form. Types of construction are indicated on the building lists.

- 1. Wall insulation boards, R8, will be installed in 15 buildings.
- 2. Wall insulation batts, R13, will be installed in 27 buildings.
- 3. Ceiling insulation batts, R19, will be installed in 14 buildings.

1. COMPONENT ARMY	FY 19 84 MILITARY CONSTRUCTION PROJECT DATA				2. date 11-19-80	
3. INSTALLATION A	DN AND LOCATION  4. PROJECT TITLE  ARCHITECTURAL \$\F\sir\R\Q\G\G\G\G\G\G\G\G\G\G\G\G\G\G\G\G\G\G				i	
CAMP EDWARDS - KS 032, KOREA						AIR FURNACES)
5. PROGRAM ELEME		6. CATEGORY CODE 211,442,740,141,214 550, Series		ECT NUMBER	8. PROJECT	соят ( <b>sooo)</b> 321

9. COST ESTIMATES						
ITEM	U/M	QUANTITY	UNIT COST	COST (\$000)		
Primary Facility Wall Insulation, Boards, R8 Wall Insulation, Batts, R13 Ceiling Insulation, Batts, R19 Ceiling Insulation, Batts, R19 Door Weather Stripping Window Treatment, Double Pane Window Treatment, Storm Window Lighting Modification, inc. to flr. Lighting Modification, inc. to HPS Warm Air Furnace (WAF) Timer Installation Supporting Facilities Subtotal Contingency (10%) Total Contract Cost Supervision, Inspection & Overhead (6.5%) Total Request Installed Equipment - Other Appropriations	SF SF SF SF W W PC	1350 7550 89523	2.840 1.498 1.147 1.368 2.661 13.999 6.657 0.904 0.728 60.511	274 (32) (27) (68) (27) (25) (5) (9) (7) (65) (9) 0 274 27 301 20 321 (0)		

Buildings at Camp Edwards are to be modified to achieve improved energy conservation.

Install wall and ceiling insulation to increase R value. Install double pane windows where windows need replacement due to age and deterioration and/or complete visibility is a requirement. Install storm windows where existing windows are in good condition. Install door weather stripping in order to decrease infiltration. Replace existing lights with more efficient lighting to reduce electrical consumption. Install timers on warm air furnaces for a  $10^{\rm O}$  setback during unoccupied hours for an approximate 30% savings of the heating energy consumed.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at Camp Edwards which are to receive each modification are attached to this form. Types of construction are indicated on the building lists.

- 1. Wall insulation, boards, R8, will be installed in 7 buildings.
- 2. Wall insulation, batts, R13, will be installed in 10 buildings.
- 3. Ceiling insulation, batts, R19, will be installed in 7 buildings.

1. COMPONENT ARMY	FY	19 <u>84</u> MILITARY COI	NSTRU	CTION PROJE	CT DATA	2. date 11-19-80
3. INSTALLATION A		S 252, KOREA		4. PROJECT TIT ARCHITECTU TIONS (INC	RAL S ATRIN	⊞RAL MODIFICA FAIR FURNACES)
5. PROGRAM ELEM	ENT	6. CATEGORY CODE 211,131,740,141 214,218,442,550	7. PROJI	ECT NUMBER	8. PROJECT	

	<b>ESTIM</b>	

ITEM	U/M	QUANTITY	UNIT COST	COST (\$000)
Primary Facility Wall Insulation, Boards, R8 Wall Insulation, Batts, R13 Ceiling Insulation, Batts, R19 Ceiling Insulation, Batts, R19 Floor/Basement Insulation, Batts, R13 Door Weather Stripping Window Weather Stripping Window Treatment, Double Pane Window Treatment, Storm Window Lighting Modification, inc. to flr. Lighting Modification, inc. to HPS. Warm Air Furnace (WAF) Timer Installation Supporting Facilities Subtotal Contingency (10%) Total Contract Cost	SF SF SF LF LF SF W PC	3511 4746 29 2608 1915 6582 4892	2.840 1.498 1.147 1.368 0.926 2.661 2.310 13.999 6.657 0.904 0.728 860.511	3 13 0 37 13 6
TOTAL CONTRACT COST				

Buildings at Camp Pelham are to be modified to achieve improved energy conservation.

Install wall, ceiling and floor/basement insulation to increase R value. Install double pane windows where windows need replacement due to age and deterioration and/or complete visibility is a requirement. Install storm windows where existing windows are in good condition. Install door and window weather stripping in order to decrease infiltration. Replace existing lights with more efficient lighting to reduce electrical consumption. Install timers on warm air furnaces for a  $10^{0}$  setback during unoccupied hours for an approximate 30% savings of the heating energy consumed.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at Camp Pelham which are to receive each modification are attached to this form. Types of construction are indicated on the building lists.

- 1. Wall insulation, boards, R8, will be installed in 11 buildings.
- 2. Wall insulation, batts, R13, will be installed in 23 buildings.
- 3. Ceiling insulation, batts, R19, will be installed in 7 buildings.

1. COMPONENT ARMY	FY 19 84 MIL	ITARY CONSTRI	JCTION PROJECT DA	ATA 2. DATE 11-19-80
3. INSTALLATION A	ND LOCATION	•	-	
CAMP PELHAM	- KS 252			
4. PROJECT TITLE ARCHITECTURA WARM AIR FUR	AL & STRUCTURA RNACES)	EWIPATION	S (INCLUDING	5. PROJECT NUMBER
Total Request	Inspection and	ed)   Overhead (6.5   Appropriation		22 361 (0)
4. Ceiling i 5. Floor/bas 6. Door weat 7. Window we 8. Window tr 9. Window tr 10. Lighting 11. Lighting	insulation, basement insulate ther stripping eather stripping reatment, doubteatment, stormodification, modification,	tion, batts, R1 y will be insta ing will be ins ble pane, will b rm window, will , inc. to flr. , inc. to HPS,	be installed in	led in 1 building. ngs. ling. buildings. 23 buildings. l in 3 buildings. l in 3 buildings.
window treatmes summer heat gas existing light furnaces will REQUIREMENT: ings per thous (B/C ratio) of 7,769.2 mega Ein a simple pacuration ment program (waste. A base situation for measures. IMPACT IF NOT continue to be	addition of weather and weather and weather and weather and weather also save on This project sand dollars of 7.7. Total ayback period TION: This project is submitted as been review as been review and been	er stripping wireducing energy efficient light the heating en will result in cost, (E/C ratiannual energy dollar savings of 1.8 years. roject is requited as part conditions audit has been ginvolved and f this project vasted, contrarewed and it has	and floor/basement Il reduce winter consumption, as ing. Adding time ergy consumed. 21.5 mega BTU an o), and a benefit savings is estima of \$198,135 per red to meet state of the energy cons permit very substance performed, docum detailing specificies is not effected, ry to national goals been determined	heat loss and/or will replacing ers on warm air unual energy saveto-cost ratio ated at year will result ed goals of energy servation investantial energy menting the c conservation energy will als.

1. COMPONENT ARMY	FY 19 84 MILITARY COM	NSTRUCTION PROJEC	T DATA	2. DATE 11-19-80
3. INSTALLATION A SWISS SWEDE (	ND LOCATION CAMP - KS 994, KOREA	4. PROJECT TITL ARCHITECTUR TIONS (INCLU	AL STRUC DING-WARN	EBRAL'MODIFICA- AIR FURNACES)
5. PROGRAM ELEME	6. CATEGORY CODE 610, 141, 740 Series	7. PROJECT NUMBER	8. PROJECT	19

9. COST ESTIMATES	•			
ITEM	U/M	QUANTITY	UNIT COST	COST (\$000)
Primary Facility Wall Insulation, Batts, R=13 Ceiling Insulation, Batts, R=19 Door Weather Stripping Window Treatment, Double Pane Window Treatment, Storm Window Warm Air Furnace (WAF) Timer Installation Supporting Facilities Subtotal Contingency (10%) Total Contract Cost Supervision, Inspection & Overhead (6.5%) Total Request Installed Equipment - Other Appropriations	SF SF SF PC	3580 1041 249 417 140 2	1.498 1.368 2.661 13.999 6.657 860.511	16 (5) (1) (1) (6) (1) (2) 0 16 2 18 1

Buildings at Swiss Swede Camp are to be modified to achieve improved energy conservation.

Install wall and ceiling insulation to increase R value. Install double pane windows where windows need replacement due to age and deterioration and/or complete visibility is a requirement. Install storm windows where existing windows are in good condition. Install door weather stripping in order to decrease infiltration. Install timers on warm air furnaces for a 10° setback during unoccupied hours for an approximate 30% savings of the heating energy consumed.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at Swiss Swede Camp which are to receive each modification are attached to this form. Types of construction are indicated on the building lists.

- 1. Wall insulation, batts, R=13 will be installed in two buildings.
- 2. Ceiling insulation, batts, R=19 will be installed in one building.

1. COMPONENT ARMY	FY 19 84 MILITARY CO	NSTRUCTION PROJE	CT DATA 2. DATE 11-19-80
3. INSTALLATION A	ND LOCATION NK - KS 540, KOREA	4. PROJECT TITE ARCHITECTU	URA STRUCTURAL MODIFI-
5. PROGRAM ELEME	,	CATIONS (1	INCLUDING WARM AIR FURNACE
	740,141,218,442, 730,550,610,Series		97
	9. COS	T ESTIMATES	

9. COST ESTIMATES				
ITEM	U/M	QUANTITY	UNIT	COST (\$000)
Primary Facility Wall insulation, boards, R8 Wall insulation, batts, R13 Ceiling insulation, batts, R19 Ceiling insulation, batts, R19 Door weather stripping Window treatment, double pane Window treatment, storm window Lighting modification, inc. to flr. Warm Air Furnace (WAF) timer installation Supporting Facilities Subtotal Contingency (10%) Total Contract Cost Supervision, Inspection & Overhead (6.5%) Total Request Installed Equipment - Other Appropriations	SF SF SF SF W PC	6546 11644 3833 12855 840 77 1337 73	2.840 1.498 1.147 1.368 2.661 13.999 6.657 .904 860.511	83 (19) (17) (4) (18) (2) (1) (9) (0) (13) 0 83 8 91 6 97 (0)

Buildings at Camp Kittyhawk are to be modified to achieve improved energy conservation.

Install wall and ceiling insulation to increase R value. Install double pane windows where windows need replacement due to age and deterioration and/or complete visibility is a requirement. Install storm windows where existing windows are in good condition. Install door weather stripping in order to decrease infiltration. Replace existing lights with more efficient lighting to reduce electrical consumption. Install timers on warm air furnaces for a  $10^\circ$  setback during unoccupied hours for an approximate 30% savings of the heating energy consumed.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at Camp Kittyhawk which are to receive each modification are attached to this form. Types of construction are indicated on the building lists.

- 1. Wall insulation, boards, R8 will be installed in 6 buildings.
- 2. Wall insulation, batts, R13 will be installed in 10 buildings.
- 3. Ceiling insulation, batts, R19 will be installed in 3 buildings.
- 4. Ceiling insulation, batts, R19 will be installed in 10 buildings.

