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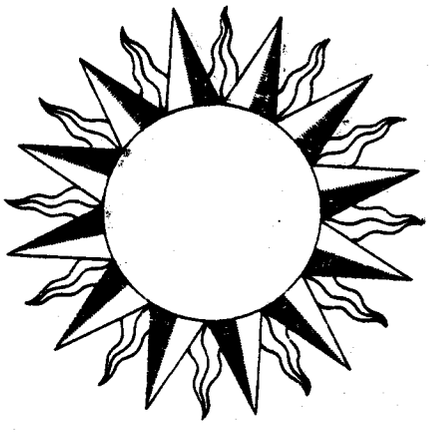
Residential Solar Data Center: Data Dictionary/Directory

U.S. DEPARTMENT OF COMMERCE
National Bureau of Standards
Center for Building Technology
Building Economics and Regulatory
Technology Division
Washington, DC 20234

August 1981



Prepared for:
U.S. Department of Housing and Urban Development
Division of Energy, Building Technology and Standards
Washington, DC 20410

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U.S. DEPARTMENT OF COMMERCE, Malcolm Baldrige, *Secretary*
NATIONAL BUREAU OF STANDARDS, Ernest Ambler, *Director*

PREFACE

This document describes and defines the individual data elements which have been collected into a computerized data base, managed and operated by the NBS Solar Data Center (SDC) for the Department of Housing and Urban Development (HUD). It is being made available to document the data which have been collected by HUD over the last four years in the Residential Solar Demonstration Program.

This is not meant to be a stand-alone document. It should be used along with Data Resources and Reports [8]* and the final computer listings of the SDC files [9]. The former publication summarizes the history and background of the SDC, gives a list of the final computer reports available, and describes the data files which comprise the SDC data base. The latter reference is to the final computer reports which use these data files.

It is hoped that the three documents will work together to give the uninitiated user a clear picture of the data being documented. The three documents together form a package which is the final report to HUD of the four-year data base project.

*Numbers in brackets [ ] refer to references on page 94.

Residential Solar Data Center:

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RESIDENTIAL SOLAR DATA CENTER:

DATA DICTIONARY/DIRECTORY

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ABSTRACT

The Residential Solar Data Center project staff in the Center for Building Technology, National Bureau of Standards, maintains a computerized data base containing non-instrumented residential data from the DoE/HUD Solar Heating and Cooling Demonstration Program. This document provides a dictionary of data elements collected as part of the Residential Solar Program and a directory of the specific files which contain the data elements. This data dictionary/directory was produced by a computer program written in ASCII COBOL. The automated procedure is briefly described in an appendix.

Key Words: Automatic data processing; data dictionary/directory; residential buildings; solar data; solar energy system; solar heating and cooling.

1. INTRODUCTION

1.1 Background

The Residential Solar Data Center (SDC) of the National Bureau of Standards is responsible for the establishment and operation of an automated data base containing non-instrumented (i.e., not collected by instruments but through interviews and forms), residential solar data collected as part of the Residential Solar Heating and Cooling Demonstration Program which is managed by the Department of Housing and Urban Development (HUD).

Data collection contractors to HUD collect and forward data to the SDC where a solar data base (shown in figure 1, page 2) is stored on the NBS Univac 1108 compter. This data base consists of the following files:

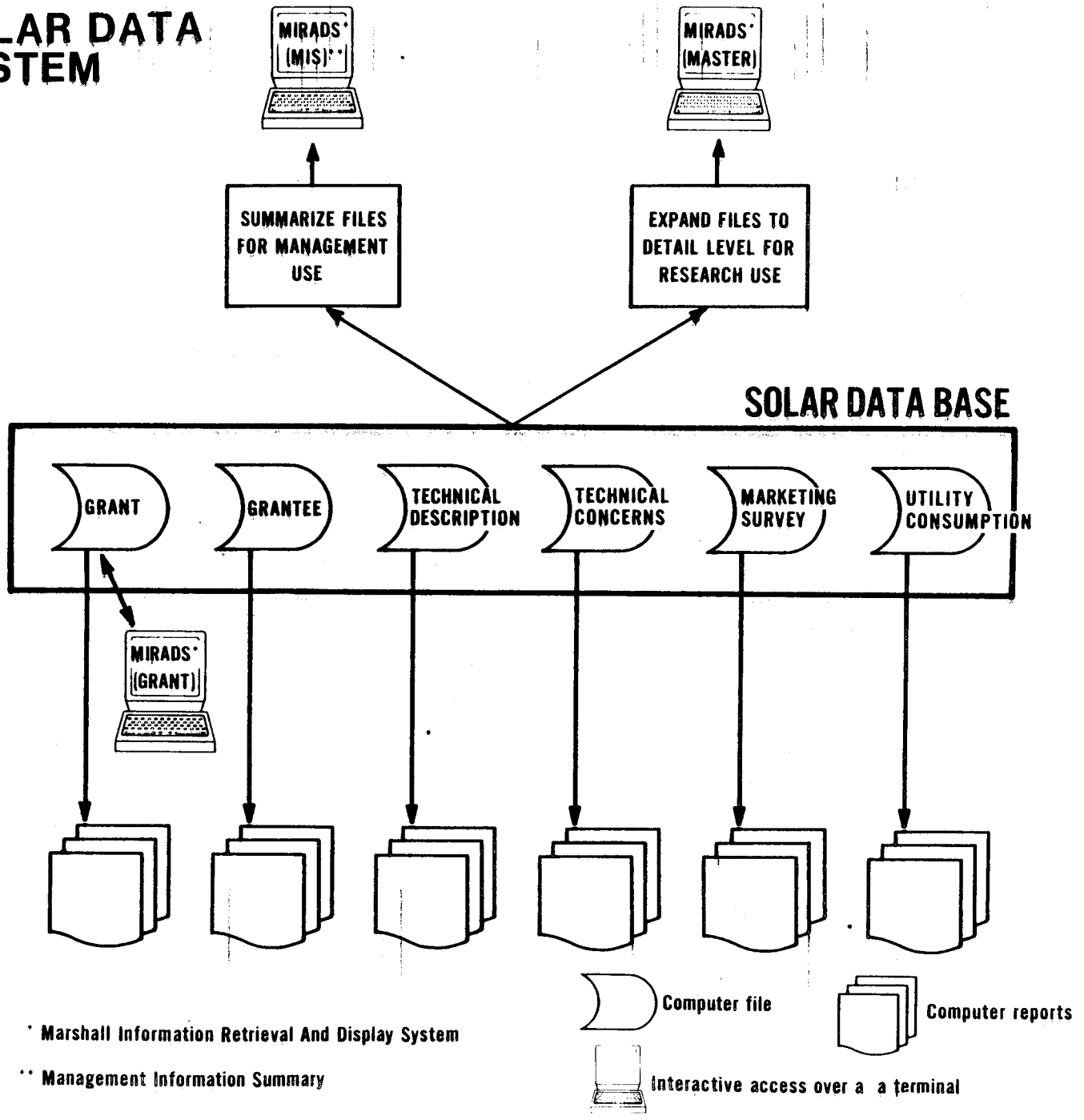
a. Grant File: This file contains basic information about the building project and the solar systems for each application funded by HUD. These data are derived from grant applications submitted to HUD and updated with information from periodic field reports.

b. Grantee Report File: Data in this file are based upon reports submitted by each grantee (the builder/designer who is awarded a grant) to Boeing Aerospace Company. These reports describe the progress of the grant from design and award of construction financing through actual construction, sale, and permanent financing. The grantee's perception of the ease or difficulty of obtaining financing, and/or obtaining building and zoning approval, as well as problems with construction or installation, are included.

c. Technical Description File: This file contains basic system design and predicted performance data collected for HUD by Dubin-Bloome Associates from a large number of selected non-instrumented systems. A more detailed set of data was collected for HUD by the American Institute of Architects/Research Corporation for those systems which are instrumented.

d. Technical Concerns File: Contained in this file are data on problems found during the design, construction, or operational phase which were recorded in field activity reports submitted by Dubin-Bloome and Boeing field representatives. Also contained are data on problems found after construction, as recorded by the grantee.

Figure 1:


SOLAR DATA SYSTEM
MIRADS* (MIS)**
MIRADS* (MASTER)
SUMMARIZE FILES FOR MANAGEMENT USE
EXPAND FILES TO DETAIL LEVEL FOR RESEARCH USE
SOLAR DATA BASE
GRANT
GRANTEE
TECHNICAL DESCRIPTION
TECHNICAL CONCERNS
MARKETING SURVEY
UTILITY CONSUMPTION
MIRADS* (GRANT)
Computer file
Computer reports
* Marshall Information Retrieval And Display System
** Management Information Summary
Interactive access over a a terminal

e. Marketing Survey File: This file contains extensive survey questionnaire results collected for HUD by the Real Estate Research Corporation from selected builders, lenders, homebuyers, code officials, utility companies, and other market participants. The data sample includes representatives of those who chose to build, lend, or buy a funded solar house and "comparatives" who did not become involved. Data are also collected after the sale to gauge builder and consumer reactions over a period of time.

f. Utility Consumption File: This file contains information on auxiliary or "back-up" fuel consumed for selected solar projects. The data are collected from utility companies (with purchaser agreement). "Comparative" data are also collected (i.e., utility bills for similar but non-solar homes).

A series of computer reports (shown in figure 1, page 2) produced from the solar data base are available to solar researchers.*

Some of the data base files are available interactively (i.e., with interaction by the data base user over a computer terminal). This means of access is described in [4].

1.2 Purpose

This publication has been compiled to document the data which have been collected by HUD and their contractors over the last four years in the Residential Solar Demonstration Program. Its anticipated use is by solar researchers, the public sector, and participants in the demonstration program. The average user is expected to be unfamiliar with the data base of the Demonstration Program. Therefore, this document should be used along with [8] and [9]. The latter documents will provide the additional information on the data base and its contents.

Another purpose of this publication is to document the data dictionary format and briefly described the computer process used to produce this format.

1.3 Organization and Approach

The data dictionary shown in section 2 orders the data into five major categories: technical, marketing, financial, institutional/legal, and miscellaneous. Other publications on the residential solar data [2, 3, 4, 8, 9] refer to data elements by the data base files which contain them. It was felt that the major use of this dictionary would be by people with no knowledge of the computer files but with knowledge of solar technology. Therefore, this dictionary is organized by categories and subcategories pertaining to solar technology and a cross reference list (page 42) is organized by computer file names.

*References [2] and [3] describe these reports in detail and explain how to obtain copies of the individual reports.

There are two cross reference lists to the dictionary included in section 3. They are meant to be used for browsing. The first is in the same order as the dictionary/directory of section 2 and includes the category and subcategory headings, data element name, and reference to the page number of the complete entry in the dictionary. The other is organized by the computer files associated with data elements and includes the file name, data element name, and page number of the complete entry in the dictionary.

2. SOLAR DATA DICTIONARY/DIRECTORY

The data in this dictionary/directory are organized first into one of five categories (technical, marketing, financial, institutional/legal, and miscellaneous). Within each category, the data are organized into subcategories (such as: auxiliary energy, construction information, design, loads, etc.). Each entry under a subcategory contains up to seven items of information to describe and define each data element.

- o Data Element Name - The name associated with this item of data.

- o Level - Data elements are collected at one of five levels: Grant (G), Location (L), Building (B), Unit (U), and System (S).

  It is important to know the level of each data element since a single grant may include several buildings, i.e. a piece of data about such a grant may occur once (if it is grant level data) or several times (if it is building level data). A single building may include several units (such as an apartment building) and/or systems. A single system may serve more than one building and/or unit. Knowing the level at which the data elements are collected can alert the user to the possibility of multiple occurences of the data in some of the computer file listings of [9].

- o Units - Units or terms of measurement. For example $ (dollars), MMBTUs (10^6 Btu), % (percent).

- o File - The name of the file in which the data element is located. In some cases, the element is listed in more than one file. The file abbreviations are:

  HA - Grant File
  BA - Grantee Report #1
  BB - Grantee Report #3
  BC - Grantee Report #4
  FC - Technical Description File
  BF - Utility Consumption File
  CB - Technical Concerns File

  The nature and scope of the various data files within the data base are explained in Data Resources and Reports [2].

- o Codes/Values - Mneumonic codes, with their values, pertaining to the data element. For example, the codes for collector type are: AT = ATtic, CON = CONcentrating, EV = EVacuated tube, and FL = FLat plate. These codes specify all types of collectors that are currently in the data base. If the list of codes/values is too long to be included in the table, it is included in appendix C.

- Data Element MIRADS Name - The name by which the data element is referenced through MIRADS, the interactive interface to the data base. For more information, see [4].

- Definition - An explanation of what the data element is. Many of the terms used in the definitions are defined in the glossary of appendix B.

I. TECHNICAL SECTION
A. AUXILIARY ENERGY

	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
BACKUP CAPACITY	S	BTU/HR	FC		AUXCAP	THE AMOUNT OF HEAT WHICH CAN BE SUPPLIED BY THE AUXILIARY (BACK UP) SYSTEM.
BACKUP EFFICIENCY	S	PERCENT	FC	75= GAS 65= OIL 99= ELEC 00= 100% ELEC	AUXEFF	THE COMBINED EFFICIENCY (SEASONAL) OF THE AUXILIARY (BACK UP) SYSTEM.
BACKUP ENERGY TYPE	U		BF	E= ELECTRIC O= OIL G= GAS W= WOOD P= PROPANE T= OTHER	AUXTYPE	THE TYPE OF ENERGY USED AS A BACKUP ENERGY SOURCE FOR THE SOLAR SYSTEM.
BACKUP ENERGY TYPE - GRANTEE RPT3	S		BB		AUXOTH-RPT3 AUXTYPE-RPT3	THE TYPE OF ENERGY USED AS A BACKUP ENERGY SOURCE FOR THE SOLAR SYSTEM - AS REPORTED IN GRANTEE REPORT 3.
BACKUP ENERGY TYPE - TECH DESC	S		FC	GA= GAS OI= OIL EL= ELECTRIC CO= COAL OT= OTHER	AUXCOOL AUXDHW AUXHEAT	THE AUXILIARY (BACK UP) FUEL (GAS, OIL, ELECTRICITY ETC.) USED FOR THE COOLING OR DOMESTIC HOT WATER OR HEATING SYSTEM (WHEN SOLAR-ASSISTED ENERGY IS NOT AVAILABLE).
BILLING FREQUENCY	U		BF	M= MONTHLY E= EVERY OTHER MONTH Q= QUARTERLY S= SEMI-ANNUALLY A= ANNUALLY I= IRREGULARLY X= NO LONGER PROVIDED C= COMP. UNIT SOLD	AUXFREQ	THE FREQUENCY WITH WHICH UTILITY BILLS ARE SUBMITTED FOR DATA ENTRY BY THE UTILITY COMPANY.
COMPARATIVE IDENTIFICATION	U		BF		COMPNO	A SEQUENCE IDENTIFICATION (A-Z) GIVEN TO UNITS OR BUILDINGS FOR WHICH "COMPARATIVE" DATA IS COLLECTED. "COMPARATIVE" DATA IS COLLECTED FOR NON-SOLAR UNITS (OR BUILDINGS) IN THE SAME NEIGHBORHOOD WHICH ARE SIMILAR TO SOLAR UNITS (OR BUILDINGS).
DESIGNATOR NO (UNIT OR BUILDING)	U		BF		AUXDESNO	A SEQUENCE NUMBER (1-99) CALLED THE

I. TECHNICAL SECTION
A. AUXILIARY ENERGY

	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
						DESIGNATOR NUMBER WHICH IS GIVEN TO ALL UNITS (FOR SINGLE-FAMILY HOMES) OR BUILDINGS (FOR MULTI-FAMILY HOMES) OF A GRANT.
END OF BILLING PERIOD	U	MO/DAY/YR	BF		AUXENDDATE	THE FINAL DAY OF THE PERIOD OVER WHICH ENERGY CONSUMPTION IS MEASURED.
ENERGY CONSUMED	U	RE AUXUNITS	BF		AUXCONSUMED	DIFFERENCE BETWEEN PRESENT METER READING AND PREVIOUS METER READING.
ENERGY COST	U	$	BF		AUXCOST	THE COST FOR THE ENERGY USED DURING THE PAST ENERGY CONSUMPTION PERIOD.
ENERGY SUPPLIED PER NON SOLAR SYSTEM	S	MBTU	HA		SYSMBTUAUX	PREDICTED ANNUAL NON-SOLAR ENERGY DELIVERED BY BACKUP SYSTEM.
METER NUMBER	U		BF		AUXMETER	A NUMBER (1-9) WHICH IS USED ONLY IF THERE IS MORE THAN ONE METER FOR THE SAME TYPE OF ENERGY.
PRESENT METER READING	U		BF		AUXSTMETER	NUMERICAL READING ON METER AT END OF PREVIOUS (START OF PRESENT) ENERGY CONSUMPTION PERIOD.
PREVIOUS METER READING	U		BF		AUXENDMETER	NUMERICAL READING ON METER AT BEGINNING OF PREVIOUS ENERGY CONSUMPTION PERIOD.
RATE CODE	U	$	BF		AUXRATECODE	THE CODE FOR A PARTICULAR RATE SCHEDULE AGAINST WHICH THE UTILITY CHARGES THE HOMEOWNER'S ENERGY CONSUMPTION.
START OF BILLING PERIOD	U	MO/DAY/YR	BF		AUXSTDATE	THE FIRST DAY OF THE PERIOD OVER WHICH ENERGY CONSUMPTION IS MEASURED.
SURCHARGE	U	$	BF		AUXSURCHARGE	THE AMOUNT CHARGED BY THE UTILITY TO COVER UNEXPECTED INCREASES IN THEIR COST OF OBTAINING FUEL DURING THE PAST CONSUMPTION PERIOD.
TAX	U	$	BF		AUXTAX	THE TAX CHARGED ON THE ENERGY COST DURING THE PAST CONSUMPTION PERIOD.
TOTAL COST THIS PERIOD	U	$	BF		AUXTOTCOST	THE SUM OF THE ENERGY COST PLUS THE SUR-

