Database Documentation

1999-2001 Building Efficiency Assessment (BEA) Study

An Evaluation of the Savings By Design Program

Prepared for California's Investor Owned Utilities:

Prepared by:

1055 Broadway Suite G
Sonoma, CA 95476
707 939 8823

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Database Documentation

This is the documentation for all databases being delivered for the final statewide report for the Non-Residential New Construction (NRNC) program area, covering program years 1999-2001.

BEA Survey Data

This section describes all survey data collected for this project. The survey data are organized in an Access database named 'BEA Surveys Final Data.mdb'. The tables in the database are named as follows:

- Site Data,
- Participant Site Data,
- Participant Measures,
- Non Participant Site Data,
- Non Participant Measures,
- Weights Non Parts, and
- Weights Parts.

The data contained in each table are described in detail below. For this database, all variable descriptions are contained in the Access table. Variable descriptions are located in the 'description' column of each table in design view.

Site Data

This table contains utility tracking data for participants and F.W. Dodge data for non-participants such as id, building type, square footage, name and location. It also contains scheduling information such as the appointment time and date, contact information, and the matching site RLW ID. Each site is a unique record in this table.

Participant Site Data

This table contains a unique record for each participant site. The table contains tracking data such as project name and location. It also contains all site-level responses to the owner, decision-maker, and screening surveys. Some of these owner responses were used in the computation of the free ridership scores. The owner and decision-maker responses were also summarized in the process evaluation section of the final report.

Participant Measures

This table contains one record for each incented measure type for each participant site. It contains the site ID, a description of each measure type at the site, the quantity of each measure type, and tracking data on the kWh and $ savings for the measure type.

In addition to the descriptive measure information, the table also contains measure-specific responses to the owner and decision-maker surveys. These owner responses were used in the computation of the free ridership scores.

Non Participant Site Data

This table contains a unique record for each non-participant site. The table contains data such as project name and location. It also contains all site-level responses to the owner, decision-maker, and screening surveys. Some of these owner responses were used in the computation of the spillover scores. The owner and decision-maker responses were also summarized in the process evaluation section of the final report.

Non Participant Measures

This table contains a unique record for each non-participant site. It contains the site ID and project name. It also contains measure-specific responses to the owner survey that were used in the computation of the spillover scores. The measure-specific responses are organized horizontally across each record.

Weights Parts

This table contains the participant weights used for the gross savings calculations and the analysis of the survey responses. It contains the RLW ID, the estimated kWh savings, the sampling stratum, and the final weight.

Weights Non Parts

This table contains the non-participant weights used for the gross savings calculations and the analysis of the survey responses. It contains the RLW ID, the estimated square footage, the building type, and the final weight.

As-Built Simulation Results Database

The As-Built Simulation Results database has 36 "raw-data" tables and 4 additional "results" tables.

The 4 "results" tables are kWh Savings – All Runs, kWh Savings – Measures Only, pkW Reduction - All Runs, and pkW Reduction – Measures Only.

Raw Data Tables

The 36 "raw-data" tables can be grouped into 2 categories by data content, which are electric consumption and coincident electric demand. Each data type is identified by the last 2 or 3 characters of the file name, which end in "kwh" and "pkw" respectively. The "raw-data" tables are also differentiated by BEA run-type definitions as identified by the first 4 or 5 characters of the file name.

Table 1 below is a list of the raw-data tables:

1. assplkwh	2. mop8kwh
3. assplpkw	4. mop8pkw
5. blinekwh	6. parm1kwh
7. Blinepkw	8. parm1pkw
9. mop1kwh	10. parm2kwh
11. mop1pkw	12. parm2pkw
13. mop2kwh	14. parm3kwh
15. mop2pkw	16. parm3pkw
17. mop3kwh	18. parm4kwh
19. mop3pkw	20. parm4pkw
21. mop4kwh	22. parm5kwh
23. mop4pkw	24. parm5pkw
25. mop5kwh	26. parm6kwh
27. mop5pkw	28. parm6pkw
29. mop6kwh	30. parm7kwh
31. mop6pkw	32. parm7pkw
33. mop7kwh	34. parm8kwh
35. mop7pkw	36. parm8pkw

Table 1: List of Raw Data Tables

Parametric Run Type Definitions

The parametric run-type definitions are described in Table 2 below. The run-type is the prefix to each of the raw data tables which is then followed by either a kwh or pkw (ie., parm1kwh).

Run-Type	Description
bline	Baseline
mop1	Shell, measures only – Baseline envelope properties (glazing U-value and shading coefficient; and opaque surface insulation) for incented measures only will be returned to their as-built condition.
parm1	All Shell – All baseline envelope properties will be returned to their as-built condition.
mop2	Lighting Power Density, measures only – Parm1 above, plus baseline lighting power densities for spaces in the building that received incentives will be returned to their as-built condition.
parm2	All Lighting Power Density – Parm1 above, plus all baseline lighting power densities will be returned to their as-built condition.
mop3	Daylighting Controls, measures only – Parm2 above, plus daylighting controls that received incentives will be returned to their as-built condition.
parm3	All Daylighting Controls – Parm2 above, plus all daylighting controls will be returned to their as-built condition.
mop4	Other Lighting Controls, measures only – Parm3 above, plus all other lighting controls that received incentives will be returned to their as-built condition.
parm4	All Other Lighting Controls – Parm3 above, plus all other lighting controls will be returned to their as-built condition.
mop5	Motors and Air Distribution, measures only – Parm4 above, plus baseline motor efficiency, fan power indices (W/CFM), and motor controls for incented measures only will be returned to their as-built condition.
parm5	All Motors and Air Distribution – Parm4 above, plus all baseline motor efficiency fan power indices (W/CFM), and motor controls will be returned to their as-built condition.
mop6	HVAC, measures only. Parm5 above, plus HVAC parameters for incented measures only will be returned to their as-built condition.
parm6	All HVAC – Parm5 above, plus all HVAC parameters will be returned to their as-built condition.

mop7	Refrigeration, measures only – Parm6 above, plus refrigeration parameters for incented measures in buildings eligible for the grocery store refrigeration program only will be returned to their as-built condition.
parm7	All Refrigeration – Parm6 above, plus all refrigeration parameters in buildings eligible for the grocery store refrigeration programs will be returned to their as-built condition. This run is equivalent to the full as-built run.
mop8	DHW, measures only - Parm7, plus incented DHW efficiency measures will be returned to their as-built condition
parm8	All DHW - Parm7 above, plus all DHW efficiency will be returned to as-built condition (should be same as Asblt run)
asspl	As-built

Table 2: Run Type Definitions

Energy Tables

Table 3 describes the field headings and values of the 18 raw-data tables with filenames ending in "kwh".

The data contained in these energy tables are annual energy consumption (KWh) values for each parametric run. As mentioned above, the parametric runs are represented by the first 4 to 5 letters in the table name (ie., parm1, mop1). Use the definitions in Table 2 to describe the values in the energy tables. For example, the *parm1kwh table* shows consumption related to the baseline building with the shell measure reset to it's as-built condition; the *parm2kwh table* shows consumption related to the baseline building with shell and LPD measures set back to its as-built conditions.

Field Heading	Value	Comments
SITEID	RLW Site ID	N/A
RUNTYPE	Run-type	N/A
WBLGANN	Whole building annual consumption (kWh)	N/A
WBLGSONP	Whole building summer on peak consumption (kWh)	N/A
WBLGSPRT	Whole building summer partial peak consumption (kWh)	N/A
WBLGSOFF	Whole building summer off peak consumption (kWh)	N/A

WBLGWPRT	Whole building winter partial peak consumption (kWh)	N/A
WBLGWOFF	Whole building winter off peak consumption (kWh)	N/A
HEATANN	Heating annual consumption (kWh)	N/A
HEATSONP	Heating summer on peak consumption (kWh)	N/A
HEATSPRT	Heating summer partial peak consumption (kWh)	N/A
HEATSOFF	Heating summer off peak consumption (kWh)	N/A
HEATWPRT	Heating winter partial peak consumption (kWh)	N/A
HEATWOFF	He Heating at winter off peak consumption (kWh)	N/A
COOLANN	Cooling annual consumption (kWh)	N/A
COOLSONP	Cooling summer on peak consumption (kWh)	N/A
COOLSPRT	Cooling summer partial peak consumption (kWh)	N/A
COOLSOFF	Cooling summer off peak consumption (kWh)	N/A
COOLWPRT	Cooling winter partial peak consumption (kWh)	N/A
COOLWOFF	Cooling winter off peak consumption (kWh)	N/A
LTGANN	Lighting annual consumption (kWh)	N/A
LTGSONP	Lighting summer on peak consumption (kWh)	N/A
LTGSPRT	Lighting summer partial peak consumption (kWh)	N/A
LTGSOFF	Lighting summer off peak consumption (kWh)	N/A
LTGWPRT	Lighting winter partial peak consumption (kWh)	N/A
LTGWOFF	Lighting winter off peak consumption (kWh)	N/A

FANANN	Fan annual consumption (kWh)	N/A
FANSONP	Fan summer on peak consumption (kWh)	N/A
FANSPRT	Fan summer partial peak consumption (kWh)	N/A
FANSOFF	Fan summer off peak consumption (kWh)	N/A
FANWPRT	Fan winter partial peak consumption (kWh)	N/A
FANWOFF	Fan winter off peak consumption (kWh)	N/A
REFRANN	Refrigeration annual consumption (kWh)	N/A
REFRSONP	Refrigeration summer on peak consumption (kWh)	N/A
REFRSPRT	Refrigeration summer partial peak consumption (kWh)	N/A
REFRSOFF	Refrigeration summer off peak consumption (kWh)	N/A
REFRWPRT	Refrigeration winter partial peak consumption (kWh)	N/A
REFRWOFF	Refrigeration winter off peak consumption (kWh)	N/A
RESDANN	Residual annual consumption (kWh)	N/A
RESDSONP	Residual summer on peak consumption (kWh)	N/A
RESDSPRT	Residual summer partial peak consumption (kWh)	N/A
RESDSOFF	Residual summer off peak consumption (kWh)	N/A
RESDWPRT	Residual winter partial peak consumption (kWh)	N/A
RESDWOFF	Residual winter off peak consumption (kWh)	N/A
WBLGJAN	Whole building January consumption (kWh)	N/A
WBLGFEB	Whole building February consumption (kWh)	N/A

WBLGMAR	Whole building March consumption (kWh)	N/A
WBLGAPR	Whole building April consumption (kWh)	N/A
WBLGMAY	Whole building May consumption (kWh)	N/A
WBLGJUN	Whole building June consumption (kWh)	N/A
WBLGJUL	Whole building July consumption (kWh)	N/A
WBLGAUG	Whole building August consumption (kWh)	N/A
WBLGSEP	Whole building September consumption (kWh)	N/A
WBLGOCT	Whole building October consumption (kWh)	N/A
WBLGNOV	Whole building November consumption (kWh)	N/A
WBLGDEC	Whole building December consumption (kWh)	N/A
HEATJAN	Heating January consumption (kWh)	N/A
HEATFEB	Heating February consumption (kWh)	N/A
HEATMAR	Heating March consumption (kWh)	N/A
HEATAPR	Heating April consumption (kWh)	N/A
HEATMAY	Heating May consumption (kWh)	N/A
HEATJUN	Heating June consumption (kWh)	N/A
HEATJUL	Heating July consumption (kWh)	N/A
HEATAUG	Heating August consumption (kWh)	N/A
HEATSEP	Heating September consumption (kWh)	N/A
HEATOCT	Heating October consumption (kWh)	N/A

HEATNOV	Heating November consumption (kWh)	N/A
HEATDEC	Heating December consumption (kWh)	N/A
COOLJAN	Cooling January consumption (kWh)	N/A
COOLFEB	Cooling February consumption (kWh)	N/A
COOLMAR	Cooling March consumption (kWh)	N/A
COOLAPR	Cooling April consumption (kWh)	N/A
COOLMAY	Cooling May consumption (kWh)	N/A
COOLJUN	Cooling June consumption (kWh)	N/A
COOLJUL	Cooling July consumption (kWh)	N/A
COOLAUG	Cooling August consumption (kWh)	N/A
COOLSEP	Cooling September consumption (kWh)	N/A
COOLOCT	Cooling October consumption (kWh)	N/A
COOLNOV	Cooling November consumption (kWh)	N/A
COOLDEC	Cooling December consumption (kWh)	N/A
LTGJAN	Lighting January consumption (kWh)	N/A
LTGFEB	Lighting February consumption (kWh)	N/A
LTGMAR	Lighting March consumption (kWh)	N/A
LTGAPR	Lighting April consumption (kWh)	N/A
LTGMAY	Lighting May consumption (kWh)	N/A
LTGJUN	Lighting June consumption (kWh)	N/A

LTGJUL	Lighting July consumption (kWh)	N/A
LTGAUG	Lighting August consumption (kWh)	N/A
LTGSEP	Lighting September consumption (kWh)	N/A
LTGOCT	Lighting October consumption (kWh)	N/A
LTGNOV	Lighting November consumption (kWh)	N/A
LTGDEC	Lighting December consumption (kWh)	N/A
FANJAN	Fan January consumption (kWh)	N/A
FANFEB	Fan February consumption (kWh)	N/A
FANMAR	Fan March consumption (kWh)	N/A
FANAPR	Fan April consumption (kWh)	N/A
FANMAY	Fan May consumption (kWh)	N/A
FANJUN	Fan June consumption (kWh)	N/A
FANJUL	Fan July consumption (kWh)	N/A
FANAUG	Fan August consumption (kWh)	N/A
FANSEP	Fan September consumption (kWh)	N/A
FANOCT	Fan October consumption (kWh)	N/A
FANNOV	Fan November consumption (kWh)	N/A
FANDEC	Fan December consumption (kWh)	N/A
REFRJAN	Refrigeration January consumption (kWh)	N/A
REFRFEB	Refrigeration February consumption (kWh)	N/A

REFRMAR	Refrigeration March consumption (kWh)	N/A
REFRAPR	Refrigeration April consumption (kWh)	N/A
REFRMAY	Refrigeration May consumption (kWh)	N/A
REFRJUN	Refrigeration June consumption (kWh)	N/A
REFRJUL	Refrigeration July consumption (kWh)	N/A
REFRAUG	Refrigeration August consumption (kWh)	N/A
REFRSEP	Refrigeration September consumption (kWh)	N/A
REFROCT	Refrigeration October consumption (kWh)	N/A
REFRNOV	Refrigeration November consumption (kWh)	N/A
REFRDEC	Refrigeration December consumption (kWh)	N/A
RESDJAN	Residual January consumption (kWh)	N/A
RESDFEB	Residual February consumption (kWh)	N/A
RESDMAR	Residual March consumption (kWh)	N/A
RESDAPR	Residual April consumption (kWh)	N/A
RESDMAY	Residual May consumption (kWh)	N/A
RESDJUN	Residual June consumption (kWh)	N/A
RESDJUL	Residual July consumption (kWh)	N/A
RESDAUG	Residual August consumption (kWh)	N/A
RESDSEP	Residual September consumption (kWh)	N/A
RESDOCT	Residual October consumption (kWh)	N/A

RESDNOV	Residual November consumption (kWh)	N/A
RESDDEC	Residual December consumption (kWh)	N/A

Table 3: Energy Tables - Tables ending in "kwh"

Demand Tables

Table 4 below describes the field headings and values of the remaining 18 raw-data tables with filenames ending in "pkw".

The data contained in these demand tables are summer on-peak (KWh) values for each parametric run. As mentioned above, the parametric runs are represented by the first 4 to 5 letters in the table name (ie., parm1, mop1). Use the definitions in Table 2 to describe the values in the energy tables. For example, the *parm1pkw table* shows demand related to the baseline building with the shell measure reset to it's as-built condition; the *parm2pkw table* shows demand related to the baseline building with shell and LPD measures set back to its as-built conditions.