## FOR OFFICIAL USE ONLY (WHEN DATA IS ENTERED)

1. NATE 2. TISCAL VEAR	3, DEPARTMENT 4, INSTALLATION	<u></u>
11-13-80 1983 MILITARY CONSTRUCTION PROJECT DATA	ARMY CAMP HUMPHREYS - KS 792	
DPOSED AUTHORIZATION 6. PRIOR AUTHORIZATION 7. CATEGORY COBENUMBER 8.	PROGRAM ELEMENT 9. STATE/COUNTRY NUMBER KOREA	
r.c. 442, 21	NA NO NA	Ma
	ARCHITECTURAL & KATRUCALINA MODIFICATIONS	·
		<
SECTION A - DESCRIPTION OF PROJECT	SECTION B - COST ESTIMATES	
14. 1 YPE OF CONSTRUCTION PHYSICAL CHARACTERISTICS OF PRIMARY FACILITY	20, PRIMARY FACILITY OUT AUANTITY UNITED ST 18000	2000)
PERMANENT 1. NO. OF BLOOS 1881 SEE ATTACHED ITST 14, WIDTH NA	A WALL INSULATION, BOARDS, R8 SF ( 141469 ) 2.894 ( 409	1
MENT X 8. DESIGN CAPACITY NA 1. GROSS AREA	WALL INSULATION, BATTS, R13 SF K 116333 ) 1.525 C	7
Y 9. COOLING NA CAP. NA COST (8	CEILING INSULATION, BATTS, R19 SF ( 88229 ) 1.169	, m
VORK 19. DESCRIPTION OF WORK TO BE DON	~	2
Ĭ	DOOR WEATHER STRIPPING LF 33523	,
h, Applition	, WINDOW WEATHER STRIPPING LF 487 2.352	
NC NC	. DOUBLE PANE SF 6100 14.261	_
m	. WINDOW TREATMENT, STORM WINDOW SF 15759 6.782 k	_
• OTHER (Specify) 4. Ceiling ins. for Quonset huts, batts, KI9 in 95 Didgs.	NI, TSF 80% S	
	., INC TO FLK W 22/325 U.921( 2	7
16. REPLACEMENT O. WEATHER SCHIPPING TOT WILLOW III & DUILIUMIS.	., INC TO HPS W 48346 0.742	10
. Double pane windows	L. LIGHTING MOD., M/V TO HPS W 40210 2.158/ 8/	
9. Iranslucent sandwich	21. SUPPORTING FACILITIES U	
c. DRAWING NO. 10. Lighting modification, inc. to HPS in 15 buildings.	22. TOTAL PROJECT COST (\$ 1502	2
SECTION C. BASIS OF REQUIREMENT	٦ѿ	
23. REQUIREMENT FOR PROJECT		
(UM) NA		
. TOTAL REQUIREMENT	This project is required to meet stated goals of energy use reduction. It is submitted	
( )	onservation investment program (ECIP). The addition of wall and	
ceiling insulation, wir	dow treatment, weather stripping, and lighting modifications will	
a. FUNDED, NOT IN INVENTORY	and/or summer heat gain, thereby reducing energy consumption.	
• ADEQUATE ASSETS (c+d) This project will result	; in 21.4 mega BTU annual energy savings per thousand dollars	
AUTHORIZED FUNDED COST. (E/C ratio). and	cost. (E/C ratio), and a benefit-to-cost ratio (B/C ratio) of 7.4. Total annual energy	
1. UNFUNDED PRIOR AUTHORIZATION SAVINGS is estimated at	32,188.1 mega BTU. A total dollar savings of \$695,468 per year	
6. INCLUDED IN FY PROGRAM WILL IN A SIMPLE	payback period of 2.2 years. If this project is not effected,	
	be needlessly wasted, contrary to national goals. This project	
24. RELATED PROJECTS NA has been reviewed and	has been reviewed and it has been determined that an EIS, pursuant to PL91-190 is not	
required.		
		7

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			ron Orrici	אר טפב טוארו	ווווודוא מעונ	FOR OFFICIAL OSE ONCE WILLIAM SALATA		-	-		
1. DATE 2. FISC	2, FISCAL YEAR 1983	MILITABY CONSTRI	RUCTION PROJECT DATA	DATA	3. DEFAULTMENT	CAMP HUMPHREYS -	. KS 792				
- 1	6. PRIO		7.CATEGORY CODE NUMBER	R. B.	PROGRAM ELEMENT	9. STATE/COUNTRY					
314,000			530, 740, 730		อะท	KOREA					
10. PROPOSED APPROPRIATION		11. BUDGET ACCOU	OUNT NUMBER	12. PROJECT NUMBER	เยยก	13. PROJECT TITLE			MN	CM	RM
314 000		61	6100			ARCHITECTURAL STRUGHTARAL MODIFICATIONS	(RÚGHBRAL N	ODIFICATIONS			×
	SECTION A	SECTION A - DESCRIPTION OF PROJECT	TOJECT				SECTION B . COST ESTIMATES	STIMATES			
14. TYPE OF CONSTRUCTION	18. PHY	PHYSICAL CHARACTERISTICS OF PRIMARY FACILITY	TICS OF PRIMARY F	FACILITY	20. PRIM,	20. PRIMARY FACILITY	Ω/Ω	QUANTITY	UNITCOST	cosr (\$000) \$ 314	\$000)
N S S S S S S S S S S S S S S S S S S S	NO. OF BLDGS, EA	SFEA	TTACHED LIST	A. WIDTH N	NA A MALL	I INSULATION, BOARDS,	. R8 SF	. ( 15390)	2.894		2
Name of the state	DESIGN CAPACITY	NA	I. GROSS AREA	NA	1	1 .	713	ار	1.525	82	2
	9. COOLING	NA CAP.	P. NA	COST (\$ NA	1.1	_	S, R19	_	1.169		
15. TYPE OF WORK	19. DESCRIPTION C	19. DESCRIPTION OF WORK TO BE DONE			D. CE1	CEILING INSULATION, BATT	S, R19	7	1.393	۲)	Ω
. NEW FACILITY	Work will consist of the	nsist of the to	Tipom gurodic	rications:	- i	DOOR WEATHER STRIPPING		3521	2./11		
b. ADDITION	1. Wall insu	1. Wall insulation, boards,	boards, KB in 6 buildings.	idings.	- !	WEALHER SIL	+	-	14 262	100	1 9
c. ALTERATION X		Wall insulation, batts, kts in 32 buildings. Coiling inculation batts R19 in 5 buildings.	7 - 11 - 12 S. H.	nuildinas.	G. WIN	WINDOW (REALMENT, DOUBL	STORM MINDOW SF	L	6.782	2	2
d. CONVERSION		Ceiling insulation, backs, its in a serialistic for Ountret huts, batts, R19 in 25 buildings.	uts batts Ri	19 in 25 build	-	TREATMENT	1-		30.442	_	3
e, OTHER (Specify)		Weather stripping for do	doors in 40 buildings.	ildings.		NG MOD. INC.	R		. 921	3	- 8
16. REPLACEMENT	6. Weather s		windows in 2 buildings.	uildings.	K. LII	IGHTING MOD., INC. TO	TO HPS W	16609	.742	[	2
17. TYPE OF DESIGN			10 buildings.		-						
*. STANDARD DESIGN X	•	Storm windows in 28 build	ldings.	1%) in 2 hldr	21.	SUPPORTING FACILITIES					
b. SPECIAL DESIGN	y. Transluce	interior modification inc. to FLR in 17 buildings.	ייר שוק סל טמ	17 huildings		,					
c. DRAWING NO.		Lighting modification, i	inc. to HPS in 1 buildings.	1 buildings.		22. TOTAL PROJECT COST				<b>3</b> 31	4
				SECTION C - BASI	SECTION C - BASIS OF REQUIREMENT	L					
23. 01	QUANTITATIVE DATA		25. REQUIREME	25. REQUIREMENT FOR PROJECT							
2	(UM NA NO)		ī		400	אַפּטט אַט טרַפטט דיי+י	por our vo	t +1 uction	s submi	T+04	
. TOTAL REQUIREMENT			Ints proj	ect is redui	red to meet	INTS project is required to meet search goars of the search goars of the search search goars of the search goars of the search sear	(FCTP)	he addition	of wall	and	
b. EXISTING SUBSTANDARD	J Oh		) as part o	or the energy	todou twosts	ont was they of right	or and lin	htina modifi	cations	 	
C. EXISTING ADEQUATE			celling	msdidtiom, w	יומסא כו המכוו	mmon hoat dain then	eby reducir	a energy con	Sumption	:	
d. FUNDED, NOT IN INVENTORY	4TORY		reduce wi	nter nedt 10	55 atlu/ 07 50	Feduce Winter Heat 1035 and/or summine heat 9411, order 9411, orde	av savinds	per thousand	dollar	0	
. ADEQUATE ASSETS (c + d)	q)			יל ייי אוון יפא	dic in ctit	+0-00+ va+10 (B/C vi	atio) of 6.	l. Total an	nual en	ergy	
	AUT	AUTHORIZED FUNDED	Ē	c ratio), an	0 a Dellei 10. 3+ 7 610 5 a	eda BTH A total do	llar savino	s of \$158,96	9 per y	ear	
1. UNFUNDED PRIOR AUTHORIZATION	HORIZATION		Savings I	is estimated	le navhach r	herind of 2 0 years.	If this pr	oject is not	effect	ed,	
9. INCLUDED IN FY	PROGRAM		WILL TEST	יווור בוווין	to be needle	while the solution of the property was ted.	v to nation	al goals. This project	his pro	ject	
1, DEFICIENCY (a - 0 - f - 9)	- 6)		energy wi	an conclude	it has been	determined that an	FTS, pursue	nt to PL91-1	90 is n	ot.	
24. RELATED PROJECTS	NA		nas been	reviewed and	ור וומא חבבו	מעיכו ווויס מומיס	55 .55 .65 .1	•			
			· reduit eu								
									L ON BOAR		
DD FORM 1391			FOR OFFICE	IAL USE ONLY	Y (WHEN DA)	FOR OFFICIAL USE, ONLY (WHEN DATA IS ENTERED)			YAUE INC.		
1 08,1 70											

1. COMPONENT  ARMY	FY 19 84 MILITARY CONST	TRUCTION PROJECT DATA	2. DATE 11-19-80
3. INSTALLATION A	ND LOCATION - KS 208, KOREA	4. PROJECT TITLE ARCHITE STRUCTURAL MODIFICAT WARM AIR FURNACES	CTURAL & IDNS (INCLUDIN I
5. PROGRAM ELEM	ENT 6. CATEGORY CODE 7. 211,131,740,141,214 218,442,550,610,730 219 Series	PROJECT NUMBER 8. PROJECT	<b>соѕт (\$000)</b> 279

9. COST ESTIMATES				
ITEM	U/M	QUANTITY	UNIT COST	COST (\$000)
Primary Facility Wall Insulation, Boards, R8 Wall Insulation, Batts, R13 Ceiling Insulation, Batts, R19 Ceiling Insulation, Batts, R19 Door Weather Stripping Window Weather Stripping Window Treatment, Double Pane Window Treatment, Storm Window Window Treatment, TSF (80%) Lighting Modification, inc. to Flr. Lighting Modification, inc. to HPS Warm Air Furnace (WAF) Timer Installation Supporting Facilities	S	8482 42045 19563 41488 7442 28 95 4002 40 865 7442 19	2.840 1.498 1.147 1.368 2.661 2.310 13.999 6.657 29.882 0.904 0.728 360.511	238 — (24) (63) (22) (57) (20) (1) (27) (1) (1) (5) (16)
Subtotal			1	238

Subtotal

Contingency (10%)

Buildings at Camp Long are to be modified to achieve improved energy . conservation.