I. TECHNICAL SECTION A. AUXILIARY ENERGY	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
						CHARGE PLUS THE TAX.
UNITS OF MEASURE	U		BF	KW= KILOWATT HRS. CF= CU. FT. TH= THERMS M= MILLIONS OF CU. FT.	AUXUNITS	THE UNITS OF MEASUREMENT USED FOR THE PREVIOUS METER READING, PRESENT METER READING AND ENERGY CONSUMED.
UTILITY COMPANY CODE	U		BF	SEE APPENDIX C	AUXSUPPLIER	NAME OF UTILITY COMPANY SUPPLYING THE ENERGY USED AS A BACKUP TO THE SOLAR SYSTEM.
B. CLIMATE CONSIDERATIONS						
AVAILABLE INSOLATION	S	10E6 BTU	FC		SUNAVAIL01 SUNAVAIL02 SUNAVAIL03 SUNAVAIL04 SUNAVAIL05 SUNAVAIL06 SUNAVAIL07 SUNAVAIL08 SUNAVAIL09 SUNAVAIL10 SUNAVAIL11 SUNAVAIL12	THE AMOUNT OF INSOLATION AVAILABLE FROM THE SUN FOR EACH MONTH OF A YEAR.
DEGREE DAYS	S		HA		DECDAYS DECDAYS01 DECDAYS02 DECDAYS03 DECDAYS04 DECDAYS05 DECDAYS06 DECDAYS07 DECDAYS08 DECDAYS09 DECDAYS10 DECDAYS11 DECDAYS12	A UNIT OF MEASUREMENT FOR OUTSIDE TERMPERATURE. THE NUMBER OF DAYS PER MONTH THAT DEVIATE 1 DEGREE F FROM SOME FIXED REFERENCE POINT (USUALLY 65 DEGREES F OR 18 DEGREES C) IN THE MEAN DAILY OUTDOOR TEMPERATURE.
ENERGY SUPPLIED PER DEG DAYS BY SYS	S	MBTU	HA		SYSMBTUDD	ENERGY DELIVERED PER DEGREE DAY BY EACH SOLAR SYSTEM.
C. CONSTRUCTION INFORMATION						
BEGIN SOLAR INSTALLATION DATE	L		BB		BEGINSTLDATE	ACTUAL DATE ON WHICH CONSTRUCTION OF THE

I. TECHNICAL SECTION
C. CONSTRUCTION INFORMATION

	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
						SOLAR ENERGY SYSTEM BEGAN.
BREAKAGE PROBLEMS	B		BB	SEE APPENDIX C	CPROBBRK	GRANTEE-REPORTED PROBLEMS RELATED TO SOLAR ENERGY EQUIPMENT START-UP AND CHECK-OUT.
BUILDER ADDRESS	G		HA		BLDADDRESS BLDCITY BLDSTATE BLDSTREET BLDZIP	ADDRESS OF GRANTEE (BUILDER) CHOSEN FOR DESIGN GRANT.
BUILDER CONTACT NAME/PHONE	G		HA		BLDCEXT BLDCNAME BLDCPHONE	NAME AND PHONE NUMBER OF CONTACT FOR THE GRANTEE (BUILDER).
BUILDER GRANT NUMBER	G		HA		BLDHGRNO HGRNO	GRANT NUMBER ASSIGNED TO BUILDER GRANT WHICH WAS AWARDED.
BUILDER NAME	G		HA		BLDNAME	NAME OF GRANTEE (BUILDER) CHOSEN FOR DESIGN GRANT.
BUILDER ORGANIZATION	G		HA	A= NON-PROFIT COMMUNITY GROUP B= BUILDER/DEVELOPER C= COOP/COND G= LOCAL GOVERNMENT I= INDIAN TRIBE N= NON-PROFIT COMMUNITY GROUP U= UTILITIES L= LOCAL HOUSING AUTH E= EDUCATIONAL INST S= STATE/LHA F= FEDERAL GOVERNMENT O= OTHER GROUPS	BLDORG BLDORGOTH	ORGANIZATION TO WHICH GRANTEE (BUILDER) BELONGS.
BUILDER PHONE	G		HA		BLDPHONE	PHONE NUMBER OF GRANTEE (BUILDER).
BUILDING TYPE	B		HA	SFA= SINGLE FAM ATTACH SFD= SINGLE FAM DETACH MOB= MOBILE HOME GAL= GARDEN LOWRISE	HSGTYPE	TYPE OF BUILDING OR BUILDINGS AT ONE LOCATION IN THE GRANT.

I. TECHNICAL SECTION C. CONSTRUCTION INFORMATION	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
				MFM= MULTI-FAM MIDRISE MFH= MULTI-FAM HIRISE OTH= OTHER		
CONSTRUCTION BEGINNING DATE	B		BB		CONSTBEGDATE	ACTUAL DATE ON WHICH CONSTRUCTION OF THE SOLAR BUILDINGS BEGAN.
CONSTRUCTION COMPLETION DATE	B		BB		CONSTDATE	ACTUAL DATE ON WHICH CONSTRUCTION OF BUILDING WAS COMPLETED.
DELIVERY PROBLEMS	B		BB	SEE APPENDIX C	CPROBDEL	GRANTEE-REPORTED PROBLEMS RELATED TO DELAYS IN DELIVERY OF SOLAR ENERGY EQUIPMENT.
GRANTEE REPORT 3 SUBMISSION DATE	U		BB		GR3DATE	THE DATE GRANTEE REPORT 3 WAS SUBMITTED. THIS REPORT IS DUE WHEN CONSTRUCTION IS COMPLETE.
LABOR PROBLEMS	B		BB	SEE APPENDIX C	CPROBLAB	GRANTEE-REPORTED PROBLEMS RELATED TO LABOR ON THE JOB.
NEW OR RETROFIT CONSTRUCTION	B		HA	N= NEW R= RETROFIT	NEW-RET	WHETHER THE SYSTEM WAS INCLUDED IN A NEW BUILDING OR RETROFITTED TO AN EXISTING BUILDING.
OTHER PROBLEMS	B		BB	SEE APPENDIX C	CPROBOTH	ADDITIONAL GRANTEE-REPORTED PROBLEMS CONNECTED WITH CONSTRUCTION OF SOLAR UNIT.
SOLAR INTERFACE PROBLEMS	B		BB	SEE APPENDIX C	CPROBINTF	GRANTEE-REPORTED PROBLEMS RELATED TO THE INTERFACING OF SOLAR ENERGY EQUIPMENT WITH THE BUILDING.
D. DESIGN						
DESIGNER ADDRESS	G		HA		DSCADDRESS DSCCITY DSCSTATE DSCSTREET DSCZIP	ADDRESS OF GRANTEE (DESIGNER) CHOSEN FOR DESIGN GRANT.
DESIGNER CONTACT NAME/PHONE	G		HA		DSCCEXT DSCCNAME DSCCPHONE	NAME AND PHONE NUMBER OF CONTACT FOR THE GRANTEE (DESIGNER).
DESIGNER GRANT AWARD AMOUNT -ALL SYS	G	$	HA		DSCRAWARD	ACTUAL AMOUNT OF AWARD MADE BY HUD TO THE

I. TECHNICAL SECTION D. DESIGN	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
						GRANTEE TO DESIGN ALL SOLAR ENERGY SYSTEM(S).
DESIGNER GRANT NUMBER	C		HA		DSGHGRNO	GRANT NUMBER ASSIGNED TO BUILDER GRANT WHICH WAS AWARDED.
DESIGNER NAME	C		HA		DSGNAME	NAME OF GRANTEE (DESIGNER) CHOSEN FOR DESIGN GRANT.
DESIGNER ORGANIZATION	C		HA		DSGORG	ORGANIZATION TO WHICH GRANTEE (DESIGNER) BELONGS.
DESIGNER PHONE	C		HA		DSGPHONE	PHONE NUMBER OF GRANTEE (DESIGNER).
FINAL - DESIGN COMPLETION DATE	L		BB		DSGDATE	ACTUAL DATE ON WHICH FINAL DESIGN OF THE SOLAR PROJECT WAS COMPLETED.
GRANTEE REPORT 2 SUBMISSION DATE	C		BB		GR2DATE	THE DATE GRANTEE REPORT 2 WAS SUBMITTED. THIS REPORT IS DUE AFTER DESIGN REVIEW IS COMPLETE.
E. LOADS						
AUX CONTRIBUTION	S	10E6 BTU	FC		AUXCONTR08 AUXCONTR12	
COOLING LOAD	S	10E6 BTU	FC		CLOAD01 CLOAD02 CLOAD03 CLOAD04 CLOAD05 CLOAD06 CLOAD07 CLOAD08 CLOAD09 CLOAD10 CLOAD11 CLOAD12	THE RATE OF FLOW OF COOL AIR REQUIRED FOR EACH MONTH OF A YEAR TO MAINTAIN INDOOR COMFORT.
DHW LOAD	S	10E6 BTU	FC		DHWLOAD01 DHWLOAD02 DHWLOAD03 DHWLOAD04 DHWLOAD05	THE DEMAND FOR DOMESTIC HOT WATER FOR EACH MONTH OF A YEAR.

I. TECHNICAL SECTION
E. LOADS

	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
					DHWLOAD06 DHWLOAD07 DHWLOAD08 DHWLOAD09 DHWLOAD10 DHWLOAD11 DHWLOAD12	
HEATING LOAD	S	10E6 BTU	FC		HLOAD01 HLOAD02 HLOAD03 HLOAD04 HLOAD05 HLOAD06 HLOAD07 HLOAD08 HLOAD09 HLOAD10 HLOAD11 HLOAD12	THE RATE OF HEAT FLOW REQUIRED FOR EACH MONTH OF A YEAR TO MAINTAIN INDOOR COMFORT.
INTERNAL HEAT LOAD	S	BTU/HR	FC		HEATLOAD	THE INTERNAL HEAT GAIN (IN BTU'S) FOR AN AVERAGE DAY.
LIQUID LOAD CORRECTION FACTOR	S		FC		TMLIQCORR	LIQUID LOAD CORRECTION FACTOR TELLS HOW WELL YOU CAN GET HEAT FROM THE STORAGE SYSTEM. IT EQUALS THE HEAT EXCHANGER EFFECTIVENESS * MINIMUM CAPACITANCE RATE THROUGH THE HEAT EXCHANGER (AIR SIDE) / UA.
TOTAL COOLING LOAD	S	10E6 BTU	FC		TOTCLOAD	THE RATE OF FLOW OF COOL AIR REQUIRED FOR THE WHOLE YEAR TO MAINTAIN INDOOR COMFORT.
TOTAL DHW LOAD	S	10E6 BTU	FC		TOTDHWLOAD	THE DEMAND FOR DOMESTIC HOT WATER FOR THE WHOLE YEAR.
TOTAL HEAT LOAD	S	10E6 BTU	FC		TOTHLOAD	THE RATE OF HEAT FLOW REQUIRED FOR THE WHOLE YEAR TO MAINTAIN INDOOR COMFORT.
TOTAL HEATING LOAD FOR THIS MODEL	S	MBTU	HA		MODMBTU	PREDICTED ANNUAL SOLAR ENERGY DELIVERED TO LOAD BY ALL SYSTEMS OF A MODEL. REFERS TO TOTAL HEAT LOAD ONLY FOR MODEL.

I. TECHNICAL SECTION E. LOADS	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
TOTAL LOAD	S	10E6 BTU	FC		TOTLOAD01 TOTLOAD02 TOTLOAD03 TOTLOAD04 TOTLOAD05 TOTLOAD06 TOTLOAD07 TOTLOAD08 TOTLOAD09 TOTLOAD10 TOTLOAD11 TOTLOAD12	THE TOTAL ENERGY LOAD (TOTLOAD = HLOAD + DHWLOAD + CLOAD) FOR EACH MONTH OF A YEAR.
TOTAL LOAD PER YEAR	S	10E6 BTU	FC		TOTLOADYR	THE TOTAL ENERGY LOAD (TOTLOADYR = TOTCLOAD + TOTHLOAD + TOTDHWLOAD) FOR THE WHOLE YEAR.
F. MAINTENANCE/REPAIRS						
DATE SERVICE PERFORMED	G	MO/DAY/YR	CB		ACTDATE	THE DATE THE MAINTENANCE SERVICE WAS PERFORMED ON THE SOLAR ENERGY SYSTEM.
HARDWARE ELEMENT SERVICED	G		CB	SEE APPENDIX C	HARDELEM	HARDWARE ELEMENT THAT IS MALFUNCTIONING.
NUMBER OF SIMILAR PROBLEMS	G		CB		FREQ	NUMBER OF TIMES THE PROBLEM HAS OCCURED IN THE SAME GRANT.
PERFORMANCE AREA SERVICED	G		CB	MAIN= MAINTAINABILITY THER= THERMAL STRU= STRUCTURAL DURA= DURABILITY GENE= GENERAL MECH= MECHANICAL SAFE= SAFETY	PERFAREA	AREA IN WHICH THE PERFORMANCE OF THE SOLAR ENERGY SYSTEM IS ADVERSELY AFFECTED DUE TO THE IDENTIFIED PROBLEM.
SOLAR OWNER'S MANUAL	S		BB	OW= OWNER'S MANUAL ON FILE NO= OWNER'S MANUAL NOT ON FILE	SOLOWN	SPECIFIES WHETHER OR NOT A SOLAR ENERGY SYSTEM MAINTENANCE MANUAL WAS ATTACHED TO GRANTEE REPORT 3.
G. REPAIRS						
PROJECT PHASE	G		CB	CONS= CONSTRUCTION OPER= OPERATIONAL	PHASE	PHASE OF THE PROJECT DURING WHICH THE PROBLEM OCCURED.

