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ENERGY ENGINEERING ANALYSIS PROGRAM
EIGHTH US ARMY, KOREA

VOLUME I

EXECUTIVE SUMMARY

FINAL REPORT

AUGUST 1981

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.
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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

<table>
<thead>
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<th>TITLE</th>
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<td></td>
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<td></td>
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<td>TONGDUCHON</td>
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<td>V</td>
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<td></td>
<td>Swiss-Swede Camp</td>
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<td>VI</td>
<td>PYONGTAEK</td>
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<td></td>
<td>Camp Humphreys</td>
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<tr>
<td>VII</td>
<td>CHUNCHON</td>
</tr>
<tr>
<td></td>
<td>Camp Long</td>
</tr>
<tr>
<td>VIII</td>
<td>TAEGU</td>
</tr>
<tr>
<td></td>
<td>Camp Henry</td>
</tr>
<tr>
<td></td>
<td>Camp Carroll</td>
</tr>
<tr>
<td></td>
<td>Camp Walker</td>
</tr>
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<td>IX</td>
<td>PUSAN</td>
</tr>
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<td>Hialeah</td>
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<td>G Utilities and Distribution Systems</td>
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<td>H Projects Investigated But Not Proposed</td>
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<td>I Solar Applications</td>
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</table>
2.0 SUMMARY

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.

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.
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):

<table>
<thead>
<tr>
<th></th>
<th>Architectural/Structural</th>
<th>Mechanical</th>
<th>EMCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>FY 1982</td>
<td>$ 663,000</td>
<td>$ -0-</td>
<td>$ -0-</td>
</tr>
<tr>
<td>FY 1983</td>
<td>8,662,000</td>
<td>175,000</td>
<td>-0-</td>
</tr>
<tr>
<td>FY 1984</td>
<td>7,062,000</td>
<td>1,875,000</td>
<td>1,691,000</td>
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<td></td>
<td>$16,387,000</td>
<td>$2,050,000</td>
<td>$1,691,000</td>
</tr>
</tbody>
</table>

![Figure 2-2. Project Submittals by Fiscal Year](image)

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.
2.2.2 End-Use Analysis

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

<table>
<thead>
<tr>
<th></th>
<th>Fuel Oil</th>
<th>Electricity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Space Heat</td>
<td>1,842</td>
<td>125</td>
</tr>
<tr>
<td>Space Cool</td>
<td>95</td>
<td>238</td>
</tr>
<tr>
<td>Domestic Hot Water</td>
<td>859</td>
<td>61</td>
</tr>
<tr>
<td>Lighting</td>
<td>-</td>
<td>1,055</td>
</tr>
<tr>
<td>Other, 19 bases</td>
<td>560</td>
<td>621</td>
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<tr>
<td>Other Installations</td>
<td>666</td>
<td>666</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>4,022</td>
<td>2,760</td>
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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)

<table>
<thead>
<tr>
<th></th>
<th>Fuel Oil</th>
<th>Electricity</th>
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<tr>
<td>Space Heat</td>
<td>13.28</td>
<td>10.78</td>
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<tr>
<td>Space Cool</td>
<td>0.68</td>
<td>20.52</td>
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<tr>
<td>Domestic Hot Water</td>
<td>6.19</td>
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<td>Lighting</td>
<td>-</td>
<td>90.95</td>
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<td>Other, 19 bases</td>
<td>4.04</td>
<td>53.54</td>
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<tr>
<td>Other Installations</td>
<td>4.81</td>
<td>57.45</td>
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<td><strong>TOTAL</strong></td>
<td><strong>29.00</strong></td>
<td><strong>238.50</strong></td>
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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 air-conditioners. 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 cost-effective 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 air-conditioning 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 air-conditioners, 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).
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<td>K-16 Airfield</td>
<td>33 135</td>
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<td>79 94</td>
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<td>Hialeah</td>
<td>260 547</td>
<td>175 431</td>
<td>67 79</td>
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<td>Camp Red Cloud</td>
<td>316 671</td>
<td>193 593</td>
<td>61 88</td>
</tr>
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<td>Camp Stanley</td>
<td>275 659</td>
<td>162 590</td>
<td>59 90</td>
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<td>Camp Howze</td>
<td>245 398</td>
<td>134 304</td>
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<td>KH/SS/JSA MAC HQ</td>
<td>109 136</td>
<td>61 112</td>
<td>56 82</td>
</tr>
<tr>
<td>Camp Long</td>
<td>130 207</td>
<td>93 181</td>
<td>72 92</td>
</tr>
<tr>
<td>Total</td>
<td>6046 15601</td>
<td>3646 12892</td>
<td>60 83</td>
</tr>
</tbody>
</table>

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. **FY 1982.** Yongsan and Walker Family Housing (At the client's request, these submissions were accelerated to the earlier fiscal year.)

b. **FY 1983.** Architectural/Structural and Central Heating (Mechanical) projects for the six bases in the original contract

c. **FY 1984.** All other mechanical projects and all architectural/structural projects for the 13 bases in the contract revision. (No projects for JSA/MAC HQ 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
Located at AFE Office P1380

2 Phone Lines

Communications Controller

Located at S2320

Telephone Lines

Figure 4-1. EMCS Hardware Layout.
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 O₂ 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.

<table>
<thead>
<tr>
<th>E/C</th>
<th>Annual Savings MBtu</th>
<th>$1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buildings S2700 and S2392, Yongsan Garrison</td>
<td></td>
<td></td>
</tr>
<tr>
<td>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.</td>
<td>21.0</td>
<td>15,867</td>
</tr>
<tr>
<td>Building 666, Camp Carroll</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Replace 300 linear feet of uninsulated steam supply and condensate return lines with insulated lines.</td>
<td>15.5</td>
<td>339.9</td>
</tr>
<tr>
<td>Buildings S170 through S174, Camp Howze</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Replace deteriorated roof surfaces and water-soaked insulation.</td>
<td>23.5</td>
<td>1,127.4</td>
</tr>
<tr>
<td>Building S0114, Camp Edwards</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Replace nine deteriorated and warped doors.</td>
<td>14.5</td>
<td>227.4</td>
</tr>
<tr>
<td>Supply Point 48, Pusan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Replace the 52 temporary refrigeration units. Insulation is deteriorated and water-soaked to the point of ineffectiveness.</td>
<td>37.2</td>
<td>4,974.0</td>
</tr>
</tbody>
</table>
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 $2.2 \times 10^6$ 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

<table>
<thead>
<tr>
<th>Options</th>
<th>Annual Savings</th>
<th>Cost</th>
<th>Pay-Back Years</th>
<th>E/C</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mega-Btu</td>
<td>Gal-Oil</td>
<td>$</td>
<td></td>
</tr>
<tr>
<td>Feedwater Economizers</td>
<td>4,870</td>
<td>35,030</td>
<td>110,344</td>
<td>1,137,800</td>
</tr>
<tr>
<td>Combustion Air Heaters</td>
<td>8,186</td>
<td>58,909</td>
<td>185,563</td>
<td>2,047,716</td>
</tr>
<tr>
<td>Blowdown Heat Recovery</td>
<td>1,366</td>
<td>9,829</td>
<td>30,961</td>
<td>148,421</td>
</tr>
</tbody>
</table>

4.5 SOLAR APPLICATIONS

The total solar energy that might be received on an area of 1 ft², 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$^2$ 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 FCHIP program gives the following monthly maximum collection values for the configuration described above.

<table>
<thead>
<tr>
<th>Month</th>
<th>Btu/ft$^2$mo</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>32,800</td>
</tr>
<tr>
<td>February</td>
<td>35,200</td>
</tr>
<tr>
<td>March</td>
<td>45,300</td>
</tr>
<tr>
<td>April</td>
<td>48,000</td>
</tr>
<tr>
<td>May</td>
<td>48,800</td>
</tr>
<tr>
<td>June</td>
<td>47,100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Month</th>
<th>Btu/ft$^2$mo</th>
</tr>
</thead>
<tbody>
<tr>
<td>July</td>
<td>46,500</td>
</tr>
<tr>
<td>August</td>
<td>46,800</td>
</tr>
<tr>
<td>September</td>
<td>44,400</td>
</tr>
<tr>
<td>October</td>
<td>43,600</td>
</tr>
<tr>
<td>November</td>
<td>38,100</td>
</tr>
<tr>
<td>December</td>
<td>31,700</td>
</tr>
</tbody>
</table>

The total for the year is 508,300 Btu/ft$^2$ or 508.3 MBtu for the 1000 ft$^2$ 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).