Install wall and ceiling insulation to increase R value. Install double pane windows where windows need replacement due to age and deterioration and/or complete visibility is a requirement. Install translucent sandwich fenestration (TSF 80%) where windows need replacement and visibility is not a requirement. Install storm windows where existing windows are in good condition. Install door and window weather stripping in order to decrease infiltration. Replace existing lights with more efficient lighting to reduce electrical consumption. Install timers on warm air furnaces for a  $10^{\circ}$  setback during unoccupied hours for an approximate 30% savings of the heating energy consumed.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at Camp Long which are to receive each modification are attached to this form. Types of construction are indicated on the building lists.

- 1. Wall insulation, boards, R8, will be installed in 6 buildings.
- 2. Wall insulation, batts, R13, will be installed in 20 buildings.

1 2

24

1. COMPONENT ARMY	FY 19 84 MILITARY CONSTRUCTION PROJECT DA	<b>ATA</b>	2. DATE 11-19-80
3. INSTALLATION A CAMP LONG -	KS 208, KOREA		
4. PROJECT TITLE ARCHITECTURAL WARM AIR FUR	& STRUCTURAL METICATIONS (INCLUDING NACES)	5. PRO	DJECT NUMBER
Total Contra Supervision, Total Reques	Inspection & Overhead (6.5%)	÷.	262 17 279 (0)

- DESCRIPTION OF PROPOSED CONSTRUCTION (Continued)
- 3. Ceiling insulation, batts, R19 will be installed in 7 buildings.
- 4. Ceiling insulation, batts, R19 will be installed in 18 buildings.
- 5. Door weather stripping will be installed in 34 buildings.
- 6. Window weather stripping will be installed in 1 building.
- 7. Window treatment, double pane will be installed in 1 building.
- 8. Window treatment, storm window will be installed in 33 buildings.
- 9. Window treatment, TSF 80% will be installed in 1 building.
- 10. Lighting modification, inc. to flr. will be installed in 4 buildings.

CONTROL TO STATE OF S

- 11. Lighting modification, inc. to HPS will be installed in 5 buildings.
- 12. WAF timer will be installed in 14 buildings.

in the control of the

## 11. REQUIREMENT:

PROJECT: The addition of wall and ceiling insulation, window treatment and weather stripping will reduce winter heat loss and/or summer heat gain, thereby reducing energy consumption, as will replacing existing lights with more efficient lighting. Adding timers on warm air furnaces will also save on the heating energy consumed.

REQUIREMENT: This project will result in 18.5 mega BTU annual energy savings per thousand dollars cost, (E/C ratio), and benefit-to-cost ratio (B/C ratio) of 6.4. Total annual energy savings is estimated at 5,157.0 mega BTU. A total dollar savings of \$136,385 per year will result in a simple payback period of 2.0 years.

CURRENT SITUATION: This project is required to meet stated goals of energy use reduction. It is submitted as part of the energy conservation investment program (ECIP). Present conditions permit very substantial energy waste. A base-wide energy audit has been performed, documenting the situation for each building involved and detailing specific conservation measures.

IMPACT IF NOT PROVIDED: If this project is not effected, energy will continue to be needlessly wasted, contrary to national goals. This project has been reviewed and it has been determined that an EIS, pursuant to PL91-190 is not required.

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			FOR OFFICIA	FOR OFFICIAL USE ONLY (WHEN DATA IS ENTENED)	IWHEN DAIA	S ENTERED)			-		Γ
1. DATE 2. FISCAL YEAR					DEFARIMENT				-		
11-13-80 1983		MILITARY CONSTRUCTION PROJECT DATA	JCTION PROJECT		ARMY	CAMP CARROLL - KS 116				·	_
9. PROPOSED AUTHORIZATION		6. PRIOR AUTHORIZATION 7	7.CATEGORY CODE NUMBER 211, 214, 215, 217 218 219	NUMBER 8. PROGRA 15, 217 NUMBE	8. PROGRAM ELEMENT NUMBER	9. STATE/GOUNTRY KORFA					
10. PROPOSED APPROPRIATION		11. BUDGET ACCOU	OUNT NUMBER	12. PROJECT NUMBER	2	13. PROJECT TITLE			MN	CM RM	Т
\$ 1.042.000		6100				ARCHITECTURAL STRUCHERAL MODIFICATIONS	ÀL MOD	IFICATIONS			
	SECTION A	SECTION A - DESCRIPTION OF PRO	PNOJECT			SECTION B - COST ESTIMATES	OST ESTI	MATES			П
14. TYPE OF CONSTRUCTION	H		TICS OF PRIMARY F	ACILITY	20. PRIMARY FACILITY	FACILITY	ΣÓ	QUANTITY	UNITCOST	COST (\$000)	_
	. NO. OF BLDGS. 76	0 330	TTACHED 11CT	d. WIDTH NA	WALL	INSULATION, BOARDS R8	SF	72902	2.893	211	T~
×	. DESIGN CAPACITY	NA			1	, BA	SF	29641	1.525	45	_
×	9. COOLING	CAP.		COST (\$	1	P		156973	1.169	183	7
YOUK	DESCRIPTION OF	19. DESCRIPTION OF WORK TO BE DONE WORK WIll consist of the following modifications:	lowing modif	ications:	1 1	CEILING INSULATION, BATTS, R19	YS =	15343	1.393	34	~ ~
T	. Wall inst	Jation, boards,	, R8 in 10 bu	ildings.	1	WINDOW WEATHER STRIPPING	i Li	186	2.352		T-
c. ALTERATION X 2	. Wall insu	Wall insulation, batts, R13 in 6 buildings.	RI3 in 6 bul	ldings.		WINDOW TREATMENT, DOUBLE PANE	SF	2318	14.259	33	^
d. CONVERSION	Celling	insulation, back	15, KIS IN 13	bulluings.	Ξ.	WINDOW TREATMENT, STORM WINDOW	SF	25378	6.781	172	-
e. OTHER (Specify)	Losthor .	tis. Tor Quonser	doors in 23 huildings	KIS HI O DIUGS ildinas		NG MOD, INC.	3	45576	.921	42	^
	Meather	Weather stripping for wi	windows in 2 buildings.	uildings.	J. LIGHT	ING MOD., INC. TO HPS.	3 [	7281	147	<u>ر</u>	7
	Double no	Double pane windows in 2	n 2 buildings.		K. LOWER	CEILINGS	7	3/6/6	3./39	747	7
17. TYPE OF DESIGN 8	Storm wir		uildings.		L. LOWER	OVER CRANE	DA D		153,000	153	-1-
B. STANDARD DESIGN X 9			nc. to flr.	, inc. to flr. in 14 buildings.	21	SUPPORTING FACTI ITTES				0	Τ
C. DRAWING NO.		modification,	nc. to HPS in	n 2 bulldıngs.							^
	Lower ce		lldings.		22: TOTAL P	22; TOTAL PROJECT COST				1042	
13.	. Lower cra	crame in 1 buildim	g.	SECTION C - BASIS OF REQUIREMENT	F REQUIREMENT						П
23. QUANT	QUANTITATIVE DATA		25. REQUIREMENT FOR PROJECT	4T FOR PROJECT							
M(U)	, VN										
A. TOTAL REQUIREMENT			This pr	oject is requi	red to meet	stated goals of energy u	se redu	ction. It	is submi	tted	
b. EXISTING SUBSTANDARD	۷		as part	of the energy	conservatio	n investment program (EC	IP). T⊦	ne addition	of wall	and	
c. EXISTING ADEQUATE			ceiling	insulation, v	rindow treatm	ceiling insulation, window treatment, weather stripping, and lighting modifications will	and lig	thting modi	fication	s will	
d. FUNDED, NOT IN INVENTORY	<u>}</u>		reduce	winter heat lo	iss and/or su	mmer heat gain, thereby	reducir	ig energy c	onsumpt	on. This	
. ADEQUATE ASSETS (c + d)			- nroier	will result	n 17 8 mega	BTU annual energy saving	s per t	housand do	llars co	st,	
	TOV	AUTHORIZED FUNDED	67 (F/C ra	tio), and a b	enefit-to-co	(F) ratio) and a benefit-to-cost ratio (B/C ratio) of 8.2. Total annual energy savings	8.2. 7	otal annua	l energy	savings	
1. UNFUNDED PRIOR AUTHORIZATION	IZATION		15 651	mated at 18.53	1 6 mega BTU	. A total dollar saving	5 of \$1	108,209.per	year wi	]] re-	
9. INCLUDED IN FY	ряодпам		Sult in	a simple pavt	ack period o	f 2.6 years. If this pro	ject is	not effec	ted, ene	rgy	
h, DEFICIENCY (* f - g)			will co	ntinue to be r	needlessly wa	sted, contrary to nation	al goal	s. This pr	oject ha	S	_
24. RELATED PROJECTS	NA		heen re	viewed and it	has been det	heen reviewed and it has been determined that an EIS, pursuant to PL91-190 is not	suant t	to PL91-190	is not		
			required	, P							
											٦