I. TECHNICAL SECTION G. REPAIRS	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
				DESI= DESIGN		
REASON FOR SERVICE	G		CB	SEE APPENDIX C	EVENT1 EVENT2 EVENT3 EVENT4 EVENT5	EXPLANATION OF MALFUNCTION OR PROBLEM WHICH OCCURED TO CAUSE SERVICE CALL.
REPAIR PERFORMED H. SOLAR ENERGY SYSTEM DESCRIPTION	G		CB	SEE APPENDIX C	ACTIONS	BRIEF DESCRIPTION OF REPAIR PERFORMED.
ABSORBER COATING	S		FC	FL= FLAT BLACK SE= SELECTIVE	ABSCOAT	AN INDICATION OF A FLAT BLACK OR SELECTIVE COATING ON THE ABSORBER OF THE COLLECTOR. IF DIFFERENT COLLECTORS FOR THE SYSTEM HAVE DIFFERENT ABSORBER COATINGS, THE ADDITIONAL INFORMATION WILL BE UNDER 'ABSFPMATLOTH'.
ABSORBER SUBSTRATE MATERIAL	S		FC	AL= ALUMINUM CO= COPPER ST= STEEL GS= GALVANIZED STEEL BR= BRASS PL= PLASTIC OT= OTHER	ABSSSMATL	A DESCRIPTION OF THE MATERIAL USED IN THE ABSORBER SUBSTRATE. IF DIFFERENT COLLECTORS FOR THE SYSTEM HAVE DIFFERENT SUBSTRATE MATERIALS, THE ADDITIONAL INFORMATION WILL BE UNDER 'ABSFPMATLOTH'.
ABSORBER - OTHER	S		FC		ABSFPMATLOTH	INFORMATION, USUALLY CONCERNING MULTIPLE COLLECTORS WITH DIFFERENT CHARACTERISTICS, WHICH COULD NOT BE RECORDED ELSEWHERE.
AIR FLOW CORR FACTOR	S		FC		TMAIRCORR	AIR FLOW CORRECTION FACTOR TO ACCOUNT FOR THE EFFECT OF STRATIFICATION IN THE STORAGE MEDIUM. IT EQUALS THE FLOW RATE OF AIR THROUGH THE COLLECTORS / COLLECTOR AREA * SPECIFIC HEAT OF AIR.
AUXIL TANK STORAGE VOLUME (DHW)	S		FC		STORAVOLDHW STORAVOLDHWU	THE VOLUME OF THE AUXILIARY (BACK UP) STORAGE TANK IN THE SOLAR DOMESTIC HOT WATER SYSTEM. FOR LIQUID STORAGE MEDIUM, THE VOLUME IS IN GALLONS; FOR SOLID STORAGE MEDIUM (IE STONE, CONCRETE, ETC.), THE VOLUME IS IN CU.FT.
AUXIL TANK STORAGE VOLUME (HEAT)	S		FC		STORAVOLH	THE VOLUME OF THE AUXILIARY (BACK UP)

I. TECHNICAL SECTION
II. SOLAR ENERGY SYSTEM DESCRIPTION

	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
					STORAVOLHU	STORAGE TANK IN THE SOLAR HEATING SYSTEM. FOR LIQUID STORAGE MEDIUM, THE VOLUME IS IS IN GALLONS; FOR SOLID STORAGE MEDIUM (IE, STONE, CONCRETE, ETC.), THE VOLUME IS IN CU.FT.
AZIMUTH ANGLE	S	DEGREES	FC		AZANGLE	THE NUMBER OF DEGREES FROM THE SOUTH THAT THE COLLECTOR IS ORIENTED (IE 0 DEG = SO, 90 DEGS = WEST, ETC). IF THE COLLECTOR IS ADJUSTABLE OR IF THE SYSTEM HAS AN ARRAY OF COLLECTORS, AN APPROPRIATE MEAN VALUE IS USED.
BACK INSULATION	S		FC	GF= GLASS FOAM MW= MINERAL-WOOD CS= CALCIUM SILICATE IS= ISOCYANURATE GL= GLASS FIBER PO= POLYURETHANE ST= STYROFOAM OT= OTHER	INSLAYER1 INSLAYER2 INSLAYER3	THE KIND OF MATERIAL USED TO INSULATE THE BACK OF THE ABSORBER. THE FIRST LAYER IS CLOSEST TO THE ABSORBER. THERE MAY BE FROM ONE TO THREE LAYERS DESCRIBED.
BACK INSULATION R-VALUE	S		FC		INSRVALUE	THE TOTAL R-VALUE (RESISTANCE) FOR ALL LAYERS OF BACK INSULATION FOR THE ABSORBER.
COLLECTOR APERATURE AREA	S	SQ FT	HA		COLSQFT	GROSS APERTURE AREA OF THE COLLECTOR ARRAY USED IN ONE SOLAR SYSTEM AT ONE LOCATION. EACH SYSTEM AT THAT LOCATION IS THE SAME SIZE.
COLLECTOR TYPE	S		HA	EVT= EVACUATED TUBE FLP= FLAT PLATE CNC= CONCENTRATING OTH= OTHER OR ANY COMBINATION OF D, N, AND/OR I WHERE D= DIRECT N= INDIRECT I= ISOLATED	COLTYPE	THE TYPE OF COLLECTOR. FOR PASSIVE SYSTEMS, THIS THREE CHARACTER ALPHABETIC FIELD CAN DENOTE DIRECT, INDIRECT AND/OR ISOLATED HEAT GAIN.
COMB HEAT EXCHANGE EFF COL-STOR	S	PERCENT	FC		HEXEFFCOL	THE COMBINED HEAT EXCHANGER EFFECTIVENESS IN THE COLLECTOR-TO-STORAGE LOOP OF THE

I. TECHNICAL SECTION
H. SOLAR ENERGY SYSTEM DESCRIPTION

	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
						SOLAR SYSTEM.
COMB HEAT EXCHANGE EFF - STOR - LOAD	S	PERCENT	FC		HEXEFFSTOR	THE COMBINED HEAT EXCHANGER EFFECTIVENESS IN THE STORAGE-TO-LOAD LOOP OF THE SOLAR SYSTEM.
CONDITIONED AREA PER BLDG	B	SQ FT	HA		SYSHEATAREA	THE AREA TO BE HEATED/COOLED BY A SYSTEM.
COVER PLATE MATERIAL	S		FC	GL= GLASS GW= GLASS,WATER WHITE GN= GLASS,NORMAL IRON FR= FIBERGLASS REIN-FORCED PLACE PS= POLYCARBONATE SHEE AS= ACRYLIC SHEET TF= TEFLON FILM TD= TEDLAR FILM MY= MYLAR OT= OTHER	CPMATLOTH1 CPMATLOTH2 CPMATL1 CPMATL2	A CODED VALUE AND OTHER INFORMATION ABOUT THE KIND OF MATERIAL USED IN THE OUTER AND INNER (IF ANY) COVER PLATE ON THE COLLECTOR.
COVER PLATE MATERIAL DESCRIPTION	S		FC	UV= UVTREATED SS= SINGLE-STRENGTH DS= DOUBLE-STRENGTH TE= TEMPERED RE= REINFORCED SH= SHEET OT= OTHER PO= POLYESTER RESIN EP= EPOXY RESIN	CPMATLDESC1 CPMATLDESC2	A DESCRIPTION OF THE CHARACTERISTICS OF TH MATERIAL USED IN THE OUTER AND INNER (IF ANY) COVER PLATE ON THE COLLECTOR.
COVER PLATE THICKNESS	S		FC		CPTHICK1 CPTHICK2	AVERAGE THICKNESS OF THE OUTER AND INNER (IF ANY) COVER PLATE ON THE COLLECTOR.
C-D	S		FC		CD	FACTOR USED IN HEAT LOSS CALCULATIONS TO DETERMINE THE HEAT LOAD OF A BUILDING.
DENSITY	S		FC		TMDENSITY	THE DENSITY OF THE TRANSFER MEDIUM IN THE COLLECTOR LOOP.
DHW CAPACITY	S	GALLONS	FC		DHWCAP	THE CAPACITY OF THE AUXILIARY (BACK UP) DOMESTIC HOT SYSTEM TO SUPPLY HOT WATER.

I. TECHNICAL SECTION
H. SOLAR ENERGY SYSTEM DESCRIPTION

	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
DHW INLET TEMP	S	DEGREES	FC		DHWINLET01 DHWINLET02 DHWINLET03 DHWINLET04 DHWINLET05 DHWINLET06 DHWINLET07 DHWINLET08 DHWINLET09 DHWINLET10 DHWINLET11 DHWINLET12	MONTHLY INLET TEMPERATURE FOR THE DOMESTIC WATER SOURCE.
DHW SET TEMP	S		FC		DHWSETTEMP	THE SET TEMPERATURE (TEMPERATURE AT WHICH THE AUXILIARY FUEL IS USED) OF THE DOMESTIC HOT WATER SYSTEM.
DHW USAGE	S		FC		DHWUSAGE	THE PREDICTED DOMESTIC HOT WATER USAGE DEMAND FOR THIS SYSTEM.
FLOW RATE	S		FC		TMFLOW TMFLOWU	THE FLOW RATE OF THE TRANSFER MEDIUM. IF AIR, THE RATE IS RECORDED IN CU.FT. PER MINUTE; IF LIQUID, IN GALLONS PER MINUTE.
FLUID PASSAGE MATERIAL	S		FC	AL= ALUMINUM CO= COPPER ST= STEEL GS= GALVANIZED STEEL BR= BRASS PL= PLASTIC OT= OTHER	ABSFPMATL	A DESCRIPTION OF THE MATERIAL USED IN THE FLUID PASSAGE PART OF THE ABSORBER (FOR A LIQUID SYSTEM). IF DIFFERENT COLLECTORS FOR THE SYSTEM HAVE DIFFERENT FLUID PASSAGE MATERIALS, THE ADDITIONAL INFORMATION WILL BE UNDER 'ABSFPMATLOTH'.
FREEZE PROTECTION	S		FC	AI= AIR AN= ANTI-FREEZE FR= FREEZE TOLERANT DD= DRAIN DOWN DB= DRAIN BACK OT= OTHER HE= HEAT TAPE	COLFRPROT	THE METHOD USED TO PROTECT THE LIQUID SYSTEM FROM FREEZING DURING THE WINTER MONTHS.
FR-PRIME-TAU	S		FC		FRPRIMETAU	THE PRIME OF 'PANELINT' WHICH TAKES INTO ACCOUNT THE HEAT EXCHANGER(S) IN THE LOOP.

I. TECHNICAL SECTION H. SOLAR ENERGY SYSTEM DESCRIPTION	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
FR-PRIME-UL	S		FC		FRPRIMEUL	THE PRIME OF 'PANELSLOPE' WHICH TAKES INTO ACCOUNT THE HEAT EXCHANGER(S) IN THE LOOP.
HEAT PUMP NOMINAL CAPACITY	S	BTU/HR	FC		HPUMPCAP	THE NOMINAL CAPACITY OF THE HEAT PUMP TO TRANSFER HEAT FROM ONE MEDIUM TO ANOTHER.
HEAT PUMP TYPE	S		FC	SE= SERIES PA= PARALLEL HY= HYBRID	HPUMPTYPE	THE TYPE OF HEAT PUMP USED IN THE SOLAR SYSTEM.
INCIDENCE ANGLE MODIFIER	S		FC		INCANGMOD	THE ANGLE OF INCIDENCE IS THE ANGLE BETWEEN A RAY OF SUNLIGHT AND A LINE DRAWN PERPENDICULAR TO THE ABSORBER PLATE. SINCE THE TILT ANGLE AND LATITUDE OF THE SOLAR PANEL CAN EASILY BE DETERMINED, TABLES EXIST THAT GIVE A 'MODIFIER' WHICH CAN BE USED TO CALCULATE THE INCIDENCE ANGLE FOR THE COLLECTOR.
MAIN TANK STORAGE MEDIUM (DHW)	S		FC	SEE STORMMEDH	STORMMEDDHW	THE MATERIAL (STONE, WATER, EARTH, ETC.) USED TO STORE THE EXCESS SOLAR HEAT COLLECTED. THIS HEAT IS THEN EXTRACTED AND USED TO HELP HEAT THE DOMESTIC HOT WATER.
MAIN TANK STORAGE MEDIUM (HEAT)	S		FC	ST= STONE CO= CONCRETE BR= BRICK WA= WATER EA= EARTH PH= PHASE-CHANGE MATERIAL OT= OTHER	STORMMEDH	THE MATERIAL (STONE, WATER, EARTH, ETC.) USED TO STORE THE EXCESS SOLAR HEAT COLLECTED. THIS HEAT IS THEN EXTRACTED AND USED TO HELP HEAT THE BUILDING.
MAIN TANK STORAGE VOLUME (DHW)	S		FC		STORMVOLDHW STORMVOLDHWU	THE VOLUME OF THE MAIN STORAGE TANK IN THE SOLAR DOMESTIC HOT WATER SYSTEM. FOR LIQUID STORAGE MEDIUM, THE VOLUME IS IN GALLONS; FOR SOLID STORAGE MEDIUM, (IE, STONE, CONCRETE, ETC.), THE VOLUME IS IN CU.FT.
MAIN TANK STORAGE VOLUME (HEAT)	S		FC		STORMVOLH STORMVOLHU	THE VOLUME OF THE MAIN STORAGE TANK IN THE SOLAR HEATING SYSTEM. FOR LIQUID STORAGE

I. TECHNICAL SECTION
H. SOLAR ENERGY SYSTEM DESCRIPTION

	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
						MEDIUM, THE VOLUME IS IN GALLONS; FOR SOLID STORAGE MEDIUM (IE, STONE, CONCRETE, ETC.), THE VOLUME IS IN CU.FT.
NET AREA	S	SQ FT	FC		COLNAREA	THE SURFACE AREA OF THE COLLECTOR, EXCLUDING THE FRAME.
NUMBER OF COVER PLATES	S		FC		CPN01 CPN02	THE NUMBER OF COVER PLATES THE AVERAGE COLLECTOR IN THIS SYSTEM HAS.
PANEL INTERCEPT	S		FC		PANELINT	THE Y-INTERCEPT OF THE EFFICIENCY CURVE MEASURED FOR THE COLLECTOR PANEL.
PANEL SLOPE	S		FC		PANELSLOPE	THE SLOPE OF THE EFFICIENCY CURVE MEASURED FOR THE COLLECTOR PANEL.
PRE-HEAT TANK STORAGE VOLUME (DHW)	S		FC		STORPVOLDHW STORPVOLDHWU	THE VOLUME OF THE PRE-HEAT STORAGE TANK IN THE SOLAR DOMESTIC HOT WATER SYSTEM. FOR LIQUID STORAGE MEDIUM, THE VOLUME IS IN GALLONS; FOR SOLID STORAGE MEDIUM (IE, STONE, CONCRETE, ETC.), THE VOLUME IS IN CU.FT.
PRE-HEAT TANK STORAGE VOLUME (HEAT)	S		FC		STORPVOLH STORPVOLHU	THE VOLUME OF THE PRE-HEAT STORAGE TANK IN THE SOLAR HEATING SYSTEM. FOR LIQUID STORAGE MEDIUM, THE VOLUME IS IN GALLONS; FOR SOLID STORAGE MEDIUM (IE, STONE, CONCRETE, ETC.), THE VOLUME IS IN CU.FT.
SOLAR ENERGY SUPPLIED PER YR BY SYS	S	MBTU	HA		SYSMBTU	PREDICTED ANNUAL SOLAR ENERGY DELIVERED BY EACH SYSTEM TO LOAD.
SOURCE CODE 1	S		FC	C= CALCULATED D= DRAWING E= ESTIMATE F= DEFAULT G= GRANT APPLICATION I= INDEPENDENT TEST LA M= MEASURED O= OTHER TEST LABS P= PHOTO T= MANUFACTURE'S TEST	SOURCE1	SOURCE OF AZIMUTH ANGLE.
SOURCE CODE 10	S		FC		SOURCE10	SOURCE OF DHW CAPACITY.

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II. SOLAR ENERGY SYSTEM DESCRIPTION

	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
SOURCE CODE 11	S		FC		SOURCE11	SOURCE OF DHW USAGE.
SOURCE CODE 12	S		FC		SOURCE12	SOURCE OF DHW SET TEMPERATURE.
SOURCE CODE 13	S		FC		SOURCE13	SOURCE OF FR-PRIME-TAU.
SOURCE CODE 14	S		FC		SOURCE14	SOURCE OF FR-PRIME-UL.
SOURCE CODE 15	S		FC		SOURCE15	SOURCE OF VENTILATION.
SOURCE CODE 16	S		FC		SOURCE16	SOURCE OF INTERNAL HEAT LOAD.
SOURCE CODE 2	S		FC		SOURCE2	SOURCE OF TILT ANGLE.
SOURCE CODE 3	S		FC		SOURCE3	SOURCE OF PANEL INTERCEPT.
SOURCE CODE 4	S		FC		SOURCE4	SOURCE OF PANEL SLOPE.
SOURCE CODE 5	S		FC		SOURCE5	SOURCE OF COMB HEAT EXHANGE EFF COL-STOR.
SOURCE CODE 6	S		FC		SOURCE6	SOURCE OF COMB HEAT EXCHANGE EFF STOR-LOAD.
SOURCE CODE 7	S		FC		SOURCE7	SOURCE OF TOTAL HEAT LOSS FACTOR.
SOURCE CODE 8	S		FC		SOURCE8	SOURCE OF C-D.
SOURCE CODE 9	S		FC		SOURCE9	SOURCE OF AUXIL TANK STORAGE VOLUME (DHW).
SPECIFIC HEAT	S		FC		TMSPECHEAT	THE SPECIFIC HEAT OF THE TRANSFER MEDIUM IN THE COLLECTOR LOOP.
STORAGE CAPACITY	S	BTU-SQFT	FC		STORCAP	THE QUANTITY OF HEAT THAT CAN BE STORED IN THE MAIN STORAGE TANKS OF THE SOLAR SYSTEM. (STORCAP = (STORMVOLH + STORMVOLDHW - STORPVOLDHW) * STORAGE DENSITY * STORAGE SPECIFIC HEAT / GROSS COLLECTOR AREA).
STORAGE TEMP IN MAIN TANK - LOWER	S	DEGREES	FC		STORTEMPL	THE LOWER LIMIT (MINIMUM) TEMPERATURE