Field Heading	Value	Comments
SITEID	RLW Site ID	N/A
RUNTYPE	Run-type	N/A
WBLGANN	Whole building annual demand (pKW)	N/A
WBLGSONP	Whole building summer on peak demand (pKW)	N/A
WBLGSPRT	Whole building summer partial peak demand (pKW)	N/A
WBLGSOFF	Whole building summer off peak demand (pKW)	N/A
WBLGWPRT	Whole building winter partial peak demand (pKW)	N/A
WBLGWOFF	Whole building winter off peak demand (pKW)	N/A
HEATANN	Heating annual demand (pKW)	N/A
HEATSONP	Heating summer on peak demand (pKW)	N/A
HEATSPRT	Heating summer partial peak demand (pKW)	N/A
HEATSOFF	Heating summer off peak	N/A

	demand (pKW)	
HEATWPRT	Heating winter partial peak demand (pKW)	N/A
HEATWOFF	He Heating at winter off peak demand (pKW)	N/A
COOLANN	Cooling annual demand (pKW)	N/A
COOLSONP	Cooling summer on peak demand (pKW)	N/A
COOLSPRT	Cooling summer partial peak demand (pKW)	N/A
COOLSOFF	Cooling summer off peak demand (pKW)	N/A
COOLWPRT	Cooling winter partial peak demand (pKW)	N/A
COOLWOFF	Cooling winter off peak demand (pKW)	N/A
LTGANN	Lighting annual demand (pKW)	N/A
LTGSONP	Lighting summer on peak demand (pKW)	N/A
LTGSPRT	Lighting summer partial peak demand (pKW)	N/A
LTGSOFF	Lighting summer off peak demand (pKW)	N/A
LTGWPRT	Lighting winter partial peak demand (pKW)	N/A
LTGWOFF	Lighting winter off peak demand (pKW)	N/A
FANANN	Fan annual demand (pKW)	N/A
FANSONP	Fan summer on peak demand (pKW)	N/A
FANSPRT	Fan summer partial peak demand (pKW)	N/A
FANSOFF	Fan summer off peak demand (pKW)	N/A
FANWPRT	Fan winter partial peak demand (pKW)	N/A
FANWOFF	Fan winter off peak demand (pKW)	N/A

REFRANN	Refrigeration annual demand (pKW)	N/A
REFRSONP	Refrigeration summer on peak demand (pKW)	N/A
REFRSPRT	Refrigeration summer partial peak demand (pKW)	N/A
REFRSOFF	Refrigeration summer off peak demand (pKW)	N/A
REFRWPRT	Refrigeration winter partial peak demand (pKW)	N/A
REFRWOFF	Refrigeration winter off peak demand (pKW)	N/A
RESDANN	Residual annual demand (pKW)	N/A
RESDSONP	Residual summer on peak demand (pKW)	N/A
RESDSPRT	Residual summer partial peak demand (pKW)	N/A
RESDSOFF	Residual summer off peak demand (pKW)	N/A
RESDWPRT	Residual winter partial peak demand (pKW)	N/A
RESDWOFF	Residual winter off peak demand (pKW)	N/A
WBLGJAN	Whole building January demand (pKW)	N/A
WBLGFEB	Whole building February demand (pKW)	N/A
WBLGMAR	Whole building March demand (pKW)	N/A
WBLGAPR	Whole building April demand (pKW)	N/A
WBLGMAY	Whole building May demand (pKW)	N/A
WBLGJUN	Whole building June demand (pKW)	N/A
WBLGJUL	Whole building July demand (pKW)	N/A
WBLGAUG	Whole building August demand (pKW)	N/A

WBLGSEP	Whole building September demand (pKW)	N/A
WBLGOCT	Whole building October demand (pKW)	N/A
WBLGNOV	Whole building November demand (pKW)	N/A
WBLGDEC	Whole building December demand (pKW)	N/A
HEATJAN	Heating January demand (pKW)	N/A
HEATFEB	Heating February demand (pKW)	N/A
HEATMAR	Heating March demand (pKW)	N/A
HEATAPR	Heating April demand (pKW)	N/A
HEATMAY	Heating May demand (pKW)	N/A
HEATJUN	Heating June demand (pKW)	N/A
HEATJUL	Heating July demand (pKW)	N/A
HEATAUG	Heating August demand (pKW)	N/A
HEATSEP	Heating September demand (pKW)	N/A
HEATOCT	Heating October demand (pKW)	N/A
HEATNOV	Heating November demand (pKW)	N/A
HEATDEC	Heating December demand (pKW)	N/A
COOLJAN	Cooling January demand (pKW)	N/A
COOLFEB	Cooling February demand (pKW)	N/A
COOLMAR	Cooling March demand (pKW)	N/A
COOLAPR	Cooling April demand (pKW)	N/A

COOLMAY	Cooling May demand (pKW)	N/A
COOLJUN	Cooling June demand (pKW)	N/A
COOLJUL	Cooling July demand (pKW)	N/A
COOLAUG	Cooling August demand (pKW)	N/A
COOLSEP	Cooling September demand (pKW)	N/A
COOLOCT	Cooling October demand (pKW)	N/A
COOLNOV	Cooling November demand (pKW)	N/A
COOLDEC	Cooling December demand (pKW)	N/A
LTGJAN	Lighting January demand (pKW)	N/A
LTGFEB	Lighting February demand (pKW)	N/A
LTGMAR	Lighting March demand (pKW)	N/A
LTGAPR	Lighting April demand (pKW)	N/A
LTGMAY	Lighting May demand (pKW)	N/A
LTGJUN	Lighting June demand (pKW)	N/A
LTGJUL	Lighting July demand (pKW)	N/A
LTGAUG	Lighting August demand (pKW)	N/A
LTGSEP	Lighting September demand (pKW)	N/A
LTGOCT	Lighting October demand (pKW)	N/A
LTGNOV	Lighting November demand (pKW)	N/A
LTGDEC	Lighting December demand (pKW)	N/A

FANJAN	Fan January demand (pKW)	N/A
FANFEB	Fan February demand (pKW)	N/A
FANMAR	Fan March demand (pKW)	N/A
FANAPR	Fan April demand (pKW)	N/A
FANMAY	Fan May demand (pKW)	N/A
FANJUN	Fan June demand (pKW)	N/A
FANJUL	Fan July demand (pKW)	N/A
FANAUG	Fan August demand (pKW)	N/A
FANSEP	Fan September demand (pKW)	N/A
FANOCT	Fan October demand (pKW)	N/A
FANNOV	Fan November demand (pKW)	N/A
FANDEC	Fan December demand (pKW)	N/A
REFRJAN	Refrigeration January demand (pKW)	N/A
REFRFEB	Refrigeration February demand (pKW)	N/A
REFRMAR	Refrigeration March demand (pKW)	N/A
REFRAPR	Refrigeration April demand (pKW)	N/A
REFRMAY	Refrigeration May demand (pKW)	N/A
REFRJUN	Refrigeration June demand (pKW)	N/A
REFRJUL	Refrigeration July demand (pKW)	N/A
REFRAUG	Refrigeration August demand (pKW)	N/A
REFRSEP	Refrigeration September demand (pKW)	N/A
REFROCT	Refrigeration October demand (pKW)	N/A
REFRNOV	Refrigeration November	N/A

	demand (pKW)	
REFRDEC	Refrigeration December demand (pKW)	N/A
RESDJAN	Residual January demand (pKW)	N/A
RESDFEB	Residual February demand (pKW)	N/A
RESDMAR	Residual March demand (pKW)	N/A
RESDAPR	Residual April demand (pKW)	N/A
RESDMAY	Residual May demand (pKW)	N/A
RESDJUN	Residual June demand (pKW)	N/A
RESDJUL	Residual July demand (pKW)	N/A
RESDAUG	Residual August demand (pKW)	N/A
RESDSEP	Residual September demand (pKW)	N/A
RESDOCT	Residual October demand (pKW)	N/A
RESDNOV	Residual November demand (pKW)	N/A
RESDDEC	Residual December demand (pKW)	N/A

Table 4: Demand Tables - Tables ending in "pkw"

Results Data Tables

The 4 "results" tables can also be grouped into 2 categories by data content, which are kWh savings and pkW reduction. Table 5 below lists the 4 results tables. Table 6 and Table 8 list their variables and description.

It is important to note that, in the 'All Runs' tables, the column 'Building' represents Title-24 whole-building consumption for kWh tables and Title-24 whole-building demand for pKW tables. On the other hand, the 'Measures Only' tables represent rebated whole-buildings but not for individual measures. Therefore, the 'Measures Only' tables will have values for individual rebated measures and not for the 'Building' category unless it was rebated as a whole-building site.

1. kWh Savings – All Runs	2. pkW Reduction – All Runs
3. kWh Savings – Measures Only	4. pkW Reduction – Measures Only

Table 5: List of Results Tables

Field Heading	Value	Comments
Weight	Weight	
Building	Whole Building savings for incented measures plus any other measure that warrants a rebate by the program (kWh)	
Shell	Shell savings for incented measures plus any other measure that warrants a rebate by the program (kWh)	
LPD	LPD savings for incented measures plus any other measure that warrants a rebate by the program (kWh)	
DayLt	Day Lighting savings for incented measures plus any other measure that warrants a rebate by the program (kWh)	
OtrLt	Outdoor Lighting savings for incented measures plus any	

	other measure that warrants a rebate by the program (kWh)	
Motors	Motors measure savings for incented measures plus any other measure that warrants a rebate by the program (kWh)	
HVAC	HVAC savings for incented measures plus any other measure that warrants a rebate by the program (kWh)	
Refr	Refrigeration savings for incented measures plus any other measure that warrants a rebate by the program (kWh)	
Utility	RLW Utility Code	1 = PG&E; 2 = SCE; 3 = SDG&E
Approach	Rebate approach	1 = performance approach; 2 = systems approach; 0 = non-participant
Part?	Participant or Non-Participant	1=participant; 2 = non-participant; 0 = neither
RLW_ID	RLW ID Number	

Table 6: kWh Savings – All Runs

Field Heading	Value	Comments
Weight	Weight	
Building	Whole Building energy savings for incented measures only (kWh)	
Shell	Shell energy savings for incented measures only (kWh)	
LPD	LPD energy savings for incented measures only (kWh)	
DayLt	Day Lighting energy savings for incented measures only (kWh)	

OtrLt	Outdoor Lighting energy savings for incented measures only (kWh)	
Motors	Motors gross measure consumption for incented measures only (kWh)	
HVAC	HVAC energy savings for incented measures only (kWh)	
Refr	Refrigeration energy savings for incented measures only (kWh)	
Utility	RLW Utility Code	1 = PG&E; 2 = SCE; 3 = SDG&E
Approach	Rebate approach	1 = performance approach; 2 = systems approach; 0 = non-participant
Part?	Participant or Non-Participant	1=participant; 2 = non-participant; 0 = neither
RLW_ID	RLW ID Number	

Table 7: kWh Savings – Measures Only

Field Heading	Value	Comments
Weight	Weight	
Building	Whole Building summer peak demand reduction for all measures (pkW)	
Shell	Shell summer peak demand reduction for all measures (pkW)	
LPD	LPD summer peak demand reduction for all measures (pkW)	
DayLt	Day Lighting summer peak demand reduction for all measures (pkW)	
OtrLt	Outdoor Lighting summer peak demand reduction for all measures (pkW)	
Motors	Motors measure summer peak demand reduction for	

	all measures (pkW)	
HVAC	HVAC summer peak demand reduction for all measures (pkW)	
Refr	Refrigeration Summer peak demand reduction for all measures (pkW)	
Utility	RLW Utility Code	1 = PG&E; 2 = SCE; 3 = SDG&E
Approach	Rebate approach	1 = performance approach; 2 = systems approach; 0 = non-participant
Part?	Participant or Non-Participant	1=participant; 2 = non-participant; 0 = neither
RLW_ID	RLW ID Number	

Table 8: pkW Reduction – All Runs

Field Heading	Value	Comments
Weight	Weight	
Building	Whole Building summer peak demand reduction for incented measures only (pkW)	
Shell	Shell summer peak demand reduction for incented measures only (pkW)	
LPD	LPD summer peak demand reduction for incented measures only (pkW)	
DayLt	Day Lighting summer peak demand reduction for incented measures only (pkW)	
OtrLt	Outdoor Lighting summer peak demand reduction for incented measures only (pkW)	
Motors	Motors measure summer peak demand reduction for incented measures only (pkW)	
HVAC	HVAC summer peak	

	demand reduction for incented measures only (pkW)	
Refr	Refrigeration Summer peak demand reduction for incented measures only (pkW)	
Utility	RLW Utility Code	1 = PG&E; 2 = SCE; 3 = SDG&E
Approach	Rebate approach	1 = performance approach; 2 = systems approach; 0 = non-participant
Part?	Participant or Non-Participant	1=participant; 2 = non-participant; 0 = neither
RLW_ID	RLW ID Number	

Table 9: pkW Reduction – Measures Only

Net Savings Simulation Results Database

Similar to the As-Built Simulation Results database, the Net Savings Simulation Results Database has 36 "raw-data" tables and 4 additional "results" tables.

The 4 "results" tables are kWh Savings – All Runs, kWh Savings – Measures Only, pkW Reduction - All Runs, and pkW Reduction – Measures Only.

Net Savings Raw Data Tables

The 36 "raw-data" tables can be grouped into 2 categories by data content, which are electric consumption and coincident electric demand. Each data type is identified by the last 2 or 3 characters of the file name, which end in "kwh" and "pkw" respectively. The "raw-data" tables are also differentiated by BEA run-type definitions as identified by the first 4 or 5 characters of the file name.

Table 1 below is a list of the raw-data tables:

1. assplkwh	2. mop8kwh
3. assplpkw	4. mop8pkw
5. blinekwh	6. parm1kwh
7. Blinepkw	8. parm1pkw
9. mop1kwh	10. parm2kwh
11. mop1pkw	12. parm2pkw
13. mop2kwh	14. parm3kwh

15. mop2pkw	16. parm3pkw
17. mop3kwh	18. parm4kwh
19. mop3pkw	20. parm4pkw
21. mop4kwh	22. parm5kwh
23. mop4pkw	24. parm5pkw
25. mop5kwh	26. parm6kwh
27. mop5pkw	28. parm6pkw
29. mop6kwh	30. parm7kwh
31. mop6pkw	32. parm7pkw
33. mop7kwh	34. parm8kwh
35. mop7pkw	36. parm8pkw

Table 10: List of Net Savings Raw Data Tables

Net Savings Parametric Run-Types

The run-type definitions are described in Table 11 below. The run-type is the prefix to each of the raw data tables which is then followed by either a kwh or pkw (ie., parm1kwh).

Parametric Run-Type	Description
bline	Baseline
mop1	Shell, measures only – Baseline envelope properties (glazing U-value and shading coefficient; and opaque surface insulation) for incented measures only will be returned to their as-built condition.
parm1	All Shell – All baseline envelope properties will be returned to their as-built condition.
mop2	Lighting Power Density, measures only – Parm1 above, plus baseline lighting power densities for spaces in the building that received incentives will be returned to their as-built condition.
parm2	All Lighting Power Density – Parm1 above, plus all baseline lighting power densities will be returned to their as-built condition.
mop3	Daylighting Controls, measures only – Parm2 above, plus daylighting controls that received incentives will be returned to their as-built condition.
parm3	All Daylighting Controls – Parm2 above, plus all daylighting controls will be returned to their as-built

	condition.
mop4	Other Lighting Controls, measures only – Parm3 above, plus all other lighting controls that received incentives will be returned to their as-built condition.
parm4	All Other Lighting Controls – Parm3 above, plus all other lighting controls will be returned to their as-built condition.
mop5	Motors and Air Distribution, measures only – Parm4 above, plus baseline motor efficiency, fan power indices (W/CFM), and motor controls for incented measures only will be returned to their as-built condition.
parm5	All Motors and Air Distribution – Parm4 above, plus all baseline motor efficiency fan power indices (W/CFM), and motor controls will be returned to their as-built condition.
mop6	HVAC, measures only. Parm5 above, plus HVAC parameters for incented measures only will be returned to their as-built condition.
parm6	All HVAC – Parm5 above, plus all HVAC parameters will be returned to their as-built condition.
mop7	Refrigeration, measures only – Parm6 above, plus refrigeration parameters for incented measures in buildings eligible for the grocery store refrigeration program only will be returned to their as-built condition.
parm7	All Refrigeration – Parm6 above, plus all refrigeration parameters in buildings eligible for the grocery store refrigeration programs will be returned to their as-built condition. This run is equivalent to the full as-built run.
mop8	DHW, measures only - Parm7, plus incented DHW efficiency measures will be returned to their as-built condition
parm8	All DHW - Parm7 above, plus all DHW efficiency will be returned to as-built condition (should be same as Asblt run)
asspl	As-built

Table 11: Parametric Run-Type Definitions

Net Savings Raw Data Tables

Table 12 below describes the field headings and values of the 18 raw-data tables with filenames ending in “kwh”.

The data contained in these energy tables are annual energy consumption (KWh) values for each parametric run. As mentioned above, the parametric runs are represented by the first 4 to 5 letters in the table name (ie., parm1, mop1). Use the definitions in Table 2 to describe the values in the energy tables. For example, the *parm1kwh table* shows

consumption related to the baseline building with the shell measure reset to it's as-built condition; the *parm2kwh table* shows consumption related to the baseline building with shell and LPD measures set back to its as-built conditions.