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				OR OFFICIA	FOR UFFICIAL USE UNLY IMMEN DATA IS ENTENED!	IWHEN DAIA	IS ENTERED!	-	-		
1. DATE 2. FISCAL YEAR	VEAR				3	3. DEPARTMENT	4. INSTALLATION				
11-13-80 1983	83	MILITAL	MILITARY CONSTRUC	RUCTION PROJECT DATA	DATA	ARMY	CAMP CARROLL - KS 116				
5. PROPOSED AUTHORIZATION		6. PRIOR AUTHORIZATION		.categony code N 550, 740, 730	7, CATEGORY CODE NUMBER 8. PROGRAM ELEMENT 550, 740, 730	AAM ELEMENT ER	9. STATE/COUNTRY KOREA				
10. PROPOSED APPROPRIATION			11. BUDGET ACCOUNT NUMBER		12, PROJECT NUMBER	ER	13. PROJECT TITLE		ΣZ	CM RM	-
\$ 195,000			6100				ARCHITECTURAL & BTRUGTURAL MODIFICATIONS	MODIFICATIONS		×	
	SEC	SECTION A - DESCRIPTION OF	IPTION OF PROJECT	ECT			SECTION B - COS	ST ESTIMATES			
14. TYPE OF CONSTRUCTION	_	PHYSICAL C	HARACTERISTIC	PHYSICAL CHARACTERISTICS OF PRIMARY FACILITY	ACILITY	20. PRIMARY FACILITY		U/M QUANTITY	UNIT COST	cost (\$000)	6
PERMANENT	NO. OF BLDGS. 23		CEE ATTACHED !	n 115T	d. WIDTH NA	A. WALL	INSULATION, BOARDS, R8	SF ( 23508	2.894	ر 98	
XENT	e. DESIGN CAPACITY		3	10		В	AITS, R13	SF ( 25589	1.525		
×	COOLING	NA	CAP.	NA cc	cost (* NA	j	4	<u> </u>	1.169		7
ян	ork wil	TION OF WORK	of the foll	119. DESCRIPTION OF WORK TO BE DONE  Work will consist of the following modifications:	ications:	1	CETLING INSULATION, BALLS, KIS	2F ( 1/096	2 711	7 8	
-1 <b>Τ</b> √	1. Wall	insulation	n, boards,	R8 in 10 bu	ildings.	F. U0UK	DOUK WEALHER SIKIPPING	1	2 352		T
>	2. Wall	insulatio	n, batts, R	13 in 6 bui	ldings.	1	WINDOW WEATHER SINIETING	L	14 260		T-
ALTERATION	3. Ceil	ing insula	tion, batts	itts, R19 in 4 buildings		3 =	4	7	6.782	1 27	[-
d. CONVENSION	4. Ceil	ing insula	tion for Qu	onset huts,			┥.・		30.439		^
		4 buildings.		4 60 25		J. LIGH	2	W 5292	0.921	2	
16. REPLACEMENT	5. Weat	Weather Stripping for	ing ror doc	doors in 23 buildings.	riaings.		- 1				
z		her stripp	בוש יוסל שום	oums ldings	• 55	21. SUPF	SUPPORTING FACILITIES			0	
STANDARD DESIGN X		ייי שרייייייייייייייייייייייייייייייייי	counte parte wildows in a barranga.	. ca ca ca							7
		COT III WILLIAMS IN IO	nduich fore	1183. 1 ration (80	ionestration (80%) in 1 huilding	ino i					7
C. DRAWING NO.		Fansincent sandwich in	inc. to fl	flr. in 10 buildings.	ildinas.					105	
1	.				01010	22. TOTAL	22. TOTAL PHOJECT COST			200	Γ
					SECTION C-BASIS	SECTION C - BASIS OF REDUITEMENT					
23. QUAT	=	DATA		ZS. REGUINEMEN	T FOR PROJECT						
M/0)	NA	_		i		400000000000000000000000000000000000000	: : : : : : : : : : : : : : : : : : :	T action	tio of +	mitted	_
A. TOTAL REQUIREMENT				nus pro	oject is requ	lred to meet	Ints project is required to meet stated goals of energy use feducation of wall and		due el a	ָבֶּרֶבֶּרְבָּרְבְּיִבְּיִבְּרָבְּרָבְּרָבְּרָבְּרָבְּרָבְּרְבְּרָבְּרָ	
b. EXISTING SUBSTANDARD		ت	1	as part	of the energ	y conservation	on investment program (Ectr	), THE AUGICA	ficetion	בוניה יי	
c. EXISTING ADEQUATE				ceiling	insulation,	window treatm	nent, weather stripping and	ingneing mous	Conclumnt		
d. FUNDED, NOT IN INVENTORY	ORY			reduce	winter heat l	oss and/or su	ummer neat gain, thereby re	ducing energy	בנישטרים.		
. ADEQUATE ASSETS (c + d)				This pr	oject will re	sult in 18.2	mega Biu annual energy sav	ings per chous	מוות מסוו	מוס	
		AUTHORIZED	FUNDED	cost (E	/c ratio), an	d a benefit-t	cost (E/C ratio), and a benefit-to-cost ratio (B/C ratio) of /.0. lotal annual energy	† /.U.  ota  uings of €76	annual e	nergy	_
1. UNFUNDED PRIOR AUTHORIZATION	DRIZATION			savings	is estimated	at 3,565.2 n	nega bio. A cocal collars	ייי +יסייסיייי	not offe	7+0-1-0-1-0-1-0-1-0-1-0-1-0-1-0-1-0-1-0-1	
9. INCLUDED IN FY	PROGRAM	5		will re	Suit in a Sim	ple payback p	Seriod of 2.0 years. It on	ational goals	This	, co.co.	
h. DEFICIENCY (a - e - f - 9)				energy	rill continue الس	to be meedle	energy will continue to be needlessly wasted, contrary to marional goals, inis project	acional goals.	7,001.10	10355	_
24. RELATED PROJECTS	ΑN			has bee	n reviewed an	d it has beer	has been reviewed and it has been determined that an ElS, pursuant to PL91-190 is not	ursuant to PLS	1-190 15	HOL	_
				required.	ġ.		٠				
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			Ma MO MM			UNITCOST CO	2.894 ( 4	10548 11.525 16 16 1	1.393(	-	2.352 (	9005 6.782 ( 61 )	1777	0		(•	(	\$ 789			ction. It is submitted	The addition of wall and	ting modifications will	a present consumption.	ser thousand dollars	. Total annual energy	gs of \$337,003 per year	oject is not effected,	al goals. This project	nt to PL91-190 is not			PAGE NO. 1
i is criteries)	A. INSTALLATION CAMP CARROLL - KS 116	9. STATE/COUNTRY	1.1 PONCH 1.1	ARCHITECTURAL ASSTRUMUNAL MODIFICATIONS	SECTION B - COST ESTIMATES	20. PRIMARY FACILITY UM	, BOARDS	WALL INSULATION, BATTS, R13 SF K	R19	WEATHER STRIPPING	W WEATHER STRIPPING	TREATMENT, STOR	LIGHTING MOD. INC. TO TER.	SUPPORTING FACILITIES				22. TOTAL PROJECT COST	LX		This project is required to meet stated goals of energy use reduction.	This project is the recommendation of wall and	two nt was they etribuing and light	common boot asin thereby reducing	summer neac garms charactery reducing 2 mena BTH annual energy savinds (	t=to_cost ratio (8/C ratio) of 9.0	Cost, (F) rate of the attention and a person of the cost of the co	period of 2.3 years. If this pro	lessly wasted, contrary to nation	has been reviewed and it has been determined that an EIS, pursuant			ra iš entenedj
FUR UFFICIAL USE UNEI IMMEN DATA 13	3. DEPARTMENT IECT DATA ARMY	CATEGORY CODE NUMBER 8. PROGRAM ELEMENT 131, 141, 224, 441, NUMBER	1/1	12. PROJECT NOMBER			d. WIDTH NA A. WALL	NA B.	) (.	<u>.</u> .	<u>; </u>	98.	R19 in H.	21.	doors in 34 buildings.	, inc. to flr in 13 buildings.		22. TOTA	SECTION C - BASIS OF REQUIREMENT	REQUIREMENT FOR PROJECT	taem of bearings of toelove	project is required to most	ing the energy conservation	ing insulation, window treat	se winter nede 1055 and/or s	(c)	oc is estimated at 15.182.	result in a simple payback	will continue to be need	peen reviewed and it has be	required.		FOR OFFICIAL USE ONLY (WHEN DATA IS ENTERED)
ויט ויטי	MILITARY CONSTRUCTION PROJECT DATA	IOR AUTHORIZATION 7		11. BUDGET ACCOUNT NUMBER 6100	SECTION A DESCRIPTION OF PROJECT			NA 1. an	P. NA	Work will consist of the following mo	, R8 i	insulation, batts, Kis in 8 or insulation hatts R19 in	ng insulation for Ouonset hu		Weather stripping for doors in 34 buildings Noathow stripping for windows in 6 huilding	Storm Williams in 15 Sailtaings. Lighting modification, inc. to f				25.	123.5		ds po	Cell	redu		AUTHORIZED FUNDED COST		ener	284	nean		FOR OF
	1. DATE 2. FISCAL YEAR	OPOSED AUTHORIZATION	P.C.	10. PROPOSED APPROPRIATION	000,607	14. TYPE OF CONSTRUCTION	PERMANENT 8, NO. OF BLDGS. 34	NENT	×	¥.	E. NEW FACILITY 1. Wall i	×	-	e. OTHER (Specify) 6 buil		× %	NO NO	c. DRAWING NO.		23. QUANTITATIVE DATA	AN WO	. TOTAL REQUIREMENT	b. EXISTING SUBSTANDARD	c. EXISTING ADEQUATE	d. FUNDED, NOT IN INVENTORY	ADEQUATE ASSETS (c + d)		RAUTHOF	9. INCLUDED IN FY PROGRAM	1.9)	24. RELATED PROJECTS NA		DD FORM 1391

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בוורבי		CAMP HENRY - KS 160	g, state/country KOREA	NM CM	ARCHITECTURAL & STRUCTURAL MODIFICATIONS X		\$ \$	S. R8 SF ( 70145 ) 2.894(	2	1.393	RATTS R13 SE 78600 0	PING   LF   8862 2,7110 2	NG LF 1392 2.3521	PANE SF 2323 14,261	INDOW SF 14362	NI TSE 80% SF 290 30 441	0.742		SUPPORTING FACILITIES 0		OJECT COST			ed anals of energy use reduction. It is submitted	ints project is required to microscopies. The addition of wall and	nsulation, window treatment, weather stripping and	lighting modifications will reduce winter heat loss and/or summer heat gain, thereby	project will result in 20.4 mega BlU annual energy	<pre>:/C ratio), and a benefit-to-cost ratio (b/c ratio)</pre>	s is estimated at 10,127.3 mega bio. A cocal collection of 1,27 years. If	ssuit in a simple payoack period of the years.	, will conclude and it has been determined that an EIS,	national goals. This project has been reviewed and recommendate to PL91-190 is not required.		IS ENTERED!
FOR OFFICIAL USE UNLY INNEW DATA IS	3, 06		MBER 8. PROGRAM ELEMENT  O, NUMBER	219 12. PROJECT NUMBER	-	X1 110 c 1 X c c 111 c c c c c c c c c c c c c		IDTH NA A. WALL	В.	ی ار		ال		: :	19 in 27 bidgs. I. WINDOW	J. WI	- - -  -		21.		1 12 buildings. 22. TOTAL PROJECT COST	u I	FOR PROJECT	sty teem of bearings of t	tis reduiled to meet 3 co the energy conservation	mlation floor/basement	difications will reduce	nergy consumption. This	thousand dollars cost	otal annual energy saving	5355,254 per year Will	the is more ellected, energing	pals. This project has a PL91-190 is not require		FOR OFFICIAL USE ONLY (WHEN DATA IS ENTERED)
FOR OFFICIAL		MILITARY CONSTRUCTION PROJECT DATA	6. PRIOR AUTHORIZATION 7.CATEGORY CODE NUMBER 211, 141, 214, 610,	11. BUDGET ACCOUNT NUMBER 12.	6100	SECTION A - DESCRIPTION OF PROJECT	PHYSICAL CHANACTENISTICS OF PRIMARY FACILITY	EB SEE ATTACHED LIST	NA	NA CAP. NA COST (\$	19. DESCRIPTION OF WORK TO BE DONE Work will consist of the following modific	nsulation, boards, R8 in 12 buil	nsulation, batts, R13 in 28 buil	3. Ceiling insulation, batts, R19 in 14 b	gins. for Quonsethuts, batts, Rl	Floor/basement insulation, batts, KI3 in 4 buildings.	rstripping for woors in 33 daile retripping for windows in 7 bui	Medener 3 of the pring of minesons in 10 buildings.		Franslucent sandwich fenestration (80%) in 1 bldg.	n, inc. to flr.	38	TA 25. REQUIREMENT FOR PROJECT	This control of the c	INIS projec	ori purities	lighting mo	reducing er	AUTHORIZED FUNDED SAVINGS DET	of 7.6. To	savings of	this project	national go	5.	FOR OFFICIAL
	1, DATE 2. FISCAL YEAR	11-13-80 1983	UTHORIZATION	\$ /92,000	\$ 792,000		14.	200 10 30 014	* PERMANENI	× 4. CO	15. TYPE OF WORK 19. DESCRIPTIO	١٠.	2.5	×	4.	e. OTHER (Specify) 5. Floor/	16. REPLACEMENT 7 1/03+ho	z	×	0N			23. QUANTITATIVE DATA	W WO	A. TOTAL REQUIREMENT	b. EXISTING SUBSTANDARD	c. EXISTING ADEQUATE			1, UNFUNDED PRIOR AUTHORIZATION	9. INCLUDED IN FY PROGRAM	t . g)	24. RELATED PROJECTS NA		DD FORM 1391