I. TECHNICAL SECTION
II. SOLAR ENERGY SYSTEM DESCRIPTION

	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
						SETTING OF THE MAIN STORAGE TANK OF THE SOLAR DOMESTIC HOT WATER SYSTEM.
STORAGE TEMP IN MAIN TANK - UPPER	S	DEGREES	FC		STORTEMPU	THE UPPER LIMIT (MAXIMUM) TEMPERATURE SETTING OF THE MAIN STORAGE TANK OF THE SOLAR DOMESTIC HOT WATER SYSTEM.
SYSTEM FUNCTION	S		HA	ANY COMB OF H, C AND W WHERE H= HEATING C= COOLING W= DHW	SYSTYPE	THE APPLICATION(S) OF THE SOLAR ENERGY SYSTEM. FOR EXAMPLE, HEATING, COOLING, HOT WATER.
SYSTEM KIND	S		HA	A= ACTIVE P= PASSIVE	SYSKIND	WHETHER THE SYSTEM IS ACTIVE, PASSIVE, OR HYBRID.
SYSTEM MANUFACTURER (ALPHA CODE)	S		HA	SEE APPENDIX C	SYSMFGR-A	CODED-4 CHARACTER ALPHABETIC CODE REPRESENTING THE MANUFACTURER OF THE SOLAR SYSTEM.
SYSTEM NUMBER (PER MODEL)	S		HA		SYSNO	THE SEQUENCE (1 OR 2) ASSIGNED TO VARIOUS SYSTEMS (WITHIN ONE LOCATION, THE SAME MODEL) OF A GRANT. THERE ARE NEVER MORE THAN 2 SYSTEM IN SEQUENCE FOR THE SAME MODEL - AN ACTIVE AND A PASSIVE ONE.
SYSTEM TRANSFER MEDIUM	S		HA	A= AIR L= LIQUID R= RADIANT	SYSTRMED	DESCRIPTION OF TYPE OF TRANSFER MEDIUM USED IN THE ACTIVE COLLECTOR: AIR OR LIQUID. IF SOLAR SYSTEM IS PASSIVE, CAN DENOTE RADIANT TRANSFER MEDIUM.
SYSTEM TYPE	S		FC	1= AIR 2= LIQUID 3= DHW ONLY	FCSYSTYPE	THE TYPE OF SOLAR SYSTEM (USED IN FCHART CALCULATIONS).
THERMAL CAPACITANCE	S	BTU X 10E3	FC		STORTHERM	(THERMAL CAPACITANCE) THAT PROPERTY OF THE COLLECTOR WHICH DETERMINES HOW MUCH HEAT IS NEEDED TO WARM IT TO ITS OPERATING TEMPERATURE.
TILT ANGLE	S	DEGREES	FC		COLTILT	THE ANGLE FROM THE HORIZONTAL AT WHICH THE COLLECTOR IS TILTED. IF THE COLLECTOR IS ADJUSTABLE OR IF THE SYSTEM HAS AN ARRAY OF COLLECTORS, THE AVERAGE TILT

I. TECHNICAL SECTION
II. SOLAR ENERGY SYSTEM DESCRIPTION

	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
						ANGLE IS USED.
TOTAL HEAT LOSS FACTOR	S	BTU/HR	FC		TOTALUA	THE RATE OF HEAT TRANSMISSION FOR THE BUILDING USING THE SYSTEM.
TRANSPORT MEDIUM	S		FC	AI= AIR WA= WATER EG= ETHYLENE GLYCOL PG= PROPYLENE GLYCOL SI= SILICONE AP= ALKYLATED PHENOL OI= OILS GL= GLCERINE OT= OTHER	TMED TMEDOTH	THE SUBSTANCE (AIR, WATER, ETC.) WHICH CARRIES HEAT FROM THE SOLAR COLLECTOR TO STORAGE.
VENTILATION	S	AIRCHNGS/HR	FC		VENT	NUMBER OF AIR CHANCES PER HOUR WHICH REPRESENT THE VENTILATION OF THE SYSTEM.
WATER PERCENT BY VOLUME	S	PERCENT	FC		TMPCENT	THE PERCENT OF WATER (BY VOLUME) IN THE TRANSFER MEDIUM IN THE COLLECTOR LOOP.
I. SOLAR ENERGY SYSTEM PERFORMANCE						
AUX CONTRIBUTION	S	10E6 BTU	FC		AUXCONTR01 AUXCONTR02 AUXCONTR03 AUXCONTR04 AUXCONTR05 AUXCONTR06 AUXCONTR07 AUXCONTR09 AUXCONTR10 AUXCONTR11	THE ENERGY CONTRIBUTION EXPECTED FROM THE AUXILIARY SYSTEM FOR EACH MONTH OF A YEAR.
PROJECT INSTR	C		BA	I= INSTR. N= NOT INSTR.	PJINSTR	SPECIFIES WHETHER ANY SYSTEM OF THIS GRANT WILL BE INSTRUMENTED OR NOT.
SOLAR CONTRIBUTION	S	10E6 BTU	FC		SOLARCONTR01 SOLARCONTR02 SOLARCONTR03 SOLARCONTR04 SOLARCONTR05 SOLARCONTR06 SOLARCONTR07	THE ENERGY CONTRIBUTION EXPECTED FROM SOLAR FOR EACH MONTH OF A YEAR.

I. TECHNICAL SECTION
I. SOLAR ENERGY SYSTEM PERFORMANCE

	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
					SOLARCONTR08 SOLARCONTR09 SOLARCONTR10 SOLARCONTR11 SOLARCONTR12	
SOLAR ENERGY SYSTEM INSTRUMENTATION	U		BC	I= INSTRUMENTED N= NOT INSTRUMENTED	UNITINSTR	SPECIFIES WHETHER THIS UNIT WILL BE INSTRUMENTED OR NOT.
SOLAR ENERGY SYSTEM TEST DATE	S		BB		TESTCOMPDATE	ACTUAL DATE ON WHICH THE SOLAR ENERGY SYSTEM TEST WAS COMPLETED.
SOLAR FRACTION	S	PERCENT	FC		SOLFRACT01 SOLFRACT02 SOLFRACT03 SOLFRACT04 SOLFRACT05 SOLFRACT06 SOLFRACT07 SOLFRACT08 SOLFRACT09 SOLFRACT10 SOLFRACT11 SOLFRACT12	THE PERCENTAGE OF THE BUILDING'S MONTHLY HEATING REQUIREMENT PROVIDED BY THE SOLAR SYSTEM.
TOTAL AUX CONTRIBUTION	S	10E6 BTU	FC		TOTAUXCONTR	THE ENERGY CONTRIBUTION EXEPECTED FROM THE AUXILIARY SYSTEM FOR THE WHOLE YEAR.
TOTAL SOLAR CONTRIBUTION	S	10E6 BTU	FC		TOTSOLCONTR	THE ENERGY CONTRIBUTION EXPECTED FROM SOLAR FOR THE WHOLE YEAR.
TOTAL SOLAR FRACTION	S	PERCENT	FC		TOTSOLFRACT	THE PERCENTAGE OF THE BUILDING'S YEARLY HEATING REQUIREMENT PROVIDED BY THE SOLAR SYSTEM.
J. WARRANTIES						
SOLAR WARRANTY	S		BB	WA= WARRANTY ON FILE NO= NOT ON FILE	SOLWARR	INDICATES WHETHER OR NOT A SOLAR WARRANTY WAS ATTACHED TO GRANTEE REPORT 3.

II. MARKETING A. BACKGROUND EXPERIENCE	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
OCCUPANCY DATE	U		BC		OCCDATE	GRANTEE'S REPORT ON ACTUAL DATE ON WHICH SOLAR UNIT WAS FIRST OCCUPIED.
SALES CONTRACT DATE	U		BC		CONTRDATE	GRANTEE'S REPORT ON ACTUAL DATE ON WHICH THE SOLAR ENERGY UNIT'S SALES CONTRACT WAS SIGNED.
UNIT FIRST OFFERED DATE	U		BC		OFFERDATE	GRANTEE'S REPORT ON ACTUAL DATE ON WHICH THE SOLAR ENERGY UNIT WENT UP FOR SALE OR RENT.
B. PRICES						
FINAL BUYING PRICE	U		BC		ENDSALEPRICE	FINAL SALE PRICE FOR THE SOLAR UNIT.
FINAL RENT	U		BC		ENDRENTOTH ENDRENTST ENDRENT1 ENDRENT2 ENDRENT3	FINAL RENTAL RATE FOR THE SOLAR UNIT.
INITIAL BUYING PRICE	U		BC		INITSALPRICE	INITIAL SALE PRICE FOR THE SOLAR UNIT.
INITIAL RENT	U		BC		INITRENTOTH INITRENTST INITRENT1 INITRENT2 INITRENT3	INITIAL RENTAL RATE FOR THE SOLAR UNIT.
C. PROBLEMS						
MARKETING PROBLEMS	U		BC	SEE APPENDIX C	MKTPROB	BUILDER'S DESCRIPTION OF PROBLEMS WITH THE SOLAR SYSTEM DURING MARKETING PERIOD AND INITIAL OCCUPANCY.
D. MARKET METHODS/EFFECTIVENESS						
NO OF VISITORS	U		BC		MKTVNO	TOTAL NUMBER OF VISITORS TO THIS SOLAR UNIT DURING THE MARKETING PERIOD.
PUBLIC INTEREST IN BUYING SOLAR	U		BC	SEE APPENDIX C	MKTPUBLIC	BUILDER'S PERCEPTIONS OF PUBLIC INTEREST IN SOLAR.
E. PROSPECTIVE BUYERS/RENTERS						
HUD ACCESS TERMS FOR UNIT	U		BB	HU= HUD ACCESS TERMS ON FILE	HTERMS	THE TERMS OF THE AGREEMENT WHICH HUD HAS WITH THE GRANTEE FOR ACCESS TO THE

II. MARKETING E. PROSPECTIVE BUYERS/RENTERS	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
				NO= HUD ACCESS TERMS NOT ON FILE		FUNDED UNITS. THE ACCESS IS PROVIDED PRIMARILY TO GATHER DATA OVER A 5 YEAR PERIOD.
NO OF BUYERS	U		BC		MKTBNO	TOTAL NUMBER OF PROSPECTIVE BUYERS TO THIS SOLAR UNIT DURING THE MARKETING PERIOD.
F. SOLAR PROJECT CHARACTERISTICS						
APPLICATION NUMBER	C		HA		APNO	A FOUR DIGIT NUMBER (0001-9999) ASSIGNED TO AN APPLICATION FOR GRANT. WHEN GRANTS ARE AWARDED, A GRANT NUMBER IS ASSIGNED.
CYCLE	C		HA	CYCLES ARE 1-5, 4A, P1 (PASSIVE)	CYCLE CYC-MRG	DENOTES WHEN THE GRANT WAS AWARDED: CYCLE 1 & 6 -FALL 75 2 -FALL 76 3 -SUMMER 77 4 -1978 4A -1978 P1 -JUNE 1979 5 -FALL 1979
DISPOSITION OF UNITS	B		HA	ANY COMB OF P, O, AND TO DESCRIBE THE DIS POSITION OF THE PROJEC WHERE P= PRIVATE O= OPEN MARKET C= CONCEPT	DISP	DESCRIBES HOW THE UNITS WILL BE DISPOSED OF (IF AT ALL).
LOCATION NUMBER	L		HA		PJLOCNO	THE SEQUENCE (1,2,3,ETC) ASSIGNED TO VARIOUS LOCATIONS FOR BUILDINGS OF A GRANT.
MODEL NUMBER (PER LOCATION)	B		HA		MODSEQ	THE SEQUENCE (1,2,3,ETC) ASSIGNED TO VARIOUS MODEL TYPES (WITHIN ONE LOCATION) OF A GRANT.
NEW OR RETROFIT CONSTRUCTION	C		BA	N= NEW R= RETROFIT	NEWRET	SPECIFIES WHETHER THE CONSTRUCTION FOR THIS GRANT WILL BE NEW OR RETROFIT.
NUMBER OF BUILDINGS	B		HA		PJBLDGS	THE NUMBER OF BUILDINGS FOR ONE MODEL TYPE (NOTE: THE CONDITIONED AREA AND COLLECTOR AREA IS THE SAME FOR EACH BUILDING.)
NUMBER OF SOLAR SYSTEMS	B		HA		PJSYS	TOTAL NUMBER OF SOLAR ENERGY SYSTEMS FOR

II. MARKETING F. SOLAR PROJECT CHARACTERISTICS	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
						ONE MODEL TYPE.
NUMBER OF UNITS	B		HA		PJUNITS	DEFINES THE NUMBER OF DWELLING UNITS THAT ARE PRESENT IN BUILDING(S) FOR ONE MODEL TYPE.
PROJECT ADDRESS	L		HA		PJCITY PJCITY-RPT1 PJCNTY PJCNTY-RPT1 PJSTATE PJSTATE-RPT1 PJSTREET PJZIP PJZIP-RPT1	THE ADDRESSES OF THE BUILDING PROJECT FOR WHICH A GRANT WAS AWARDED.
PROJECT TYPE	B		HA		PJCAT	THE TYPE OF BUILDING PROJECT: DESIGN, CONSTRUCT OR RETROFIT.
SALES/RENTAL TERMS FOR UNIT	U		BB	SA= SALES/RENT AGREEMENT ON FILE NO= SALES/RENT AGREEMENT NOT ON FILE	SRTERMS	THE TERMS OF THE AGREEMENT BETWEEN THE GRANTEE AND THE BUYER/RENTER OF THE HUD FUNDED DWELLING UNIT. THESE TERMS INCLUDE THE HUD ACCESS AGREEMENT AND ARE PART OF THE SALES CONTRACT, DEED, OR LEASE AGREEMENT.
SEA (STANDARD ECONOMIC AREA)	B		HA		PJSEA	DEMOGRAPHIC CLASSIFICATION.
UNIT STATUS	U		BC	SO= SOLD RE= RENTED MO= MODEL	UNITSTATUS	THE STATUS OF A UNIT FUNDED UNDER THIS GRANT. UNITS FOR THE SAME GRANT MAY HAVE A DIFFERENT STATUS -- USUALLY WITH ONE UNIT BEING A MODEL.
G. SOLAR ENERGY SYSTEM COSTS						
BUILDER ESTIMATED $ OF ALL SYSTEMS	C	$	HA		SYSCOSTEST	GRANTEE'S ESTIMATE OF THE COST OF ALL THE SOLAR ENERGY SYSTEMS COVERED BY THE GRANT.
BUILDER GRANT AWARD AMOUNT - ALL SYS	C	$	HA		BLDGRAWARD GRAWARD	ACTUAL AMOUNT OF AWARD MADE BY HUD TO THE GRANTEE TO BUILD ALL SOLAR ENERGY SYSTEM(S).
COST OF ONE SYSTEM TO GOVT	S	$	HA		SYSCOSTGVT	THE COST TO HUD (AMOUNT FUNDED) FOR ONE SOLAR ENERGY SYSTEM; ALL SYSTEMS AT ONE

II. MARKETING G. SOLAR ENERGY SYSTEM COSTS	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
						LOCATION FOR THE SAME MODEL HAVE THE SAME FUNDING.
INDIVIDUAL SYSTEM COST	S	$	HA		INDSYSCOST	THE COST TO THE BUILDER FOR ONE SOLAR ENERGY SYSTEM; ALL SYSTEMS AT ONE LOCATION FOR THE SAME MODEL COST THE SAME.
$ REQUESTED BY BUILDER FOR ALL SYS	G	$	HA		GRREQUEST	THE FUNDS REQUESTED TO COVER THE GRANTEE'S BUILDING COSTS OF ADDING SOLAR ENERGY SYSTEM(S) TO BASIC HOME(S).
$ REQUESTED BY DESIGNER FOR ALL SYS	G	$	HA		DSGRCOST	THE FUNDS REQUESTED TO COVER THE GRANTEE'S DESIGN COSTS TO ADD SOLAR ENERGY SYSTEM(S) TO BASIC HOME(S).

III. FINANICAL A. CONSTRUCTION FINANCING	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
BUILDER FINANCING	G		HA	A03= MKT RATE/SALES A06= MKT RATE/RENT A09= MKT RATE/COOP /CONDO A12= MKT RATE/COOP /CONDO A15= MKT RATE/COOP /CONDO B03= MKT RATE/FHA SECT 207 B06= MKT RATE/FHA SECT 213 B09= MKT RATE/FHA SECT 221(D)(4) B12= MKT RATE/FHA SECT 223(F) B15= MKT RATE/FHA SECT 234 C03= FHA S. 202 C06= FHA S. 202/S. 8 C09= FHA S. 221(D)(3) C12= FHA S. 221(D)(3) /SECT 8 C15= FHA S. 221(D)(3) ST/LOC/S. 8 C18= FHA S. 221(D)(4) /SECT 8 C21= FHA S. 231/ST/ LOC/S. 8 C24= FHA S. 236 C27= FHA S. 236/S. 8 C30= HUD PUB HOUSING C33= HUD IND MUTUAL HELP PROGRAM C36= HUD SECT 312 C39= HUD/CDBG C42= FMHA SECT 502 C45= FMHA S. 514/516 /SECT 8 C48= FMHA SECT 515 C51= FMHA S. 515/S. 8 C54= STATE/LOCAL C57= STATE/LOCAL/S. 8	BLDFIN	THE METHOD BY WHICH THE BUILDER PLANS TO FINANCE THE BUILDING PROJECT.