Field Heading	Value	Comments
SITEID	RLW Site ID	N/A
RUNTYPE	Run-type	N/A
WBLGANN	Whole building annual consumption (kWh)	N/A
WBLGSONP	Whole building summer on peak consumption (kWh)	N/A
WBLGSPRT	Whole building summer partial peak consumption (kWh)	N/A
WBLGSOFF	Whole building summer off peak consumption (kWh)	N/A
WBLGWPRT	Whole building winter partial peak consumption (kWh)	N/A
WBLGWOFF	Whole building winter off peak consumption (kWh)	N/A
HEATANN	Heating annual consumption (kWh)	N/A
HEATSONP	Heating summer on peak consumption (kWh)	N/A
HEATSPRT	Heating summer partial peak consumption (kWh)	N/A
HEATSOFF	Heating summer off peak consumption (kWh)	N/A
HEATWPRT	Heating winter partial peak consumption (kWh)	N/A
HEATWOFF	He Heating at winter off peak consumption (kWh)	N/A
COOLANN	Cooling annual consumption (kWh)	N/A
COOLSONP	Cooling summer on peak consumption (kWh)	N/A
COOLSPRT	Cooling summer partial peak consumption (kWh)	N/A
COOLSOFF	Cooling summer off peak consumption (kWh)	N/A

COOLWPRT	Cooling winter partial peak consumption (kWh)	N/A
COOLWOFF	Cooling winter off peak consumption (kWh)	N/A
LTGANN	Lighting annual consumption (kWh)	N/A
LTGSONP	Lighting summer on peak consumption (kWh)	N/A
LTGSPRT	Lighting summer partial peak consumption (kWh)	N/A
LTGSOFF	Lighting summer off peak consumption (kWh)	N/A
LTGWPRT	Lighting winter partial peak consumption (kWh)	N/A
LTGWOFF	Lighting winter off peak consumption (kWh)	N/A
FANANN	Fan annual consumption (kWh)	N/A
FANSONP	Fan summer on peak consumption (kWh)	N/A
FANSPRT	Fan summer partial peak consumption (kWh)	N/A
FANSOFF	Fan summer off peak consumption (kWh)	N/A
FANWPRT	Fan winter partial peak consumption (kWh)	N/A
FANWOFF	Fan winter off peak consumption (kWh)	N/A
REFRANN	Refrigeration annual consumption (kWh)	N/A
REFRSONP	Refrigeration summer on peak consumption (kWh)	N/A
REFRSPRT	Refrigeration summer partial peak consumption (kWh)	N/A
REFRSOFF	Refrigeration summer off peak consumption (kWh)	N/A
REFRWPRT	Refrigeration winter partial peak consumption (kWh)	N/A
REFRWOFF	Refrigeration winter off peak consumption (kWh)	N/A

RESDANN	Residual annual consumption (kWh)	N/A
RESDSONP	Residual summer on peak consumption (kWh)	N/A
RESDSPRT	Residual summer partial peak consumption (kWh)	N/A
RESDSOFF	Residual summer off peak consumption (kWh)	N/A
RESDWPRT	Residual winter partial peak consumption (kWh)	N/A
RESDWOFF	Residual winter off peak consumption (kWh)	N/A
WBLGJAN	Whole building January consumption (kWh)	N/A
WBLGFEB	Whole building February consumption (kWh)	N/A
WBLGMAR	Whole building March consumption (kWh)	N/A
WBLGAPR	Whole building April consumption (kWh)	N/A
WBLGMAY	Whole building May consumption (kWh)	N/A
WBLGJUN	Whole building June consumption (kWh)	N/A
WBLGJUL	Whole building July consumption (kWh)	N/A
WBLGAUG	Whole building August consumption (kWh)	N/A
WBLGSEP	Whole building September consumption (kWh)	N/A
WBLGOCT	Whole building October consumption (kWh)	N/A
WBLGNOV	Whole building November consumption (kWh)	N/A
WBLGDEC	Whole building December consumption (kWh)	N/A
HEATJAN	Heating January consumption (kWh)	N/A
HEATFEB	Heating February consumption (kWh)	N/A

HEATMAR	Heating March consumption (kWh)	N/A
HEATAPR	Heating April consumption (kWh)	N/A
HEATMAY	Heating May consumption (kWh)	N/A
HEATJUN	Heating June consumption (kWh)	N/A
HEATJUL	Heating July consumption (kWh)	N/A
HEATAUG	Heating August consumption (kWh)	N/A
HEATSEP	Heating September consumption (kWh)	N/A
HEATOCT	Heating October consumption (kWh)	N/A
HEATNOV	Heating November consumption (kWh)	N/A
HEATDEC	Heating December consumption (kWh)	N/A
COOLJAN	Cooling January consumption (kWh)	N/A
COOLFEB	Cooling February consumption (kWh)	N/A
COOLMAR	Cooling March consumption (kWh)	N/A
COOLAPR	Cooling April consumption (kWh)	N/A
COOLMAY	Cooling May consumption (kWh)	N/A
COOLJUN	Cooling June consumption (kWh)	N/A
COOLJUL	Cooling July consumption (kWh)	N/A
COOLAUG	Cooling August consumption (kWh)	N/A
COOLSEP	Cooling September consumption (kWh)	N/A
COOLOCT	Cooling October consumption (kWh)	N/A

COOLNOV	Cooling November consumption (kWh)	N/A
COOLDEC	Cooling December consumption (kWh)	N/A
LTGJAN	Lighting January consumption (kWh)	N/A
LTGFEB	Lighting February consumption (kWh)	N/A
LTGMAR	Lighting March consumption (kWh)	N/A
LTGAPR	Lighting April consumption (kWh)	N/A
LTGMAY	Lighting May consumption (kWh)	N/A
LTGJUN	Lighting June consumption (kWh)	N/A
LTGJUL	Lighting July consumption (kWh)	N/A
LTGAUG	Lighting August consumption (kWh)	N/A
LTGSEP	Lighting September consumption (kWh)	N/A
LTGOCT	Lighting October consumption (kWh)	N/A
LTGNOV	Lighting November consumption (kWh)	N/A
LTGDEC	Lighting December consumption (kWh)	N/A
FANJAN	Fan January consumption (kWh)	N/A
FANFEB	Fan February consumption (kWh)	N/A
FANMAR	Fan March consumption (kWh)	N/A
FANAPR	Fan April consumption (kWh)	N/A
FANMAY	Fan May consumption (kWh)	N/A
FANJUN	Fan June consumption (kWh)	N/A

FANJUL	Fan July consumption (kWh)	N/A
FANAUG	Fan August consumption (kWh)	N/A
FANSEP	Fan September consumption (kWh)	N/A
FANOCT	Fan October consumption (kWh)	N/A
FANNOV	Fan November consumption (kWh)	N/A
FANDEC	Fan December consumption (kWh)	N/A
REFRJAN	Refrigeration January consumption (kWh)	N/A
REFRFEB	Refrigeration February consumption (kWh)	N/A
REFRMAR	Refrigeration March consumption (kWh)	N/A
REFRAPR	Refrigeration April consumption (kWh)	N/A
REFRMAY	Refrigeration May consumption (kWh)	N/A
REFRJUN	Refrigeration June consumption (kWh)	N/A
REFRJUL	Refrigeration July consumption (kWh)	N/A
REFRAUG	Refrigeration August consumption (kWh)	N/A
REFRSEP	Refrigeration September consumption (kWh)	N/A
REFROCT	Refrigeration October consumption (kWh)	N/A
REFRNOV	Refrigeration November consumption (kWh)	N/A
REFRDEC	Refrigeration December consumption (kWh)	N/A
RESDJAN	Residual January consumption (kWh)	N/A
RESDFEB	Residual February consumption (kWh)	N/A

RESDMAR	Residual March consumption (kWh)	N/A
RESDAPR	Residual April consumption (kWh)	N/A
RESDMAY	Residual May consumption (kWh)	N/A
RESDJUN	Residual June consumption (kWh)	N/A
RESDJUL	Residual July consumption (kWh)	N/A
RESDAUG	Residual August consumption (kWh)	N/A
RESDSEP	Residual September consumption (kWh)	N/A
RESDOCT	Residual October consumption (kWh)	N/A
RESDNOV	Residual November consumption (kWh)	N/A
RESDDEC	Residual December consumption (kWh)	N/A

Table 12: Net Savings Consumption Tables - Tables ending in "kwh"

Table 13 below describes the field headings and values of the remaining 18 raw-data tables with filenames ending in "pkw".

Field Heading	Value	Comments
SITEID	RLW Site ID	N/A
RUNTYPE	Run-type	N/A
WBLGANN	Whole building annual demand (kW)	N/A
WBLGSONP	Whole building summer on peak demand (kW)	N/A
WBLGSPRT	Whole building summer partial peak demand (kW)	N/A
WBLGSOFF	Whole building summer off peak demand (kW)	N/A
WBLGWPRT	Whole building winter partial peak demand (kW)	N/A
WBLGWOFF	Whole building winter off	N/A

	peak demand (kW)	
HEATANN	Heating annual demand (kW)	N/A
HEATSONP	Heating summer on peak demand (kW)	N/A
HEATSPRT	Heating summer partial peak demand (kW)	N/A
HEATSOFF	Heating summer off peak demand (kW)	N/A
HEATWPRT	Heating winter partial peak demand (kW)	N/A
HEATWOFF	Heating at winter off peak demand (kW)	N/A
COOLANN	Cooling annual demand (kW)	N/A
COOLSONP	Cooling summer on peak demand (kW)	N/A
COOLSPRT	Cooling summer partial peak demand (kW)	N/A
COOLSOFF	Cooling summer off peak demand (kW)	N/A
COOLWPRT	Cooling winter partial peak demand (kW)	N/A
COOLWOFF	Cooling winter off peak demand (kW)	N/A
LTGANN	Lighting annual demand (kW)	N/A
LTGSONP	Lighting summer on peak demand (kW)	N/A
LTGSPRT	Lighting summer partial peak demand (kW)	N/A
LTGSOFF	Lighting summer off peak demand (kW)	N/A
LTGWPRT	Lighting winter partial peak demand (kW)	N/A
LTGWOFF	Lighting winter off peak demand (kW)	N/A
FANANN	Fan annual demand (kW)	N/A
FANSONP	Fan summer on peak demand (kW)	N/A

FANSPRT	Fan summer partial peak demand (kW)	N/A
FANSOFF	Fan summer off peak demand (kW)	N/A
FANWPRT	Fan winter partial peak demand (kW)	N/A
FANWOFF	Fan winter off peak demand (kW)	N/A
REFRANN	Refrigeration annual demand (kW)	N/A
REFRSONP	Refrigeration summer on peak demand (kW)	N/A
REFRSPRT	Refrigeration summer partial peak demand (kW)	N/A
REFRSOFF	Refrigeration summer off peak demand (kW)	N/A
REFRWPRT	Refrigeration winter partial peak demand (kW)	N/A
REFRWOFF	Refrigeration winter off peak demand (kW)	N/A
RESDANN	Residual annual demand (kW)	N/A
RESDSONP	Residual summer on peak demand (kW)	N/A
RESDSPRT	Residual summer partial peak demand (kW)	N/A
RESDSOFF	Residual summer off peak demand (kW)	N/A
RESDWPRT	Residual winter partial peak demand (kW)	N/A
RESDWOFF	Residual winter off peak demand (kW)	N/A
WBLGJAN	Whole building January demand (kW)	N/A
WBLGFEB	Whole building February demand (kW)	N/A
WBLGMAR	Whole building March demand (kW)	N/A
WBLGAPR	Whole building April demand (kW)	N/A

WBLGMAY	Whole building May demand (kW)	N/A
WBLGJUN	Whole building June demand (kW)	N/A
WBLGJUL	Whole building July demand (kW)	N/A
WBLGAUG	Whole building August demand (kW)	N/A
WBLGSEP	Whole building September demand (kW)	N/A
WBLGOCT	Whole building October demand (kW)	N/A
WBLGNOV	Whole building November demand (kW)	N/A
WBLGDEC	Whole building December demand (kW)	N/A
HEATJAN	Heating January demand (kW)	N/A
HEATFEB	Heating February demand (kW)	N/A
HEATMAR	Heating March demand (kW)	N/A
HEATAPR	Heating April demand (kW)	N/A
HEATMAY	Heating May demand (kW)	N/A
HEATJUN	Heating June demand (kW)	N/A
HEATJUL	Heating July demand (kW)	N/A
HEATAUG	Heating August demand (kW)	N/A
HEATSEP	Heating September demand (kW)	N/A
HEATOCT	Heating October demand (kW)	N/A
HEATNOV	Heating November demand (kW)	N/A
HEATDEC	Heating December demand (kW)	N/A
COOLJAN	Cooling January demand (kW)	N/A
COOLFEB	Cooling February demand (kW)	N/A

COOLMAR	Cooling March demand (kW)	N/A
COOLAPR	Cooling April demand (kW)	N/A
COOLMAY	Cooling May demand (kW)	N/A
COOLJUN	Cooling June demand (kW)	N/A
COOLJUL	Cooling July demand (kW)	N/A
COOLAUG	Cooling August demand (kW)	N/A
COOLSEP	Cooling September demand (kW)	N/A
COOLOCT	Cooling October demand (kW)	N/A
COOLNOV	Cooling November demand (kW)	N/A
COOLDEC	Cooling December demand (kW)	N/A
LTGJAN	Lighting January demand (kW)	N/A
LTGFEB	Lighting February demand (kW)	N/A
LTGMAR	Lighting March demand (kW)	N/A
LTGAPR	Lighting April demand (kW)	N/A
LTGMAY	Lighting May demand (kW)	N/A
LTGJUN	Lighting June demand (kW)	N/A
LTGJUL	Lighting July demand (kW)	N/A
LTGAUG	Lighting August demand (kW)	N/A
LTGSEP	Lighting September demand (kW)	N/A
LTGOCT	Lighting October demand (kW)	N/A
LTGNOV	Lighting November demand (kW)	N/A
LTGDEC	Lighting December demand (kW)	N/A
FANJAN	Fan January demand (kW)	N/A
FANFEB	Fan February demand (kW)	N/A

FANMAR	Fan March demand (kW)	N/A
FANAPR	Fan April demand (kW)	N/A
FANMAY	Fan May demand (kW)	N/A
FANJUN	Fan June demand (kW)	N/A
FANJUL	Fan July demand (kW)	N/A
FANAUG	Fan August demand (kW)	N/A
FANSEP	Fan September demand (kW)	N/A
FANOCT	Fan October demand (kW)	N/A
FANNOV	Fan November demand (kW)	N/A
FANDEC	Fan December demand (kW)	N/A
REFRJAN	Refrigeration January demand (kW)	N/A
REFRFEB	Refrigeration February demand (kW)	N/A
REFRMAR	Refrigeration March demand (kW)	N/A
REFRAPR	Refrigeration April demand (kW)	N/A
REFRMAY	Refrigeration May demand (kW)	N/A
REFRJUN	Refrigeration June demand (kW)	N/A
REFRJUL	Refrigeration July demand (kW)	N/A
REFRAUG	Refrigeration August demand (kW)	N/A
REFRSEP	Refrigeration September demand (kW)	N/A
REFROCT	Refrigeration October demand (kW)	N/A
REFRNOV	Refrigeration November demand (kW)	N/A
REFRDEC	Refrigeration December demand (kW)	N/A
RESDJAN	Residual January demand (kW)	N/A

RESDFEB	Residual February demand (kW)	N/A
RESDMAR	Residual March demand (kW)	N/A
RESDAPR	Residual April demand (kW)	N/A
RESDMAY	Residual May demand (kW)	N/A
RESDJUN	Residual June demand (kW)	N/A
RESDJUL	Residual July demand (kW)	N/A
RESDAUG	Residual August demand (kW)	N/A
RESDSEP	Residual September demand (kW)	N/A
RESDOCT	Residual October demand (kW)	N/A
RESDNOV	Residual November demand (kW)	N/A
RESDDEC	Residual December demand (kW)	N/A

Table 13: Net Savings Demand Tables - Tables ending in "pkw"

Net Savings Results Data Tables

The 4 "results" tables can also be grouped into 2 categories by data content, which are kWh Savings and pkW reduction. Table 5 below lists the 4 results tables. Table 15 through Table 18 list their variables and description.

5. kWh Savings – All Runs	6. pkW Reduction – All Runs
7. kWh Savings – Measures Only	8. pkW Reduction – Measures Only

Table 14: List of Net Savings Results Tables

Field Heading	Value	Comments
Weight	Weight	N/A
Building	Whole Building savings for incented measures plus any other measure that warrants a rebate by the program (kWh)	N/A

Shell	Shell savings for incented measures plus any other measure that warrants a rebate by the program (kWh)	N/A
LPD	LPD savings for incented measures plus any other measure that warrants a rebate by the program (kWh)	N/A
DayLt	Day Lighting savings for incented measures plus any other measure that warrants a rebate by the program (kWh)	N/A
OtrLt	Outdoor Lighting savings for incented measures plus any other measure that warrants a rebate by the program (kWh)	N/A
Motors	Motors measure savings for incented measures plus any other measure that warrants a rebate by the program (kWh)	N/A
HVAC	HVAC savings for incented measures plus any other measure that warrants a rebate by the program (kWh)	N/A
Refr	Refrigeration savings for incented measures plus any other measure that warrants a rebate by the program (kWh)	N/A
Utility	RLW Utility Code	1 = PG&E; 2 = SCE; 3 = SDG&E
Approach	Rebate approach	1 = performance approach; 2 = systems approach; 0 = non-participant
Part?	Participant or Non-Participant	1=participant; 2 = non-participant; 0 = neither
RLW_ID	RLW ID Number	N/A

Table 15: kWh Savings – All Runs

Field Heading	Value	Comments
Weight	Weight	N/A
Building	Whole Building savings for incented measures only (kWh)	N/A
Shell	Shell savings for incented measures only (kWh)	N/A
LPD	LPD savings for incented measures only (kWh)	N/A
DayLt	Day Lighting savings for incented measures only (kWh)	N/A
OtrLt	Outdoor Lighting savings for incented measures only (kWh)	N/A
Motors	Motors measure savings for incented measures only (kWh)	N/A
HVAC	HVAC savings for incented measures only (kWh)	N/A
Refr	Refrigeration savings for incented measures only (kWh)	N/A
Utility	RLW Utility Code	1 = PG&E; 2 = SCE; 3 = SDG&E
Approach	Rebate approach	1 = performance approach; 2 = systems approach; 0 = non-participant
Part?	Participant or Non-Participant	1=participant; 2 = non-participant; 0 = neither
RLW_ID	RLW ID Number	N/A

Table 16: kWh Savings – Measures Only

Field Heading	Value	Comments
Weight	Weight	N/A
Building	Whole Building summer peak demand reduction for all measures (kWh)	N/A
Shell	Shell summer peak demand	N/A

	reduction for all measures (kWh)	
LPD	LPD summer peak demand reduction for all measures (kWh)	N/A
DayLt	Day Lighting summer peak demand reduction for all measures (kWh)	N/A
OtrLt	Outdoor Lighting summer peak demand reduction for all measures (kWh)	N/A
Motors	Motors measure summer peak demand reduction for all measures (kWh)	N/A
HVAC	HVAC summer peak demand reduction for all measures (kWh)	N/A
Refr	Refrigeration Summer peak demand reduction for all measures (kWh)	N/A
Utility	RLW Utility Code	1 = PG&E; 2 = SCE; 3 = SDG&E
Approach	Rebate approach	1 = performance approach; 2 = systems approach; 0 = non-participant
Part?	Participant or Non-Participant	1=participant; 2 = non-participant; 0 = neither
RLW_ID	RLW ID Number	N/A

Table 17: pkW Reduction – All Runs

Field Heading	Value	Comments
Weight	Weight	N/A
Building	Whole Building summer peak demand reduction for incented measures only (kWh)	N/A
Shell	Shell summer peak demand reduction for incented measures only (kWh)	N/A
LPD	LPD summer peak demand reduction for incented measures only (kWh)	N/A

DayLt	Day Lighting summer peak demand reduction for incented measures only (kWh)	N/A
OtrLt	Outdoor Lighting summer peak demand reduction for incented measures only (kWh)	N/A
Motors	Motors measure summer peak demand reduction for incented measures only (kWh)	N/A
HVAC	HVAC summer peak demand reduction for incented measures only (kWh)	N/A
Refr	Refrigeration Summer peak demand reduction for incented measures only (kWh)	N/A
Utility	RLW Utility Code	1 = PG&E; 2 = SCE; 3 = SDG&E
Approach	Rebate approach	1 = performance approach; 2 = systems approach; 0 = non-participant
Part?	Participant or Non-Participant	1=participant; 2 = non-participant; 0 = neither
RLW_ID	RLW ID Number	N/A

Table 18: pkW Reduction – Measures Only

Survey-It BEA Database

The following tables document the database tables in the BEA Confidential Survey-IT database and BEA Free-rider Survey-IT database. Note that both the databases have the exact same tables (with different data) and therefore the tables are documented once below.