DD FORM 1391

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			FOR OFFICIAL USE ONLY (WHEN DATA IS ENTERED)	ONLY YWHEN D,	4TA IS ENTERED)						
1. DATE 2. F	2. FISCAL YEAR			3. DEPARTMENT	NT 4. INSTALLATION	z					
11-13-80	1982	. MILITARY CONSTI	MILITARY CONSTRUCTION PROJECT DATA	ARMY	CAMP WALKER	R - FH - KS 300	0				
PROPOSED AUTHORIZATION     47,000	ZATION	6. PRIOR AUTHORIZATION P.L.	711	8. PROGRAM ELEMEN NUMBER	T 9. STATE/COUNTRY KOREA	RY					
10. PROPOSED APPROPRIATION	RIATION	11. BUDGET ACCOUNT NUMBER		12. PROJECT NUMBER	13, PROJECT TITLE	11			WN	CM RM	T
\$ 47,000		610	6100		ARCHITECTU	ARCHITECTURAL 医成似件\RAL MODIFICATIONS	L MOD	IFICATIONS			
	S	SECTION A - DESCRIPTION OF PROJECT	ROJECT			SECTION B - COST ESTIMATES	ST ESTIN	AATES		-	Τ
14. TYPE OF CONSTRUCTION	18.	PHYSICAL CHARACTERI	RISTICS OF PRIMARY FACILITY	20. PR	20. PRIMARY FACILITY		M/U	41114	UNIT COST	COST (\$000)	
8. PERMANENT	8. NO. OF	» NO. OF BLDGS. 49 SEE ATT	TACHED LIST 4. WIDTH	NA A	WALL INSTIL ATTON	ROARDS R8	17.	7062	2 520	4/	7-
b. SEMI-PERMANENT	X . DESIGN		1. GROSS AREA NA	] .	R WFATHER STRI		LL.	7643	2 361		Γ
c, TEMPORARY	9. COOLING	NA	CAP. NA COST (\$		WINDOW TREATMENT, DOUBLE PANE	DOUBLE PANE	SF	934	12.419	( 12	T-
15. TYPE OF WORK	Work w	19. DESCRIPTION OF WORK TO BE DONE WORK WILL CONSIST OF the fo	following modifications:	;			-			J	1
. NEW PACIFIE	1. Wa	11 insulation, board	s. R8 in 6 dwelling ur	nits. $\frac{21}{1}$ .	SUPPORTING FACILITIES	ITIES	+			0	ļ
c. ALTERATION	Z. Wei	ather stripping for	2. Weather stripping for doors in 96 dwelling units.	mits.							
d. CONVERSION	Jo E	uble pane windows in	2 dwelling units.				1				1
e. OTHER (Specify)			•								_
171111111111111111111111111111111111111	T										$\Box$
10. REPLACEMENT	T									_	~
17. I TPE OF DESIGN	Ţ.									J	^
8. STANDARD DESIGN	×										$\overline{}$
b. SPECIAL DESIGN	1									J	
C. DRAWING NO.			•							_	~
			2 MOITS	22; TOTAL	22; TOTAL PROJECT COST					\$ 47	
23.	QUANTITATIN	VE DATA	25. REQUIREMENT FOR PROJECT	JECT							T
	(U/M NA										
. TOTAL REQUIREMENT	-		This project in	4 box ::::00x	40 40 40		-	;	٠		
b. EXISTING SUBSTANDARD	JARD		as part of the	nednijen to me	tion invoctment.	or energy use y	reduci	tion. it	mqns sı	itted	
c. EXISTING ADEQUATE	E		sulation window	w treatment and	weather ctrinelle	program (ECIF).	)	e addition	OT Wal	-ur	
d. FUNDED, NOT IN INVENTORY	FNTORY		mer heat dain t	thereby reducit	nearmer serippin	tion This par	. W - FI C.	ייים וניה הביוליה	55 ana/	or sum-	
ADEQUATE ASSETS (c + d)	(p+ a		meda BTII appula].	enercey reducin	ner thousand do	112 pr 1015 pr	olect olect	will resu	7 UL 11	0.5	
		AUTHORIZED FUNDED		ratio) of 5 o	Total appliator	IIATS COST (E/C	rati	10), and a	Denet	T-T0-	
1. UNFUNDED PRIOR AUTHORIZATION	UTHORIZATIO	Z	A total dollar	savings of \$17	A fortal dollar expines of \$17 533 new year will wently to commune the best med a \$10.	י אוויאמיינוסארו	Ly day	cillated at	1.7/6	mega BIU.	
9. INCLUDED IN FY	PROGRAM	AM	vears. If this	project is not	effected energy	s a III o i i i i i i i i i i i i i i i i i		e payback bo poodlor	ממיי אבי	/·/ +04	
h. DEFICIENCY (* - + - f - g)	f — g}		contrary to nati	Ional goals.	his project has I	heen reviewed	יי דעמה	t has boom	א אין א	ימם, ייסטי	
24. RELATED PROJECTS	s NA		that an EIS. pur	rsuant to PI 91-	190 is not require	מככון וכייומים כי	7	ר וומא חבבוו	מבים	מכ	
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				=	ST ESTIMA	ט/או ט	7 7 7 7		7	7 7	<u> </u>	7.	SF	3	M							uction.	additi	winter	oject w	rat10),	ited at	mple pa	seen det				
A 15 EIVI ERED)	CAMP WAIKER - KS 300	COUNTRY	KOREA	Architectural & Styluchural	MODITICATIONS SECTION B - COST ESTIMATES	20. PRIMARY FACILITY	TNS11 ATTON BOABOS R=8	INSULATION, BATTS,	CEILING INSULATION, BATTS, R=19	CEILING INSULATION, BALLS, K=19	MINDON MEATHER STATES THE	WINDOW TREATMENT, DOUBLE PANE	WINDOW TREATMENT, STORM WINDOW		LIGHTING MOD INC. TO HPS	SUPPORTING FACILITIES			22 TOTAL BRO IFCT COST			This project is required to meet stated goals of energy use reduction. It is submitted as	estment program (ECIP). The	insulation, window treatment and weather stripping will reduce winter heat loss and/or	energy consumption. This pr	mega BTU annual energy savings per thousand dollars cost, (E/C rain), and a benefit-to-cost	al energy savings is estima المالية.	A total dollar savings of \$172,73/ per year Will result in a simple payback period of 2.2	years. It this project is not ellected, energy will continue to be incentional masses, or set in a series of t to mational popular This project has been reviewed and it has been determined that an EIS	d.	•	-	4 5% TritTTT
INHEN DAIA	ARMY	PROGRAM ELEMENT				20. PRIMA	1.101.1	B. WALL		O. CEIL		]	I			21. SUE			22 TOTAL	EQUIREMEN		meet sta	tion inve	t and wea	educing e	ngs per t	otal annu	172,737 [	not erret	requirec	-	÷	17.1 1.1 1.1 1. 1. 1. 1. 1. 1. 1. 1. 1. 1.
FOR OFFICIAL USE UNLY (WHEN DAIA IS ENTERED)	RUCTION PROJECT DATA	e-	214,219,550,730,442	NUMBER 12, PROJECT NUMBER	CT	OF PRIMARY FACILITY	I ICT NOTE IN NA	SS AREA NA	NA cost (* NA	SSCRIPTION OF WORK TO BE DONE  1. 111	DWING MOULTICACIONS. R8 in 30 buildings	ng in 7 buildings.	, R19 in 16 buildings.	uset huts, batts, R19 in 7 bldgs.	Weather stripping for doors in 43 buildings. Weather stripping for windows in 8 buildings.	n 4 buildings.	uildings.	inc. to flr.in 4 buildings.	ic. to HPS in 1 building.	SECTION C - BASIS OF REQUIREMENT	25, REQUIREMENT FOR PROJECT	his project is required to	art of the energy conserva	nsulation, window treatmen	ummer heat gain, thereby	lega BTU annual energy sav	atio (8/C ratio)of 8.6.	total dollar savings of	years. It this project is to mational doals. This m	to mational goals. This project has			CHATTER STATE OF THE CHATTER OF THE CASE OF THE CHATTER OF THE CHA
	MILITARY CONSTRUCT	6. PRIOR AUTHORIZATION 7.CA		11. BUDGET ACCOUNT 6100	SECTION A - DESCRIPTION OF PROJECT		יין כבב אדדארטבט ויכד	NA NACHE	NA CAP.	19. DESCRIPTION OF WORK TO BE DONE	WORK Will CONSIST OF the foll	insulation, boatts, R	ng insulation, batts	ng ins. for Quonset	er stripping for doo er strioning for win	Double pane windows in 4	Ξ	fication,	_			T	0		S	U		AUTHORIZED FUNDED A	Λ +				
2017	1082		P.L.	PRIATION	SECTIO	18.	000	X e. DESIGN CAPACITY	X 4. COOLING	19. DESCRIPTIC	MOYK WILL		3. Ceilir		5. Weathe		× 8				QUANTITATIVE DATA	rum NA	ENT	NOARD	\re	NVENTORY			AUTHORIZATION	.1	CTS NA		
	0	5. PROPOSED AUTHORIZATION	\$ 382,000	10. PROPOSED APPROPRIATION	\$ 206,000	14.	- DEBMONENT	b. SEMI-PERMANENT	c. TEMPORARY	15. TYPE OF WORK	F. NEW FACILITY	c. ALTERATION	d. CONVERSION	A. OTHER (Specify)	16. REPLACEMENT	17. TYPE OF DESIGN	4. STANDARD DESIGN	b. SPECIAL DESIGN	C. DRAWING NO.		23.		. TOTAL REQUIREMENT	b. EXISTING SUBSTANDARD	c. EXISTING ABEQUATE	d, FUNDED, NOT IN INVENTORY	e. ADEQUATE ASSETS (c + d)		I. UNFUNDED PRIOR AUTHORITZATION	h, DEFICIENCY (* - * - f - 9)	24. RELATED PROJECTS		FORM 1991

1. COMPONENT  ARMY	FY	19 84 MILITARY CO	ONSTRU	CTION PROJE	CT DATA	2. DATE 11-19-80
3. INSTALLATION A		S 456, KOREA		4. PROJECT TIT ARCHITECTUR TIONS (INCL	AL FROND UDING DOME	MODIFICA- STIC HOT WATER
5. PROGRAM ELEMI	ENT	6. CATEGORY CODE	7. PRO	ECT NUMBER	8. PROJECT	cost (\$000)HEATERS
		711 Series			3	43

9. COST ESTIMATES				
ITEM	U <b>/</b> M	QUANTITY	UNIT COST	COST (\$000)
Primary Facility Wall Insulation, Boards, R8 Ceiling Insulation, Batts, R19 Door Weather Stripping Window Treatment, Storm Window Hot Water (H.W.) Heater Replacement (US) Supporting Facilities Subtotal Contingency (10%) Total Contract Cost Supervision, Inspection & Overhead (6.5%) Total Request Installed Equipment - Other Appropriations	SF SF LF SF PC	19395 12063 2202 15236 50 23	2.840 1.147 2.661 6.657 342.597	293 (55) (14) (6) (101) (117) 0 293 29 322 21 343 (0)

Buildings at Hialeah-FH are to be modified to achieve improved energy conservation.