III. FINANICAL A. CONSTRUCTION FINANCING	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
				C60= ST (PUB HOUSING) C63= MARKET RATE/S. 8 D03= EDUCATION		
CONSTRUCTION FINANCING AMNT	L		BB		CFINAMNT	THE AMOUNT OF MONEY IN DOLLARS PROVIDED FOR CONSTRUCTION FINANCING.
CONSTRUCTION FINANCING DATE	L		BB		CFINDATE	ACTUAL DATE ON WHICH CONSTRUCTION FINANCING WAS COMMITTED TO THE SOLAR PROJECT.
CONSTRUCTION FINANCING ORG	L		BB		CFINORG	GRANTEE'S REPORT OF ACTUAL ORGANIZATION THAT GAVE THE CONSTRUCTION FINANCING.
CONSTRUCTION FINANCING ORG ADDRESS	L		BB		CFINCITY CFINSTATE CFINSTREET CFINZIP	GRANTEE'S REPORT OF FULL ADDRESS OF ACTUAL ORGANIZATION THAT GAVE THE CONSTRUCTION FINANCING.
CONSTRUCTION FINANCING PERIOD	L		BB		CFINPERIOD	TIME IN NUMBER OF MONTHS FOR WHICH THE CONSTRUCTION LOAN WAS GIVEN.
CONSTRUCTION FINANCING PHONE	L		BB		CFINPHONE	GRANTEE'S REPORT OF TELEPHONE NUMBER OF ACTUAL ORGANIZATION THAT GAVE THE CONSTRUCTION FINANCING.
CONSTRUCTION FINANCING PROB	L		BA	SEE APPENDIX C	CFINPROB	DESCRIBES EXPERIENCE/PROBLEMS OF BUILDER IN OBTAINING CONSTRUCTION FINANCING.
CONSTRUCTION FINANCING RATE	L		BB		CFINRATE	RATE OF INTEREST ON CONSTRUCTION LOAN.
CONSTRUCTION FINANCING STATUS	L		BA	YE= YES NO= NO PE= PENDING	CFINSTAT	THE STATUS OF CONSTRUCTION FINANCING FOR THIS BUILDING PROJECT.
CONSTRUCTION FINANCING TYPE	L		BB	NO= NORMAL SE= SELF PR= PRIVATE PU= PUBLIC LOAN (GRANT) OT= OTHER	CFINTYPE	SPECIFIES FROM WHERE THE CONSTRUCTION FINANCING IS COMING.
B. PERMANENT FINANCING/MORTGAGE						
MARKETING PERIOD	U		BC		MKTPERIOD	MARKETING PERIOD OF UNIT IN WEEKS.

III. FINANICAL B. PERMANENT FINANCING/MORTGAGE	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
MORTGAGE AMNT	U		BC		MTGAMNT	DOLLAR AMOUNT OF FULL PERMANENT MORTGAGE.
MORTGAGE APPROVAL DATE	U		BC		MTGAPPDATE	CLOSING DATE OR APPROVAL DATE OF THE MORTGAGE.
MORTGAGE ARRANGED BY	U		BC	BU= BUYER PU= PURCHASER GR= GRANTEE	MTGARRANGE	SPECIFIES WHETHER THE PERMANENT FINANCING WAS ARRANGED BY THE BUILDER, PURCHASER, OR GRANTEE.
MORTGAGE FEES	U		BC		MTGFEES	FEES ON THE PERMANENT MORTGAGE.
MORTGAGE PERIOD	U		BC		MTGPERIOD	PERIOD IN YEARS OF THE PERMANENT MORTGAGE.
MORTGAGE PROBLEMS	U		BC	SEE APPENDIX C	MTGPROB	GRANTEE'S REPORT ON ANY PROBLEMS IN OBTAINING PERMANENT FINANCING.
MORTGAGE RATE	U		BC		MTGRATE	INTEREST RATE RECEIVED ON THE PERMANENT MORTGAGE.
MORTGAGE TYPE	U		BC	NO= NONE CO= CONVENTIONAL FH= FHA VA= VA PR= PRIVATE OT= OTHER	MTGTYPE	SPECIFIES TYPE OF MORTGAGE.
MORTGAGOR	U		BC		MORTGAGOR	NAME OF THE FIRM OR ORGANIZATION GRANTING THE PERMANENT MORTGAGE.
MORTGAGOR ADDRESS	U		BC		MTGCITY MTGSTATE MTGSTREET MTGZIP	FULL ADDRESS OF THE ORGANIZATION GRANTING THE PERMANENT MORTGAGE.
MORTGAGOR PHONE	U		BC		MTGPHONE	TELEPHONE NUMBER OF THE FIRM GRANTING THE PERMANENT MORTGAGE.

IV. INSTITUTIONAL/LEGAL A. BUILDING CODES	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
BUILDING PERMIT APPROVAL DATE	B		BB		BPERDATE	DATE ON WHICH BUILDING PERMIT, IF REQUIRED WAS APPROVED.
BUILDING PERMIT AUTHORITY	B		BB		BPERAUTH	NAME OF BUILDING PERMIT AUTHORITY.
BUILDING PERMIT AUTHORITY ADDRESS	B		BB		BPERCITY BPERSTATE BPERSTREET BPERZIP	ADDRESS OF BUILDING PERMIT AUTHORITY.
BUILDING PERMIT PROBLEMS	B		BB	SEE APPENDIX C	BPERPROB	GRANTEE'S REPORT ON ANY PROBLEM RELATED TO OBTAINING A BUILDING PERMIT.
CODE BASED OR NOT	B		BB	BA= BASED ON NATIONAL CODES NO= NOT BASED ON NATIONAL CODES	CODEBASED	GRANTEE'S REPORT OF WHETHER CODE IS BASED ON NATIONAL MODEL CODE.
CODE-LOCAL	B		BB		CODELOCAL	GRANTEE'S REPORT OF LOCAL CODES APPLICABLE TO SOLAR PROJECT.
CODE-NATIONAL	B		BB		CODENATL	GRANTEE'S REPORT OF APPLICABLE NATIONAL CODES TO SOLAR PROJECTS.
B. ZONING						
ZONING PERMIT AUTHORITY	B		BB		ZONAUTH	NAME OF AUTHORITY GIVING ZONING APPROVAL.
ZONING PERMIT AUTHORITY ADDRESS	B		BB		ZONCITY ZONSTATE ZONSTREET ZONZIP	ADDRESS OF AUTHORITY GIVING ZONING APPROVAL.
ZONING PERMIT AUTHORITY DATE	B		BB		ZONDATE	DATE ON WHICH ZONING FOR SOLAR BUILDING WAS APPROVED.
ZONING PERMIT PROBLEMS	B		BB	SEE APPENDIX C	ZONPROB	SPECIFIES ANY DESIGN CHANGES REQUIRED IN THE PROCESS OF ACQUIRING ZONING APPROVAL.
C. OCCUPANCY PERMITS						
OCCUPANCY PERMIT APPROVAL DATE	B		BB		OPERDATE	DATE ON WHICH OCCUPANCY PERMIT, IF REQUIRED, WAS APPROVED.
OCCUPANCY PERMIT AUTHORITY	B		BB		OPERAUTH	NAME OF APPROVING CODES AUTHORITY.

IV. INSTITUTIONAL/LEGAL C. OCCUPANCY PERMITS	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
OCCUPANCY PERMIT AUTHORITY ADDRESS	B		BB		OPERCITY OPERSTATE OPERSTREET OPERZIP	ADDRESS OF APPROVING CODES AUTHORITY.
OCCUPANCY PERMIT PROBLEMS	B		BB	SEE APPENDIX C	OPERPROB	EXPERIENCE IN SECURING OCCUPANCY PERMIT.

V. MISCELLANEOUS	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
CITY CODE	S		FC	UNIV. OF WISC.FCHART CODES FOR CITIES.	CITYCODE	THE CODE FOR THE CITY WHICH WAS USED IN MAKING FCHART CALCULATIOMS FOR THE SYSTEM PERFORMANCE.
GRANT AWARD DATE	G		BA		AWARDDATE	THE DATE THE GRANT WAS AWARDED.
GRANTEE REPORT 1 SUBMISSION DATE	G		BA		GR1DATE	THE DATE GRANTEE REPORT 1 WAS SUBMITTED. THIS REPORT IS DUE SHORTLY AFTER GRANT IS AWARDED.
GRANTEE REPORT 4 SUBMISSION DATE	U		BC		GR4DATE	THE DATE GRANTEE REPORT 4 WAS SUBMITTED. THIS REPORT IS DUE WHEN UNIT IS SOLD OR RENTED.

3. CROSS REFERENCES TO THE SOLAR DATA DICTIONARY/DIRECTORY

3.1 Abbreviated Category Code Cross Reference

Page

H. Solar Energy System Description

3.2 Computer File Cross Reference

3.2.1 Grant File Data Elements

Page

H. Solar Energy System Description

APPENDIX A

Computer Processing for the Solar Data Dictionary/Directory

The Solar Data Dictionary/Directory (DD/D) of section 2 was produced by a computer program called DD-PROG, wirtten in ANSI COBOL and run on the UNIVAC 1100 Series computer at the National Bureau of Standards. Figure 2 gives a flow chart of the computer processing involved in producing the DD/D.

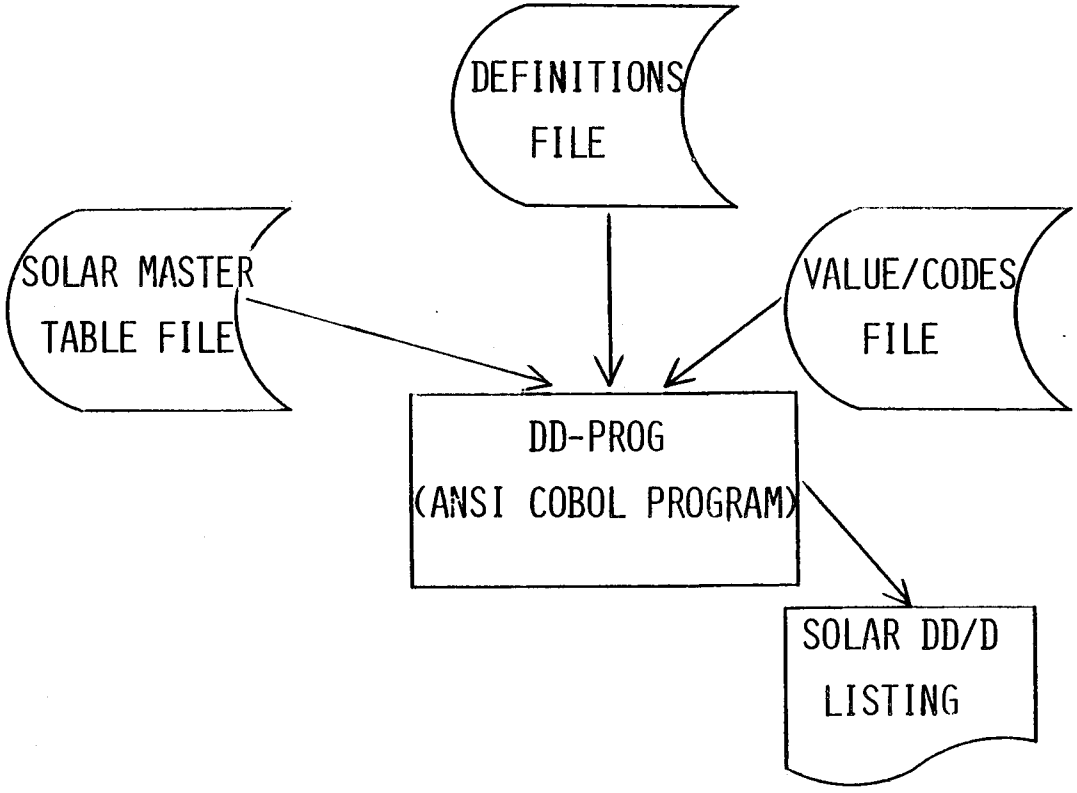
The program requires three input files to operate:

- o Solar Master Table File which contains the name and attributes of each data element to be included in the DD/D;
- o Definitions File which contains the definition for each data element in the Solar Master Table File; and
- o Value/Codes File which contains the list of values and codes for certain data elements in the Solar Master Table File.

The only output from execution of the program is the DD/D, exactly as shown in section 2.

Complete documentation on this program and format layouts for the input files is available from the Solar Data Center at NBS.

Figure 2: Flow Chart of Computer Processing for Solar DD/D



APPENDIX B

Glossary*

Absorber - The blackened surface in a collector that absorbs the solar radiation and converts it to heat energy.

Absorber Coating - The painted or treated surface of the absorber which absorbs sunlight (see selective surface).

Absorber Substrate - That part of the absorber plate to which the surface coating(s) is adhered. In liquid systems, this layer contains the fluid passage tubes.

Auxiliary Heat - The extra heat provided by a conventional heating system for periods of cloudiness or intense cold, which a solar heating system cannot provide enough.

Azimuth - The angular distance between true south and the point on the horizon directly below the sun.

British Thermal Unit or Btu - The quantity of heat needed to raise the temperature of 1 pound of water 1°F.

Collector - Any of wide variety of devices used to collect solar energy and convert it to heat.

Cover Plate - A sheet of glass or transparent plastic that sits about an inch above the absorber in a flat-plate collector. The escape of heat is retarded by the cover plate.

Degree Day - A unit that represents a 1°F deviation from some fixed reference point (usually 65°F) in the mean daily outdoor temperature.

Double-Glazed - Covered by two panes of glass or other transparent material.

Heat Exchanger - A device, such as a coiled copper tube immersed in a tank of water, that is used to transfer heat from one fluid to another through an intervening metal surface.

Heating Load - The rate of heat flow required to maintain indoor comfort; measured in Btu per hour.

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*This glossary was compiled from [5, 6, 7].

Heat Pump - An electrically operated machine for heating and cooling. When heating, it transfers heat from one medium at a lower temperature (called the heat source) to a medium at a higher temperature (called the heat sink), thereby cooling the source (outside air) and warming the sink (the house). When cooling, the heat pump functions much like an air conditioner - taking unwanted heat from the heat source (a building) and dumping it to heat sink (the outside).

Heat Storage - A device or medium that absorbs collected solar heat and stores it for periods of inclement or cold weather.

Insulation - A material with high resistance or R-value that is used to retard heat flow.

R-value - The tendency of a material to retard the flow of heat.

Selective Surface - An absorber coating that absorbs most of the sunlight hitting it but emits very little thermal radiation.

Specific Heat - The quantity of heat, in Btu, needed to raise the temperature of 1 pound of a material 1°F.

APPENDIX C

Codes/Values for Certain Data Elements

Introduction

Codes and their values are associated with certain data element names. For example, data element PJINSTR can be coded in two ways: "IN" or "NO". The "values" or "meanings" of these two codes are: "IN" means "instrumented" and "NO" means "not instrumented." Appendix C contains all those codes and values which were too long to fit into the SOLAR DATA DICTIONARY.

The following pages contain a data element name at the top of the page, followed by the name of the interactive file or files which reference this data element, followed by the codes and their corresponding values. The data elements are in alphabetical order. The codes/values lists are usually alphabetical with the exception of EVENTS and HARDELEM.

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS

Data Element Name: ACTIONS

ADED	ADDED
ADED1	ANTIFREEZE
ADED2	FLUID
ADED3	INHIBITOR
ADED4	ADDITIONAL HARDWARE
ADED5	ADDITIONAL MEMBERS
ADJT	ADJUST
ADJT1	BLEED
ADJT2	CLEAN
ADJT3	THAW
ADJT4	TIGHTEN
ADJT5	LUBRICATE
BRAZ	BRAZE
ELIM	ELIMINATE
NONE	NONE
NBAR	NONE BUT ACTION REQD
NBAR1	AWAITING SHIPMT OF RPLMT ELEMENTS
MANI	MANFTR INVESTG
OCIN	OCCUPANT INSTRUCTED
OCIN1	ON PROPER USE OF SYS
OCIN2	ON RELSHP-FENES/ECON
RECT	RECOAT
REGR	REGROUTED
REMV	REMOVE
REPK	REPACK
REPA	REPAINT
REPR	REPAIR
RPLI	REPLACE W/ IDENT ITEM
RPLI1	LEVEL 1
RPLI2	LEVEL 2
RPLI3	LEVEL 3
RPLI4	LEVEL 4
RPLS	REPLACE W/SUB ITEM
RPLS1	LEVEL 1
RPLS2	LEVEL 2
RPLS3	LEVEL 3
RPLS4	LEVEL 4
RELO	RELOCATE
RESL	RESEAL
RETP	RETAPE
REWK	REWORK
REWR	REWIRE
RSMA	ROU OR SCHD MAIN
SLDR	SOLDER
WELD	WELD
NBAR2	WAITING OPPORTUNE TIME
REMV1	ISOLATE FROM SYSTEM

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: AUXSUPPLIER

AL01 Huntsville Utilities
P.O. Box 2048
Hunstsville, AL 35804

AZ01 Arizona Public Service Co.
P.O. Box 2907
Phoenix, AZ 85062

CA01 Pacific Gas & Electric Co.
111 Almaden Blvd.
San Jose, CA 95198

CA02 Pacific Gas & Electric Co.
314 "F" Street
Davis, CA 95616

CA03 San Diego Gas & Electric Co.
P.O. Box 1831
San Diego, CA 92112

CA04 So. California Gas Co.
340 N. Juanita St.
Hemet, CA 92343

CA05 California Edison Co.
10180 Telegraph Rd.
Ventura, CA 92343

CO01 Public Service Co. of Colorado
P.O. Box 840
550 15th St.
Denver, CO 80202

CO02 Public Service Co. of Colorado
1155 Canyon Blvd.
Box 551
Boulder, CO 80302

CO03 Public Service Co. of Colorado
HWY 74
P.O. Box 640
Evergreen, CO 80439

CO05 Union Rural Electric Assn.
P.O. Box 359
Brighton, CO 80601

Data Element Name: AUXSUPPLIER (Continued)