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

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

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

$$1691.4 \text{ gal/yr} \times 3.15 \frac{\text{$}}{\text{gal}} = $5328 \text{ saved in the first year}$$

4.5.2 Costs

Solar collectors, insulated storage tanks, and piping are available in Korea. The following prices are estimated:
<table>
<thead>
<tr>
<th>Item</th>
<th>Material</th>
<th>Labor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collector (1000 ft²)</td>
<td>17,000</td>
<td>5,700</td>
</tr>
<tr>
<td>Insulated tank (1200 gal)</td>
<td>2,500</td>
<td>500</td>
</tr>
<tr>
<td>Piping (600 LF)</td>
<td>3,000</td>
<td>2,000</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>30,700</strong></td>
<td></td>
</tr>
</tbody>
</table>

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:

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

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

\[
= 9.1
\]

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)

<table>
<thead>
<tr>
<th>1. DATE</th>
<th>2. FISCAL YEAR</th>
<th>3. DEPARTMENT</th>
<th>4. INSTALLATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-13-80</td>
<td>1982</td>
<td>ARMY</td>
<td>YONGSAN GARRISON - FH - KS 948</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. PROPOSED AUTHORIZATION</th>
<th>6. PRIOR AUTHORIZATION</th>
<th>7. CATEGORY CODE NUMBER</th>
<th>8. PROGRAM ELEMENT NUMBER</th>
<th>9. STATE/COUNTRY</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ 616,000</td>
<td>P.L.</td>
<td>711</td>
<td></td>
<td>KOREA</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>10. PROPOSED APPROPRIATION</th>
<th>11. BUDGET ACCOUNT NUMBER</th>
<th>12. PROJECT NUMBER</th>
<th>13. PROJECT TITLE</th>
<th>Modification(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ 615,000</td>
<td>6100</td>
<td></td>
<td>Architectural &amp; Structural Modifications</td>
<td></td>
</tr>
</tbody>
</table>

### SECTION A - DESCRIPTION OF PROJECT

<table>
<thead>
<tr>
<th>14. TYPE OF CONSTRUCTION</th>
<th>15. PHYSICAL CHARACTERISTICS OF PRIMARY FACILITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>PERMANENT</td>
<td><strong>NO. OF BLDGS</strong> <strong>SEE ATTACHED LIST</strong></td>
</tr>
<tr>
<td>SEMI-PERMANENT</td>
<td><strong>WIDTH NA</strong></td>
</tr>
<tr>
<td>TEMPORARY</td>
<td><strong>COOLING</strong> <strong>CAP.</strong> <strong>NA</strong> <strong>COST ($ NA)</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>15. TYPE OF WORK</strong></th>
<th><strong>16. DESCRIPTION OF WORK TO BE DONE</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>REPLACEMENT</strong></td>
<td>Work will consist of the following modifications:</td>
</tr>
<tr>
<td><strong>ADDITION</strong></td>
<td>1. Wall insulation, Boards, R-8 in 57 dwelling units.</td>
</tr>
<tr>
<td><strong>ALTERATION</strong></td>
<td>2. Ceiling insulation, batts, R19 in 1 dwelling unit.</td>
</tr>
<tr>
<td><strong>CONVERSION</strong></td>
<td>3. Weather stripping for doors in 65 dwelling units.</td>
</tr>
<tr>
<td><strong>REPLACEMENT</strong></td>
<td>4. Double pane windows in 56 dwelling units.</td>
</tr>
</tbody>
</table>

### SECTION B - COST ESTIMATES

<table>
<thead>
<tr>
<th>20. PRIMARY FACILITY</th>
<th>21. SUPPORTING FACILITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>WALL INSULATION, BOARDS, R-8</td>
<td></td>
</tr>
<tr>
<td>CEILING INSULATION, BATTs, R19</td>
<td></td>
</tr>
<tr>
<td>DOOR WEATHER STRIPPING</td>
<td></td>
</tr>
<tr>
<td>WINDOW TREATMENT, DOUBLE PANE</td>
<td></td>
</tr>
</tbody>
</table>

### SECTION C - BASIS OF REQUIREMENT

<table>
<thead>
<tr>
<th>23. QUANTITATIVE DATA</th>
<th>24. REQUIREMENT FOR PROJECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>TON/NA</td>
<td></td>
</tr>
</tbody>
</table>

This project is required to meet stated goals of energy use reduction. It is submitted as part of the energy conservation investment program (ECIP). 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. This project will result in 19,2 mega BTU, annual energy savings per thousand dollars cost, (E/C ratio), and a benefit-to-cost ratio (B/C ratio) of 8.3. Total annual energy savings is estimated at 11,810.6 mega BTU. A total dollar savings of $212,185 per year will result in a simple payback period of 2.9 years. If this project is not affected, 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. DATE: 11-13-80  
2. FISCAL YEAR: 1983  

### MILITARY CONSTRUCTION PROJECT DATA

<table>
<thead>
<tr>
<th>1. PROPOSED AUTHORIZATION</th>
<th>5. PRIOR AUTHORIZATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,478,000</td>
<td></td>
</tr>
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<table>
<thead>
<tr>
<th>6. CATEGORY CODE NUMBER</th>
<th>7. PROGRAM ELEMENT NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>442, 131, 211, 610</td>
<td>161, 214, 217, 641</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>8. INSTALLATION</th>
<th>9. STATE/COUNTRY</th>
</tr>
</thead>
<tbody>
<tr>
<td>YONSGAN GARRISON - KS 948</td>
<td>KOREA</td>
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</table>

### SECTION A - DESCRIPTION OF PROJECT

<table>
<thead>
<tr>
<th>10. PROPOSED APPROPRIATION</th>
<th>11. BUDGET ACCOUNT NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,478,000</td>
<td>6100</td>
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</tbody>
</table>

#### ARCHITECTURAL MODIFICATIONS

<table>
<thead>
<tr>
<th>12. PROJECT NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>5510</td>
</tr>
</tbody>
</table>

### SECTION B - COST ESTIMATES

- **MATERIALS**
  - WALL INSULATION, DOORS, REA: SF = 267899, $2.894, 775.2
  - CEILING INSULATION, BATT, R19 in 39 bulidings: SF = 260762, $1.169, 704.8
  - DOOR WEATHER STRIPPING: LF = 172, $2.711, 46.5
  - WINDOW WEATHER STRIPPING: LF = 15845, $2.322, 37.3
  - WINDOW TREATMENT, DOUBLE PANE: SF = 830, 44.561, 11.8
  - WINDOW TREATMENT, STORM WINDOW: SF = 27110, $7.982, 183.8
  - LIGHTING MOD., INC. TO FLR: W = 36299, 0.921, 31.6
  - LIGHTING MOD., INC. TO HPS: W = 117748, 0.742, 87.3

### SECTION C - BASIS OF REQUIREMENT

- **TOTAL PROJECT COST**: $1478.3

This project is required to meet stated goals of energy use reduction. It is submitted as part of the energy conservation investment program (ECIP). The addition of wall and ceiling insulation, window treatment, weather stripping and lighting modifications will reduce winter heat loss and/or summer heat gain, thereby reducing energy consumption. This project will result in 24.2 mega BTU annual energy savings per thousand dollars cost, (E/C ratio), and a benefit-to-cost ratio (B/C ratio) of 12.1. Total annual energy savings is estimated at 35,729.8 mega BTU. A total dollar savings of $779,823 per year will result in a simple payback period of 1.9 years. 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 PL 91-190 is not required.
This project is required to meet stated goals of energy use reduction. It is submitted as part of the energy efficiency conservation investment program (ECIP). The addition of wall and ceiling insulation, window treatment, weather stripping and lighting modifications will reduce winter heat loss and/or summer heat gain, thereby reducing energy consumption. This project will result in 30.0 mega BTU annual energy savings per thousand dollars cost (E/C ratio), and a benefit-to-cost ratio (B/C ratio) of 4.6. Total annual energy savings is estimated at 24903.7 mega BTU. A total dollar savings of $552,179 per year will result in a simple payback period of 1.5 years. 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 PL 91-190 is not required.
This project is required to meet stated goals of energy use reduction. It is submitted as part of the energy conservation investment program (ECIP). The addition of wall and ceiling insulation, window treatment, weather stripping and lighting modifications will reduce winter heat loss and/or summer heat gain, thereby reducing energy consumption. This project will result in 23.9 mea BTU annual energy savings per thousand dollars cost, (E/C ratio), and a benefit-to-cost ratio (B/C ratio) of 9.6. Total annual energy savings is estimated at 29,725.4 mea BTU. A total dollar savings of $628,400 per year will result in a simple payback period of 2.0 years. 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 PL 91-190 is not required.
This project is required to meet stated goals of energy use reduction. It is submitted as part of the energy conservation investment program (ECIP). The addition of wall and ceiling insulation, window treatments, weather stripping and lighting modifications will reduce winter heat loss and/or summer heat gain, thereby reducing energy consumption. This project will result in 27.9 mega BTU annual energy savings per thousand dollars cost (E/C ratio), and a benefit-to-cost ratio (B/C) ratio of 11.3. Total annual energy savings is estimated at 2,386.7 mega BTU. A total dollar savings of $53,630 per year will result in a simple payback period of 1.6 years. If this project is not affected, 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  

2. DATE 11-19-80  

3. INSTALLATION AND LOCATION  
CAMP STANLEY - KS 284, KOREA  

4. PROJECT TITLE ARCHITECTURAL & STRUCTURAL MODIFICATIONS (INCLUDING WARM AIR FURNACES)  

5. PROGRAM ELEMENT  
211,131,141,610,740,  
171,214,218,442,540,  

6. CATEGORY CODE 550,730,219  

7. PROJECT NUMBER 780  

9. COST ESTIMATES  

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Supporting Facilities  
Subtotal  
Contingency (10%)  
Total Contract Cost  

10. DESCRIPTION OF PROPOSED CONSTRUCTION  
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 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 Stanley which are to receive each modification are attached to this form. Types of construction are indicated on the building lists.
1. COMPONENT
ARMY