Field Heading	Value	Comments
SITEID	RLW Site ID Number	N/A
CCN_NO	Air handler ID number	N/A
CCNT24	Air handler Name	N/A
CCNLOC	Air handler location	N/A
CCNQTY	Quantity	N/A
CCNQTYM	Energy-efficient duct system measure (W/CFM) ID flag	N/A
CCNTYPE	Air handler type code	1 = Single duct 2 = Dual duct 3 = Multizone
CCNEVAP	Evaporative section type code	0 = None 1 = Direct 2 = Indirect 3 = Ind-Dir 4 = None
CCNEVAPM	Evaporative system measure ID flag	
CCNFTYPE	Fan type code	0 = DK 1 = Constant Volume 2 = Two-Speed 3 = Variable Volume
CCNFCON	Fan control code	0 = DK 1 = Constant Volume 2 = Cycles 3 = VSD 4 = Discharge Dampers 5 = Inlet Vanes
CCNFCONM	Fan control measure ID flag	N/A
CCNFLOW	AHU Supply CFM	N/A
CCNSHP	Supply Fan motor hp	N/A
CCNSHPM	Supply fan motor measure	N/A

	ID flag	
CCNSRPM3	Supply fan motor efficiency	N/A
CCNRHP	Return fan motor hp	N/A
CCNRRPM3	Return fan motor efficiency	N/A
CCNRHPM	Return fan motor measure ID flag	N/A
CCNOA	Economizer control code	1 = Fixed 2 = Temperature 3 = Enthalpy 4 = DK
CCNOAM	Economizer measure flag	N/A
C_OA	Outdoor Air Fraction	N/A
CNOTE	AHU Notes field	N/A
vsys	Virtual system assignment	N/A
zC_OARQD	Not Used	N/A
zCENQTY	Not Used	N/A
zCENQTYM	Not Used	N/A
zCENTYPE	Not Used	N/A
zCENEVAP	Not Used	N/A
zCENEVAPM	Not Used	N/A
zCENFTYPE	Not Used	N/A
zCENFCON	Not Used	N/A
zCENFCONM	Not Used	N/A
zCENFLOW	Not Used	N/A
zCENSHP	Not Used	N/A
zCENSHPM	Not Used	N/A
zCENSMOT	Not Used	N/A
zCENSRPM3	Not Used	N/A
zCENSRPM1	Not Used	N/A
zCCNSRPM1	Not Used	N/A
zCENSRPM2	Not Used	N/A
zCCNSRPM2	Not Used	N/A
zCENRHP	Not Used	N/A

zCENRHPM	Not Used	N/A
zCENRMOT	Not Used	N/A
zCCNRMOT	Not Used	N/A
zCENRRPM1	Not Used	N/A
zCCNRRPM1	Not Used	N/A
zCENRRPM2	Not Used	N/A
zCCNRRPM2	Not Used	N/A
zCENRRPM3	Not Used	N/A
zCENOA	Not Used	N/A
zCENOAM	Not Used	N/A
zSRVMORE	Not Used	N/A
zCEN_NO	Not Used	N/A
zCENT24	Not Used	N/A
zCENLOC	Not Used	N/A
CNFLOWUN	AHU Supply flow rate units. Code	0 = cfm 1 = cfm/sf
bOld	Old Construction?	N/A
EMSSupFanC	EMS Control of Supply Fan	N/A
EMSOACtrl	EMS Control of OA	N/A
DuctLeak	Duct leakage as percent of design flow.	N/A

Table 19: ccentair

Field Heading	Value	Comments
SITEID	RLW Site ID Number	N/A
CCH_NO	Chiller ID number	N/A
SRVMORE	Flag to indicate matchup between chiller and surveyed space	N/A
CCHT24	Chiller name	N/A
CCHLOC	Chiller location	N/A

CCHQTY	Chiller quantity	N/A
CCHQTYM	Chiller measure flag	N/A
CCHMANU	Chiller manufacturer	N/A
CCHMOD	Chiller model number	N/A
CCHSER	Chiller serial number Only required when greater than 250 tons.	N/A
CCHSIZE	Chiller size (tons)	N/A
CCHTYPE	Chiller type code	1 = Electric Reciprocating Chiller 2 = Electric Screw Chiller 3 = Electric Centrifugal Chiller 4 = Absorption Chiller 5 = Gas Engine Chiller
CCHEFFC	Chiller rated efficiency (kW/ton)	N/A
CCHFANHP	Air-cooled condenser fan hp (air cooled chillers w/ integral condenser only)	N/A
CNOTE	Chiller notes	N/A
CT24EFF	Not used	N/A
CMSTRYCHL	Flag for invalid make/model number	N/A
CISGT250	Not used	N/A
bOld	Old Construction?	N/A
CondType	Condenser Type Air/ Water default = Water	N/A

Table 20: cchiller

Field Heading	Value	Comments
SITEID	RLW Site ID Number	N/A
CHE_NO	Heating system ID number	N/A
CHET24	Heating system name	N/A
CHELOC	Heating system location	N/A
CHEQTY	Equipment quantity	N/A

CHEQTYM	Measure ID flag	N/A
CHEMANU	Manufacturer	N/A
CHEMOD	Model number	N/A
cCap	Heating output capacity	N/A
CHETYPE	Equipment type code	N/A
CHEFUEL	Heating fuel	N/A
CNOTE	Heating system notes	N/A
zCHEFANHP	Draft fan hp	N/A
hCapUnit	Heating capacity units (kBtu/hr or kW)	N/A
bOld	Old Construction?	N/A
Effcy	Boiler Efficiency	N/A

Table 21: cHeatSys

Field Heading	Value	Comments
City Name	City name closest to building site	N/A
Elevation	Elevation (ft)	N/A
Climate Zone	CEC climate zone	N/A
C Dry Bulb	Summer design dry bulb temperature (deg F)	N/A
C Wet Bulb	Summer design wet bulb temperature (deg F)	N/A
Latitiude	Degrees N latitude	N/A

Table 22: CityList

Field Heading	Value	Comments
SITEID	RLW Site ID	N/A
cac_no	Unit ID number	N/A
cact24	Unit name	N/A
CACLOC	Unit location	N/A

CACQTY	Quantity	N/A
CACQTYM	Measure flag	N/A
CACTYPE	Unit type code	1 = Pkg Rooftop AC, 2 = Pkg Rooftop HP, 3 = Split AC, 4 = Split HP, 5 = PTAC, 6 = PTHP, 7 = Window/Wall AC, 8=Window/Wall HP, 9=Water Loop HP, 10 = Dual Fuel HP, 11 = Evap System, 12 = Groundwater Source HP, 13 = Ground Source HP
CACMANU	Manufacturer	N/A
CACMOD	Model number of unit (outdoor section only if split system)	N/A
cMod_In	Model number of indoor section if split system	N/A
CACCCAP	Output capacity at ARI rating conditions (ton)	N/A
CACEFFC	Cooling efficiency at ARI rating conditions (EER or SEER)	N/A
CACEER	Cooling efficiency units (EER or SEER)	N/A
CACFUEL	Heating fuel	N/A
CACHCAP	Heating capacity (kBtu/hr) (at 47 OAT if heat pump)	N/A
CACCON	Condenser type	0 = DK; 1 = ap. Cnd.; 2 = Dry Air; 3 = Pad pre-cooler
CACCONM	Condenser measure flag	
CACESYS	Evaporative section type code	0 = None, 1 = Direct, 2 = Indirect, 3 = Ind-Dir, 4 = None
CACESYSM	Evaporative section measure flag	N/A
CACFTYPE	Fan type code	0 = DK , 1 = Constant Volume, 2 = VAV, 3 =

		VVT
CACFCON	Fan control code	0 = DK, 1 = Constant Volume, 2 = Cycles, 3 = VSD, 4 = Discharge Dampers, 5 = Inlet Vanes
CACFCONM	Fan control measure flag	N/A
CACFANHP	Supply fan hp	N/A
CACCONHP	Not used	N/A
CACRETHP	Return fan hp	N/A
CACOA	Economizer control code	1 = Fixed, 2 = Temperature, 3 = Enthalpy, 4 = DK
CACOAM	Economizer measure flag	N/A
CSUPCFM	Supply fan CFM	N/A
C_HCOP	Heating system efficiency	N/A
m_hcp	Heating system measure flag - either heat pump or gas furnace	N/A
htEfUnit	Heating efficiency units	1 = COP, 2 = HSPF, 3 = AFUE
C_OA	Outdoor air fraction	N/A
CNOTE	Packaged system notes	N/A
CMSTRYUNIT	Not used	N/A
vsys	Virtual system assignment	N/A
TwrCode	Cooling tower assignment (for water loop heat pumps only)	N/A
bOld	Old Construction?	N/A
EMSSupFanC	EMS Supply Fan Control?	N/A
EMSOACtrl	EMS OA Control?	N/A
SerialNo	Serial Number	N/A
TStatMN	Thermostat model number	N/A
TStatLoc	Thermostat location	N/A
SFMotorEff	Supply fan motor efficiency(0-100)	N/A

RFMotorEff	Return fan motor efficiency(0-100)	N/A
DuctLeak	Duct leakage as percent of design flow.	N/A
SFMotorKw	Supply fan motor kW	N/A
RFMotorKw	Return fan motor kW	N/A
EcNoWork	Economizer not working (Yes means it's not working)	N/A

Table 23: cPHVACSY

Field Heading	Value	Comments
SITEID	RLW Site ID	N/A
CPMP_NO	Pump ID	N/A
PmpQty	Quantity of this type of pump	N/A
cPmpNm	Pump Name	N/A
CPMPHP	Pump motor hp	N/A
CPMPRPM3	Pump motor efficiency	N/A
mP_Eff	motor efficiency measure flag	N/A
CPMPCTRL	Pump control code	1 = CV, 2 = 2-spd, 3 = VSD, 4 = DK
mP_ctrl	pump control measure flag	N/A
CPMPLOC	Pump location	N/A
CPMPLOOP	Pump loop flag	1 = Chilled water, 2 = Condenser water, 3 = Hot water
CPMPUSE	loop type flag	1 = primary, 2 = secondary
CNOTE	Pump notes	N/A
zCPMPTYPE	not used	N/A
zCPMPRPM1	not used	N/A
zCPMPRPM2	not used	N/A

zCPMPM	not used	N/A
SRVMORE	not used	N/A
M94	Generic measure flag from '94 PGE/SCE survey data	N/A
Bold	Old Construction?	N/A
EMS	EMS Control ?	N/A

Table 24: cPump

Field Heading	Value	Comments
SITEID	RLW Site ID	N/A
CTW_NO	Tower ID	N/A
CTWT24	Tower name	N/A
CTWLOC	Tower location	N/A
CTWQTY	Tower quantity	N/A
CTWQTYM	Tower measure flag	N/A
CTWMANU	Tower manufacturer	N/A
CTWMOD	Tower model number	N/A
CTWFANHP	Tower fan hp(Large)	N/A
CTWCTRL	Tower fan control code	1 = 1 speed, 2 = 2 speed, 3 = VSD, 4 = Pony
CTWCTRLM	Tower fan control measure flag	N/A
CTWPUMP	Tower pump hp(Spray)	N/A
CNOTE	Tower notes	N/A
RateCap	Heat rejection capacity at rated conditions	N/A
RateCond	Rated Condensing Temp	N/A
RambWB	Rated Ambient Wet Bulb	N/A
RambDB	Rated Ambient Dry Bulb	N/A
TWFANEFF	Tower fan motor efficiency(Large)	N/A

Bold	Old Construction?	N/A
SmlFanHP	Small Fan HP	N/A
SmlFanEff	Small Fan Efficiency	N/A
SprayPmpEf	Tower pump efficiency (Spray)	N/A

Table 25: cTower

Field Heading	Value	Comments
SITEID	RLW site ID	N/A
ZONE	Zone ID	N/A
cst24	Wall name	N/A
CSTYPE	Wall type code	1 = Brick & brick, 2 = Brick & conc, 3 = Brick & block, 4 = Concrete & finish, 5 = Block & finish, 6 = Wood frame, 7 = Metal frame, 8= Curtain wal, 9= Open
CSR	Insulation R-value	N/A
CUval	Overall U-value	N/A
CHC	Assembly heat capacity	N/A
CSORI	Compass Orientation= N, NE, E , SE, S, SW, W, NW	N/A
CSHGHT	Gross Wall height (ft) (includes windows)	N/A
CSWDTH	Gross Wall width (ft) (includes windows)	N/A
CSM	Measure ID flag	N/A
CNOTE	Wall notes	N/A
Bold	Old Construction?	N/A
WallNo	Wall number, auto generated	N/A

Table 26: cWalls

Field Heading	Value	Comments
SITEID	RLW site ID	N/A
ZONE	Zone ID	N/A
CWT24	Window name	N/A
CWTYPE	Glass type code	C=Clear, R=Reflective, T=Tinted, F=Fritted
CWSC	Window shading coefficient	N/A
cWinuVAl	Window U-value	N/A
CWORI	Window orientation	SW, W, NW, H (horizontal) (Not used v17.15+)
CWHGHT	Window height (ft)	N/A
CWWDTH	Window width (ft)	N/A
CWQTY	Window quantity	N/A
CWISHAD	Interior shading type code	1 = None, 2 = Blinds, 3 = Light shds/drps, 4 = Dark shds/drps
cPctShd	Overall window shading (%)	N/A
CWOHOFF	Fixed overhang offset (ft)	N/A
CWOHPROJ	Fixed overhang projection (ft)	N/A
CWM	Measure flag	0 = No, 1 = Shell Measure, 2 = Daylighting Measure
CNOTE	Window notes	N/A
Panes	Number of panes	N/A
Frame	Frame type code	S=Std. Metal; T=Thermal Break Metal; W=Wood or Vinyl
Bold	Old Construction	N/A
MeasTrans	Measured transmission	N/A
SHGC	Solar heat gain coefficent	N/A
SFOffset	Side fin offset (ft)	N/A
SFProj	Side fin projection (ft)	N/A
WallNo	Wall number to which	N/A

	window is assigned	
Features	Window features	1 = Low-E, 2 = Gas-Filled, 3 = Low-E, Gas-Filled

Table 27: cWindows

Field Heading	Value	Comments
SiteID	Site ID	N/A
Vsys	Virtual system assignment	N/A
Location	Location of the ducts	1 = Plenum, 2 = Conditioned, 3 = Outside, 4 = Other
Constr	Duct construction	1 = Sheetmetal, 2 = Flex, 3 = Fiberglass, 4 = Ductboard, 5 = Other
Rvalue	Insulation R-value	N/A
RelArea	Not Used	N/A
Type	Type of duct	1 = Supply, 2 = Return
Diameter	Diameter of round ducts	N/A
Width	Width of rectangular ducts	N/A
Height	Height of rectangular ducts	N/A
Run	Length of duct run	N/A
Notes	Notes regarding this duct entry	N/A