C005 Public Service Co. of Colorado
P.O. Box 707
Frisco, CO 80443

C006 Public Service Co. of Colorado
9722 E. 16th St.
Aurora, CO 80010

C007 Public Service Co. of Colorado
209 S. Meldrum St.
Box 1668
Fort Collins, CO 80521

CT01 Hartford Electric Light Co.
34 Hopmeadow
Simsburg, CT 06070

CT02 The United Illuminating Co.
80 Temple Street
New Haven, CT 06506

CT03 Hartford Electric Light Co.
P.O. Box 2370
New Haven, CT 06506

CT04 Connecticut Light & Power
King Street
Enfield, CT 06082

FL01 Florida Power Corp.
P.O. Box 33733
St. Petersburg, FL 33152

FL02 Florida Power & Light Company
P.O. Box 529100
9520 W Flager
Miami, FL 33152

FL03 Florida Power & Light Company
P.O. Box 341608
Coral Gables, FL 33134

FL04 City of Gainesville Utilities
200 E. University Ave. Rm 402
Gainesville, FL 32602

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: AUXSUPPLIER (Continued)

FL05 Florida Public Utilities Co.
Drawer C
West Palm Beach, FL 33406

GA01 Coweta/Fayette, Inc.
P.O. Box 488
Newnan, GA 30264

GA02 Atlanta Gas Light
89 Annex
Atlanta, GA 30389

GA03 Georgia Power Company
1790 Montreal Circle
Tucker, GA 30084

GA04 Georgia Power Company
96 Annex
Atlanta, GA 30396

GA05 Georgia Power Company
Duluth, GA 30246

GA06 Buford Gas Company
30 Garnett Street
Buford, GA 30518

GA07 Georgia Power Company
P.O. Box 327
Lawrenceville, GA 30246

GA08 Georgia Power Company
P.O. Box 271
Canton, GA 30114

GA09 Jefferson Electric Company
1001 Peachtree Street
Louisville, GA 30434

HI01 Hawaiian Electric Co., Inc.
P.O. Box 3978
Honolulu, HI 96813

IN01 Public Service of Indiana
105 S. Madison
Greenwood, IN 46142

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: AUXSUPPLIER (Continued)

MA01 Bay State Gas Co.
2025 Roosevelt Avenue
Springfield, MA 01101

MA02 Boston Edison Company
P.O. Box 488
Boston, MA 02199

MA03 Bay State Gas Company
120 Royall Street
Canton, MA 02021

MA04 Bay State Gas Company
995 Belmont Street
Brocton, MA 02401

MD01 Baltimore Gas & Electric Co.
1508 Woodlawn Drive
Baltimore, MD 21207

MI01 Berrien City Farm Bureau Oil Co.
M-140 &M-62
Eau Claire, MI 41911

MN01 Minnegasco/Minnesota Gas Co.
626 Nicollet Mall
Minneapolis, MN 55402

MN02 Northern States Power
414 Nicollet Mall
Minneapolis, MN 55401

MO01 The Gas Service Co.
2460 Pershing Rd.
Kansas City, MO 64108

MO02 Kansas City Power & Light Co.
13330 Baltimore Avenue
Kansas City, MO 64145

NC01 Duke Power Company
Drawer A D Salem Station
Winston-Salem, NC 27108

NE01 Cengas/Minnesota Gas Co.
1201 N Street
Lincoln, NE 68512

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: AUXSUPPLIER (Continued)

NH01 Public Service Co. of New Hampshire
Crystal Avenue
Derry, NH 03038

NH02 Public Service Co. of New Hampshire
370 Amherst Street
Nashua, NH 03061

NH03 New Hampshire Elec. Cooperative, Inc.
Red 2 Tenney Mt. Hwy.
Plymouth, NH 03264

NM01 Gas Co. of New Mexico
P.O. Box 1692
Albuquerque, NM 87103

NM02 Public Service Co. of New Mexico
414 Silver Ave. N.W.
Albuquerque, NM 87103

NM03 Public Service Co. of New Mexico
124 E. Marcy
Santa Fe, NM 87501

NY01 New York State Electric & Gas
5655 South Park Ave.
Hamburg, NY 14075

NY02 National Fuel Gas
455 Main Street
Buffalo, NY 14203

NY03 Orange & Rockland Electric & Gas Co.
One Bluehill Plaza
Peael River, NY 10965

NY04 Niagara Mohawk Power
383 Broadway
Saratoga Springs, NY 12866

NY05 Moore Oil Company
Charlton Road
Ballston Spa, NY 12020

OH01 Cincinnati Gas & Electric Company
139 E. 4th
Cincinnati, OH 45201

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: AUXSUPPLIER (Continued)

OH02 Ohio Power Company
Box 630
Canton, OH 44701

OH03 Columbus & Southern Ohio Electric Co.
215 North Front Street
Columbus, OH 44701

OR01 Pacific Power & Light Co.
300 W. Anderson Avenue
Coos Bay, OR 97420

OR02 Ashland Municipal Electric
20 E. Main
Ashland, OR 97420

PA01 Philadelphia Electric Co.
230 Market Street
Philadelphia, PA 19101

SC01 Palmetto Elec Cooperative, Inc.
Box 1218
Hilton Head, SC 29928

SC02 Piedmont Natural Gas Co., Inc.
P.O. Box 1905
Greenville, SC 29602

SC03 South Carolina Electric and Gas
P.O. Box 764
Columbus, SC 29218

TN01 Memphis Light, Gas & Water Co.
P.O. Box 430
Memphis, TN 29218

TX01 El Paso Electric Co.
P.O. Box 982
El Paso, TX 79999

TX03 Lone Star Gas
301 Harwood St.
Dallas, TX 75201

TX04 Dallas Power & Light Co.
1506 Commerce Street
Dallas, TX 75201

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: AUXSUPPLIER (Continued)

TX05 West Texas Utilities
106 S. Chadbourne
San Angelo, TX 76901

TX06 Lone Star Gas Company
P.O. Box 471
San Angelo, TX 76902

UT01 Utah Power & Light Company
1407 West North Temple St.
Salt Lake City, UT 84116

UT02 Logan Power & Light Co.
61 W. 100 N.
Logan, UT 84321

UT03 Mountain Fuel
45 E. 200 N.
Logan, UT 84321

VA01 Appalachian Power Company
523 Main Street
Lynchburg, VA 24506

WI01 Wisconsin Power & Light Co.
401 Oak Street
Baraboo, WI 53913

WI02 Northern States Power Company
P.O. Box 1147
Eau Claire, WI 54701

WI03 Wisconsin Electric
231 W. Michigan Street
Milwaukee, WI 53201

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: BPERPROB

A	NONE
B	BLDG. DEPT. CODE PROHIBIT SOLAR
C	CODES DON'T ADDR SOLAR CAN'T ISSUE
D	BLDG. DEPT. REQ. REDESIGN OF SOLAR
E	WILL NOT ISSUE NON SOLAR CAUSE
F	PERMIT NOT REQ. RETROFIT
G	PERMIT NOT REQ.
H	100% COMPLETION REQ. TO ISSUE
I	BLDG. DEPT. SHOWED INTEREST
J	OTHER SEPARATE PERMITS REQ'D.
K	ADDS/CHANGES TO BLDG. REQ'D.
L	OBTAINED BY OTHER THAN GRANTEE
Z	MORE INFO. IN FILES

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Names: CFINPROB

A	NO PROBLEM
B	FIN. ORG. NEG ON SOLAR
C	FIN. ORG. HAS TECH CONCERNS
D	FIN. ORG. HAS MARKET CONCERNS
E	FIN. ORG. NOT MAKING CONST. LOANS
F	INCR. INT. RATE DUE TO SOLAR
G	CONST./MORTGAGE COMBINED
H	HUD FINANCED
I	RETROFIT INTERNAL FIN.
J	APPRAISAL PROBLEMS
K	LOAN LESS THAN APPR. VALUE
L	COND. COMMIT. NON SOLAR
M	COND. COMMIT. SOLAR CAUSED
N	PENDING FHA/VA APPROV.
O	REVOLVING CREDIT LINE
P	INTERNAL FUNDING
Q	RETROFIT NO FIN. REQ.
R	CONST. & PERMANENT FIN.
S	GRANT AMT. INCL. IN SALES PRICE
T	STATE FUNDS
U	LOW INC. HSG LOAN ONLY
Z	MORE INFO. IN FILES

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: CPROBBRK

A	NONE
B	IMPROPER HANDLING DEL. OR ON SITE
C	EQUIP. TOO FRAGILE
D	FAULTY MANUFACTURE
E	OPERATIONAL FAILURE
F	DAMAGED OR INSTALLED INCORRECTLY
G	FAULTY EQUIP REPLACED
H	DEFECTIVE HOSES/DAMPERS/FANS
I	INST. MANUALS NOT PROVIDED
J	MALFUNCTIONING CONTROLS
K	ALL COLLECTORS/PANELS REPLACED
L	LEAKAGE PROBLEMS
M	MISC. COLLECTOR BREAKDOWNS
N	STORAGE PROBLEMS
O	DAMAGED IN TRANSIT
Z	MORE INFO. IN FILES

APPENDIX C

CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: CPROBDEL

A	NONE
B	TEMP. PROD. DELAY
C	MAJOR PROD. DELAY CHANGE OF EQUIP.
D	DEL. DELAY DUE TO WEATHER
E	DEL. DELAY CAUSE UNSPECIFIED
F	COMPANY OUT OF BUSINESS
G	MORE LEAD TIME REQ'D ON ORDERS
H	HUD/BOEING INSTR. PACKAGE DELAYED
I	INCOMPLETE ORDER
J	DELAYED AT CUSTOMS
K	DISPUTE CONTRACTORS & MFG.
L	LOCAL SUPPLIER OUT OF MATERIALS
M	MISC. PARTS REORDERED
N	MISC. MATERIALS UNAVAILABLE
O	ORDER REC'D W/WRONG COMPONENTS
P	PLANT SHUTDOWN/STRIKE
Q	REORDER/DAMAGED PARTS REC'D
S	SUPPLIER UNABLE TO SHIP PER SCHED.
T	TRANSPORTATION RELATED DELAY
U	MAJOR PARTS REORDERED
V	FABRICATION DELAY
Z	MORE INFO. IN FILES

Data Element Name: CPROBINTF

A	NONE
B	MAJOR STRUCTURAL CHANGES
C	MINOR STRUCTURAL CHANGES
D	WEATHER
E	AESTHESTIC PROBLEMS
F	FURTHER CONST. AFTER COMPL.
G	ADD'L MAT./COMPONENTS REQD.
H	IMPROPER DESIGN ROOF OR COLL.
I	INSULATION RELATED
J	ACQUISITION OF MATERIALS
K	ADD'L DUCT WORK REQD.
L	LEAKS
M	MULTIPLE INTERFACE PROBLEM
N	NEW DESIGN DEV. & INSTALLED
O	ROOF DESIGN CREATED PROBLEMS
P	SOLAR MFG. RECOMMENDS CHANGE
Q	ROOF DESIGN CREATED PROBLEMS
R	SOLAR PLUMB./WIRING RELATED
S	SENORS OMITTED
T	TRUSS DESIGNS ADDED
U	STORAGE TANK MODS.
V	SCHEDULING OF OTHER SUBCONT.
W	WATERPROOFING
Y	SOLAR INSTALL. PROBLEMS
Z	MORE INFO. IN FILES

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: CPROBLAB

A	NONE
B	NO INTEREST WILL NOT WORK SOLAR
C	LACK OF SKILL
D	JURISDICTIONAL DISPUTE
E	POOR WORKMANSHIP
F	LACKS TECH. COMPETANCE
G	WEATHER RELATED
H	HAD TO TRAIN CO. PERSONNEL
I	INTITAL CONTR. TERMINATED
J	SLOW PYMNT SLOW LAB. RESPONSE
K	EXTRA SUPERVISION REQ.
L	INSTALLATION COSTS OVER ESTIMATE
M	MORE INSTR. FROM SOL. MFG.
N	NOT AVAIL TO COMPL. WORK
O	SUBCONTR. BEHIND SCHEDULE
P	LAB. PRODUCTION DEL. UNSPECFIED
Q	ACQUIRING QUALIFIED LABOR
R	UNSKILLED PROSPECTIVE OWNERS
S	HIGH LABOR COSTS
Z	MORE INFO. IN FILES

Data Element Name: CPROBOTH

A	NONE
B	PROB. W/GEN. CONTR. & SUBCONTR.
C	RELATED TO COSTS
D	SUBCONTR. WORKING OTHER JOBS
E	ROOFING COORDINATION
F	MISC. WEATHER RELATED
G	VANDALISM/THEFT
H	MODIFICATIONS AFTER COMPL.
I	OBTAINING GEN. MATERIALS
J	ROCK BOX/FILL/STORAGE
K	INSTRUMENTATION INSTALLATION
L	CONSTRUCTION START DELAY
M	INSTALL. TIME UNDERESTIMATED
N	MAJOR CONSTRUCTION PROBLEMS
O	UNFAMILIAR W/SOLAR COMPONENTS
Z	MORE INFORMATION IN FILES

Data Element Name: EVENTS

GENE	GENERAL
AIRE	AIR ENTRAPMENT
DMBY	DAMAGED
DMBY1	ACCIDENT
DMBY11	IN TRANSIT
DMBY12	DURING INSTALLATION
DMBY2	FREEZING OF LIQUID
DMBY3	LEAKAGE OF MOISTURE OR RAIN
DMBY4	LEAKAGE OF SYSTEM FLUIDS
DMBY41	BETWEEN COMPONENTS
DMBY42	FROM COMPONENTS
DMBY5	LIGHTNING
DMBY6	MAINTENANCE ACTION
DMBY7	SOIL EROSION
DMBY71	OVERFLOW PROVISIONS INADEQUATE
DMBY72	STORM DRAINS INADEQUATE
DMBY8	VANDALISM
DESC	DESIGN CHANGE
FLOP	FAILED TO OPERATE
FLOP1	BROKEN
FLOP2	BURNED OUT
FLOP3	BURST
FLOP4	CLOGGED OR BLOCKED
FLOP7	FAULTY
FLOP6	INCOMPATIBLE
FLOP8	MALF-OTH COMPO
FLOP5	WORN OUT
FLBO	FAILED TO OPERATE BECAUSE OF OUTAGE
FLBO1	ELECTRICITY
FLBO2	GAS
FLBO3	OIL
FLBO4	WATER
OPIM	OPERATING, BUT IMPROPERLY
OPIM6	CONTINUOUSLY
OPIM1	DEPOSITION OF
OPIM11	CONDENSATION PRODUCT
OPIM111	MOISTURE
OPIM112	SOLID
OPIM12	DUST OR DIRT ON EXTERIOR SURFACES
OPIM13	DUST OR DIRT ON INTERIOR SURFACES
OPIM14	GUM OR VARNISH
OPIM15	PRECIPITATED MATTER
OPIM16	SEDIMENTATION
OPIM4	ELEMENT INADEQUACIES
OPIM2	INCORRECT
OPIM21	ADJUSTMENT
OPIM22	ALIGNMENT
OPIM23	CAPACITY
OPIM24	INSTALLATION
OPIM25	MANUFACTURING

Data Element Name: EVENTS (Continued)

OPIM26	PART OR COMPONENT
OPIM3	LEAKAGE OF AIR
OPIM5	SOLAR SHADING
OPIM51	OFF-SITE OBSTRUCTION
OPIM52	ON-SITE OBSTRUCTION
RUBN	RESTRAINS USE BECAUSE OF NOISE
RUBN1	FLUID MOVEMENT
RUBN2	VIBRATION
RUBN3	WATER HAMMER
RULS	RESTRICTS USE OF LIVING SPACE
RULS1	ENCROACHMENT
RULS2	EXCESSIVE AIR MOVEMENT
RULS3	LEAKAGE OF AIR
RULS4	ODORS
RULS5	SOLAR REFLECTION
RULS6	THERMAL RADIATION
RUOS	RESTRICTS USE OF OUTDOOR SPACE
RUOS1	FLUIDS ESCAPING
RUOS2	SOLAR REFLECTION
RUOS3	THERMAL RADIATION
SCHD	SCHEDULING INADEQUACIES
SHPM	SHPMT/PARTS & MATERIALS INCOMPLETE
MECH	MECHANICAL
FLIN	FILTRATION INADEQUATE
FLRA	FLOW RATE
FLRA1	HIGHER THAN DESIGN
FLRA2	LOWER THAN DESIGN
FLRG	FLOW REGULATION INADEQUATE
FLRG1	CYCLING EXCESSIVE
FLSD	FLOW SEQUENCING NOT ACCORDING TO DESIGN
FLSD1	DIRECTION
FLSD2	SCHEDULING
FLUN	FLOW UNBALANCED
FLVE	FLUID VOLUME EXCESSIVE
FLVE1	BOILING PROVISIONS INADEQUATE
FLVE2	THERMAL EXPANSION PROVISIONS INADEQUATE
FRIC	FRICTION EXCESSIVE
FRIC1	FOREIGN MATTER
FRIC2	IMPROPER MATERIALS
FRIC3	INADEQUATE BEARING SURFACES
FRIC4	INADEQUATE CLEARANCE
FRIC5	INADEQUATE LUBRICATION
INST	INSTALL DIF
INST1	HARDWARE INADEQUATE
INST2	INSTRUCTIONS INADEQUATE
INST3	BUILDING INADEQUATE
LGRU	LEAKAGE RUNOFF PROVISIONS INADEQUATE
LEAK	LEAKING
OPIN	OVERFLOW PROVISIONS INADEQUATE
OVLD	OVERLOADED