2. DATE
11-19-80

3. INSTALLATION AND LOCATION
CAMP STANLEY - KS 284, KOREA

4. PROJECT TITLE
ARCHITECTURAL STRUCTURAL MODIFICATIONS (INCLUDING WARM AIR FURNACES)

5. PROJECT NUMBER
ECIP

9. COST ESTIMATES (Continued)
Supervision, Inspection & Overhead (6.5%)
Total Request
Installed Equipment - Other Appropriations

48
780
(0)

10. DESCRIPTION OF PROPOSED CONSTRUCTION (Continued)
1. Wall insulation, boards, R8 will be installed in 27 buildings.
2. Wall insulation, batts, R13 will be installed in 51 buildings.
3. Ceiling insulation, batts, R19 will be installed in 23 buildings.
4. Ceiling insulation, batts, R19 will be installed in 49 buildings.
5. Door weather stripping will be installed in 90 buildings.
6. Window weather stripping will be installed in 2 buildings.
7. Window treatment, double pane will be installed in 15 buildings.
8. Window treatment, storm window will be installed in 74 buildings.
9. Window treatment, TSF 80% will be installed in 1 building.
10. Lighting modification, inc. to flr. will be installed in 8 buildings.
11. Lighting modification, inc. to HPS will be installed in 9 buildings.
12. WAF timer will be installed in 84 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 well as 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 20.5 mega BTU annual energy savings per thousand dollar cost (E/C ratio), and a benefit-to-cost ratio (B/C ratio) of 7.0. Total annual energy savings is estimated at 15,963.6 mega BTU. A total dollar savings of $420,366 per year will result in a simple payback period of 1.9 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.
1. COMPONENT
ARMY

2. DATE
11-19-80

3. INSTALLATION AND LOCATION
CAMP RED CLOUD - KS 256, KOREA

4. PROJECT TITLE
ARCHITECTURAL AND STRUCTURAL MODIFICATIONS (INCLUDING WARM AIR FURNACES)

5. PROGRAM ELEMENT
211, 131, 214, 240, 171, 218, 442, 550, 610, 730 Series

6. CATEGORY CODE

7. PROJECT NUMBER
881

8. PROJECT COST ($000)
881

9. COST ESTIMATES

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10. DESCRIPTION OF PROPOSED CONSTRUCTION

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° 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.
1. COMPONENT
ARMY

FY 1984 MILITARY CONSTRUCTION PROJECT DATA

2. DATE
11-19-80

3. INSTALLATION AND LOCATION
CAMP RED CLOUD - KS 256

4. PROJECT TITLE
ARCHITECTURAL & STRUCTURAL MODIFICATIONS (INCLUDING WARM AIR FURNACES)

5. PROJECT 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.
5. Door weather stripping will be installed in 98 buildings.
6. 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 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.
1. **COMPONENT**
   ARMY

2. **FY 1984 MILITARY CONSTRUCTION PROJECT DATA**

3. **INSTALLATION AND LOCATION**
   CAMP CASEY - KS 124, KOREA

4. **DATE**
   11-19-80

5. **PROJECT TITLE**
   ARCHITECTURAL & STRUCTURAL MODIFICATIONS (INCLUDING WARM AIR FURNACES).

6. **CATEGORY CODE**
   211, 131, 141, 214, 452
   442, 610, 171, 218 series

7. **PROJECT NUMBER**
   442, 610, 171, 218 series

8. **PROJECT COST ($000)**
   1,216

9. **COST ESTIMATES**

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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.
1. COMPONENT ARMY
2. DATE 11-19-80
3. INSTALLATION AND LOCATION
   CAMP CASEY - KS 124
4. PROJECT TITLE
   ARCHITECTURAL & STRUCTURAL MODIFICATIONS (INCLUDING WARM AIR FURNACES)
5. PROJECT NUMBER

9. COST ESTIMATES (Continued)
   Supervision, Inspection & Overhead (6.5%) 74
   Total Request 1,216
   Installed Equipment - Other Appropriates (0)

10. DESCRIPTION OF PROPOSED CONSTRUCTION (Continued)
    1. Wall insulation, boards, R8 will be installed in 29 buildings.
    2. Wall insulation, batts, R13 will be installed in 113 buildings.
    3. Ceiling insulation, batts, R19 will be installed in 31 buildings.
    4. Ceiling insulation, batts, R19 will be installed in 113 buildings.
    5. Door weather stripping will be installed in 153 buildings.
    6. Window weather stripping will be installed in 2 buildings.
    7. Window treatment, double pane will be installed in 25 buildings.
    8. Window treatment, storm windows will be installed in 123 buildings.
    9. Window treatment, TSF 80% will be installed in 1 building.
   10. Lighting Modification, Inc. to FLR will be installed in 9 buildings.
   11. Lighting Modification, Inc. to HPS will be installed in 8 buildings.
   12. WAF timer installation will be installed in 167 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 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 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.
1. COMPONENT
ARMY

2. DATE
11-19-80

3. INSTALLATION AND LOCATION
CAMP CASEY - KS 124

4. PROJECT TITLE
ARCHITECTURAL STRUCTURED MODIFICATIONS (INCLUDING WARM AIR FURNACES)

5. PROGRAM ELEMENT
740,510,550,730
760,721,540 Series

6. CATEGORY CODE

7. PROJECT NUMBER
8. PROJECT COST ($000)
1195

9. COST ESTIMATES

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<td>Warm Air Furnaces (WAF)'Timer Installaton</td>
<td>PC</td>
<td>76</td>
<td>860.511</td>
<td>(65)</td>
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<tr>
<td>Supporting Facilities</td>
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<tr>
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<td>1039</td>
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<tr>
<td>Contingency (10%)</td>
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</table>

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.
<table>
<thead>
<tr>
<th>1. COMPONENT</th>
<th>ARMY</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. DATE</td>
<td>11-19-80</td>
</tr>
<tr>
<td>3. INSTALLATION AND LOCATION</td>
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<td>CAMP CASEY - KS 124</td>
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<tr>
<td>4. PROJECT TITLE</td>
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<tr>
<td>ARCHITECTURAL STRUCTURAL MODIFICATIONS (INCLUDING WARM AIR FURNACES)</td>
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</tr>
<tr>
<td>5. PROJECT NUMBER</td>
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<tr>
<td>ECIP</td>
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</table>

### 9. COST ESTIMATES (Continued)

<table>
<thead>
<tr>
<th>Description</th>
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<tr>
<td>Total Contract Cost</td>
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<tr>
<td>Supervision, Inspection &amp; Overhead (6.5%)</td>
</tr>
<tr>
<td>Total Request</td>
</tr>
<tr>
<td>Installed Equipment - Other Appropriations</td>
</tr>
</tbody>
</table>

### 10. DESCRIPTION OF PROPOSED CONSTRUCTION (Continued)

1. Wall insulation, boards, R8 will be installed in 26 buildings.
2. Wall insulation, batts, R13 will be installed in 41 buildings.
3. Ceiling insulation, batts, R19 will be installed in 21 buildings.
4. Ceiling insulation, batts, R19 will be installed in 33 buildings.
5. Door weather stripping will be installed in 75 buildings.
6. Window weather stripping will be installed in 2 buildings.
7. Window treatment, double pane will be installed in 15 buildings.
8. Window treatment, storm window will be installed in 57 buildings.
9. Window treatment, TSF 80% will be installed in 4 buildings.
10. Lighting modification, inc. to flr. will be installed in 8 buildings.
11. Lighting modification, inc. to HPS will be installed in 1 building.
12. WAF timer 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 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 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

2. DATE
   11-19-80

3. INSTALLATION AND LOCATION
   CAMP HOVEY - KS 168, KOREA

4. PROJECT TITLE
   ARCHITECTURAL AND STRUCTURAL MODIFICATIONS (INCLUDING WARM AIR FURNACES)

5. PROGRAM ELEMENT
   211, 740, 610, 141,
   171, 214, 218, 442, 550
   Series

6. CATEGORY CODE
   211, 740, 610, 141,
   171, 214, 218, 442, 550
   Series

7. PROJECT NUMBER
   513

8. PROJECT COST ($000)
   $513

9. COST ESTIMATES

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<thead>
<tr>
<th>ITEM</th>
<th>U/M</th>
<th>QUANTITY</th>
<th>UNIT COST</th>
<th>COST ($000)</th>
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<tbody>
<tr>
<td>Primary Facility</td>
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<td></td>
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<td>20</td>
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<td>SF</td>
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<td>60</td>
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<tr>
<td>Subtotal</td>
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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° 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

2. DATE
   11-19-80

3. INSTALLATION AND LOCATION
   CAMP HOVEY - KS 168

4. PROJECT TITLE
   ARCHITECTURAL & STRUCTURAL MODIFICATIONS (INCLUDING WARM AIR FURNACES)

5. PROJECT NUMBER
   ECIP

9. COST ESTIMATES (Continued)
   Supervision, Inspection & Overhead (6.5%)
   Total Request
   Installed Equipment - Other Appropriations

   31
   513
   (0)

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.
   6. 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 HPS, 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

