

PN-ARE-914

**PROEXAG**

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P R O E X A G  
NON-TRADITIONAL AGRICULTURAL EXPORT SUPPORT PROJECT

ASSESSMENT OF HONDURAS COOLING SYSTEMS  
FOR MELON, SQUASH AND CUCUMBERS

Assignment Number: ST/89-13B  
Contract Number: 596-0108-C-00-6060-00

SUBMITTED TO:

Regional Office for Central America and Panama (ROCAP)  
U.S. Agency for International Development  
Guatemala City, Guatemala

SUBMITTED BY:

Lowell Flowers

through

Chemonics International Consulting Division  
2000 M Street, Northwest  
Suite 200  
Washington, D.C. 20036

May 1989

#### I. DATES OF ASSIGNMENT

This assignment took place in May 1989.

#### II. PURPOSE

Cucurbits represent one of PROEXAG's priority crop groups. Therefore the proper cooling of cucurbits at the packing shed is an important area of work for the Project. Observations made by John Guy Smith and Ricardo Frohmader on various trips to Honduras, as well as feedback from U.S. receivers, indicate that the lack of prompt, efficient cooling is one of the major constraints to successful export of Honduran cucurbits.

#### III. SCOPE OF WORK

Travel to Honduras to visit, with FEPROEXAAH personnel, the packing operations assisted and/or financed by FEPROEXAAH. Assess the adequacy of these facilities, making recommendations on possible improvements through repair, upgrading or the purchase and installation of new equipment. Options should include hydrocooling, forced air cooling and slush ice cooling.

#### IV. PERSONS CONTACTED

Visits were made to the packing plants of the following companies during the assessment:

- PRODENZA
- AGROPECUARIA MONTE LIBANO
- VILLANUEVA
- COAGROVAL
- CREHSUI

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Honduras Trip

Miguel Molina

This is a very well designed facility. It is properly insulated and refrigerated!

The air cooled condensing units have a shed type roof built over them. This is causing heated air from the discharge to be recirculated back into the intake. This causes reduced capacity and a higher power bill. It was requested of them to remove the sections of roof that are directly over the units.

In a meeting with Miguel, a new precooling and cold storage was discussed. I am to develop plans and specifications and meet with Mr. Molino in Pompano, FL on Monday May 8, 1989.

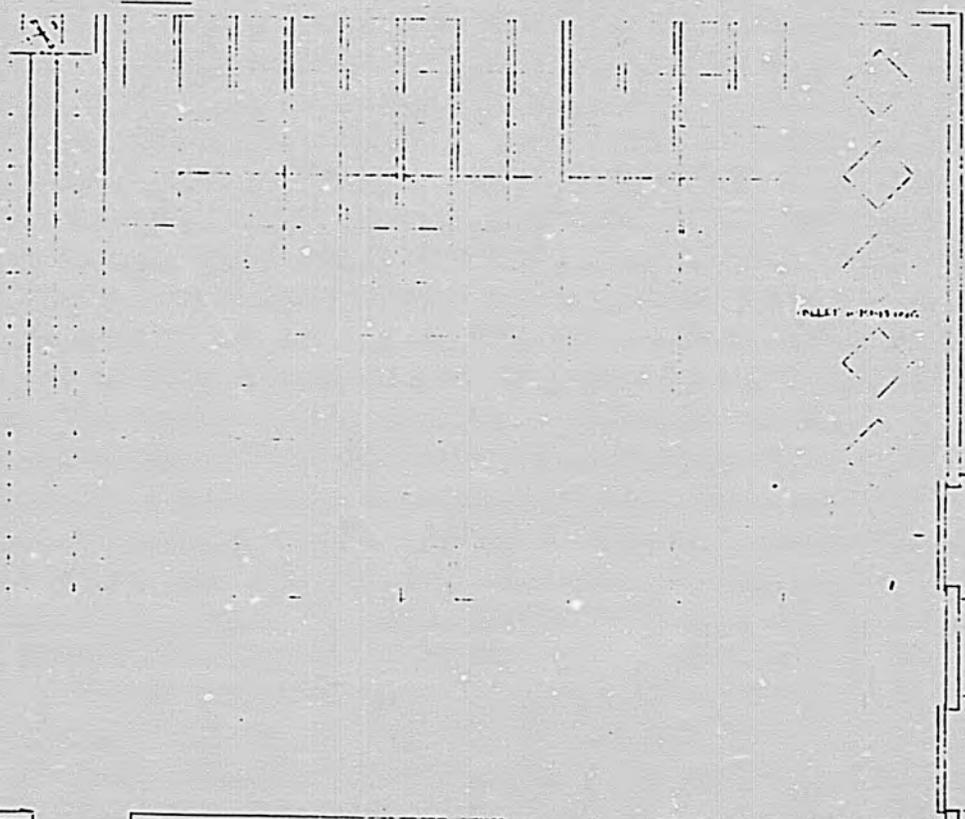
New facility plan included with report. One copy delivered directly to Mr. Molina.