Data Element Name: EVENTS (Continued)

OVLD1	ELECTRICALLY
OVLD2	MECHANICALLY
PASS	PASSAGE SIZE
PASS1	LARGER THAN DESIGN
PASS2	SMALLER THAN DESIGN
PBHD	PRESSURE BUILDUP HIGHER THAN DESIGN
PBHD1	DURING NO FLOW CONDITIONS
PBHD2	DURING NORMAL OPERATING CONDITIONS
PROP	PRESSURE DURING OPERATION
PROP1	HIGHER THAN DESIGN
PROP2	LOWER THAN DESIGN
PRIN	PRESSURE REGULATION INADEQUATE
PREF	PRESSURE RELIEF INADEQUATE
SUPI	SUPPORT INADEQUATE
SUPI1	CAUSING IMPROPER DRAINAGE
SUPI2	CAUSING JOINT FAILURE
SUPI3	LOW SPOTS OR SAGGING
TMOV	THERMAL MOVEMENT
TMOV1	CONTRACTION EXCESSIVE
TMOV2	DIFFERENTIAL DISPLACEMENT EXCESSIVE
TMOV3	EXPANSION EXCESSIVE
VHDE	VACUUM HIGHER THAN DESIGN
VHDE1	BECAUSE OF INADEQUATE RELIEF
VLDE	VACUUM LOWER THAN DESIGN
VLDE1	BECAUSE OF OUTGASSING
VLDE2	BECAUSE OF LEAKAGE
VIBE	VIBRATION EXCESSIVE
VIBE1	INADEQUATE/NO VIBRATION ISOLATORS
VIBE2	INADEQUATE/NO WATER HAMMER ARRESTORS
VLIN	VOLUME INSUFFICIENT
VLTL	VOLUME TOO LARGE
MAIN	MAINTAINABILITY
ACRE	ACCESS FOR REPAIRS INADEQUATE
ACRU	ACCESS FOR ROUTINE MAINTENANCE INADEQUATE
BYPA	BY PASSES OR SHUT-OFFS INADEQUATE
FAMA	FACILITIES FOR MAINTENANCE INADEQUATE
FAMA1	USE OF ELECTRICAL MAINTENANCE EQUIPMENT
FAMA2	WASTE DISPOSAL
MAST	MAINTENANCE INSTRUCTIONS
MAST1	INADEQUATE
MAST2	NOT AVAILABLE
MAEP	MAINTENANCE EQUIPMENT
MAEP1	INADEQUATE
MAEP2	NOT AVAILABLE
RERP	REMOVAL AND/OR REPLACEMENT DIFFICULT
RPDR	REPAIR PROCEDURES
RPDR1	ARE CUMBERSOME
RPDR2	REQUIRES UNAVAILABLE SKILLED PERSONNEL
RNAV	REPLACEMENT NOT AVAILABLE
RSNP	ROUTINE SCHEDULED MAINTENANCE NOT PERFORME

Data Element Name: EVENTS (Continued)

TCHP	TEST CHECK POINTS
TCHP1	INACCESSIBLE
TCHP2	LACKING
DURA	MATERIALS DURABILITY/RELIABILITY
ANTF	ANTIFREEZE DETERIORATION
ATAC	ATTACK BY
ATAC1	AIRBORNE POLLUTANT OF
ATAC11	HYDROGEN CHLORIDE [HCL]
ATAC12	NITROGEN OXIDES [NOX]
ATAC13	OZONE
ATAC14	SALT SPRAY
ATAC15	SULPHUR DIOXIDE
ATAC16	OTHER
ATAC2	FUNGI
ATAC3	SOIL
ATAC4	ULTRA VIOLET RADIATION
ATAC5	VERMIN
CBCB	CORROSION
CBCB1	DECOMPOSITION PRODUCT AND METAL
CBCB2	DISSIMILAR METALS
CBCB3	FLUID + DISSIMILAR METALS
CBCB4	FLUID AND METAL
DETR	DETERIORATION
DETR1	BLOATING
DETR2	BOND FAILURE
DETR3	DEPOSITION OF OUTGASSED VOLATILES
DETR4	EMBRITTLEMENT
DETR5	LOSS OF HOMOGENEITY
DETR51	PRECIPITATION
DETR52	SEGREGATION
DETR53	SHRINKAGE
DETR6	MOISTURE BUILDUP
DETR7	PH CHANGE
DETR8	PLASTIC FLOW
DETR9	SOFTENING
EROD	EROSION
EROD1	BY AIRBORNE PARTICULATE
EROD2	BY FLUID
EROD3	BY FOREIGN MATTER
FAIL	FAILED
FAIL1	CREEP RUPTURE
FAIL2	EXCESSIVE DIMENSIONAL CHANGE
FAIL3	FREEZING
FAIL4	MOISTURE DEGRADATION
FAIL5	THERMAL CYCLING
FAIL6	THERMAL DEGRADATION
FAIL7	THERMAL SHOCK
FAIL71	COLD FLUID ON HOT SURFACE
FAIL72	HOT FLUID ON COLD SURFACE
FAIL73	VIOLENT BOILING

Data Element Name: EVENTS (Continued)

FAIL8	WET-DRY CYCLING
FAIL9	OUTGASSING OF VOLITALS
SRDG	SURFACE DEGRADATION
SRDG1	BLISTERING
SRDG2	CRACKING
SRDG3	DISCOLORATION OR STAINING
SRDG4	PITTING
SRDG5	PEELING
VISC	VISCOSITY CHANGE
SAFE	SAFETY
EGEM	EGRESS, EMERGENCY
EGEM1	BLOCKED
EGEM2	INADEQUATE
EGEN3	LACKING
EXED	EXPOSED SHARP EDGES
FIRE	FIRE POTENTIAL FIRE DAMAGE
FIRE1	AUTO IGNITION TEMPERATURE EXCEEDED
FIRE2	ELECTRICAL ARCING AND/OR SHORT
FIRE3	FIRE STOPS INEFFECTIVE OR MISSING
FIRE4	FLASH POINT TEMPERATURE EXCEEDED
FIRE5	INADEQUATE CLEARANCE
FIRE51	BETWEEN COMBUSTIBLES + HOT HARDWARE
FIRE52	BETWEEN FLAMMABLE FLUID AND SPARK SOUR
FIRE6	OVERHEATED EQUIPMENT
PRSL	PERSONAL INJURY
PRSL1	ALLERGY
PRSL2	BROKEN BONE
PRSL3	BURN
PRSL4	CUT
PRSL5	ELECTRIC SHOCK
PRSL6	POISONED
PRSL7	SCRATCH
PRSL8	STRAIN
PRSN	PERSON INJURED
PRSN1	OCCUPANT
PRSN2	MAINTENANCE PERSON
PRSN3	PASSER BY
SAHD	SAFETY HAZARDS [OTHER THAN FIRE]
SAHD1	ACCESS, EMERGENCY
SAHD11	BLOCKED
SAHD12	INADEQUATE
SAHD13	LACKING
SAHD2	CONTACT POSSIBLE WITH
SAHD21	HOT FLUIDS
SAHD22	HOT SURFACES
SAHD23	TOXIC SUBSTANCE
SAHD231	INHALATION
SAHD232	DRINKING
SAHD233	SKIN CONTACT
SHEM	SHUTOFFS, EMERGENCY

Data Element Name: EVENTS (Continued)

SHEM1	INACCESSIBLE
SHEM2	INCONSPICUOUS
SHEM3	LACKING
CNSL	SOIL CONTAMINATION
SLRA	SOLAR RADIATION CONCENTRATION
CNSW	WATER SUPPLY, POTABLE, CONTAMINATION
CNSW1	DIRECT CONTACT WITH TOXIC MATERIAL
CNSW2	LACK OF SEPARATION OF CIRCULATION LOOPS
CNSW3	IMPROPER DESIGN OF TOXIC FLUID DISCHARGE
CNSW4	TOXIC FLUID LEAKAGE OR OVERFLOW
MPPR	MOVING PARTS INADEQUATELY PROTECTED
STRU	STRUCTURAL
DEFL	DEFLECTIONS WERE EXCESSIVE
DEFL1	HORIZONTALLY
DEFL2	VERTICALLY
DCHG	DIMENSIONAL CHANGES EXCESSIVE
DCHG1	CREEP
DCHG2	DIFFERENTIAL SETTLEMENT
DCHG3	DRYING/SHRINKAGE
DCHG4	MOISTURE EXPANSION
DCHG5	THERMAL EFFECTS
FDLB	FAILURE
FDLB1	BENDING
FDLB2	BUCKLING
FDLB3	BULGING
FDLB4	FATIGUE
FDLB7	FLOTATION
FDLB5	FRACTURE
FDLB51	BRITTLE
FDLB52	DUCTILE
FDLB6	YIELDING
FDLB61	AXIAL
FDLB62	TRANSVERSE
LLOD	LIVE LOADS
LLOD1	EQUIPMENT [SOLAR HARDWARE]
LLOD2	HAIL
LLOD3	ICE
LLOD4	MAINTENANCE EQUIPMENT OR ACTIONS
LLOD5	PONDING OF WATER
LLOD6	SNOW
LLOD7	VEHICLE
LLOD8	WIND
LLOD81	BUFFETING
LLOD82	HORIZONTAL
LLOD83	UPLIFT
LLOD84	VORTEX SHEDDING
LLOD9	INSTALLATION PERSONNEL
LOBY	OVERLOADED
LOBY1	ACCIDENTAL LOADS
LOBY11	ANIMAL

Data Element Name: EVENTS (Continued)

LOBY12	DEBRIS, FALLING
LOBY13	DEBRIS, WIND BLOWN
LOBY14	HUMAN
LOBY15	VEHICLE
LOBY2	DEAD LOADS
LOBY3	EXTREME ENVIRONMENTAL LOADS FROM
LOBY31	EARTHQUAKE
LOBY32	FLOOD
LOBY33	HURRICANE
LOBY34	TORNADO
THER	THERMAL
TCAP	CAPACITY
TCAP1	TOO SMALL
TCAP2	MISMATCHED
TCIR	CIRCULATION OF AIR, INDOOR SPACE
TCIR1	TOO HIGH
TCIR2	TOO SMALL
TCON	CONDUCTION, THERMAL
TCON1	TOO HIGH
TCON2	TOO LOW
TCLG	COOLING INADEQUATE
TERA	ENERGY EXCHANGE RATE
TERA1	TOO HIGH
TERA2	TOO LOW
TSIR	ENERGY, SOLAR
TEAX	ENERGY USE, AUXILIARY, TOO HIGH
TEOH	ENERGY USE, OPERATING, TOO HIGH
TSIR1	CONTRIBUTION TO LOAD TOO LOW
TSIR2	CONVERSION EFFICIENCY TOO LOW
TSIR3	DISSIPATION RATE TOO LOW
HGIN	HEATING INADEQUATE
HWSP	HOT WATER SUPPLY IS INADEQUATE
HWSP1	DRAW RATE TOO HIGH
HWSP2	RECOVERY RATE TOO LOW
HUMD	HUMIDITY, INDOOR AIR
HUMD1	HIGHER THAN DESIGN VALUE
HUMD2	LOWER THAN DESIGN VALUE
OCIM	OCCUPANT USE IMPROPER
OCIM1	INEFFICIENT SCHEDULING OF LOAD DEMANDS
OCIM2	THERMOSTAT SET POINT
OCIM21	TOO HIGH
OCIM22	TOO LOW
OPTP	OPTICAL PROPERTIES INADEQUATE
OPTP1	ABSORPTANCE
OPTP11	TOO HIGH
OPTP12	TOO LOW
OPTP2	EMITTANCE TOO HIGH
OPTP3	REFLECTANCE, SOLAR, TOO HIGH
OPTP4	TRANSMITTANCE TOO LOW
ORAN	ORIENTATION ANGLE

Data Element Name: EVENTS (Continued)

ORAN1	TOO FAR EAST
ORAN2	TOO FAR WEST
RSLR	RADIATION, SOLAR
RSLR1	EXCESSIVE
RSLR2	INADEQUATE CONTROL
RSLR3	INSUFFICIENT
RTHL	RADIATION, THERMAL
RTHL1	TOO HIGH
RTHL2	TOO LOW
THPG	TEMPERATURE, HARDWARE OPERATING,
THPG1	DURING NOCTURNAL OPERATION
THPG11	TOO HIGH
THPG12	TOO LOW
THPG2	DURING NO FLOW CONDITION
THPG21	TOO HIGH
THPG22	TOO LOW
THPG3	DURING NORMAL OPERATION
THPG31	TOO HIGH
THPG32	TOO LOW
THPG4	DURING FILL
THPG41	TOO HIGH
THPG42	TOO LOW
TAIR	TEMPERATURE, OUTDOOR AIR
TAIR1	HIGHER THAN DESIGN VALUE
TAIR2	LOWER THAN DESIGN VALUE
TSTP	TEMPERATURE SET POINTS,
TSTP1	DIFFERENTIAL
TSTP11	TOO HIGH
TSTP12	TOO LOW
TSTP3	HIGHER THAN DESIGN VALUE
TSTP4	LOWER THAN DESIGN VALUE
TLTA	TILT ANGLE
TLTA1	TOO HIGH
TLTA2	TOO LOW
THMOSY	THERMOSYPHONING

Data Element Name: HARDELEM

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SBLD	SITE/BUILDING
SITE	SITE
SUDR	SURFACE DRAINAGE
UTIL	UTILITIES
WATR	WATER
ELEC	ELECTRIC
SWER	SEWER
FUEL	FUEL
SOIL	SOIL
PLTR	PLANTS/TREES
ADST	ADJACENT STRUC
BLDG	BUILDING
ROOF	ROOF
ROFG	ROOFING
INSU	INSULATION
STRE	STRUCTURE
CEIL	CEILING
WALL	WALL
INTR	INTERIOR
EXTR	EXTERIOR
FLOR	FLOOR
BSMT	BASEMENT
OPNG	OPENINGS
DOOR	DOOR
WNDW	WINDOW
OTER	OTHER
SHSY	SHS-H/C/HW-ACT/PASS
ACSD	T W/DISC SHS
COLA	COLLECTOR ARRAY
COLU	COLLECTOR UNITS
COVA	COVER ASSY
HTRP	HEAT TRAP
ABAS	ABSORBER ASSY
THRM	THERMAL INSUL
DESA	DESICCANT
INUR	INT UNIT REF
CASA	CASE ASSY
HCON	HEADERS-CONNECTORS
AIRD	AIR DUCT ASSY
LPIP	LIQUID PIPE ASSY
EXRA	EXTR REF ARRAY
REFA	REFLECTOR ARRAY
RINS	INSULATION
MTGS	MOUNTING STRUC
SUPS	SUPTG STRUC
FIXM	FIXED MOUNT
SADJ	SEASON ADJ MOUNT

Data Element Name: HARDELEM (Continued)

TKGM	TRACKING MOUNT
ENCL	ENCLOSURE
THST	THERMAL STORAGE
TKCU	TANK/CONTN UNITS
SMCV	STOR MED CONTN VL
VSLC	VESSEL LIN/COAT
GASK	GASKETS/SEALANTS
THIA	INSULATION ASSY
STEL	STRUC ELEMENTS
INRT	INT RACKS/TROUGHS
STMD	STORAGE MEDIUM
STLQ	LIQUID
STRK	ROCK
HTEX	HEAT EXCHANGERS
CLST	COLLECTOR TO STOR
STLD	STORAGE TO LOAD
ENTP	ENERGY TRANSPORT
LISY	LIQUID SYSTEMS
HTRS	HEAT TRANSFER LIQ
PIAS	PIPING ASSY
PUMP	PUMPS
LFIL	FILTERS
VALV	VALVES
ELIN	INSULATION
AIRS	AIR SYSTEMS
DUCA	DUCT ASSY
BLOW	BLOWERS
AFIL	FILTERS
DAMP	DAMPERS
EAIN	INSULATION
CONT	CONTROLS
LSMC	LLD SUP MODE CONT U
LCLS	CONTROL LOGIC SELECTOR
LSEN	SENSORS (L S)
LADV	ACTUATED DEV (L S)
CSFL	COL/STOR FLOW CONT U
CDTC	DIFF THERMOSTAT CONT
CSEN	SENSORS (T C)
CADV	ACTUATED DEV (T C)
ETOR	ENERGY TRANS OPRN REGS
EPRG	PRESSURE REGULATORS
EFRG	FLOW REGULATORS
SFSC	SSVS FAIL-SAFE CONT
SPRV	PRES RELIEF VALVES
STRV	TEMP RELIEF VALVES
SEOP	ELEC OVERLOAD PROTEC
SVRV	VACUUM RELIEF VALVES