2. DATE
11-19-80

3. INSTALLATION AND LOCATION
H-220 HELIPORT - KS 971, KOREA

4. PROJECT TITLE
ARCHITECTURAL & STRUCTURAL MODIFICATIONS (INCLUDING WARM FURNACE)

5. PROGRAM ELEMENT

6. CATEGORY CODE
141,171,610,730,
740,211,550, Series

7. PROJECT NUMBER

8. PROJECT COST ($000)
117

9. COST ESTIMATES

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<th>UNIT COST</th>
<th>COST ($000)</th>
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<tr>
<td>Primary Facility</td>
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<tr>
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<td>2321</td>
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<tr>
<td>Window Treatment, Double Pane</td>
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<td>Window Treatment, Storm Window</td>
<td>SF</td>
<td>529</td>
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<td>(22)</td>
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<tr>
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<tr>
<td>Subtotal</td>
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<td>Contingency (10%)</td>
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<td>Supervision, Inspection &amp; Overhead (6.5%)</td>
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<td></td>
<td>7</td>
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<tr>
<td>Total Request</td>
<td></td>
<td></td>
<td></td>
<td>117</td>
</tr>
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</table>

10. DESCRIPTION OF PROPOSED CONSTRUCTION

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° 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, battins, R13 will be installed in 14 buildings.
Ceiling insulation, battins, R19 will be installed in 14 buildings.
Door weather stripping will be installed in 16 buildings.
1. COMPONENT
ARMY

2. DATE
11-19-80

3. INSTALLATION AND LOCATION
CAMP HOWZE - KS 176, KOREA

4. PROJECT TITLE
ARCHITECTURAL STRUCTURAL MODIFICATIONS (INCLUDING WARM AIR FURNACES)

5. PROGRAM ELEMENT
131,141,211,740,171,
214,610,550

6. CATEGORY CODE

7. PROJECT NUMBER

8. PROJECT COST ($000)
368

9. COST ESTIMATES

<table>
<thead>
<tr>
<th>ITEM</th>
<th>U/M</th>
<th>QUANTITY</th>
<th>UNIT COST</th>
<th>COST ($000)</th>
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<tr>
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<td>(9)</td>
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<tr>
<td>Window Weather Stripping</td>
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<td>365</td>
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<td>(1)</td>
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<td>Window Treatment, Double Pane</td>
<td>SF</td>
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<td>13.999</td>
<td>(24)</td>
</tr>
<tr>
<td>Window Treatment, Storm Window</td>
<td>SF</td>
<td>3490</td>
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<td>(23)</td>
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<tr>
<td>Lighting Modification, inc. to flr.</td>
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<td>0.904</td>
<td>(15)</td>
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<tr>
<td>Warm Air Furnace (WAF) Timer</td>
<td>PC</td>
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<td>860.511</td>
<td>(34)</td>
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</table>

Supporting Facilities

Subtotal                                      |     |          |           | 314         |
Contingency (10%)                              |     |          |           | 31          |
Total Contract Cost                            |     |          |           | 345         |
Supervision, Inspection & Overhead (6.5%)      |     |          |           | 23          |
Total Request                                  |     |          |           | 368         |
Installed Equipment - Other Appropriations     |     |          |           | (0)         |

10. DESCRIPTION OF PROPOSED CONSTRUCTION

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° 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

2. DATE
11-19-80

3. INSTALLATION AND LOCATION
CAMP EDWARDS - KS 032, KOREA

4. PROJECT TITLE
ARCHITECTURAL & STRUCTURAL MODIFICATIONS (INCLUDING WARM AIR FURNACES)

5. PROGRAM ELEMENT
211,442,740,141,214, 550, Series

6. CATEGORY CODE

7. PROJECT NUMBER
550, Series

8. PROJECT COST ($000)
321

9. COST ESTIMATES

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<tr>
<td>Wall Insulation, Boards, R8</td>
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<td>Window Treatment, Double Pane</td>
<td>SF</td>
<td>327</td>
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<td>Window Treatment, Storm Window</td>
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<td>7550</td>
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<tr>
<td>Warm Air Furnace (WAF) Timer Installation</td>
<td>PC</td>
<td>10</td>
<td>860.511</td>
<td>(9)</td>
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</tbody>
</table>

10. DESCRIPTION OF PROPOSED CONSTRUCTION

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° 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 1984 MILITARY CONSTRUCTION PROJECT DATA

2. DATE
11-19-80

3. INSTALLATION AND LOCATION
CAMP PELHAM - KS 252, KOREA

4. PROJECT TITLE
ARCHITECTURAL & STRUCTURAL MODIFICATIONS (INCLUDING WARM AIR FURNACES)

5. PROGRAM ELEMENT
6. CATEGORY CODE
211, 131, 740, 141, 218, 219, 442, 550
7. PROJECT NUMBER
8. PROJECT COST ($000)
361

9. COST ESTIMATES

<table>
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<th>QUANTITY</th>
<th>UNIT</th>
<th>COST ($000)</th>
</tr>
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<tr>
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<td>Window Weather Stripping</td>
<td>LF</td>
<td>29</td>
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<tr>
<td>Window Treatment, Double Pane</td>
<td>SF</td>
<td>2608</td>
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<td>Window Treatment, Storm Window</td>
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10. DESCRIPTION OF PROPOSED CONSTRUCTION

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° 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 1984 MILITARY CONSTRUCTION PROJECT DATA

2. DATE
   11-19-80

3. INSTALLATION AND LOCATION
   CAMP PELHAM - KS 252

4. PROJECT TITLE
   ARCHITECTURAL & STRUCTURAL MODIFICATIONS (INCLUDING WARM AIR FURNACES)

5. PROJECT NUMBER

9. COST ESTIMATES (Continued)

   Supervision, Inspection and Overhead (6.5%)  22
   Total Request  361
   Installed Equipment - Other Appropriations  (0)

10. DESCRIPTION OF PROPOSED CONSTRUCTION (Continued)

4. Ceiling insulation, batts, R19, will be installed in 22 buildings.
5. Floor/basement insulation, batts, R13, will be installed in 1 building.
6. Door weather stripping will be installed in 38 buildings.
7. Window weather stripping will be installed in 1 building.
8. Window treatment, double pane, will be installed in 12 buildings.
9. Window treatment, storm window, will be installed in 23 buildings.
10. Lighting modification, inc. to flr. will be installed in 3 buildings.
11. Lighting modification, inc. to HPS, will be installed in 3 buildings.
12. WAF timer installation will be installed in 33 buildings.

11. REQUIREMENTS:

   PROJECT: The addition of wall, ceiling and floor/basement 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 21.5 mega BTU annual energy savings per thousand dollars cost, (E/C ratio), and a benefit-to-cost ratio (B/C ratio) of 7.7. Total annual energy savings is estimated at 7,769.2 mega BTU. A total dollar savings of $198,135 per year will result in a simple payback period of 1.8 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.
1. COMPONENT
ARMY

2. DATE
11-19-80

3. INSTALLATION AND LOCATION
SWISS SWEDE CAMP - KS 994, KOREA

4. PROJECT TITLE
ARCHITECTURAL & STRUCTURAL MODIFICATIONS (INCLUDING WARM AIR FURNACES)

5. PROGRAM ELEMENT
610, 141, 740 Series

6. CATEGORY CODE

7. PROJECT NUMBER
19

8. PROJECT COST ($000)
19

9. COST ESTIMATES

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<tr>
<th>ITEM</th>
<th>U/M</th>
<th>QUANTITY</th>
<th>UNIT COST</th>
<th>COST ($000)</th>
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<td>Primary Facility</td>
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<tr>
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<td>Window Treatment, Storm Window</td>
<td>SF</td>
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10. DESCRIPTION OF PROPOSED CONSTRUCTION

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 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 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
ARvY

2. DATE
11-19-80

3. INSTALLATION AND LOCATION
CAMP KITTYHAWK - KS 540, KOREA

4. PROJECT TITLE
ARCHITECTURAL STRUCTURAL MODIFICATIONS (INCLUDING WARM AIR FURNACES)

5. PROGRAM ELEMENT
740, 141, 218, 442,
730, 550, 610, Series

6. CATEGORY CODE
740, 141, 218, 442,
730, 550, 610, Series

7. PROJECT NUMBER
LM0DIFI-
AIRFURNACE3

8. PROJECT COST ($000)
97

9. COST ESTIMATES

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<th>COST ($000)</th>
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10. DESCRIPTION OF PROPOSED CONSTRUCTION
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° 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)

<table>
<thead>
<tr>
<th>1. DATE</th>
<th>2. FISCAL YEAR</th>
<th>3. DEPARTMENT</th>
<th>4. INSTALLATION</th>
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<td>11-13-80</td>
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<td>ARMY</td>
<td>CAMP HUMPHREYS - KS 792</td>
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<th>7. CATEGORY CODE NUMBER</th>
<th>8. PROGRAM ELEMENT NUMBER</th>
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<th>11. BUDGET ACCOUNT NUMBER</th>
<th>12. PROJECT NUMBER</th>
<th>13. PROJECT TITLE</th>
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SECTION A - DESCRIPTION OF PROJECT

<table>
<thead>
<tr>
<th>14. TYPE OF CONSTRUCTION</th>
<th>15. PHYSICAL CHARACTERISTICS OF PRIMARY FACILITY</th>
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</thead>
<tbody>
<tr>
<td>PERMANENT</td>
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<td>SEMIPERMANENT</td>
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<tr>
<td>TEMPORARY</td>
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<td>CONVERSION</td>
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<td>REPLACEMENT</td>
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<tr>
<td>TYPE OF DESIGN</td>
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<td>DRAWING NO.</td>
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</table>

- Wall insulation, boards, R8 in 48 buildings.
- Insulation, batts, R13 in 95 buildings.
- Ceiling insulation, batts, R19 in 28 buildings.
- Ceiling insulation, batts, R19 in 95 bldgs.
- Weather stripping for doors in 175 buildings.
- Weather stripping for windows in 2 buildings.
- Double pane windows in 28 buildings.
- Storm windows in 140 buildings.
- Translucent sandwich fenestration, (80%) in 7 bldgs.
- Lighting modification, inc to flr in 27 buildings.
- Lighting modification, inc to HPS in 15 buildings.