Table 28: Ducts

Field Heading	Value	Comments
siteid	RLW SIte ID number	N/A
emefl01	Full occupancy exterior miscellaneous load schedule hour 1	N/A
emefl02	Full occupancy exterior miscellaneous load schedule hour 2	N/A

emefl03	Full occupancy exterior miscellaneous load schedule hour 3	N/A
emefl04	Full occupancy exterior miscellaneous load schedule hour 4	N/A
emefl05	Full occupancy exterior miscellaneous load schedule hour 5	N/A
emefl06	Full occupancy exterior miscellaneous load schedule hour 6	N/A
emefl07	Full occupancy exterior miscellaneous load schedule hour 7	N/A
emefl08	Full occupancy exterior miscellaneous load schedule hour 8	N/A
emefl09	Full occupancy exterior miscellaneous load schedule hour 9	N/A
emefl10	Full occupancy exterior miscellaneous load schedule hour 10	N/A
emefl11	Full occupancy exterior miscellaneous load schedule hour 11	N/A
emefl12	Full occupancy exterior miscellaneous load schedule hour 12	N/A
emefl13	Full occupancy exterior miscellaneous load schedule hour 13	N/A
emefl14	Full occupancy exterior miscellaneous load schedule hour 14	N/A
emefl15	Full occupancy exterior miscellaneous load schedule hour 15	N/A
emefl16	Full occupancy exterior miscellaneous load	N/A

	schedule hour 16	
emefl17	Full occupancy exterior miscellaneous load schedule hour 17	N/A
emefl18	Full occupancy exterior miscellaneous load schedule hour 18	N/A
emefl19	Full occupancy exterior miscellaneous load schedule hour 19	N/A
emefl20	Full occupancy exterior miscellaneous load schedule hour 20	N/A
emefl21	Full occupancy exterior miscellaneous load schedule hour 21	N/A
emefl22	Full occupancy exterior miscellaneous load schedule hour 22	N/A
emefl23	Full occupancy exterior miscellaneous load schedule hour 23	N/A
emefl24	Full occupancy exterior miscellaneous load schedule hour 24	N/A
emelt01	Light occupancy exterior miscellaneous load schedule hour 1	N/A
emelt02	Light occupancy exterior miscellaneous load schedule hour 2	N/A
emelt03	Light occupancy exterior miscellaneous load schedule hour 3	N/A
emelt04	Light occupancy exterior miscellaneous load schedule hour 4	N/A
emelt05	Light occupancy exterior miscellaneous load schedule hour 5	N/A
emelt06	Light occupancy exterior	N/A

	miscellaneous load schedule hour 6	
emelt07	Light occupancy exterior miscellaneous load schedule hour 7	N/A
emelt08	Light occupancy exterior miscellaneous load schedule hour 8	N/A
emelt09	Light occupancy exterior miscellaneous load schedule hour 9	N/A
emelt10	Light occupancy exterior miscellaneous load schedule hour 10	N/A
emelt11	Light occupancy exterior miscellaneous load schedule hour 11	N/A
emelt12	Light occupancy exterior miscellaneous load schedule hour 12	N/A
emelt13	Light occupancy exterior miscellaneous load schedule hour 13	N/A
emelt14	Light occupancy exterior miscellaneous load schedule hour 14	N/A
emelt15	Light occupancy exterior miscellaneous load schedule hour 15	N/A
emelt16	Light occupancy exterior miscellaneous load schedule hour 16	N/A
emelt17	Light occupancy exterior miscellaneous load schedule hour 17	N/A
emelt18	Light occupancy exterior miscellaneous load schedule hour 18	N/A
emelt19	Light occupancy exterior miscellaneous load schedule hour 19	N/A

emelt20	Light occupancy exterior miscellaneous load schedule hour 20	N/A
emelt21	Light occupancy exterior miscellaneous load schedule hour 21	N/A
emelt22	Light occupancy exterior miscellaneous load schedule hour 22	N/A
emelt23	Light occupancy exterior miscellaneous load schedule hour 23	N/A
emelt24	Light occupancy exterior miscellaneous load schedule hour 24	N/A
emecl01	Closed occupancy exterior miscellaneous load schedule hour 1	N/A
emecl02	Closed occupancy exterior miscellaneous load schedule hour 2	N/A
emecl03	Closed occupancy exterior miscellaneous load schedule hour 3	N/A
emecl04	Closed occupancy exterior miscellaneous load schedule hour 4	N/A
emecl05	Closed occupancy exterior miscellaneous load schedule hour 5	N/A
emecl06	Closed occupancy exterior miscellaneous load schedule hour 6	N/A
emecl07	Closed occupancy exterior miscellaneous load schedule hour 7	N/A
emecl08	Closed occupancy exterior miscellaneous load schedule hour 8	N/A
emecl09	Closed occupancy exterior miscellaneous load	N/A

	schedule hour 9	
emecl10	Closed occupancy exterior miscellaneous load schedule hour 10	N/A
emecl11	Closed occupancy exterior miscellaneous load schedule hour 11	N/A
emecl12	Closed occupancy exterior miscellaneous load schedule hour 12	N/A
emecl13	Closed occupancy exterior miscellaneous load schedule hour 13	N/A
emecl14	Closed occupancy exterior miscellaneous load schedule hour 14	N/A
emecl15	Closed occupancy exterior miscellaneous load schedule hour 15	N/A
emecl16	Closed occupancy exterior miscellaneous load schedule hour 16	N/A
emecl17	Closed occupancy exterior miscellaneous load schedule hour 17	N/A
emecl18	Closed occupancy exterior miscellaneous load schedule hour 18	N/A
emecl19	Closed occupancy exterior miscellaneous load schedule hour 19	N/A
emecl20	Closed occupancy exterior miscellaneous load schedule hour 20	N/A
emecl21	Closed occupancy exterior miscellaneous load schedule hour 21	N/A
emecl22	Closed occupancy exterior miscellaneous load schedule hour 22	N/A
emecl23	Closed occupancy exterior	N/A

	miscellaneous load schedule hour 23	
emecl24	Closed occupancy exterior miscellaneous load schedule hour 24	N/A

Table 29: ExtMiscSched

Field Heading	Value	Comments
SITEID	RLW site ID	N/A
ZONE	Zone ID	N/A
K1QTY	Equipment quantity	N/A
K1TYPE	Equipment type code	N/A
K1FUEL	Fuel type code	1 = Electric, 2 = Other, 3 = DK, 4 = none
K1KW	Electric equip nameplate kW	N/A
K1VOLT	Electric equip nameplate V	N/A
K1AMP	Electric equip nameplate amps	N/A
K1KBTUH	Gas equip nameplate input rating (kBtu/hr)	N/A
K1SIZE	Trade size	N/A
K1HOOD	Hood ID code	N/A

Table 30: foodsvc

Field Heading	Value	Comments
SITEID	RLW site ID	N/A
ZONE	Zone ID	N/A
H1TYPE	Hood type code	0 = DK, 1 = Canopy, 2 = Island, 3 = Backshelf
H1SIZE	Hood face area (SF)	N/A
H1FLOW	Hood flow rate (CFM)	N/A
H1HP	Makeup and Exhaust fan	N/A

	hp	
H1AIR	Makeup air source	0 = DK, 1 = Conditioned MUA, 2 = Unconditioned MUA

Table 31: foodsvc2

Field Heading	Value	Comments
SITEID	RLW site ID	N/A
wh1loc	Water heater location	N/A
WH1TYPE	Water heater type code	1 = Storage, 2 = Instantaneous, 3 = Heat Pump
WH1CAP	Water heater storage tank capacity (gal)	N/A
WH1FUEL	Water heater fuel code	1 = Electric, 2 = Other, 3 = DK, 4 = none
WH1HP	Service hot water recirc pump hp	N/A
WH1M	Measure flag	N/A
bOld	Old Construction ?	N/A
Input	Energy input, kBtuh for fuel type other, kWh for fuel type electric	N/A
EF	Energy Factor (if type residential)	N/A
RecEff	Recovery efficency (%) (if type residential)	N/A
ThermEff	Thermal efficiency (%) (if type commercial)	N/A
SBLoss	Standby loss (%/hr) (if type commercial)	N/A
Make	Manufacturer	N/A
ModelNo	Model number	N/A

Table 32: hotwat1

Field Heading	Value	Comments
siteID	Text	N/A
Incident	Text	N/A
Comment	Memo	N/A

Table 33: Incidents

Field Heading	Value	Comments
SITEID	RLW Site ID	N/A
Name1	Site Name	N/A
Name2	Site Name	N/A
Address1	Site Address	N/A
city	Site City	N/A
SURVEYOR	Surveyor name	N/A
Engineer	Engineer name	N/A
NCCalcBlg	Building type code, see keyNCCalcBlg	N/A
qFlr_sf	Total building SF	N/A
qnew_eq	Whole building flag (new const = total)	N/A
qnew_sf	New construction SF	N/A
qChgs	Any changes in overall energy use since built	N/A
qTnt_cnt	# of tenants	N/A
qTnt_mtr	Tenant metering flag (Do the majority of tentants have their own electric meters)	N/A
t24env	Title 24 ENV compliance path code	0 = DK, 1 = Component, 2 = Overall Envelope, 3 = Performance
t24mech	Title 24 MECH compliance path code	0 = DK, 1 = Prescriptive, 2 = Performance
t24ltg	Title 24 LTG compliance path code	0 = DK, 1 = Complete Building, 2 = Area

		Category, 3 = Tailored, 4 = Performance
qRfCtrl1	Not used	N/A
qRfCtrl2	Not used	N/A
Q1	Number of areas in building	N/A
Q2AREA1	Not used	N/A
Q2AREA2	Not used	N/A
Q2AREA3	Not used	N/A
Q2AREA4	Not used	N/A
Q2AREA5	Not used	N/A
Q38	Exterior lighting control type code	1 = Time Clock, 2 = Photocell, 3 = Both, 4 = Neither, 5 = Don't Know
Q401	Exterior lighting schedule under time clock control= hour 1	N/A
Q402	Exterior lighting schedule under time clock control= hour 2	N/A
Q403	Exterior lighting schedule under time clock control= hour 3	N/A
Q404	Exterior lighting schedule under time clock control= hour 4	N/A
Q405	Exterior lighting schedule under time clock control= hour 5	N/A
Q406	Exterior lighting schedule under time clock control= hour 6	N/A
Q407	Exterior lighting schedule under time clock control= hour 7	N/A
Q408	Exterior lighting schedule under time clock control= hour 8	N/A
Q409	Exterior lighting schedule under time clock control=	N/A

	hour 9	
Q4010	Exterior lighting schedule under time clock control= hour 10	N/A
Q4011	Exterior lighting schedule under time clock control= hour 11	N/A
Q4012	Exterior lighting schedule under time clock control= hour 12	N/A
Q4013	Exterior lighting schedule under time clock control= hour 13	N/A
Q4014	Exterior lighting schedule under time clock control= hour 14	N/A
Q4015	Exterior lighting schedule under time clock control= hour 15	N/A
Q4016	Exterior lighting schedule under time clock control= hour 16	N/A
Q4017	Exterior lighting schedule under time clock control= hour 17	N/A
Q4018	Exterior lighting schedule under time clock control= hour 18	N/A
Q4019	Exterior lighting schedule under time clock control= hour 19	N/A
Q4020	Exterior lighting schedule under time clock control= hour 20	N/A
Q4021	Exterior lighting schedule under time clock control= hour 21	N/A
Q4022	Exterior lighting schedule under time clock control= hour 22	N/A
Q4023	Exterior lighting schedule	N/A

	under time clock control= hour 23	
Q4024	Exterior lighting schedule under time clock control= hour 24	N/A
Q42	Window shading occupant behavior code	1 = Always open, 2 = Always closed, 3 = Operated to control comfort, 4 = Open only when occupied
Q56SET	Cooling supply air temperature setpoint (NOT USED MOVED TO VSYSTEMS)	N/A
Q58SET	Chilled water set point temperature	N/A
Q59MIN	Minimum condenser water setpoint	N/A
Q59DK	Not used	N/A
Q59CON	Not used	N/A
Q59FAN	Not used	N/A
Q76	Refrigeration remote condenser flag	1 = Yes, 2 = No
Q78ATEMP	Refrigeration system minimum condensing temperature setpoint	N/A
RefrFhpM	Floating head pressure measure code	N/A
zQ78ADK	Not used	N/A
zQ78BTEMP	Not used	N/A
zQ78BDK	Not used	N/A
zQ78CTEMP	Not used	N/A
zQ78CDK	Not used	N/A
Q79A	LT refrigeration system defrost type code	1 = electric, 2 = hot gas, 3 = time off, 4 = DK
Q79B	MT refrigeration system defrost type code	1 = electric, 2 = hot gas, 3 = time off, 4 = DK
Q79C	HT refrigeration system	1 = electric, 2 = hot gas,

	defrost type code	3 = time off, 4 = DK
METINFNA	Meter information availability status flag	N/A
STATUS	Not used	N/A
NOTES	Not used	N/A
q57	Not used	N/A
Q60	Water side economizer flag	0 = Don't know, 1 = Yes, 2 = No
Q61	Water side economizer type flag	1 = Strainer Cycle, 2 = Thermosyphon, 3 = Plate HX, 4 = Unknown
q62jan	Water side economizer enabled flag	N/A
q62feb	Water side economizer enabled flag	N/A
q62mar	Water side economizer enabled flag	N/A
q62apr	Water side economizer enabled flag	N/A
q62may	Water side economizer enabled flag	N/A
q62jun	Water side economizer enabled flag	N/A
q62jul	Water side economizer enabled flag	N/A
q62aug	Water side economizer enabled flag	N/A
q62sep	Water side economizer enabled flag	N/A
q62oct	Water side economizer enabled flag	N/A
q62nov	Water side economizer enabled flag	N/A
q62dec	Water side economizer enabled flag	N/A
q62dk	Water side economizer enabled flag	N/A

ht_off	Heating system lockout flag	N/A
htjan	Monthly heating lockout flag	N/A
htfeb	Monthly heating lockout flag	N/A
htmar	Monthly heating lockout flag	N/A
htapr	Monthly heating lockout flag	N/A
htmay	Monthly heating lockout flag	N/A
htjun	Monthly heating lockout flag	N/A
htjul	Monthly heating lockout flag	N/A
htaug	Monthly heating lockout flag	N/A
htsep	Monthly heating lockout flag	N/A
htoct	Monthly heating lockout flag	N/A
htnov	Monthly heating lockout flag	N/A
htdec	Monthly heating lockout flag	N/A
htdk	Monthly heating lockout flag	N/A
q43	Pool water temperature setpoint	N/A
q44	Pool cover used flag	0 = No, -1 = Yes
q45	Pool cover on time (24 hr clock)	N/A
q46	Pool cover off time (24 hr clock)	N/A
q47	Spa setpoint temperature	N/A
q48	Spa cover used flag	0 = No, -1 = Yes
q49	Spa cover on time (24 hr	N/A

	clock)	
q50	Spa cover off time (24 hr clock)	N/A
Q3JAN	Occupied fraction, Jan 1996	N/A
Q3FEB	Occupied fraction, Feb 1996	N/A
Q3MAR	Occupied fraction, Mar 1996	N/A
Q3APR	Occupied fraction, Apr 1996	N/A
Q3MAY	Occupied fraction, May 1996	N/A
Q3JUN	Occupied fraction, Jun 1996	N/A
Q3JUL	Occupied fraction, Jul 1996	N/A
Q3AUG	Occupied fraction, Aug 1996	N/A
Q3SEP	Occupied fraction, Sep 1996	N/A
Q3OCT	Occupied fraction, Oct 1996	N/A
Q3NOV	Occupied fraction, Nov 1996	N/A
Q3DEC	Occupied fraction, Dec 1996	N/A
Q3bJAN	Occupied fraction, Jan 1997	N/A
Q3bFEB	Occupied fraction, Feb 1997	N/A
Q3bMAR	Occupied fraction, Mar 1997	N/A
Q3bAPR	Occupied fraction, Apr 1997	N/A
Q3bMAY	Occupied fraction, May 1997	N/A
Q3bJUN	Occupied fraction, Jun 1997	N/A

Q3bJUL	Occupied fraction, Jul 1997	N/A
Q3bAUG	Occupied fraction, Aug 1997	N/A
Q3bSEP	Occupied fraction, Sep 1997	N/A
Q3bOCT	Occupied fraction, Oct 1997	N/A
Q3bNOV	Occupied fraction, Nov 1997	N/A
Q3bDEC	Occupied fraction, Dec 1997	N/A
Q4JAN	Conditioned fraction, Jan 1996	N/A
Q4FEB	Conditioned fraction, Feb 1996	N/A
Q4MAR	Conditioned fraction, Mar 1996	N/A
Q4APR	Conditioned fraction, Apr 1996	N/A
Q4MAY	Conditioned fraction, May 1996	N/A
Q4JUN	Conditioned fraction, Jun 1996	N/A
Q4JUL	Conditioned fraction, Jul 1996	N/A
Q4AUG	Conditioned fraction, Aug 1996	N/A
Q4SEP	Conditioned fraction, Sep 1996	N/A
Q4OCT	Conditioned fraction, Oct 1996	N/A
Q4NOV	Conditioned fraction, Nov 1996	N/A
Q4DEC	Conditioned fraction, Dec 1996	N/A
Q4bJAN	Conditioned fraction, Jan 1997	N/A

Q4bFEB	Conditioned fraction, Feb 1997	N/A
Q4bMAR	Conditioned fraction, Mar 1997	N/A
Q4bAPR	Conditioned fraction, Apr 1997	N/A
Q4bMAY	Conditioned fraction, May 1997	N/A
Q4bJUN	Conditioned fraction, Jun 1997	N/A
Q4bJUL	Conditioned fraction, Jul 1997	N/A
Q4bAUG	Conditioned fraction, Aug 1997	N/A
Q4bSEP	Conditioned fraction, Sep 1997	N/A
Q4bOCT	Conditioned fraction, Oct 1997	N/A
Q4bNOV	Conditioned fraction, Nov 1997	N/A
Q4bDEC	Conditioned fraction, Dec 1997	N/A
qVAV	VAV box type code	0 = Std Boxes, 1 = Fan-powered Boxes, 2 = DK
EntStat	Data entry status code	0 = In progress, 1 = Entry complete DOE, 2 not running, 3 = Entry complete DOE2 runs
CalStat	Calibration status code	0 = In progress, 1 = Billing data not available, 2 = Could not calibrate, 3 = Calibration completed, 4 = Not Started=default
QCStat	QC status code	0 = In progress, 1 = As-built model QC'd, 2 = Savings QC'd
BriefDsc	Not used	N/A
Incent	Not used	N/A
Floors	Number of floors	N/A