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10' 0" 1/2" SCALE

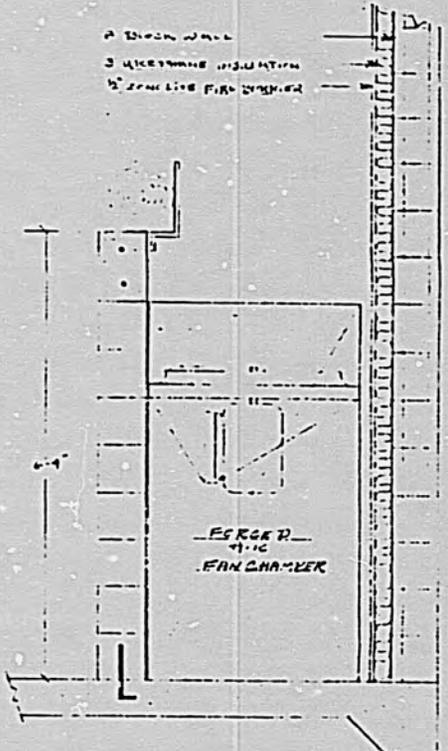


120'-0" 62'-6"

2'-0" 1/2" SCALE



- 1. 2" BRICK WALL
- 2. 1/2" GYPSUM BOARD
- 3. 1/2" ZINC PLATE FINISH



ELEVATION FERRIS SYSTEM 1/2" = 1'-0"

4-

<b>MIGUEL MOLINO</b>	
DRAWN BY	DATE
NO. 5-6-83	1983
<b>COOLING FACILITY</b>	
PALM BEACH REFRIGERATION CO.	

Honduras

PRODENZA - This facility has a hydrocooler constructed by American Conveyor Corporation. The hydrocooler appears to be inadequate for the duty required. The hydrocooler will contain approximately 100 wire bound packages of melons. From information available, this cooler was supposed to handle approximately 300 packages per hour. If it can be assumed that this is correct, the cooler is too short to handle this volume. The conveyor speed is too fast and there is insufficient refrigeration capacity.

Hydrocooling requires properly refrigerated water and a proper length of product exposure to the water. In this case, 33° to 34° water is desirable and a 40 to 45 minute exposure to the water is required to properly cool melons.

It is not economically feasible to alter this hydrocooler to do an adequate job at the volume required. It was suggested that they move this hydrocooler to another smaller volume location they are considering. A forced air system can be incorporated into their new proposed cold storage room that is proposed for the Prodenza plant.

This is an example of the need for proper specifications for a cooling system before the purchase is made. All too often the vendor's judgment prevails and all too often it's wrong.

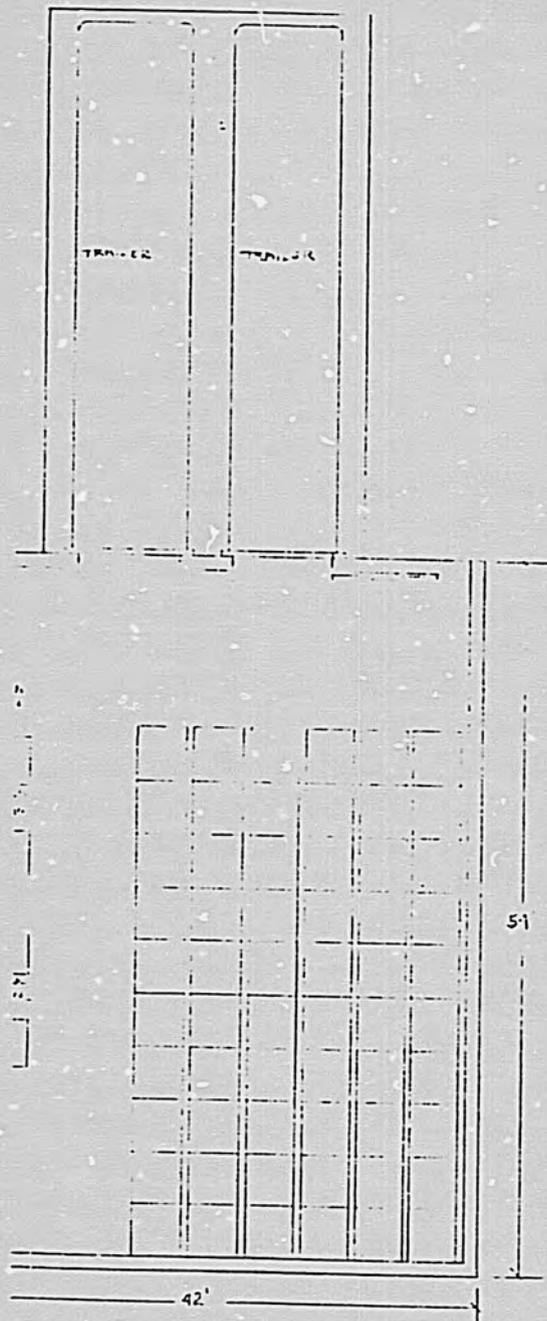
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Honduras