SECTION B - COST ESTIMATES

<table>
<thead>
<tr>
<th>16. PRIMARY FACILITY</th>
<th>17. QUANTITY</th>
<th>18. UNIT COST</th>
<th>19. COST ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. WALL INSULATION, BOARDS, R8</td>
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<td>2.894</td>
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<td>SF: 89,239</td>
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<td>D. CEILING INSULATION, BATTs, R19</td>
<td>SF: 96,304</td>
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<td>E. DOOR WEATHER STRIPPING</td>
<td>LF: 35,238</td>
<td>2.711</td>
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<td>F. WINDOW WEATHER STRIPPING</td>
<td>LF: 487</td>
<td>2.352</td>
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<td>G. WINDOW TREATMENT, DOUBLE PANE</td>
<td>LF: 10,200</td>
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<td>H. WINDOW TREATMENT, STORM WINDOW</td>
<td>LF: 17,759</td>
<td>6,782</td>
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<td>K. LIGHTING MOD., INC TO HPS</td>
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<td>L. LIGHTING MOD., M/V TO HPS</td>
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<td>0.921</td>
<td>209</td>
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<td>M. LIGHTING MOD., M/V TO HPS</td>
<td>W: 2,273</td>
<td>0.921</td>
<td>209</td>
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</table>

21. SUPPORTING FACILITIES

- TOTAL PROJECT COST: $1,502

SECTION C - BASIS OF REQUIREMENT

This project is required to meet stated goals of energy use reduction. It is submitted as part of the energy conservation investment program (ECIP). The addition of wall and ceiling insulation, window treatment, weather stripping, and lighting modifications will reduce winter heat loss and/or summer heat gain, thereby reducing energy consumption. This project will result in 21.4 mega BTU annual energy savings per thousand dollars cost, (E/C ratio), and a benefit-to-cost ratio (B/C ratio) of 7.4. Total annual energy savings is estimated at 32,168.1 mega BTU. A total dollar savings of $995,468 per year will result in a simple payback period of 2.2 years. 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.

DD FORM 1391 OCT 79

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FOR OFFICIAL USE ONLY (WHEN DATA IS ENTERED)

### MILITARY CONSTRUCTION PROJECT DATA

<table>
<thead>
<tr>
<th>1. DATE</th>
<th>2. FISCAL YEAR</th>
<th>3. DEPARTMENT</th>
<th>4. INSTALLATION</th>
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<td>1983</td>
<td>ARMY</td>
<td>CAMP HUMPHREYS - KS 792</td>
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<th>7. CATEGORY CODE NUMBER</th>
<th>8. PROGRAM ELEMENT NUMBER</th>
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<td>P.L.</td>
<td>530, 740, 730</td>
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<th>11. BUDGET ACCOUNT NUMBER</th>
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<tbody>
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<td>$314,000</td>
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### DESCRIPTION OF PROJECT

**PHYSICAL CHARACTERISTICS OF PRIMARY FACILITY**

- **PERMANENT**
  - NO. OF BLDGS: 50
  - SEE ATTACHED LIST
  - WIDTH: NA

- **SEMI-PERMANENT**
  - X
  - DESIGN CAPACITY: NA
  - GROSS AREA: NA

- **TEMPORARY**
  - Y
  - COOLING: NA
  - CAP: NA
  - COST ($): NA

**DESCRIPTION OF WORK TO BE DONE**

- **NEW FACILITY**
  - WORK will consist of the following modifications:
    1. Wall insulation, boards, R8 in 6 buildings.
    2. Wall insulation, batts, R13 in 32 buildings.
    3. Ceiling insulation, batts, R19 in 5 buildings.
    5. Weather stripping for doors in 40 buildings.

- **REPLACEMENT**
  - 9. Translucent sandwich fenestration (80%) in 2 bldgs.
  - 10. Lighting modification, inc. to FLR in 17 buildings.
  - 11. Lighting modification, inc. to HPS in 1 building.

**EQUIPMENT AND HARDWARE**

- 13. AIR CONDITIONING
  - 14. HEATING SYSTEMS
  - 15. WATER HEATING SYSTEMS
  - 16. PRESSURE SYSTEMS
  - 17. OTHER SYSTEMS

### COST ESTIMATES

<table>
<thead>
<tr>
<th>20. PRIMARY FACILITY</th>
<th>UOM</th>
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<th>UNIT COST</th>
<th>COST ($000)</th>
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<td>I. WINDOW TREATMENT, TSE 80%</td>
<td>SF</td>
<td>91</td>
<td>30.440</td>
<td>3</td>
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<tr>
<td>J. LIGHTING MODIFICATION, INC. TO FLR</td>
<td>W</td>
<td>41684</td>
<td>0.924</td>
<td>38</td>
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<tr>
<td>K. LIGHTING MODIFICATION, INC. TO HPS</td>
<td>W</td>
<td>16509</td>
<td>0.742</td>
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**BASIS OF REQUIREMENT**

- 21. SUPPORTING FACILITIES
  - 22. TOTAL PROJECT COST | $314

**REQUIREMENT FOR PROJECT**

<table>
<thead>
<tr>
<th>23. QUANTITATIVE DATA</th>
<th>UOM</th>
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<tr>
<td>A. TOTAL REQUIREMENT</td>
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<td></td>
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<tr>
<td>B. EXISTING SUBSTANDARD</td>
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<tr>
<td>C. EXISTING ADEQUATE</td>
<td></td>
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<tr>
<td>D. FUNDED, NOT IN INVENTORY</td>
<td></td>
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<tr>
<td>F. FUNDED ADEQUATE ASSETS (A + GI)</td>
<td></td>
<td></td>
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<tr>
<td>G. UNFUNDED PRIOR AUTHORIZATION</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H. AUTHORIZED FUNDED</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I. INCLUDED IN FY PROGRAM</td>
<td></td>
<td></td>
</tr>
<tr>
<td>J. DEFICIENCY IN B/C = 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>K. RELATED PROJECTS</td>
<td>NA</td>
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</table>

This project is required to meet stated goals of energy use reduction. It is submitted as part of the energy conservation investment program (ECIP). The addition of wall and ceiling insulation, window treatment, weather stripping, and lighting modifications will reduce winter heat loss and/or summer heat gain, thereby reducing energy consumption. This project will result in 24.2 mega BTU annual energy savings per thousand dollars cost, (E/C ratio), and a benefit-to-cost ratio (B/C ratio) of 6.1. Total annual energy savings is estimated at 7,610.5 mega BTU. A total dollar savings of $158,969 per year will result in a simple payback period of 2.0 years. If this project is not effected, energy will continue to be needlessly wasted, contrary to national goals. This project has been reviewed and has been determined that an EIS, pursuant to PL91-190 is not required.

DD FORM 11-70 1974 OTD 10 1391 FOR OFFICIAL USE, ONLY (WHEN DATA IS ENTERED) PAGE NO. 1
1. **COMPONENT**
   ARMY

2. **DATE**
   11-19-80

3. **INSTALLATION AND LOCATION**
   CAMP LONG - KS 208, KOREA

4. **PROJECT TITLE**
   ARCHITECTURAL & STRUCTURAL MODIFICATIONS (INCLUDING WARM AIR FURNACES)

5. **PROGRAM ELEMENT**
   211,131,740,141,214
   218,442,550,610,73C
   219 Series

6. **CATEGORY CODE**
   211,131,740,141,214
   218,442,550,610,73C
   219 Series

7. **PROJECT NUMBER**
   279

8. **PROJECT COST ($000)**
   279

9. **COST ESTIMATES**

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<tr>
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<th>QUANTITY</th>
<th>UNIT</th>
<th>COST</th>
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<td>8482</td>
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<td>238</td>
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<tr>
<td>Wall Insulation, Batts, R13</td>
<td>SF</td>
<td>42045</td>
<td>1.498</td>
<td>(24)</td>
</tr>
<tr>
<td>Ceiling Insulation, Batts, R19</td>
<td>SF</td>
<td>19563</td>
<td>1.147</td>
<td>(22)</td>
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<tr>
<td>Ceiling Insulation, Batts, R19</td>
<td>SF</td>
<td>41488</td>
<td>1.368</td>
<td>(57)</td>
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<tr>
<td>Door Weather Stripping</td>
<td>LF</td>
<td>7442</td>
<td>2.661</td>
<td>(20)</td>
</tr>
<tr>
<td>Window Weather Stripping</td>
<td>LF</td>
<td>28</td>
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<td>(0)</td>
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<tr>
<td>Window Treatment, Double Pane</td>
<td>SF</td>
<td>95</td>
<td>13.999</td>
<td>(1)</td>
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<tr>
<td>Window Treatment, Storm Window</td>
<td>SF</td>
<td>4002</td>
<td>6.657</td>
<td>(27)</td>
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<tr>
<td>Window Treatment, TSF (80%)</td>
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<td>40</td>
<td>29.882</td>
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<tr>
<td>Lighting Modification, inc. to Flr.</td>
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<td>865</td>
<td>0.904</td>
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<td>7442</td>
<td>0.728</td>
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<tr>
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<td>PC</td>
<td>19</td>
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</table>