Install wall and ceiling insulation to increase R value. Install storm windows where existing windows are in good condition. Install door weather stripping in order to decrease infiltration. Replace hot water heaters to reduce energy consumption.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at Hialeah-FH which are to receive each modification are attached to this form. Types of construction are indicated on the building lists.

Wall insulation boards, R8, will be installed in 18 dwelling units. Ceiling insulation batts, R19, will be installed in 16 dwelling units. Door weather stripping will be installed in 68 dwelling units. Window treatment storm window will be installed in 68 dwelling units. H. W. heater replacement (US) will be installed in 50 dwelling units.

1. COMPONENT ARMY	FY 19 84 MILITARY	CONSTRU	CTION PROJE	CT DATA	2. DATE 11-19-80		
3. INSTALLATION A HIALEAH - K	nd Location S 456, KOREA	4. PROJECT TITE ARCHITECTURA TION (INCLUE	AL SESTRUCT	₩AL MODIFICA- YR FURNACE)			
211,131,214,740, 218,442,510,610,730				8. PROJECT (	00ST (\$000)		
Serries 9. COST ESTIMATES							

			9. COST ESTIMATES							
ITEM U.	U/M	QUANTITY	UNIT COST	COST (\$000)						
Primary Facility Wall Insulation, Boards, R8 Wall Insulation, Batts, R13 Ceiling Insulation, Batts, R19 Ceiling Insulation, Batts, R19 Door Weather Stripping Window Weather Stripping Window Treatment, Double Pane Window Treatment, Storm Window Lighting Modification, inc. to flr. Lighting Modification, inc. to HPS Warm Air Furnace (WAF) Timer Installation Supporting Facilities Subtotal Contingency (10%) Total Contract Cost Supervision, Inspection and Overhead (6.5%) Total Request		58989 32996 86357 23504 8524 1762 781 6531 7643 7442 54	2.840 1.498 1.147 1.368 2.661 2.310 13.999 6.657 0.904 0.728 860.511	488 (168) (49) (99) (32) (23) (4) (11) (44) (7) (5) (47) 0 488 49 537 35 572						

Buildings at Hialeah are to be modified to achieve improved energy conservation.

Install wall and ceiling insulation to increase R value. Install double pane windows where windows need replacement due to age and deterioration and/or complete visibility is a requirement. Install storm windows where existing windows are in good condition. Install door and window weather stripping in order to decrease infiltration. Replace exisiting lights with more efficient lighting to reduce electrical consumption. Install timers on warm air furnaces for a 10° setback during unoccupied hours for an approximate 30% savings of the heating energy consumed.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at Hialeah which are to receive each modification are attached to this form. Types of construction are indicated on the building lists.

- 1. Wall insulation, boards, R=8 will be installed in 16 buildings.
- 2. Wall insulation, batts, R=13 will be installed in 20 buildings.

1. COMPONENT ARMY	FY 19 84 MILITARY COM	FY 19 84 MILITARY CONSTRUCTION PROJECT DATA					
	YONGSAN GARRISON - KS 948, KOREA  4. PROJECT TITLE MODIFICATION OF CLOCK OUTSIDE AIR THERMOSTAT						
5. PROGRAM ELEM	ENT 6. CATEGORY CODE 131,141,171,214,217,218, 219,510,530,540,550,610, 730,740,841,842 Series	7, 7,100207,700	8. PROJECT COST (\$000)  173				

9. COST ESTIMATES							
ITEM	U/M	QUANTITY	UNIT COST	COST (\$000)			
Primary Facility Clock Thermostat with Outside Air Thermostat Override	EΑ	171	861.40	147 (147)			
Supporting Facilities Subtotal Contingency (10%) Total Contract Cost Supervision, Inspection & Overhead (6.5%) Total Request Installed Equipment - Other Appropriations				0 147 15 162 11 173 (0)			
			·				

Buildings at Yongsan Garrison are to be modified to achieve improved energy conservation.

Install 7-day time clock with set back feature, spring back-up (in case of power failure) and outdoor air thermostat override to reduce energy consumption on all warm-air furnaces.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at Yongsan Garrison which are to receive each modification are attached to this form. Types of construction are indicated on the building lists.

Clock thermostats with outside air thermostat override will be installed in 148 buildings.

1. COMPONENT ARMY	FY	19 <sup>84</sup> MILITARY COI	ARY CONSTRUCTION PROJECT DATA					
3. INSTALLATION A YONGSAN GAI		OCATION ON - KS 948, KOREA	4. PROJECT TITL MODIFICATION HEAT RECOVE		ASHER			
5. PROGRAM ELEM	ENT	6. CATEGORY CODE	7. PROJECT NUMBER	8. PROJECT	COST (\$000)			

72210

19

9. COST ESTIMATE	s			·
ITEM	U/M	QUANTITY	UNIT	COST (\$000)
Primary Facility Dishwasher Waste Heat Recovery System,	EA	2	8130	16 (16)
1000-Man Mess Supporting Facilities				0 16
Subtotal Contingency (10%) Total Contract Cost				2, · 18
Supervision, Inspection and Overhead (6.5% Total Request	)			1 19
Installed Equipment - Other Appropriation	ns .			(0)
			-	
	1			
	1	1		1

### 10. DESCRIPTION OF PROPOSED CONSTRUCTION

Buildings at Yongsan Garrison are to be modified to achieve improved energy conservation.

Installation of this system, which includes a cleanable heat exchanger, dishwater strainer and pump, potable water pump, associated piping, valves, insulation and controls will recover heat from the dishwasher which would be rejected into the sewer. The recovered heat will be returned to the domestic hot water boiler, thus reducing oil consumption.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at Yongsan Garrison which are to receive each modification are attached to this form. Types of construction are indicated on the building lists.

Dishwasher waste heat recovery systems will be installed in 2 buildings.

1.	COMPONENT ARMY	FY 1	1 <b>9</b> <u>84</u>	MILI	TARY	cor	NSTRUC	CTION PROJEC	T DATA	2. DATE 11-19-80
3.	YONGSAN GARR				KOREA			4. PROJECT TITL MODIFICATION HEAT RECOVER	FOR COMMI	SARY WASTE
5.	PROGRAM ELEME	ENT		egor 74021	YCODE		7. PROJE	ECT NUMBER	8. PROJECT (	COST (\$000) 52
					9,	cos	T ESTIMA	TES		

9. COST ESTIMATES				
ITEM .	U/M	QUANTITY	UNIT COST	COST (\$000)
Primary Facility Heat Transfer Coil and Associated Refrigerant Lines and Controls	EA	1	44,860	45 (45)
Supporting Facilities Subtotal Contingency (10%) Total Contract Cost Supervision, Inspection And Overhead (6.5%)	÷			45 4 49 3
Total Request Installed Equipment - Other Appropriations			-	52 (0)

Buildings at Yongsan Garrison are to be modified to achieve improved energy conservation.

Install a heat transfer coil in the existing York air handler and connect to the nine R502 refrigerant compressors in the commissary building S7003. This project also includes the necessary controls and modifications to the existing facility.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at Yongsan Garrison which are to receive each modification are attached to this form. Types of construction are indicated on the building lists.

Heat transfer coil and associated refrigerant lines and controls will be installed in l building.

## 11. REQUIREMENT:

PROJECT: Installation of a heat recovery coil will save energy by utilizing the

1.	COMPONENT ARMY	FY	19 <u>84</u> MILITARY C	ONSTRU	CTION PE	ROJE	T DA		2. DA	ATE -19-80
3.	YONGSAN GAR		CATION N - KS 948, KOREA		4. PROJEC	TTITL ER REI	E MOI	DIFICA EVIII		N FOR
5.	PROGRAM ELEM						382		(\$000)	
_			9, 0	OST ESTIM	ATES					
	······································		17514		U/M	OUAI	YTITY	UNIT		COST

9, COST ESTIMATES				
ITEM	U <b>/M</b>	QUANTITY	UNIT COST	COST (\$000)
Primary Facility Centrifugal Chiller, 400 ton Supporting Facilities Subtotal	EA	1	325,500	326 (326) 0 326
Contingency (10%) Total Contract Cost Supervision, Inspection & Overhead (6.5%) Total Request	-			33 359 23 382
Installed Equipment - Other Appropriations				(0)

Buildings at Yongsan Garrison are to be modified to achieve improved energy conservation.

Installation of a 400-ton centrifugal chiller to replace the existing lithium bromide absorption chiller. This will result in an increase in electrical consumption, but a decrease in fuel oil consumption for a net reduction in source energy and operating costs. The supporting boilers are to be abandoned in place as possible back up for the heating system. (Refer to Boiler Modifications at Yongsan Garrison - KS 948, FY83)

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at Yongsan Garrison which are to receive each modification are attached to this form. Types of construction are indicated on the building lists.

A 400-ton centrifugal chiller will be installed in one building.

1. COMPONENT ARMY	FY	19 <u>84</u> MILITARY CO	NSTRU	CTION PROJ	ECT D	ATA	2. DA	TE 19-80
3. INSTALLATION A YONGSAN GARRIS		CATION FH) - KS 948, KORE		4. PROJECT ȚI DOMESTIC H MENT	<i>[</i> 7	ODJEJC IERH	ALIO PER	N FOR REPLACE-
5. PROGRAM ELEM	ENT	6. CATEGORY CODE 711 Series	7. PROJ	ECT NUMBER	8. P	ROJECT 6	68	\$000)
		9. co	ST ESTIM	ATES		LIN		COST

NTITY UNIT	COST (\$000)
243 2343.9	570 (570)
	570 57 627 41 668 (0)

Buildings at Yongsan Garrison are to be modified to achieve improved energy conservation.

Installation of oil fired water heaters and associated trim to replace electric water heaters, thereby reducing electrical consumption.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at Yongsan Garrison which are to receive each modification are attached to this form. Types of construction are indicated on the building lists.

Oil fired water heaters and associated trim will be installed in 238 dwelling units.

11. REOUIREMENT:

PROJECT: The addition of oil fired water heaters and associated trim to replace electric water heaters will reduce electrical consumption.

1. COMPONENT ARMY	FY 19 84 MILITARY COI	NSTRUCTION PROJECT DATA	2. DATE 11-19-80		
3. INSTALLATION AT YONGSAN GARRI	ND LOCATION SON - KS 948, KOREA	4. PROJECT TITLE  MODIFICATION FOR ENE  CONTROL SYSTEM	4. PROJECT TITLE  MODIFICATION FOR ENERGY MONITOR &  CONTROL SYSTEM		
5. PROGRAM ELEME	NT 6. CATEGORY CODE 740, 510, 610,620 821 SERIES	1. 11.00201	COST (\$000)		

9. COST ESTIMATES				
ITEM	U/M	QUANTITY	COST	COST (\$000)
Primary Facility Energy Monitor and Control System Supporting Facilities Subtotal Contingency (10%) Total Contract Cost Supervision, Inspection and Overhead (6.5%) Total Request Installed Equipment - Other Appropriations	EA	1	1,444	1,444 (1,444) 0 1,444 144 1,588 103 1,691 (0)

Buildings at Yongsan Garrison are to be modified to achieve improved energy conservation.