Tlr_ltg	Tailored lighting compliance notes	N/A
Perf_frm	Performance compliance notes	N/A
StartDate	Survey start date	N/A
Start	Survey start time	N/A
FinishDate	Survey finish date	N/A
Finish	Survey finish time	N/A
DiffInfo	Contact info notes field	N/A
backup	Backup generator flag	N/A
pkReduc	Peak reduction flag	N/A
Cogen	Cogen system flag	N/A
Tes	Thermal energy storage flag	N/A
RfConPsi	Minimum condensing pressure setpoint (psig)	N/A
ASHtCtrl	Anti-sweat heater control on room RH flag	N/A
RhOff	Room RH setpoint to turn AS heaters off	N/A
RhOn	Room RH setpoint to turn AS heaters on	N/A
RfCoName	Refrigeration mechanic name	N/A
Stock	Stocking practices code 1 = Cases stocked randomly as needed 2 = Cases stocked on a regular schedule	N/A
StockTxt	Stocking practices comment field	N/A
rfgntLow	Refrigerant type for LT system= HCFC-22, HFC-134a, R-502, R-11, R-12	N/A
rfgntMed	Refrigerant type for MT system= HCFC-22, HFC-134a, R-502, R-11, R-12	N/A

rfgntHgh	Refrigerant type for HT system= HCFC-22, HFC-134a, R-502, R-11, R-12	N/A
STM	Potential short term monitoring site flag	0 = no , -1 = yes
WinNotes	Not used	N/A
T24Type	Building type from Title 24 categories, see keyTitle24BlgTypes	N/A
EntStatN	Entry status notes.	N/A
CalStatN	Calibration status notes.	N/A
QCStatN	QC status notes.	N/A
CTAppro	Cooling tower approach	N/A
SiteChar	Site Characterization 1-New;2-Alter;3-Addition;4-Alt and Addition	N/A
bInRebateP	Partcipate in in an energy efficient rebate program with local utility?	N/A
CndCtrl	Condenser control	0 = DK, 1 = Fixed, 2 = Reset on Outside temp
CndCtrlEMS	Condenser control on EMS?	N/A
HaveEMS	Does the building have a central EMS system	N/A
EMSM	Did the EMS receive a rebate?	N/A
RfCondCtrl	Refrigeration condenser control	1 = fixed, 2 = wetbulb offset
RfWBDeltaT	Refrigeration condenser wetbulb offset temperature	N/A
RfLtDfCtrl	LT refrigeration system defrost control code	1 = time clock, 2 = demand, 3 = don't know
RfMtDfCtrl	MT refrigeration system defrost control code	1 = time clock, 2 = demand, 3 = don't know
RfHtDfCtrl	HT refrigeration system defrost control code	1 = time clock, 2 = demand, 3 = don't know
qCEC_typ	Building type code	1 = Large Office, 2 =

		Small Office, 3 = Restaurants, 4 = Large Retail, 5 = Small Retail, 6 = Food Stores, 7 = Refrg Whses, 8=Non-Refrg Whses, 9=Elem/Scndry Schools, 10 = Colleges, Universities, 11 = Hospitals, 12 = Medical Clinic, 13 = Hotel/Motel, 14 = Misc.
RefrigCalc	Calculate refrigeration savings?	N/A

Table 34: intview1

Field Heading	Value	Comments
SiteID	RLW site ID	N/A
Zone	Zone ID	N/A
Name	Wall name	N/A
Type	Wall type code	1 = Wall, 2 = Air
Area	Wall area (sf) (takes precedense over height/width)	N/A
Height	Wall height (ft)	N/A
Width	Wall width (ft)	N/A
NextTo	Number of adjacent zone	N/A
Notes	Wall notes	N/A

Table 35: IntWalls

Field Heading	Value	Comments
SITEID	RLW Site ID	N/A
XL1FIXT	Exterior lighting fixture code	N/A
XL1CNT	Exterior lighting fixture count	N/A
zXL1CONT	Not used	N/A
zXL1HRWK	Not used	N/A

XL1M	Not used, exterior lighting not a measure	N/A
STATUS	Not used	N/A
Comment	Not used	N/A
Location	Exterior lighting fixture location	N/A
bOld	Old construction	N/A

Table 36: lite_ext

Field Heading	Value	Comments
SITEID	RLW Site ID	N/A
mc1code	Miscellaneous exterior equipment type code	1 = Misc. Appliance, 2 = Washer, 3 = Dryer, 4 = Cash Register, 5 = Box Crusher, 6 = Gasoline pump, 7 = Air Compressor, 8= Welder, 9 = Battery Charger, 10 = Machine Tools, 11 = Motor, 12 = Other
MC1DESC	Miscellaneous exterior equipment description	N/A
MC1QTY	Miscellaneous exterior equipment quantity	N/A
MC1KW	Miscellaneous exterior equipment kW/unit	N/A
MC1HP	Miscellaneous exterior equipment hp/unit	N/A
MC1HRWK	Not used	N/A
dvrsty	Not used	N/A
STATUS	Comment field	N/A

Table 37: Misc1

Field Heading	Value	Comments
SiteID	RLW site ID	N/A

Coupon Number	Coupon number	N/A
Coupon Date	Check issue date	N/A
SCE Rep	SCE NC rep	N/A
Address	Street	N/A
City	City	N/A
Zip Code	zip	N/A
Rebate	Check amount	N/A
KW Reduced	Expected demand savings	N/A
KWH Saved	Expected energy savings	N/A
Program	Program year	N/A
category	SIC code	N/A
new cat	SIC description	N/A
Case/Cust	Customer name	N/A
Name		N/A
Project Title	Project title	N/A

Table 38: participants

Field Heading	Value	Comments
SITEID	RLW Site ID	N/A
PS1LOC	Pool location	N/A
PS1SF	Water surface area (SF)	N/A
PS1HP	Pump hp	N/A
PS1HEAT	Heated pool flag	N/A
PH1LOC	Pool heater location	N/A
PH1FUEL	Pool heater fuel type	1 = DK, 2 = Electric, 3 = Other, 4 = DK
PH1TYPE	Solar pool heater type	0 = DK, 1 = Glazed, 2 = Unglazed
PH1SF	Solar pool heater SF	N/A
PH1TILT	Solar pool heater tilt (deg, 0=horizontal)	N/A

PH1HEAT	Pool heat recovery flag	0 = No, -1 = Yes
PH1M	Pool heating measure flag	0 = No, -1 = Yes

Table 39: pools

Field Heading	Value	Comments
SITEID	RLW Site ID	N/A
RC1MAKE	Condenser make	N/A
RC1MOD	Condenser model	N/A
RC1TYPE	Condenser type flag	0= DK, 1= Dry, 2 = Evap Cnd or Tower, 3= DK
RC1FANHP	Large Condenser fan hp	N/A
RC1PUMP	Condenser pump hp	N/A
RC1SPCON	Condenser fan control flag	0 = DK 1 = One speed 2 = Two speed 3 = VSD
4 = Pony motor		N/A
RC1M	Oversized condenser measure flag	N/A
RCNote	Condenser notes	N/A
NameCnd	Condenser name	N/A
CompServ	Compressor rack served	N/A
RateCap	Heat rejection capacity at rated conditions	N/A
RateCond	Rated Condensing Temp	N/A
RambWB	Rated Ambient Wet Bulb	N/A
RambDB	Rated Ambient Dry Bulb	N/A
Mfan	Fan control measure flag	N/A
M94	Generic measure flag from '94 PGE/SCE survey data	N/A
bOld	Old Construction?	N/A
LrgFanEff	Large Condenser Fan motor efficiency	N/A
SmlFanHP	Small Condenser Fan motor	N/A

	HP	
SmlFanEff	Small Condenser Fan motor efficiency	N/A
SpPmpHP	Spray Pump HP	N/A
LrgFanM	Text	N/A
SmFanM	Text	N/A
PumpM	Text	N/A
SpPmpEff	Spray Pump efficiency	N/A

Table 40: refr_Cnd

Field Heading	Value	Comments
SITEID	RLW Site ID	N/A
ZONE	Zone containing refrigerated cases	N/A
CR1MAKE	Compressor Make	N/A
CR1MOD	Compressor Model No.	N/A
CR1COMP	Compressor type code	1 = Stand-alone, 2 = Stand-alone w/ VSD, 3 = Parallel equal multiplex, 4 = Parallel unequal multiplex
CR1HP	Compressor motor hp	N/A
CR1TEMP	Rack temperature L;M;H	N/A
CR1AHU	Rejects heat to building HVAC system flag	N/A
CR1M	Compressor measure flag	N/A
NameRCmp	Condenser name	N/A
sst	Compressor Saturated Suction Temperature (SST)	N/A
EvTons	Compressor capacity (tons)	N/A
bOld	Old Construction?	N/A

Table 41: refrCmp

Field Heading	Value	Comments
SITEID	RLW SIte ID	N/A
ZONE	Zone containing refrigerated cases	N/A
RF1TYPE	Refrigerated case type code	N/A
RF1QTY	Quantity	N/A
RF1SIZE	Refrigerated case size (LF) all except walk-in	N/A
sfWalkIn	Walk-in and walk-in/reach-in size (SF)	N/A
RF1PROD	Product displayed	1 = Ice Cream, 2 = Frozen Food, 3 = Fresh Meat, 4 = Deli, 5 = Dairy/Beverage, 6 = Produce
RF1LOC	Condenser location Int=Inside Rem=Remote	N/A
doorCode	Door type code	N/A
M_door	Door measure flag	N/A
RF1LTG	Case display lighting code	1 = Std, 2 = Ebal, 3 = T-8
M_ltg	Display lighting measure flag	N/A
EE_mtr	Energy efficient evaporator motor flag	N/A
M_mtr	Motor measure flag	N/A
RF1MANU	Not used	N/A
M94	Generic measure flag from '94 PGE/SCE survey data	N/A
bOld	Old Construction?	N/A
HELSX	High efficiency liquid suction heat exchanger?	N/A
HELSX_M	High efficiency liquid suction heat exchanger a measure?	N/A

Table 42: refrig

Field Heading	Value	Comments
SITEID	Site ID	N/A
ZONE	Zone ID	N/A
cst24	Roof name	N/A
CSTYPE	Roof type code	10 = ROOF-Conc deck, 11 = ROOF-wood joist, 12 = ROOF-metal joist
CSR	Roof insulation R-value	N/A
cUval	Overall U-value	N/A
cHC	Assembly heat capacity	N/A
CSHGHT	Height (ft)	N/A
CSWDTH	Width (ft)	N/A
CSM	Measure flag	N/A
CNOTE	Notes	N/A
bOld	Old Construction?	N/A
CeilingR	Ceiling insulation R-value	N/A
Color	Roof color	1=White, 2=Silver, 3=Light grey, 4=Grey, 5=Green, 6=Light brown, 7=Medium brown, 8=Dark brown, 9=Black
Reflect	Roof reflectivity, 0 to 1	N/A
PlenumHt	Plenum height (ft)	N/A
PlenumR	Plenum wall insulation R-value	N/A
RetPlenum	Plenum used for return air?	N/A
Emittance	Roof emittance, 0 to 1	N/A
Surface	Surface type	1=Paint, 2=Elastomeric coating, 3=Single-ply membrane, 4=Metal roofing, 5=Asphalt shingles or roll, 6=Gravel (ballast)
Tilt	Tilt of the roof surface	N/A

	(degrees); 0 = horizontal	
Orient	Compass Orientation= N, NE, E , SE, S, SW, W, NW	N/A
RoofNo	Roof number, auto generated	N/A

Table 43: Roofs

Field Heading	Value	Comments
SITEID	RLW SIte ID	N/A
AREA	Area ID	N/A
Q5_M	Daytype code for Monday	1=full, 2=light, 3=closed
Q5_TU	Daytype code for Tuesday	1=full, 2=light, 3=closed
Q5_W	Daytype code for Wednesday	1=full, 2=light, 3=closed
Q5_TH	Daytype code for Thursday	1=full, 2=light, 3=closed
Q5_F	Daytype code for Friday	1=full, 2=light, 3=closed
Q5_SA	Daytype code for Saturday	1=full, 2=light, 3=closed
Q5_SU	Daytype code for Sunday	1=full, 2=light, 3=closed
Q5_HOL	Daytype code for Holiday	1=full, 2=light, 3=closed
Q6JANLIT	Lighting % of normal, Jan	N/A
Q6JANHVC	HVAC % of normal, Jan	N/A
Q6JANEQU	Misc. equipment % of normal, Jan	N/A
Q6FEBLIT	Lighting % of normal, Feb	N/A
Q6FEBHVC	HVAC % of normal, Feb	N/A
Q6FEBEQU	Misc. equipment % of normal, Feb	N/A
Q6MARLIT	Lighting % of normal, Mar	N/A
Q6MARHVC	HVAC % of normal, Mar	N/A
Q6MAREQU	Misc. equipment % of normal, Mar	N/A
Q6APRLIT	Lighting % of normal, Apr	N/A
Q6APRHVC	HVAC % of normal, Apr	N/A

Q6APREQU	Misc. equipment % of normal, Apr	N/A
Q6MAYLIT	Lighting % of normal, May	N/A
Q6MAYHVC	HVAC % of normal, May	N/A
Q6MAYEQU	Misc. equipment % of normal, May	N/A
Q6JUNLIT	Lighting % of normal, Jun	N/A
Q6JUNHVC	HVAC % of normal, Jun	N/A
Q6JUNEQU	Misc. equipment % of normal, Jun	N/A
Q6JULLIT	Lighting % of normal, Jul	N/A
Q6JULHVC	HVAC % of normal, Jul	N/A
Q6JULEQU	Misc. equipment % of normal, Jul	N/A
Q6AUGLIT	Lighting % of normal, Aug	N/A
Q6AUGHVC	HVAC % of normal, Aug	N/A
Q6AUGEQU	Misc. equipment % of normal, Aug	N/A
Q6SEPLIT	Lighting % of normal, Sep	N/A
Q6SEPHVC	HVAC % of normal, Sep	N/A
Q6SEPEQU	Misc. equipment % of normal, Sep	N/A
Q6OCTLIT	Lighting % of normal, Oct	N/A
Q6OCTHVC	HVAC % of normal, Oct	N/A
Q6OCTEQU	Misc. equipment % of normal, Oct	N/A
Q6NOVLIT	Lighting % of normal, Nov	N/A
Q6NOVHVC	HVAC % of normal, Nov	N/A
Q6NOVEQU	Misc. equipment % of normal, Nov	N/A
Q6DECLIT	Lighting % of normal, Dec	N/A
Q6DECHVC	HVAC % of normal, Dec	N/A
Q6DECEQU	Misc. equipment % of normal, Dec	N/A

Q7NY	Holiday observed flag, New Years Day	N/A
Q7MLK	Holiday observed flag, MLK day	N/A
Q7PRES	Holiday observed flag, Presidents day	N/A
Q7ESTR	Holiday observed flag, Easter	N/A
Q7MEM	Holiday observed flag, Memorial Day	N/A
Q74TH	Holiday observed flag, Jul 4	N/A
Q7LABOR	Holiday observed flag, Labor Day	N/A
Q7COLS	Holiday observed flag, Columbus day	N/A
q7VETS	Holiday observed flag, Veterans day	N/A
Q7THANKS	Holiday observed flag, Thanksgiving	N/A
Q7XMAS	Holiday observed flag, Christmas	N/A
Q8	Not used	N/A
Q91	Full day occupancy, hour 1	N/A
Q92	Full day occupancy, hour 2	N/A
Q93	Full day occupancy, hour 3	N/A
Q94	Full day occupancy, hour 4	N/A
Q95	Full day occupancy, hour 5	N/A
Q96	Full day occupancy, hour 6	N/A
Q97	Full day occupancy, hour 7	N/A
Q98	Full day occupancy, hour 8	N/A
Q99	Full day occupancy, hour 9	N/A
Q910	Full day occupancy, hour 10	N/A
Q911	Full day occupancy, hour 11	N/A
Q912	Full day occupancy, hour 12	N/A

Q913	Full day occupancy, hour 13	N/A
Q914	Full day occupancy, hour 14	N/A
Q915	Full day occupancy, hour 15	N/A
Q916	Full day occupancy, hour 16	N/A
Q917	Full day occupancy, hour 17	N/A
Q918	Full day occupancy, hour 18	N/A
Q919	Full day occupancy, hour 19	N/A
Q920	Full day occupancy, hour 20	N/A
Q921	Full day occupancy, hour 21	N/A
Q922	Full day occupancy, hour 22	N/A
Q923	Full day occupancy, hour 23	N/A
Q924	Full day occupancy, hour 24	N/A
Q101	Light day occupancy, hour 1	N/A
Q102	Light day occupancy, hour 2	N/A
Q103	Light day occupancy, hour 3	N/A
Q104	Light day occupancy, hour 4	N/A
Q105	Light day occupancy, hour 5	N/A
Q106	Light day occupancy, hour 6	N/A
Q107	Light day occupancy, hour 7	N/A
Q108	Light day occupancy, hour 8	N/A
Q109	Light day occupancy, hour 9	N/A
Q1010	Light day occupancy, hour 10	N/A
Q1011	Light day occupancy, hour 11	N/A
Q1012	Light day occupancy, hour 12	N/A
Q1013	Light day occupancy, hour 13	N/A
Q1014	Light day occupancy, hour 14	N/A
Q1015	Light day occupancy, hour	N/A