**Supporting Facilities**

| Subtotal                           |      |          |           | 238    |
| Contingency (10%)                  |      |          |           | 24     |

10. **DESCRIPTION OF PROPOSED CONSTRUCTION**

   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° 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. COMPONENT
   ARMY
2. DATE
   11-19-80
3. INSTALLATION AND LOCATION
   CAMP LONG - KS 208, KOREA
4. PROJECT TITLE
   ARCHITECTURAL & STRUCTURAL MODIFICATIONS (INCLUDING WARM AIR FURNACES)
5. PROJECT NUMBER

<table>
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<tr>
<th>9. COST ESTIMATES (Continued)</th>
<th>5. PROJECT NUMBER</th>
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<tr>
<td>Total Contract Cost</td>
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<tr>
<td>Total Request</td>
<td>279</td>
</tr>
<tr>
<td>Installed Equipment - Other Appropriations</td>
<td>(0)</td>
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</tbody>
</table>

10. 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.
  11. Lighting modification, inc. to HPS will be installed in 5 buildings.
  12. WAF timer will be installed in 14 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 well as replacing existing lighting 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.
This project is required to meet stated goals of energy use reduction. It is submitted as part of the energy conservation investment program (ECIP). The addition of wall and ceiling insulation, window treatment, weather stripping and lighting modifications will reduce winter heat loss and/or summer heat gain, thereby reducing energy consumption. This project will result in 18.2 mega BTU annual energy savings per thousand dollars cost (E/C ratio), and a benefit-to-cost ratio (B/C ratio) of 7.0. Total annual energy savings is estimated at 3,565.2 mega BTU. A total dollar savings of $76,132 per year will result in a simple payback period of 2.6 years. If this project is not affected, 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.
This project is required to meet stated goals of energy use reduction. It is submitted as part of the energy conservation investment program (ECIP). The addition of wall and ceiling insulation, window treatment, weather stripping and lighting modifications will reduce winter heat loss and/or summer heat gain, thereby reducing energy consumption. This project will result in 19.2 mega BTU annual energy savings per thousand dollars cost, (E/C ratio); and a benefit-to-cost ratio (B/C ratio) of 9.0. Total annual energy savings is estimated at 15,102.1 mega BTU. A total dollar savings of $337,003 per year will result in a simple payback period of 2.3 years. 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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---

### MILITARY CONSTRUCTION PROJECT DATA

- **Date**: 11-13-80
- **Fiscal Year**: 1983
- **Department**: ARMY
- **Installation**: CAMP HENRY - KS 160
- **Category Code Number**: 211,141,214,610, 740, 131, 171, 219
- **Program Element Number**: 5100
- **State/Country**: KOREA
- **Project Number**: 5100
- **Budget Account Number**: 11

**Architectural & Structural Modifications**

### DESCRIPTION OF PROJECT

- **Type of Construction**: PERMANENT, SEMI-PERMANENT, TEMPORARY
- **Design Capacity**: NA
- **Cooling**: NA
- **Heating**: NA

**Physical Characteristics of Primary Facility**

| A. Wall Insulation, Boards, R8 | SF | 70145 | 2,899 | 203 |
| B. Wall Insulation, Batt, R13 | SF | 72342 | 1,529 | 110 |
| C. Ceiling Insulation, Batt, R19 | SF | 86466 | 1,169 | 101 |
| D. Ceiling Insulation, Batt, R19 | SF | 88191 | 1,393 | 123 |
| E. Floor/Basement Insulation, Batt, R13 | SF | 78600 | 0,924 | 74 |
| F. Door Weather Stripping | LF | 8062 | 2,711 | 24 |
| G. Window Weather Stripping | LF | 1392 | 2,352 | 3 |
| H. Window Treatment, Double Pane | SF | 2323 | 14,251 | 33 |
| I. Window Treatment, Storm Window | SF | 14362 | 6,782 | 97 |
| J. Window Treatment, TSE Box | SF | 290 | 30,441 | 9 |
| K. Lighting Mod., Inc to FLR | W | 10490 | 0,928 | 10 |
| L. Lighting Mod., Inc to HPS | W | 6097 | 0,742 | 5 |

**Supporting Facilities**

- **Total Project Cost**: $792

---

### QUANTITATIVE DATA

- **Total Requirement**: NA
- **Existing Sustandard**: 1
- **Deficiency**: NA
- **Related Projects**: NA

### REQUIREMENT FOR PROJECT

This project is required to meet stated goals of energy use reduction. It is submitted as part of the energy conservation investment program (ECIP). The addition of wall and ceiling insulation, floor/basement insulation, window treatment, weather stripping and lighting modifications will reduce winter heat loss and/or summer heat gain, thereby reducing energy consumption. This project will result in 20.4 mega BTU annual energy savings per thousand dollars cost (E/C ratio), and a benefit-to-cost ratio (B/C ratio) of 7.6. Total annual energy savings is estimated at 16,127.3 mega BTU. A total dollar savings of $355,254 per year will result in a simple payback period of 2.2 years. 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.
This project is required to meet stated goals of energy use reduction. It is submitted as part of the energy conservation investment program (ECIP). The addition of wall insulation, window treatment and weather stripping will reduce winter heat loss and/or summer heat gain, thereby reducing energy consumption. This project will result in 20.5 mega BTU annual energy savings per thousand dollars cost (E/C ratio), and a benefit-to-cost ratio (B/C ratio) of 5.8. Total annual energy savings is estimated at 972.1 mega BTU. A total dollar savings of $7,533 per year will result in a simple payback period of 2.7 years. If this project is not effected, energy will continue to be needlessly wasted, contrary to national goals. This project has been reviewed and has been determined that an EIS, pursuant to PL91-190 is not required.
## FOR OFFICIAL USE ONLY (WHEN DATA IS ENTERED)

<table>
<thead>
<tr>
<th>1. DATE</th>
<th>2. FISCAL YEAR</th>
<th>3. DEPARTMENT</th>
<th>4. INSTALLATION</th>
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<tbody>
<tr>
<td>11-13-80</td>
<td>1983</td>
<td>ARMY</td>
<td>CAMP WALKER - KS 300</td>
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<th>6. PRIOR AUTHORIZATION</th>
<th>7. CATEGORY CODE NUMBER</th>
<th>8. PROGRAM ELEMENT NUMBER</th>
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<td>$382,000</td>
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<td>211,610,740,131,141</td>
<td>214,219,550,730,442</td>
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<th>10. PROPOSED APPROPRIATION</th>
<th>11. BUDGET ACCOUNT NUMBER</th>
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### SECTION A - DESCRIPTION OF PROJECT

<table>
<thead>
<tr>
<th>14. TYPE OF CONSTRUCTION</th>
<th>15. DESCRIPTION OF WORK TO BE DONE</th>
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<tbody>
<tr>
<td></td>
<td>Work will consist of the following modifications:</td>
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<tr>
<td></td>
<td>1. Wall insulation, boards, R8 in 30 buildings.</td>
</tr>
<tr>
<td></td>
<td>2. Wall insulation, batts, R13 in 7 buildings.</td>
</tr>
<tr>
<td></td>
<td>3. Ceiling insulation, batts, R19 in 16 buildings.</td>
</tr>
<tr>
<td></td>
<td>4. Ceiling Ins. for Qnset huts, batts, R19 in 7 bdgs.</td>
</tr>
<tr>
<td></td>
<td>5. Weather stripping for doors in 43 buildings.</td>
</tr>
<tr>
<td></td>
<td>7. Double pane windows in 4 buildings.</td>
</tr>
<tr>
<td></td>
<td>8. Storm windows in 28 buildings.</td>
</tr>
<tr>
<td></td>
<td>10. Lighting modification, inc. to HPS in 1 building.</td>
</tr>
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</table>

### SECTION B - COST ESTIMATES

<table>
<thead>
<tr>
<th>20. PRIMARY FACILITY</th>
<th>21. SUPPORTING FACILITIES</th>
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</thead>
<tbody>
<tr>
<td><strong>A. WALL INSULATION, BOARDS, R8</strong></td>
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</tr>
<tr>
<td><strong>B. WALL INSULATION, BATTs, R=13</strong></td>
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<td><strong>C. CEILING INSULATION, BATTs, R=19</strong></td>
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<tr>
<td><strong>D. CEILING INSULATION, BATTs, R=19</strong></td>
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</tr>
<tr>
<td><strong>E. DOOR WEATHER STRIPPING</strong></td>
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<tr>
<td><strong>F. WINDOW WEATHER STRIPPING</strong></td>
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</tr>
<tr>
<td><strong>G. WINDOW TREATMENT, DOUBLE PANE</strong></td>
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<tr>
<td><strong>H. WINDOW TREATMENT, STORM WINDOW</strong></td>
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<tr>
<td><strong>I. LIGHTING MOD, INC. TO HPS</strong></td>
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<td><strong>J. LIGHTING MOD, INC. TO HPS</strong></td>
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<td><strong>K. LIGHTING MOD, INC. TO HPS</strong></td>
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<tr>
<td><strong>L. LIGHTING MOD, INC. TO HPS</strong></td>
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</table>

### SECTION C - BASIS OF REQUIREMENT

This project is required to meet stated goals of energy use reduction. It is submitted as part of the energy conservation investment program (ECIP). 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. This project will result in 20.7 mega BTU annual energy savings per thousand dollars cost, (E/C ratio) and a benefit-to-cost ratio (B/C ratio) of 5.6. Total annual energy savings is estimated at 7,927.4 mega BTU.