Install Energy Monitor and Control System (EMCS) to control and minimize energy consumption. Useful management data will be reported to reduce manual requirements and report malfunctions as well as minimizing energy consumption during building non-use hours.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at Yongsan Garrison which are to receive each modification are attached to this form. Types of construction are indicated on the building lists.

A computer controlled Energy Monitor and Control System will be installed in 39 buildings.

1. COMPONENT  ARMY	FY	19 <u>84</u> MILITARY CO	NSTRU	CTION PROJE	CT DATA	2. DATE 11-19-80
3. INSTALLATION A K-16 AIRFIEL		CATION KS 508, KOREA			I OFFICE (OCK)	ATION FOR TEERMOSTAT W/ AT OVERRIDE
5. PROGRAM ELEM	ENT	6. CATEGORY CODE 740,141,131,730, 219,214,550 Series		ECT NUMBER	8. PROJECT	COST (\$000) 8
		9. CDS	T ESTIM	ATES		

9. COST ESTIMATES				
ITEM	U/M	QUÂNTITY	UNIT COST	COST (\$000)
Primary Facility Clock Thermostats with Outside Air Thermostat Override	EΑ	7	861.40	6 (6)
Supporting Facilities Subtotal Contingency (10%) Total Contract Cost Supervision, Inspection & Overhead (6.5%) Total Request Installed Equipment - Other Appropriations				0 6 1 7 1 8 (0)
				· <b>(</b> ·

Buildings at K-16 Airfield are to be modified to achieve improved energy conservation.

Install 7-daytime clock with setback feature, spring back-up (in case of power failure) and outdoor air thermostat override to reduce energy consumption on all warm-air furnaces.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at K-16 Airfield which are to receive each modification are attached to this form. Types of construction are indicated on the buildings lists.

Clock thermostat with outside thermostat override will be installed in 7 buildings.

1. COMPONENT ARMY	FY	19 <u>84</u> MILITARY CO	NSTRU	CTION PROJE	CT DATA	2. date 11-19-80
3. INSTALLATION A		cation - KS 792, KÖREA		4. PROJECT TITL THERMOSTAT THERMOSTAT	WITH (OT)	
5. PROGRAM ELEME	ENT	<b>6. CATEGORY CODE</b> 740,214,131,219,218,610, 217,141,310,211,212,133 Series	7. PROJ	ECT NUMBER	8. PROJECT	94

9. COST ESTIMATES				
ITEM	U/M	QUANTITY	UNIT COST	COST (\$000)
Primary Facility Clock Thermostat With Outside Air Thermostat Override Supporting Facilities Subtotal Contingency (10%) Total Contract Cost Supervision, Inspection & Overhead (6.5%) Total Request Installed Equipment - Other Appropriations	EA	93	861.40	80 (80) 0 80 8 88 6 94 (0)

Buildings at Camp Humphreys are to be modified to achieve improved energy conservation.

Install 7-day time clock with setback feature, spring back-up (in case of power failure) and outdoor air thermostat override to reduced energy consumption.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at Camp Humphreys which are to receive each modification are attached to this form. Types of construction are indicated on the building lists.

Clock thermostats with outside air thermostat override will be installed in 88 buildings on all warm-air furnaces.

## 11. REQUIREMENT:

<u>PROJECT</u>: The addition of 7-day time clocks with setback feature, spring back-up (in case of power failure) and outdoor air thermostat override to reduce energy consumption.

REQUIREMENT: This project will result in 50.8 mega BTU annual energy savings per thousand dollars cost, (E/C ratio), and a benefit-to-cost ratio (B/C

# FOR OFFICIAL USE ONLY YWHEN DATA IS ENTERED!

		FOR	FOR OFFICIAL USE ONLY (WHEN DATA IS ENTERED)	YWHEN DATA IS	S ENTERED!		-		
1. PATE 2. FIS 11-19-80	2. FISCAL YEAR 1983	. MILITARY CONSTRUCTION PROJECT DATA			CAMP HUMPHREYS - KS 792				
A BRODOSED AUTHORIZATION		6. PRIOR AUTHORIZATION 7.CATE	7.CATEGORY CODE NUMBER 8. PROGRAM ELEMENT		9. STATE/COUNTRY				
125,000			722 and 821		KOREA			}	
10. PROPOSED APPROPRIATION		11. BUDGET ACCOUNT NUMBER	MBER 12, PROJECT NUMBER		13. PROJECT TITLE		ž	- C	RN >
125.000		6100			BOILER MODIFICGAL DONS		_		<
2006	SECT	SECTION A - DESCRIPTION OF PROJECT			SECTION B - COST ESTIMATES	ST ESTIMATES	Γ	L	
14.	7.	O SOLTSIGNATOR OF TRANSPORT	ENISTICS OF PRIMARY FACILITY	20. PRIMARY FACILITY	ACILITY	U/M QUANTITY	ITY UNITCOST	- 1 **	125
TYPE OF CONSTRUCTION	_	TSICAL CHARACT			O TEIM CONTROL	FA 1 5	, 24,992		125
. PERMANENT	. NO. OF BLDGS.	SEE ATTACHED	LIST I A WIOTH NA	A. BUILD	BUILER OF INTEL CONTROL			J	
b. SEMI-PERMANENT X	9. DESTAN CAPACITY	NA CAP.	COST (	21. SUPP(	SUPPORTING FACILITIES				0
14 TYPE OF WORK	19. DESCRIP	19. DESCRIPTION OF WORK TO BE DONE				_	-		
. NEW FACILITY	Instal	1 0, trim controls on 5	boilers in the buildings						
b. ADDITION	] noted.	The project includes	noted. The project includes installation of an $0_2$						
C. ALTERATION X	sensor	, analyser, controller,	control panel and						-
d. CONVERSION	_ modifi	cation of modulating mo	tor iinkage ror air/iuei						_
. OTHER (Specify)	contro	on each boller.							
	- B1 dg.	3 2							_
16. REPLACEMENT	(2) at 30/3/	537.57					-		
17. TYPE OF DESIGN	_							_ .	
	T							<u> </u>	
DECINE OF STREET	1							1	7
				22. TOTAL PROJECT COST	OJECT COST				163
			SECTION C - BASIS OF REQUIREMENT	REQUIREMENT					
23,	QUANTITATIVE DATA	25.	REQUIREMENT FOR PROJECT			:	4		
INTEREST INTO TO TOTAL	(U/M		This project is required	to meet st	This project is required to meet stated goals of energy use reduction. It is submitted as	reduction. Installatio	17 18 S n of 0.	trim con	trols
F EXISTING SUBSTANDARD	ARD		part of the energy conser	rvation inv	esument program (com/,	o to accoun	t for ba	iriations	in
C. EXISTING ADEQUATE			will save tuel by automate	LICALLY CUL	second this project will	result in	31.6 meg	ja BTU an	nual
d. FUNDED, NOT IN INVENTORY	ENTORY		load, temperature, number	icy and pre	cost and a benefit-to-c	ost ratio o	f 10.8.	Total a	ınnual
e. ADEQUATE ASSETS (c + d)	(p +	$\neg$	energy savings per chouse	404 at 3 94	A meda BTIL. A total doll	ar savings o	of 89,614	t per yea	7.
		AUTHORIZED FUNDED	energy savings is estimated to the second of	red at 3,24	ind of 1.4 vears. If thi	s project i	s not ef	fected,	energy
1. UNFUNDED PRIOR AUTHORIZATION	THORIZATION		Will result in a simple	Joselv wast	ed contrary to national	qoals. Thi	s projec	t has be	en
9. INCLUDED IN FY	PROGRAM		Will Continue to be need	determined	that an EIS pursuant to	ŘL 91-190 i	s not re	equired.	
n. DEFICIENCY (	1		reviewed and it has been						
24. RELATED PROJECTS	NA								
				-					
							1046	07 1040	
DD FORM 1391		FO	FOR OFFICIAL USE ONLY (WHEN DATA IS ENTERED)	HEN DATA	IS ENTERED!		1		

2. DATE 1. COMPONENT FY 19 84 MILITARY CONSTRUCTION PROJECT DATA ARMY 11-19-80 4. PROJECT TITLE 3. INSTALLATION AND LOCATION MODIFICATION FOR DISMEASHER CAMP HUMPHREYS - KS 792, KOREA HEAT RECOVERY 7. PROJECT NUMBER 8. PROJECT COST (\$000) 6. CATEGORY CODE 5. PROGRAM ELEMENT 28 72210

9. COST ESTIMATES	<del></del>			
ITEM	U/M	QUANTITY	UNIT COST	COST (\$000)
Primary Facility Dishwasher Waste Heat Recovery Systems,	EΑ	3	8127	24 (24)
1000-Man Mess <u>Supporting Facilities</u> Subtotal  Contingency (10%)  Total Contract Cost  Supervision, Inspection and Overhead (6.5%)  Total Request  Installed Equipment - Other Appropriations			·	24 2 26 2 28 (0)

## 10. DESCRIPTION OF PROPOSED CONSTRUCTION

Buildings at Camp Humphreys are to be modified to achieve improved energy conservation.

Installation of this system, which includes a cleanable heat exchanger, dishwater strainer and pump, potable water pump, associated piping, valves, insulation and controls, will recover heat from the dishwasher which would be rejected into the sewer.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at Camp Humphreys which are to receive each modification are attached to this form. Types of construction are indicated on the building lists.

Dishwasher waste heat recovery systems will be installed in 3 buildings.

11. REQUIREMENT:

PROJECT: The addition of this system will recover heat from the dishwasher

1. COMPONENT	FY 19_84 MILITARY CONS	STRUCTION PROJECT DATA	2. DATE 11-19-80
ARMY 3. INSTALLATION A	ND LOCATION	4. PROJECT TITLE MODIFI	
CAMP CARROL	L - KS 116,KOREA	OUTSIDE AIR THERMOST	AT OVERRIDE
5. PROGRAM ELEM	ENT 6. CATEGORY CODE 740,610,872,141,841,219,	. PROJECT NUMBER 8. PROJECT	COST (\$000)
	730,214,843,171,217,218, Series		43

9. COST ESTIMATES				
ITEM	U/M	QUANTITY	UNIT COST	COST (\$000)
Primary Facility Clock Thermostat with Outside Air Thermostat Override Supporting Facilities Subtotal Contingency (10%) Total Contract Cost Supervision, Inspection & Overhead (6.5%) Total Request Installed Equipment - Other Appropriations	EA	42	861.40	36 (36) 0 36 4 40 3 43 (0)

Buildings at Camp Carroll are to be modified to achieve improved energy conservation.

Install 7-day time clock with set back feature, spring back-up (in case of power failure) and outdoor air thermostat override to reduce energy consumption on all warm-air furnaces.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at Camp Carroll which are to receive each modification are attached to this form. Types of construction are indicated on the building list.

Clock thermostat with outside thermostat override will be installed in 42 buildings.