	15	
Q1016	Light day occupancy, hour 16	N/A
Q1017	Light day occupancy, hour 17	N/A
Q1018	Light day occupancy, hour 18	N/A
Q1019	Light day occupancy, hour 19	N/A
Q1020	Light day occupancy, hour 20	N/A
Q1021	Light day occupancy, hour 21	N/A
Q1022	Light day occupancy, hour 22	N/A
Q1023	Light day occupancy, hour 23	N/A
Q1024	Light day occupancy, hour 24	N/A
Q111	Closed day occupancy, hour 1	N/A
Q112	Closed day occupancy, hour 2	N/A
Q113	Closed day occupancy, hour 3	N/A
Q114	Closed day occupancy, hour 4	N/A
Q115	Closed day occupancy, hour 5	N/A
Q116	Closed day occupancy, hour 6	N/A
Q117	Closed day occupancy, hour 7	N/A
Q118	Closed day occupancy, hour 8	N/A
Q119	Closed day occupancy, hour 9	N/A
Q1110	Closed day occupancy, hour	N/A

	10	
Q1111	Closed day occupancy, hour 11	N/A
Q1112	Closed day occupancy, hour 12	N/A
Q1113	Closed day occupancy, hour 13	N/A
Q1114	Closed day occupancy, hour 14	N/A
Q1115	Closed day occupancy, hour 15	N/A
Q1116	Closed day occupancy, hour 16	N/A
Q1117	Closed day occupancy, hour 17	N/A
Q1118	Closed day occupancy, hour 18	N/A
Q1119	Closed day occupancy, hour 19	N/A
Q1120	Closed day occupancy, hour 20	N/A
Q1121	Closed day occupancy, hour 21	N/A
Q1122	Closed day occupancy, hour 22	N/A
Q1123	Closed day occupancy, hour 23	N/A
Q1124	Closed day occupancy, hour 24	N/A
STATUS	Not used	N/A
thnk_cnt	Days observed during thanksgiving	N/A
xmas_cnt	Days observed during Christmas	N/A
estr_cnt	Days observed during Easter	N/A
nSchdAdj	How to adjust schedule	1 = By duration, 2 = By Intensity

Table 44: sched1

Field Heading	Value	Comments
SITEID	RLW Site ID	N/A
AREA	Area ID	N/A
Q121	Full day interior lighting use, hour 1	N/A
Q122	Full day interior lighting use, hour 2	N/A
Q123	Full day interior lighting use, hour 3	N/A
Q124	Full day interior lighting use, hour 4	N/A
Q125	Full day interior lighting use, hour 5	N/A
Q126	Full day interior lighting use, hour 6	N/A
Q127	Full day interior lighting use, hour 7	N/A
Q128	Full day interior lighting use, hour 8	N/A
Q129	Full day interior lighting use, hour 9	N/A
Q1210	Full day interior lighting use, hour 10	N/A
Q1211	Full day interior lighting use, hour 11	N/A
Q1212	Full day interior lighting use, hour 12	N/A
Q1213	Full day interior lighting use, hour 13	N/A
Q1214	Full day interior lighting use, hour 14	N/A
Q1215	Full day interior lighting use, hour 15	N/A
Q1216	Full day interior lighting use, hour 16	N/A

Q1217	Full day interior lighting use, hour 17	N/A
Q1218	Full day interior lighting use, hour 18	N/A
Q1219	Full day interior lighting use, hour 19	N/A
Q1220	Full day interior lighting use, hour 20	N/A
Q1221	Full day interior lighting use, hour 21	N/A
Q1222	Full day interior lighting use, hour 22	N/A
Q1223	Full day interior lighting use, hour 23	N/A
Q1224	Full day interior lighting use, hour 24	N/A
Q131	Light day interior lighting use, hour 1	N/A
Q132	Light day interior lighting use, hour 2	N/A
Q133	Light day interior lighting use, hour 3	N/A
Q134	Light day interior lighting use, hour 4	N/A
Q135	Light day interior lighting use, hour 5	N/A
Q136	Light day interior lighting use, hour 6	N/A
Q137	Light day interior lighting use, hour 7	N/A
Q138	Light day interior lighting use, hour 8	N/A
Q139	Light day interior lighting use, hour 9	N/A
Q1310	Light day interior lighting use, hour 10	N/A
Q1311	Light day interior lighting use, hour 11	N/A

Q1312	Light day interior lighting use, hour 12	N/A
Q1313	Light day interior lighting use, hour 13	N/A
Q1314	Light day interior lighting use, hour 14	N/A
Q1315	Light day interior lighting use, hour 15	N/A
Q1316	Light day interior lighting use, hour 16	N/A
Q1317	Light day interior lighting use, hour 17	N/A
Q1318	Light day interior lighting use, hour 18	N/A
Q1319	Light day interior lighting use, hour 19	N/A
Q1320	Light day interior lighting use, hour 20	N/A
Q1321	Light day interior lighting use, hour 21	N/A
Q1322	Light day interior lighting use, hour 22	N/A
Q1323	Light day interior lighting use, hour 23	N/A
Q1324	Light day interior lighting use, hour 24	N/A
Q141	Closed day interior lighting use, hour 1	N/A
Q142	Closed day interior lighting use, hour 2	N/A
Q143	Closed day interior lighting use, hour 3	N/A
Q144	Closed day interior lighting use, hour 4	N/A
Q145	Closed day interior lighting use, hour 5	N/A
Q146	Closed day interior lighting use, hour 6	N/A

Q147	Closed day interior lighting use, hour 7	N/A
Q148	Closed day interior lighting use, hour 8	N/A
Q149	Closed day interior lighting use, hour 9	N/A
Q1410	Closed day interior lighting use, hour 10	N/A
Q1411	Closed day interior lighting use, hour 11	N/A
Q1412	Closed day interior lighting use, hour 12	N/A
Q1413	Closed day interior lighting use, hour 13	N/A
Q1414	Closed day interior lighting use, hour 14	N/A
Q1415	Closed day interior lighting use, hour 15	N/A
Q1416	Closed day interior lighting use, hour 16	N/A
Q1417	Closed day interior lighting use, hour 17	N/A
Q1418	Closed day interior lighting use, hour 18	N/A
Q1419	Closed day interior lighting use, hour 19	N/A
Q1420	Closed day interior lighting use, hour 20	N/A
Q1421	Closed day interior lighting use, hour 21	N/A
Q1422	Closed day interior lighting use, hour 22	N/A
Q1423	Closed day interior lighting use, hour 23	N/A
Q1424	Closed day interior lighting use, hour 24	N/A
Q151	Full day miscellaneous equipment use, hour 1	N/A

Q152	Full day miscellaneous equipment use, hour 2	N/A
Q153	Full day miscellaneous equipment use, hour 3	N/A
Q154	Full day miscellaneous equipment use, hour 4	N/A
Q155	Full day miscellaneous equipment use, hour 5	N/A
Q156	Full day miscellaneous equipment use, hour 6	N/A
Q157	Full day miscellaneous equipment use, hour 7	N/A
Q158	Full day miscellaneous equipment use, hour 8	N/A
Q159	Full day miscellaneous equipment use, hour 9	N/A
Q1510	Full day miscellaneous equipment use, hour 10	N/A
Q1511	Full day miscellaneous equipment use, hour 11	N/A
Q1512	Full day miscellaneous equipment use, hour 12	N/A
Q1513	Full day miscellaneous equipment use, hour 13	N/A
Q1514	Full day miscellaneous equipment use, hour 14	N/A
Q1515	Full day miscellaneous equipment use, hour 15	N/A
Q1516	Full day miscellaneous equipment use, hour 16	N/A
Q1517	Full day miscellaneous equipment use, hour 17	N/A
Q1518	Full day miscellaneous equipment use, hour 18	N/A
Q1519	Full day miscellaneous equipment use, hour 19	N/A
Q1520	Full day miscellaneous equipment use, hour 20	N/A

Q1521	Full day miscellaneous equipment use, hour 21	N/A
Q1522	Full day miscellaneous equipment use, hour 22	N/A
Q1523	Full day miscellaneous equipment use, hour 23	N/A
Q1524	Full day miscellaneous equipment use, hour 24	N/A
Q161	Light day miscellaneous equipment use, hour 1	N/A
Q162	Light day miscellaneous equipment use, hour 2	N/A
Q163	Light day miscellaneous equipment use, hour 3	N/A
Q164	Light day miscellaneous equipment use, hour 4	N/A
Q165	Light day miscellaneous equipment use, hour 5	N/A
Q166	Light day miscellaneous equipment use, hour 6	N/A
Q167	Light day miscellaneous equipment use, hour 7	N/A
Q168	Light day miscellaneous equipment use, hour 8	N/A
Q169	Light day miscellaneous equipment use, hour 9	N/A
Q1610	Light day miscellaneous equipment use, hour 10	N/A
Q1611	Light day miscellaneous equipment use, hour 11	N/A
Q1612	Light day miscellaneous equipment use, hour 12	N/A
Q1613	Light day miscellaneous equipment use, hour 13	N/A
Q1614	Light day miscellaneous equipment use, hour 14	N/A
Q1615	Light day miscellaneous equipment use, hour 15	N/A

Q1616	Light day miscellaneous equipment use, hour 16	N/A
Q1617	Light day miscellaneous equipment use, hour 17	N/A
Q1618	Light day miscellaneous equipment use, hour 18	N/A
Q1619	Light day miscellaneous equipment use, hour 19	N/A
Q1620	Light day miscellaneous equipment use, hour 20	N/A
Q1621	Light day miscellaneous equipment use, hour 21	N/A
Q1622	Light day miscellaneous equipment use, hour 22	N/A
Q1623	Light day miscellaneous equipment use, hour 23	N/A
Q1624	Light day miscellaneous equipment use, hour 24	N/A
Q171	Closed day miscellaneous equipment use, hour 1	N/A
Q172	Closed day miscellaneous equipment use, hour 2	N/A
Q173	Closed day miscellaneous equipment use, hour 3	N/A
Q174	Closed day miscellaneous equipment use, hour 4	N/A
Q175	Closed day miscellaneous equipment use, hour 5	N/A
Q176	Closed day miscellaneous equipment use, hour 6	N/A
Q177	Closed day miscellaneous equipment use, hour 7	N/A
Q178	Closed day miscellaneous equipment use, hour 8	N/A
Q179	Closed day miscellaneous equipment use, hour 9	N/A
Q1710	Closed day miscellaneous equipment use, hour 10	N/A

Q1711	Closed day miscellaneous equipment use, hour 11	N/A
Q1712	Closed day miscellaneous equipment use, hour 12	N/A
Q1713	Closed day miscellaneous equipment use, hour 13	N/A
Q1714	Closed day miscellaneous equipment use, hour 14	N/A
Q1715	Closed day miscellaneous equipment use, hour 15	N/A
Q1716	Closed day miscellaneous equipment use, hour 16	N/A
Q1717	Closed day miscellaneous equipment use, hour 17	N/A
Q1718	Closed day miscellaneous equipment use, hour 18	N/A
Q1719	Closed day miscellaneous equipment use, hour 19	N/A
Q1720	Closed day miscellaneous equipment use, hour 20	N/A
Q1721	Closed day miscellaneous equipment use, hour 21	N/A
Q1722	Closed day miscellaneous equipment use, hour 22	N/A
Q1723	Closed day miscellaneous equipment use, hour 23	N/A
Q1724	Closed day miscellaneous equipment use, hour 24	N/A
Q181	Full day kitchen appliance use (High, Med, Low, Idle, Off), hour 1	N/A
Q182	Full day kitchen appliance use (High, Med, Low, Idle, Off), hour 2	N/A
Q183	Full day kitchen appliance use (High, Med, Low, Idle, Off), hour 3	N/A
Q184	Full day kitchen appliance use (High, Med, Low, Idle,	N/A

	Off), hour 4	
Q185	Full day kitchen appliance use (High, Med, Low, Idle, Off), hour 5	N/A
Q186	Full day kitchen appliance use (High, Med, Low, Idle, Off), hour 6	N/A
Q187	Full day kitchen appliance use (High, Med, Low, Idle, Off), hour 7	N/A
Q188	Full day kitchen appliance use (High, Med, Low, Idle, Off), hour 8	N/A
Q189	Full day kitchen appliance use (High, Med, Low, Idle, Off), hour 9	N/A
Q1810	Full day kitchen appliance use (High, Med, Low, Idle, Off), hour 10	N/A
Q1811	Full day kitchen appliance use (High, Med, Low, Idle, Off), hour 11	N/A
Q1812	Full day kitchen appliance use (High, Med, Low, Idle, Off), hour 12	N/A
Q1813	Full day kitchen appliance use (High, Med, Low, Idle, Off), hour 13	N/A
Q1814	Full day kitchen appliance use (High, Med, Low, Idle, Off), hour 14	N/A
Q1815	Full day kitchen appliance use (High, Med, Low, Idle, Off), hour 15	N/A
Q1816	Full day kitchen appliance use (High, Med, Low, Idle, Off), hour 16	N/A
Q1817	Full day kitchen appliance use (High, Med, Low, Idle, Off), hour 17	N/A
Q1818	Full day kitchen appliance	N/A

	use (High, Med, Low, Idle, Off), hour 18	
Q1819	Full day kitchen appliance use (High, Med, Low, Idle, Off), hour 19	N/A
Q1820	Full day kitchen appliance use (High, Med, Low, Idle, Off), hour 20	N/A
Q1821	Full day kitchen appliance use (High, Med, Low, Idle, Off), hour 21	N/A
Q1822	Full day kitchen appliance use (High, Med, Low, Idle, Off), hour 22	N/A
Q1823	Full day kitchen appliance use (High, Med, Low, Idle, Off), hour 23	N/A
Q1824	Full day kitchen appliance use (High, Med, Low, Idle, Off), hour 24	N/A
Q191	Light day kitchen appliance use (High, Med, Low, Idle, Off), hour 1	N/A
Q192	Light day kitchen appliance use (High, Med, Low, Idle, Off), hour 2	N/A
Q193	Light day kitchen appliance use (High, Med, Low, Idle, Off), hour 3	N/A
Q194	Light day kitchen appliance use (High, Med, Low, Idle, Off), hour 4	N/A
Q195	Light day kitchen appliance use (High, Med, Low, Idle, Off), hour 5	N/A
Q196	Light day kitchen appliance use (High, Med, Low, Idle, Off), hour 6	N/A
Q197	Light day kitchen appliance use (High, Med, Low, Idle, Off), hour 7	N/A

Q198	Light day kitchen appliance use (High, Med, Low, Idle, Off), hour 8	N/A
Q199	Light day kitchen appliance use (High, Med, Low, Idle, Off), hour 9	N/A
Q1910	Light day kitchen appliance use (High, Med, Low, Idle, Off), hour 10	N/A
Q1911	Light day kitchen appliance use (High, Med, Low, Idle, Off), hour 11	N/A
Q1912	Light day kitchen appliance use (High, Med, Low, Idle, Off), hour 12	N/A
Q1913	Light day kitchen appliance use (High, Med, Low, Idle, Off), hour 13	N/A
Q1914	Light day kitchen appliance use (High, Med, Low, Idle, Off), hour 14	N/A
Q1915	Light day kitchen appliance use (High, Med, Low, Idle, Off), hour 15	N/A
Q1916	Light day kitchen appliance use (High, Med, Low, Idle, Off), hour 16	N/A
Q1917	Light day kitchen appliance use (High, Med, Low, Idle, Off), hour 17	N/A
Q1918	Light day kitchen appliance use (High, Med, Low, Idle, Off), hour 18	N/A
Q1919	Light day kitchen appliance use (High, Med, Low, Idle, Off), hour 19	N/A
Q1920	Light day kitchen appliance use (High, Med, Low, Idle, Off), hour 20	N/A
Q1921	Light day kitchen appliance use (High, Med, Low, Idle, Off), hour 21	N/A
Q1922	Light day kitchen appliance	N/A

	use (High, Med, Low, Idle, Off), hour 22	
Q1923	Light day kitchen appliance use (High, Med, Low, Idle, Off), hour 23	N/A
Q1924	Light day kitchen appliance use (High, Med, Low, Idle, Off), hour 24	N/A
STATUS	Not used	N/A

Table 45: sched2

Field Heading	Value	Comments
SITEID	RLW SIte ID	N/A
VSYS	Virtual system ID	N/A
h1	Closed daytype fan operation status flag, hour 1	N/A
h2	Closed daytype fan operation status flag, hour 2	N/A
h3	Closed daytype fan operation status flag, hour 3	N/A
h4	Closed daytype fan operation status flag, hour 4	N/A
h5	Closed daytype fan operation status flag, hour 5	N/A
h6	Closed daytype fan operation status flag, hour 6	N/A
h7	Closed daytype fan operation status flag, hour 7	N/A
h8	Closed daytype fan operation status flag, hour 8	N/A
h9	Closed daytype fan operation status flag, hour 9	N/A
h10	Closed daytype fan operation status flag, hour 10	N/A
h11	Closed daytype fan operation status flag, hour 11	N/A
h12	Closed daytype fan operation	N/A

	status flag, hour 12	
h13	Closed daytype fan operation status flag, hour 13	N/A
h14	Closed daytype fan operation status flag, hour 14	N/A
h15	Closed daytype fan operation status flag, hour 15	N/A
h16	Closed daytype fan operation status flag, hour 16	N/A
h17	Closed daytype fan operation status flag, hour 17	N/A
h18	Closed daytype fan operation status flag, hour 18	N/A
h19	Closed daytype fan operation status flag, hour 19	N/A
h20	Closed daytype fan operation status flag, hour 20	N/A
h21	Closed daytype fan operation status flag, hour 21	N/A
h22	Closed daytype fan operation status flag, hour 22	N/A
h23	Closed daytype fan operation status flag, hour 23	N/A
h24	Closed daytype fan operation status flag, hour 24	N/A