A total dollar savings of $172,737 per year will result in a simple payback period of 2.2 years. 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 1984 MILITARY CONSTRUCTION PROJECT DATA

3. INSTALLATION AND LOCATION
HIALEAH FH - KS 456, KOREA

4. PROJECT TITLE
ARCHITECTURAL STRUCTURAL MODIFICATIONS (INCLUDING DOMESTIC HOT WATER HEATERS)

5. PROGRAM ELEMENT
711 Series

6. CATEGORY CODE
711 Series

7. PROJECT NUMBER
343

8. PROJECT COST ($000)

9. COST ESTIMATES

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<th>COST ($000)</th>
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<tr>
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<td>(145)</td>
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<td>Door Weather Stripping</td>
<td>LF</td>
<td>2202</td>
<td>2.661</td>
<td>(6)</td>
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<tr>
<td>Window Treatment, Storm Window</td>
<td>SF</td>
<td>15236</td>
<td>6.657</td>
<td>(101)</td>
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<td>Installed Equipment - Other Appropriations</td>
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<td></td>
<td>(0)</td>
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10. DESCRIPTION OF PROPOSED CONSTRUCTION

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 1984 MILITARY CONSTRUCTION PROJECT DATA

2. DATE

11-19-80

3. INSTALLATION AND LOCATION

HIALEAH - KS 456, KOREA

4. PROJECT TITLE

ARCHITECTURAL MODIFICATION (INCLUDING WARM AIR FURNACE)

5. PROGRAM ELEMENT

211, 131, 214, 740, 218, 442, 510, 610, 730

6. CATEGORY CODE

7. PROJECT NUMBER

572

8. PROJECT NUMBER

9. COST ESTIMATES

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<th>COST (S000)</th>
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<tr>
<td>Door Weather Stripping</td>
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<td>2.661</td>
<td>(23)</td>
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<tr>
<td>Window Weather Stripping</td>
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<td>1762</td>
<td>2.310</td>
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<tr>
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<td>6531</td>
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</table>

10. DESCRIPTION OF PROPOSED CONSTRUCTION

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 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 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

2. DATE
11-19-80

3. INSTALLATION AND LOCATION
YONGSAN GARRISON - KS 948, KOREA

4. PROJECT TITLE
MODIFICATION FOR INSTALLATION OF CLOCK THERMOSTAT W/ OUTSIDE AIR THERMOSTAT OVERRIDE

5. PROGRAM ELEMENT
6. CATEGORY CODE
131, 141, 171, 214, 217, 218, 219, 510, 530, 540, 550, 610, 730, 740, 841, 842 Series

7. PROJECT NUMBER
8. PROJECT COST ($000)

9. COST ESTIMATES

<table>
<thead>
<tr>
<th>ITEM</th>
<th>U/M</th>
<th>QUANTITY</th>
<th>UNIT COST</th>
<th>COST ($)</th>
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<tr>
<td>Primary Facility</td>
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<td>Clock Thermostat with Outside Air Thermostat Override</td>
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<td>171</td>
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<td>Installed Equipment - Other Appropriations</td>
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</table>

10. DESCRIPTION OF PROPOSED CONSTRUCTION

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.
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, dishwasher 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

2. DATE
11-19-80

3. INSTALLATION AND LOCATION
YONGSAN GARRISON - KS 948, KOREA

4. PROJECT TITLE
MODIFICATION FOR MILITARY WASTE HEAT RECOVERY

5. PROGRAM ELEMENT
74021

6. CATEGORY CODE

7. PROJECT NUMBER
52

8. PROJECT COST ($000)

9. COST ESTIMATES

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</tbody>
</table>

10. DESCRIPTION OF PROPOSED CONSTRUCTION

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 1 building.

11. REQUIREMENT:
PROJECT: Installation of a heat recovery coil will save energy by utilizing the
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.
3. INSTALLATION AND LOCATION
YONGSAN GARRISON (FH) - KS 948, KOREA

4. PROJECT TITLE
MODIFICATION FOR
DOMESTIC HOT WATER HEATER REPLACE-
MENT

5. PROGRAM ELEMENT
Army FY 1984 MILITARY CONSTRUCTION PROJECT DATA

6. CATEGORY CODE
711 Series

7. PROJECT NUMBER
8. PROJECT COST ($000)
668

9. COST ESTIMATES

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<th>UNIT</th>
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</table>

10. DESCRIPTION OF PROPOSED CONSTRUCTION
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. REQUIREMENT:
PROJECT: The addition of oil fired water heaters and associated trim to replace electric water heaters will reduce electrical consumption.
1. COMPONENT
ARMY

2. DATE
11-19-80

3. INSTALLATION AND LOCATION
YONGSAN GARRISON - KS 948, KOREA

4. PROJECT TITLE
MODIFICATION FOR ENERGY MONITOR & CONTROL SYSTEM

5. PROGRAM ELEMENT
740, 510, 610, 620
821 SERIES

6. CATEGORY CODE
740, 510, 610, 620
821 SERIES

7. PROJECT NUMBER
EF

8. PROJECT COST ($000)
1,691

9. COST ESTIMATES

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</table>

10. DESCRIPTION OF PROPOSED CONSTRUCTION
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

2. DATE
11-19-80

3. INSTALLATION AND LOCATION
K-16 AIRFIELD - KS 508, KOREA

4. PROJECT TITLE
MODIFICATION FOR INSTALLATION OF CLOCK THERMOSTAT W/ OUTSIDE AIR THERMOSTAT OVERRIDE

5. PROGRAM ELEMENT
740,141,131,730, 219,214,550 Series

6. CATEGORY CODE
740,141,131,730, 219,214,550 Series

7. PROJECT NUMBER
8

8. PROJECT COST ($000)

9. COST ESTIMATES

<table>
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<tr>
<th>ITEM</th>
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<th>UNIT COST</th>
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<tbody>
<tr>
<td>Primary Facility</td>
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<tr>
<td>Clock Thermostats with Outside Air Thermostat Override</td>
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<td>Contingency (10%)</td>
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10. DESCRIPTION OF PROPOSED CONSTRUCTION
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.
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:
PROJECT: 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 (WHEN DATA IS ENTERED)

<table>
<thead>
<tr>
<th>1. DATE</th>
<th>2. FISCAL YEAR</th>
<th>3. MILITARY CONSTRUCTION PROJECT DATA</th>
<th>4. INSTALLATION</th>
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<td>11-19-80</td>
<td>1983</td>
<td>CAMP HUMPHREYS - KS 792</td>
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**6. PROPOSED AUTHORIZATION**

- Amount: $125,000
- Method: P.L.
- Account: 722 and 821

**8. PROPOSED APPROPRIATION**

- Amount: $125,000
- Account: 6100

#### SECTION A - DESCRIPTION OF PROJECT

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<th>Physical Characteristics of Primary Facility</th>
<th>Section B - Cost Estimates</th>
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**Section C - Basis of Requirement**

- This project is required to meet stated goals of energy use reduction. It is submitted as part of the energy conservation investment program (ECIP). Installation of O2 trim controls will save fuel by automatically correcting the air/fuel ratio to account for variations in load, temperature, humidity and pressure. This project will result in a 31.6 mega BTU annual energy savings per thousand dollars cost, and a benefit-to-cost ratio of 10.8. Total annual energy savings is estimated at 3,946 mega BTU. A total dollar savings of 89,614 per year will result in a simple payback period of 1.4 years. If this project is not affected, 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 PL 91-190 is not required.
Buildings at Camp Humphreys are to be modified to achieve improved energy conservation.