## 11. REQUIREMENT:

PROJECT: The addition of 7-day time clock with setback feature, spring back up (in case of power failure) and outdoor air thermostat override

		TOR OFFICIAL USE ONLY TOTAL					
I FISCAL VEAR	EAR		3. DEPARTMENT	4. INSTALLATION			
1. DATE 2. 1502.12 11_1980 1983		MILITARY CONSTRUCTION PROJECT DATA	ARMY	CAMP CARROLL - KS 116			
· · ·	6. PRIO	7, CATEGORY CODE NUMBER	8. PROGRAM ELEMENT	9, STATE/COUNTRY			
5, PROPOSED ACT	NONE	821		KOREA			
S 30,000	4	11. BUDGET ACCOUNT NUMBER 12. PROJECT NUMBER	BER	13, PROJECT TITLE		NM	MR M
To. Processed Arrangement		0019		BOILER MODIFICATIONSP?			×
000,00	to and the control of	TOST ON OF THE PROPERTY AND TRAINING A PROPERTY	_	SECTION B - COST ESTIMATES			
	SECTION A - DESCRI	TORON OF STOCKE	20, PRIMARY FACILITY		4117	UNITCOST CO	COST (\$000)
14. TYPE OF CONSTRUCTION	PHYSICAL C	PHYSICAL CHARACTERISTICS OF PRIMARY FACILITY				*	50
	NO OF BLDGS. 1 CFF	SEF ATTACHED LIST   d. WIDTH NA	Α.	BOILER 0, TRIM CONTROLS EA	( 2 ) 24	24,977	20
×	]≿	1. GROSS AREA					c
	SOLING NA	CAP. INA COST (\$ NA	, 21. SUPP	21. SUPPUKIING FACILITIES			0
Xao	19. DESCRIPTION OF WORK TO BE DONE	TO BE DONE					
	Install O. trim	controls on 2 boilers in the buildings	lings				
	noted. The pro	ject included installation of an $0_2$					
×	sensor, analyse	sensor, analyser, controller, control panel and					
	modification of	modulating motor linkage for air/fuel	fue]				
2	control on each boiler.	boiler.					
Ţ	B1dg.	Cat. Code					
	(Z) at >10Z2	92120				اپ	
_[						J	
STANDARD DESIGN A							
b. SPECIAL DESIGN						١	
C. DRAWING NO.			22. TOTALP	22. TOTAL PROJECT COST		-	22
			SECTION C - BASIS OF REQUIREMENT				
23. QUANT	QUANTITATIVE DATA	25. REQUIREMENT FOR PROJECT			0++0n 1+ 10	submitte	20
M/U)	NA ,	This project is requi	ired to meet s	This project is required to meet stated goals of energy use reduction. 1.5 such course.	allation of O	trim co	ntrols
. TOTAL REQUIREMENT		part of the energy co	onservation in	Vestment program (mon/).	account for	Variation	ni si
b. EXISTING SUBSTANDARD	_	will save tuel by aut	tomatically co	rrecuing the air/lati tatio co	11) t in 29.1 m	nega BTU	nnual
c. EXISTING ADEQUATE		load, temperature, nu	משומום (מומושות) מינוקה למומותות	load, temperature, final of and pressure.	ratio fo 9.9.	Total	nnnal
d. FUNDED, NOT IN INVENTORY	<u>}</u>	energy savings per tr	nousand dollar	5 (OSt.) Alla A Balleric co cost	savings of 32.	998 per	/ear
e. ADEQUATE ASSETS (c + d)			timated at 1,4	energy savings is estimated at 1492 miled blow. A cycui doing against a not effected, energy	oiect is not	effected.	energ
	AUTHORIZED	FUNDED	ple payback pe	FIOG 01 1.3 years. 11 cm3 F1	s This proj	iect has	seen
1. UNFUNDED PRIOR AUTHORIZATION	IZATION	will continue to be	needlessly was	ted, contrary to marronal goal	31-190 is not	required	
9. INCLUDED IN FY	рпоапам	reviewed and 1t has	peen determine	ים רומר מוו בזם אמו שממוני כם יבי			
h, DEFICIENCY ( f - 9)							
24. RELATED PROJECTS	NA			•			
				1 1 1 1	44	PAGE NO. ]	
		CONTRACTOR ONLY (WILE) BATA IS FIXTERFD	V IWITEN DATA	IS FNTFIRED!			

1. COMPONENT ARMY	FY	19 84 MILITARY CO	ONSTRU	CTION PROJE	CT DATA	2. DATE 11-19-80		
3. INSTALLATION A		KS 116, KOREA		MODIFICATIONS TO THE MODIFICATIONS TO THE MODIFICATION STORY THE MODIFICATION STORY TO THE MODIFICATION STORY TO THE MODIFICATION STORY TO THE MODIFICATION STORY TO THE MODIFICATION STORY THE MODIFICATION STORY TO THE MODIFICA				
5. PROGRAM ELEM	ENT	6. CATEGORY CODE 72210	7. PROJ	ECT NUMBER	8. PROJECT	COST (\$000)		

9. COST ESTIMATES						
ITEM	U/M	QUANTITY	UNIT COST	COST (\$000)		
Primary Facility Dishwasher Waste Heat Recovery System (1000-Man Mess)	EΑ	1	8130	8 (8)		
Supporting Facilities Subtotal Contingency (10%) Total Contract Cost Supervision, Inspection and Overhead (6.5%) Total Request Installed Equipment - Other Appropriation	S			0 8 1.' 9 1 10 (0)		
			•			

Buildings at Camp Carroll are to be modified to achieve improved energy conservation.

Installation of this system, which includes a cleanable heat exchanger, dishwater strainer and pump, potable water pump, associated piping, valves, insulation and controls will recover heat form the dishwasher which would be rejected into the sewer. The recovered heat will be returned to the domestic hot water boiler, thus reducing oil consumption.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at Camp Carroll which are to receive each modification are attached to this form. Types of construction are indicated on the building lists.

Dishwasher waste heat recovery system will be installed in one building.

1.	COMPONENT	EV	10 0/ 1411 177	NOV CONS	TRUCTION BROJE	~ ~ ~ ~ ~ ~	2. DATE
	ARMY	FT	19 84 MILITA	ARY CONS	TRUCTION PROJEC	JIDAIA	11-19-80
3.	INSTALLATION A	ND LO	CATION		4. PROJECT TITL	≡ MODIFICA	TION FOR
	CAMP HENRY -	- KS	160, KOREA		INSTALLATION WITH OUTSIDE	OF GEOCK	THEBMOSTAT OSTAT OVERRIDE
5.	PROGRAM ELEMI	ENT	6. CATEGORY 0 610,740,219 730,214,171	,141,131,	PROJECT NUMBER	8. PROJECT	
			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	001103			

9. COST ESTIMATES						
ITEM	U/M	QUANTITY	UNIT COST	COST (\$000)		
Primary Facility Clock Thermostats with outside air thermostat override Supporting Facilities Subtotal Contingency (10%) Total Contract Cost Supervision, Inspection & Overhead (6.5%) Total Request Installed Equipment - Other Appropriations	EA	77	861.40	66 (66) 0 66 7 73 5 78 (0)		

Buildings at Camp Henry are to be modified to achieve improved energy conservation.

Install 7-day time clock with setback feature, spring back-up (in case of power failure) and outdoor air thermostat override on all warm-air furnaces.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at Camp Henry which are to receive each modification are attached to this form. Types of construction are indicated on the building lists.

Clock thermostats with outside air thermostat override will be installed in 52 buildings.

1. COMPONENT	V 19 OA MILITARY COM	T DATA 2. DATE			
ARMY	FY 19 84 MILITARY CONSTRUCTION PROJECT DATA				
3. INSTALLATION AND	≖ MODIFICATION FOR ON DF CLOC ©THERMOST DE ATR THERMOSTAT Ο\	TAT /FRRIDE			
5. PROGRAM ELEMENT		7. PROJECT NUMBER	8. PROJECT COST (\$000)	LIMITE	
	730,141,610,740,540, 131,550,841,872,811, 211,214,530,219,Series		48		

9. COST ESTIMATES						
ITEM	U/M	QUANTITY	UNIT COST	COST (\$000)		
Primary Facility Clock thermostats with outside air thermostat override	EΑ	48	861.40	41		
Supporting Facilities Subtotal Contingency (10%)	EA	40	001.40	(41) 0 41		
Total Contract Cost Supervision, Inspection & Overhead (6.5%)	-			45 3		
Total Request Installed Equipment - Other Appropriations				48 (0)		
	<u> </u>					

Buildings at Camp Walker are to be modified to achieve improved energy conservation.

Install 7-day time clock with set-back feature, spring back-up (in case of power failure) and outdoor air thermostat override on all warm-air furnaces.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at Camp Walker which are to receive each modification are attached to this form. Types of construction are indicated on the building lists.

Clock thermostats with outside air thermostat override will be installed in 41 buildings.

## REQUIREMENT:

PROJECT: The addition of 7-day time clocks with set-back feature, spring back-up (in case of power failure) and outdoor air thermostat override will reduce energy consumption.

1. COMPONENT ARMY	Y 19 84 MILITARY C	ONSTRUCTION P	ROJECT DATA	2. DATE 11-19-80
3. INSTALLATION AND CAMP WALKER -	KS 300, KOREA	4. PROJE MODI HEAT	FICATION P	WASHER
5. PROGRAM ELEMENT	PROGRAM ELEMENT 6. CATEGORY CODE 7. PROJECT NUMBER 8.		er 8. project	COST (\$000)
	9. C	OST ESTIMATES		

9. COST ESTIMATES						
ITEM	U/M	QUANTITY	UNIT COST	COST (\$000)		
Primary Facility Dishwasher Waste Heat Recovery Systems, 1000-Man Mess Supporting Facilities Subtotal Contingency (10%)	EA	1	8130	8 (8) 0 8 1		
Total Contract Cost Supervision, Inspection and Overhead (6.5%) Total Request Installed Equipment - Appropriations			-	1 10 (0)		

Buildings at Camp Walker are to be modified to achieve improved energy conservation.

Installation of this system, which includes a cleanable heat exchanger, dishwater strainer and pump, potable water pump, associated piping, valves, insulation and controls, will recover heat from the dishwasher which would be rejected into the sewer.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at Camp Walker which are to receive each modification are attached to this form. Types of construction are indicated on the building lists.

Dishwasher waste heat recovery system will be installed in 1 building.

1. COMPONENT ARMY	FY 1984 MILITARY CO	T DATA	11-19-80	
3. INSTALLATION AN	MD LOCATION (FH) - KS 300, KOREA	4. PROJECT TITLE MODIFICATION FOR DOMESDIC HOT WATER HEATER REPLACEMENT		
5. PROGRAM ELEME	NT 6. CATEGORY CODE 711 Series	7. PROJECT NUMBER	8. PROJECT CO	DST (\$000)

9. COST ESTIMATES						
ITEM	U/M	QUANTITY	UNIT COST	COST (\$000)		
Primary Facility Oil Fired Water Heaters and Associated Trim	EΑ	96	2343.9	225 (225)		
Supporting Facilities Subtotal Contingency (10%) Total Contract Cost Supervision, Inspection and Overhead (6.5%) Total Request Installed Equipment - Other Appropriations		: :		0 225 23, · 248 16 264 (0)		

Buildings at Camp Walker are to be modified to achieve improved energy conservation.

Installation of oil fired water heaters and associated trim to replace electric water heaters, thereby reducing electrical consumption.

Insulation will satisfy criteria in DOD Manual 4270.1-M.

No provisions for the handicapped will be made because the scope of the project is in no way applicable to the handicapped.

Lists of individual buildings at Camp Walker which are to receive each modification are attached to this form. Types of construction are indicated on the building lists.

Oil fired water heaters and associated trim will be installed in 96 dwelling units.

## 11. REQUIREMENT:

PROJECT: The addition of oil fired water heaters and associated trim to replace electric water heaters, will reduce electrical consumption.