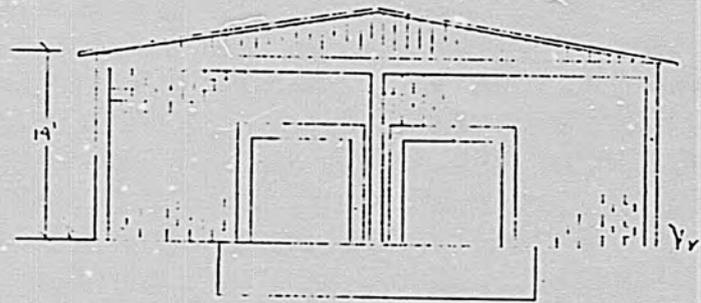
VILLANUEVA - This plant appears to be well organized and efficient. The owners recently purchased a slightly used hydrocooler that was constructed by Clarksville Machine Works. The hydrocooler has 60 tons of refrigeration on it which is very adequate to cool the proposed volume of melons. The refrigeration is just being installed and I was not able to check it out. The installation thus far appears correct.

The plant is in need of a cold storage room of approximately three (3) truckload capacity. A plan is submitted with this report.

-END OF REPORT -



D STORAGE FLOOR PLAN SCALE 3/16"=1'-0"



TRUCK LOADING ELEVATION SCALE 3/16"=1'-0"

VILLANUEVA  
 ARCHITECT  
 COLD STORAGE PL.

## HONDURAS

COAGROVAL - This facility is desperately in need of upgrading.

INSULATION - While serviceable, needs to be improved as funds become available.

This cold storage room, for the duty required, should have a minimum thickness of 3" of polyurethane insulation. The existing insulation, where tested, was approximately 1½" thick. Another 1½" could be applied directly to the existing insulation to bring it up to par.

Exposed polyurethane insulation, with an adequate ignition source, will burn, contribute fuel to a fire and create toxic smoke. A minimum thickness of ½" zonolite 3300 or ½" of plaster applied directly to the foam insulation will provide a 15 minute thermal barrier.

The approximate cost of the additional 1½" of insulation is \$7200.00 U.S. funds. The approximate cost of the thermal barrier using zonolite 3300 is \$7680.00 U.S. funds.

REFRIGERATION - The existing refrigeration consists of used railcar refrigeration units. Each unit is powered by it's own used railcar generator. Each of the six operable units developed approximately 7 tons refrigeration capacity when they were new. A fair estimate of the capacity of each unit now is 6 tons.

A plan was discussed to construct a divider wall partitioning off the cold storage area from a newly refrigerated precooling area. All of the existing refrigeration units are to be dedicated to refrigerating the cold storage area.

Three new forced air systems are to be constructed and new refrigeration capacity is to be installed in the precooling area. I will develop prices on this modification and the required equipment.

A generator must be purchased to provide electrical power to the new precooler refrigeration and forced air systems.