Installation of this system, which includes a cleanable heat exchanger, dishwasher 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.
1. COMPONENT

Army

2. DATE

11-19-80

3. INSTALLATION AND LOCATION

Camp Carroll - KS 116, Korea

4. PROJECT TITLE

Modification for Installation of Clock Thermostat W/ Outside Air Thermostat Override

5. PROGRAM ELEMENT

740, 610, 872, 141, 841, 219, 730, 214, 843, 171, 217, 218 Series

6. CATEGORY CODE

7. PROJECT NUMBER

8. PROJECT COST ($000)

43

9. COST ESTIMATES

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<th>COST ($000)</th>
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<tbody>
<tr>
<td>Primary Facility</td>
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</tr>
<tr>
<td>Clock Thermostat with Outside Air Thermostat Override</td>
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10. DESCRIPTION OF PROPOSED CONSTRUCTION

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
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<tr>
<th>1. DATE</th>
<th>11-19-80</th>
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<th>1983</th>
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<td>4. INSTALLATION</td>
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</tr>
<tr>
<td>5. PROPOSED AUTHORIZATION</td>
<td>$ 50,000</td>
<td>6. PRIOR AUTHORIZATION</td>
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<td>7. CATEGORY CODE NUMBER</td>
<td>821</td>
<td>8. PROGRAM ELEMENT NUMBER</td>
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<td>9. STATE/COUNTRY</td>
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<td>10. PROPOSED APPROPRIATION</td>
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<td>11. BUDGET ACCOUNT NUMBER</td>
<td>6100</td>
<td>12. PROJECT NUMBER</td>
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<tr>
<td><strong>SECTION A - DESCRIPTION OF PROJECT</strong></td>
<td></td>
<td><strong>SECTION B - COST ESTIMATES</strong></td>
<td></td>
</tr>
<tr>
<td>14. TYPE OF CONSTRUCTION</td>
<td></td>
<td>20. PRIMARY FACILITY</td>
<td></td>
</tr>
<tr>
<td>a. PERMANENT</td>
<td></td>
<td>A. BOILER O₂ TRIM CONTROLS</td>
<td></td>
</tr>
<tr>
<td>b. SEMI-PERMANENT</td>
<td></td>
<td>EA</td>
<td>2</td>
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<tr>
<td>c. TEMPORARY</td>
<td></td>
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</tr>
<tr>
<td>15. TYPE OF WORK</td>
<td>16. DESCRIPTION OF WORK TO BE DONE</td>
<td>21. SUPPORTING FACILITIES</td>
<td></td>
</tr>
<tr>
<td>Install O₂ trim controls on 2 boilers in the buildings noted. The project included installation of an O₂ sensor, analyser, controller, control panel and modification of modulating motor linkage for air/fuel control on each boiler.</td>
<td></td>
<td></td>
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<tr>
<td>Bldg. (2) at S1025 82120</td>
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<tr>
<td><strong>SECTION C - BASIS OF REQUIREMENT</strong></td>
<td></td>
<td><strong>22. TOTAL PROJECT COST</strong></td>
<td>$ 50</td>
</tr>
<tr>
<td>23. QUANTITATIVE DATA</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>a. TOTAL REQUIREMENT</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>b. EXISTING SUBSTANDARD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c. EXISTING ADEQUATE</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>d. FUNDED, NOT IN INVENTORY</td>
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<tr>
<td>e. ADEQUATE ASSETS (c + d)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>f. UNFUNDED PRIOR AUTHORIZATION</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>g. INCLUDED IN FY PROGRAM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>h. DEFICIENCY (e + f - g)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>i. RELATED PROJECTS</td>
<td>NA</td>
<td></td>
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</tr>
</tbody>
</table>

This project is required to meet stated goals of energy use reduction. It is submitted as part of the energy conservation investment program (ECIP). Installation of O₂ trim controls will save fuel by automatically correcting the air/fuel ratio to account for variations in load, temperature, humidity and pressure. This project will result in 29.1 mega BTU annual energy savings per thousand dollars cost, and a benefit-to-cost ratio of 9.9. Total annual energy savings is estimated at 1,452 mega BTU. A total dollar savings of 32,998 per year will result in a simple payback period of 1.5 years. 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 PL 91-190 is not required.
1. COMPONENT
ARMY
2. DATE
11-19-80
3. INSTALLATION AND LOCATION
CAMP CARROLL - KS 116, KOREA
4. PROJECT TITLE
MODIFICATIONS OF DISHWASHER HEAT RECOVERY
5. PROGRAM ELEMENT
72210
6. CATEGORY CODE
72210
7. PROJECT NUMBER
10
8. PROJECT COST ($000)
10

9. COST ESTIMATES

<table>
<thead>
<tr>
<th>ITEM</th>
<th>U/M</th>
<th>QUANTITY</th>
<th>UNIT COST</th>
<th>COST ($000)</th>
</tr>
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<tbody>
<tr>
<td>Primary Facility</td>
<td>EA</td>
<td>1</td>
<td>8130</td>
<td>(8)</td>
</tr>
<tr>
<td>Dishwasher Waste Heat Recovery System (1000-Man Mess)</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supporting Facilities</td>
<td></td>
<td></td>
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<tr>
<td>Subtotal</td>
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<td></td>
</tr>
<tr>
<td>Contingency (10%)</td>
<td></td>
<td></td>
<td></td>
<td>(8)</td>
</tr>
<tr>
<td>Total Contract Cost</td>
<td></td>
<td></td>
<td></td>
<td>(1)</td>
</tr>
<tr>
<td>Supervision, Inspection and Overhead (6.5%)</td>
<td></td>
<td></td>
<td></td>
<td>(9)</td>
</tr>
<tr>
<td>Total Request</td>
<td></td>
<td></td>
<td></td>
<td>(10)</td>
</tr>
<tr>
<td>Installed Equipment - Other Appropriations</td>
<td></td>
<td></td>
<td></td>
<td>(0)</td>
</tr>
</tbody>
</table>

10. DESCRIPTION OF PROPOSED CONSTRUCTION

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

Installation of this system, which includes a cleanable heat exchanger, dishwasher 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
   ARMY

2. DATE
   11-19-80

3. INSTALLATION AND LOCATION
   CAMP HENRY - KS 160, KOREA

4. PROJECT TITLE
   MODIFICATION FOR INSTALLATION OF CLOCK THERMOSTAT WITH OUTSIDE AIR THERMOSTAT OVERRIDE

5. PROGRAM ELEMENT
   610, 740, 219, 141, 131, 730, 214, 171 Series

6. CATEGORY CODE

7. PROJECT NUMBER
   78

8. PROJECT COST ($000)

9. COST ESTIMATES

<table>
<thead>
<tr>
<th>ITEM</th>
<th>U/M</th>
<th>QUANTITY</th>
<th>UNIT COST</th>
<th>COST ($000)</th>
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<tbody>
<tr>
<td>Primary Facility</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Clock Thermostats with outside air thermostat override</td>
<td>EA</td>
<td>77</td>
<td>861.40</td>
<td>(66)</td>
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<td>Supporting Facilities</td>
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<td>Subtotal</td>
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<td>Contingency (10%)</td>
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<td>Installed Equipment - Other Appropriations</td>
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<td>(0)</td>
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</tbody>
</table>

10. DESCRIPTION OF PROPOSED CONSTRUCTION

   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
ARMY

2. DATE
11-19-80

3. INSTALLATION AND LOCATION
CAMP WALKER - KS 300, KOREA

4. PROJECT TITLE
MODIFICATION FOR INSTALLATION OF CLOCK THERMOSTAT WITH OUTSIDE AIR THERMOSTAT OVERRIDE

5. PROGRAM ELEMENT
6. CATEGORY CODE
730, 141, 610, 740, 540, 121, 550, 841, 872, 861, 211, 214, 530, 219, Series

7. PROJECT NUMBER
8. PROJECT COST ($000)
48

9. COST ESTIMATES

<table>
<thead>
<tr>
<th>ITEM</th>
<th>U/M</th>
<th>QUANTITY</th>
<th>UNIT</th>
<th>COST ($000)</th>
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<tbody>
<tr>
<td>Primary Facility</td>
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<td></td>
</tr>
<tr>
<td>Clock thermostats with outside air thermostat override</td>
<td>EA</td>
<td>48</td>
<td>861.40</td>
<td>(41)</td>
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<tr>
<td>Supporting Facilities</td>
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<td>Subtotal</td>
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<td>Supervision, Inspection &amp; Overhead (6.5%)</td>
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<td>Installed Equipment - Other Appropriations</td>
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<td>(0)</td>
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</table>

10. DESCRIPTION OF PROPOSED CONSTRUCTION
Buildings at Camp Walker are to be modified to achieve improved energy conservation.

Install 7-day time clock with set-back feature, spring backup (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.

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

2. DATE
11-19-80

3. INSTALLATION AND LOCATION
CAMP WALKER - KS 300, KOREA

4. PROJECT TITLE
MODIFICATION FOR DRYWASHER HEAT RECOVERY

5. PROGRAM ELEMENT

6. CATEGORY CODE
72210

7. PROJECT NUMBER

8. PROJECT COST ($000)
10

9. COST ESTIMATES

<table>
<thead>
<tr>
<th>ITEM</th>
<th>U/M</th>
<th>QUANTITY</th>
<th>UNIT COST</th>
<th>COST ($000)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary Facility</td>
<td>Dishwasher Waste Heat Recovery Systems, 1000-Man Mess</td>
<td>EA</td>
<td>1</td>
<td>8130</td>
</tr>
<tr>
<td>Supporting Facilities</td>
<td>Subtotal</td>
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<td></td>
<td>Total Contract Cost</td>
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<td>Supervision, Inspection and Overhead (6.5%)</td>
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<td>Total Request</td>
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<td></td>
<td>Installed Equipment - Appropriations</td>
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<td>(0)</td>
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</table>

10. DESCRIPTION OF PROPOSED CONSTRUCTION

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

2. DATE
11-19-80

3. INSTALLATION AND LOCATION
CAMP WALKER (FH) - KS 300, KOREA

4. PROJECT TITLE
MODIFICATION FOR DOMESTIC HOT WATER HEATER REPLACEMENT

5. PROGRAM ELEMENT
711 Series

6. CATEGORY CODE

7. PROJECT NUMBER
264

8. PROJECT COST ($000)
264

9. COST ESTIMATES

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</table>

10. DESCRIPTION OF PROPOSED CONSTRUCTION
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.