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: HARDELEM (Continued)

SCVA	CHECK VALVES
SADV	AUTO DRAINDOWN VALVES
SWHA	WATER HAMMER ARRES
SABV	AUTO BACKFILL VALVES
SBFP	BACK FLOW PREVENTORS
CMPC	COMPONENT OPRN CONTS
TMDC	TRACKING MOUNT DRIVE CONTS
STHT	STOR HEATER THERMOSTAT
AUXE	AUXILIARY ENERGY
ARHT	INTERNAL W/STORAGE
ITWS	RESISTANCE HEATER
ILWS	IN LINE W/STORAGE
ILFR	FURNACE
ILHP	HEAT PUMP
ILBR	BOILER
ILRH	RESISTANCE HEATER
ILAC	AIR CONDITIONER
ILWH	HOT WATER HEATER
IPST	IN PARALLEL W/STOR
IPFR	FURNACE
IPHP	HEAT PUMP
IPBR	BOILER
IPRH	RESISTANCE HEATER
IPAC	AIR CONDITIONER
IPDE	DEHUMIDIFIER
IPHW	HOT WATER HEATER
DIST	DISTRIBUTION
CENA	CENTRAL AIR TYPE
CSND	SINGLE DUCT
CDUD	DOUBLE DUCT
CMUL	MULTIZONE
CVAV	VAR AIR VOLUME
HYDR	HYDRONIC/AIR TYPE
HFAN	FAN COIL
HIND	INDUCTION
HRAD	RADIATION
ECON	ENERGY CONSER TYPE
EHRL	HEAT RECOVERY
EHRC	HEAT RECLAIM
EHES	ENERGY STORAGE
EHDL	DEMAND LIMITER
EHVC	VENTILATION CONT
PSYS	T SYS INTG W/BLDG
PCSA	COL/STOR ARRAY
PCPA	COVER PLATE ASSY
PINS	COL HT INSUL ASSY
PABS	ABS/THER STOR UNIT

Data Element Name: HARDELEM (Continued)

PCON	CONTROLS
PACC	AIR CIR CONTROLS
PCOL	COL HT INSUL ASSY
PAUX	AUXILIARY ENERGY
PADI	INTG INTO DIST
PSEP	COMP SEP CONVN SYS
PDIS	DISTRIBUTION
PDUC	DUCTS
PDAM	DAMPERS

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: MKTPROB

A	NONE
B	MINOR REPAIRS
C	MAJOR REPAIRS
D	REPLACED MISC. PARTS
E	NO MARKETING RETROFIT
F	SOLAR FAILED TO MEET EXPECTATIONS
G	NUMEROUS SYSTEM SHUTDOWNS
H	CONTROL MALFUNCTION
I	MINOR ADJUSTMENTS
J	REPLACED A MAJOR PART
K	OPERATIONAL FAILURE
L	HOUSE SOLD FROM MODEL
M	SYSTEM INOPERATIVE AT OPEN HOUSE
N	INSTALLED AUXILIARY SYSTEM
O	SOLD DURING CONST. NO MKTG
P	PRE SOLD NO MKTG
Q	HOUSE IS MODEL/TO BE SOLD LATER
R	LACK OF INFO AVAILABLE
S	HOUSE/BLDG OCCUPIED DURING RETROFIT
T	PUBLIC UNFAMILIAR WITH SYSTEM
U	INTEREST RATES TOO HIGH
Z	MORE INFO IN FILES

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: MKTPUBLIC

A	FAVORABLE, ENTHUSIASTIC
B	FAVORABLE, BUT SKEPTICAL
C	HOME NOT AESTHETICALLY PLEASING
D	PRICE TOO HIGH
E	DONT CARE FOR DEVEL/NEIGHD
F	NONE TAKEN
G	POSITIVE
H	NEGATIVE
I	CURIOUS
J	MIXED
K	SKEPTICAL
L	LACKED SOLAR KNOWLEDGE
M	CAUTIOUS W/ COST CONCERNS
N	CONCERN WITH MAINTENANCE
O	HAD SOLAR KNOWLEDGE
P	WANT PERFORMANCE ASSURANCE
Q	WANT MORE INFORMATION
R	LEERY OF SOLAR
S	INTERESTED BUT MONEY NOT AVAILABLE
Z	MORE INFO IN FILES

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: MTGPROB

A	NONE
B	HUD 235 LOAN
C	HUD COLLEGE HSG LOAN
D	HUD LOW INCOME HSG
E	RETROFIT
F	LOW INCOME PUB. HSG.
G	NO MORTGAGE CASH
H	HOUSE RENTED/LEASED AT THIS TIME
I	HUD SEC. 8 ELDERLY HOUSING
J	SELF HELP HOUSING LOAN/HUD FINANCED
K	NO MORTGAGE USED UNIVERSITY FUNDS
L	MORTGAGE OBTAINED PRIOR TO GRANT
M	GRANTEE HOLDS MORTGAGE
N	INT. RATE HIGH/MONEY NOT AVAIL.
Z	MORE INFO. IN FILE

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: OPERPROB

A	NO PROBLEM
B	WILL NOT ISSUE NON SOLAR CAUSE
C	PENDING COMPL. OF CONST.
D	PENDING ISSUED WHEN SOLD
F	PERMIT NOT REQ. RETROFIT
G	PERMIT NOT REQ.
H	ADD'L BLDG. MODS REQ.
I	INSPECTION VERBAL APPROVAL
Z	MORE INFO. IN FILES

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Names: SYSMFGR-A, SYSMFGR-G

ACRN	ACORN STRUCTURES INC
AIRC	AIR COMFORT INC
ALBQ	ALBUQUERQUE WESTERN
ALSN	ALL SUN POWER INC
ALIB	ALLEN IRA BASS
ALHE	ALTERNATIVE HEAT SYS
ASFE	AMERAUS SYS/FLEETWOO
AMTH	AMERICAN HELIOTHERM
ASHS	AMERICAN SOLAR HEAT
ASKC	AMERICAN SOLAR KING
AMSI	AMERICAN SUN IND.
APOL	APOLLO SOLAR SYSTEMS
ARKL	ARKLA INDUSTRIES
AZTC	AZTEC SOLAR CO
BDPC	BDP COMPANY
BEAS	BEASLEY COMPANY
BRAD	BRADLEY LOREN CO
BRWN	BROWN MANUFACTURING
CDVA	C AND D VALVE
CJAS	C J ASSOCIATES INC
CALM	CALMAC MFG
CPTL	CAPITAL
CARO	CAROLINA SOLAR EQUIP
CASA	CASAGRANDE CONST CO
CBLR	CENTRAL BOILERS LTD
CHBL	CHAMBERLAIN MFG
CHPN	CHAMPION HOME BLDRS
COLE	COLE SOLAR SYSTEMS
COLT	COLT INC OF SO CAL
COLU	COLUMBI CHASE SOL EN
CNSL	CONSOLAR INC
CONS	CONSOLIDATED WESTERN
COEN	CONSUMER ENERGY CORP
CTEM	CONTEMPORARY SYSTEMS
CREP	CREIGHTON SOLAR CONC
CSIS	CSI SOLAR SYSTEMS
DAYS	DAYSTAR
EKSC	E AND K SERVICE CO
ERSB	EDWIN R SANDERS BLDR
ENAL	ENERGY ALTERNATIVES
ENCO	ENERGY CONSERV ENG
ENDY	ENERGY DYNAMICS CORP
ENRG	ENERGY RESEARCH GRP
ELTD	ENGINEERS LTD
FASC	FASCO INC
FERN	FERN ENGINEERING CO

Data Element Names: SYSMFGR-A, SYSMFGR-G (Continued)

FILN	FILON DIVISION
FLAG	FLAGALA CORP
FLET	FLETCHER MYERS
FLPR	FLOW PRODUCTS INC
FOXS	FOX STEEL CO
FRED	FRED RICE PROD
FRON	FRONTIER DEVELOPMENT
FUSY	FUTURE SYSTEMS INC
GENE	GENERAL ELECTRIC
GEDE	GENERAL ENERGY DEVIC
GNSO	GENERAL SOLARGENIC
GSUN	GENERAL SUN
GNSS	GNS SOLARWALL
GRIP	GRIEP HEATING
GRUM	GRUMMAN ENERGY SYS
GULF	GULF THERMAL
HALS	HALSUN SOLAR ENG
HEFR	HEFRON SOLAR SYSTEMS
HLIO	HELIO THERMICS
HDYN	HELIODYNE
HELP	HELIOPHASE
HTRM	HELIOTHERM INC
HECL	HEX CELL
HYPE	HYPERION INC
ILSE	ILSE ENGINEERING INC
ITEC	INTERTECHNOLOGY
IENV	INTL ENVIRONMENT
ISOL	INTL SOLARTHERMICS
JACK	JACKSON
KALW	KALWALL
KENN	KENNECOTT COPPER
KENW	KENWALL CORPORATION
KTAC	KTA CORP
LARG	LARGO SOLAR SYS INC
LENX	LENNOX-HONEYWELL
LOFC	LIBBY OWENS FORD CO
MIRO	MIROMIT
NENG	NATIONAL ENERGY CORP
NESC	NATIONAL ENERGY SYST
NSOL	NATIONAL SOLAR CORP
NUTS	NATURAL ENERGY CORP
NENW	NATURAL ENERGY WKSHP
NORT	NORTHRUP
NRGL	NRG LTD
NRGM	NRG MANUFACTURING
NPTD	NTL PATENT DEVELOP

Data Element Names: SYSMFGR-A, SYSMFGR-G (Continued)

OCON	OCON INDUSTRIES INC
OLIN	OLIN BRASS
OVER	OVERLY MANUFACTURING
OWEN	OWENS ILLINOIS
PARK	PARK ENERGY
PAYN	PAYNE AIR CONDITION
PION	PIONEER ENERGY PROD.
PIPR	PIPER HYDRO INC
PLIN	PLEIAD INDUSTRIES
PPGI	PPG INDUSTRIES
PPIE	PPG/INT ENVIR
PRSH	PRACTICAL SOLAR HEAT
RMPR	R M PRODUCTS
RALS	RALEIGH SOLAR SYSTEM
RAYP	RAYPAK
REFR	REFRIGERATION RESERC
REPC	RESEARCH PRODUCTS
REVE	REVERE
REYN	REYNOLDS
RICK	RICKER MANUFACTURING
ROCK	ROCKY MOUNTAIN PROD
ROMA	ROM-AIRE
SATL	SCIENTIFIC-ATLANTA
SEBN	SEECO BINKLEY
SMSP	SEMCO SOLAR PRODUCTS
SHAL	SHALLA CORP
SHEL	SHELDAHL
SITE	SITE BUILT
SKYT	SKYTHERM
SOFA	SOLAFERN LTD
SOHT	SOLAHART
SLAP	SOLAPAK
SACC	SOLAR ACCESS INC
SLCN	SOLAR CENTRAL
SCOM	SOLAR COMFORT INC
SDVL	SOLAR DEVELOPMENT
SDEV	SOLAR DEVICES
SELI	SOLAR ELECTRIC INTL
SENC	SOLAR ENERGY CORP
SENI	SOLAR ENERGY INC
SEPR	SOLAR ENERGY PROD
SERC	SOLAR ENERGY RESEARCH
SEST	SOLAR ENERGY STRUCT
SEEQ	SOLAR ENERGY & EQUIP
SNGY	SOLAR ENERGYTICS INC
SENG	SOLAR ENGINEERING

SENT	SOLAR ENTERPRISES
SFRM	SOLAR FARMS
SLHC	SOLAR HEAT CORP
SLHT	SOLAR HEAT INC
SHST	SOLAR HEATING SYST
SHOM	SOLAR HOMES INC
SHSG	SOLAR HOUSING INC
SLHY	SOLAR HYDRO INC
SINC	SOLAR INC
SIOF	SOLAR IND OF FLORIDA
SINN	SOLAR INNOVATIONS
SLKN	SOLAR KINETICS CORP
SKIN	SOLAR KING
SMFG	SOLAR MANUFACTURING
SOLI	SOLAR ONE
SPAS	SOLAR PACKAGE STRUCT
SPST	SOLAR PROD SUN TANK
SORE	SOLAR RESEARCH
SLRM	SOLAR ROOM CO
SSEV	SOLAR SEVEN IND
SSHL	SOLAR SHELTER
SSTR	SOLAR STOR
SUNS	SOLAR SUN
SSVA	SOLAR SYST OF VA
SSSD	SOLAR SYST SUNDANCE
SSEN	SOLAR SYSTEM ENTERP.
SSII	SOLAR SYSTEMS INT
SOTH	SOLAR THERM
SOUL	SOLAR UNLIMITED INC
SOLA	SOLARA
SRAY	SOLARAY
SCEL	SOLARCELL
SCOA	SOLARCOA INC
SLIN	SOLAREIN
SGEN	SOLARGENICS
SRIS	SOLARIS
SLMR	SOLARMASTER
SMAT	SOLARMATIC
SROL	SOLAROLL
SRON	SOLARON
SOTC	SOLARTEC
SOTR	SOLARTRONICS INC
SAIR	SOLAR-AIRE
SLRA	SOLA-RAY
SOLC	SOLCAN
SRGY	SOLERGY INC

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Names: SYSMFGR-A, SYSMFGR-G (Continued)

SLOP	SOLOP CORP
SOLP	SOLPOWER INDUSTRIES
SOLW	SOLWIN INDUSTRIES
SWET	SOUTH WEST ENER-TECH
SPEC	SPECTRA ENERGY SYS
SRWI	SRW INC
SSSI	SS SOLAR INC
SSPA	SSP ASSOC
SSCO	STANDARD SOLAR COLL
STIN	STATE INDUSTRIES
STOR	STORAGE ONLY
SCFT	SUN CRAFT
SUDS	SUN DESIGN
SNFL	SUN FLOW
SHAR	SUN HARVESTER CORP
SUPC	SUN PAC
SUPO	SUN POWER CORP
SPIN	SUN POWER INDUSTRIES
SPSY	SUN POWER SYSTEMS
SURE	SUN RAY SOLAR EQUIP
SSYS	SUN SYSTEMS INC
SNBL	SUNBLAZER SOLAR FURN
SBUR	SUNBURST
SNLL	SUNCELL
SEAR	SUNEARTH
SPOW	SUNENERGY POWER LTD
SUFO	SUNFLOWER SOLAR INC
SLPO	SUNLIGHT & POWER CO
SUMA	SUNMASTER CORP.
SNSV	SUNSAV INC
SNSR	SUNSAVER
SNUT	SUNSHINE UTILITY CO
SSTN	SUNSTONE
SNST	SUNSTREAM
SNTP	SUNTAP INC
SUNW	SUNWALL INC
SWAT	SUNWATER
SWOR	SUNWORKS
SUHE	SUN-HEET
TREK	TECHNITREK CORP
TESO	TELLURIDE SOLAR WORK
TECH	THERMAL TECH
TOMS	THOMASON
TRAN	TRANTER
TRSI	TRITEC SOLAR INDUSTR
UNCO	UNION CO CORRECTIONL

Data Element Names: SYSMFGR-A, SYSMFGR-G (Continued)

USSC	UNITED STATES SOLAR
UNSP	UNSPECIFIED
USIN	US INSTALLATIONS
VEST	VALMONT ENERGY SYSTE
WEAT	WEATHER KING
WEST	WESTERN ENERGY INC
WSDI	WESTERN SOLAR DEVEL
WHIT	WHITE LINE INC
WILX	WILCOX MFG & DISTR
WILC	WILSON CORPORATION
WYSO	WYOMING SOLAR
YING	YING MANUFACTURING
ZIEN	ZIEN
ZORK	ZOMEWORKS
ZZZZ	ZZZZZZ - END OF LIST

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: ZONPROB

A	NO PROBLEM
B	DOES NOT CONFORM SOLAR CAUSE
C	DOES NOT CONFORM NON SOLAR CAUSE
D	"SUN RIGHTS"
F	PERMIT NOT REQ. RETROFIT
G	PERMIT NOT REQ.
H	ADD'L BLDG. MODS REQ.
I	PREVIOUSLY ZONED
Z	MORE INFO. IN FILES

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10. SUPPLEMENTARY NOTES

☐ Document describes a computer program; SF-185, FIPS Software Summary, is attached.

11. ABSTRACT (*A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here*)

The Residential Solar Data Center project staff in the Center for Building Technology, National Bureau of Standards, maintains a computerized data base containing non-instrumented residential data from the DoE/HUD Solar Heating and Cooling Demonstration Program. This document provides a dictionary of data elements collected as part of the Residential Solar Program and a directory of the specific files which contain the data elements. This data dictionary/directory was produced by a computer program written in ASCII COBOL. The automated procedure is briefly described in an appendix.

12. KEY WORDS (*Six to twelve entries; alphabetical order; capitalize only proper names; and separate key words by semicolons*)

Automatic data processing; data dictionary/directory; residential buildings; solar data; solar energy system; solar heating and cooling.

13. AVAILABILITY

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