-END OF REPORT-



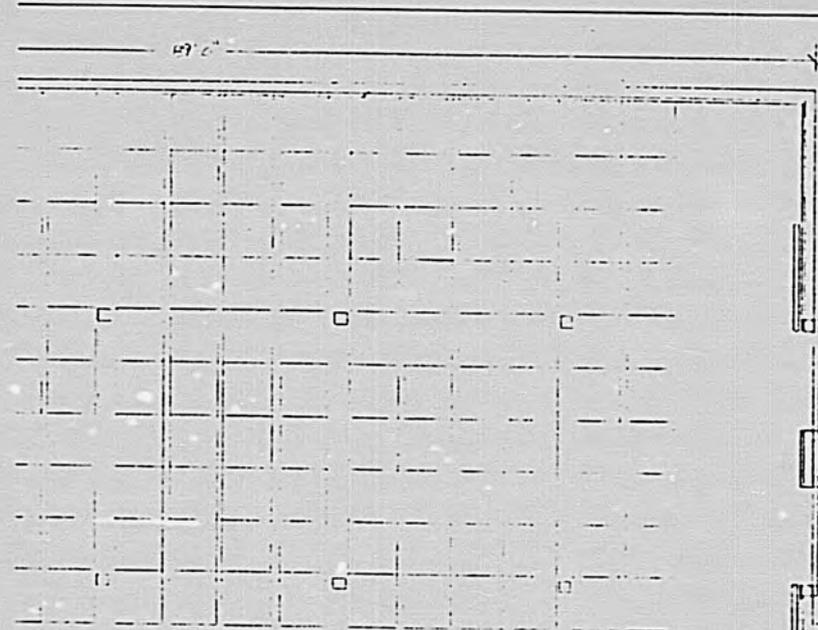
## CREHSUL

This facility has a hydrocooler that is equipped with the proper capacity of refrigeration. They are experiencing some difficulty maintaining proper water temperatures during melon season. Upon inspection of the system, it was discovered that the cooling coils were not installed properly. A sketch of the required revisions were given to the plant manager for corrections by a local refrigeration service man.

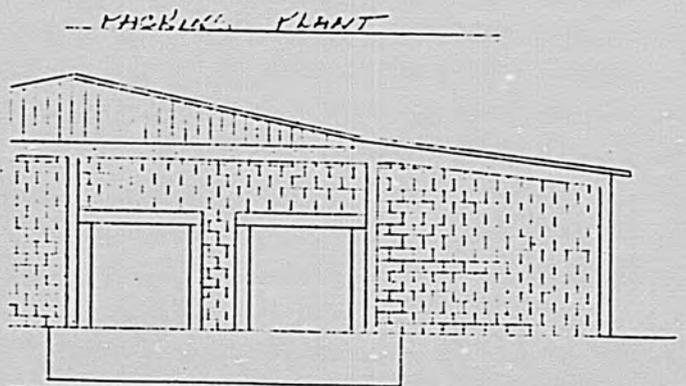
Crehsul plans to construct a cold storage facility to contain 6,000 to 10,000 packages of melons depending on construction costs and available funds. There exists a building presently covering the hydrocooler that can be incorporated into the new room construction. The present plans are to move the hydrocooler into the melon line to facilitate bulk cooling and packing in cartons.

The costs of the cold storage construction will vary with the size of room selected. I will develop various prices based on owner selection. A plan for a 9,000 package is supplied with report.

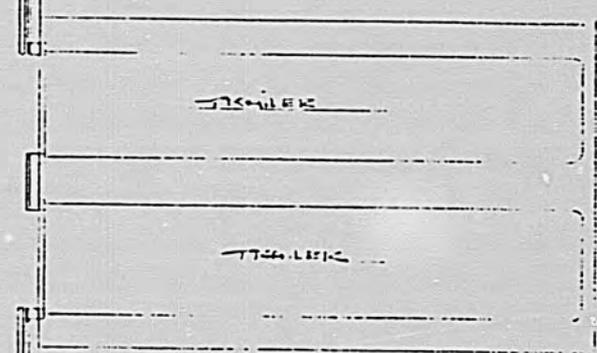
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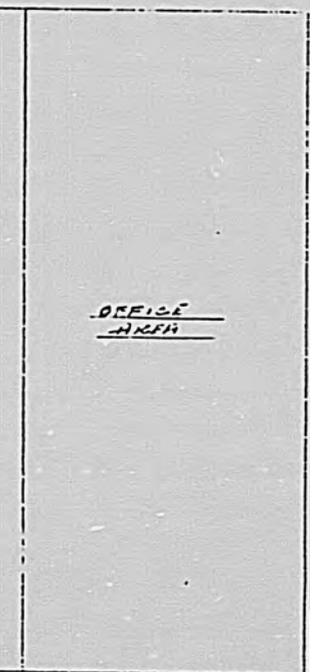
PLAN HEAD COUNTER 31' x 76" x 10"



ELEVATION SIDE 31' x 76" x 10"



NOTE:  
 1. ALL PACKAGING ROOMS - 57' LONG x 61' WIDE  
 2. ALL PACKAGING ROOMS - 21' LONG x 61' WIDE  
 3. ALL PACKAGING ROOMS - 21' LONG x 61' WIDE  
 4. ALL PACKAGING ROOMS - 21' LONG x 61' WIDE



OFFICE AREA

CREHSUL  
 31' x 76" x 10"  
 5-7-81  
 COLD STORAGE

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