Table 46: schFnCl

Field Heading	Value	Comments
SITEID	RLW SIte ID	N/A
VSYS	Virtual system ID	N/A
h1	Full operation daytype fan operation status flag, hour 1	N/A
h2	Full operation daytype fan operation status flag, hour 2	N/A
h3	Full operation daytype fan operation status flag, hour 3	N/A

h4	Full operation daytype fan operation status flag, hour 4	N/A
h5	Full operation daytype fan operation status flag, hour 5	N/A
h6	Full operation daytype fan operation status flag, hour 6	N/A
h7	Full operation daytype fan operation status flag, hour 7	N/A
h8	Full operation daytype fan operation status flag, hour 8	N/A
h9	Full operation daytype fan operation status flag, hour 9	N/A
h10	Full operation daytype fan operation status flag, hour 10	N/A
h11	Full operation daytype fan operation status flag, hour 11	N/A
h12	Full operation daytype fan operation status flag, hour 12	N/A
h13	Full operation daytype fan operation status flag, hour 13	N/A
h14	Full operation daytype fan operation status flag, hour 14	N/A
h15	Full operation daytype fan operation status flag, hour 15	N/A
h16	Full operation daytype fan operation status flag, hour 16	N/A
h17	Full operation daytype fan operation status flag, hour 17	N/A
h18	Full operation daytype fan operation status flag, hour 18	N/A
h19	Full operation daytype fan	N/A

	operation status flag, hour 19	
h20	Full operation daytype fan operation status flag, hour 20	N/A
h21	Full operation daytype fan operation status flag, hour 21	N/A
h22	Full operation daytype fan operation status flag, hour 22	N/A
h23	Full operation daytype fan operation status flag, hour 23	N/A
h24	Full operation daytype fan operation status flag, hour 24	N/A

Table 47: schFnFul

Field Heading	Value	Comments
SITEID	RLW SIte ID	N/A
VSYS	Virtual system ID	N/A
h1	Light operation daytype fan operation status flag, hour 1	N/A
h2	Light operation daytype fan operation status flag, hour 2	N/A
h3	Light operation daytype fan operation status flag, hour 3	N/A
h4	Light operation daytype fan operation status flag, hour 4	N/A
h5	Light operation daytype fan operation status flag, hour 5	N/A
h6	Light operation daytype fan operation status flag, hour 6	N/A
h7	Light operation daytype fan operation status flag, hour 7	N/A
h8	Light operation daytype fan	N/A

	operation status flag, hour 8	
h9	Light operation daytype fan operation status flag, hour 9	N/A
h10	Light operation daytype fan operation status flag, hour 10	N/A
h11	Light operation daytype fan operation status flag, hour 11	N/A
h12	Light operation daytype fan operation status flag, hour 12	N/A
h13	Light operation daytype fan operation status flag, hour 13	N/A
h14	Light operation daytype fan operation status flag, hour 14	N/A
h15	Light operation daytype fan operation status flag, hour 15	N/A
h16	Light operation daytype fan operation status flag, hour 16	N/A
h17	Light operation daytype fan operation status flag, hour 17	N/A
h18	Light operation daytype fan operation status flag, hour 18	N/A
h19	Light operation daytype fan operation status flag, hour 19	N/A
h20	Light operation daytype fan operation status flag, hour 20	N/A
h21	Light operation daytype fan operation status flag, hour 21	N/A
h22	Light operation daytype fan operation status flag, hour 22	N/A
h23	Light operation daytype fan operation status flag, hour 23	N/A
h24	Light operation daytype fan operation status flag, hour 24	N/A

Table 48: schFnLt

Field Heading	Value	Comments
SITEID	RLW Site ID	N/A

AREA	Area ID	N/A
hSPOCC	Occupied period heating setpoint	N/A
hSPUNOCC	Unoccupied period heating setpoint	N/A
cSPOCC	Occupied period cooling setpoint	N/A
cSPUNOCC	Unoccupied period cooling setpoint	N/A
FanSch	Thermostat schedule follows fan schedule flag	N/A
full1	Full occupancy daytype occupied mode flag for hour 1	N/A
full2	Full occupancy daytype occupied mode flag for hour 2	N/A
full3	Full occupancy daytype occupied mode flag for hour 3	N/A
full4	Full occupancy daytype occupied mode flag for hour 4	N/A
full5	Full occupancy daytype occupied mode flag for hour 5	N/A
full6	Full occupancy daytype occupied mode flag for hour 6	N/A
full7	Full occupancy daytype occupied mode flag for hour 7	N/A
full8	Full occupancy daytype occupied mode flag for hour 8	N/A
full9	Full occupancy daytype occupied mode flag for hour 9	N/A
full10	Full occupancy daytype occupied mode flag for hour 10	N/A
full11	Full occupancy daytype occupied mode flag for hour 11	N/A
full12	Full occupancy daytype occupied mode flag for hour 12	N/A

full13	Full occupancy daytype occupied mode flag for hour 13	N/A
full14	Full occupancy daytype occupied mode flag for hour 14	N/A
full15	Full occupancy daytype occupied mode flag for hour 15	N/A
full16	Full occupancy daytype occupied mode flag for hour 16	N/A
full17	Full occupancy daytype occupied mode flag for hour 17	N/A
full18	Full occupancy daytype occupied mode flag for hour 18	N/A
full19	Full occupancy daytype occupied mode flag for hour 19	N/A
full20	Full occupancy daytype occupied mode flag for hour 20	N/A
full21	Full occupancy daytype occupied mode flag for hour 21	N/A
full22	Full occupancy daytype occupied mode flag for hour 22	N/A
full23	Full occupancy daytype occupied mode flag for hour 23	N/A
full24	Full occupancy daytype occupied mode flag for hour 24	N/A
light1	Light occupancy daytype occupied mode flag for hour 1	N/A
light2	Light occupancy daytype occupied mode flag for hour 2	N/A
light3	Light occupancy daytype	N/A

	occupied mode flag for hour 3	
light4	Light occupancy daytype occupied mode flag for hour 4	N/A
light5	Light occupancy daytype occupied mode flag for hour 5	N/A
light6	Light occupancy daytype occupied mode flag for hour 6	N/A
light7	Light occupancy daytype occupied mode flag for hour 7	N/A
light8	Light occupancy daytype occupied mode flag for hour 8	N/A
light9	Light occupancy daytype occupied mode flag for hour 9	N/A
light10	Light occupancy daytype occupied mode flag for hour 10	N/A
light11	Light occupancy daytype occupied mode flag for hour 11	N/A
light12	Light occupancy daytype occupied mode flag for hour 12	N/A
light13	Light occupancy daytype occupied mode flag for hour 13	N/A
light14	Light occupancy daytype occupied mode flag for hour 14	N/A
light15	Light occupancy daytype occupied mode flag for hour 15	N/A
light16	Light occupancy daytype occupied mode flag for hour 16	N/A
light17	Light occupancy daytype occupied mode flag for hour 17	N/A
light18	Light occupancy daytype occupied mode flag for hour 18	N/A

light19	Light occupancy daytype occupied mode flag for hour 19	N/A
light20	Light occupancy daytype occupied mode flag for hour 20	N/A
light21	Light occupancy daytype occupied mode flag for hour 21	N/A
light22	Light occupancy daytype occupied mode flag for hour 22	N/A
light23	Light occupancy daytype occupied mode flag for hour 23	N/A
light24	Light occupancy daytype occupied mode flag for hour 24	N/A
close1	Closed daytype occupied mode flag for hour 1	N/A
close2	Closed daytype occupied mode flag for hour 2	N/A
close3	Closed daytype occupied mode flag for hour 3	N/A
close4	Closed daytype occupied mode flag for hour 4	N/A
close5	Closed daytype occupied mode flag for hour 5	N/A
close6	Closed daytype occupied mode flag for hour 6	N/A
close7	Closed daytype occupied mode flag for hour 7	N/A
close8	Closed daytype occupied mode flag for hour 8	N/A
close9	Closed daytype occupied mode flag for hour 9	N/A
close10	Closed daytype occupied mode flag for hour 10	N/A
close11	Closed daytype occupied	N/A

	mode flag for hour 11	
close12	Closed daytype occupied mode flag for hour 12	N/A
close13	Closed daytype occupied mode flag for hour 13	N/A
close14	Closed daytype occupied mode flag for hour 14	N/A
close15	Closed daytype occupied mode flag for hour 15	N/A
close16	Closed daytype occupied mode flag for hour 16	N/A
close17	Closed daytype occupied mode flag for hour 17	N/A
close18	Closed daytype occupied mode flag for hour 18	N/A
close19	Closed daytype occupied mode flag for hour 19	N/A
close20	Closed daytype occupied mode flag for hour 20	N/A
close21	Closed daytype occupied mode flag for hour 21	N/A
close22	Closed daytype occupied mode flag for hour 22	N/A
close23	Closed daytype occupied mode flag for hour 23	N/A
close24	Closed daytype occupied mode flag for hour 24	N/A
EMS	Is the system on EMS?	N/A
SPMaint	Setpoint maintenance list	1 = occupants, 2 = management, 3 = HVAC Service Co, 4 = Other

Table 49: SchTStat

Field Heading	Value	Comments
SiteID	RLW Site ID	N/A
Area	Area ID code	N/A

AreaName	Area name	N/A

Table 50: SiteArea

Field Heading	Value	Comments
SITEID	Site ID	N/A
ZONE	Zone ID	N/A
CWT24	Skylight name	N/A
CWTYPE	Glass type code	1 = Clear Glass, 2 =Tinted Glass (transparent), 3 = Fritted Glass (diffusing), 4 =Clear Plastic - clear, 5 = Tinted Plastic (transparent), 6 White Plastic (diffusing), 7 Translucent Plastic (e.g. Kalwall), 8 Other (describe in notes)
CWSC	Window shading coefficient	N/A
cWinuVAl	Window U-value	N/A
CWHGHT	Window height (ft)	N/A
CWWDTH	Window width (ft)	N/A
CWQTY	Window quantity	N/A
CWISHAD	Interior shading type code	1 = None, 2 = Blinds, 3 = Drapes/Shades, 4 = Prismatic Diffuser, 5 = Other
CWM	Measure ID flag	N/A
CNOTE	Window notes	N/A
Panes	Number of panes	N/A
Frame	Frame type code FrameType	1 = Std. Metal w/o Curb, 2 = Std. Metal w/ Curb, 3 = Thermal Break Metal w/o Curb, 4 = Thermal Break Metal w/ Curb,
bOld	Old Construction	N/A
MeasTrans	Measured transmission	N/A

SHGC	Solar heat gain coefficent	N/A
Shape	Shape of the skylight	1=Domed, 2=Flat, 3=Pyramid, 4=Ridge, 5=Vault, 6=Other
RoofNo	Number of the roof to which the skylight is assigned	N/A
Features	Window features	1 = Low-E, 2 = Gas-Filled, 3 = Low-E, Gas-Filled

Table 51: SkyIts

Field Heading	Value	Comments
SITEID	RLW SIte ID	N/A
SW1LOC	Location	N/A
SW1TYPE	System Type	N/A
SW1SF	Area(ft2)	N/A
SW1TILT	Tilt(deg)	N/A
SW1CAP	Tank Cap(gal)	N/A
SW1M	Rebated Measure?	N/A
Comment	Comment	N/A

Table 52: sol_DHW

Field Heading	Value	Comments
SITEID	RLW Site ID	N/A
CH1	Virtual system number for chiller 1	N/A
CH2	Virtual system number for chiller 2	N/A
CH3	Virtual system number for chiller 3	N/A
CH1B	Virtual system number for chiller 1b	N/A
CH2B	Virtual system number for chiller 2b	N/A

CH3B	Virtual system number for chiller3b	N/A
T1	Virtual system number for Tower 1	N/A
T2	Virtual system number for Tower 2	N/A
T3	Virtual system number for Tower 3	N/A
T1B	Virtual system number for Tower 1b	N/A
T2B	Virtual system number for Tower 2b	N/A
T3B	Virtual system number for Tower 3b	N/A
HS1	Virtual system number for Heating system 1	N/A
HS2	Virtual system number for Heating system 2	N/A
HS3	Virtual system number for Heating system 3	N/A
HS1B	Virtual system number for Heating system 1b	N/A
HS2B	Virtual system number for Heating system 2b	N/A
HS3B	Virtual system number for Heating system 3b	N/A
P1	Virtual system number for pump 1	N/A
P2	Virtual system number for pump 2	N/A
P3	Virtual system number for pump 3	N/A
P4	Virtual system number for pump 4	N/A
P5	Virtual system number for pump 5	N/A
P6	Virtual system number for pump 6	N/A

P7	Virtual system number for pump 7	N/A
P8	Virtual system number for pump 8	N/A
P9	Virtual system number for pump 9	N/A
P10	Virtual system number for pump 10	N/A
P11	Virtual system number for pump 11	N/A
P12	Virtual system number for pump 12	N/A
P13	Virtual system number for pump 13	N/A
P14	Virtual system number for pump 14	N/A
P15	Virtual system number for pump 15	N/A
P16	Virtual system number for pump 16	N/A
P17	Virtual system number for pump 17	N/A
P18	Virtual system number for pump 18	N/A
P19	Virtual system number for pump 19	N/A
P20	Virtual system number for pump 20	N/A
ZONE1	Virtual system number zone 1	N/A
ZONE2	Virtual system number zone 2	N/A
ZONE3	Virtual system number zone 3	N/A
ZONE4	Virtual system number zone 4	N/A
ZONE5	Virtual system number zone 5	N/A

ZONE1B	Virtual system number zone 1b	N/A
ZONE2B	Virtual system number zone 2b	N/A
ZONE3B	Virtual system number zone 3b	N/A
ZONE4B	Virtual system number zone 4b	N/A
ZONE5B	Virtual system number zone 5b	N/A
Z1AREA	Area assignment for Zone 1	N/A
Z2AREA	Area assignment for Zone 2	N/A
Z3AREA	Area assignment for Zone 3	N/A
Z4AREA	Area assignment for Zone 4	N/A
Z5AREA	Area assignment for Zone 5	N/A
Z1BAREA	Area assignment for Zone 1b	N/A
Z2BAREA	Area assignment for Zone 2b	N/A
Z3BAREA	Area assignment for Zone 3b	N/A
Z4BAREA	Area assignment for Zone 4b	N/A
Z5BAREA	Area assignment for Zone 5b	N/A
STATUS	Not used	N/A

Table 53: syszone

Field Heading	**Value**	**Comments**
siteid	RLW Site ID	N/A
spc_num	Space ID	N/A
ECODE	Equipment type code	N/A
ECOUNT	Equipment unit count	N/A
EKW	Equipment nameplate kW, if different from	N/A

	default	
EHP	Equipment nameplate hp, if different from default	N/A
EKBTUH	Equipment nameplate fuel input rating, kBtu/hr	N/A
EHOOD	Hood status code	N/A
EINTENS	Not used	N/A
ENOTES	comment field	N/A
Units	Equipment namplate units flag	1 = kW, 2 = HP, 3 = kBtuh
EpwrRat	Not used	N/A
UseFactor	Fraction of time equipment in use	N/A

Table 54: tbSpEq

Field Heading	Value	Comments
siteid	RLW Site ID	N/A
spc_num	Space ID	N/A
lfcode	fixture code	N/A
lcount	Fixture count	N/A
lmt	mounting type code	1 = Recessed, 2 = Suspended, 3 = Plug-In Task, 4 = Direct, 5 = Indirect, 6 = Indirect-Direct, 7 = Furniture-Integrated Task, 8 = Track, 9 = Exempt
lccode	Control code	1 = Occ sensor, 2 = Daylighting - cont dim, 3 = Daylighting - stepped, 4 = Lumen maint, 5 = Occ sensor plus daylighting, 6 = Occ sensor plus lumen maint, 7 = Daylighting plus lumen maint, 8= None

lfcon	% fixtures controlled	N/A
lcon_opr	% lighting controls operational	N/A
lm	Fixture measure flag	N/A
NameNote	Notes field	N/A
lc_m	Control measure flag	N/A
M94	Generic measure flag from '94 PGE/SCE survey data	N/A
bEMS	EMS?	N/A
TrkLength	Length of track lighting in feet.	N/A

Table 55: tbSpLt

Field Heading	Value	Comments
siteid	RLW SIte ID	N/A
Number	Number used to reference definition of typical loads	N/A
ECODE	Equipment type code	N/A
ECOUNT	Equipment unit count	N/A
EKW	Equipment nameplate kW, if different from default	N/A
EHP	Equipment nameplate hp, if different from default	N/A
EKBTUH	Equipment nameplate fuel input rating, kBtu/hr	N/A
EHOOD	Hood status code	N/A
EINTENS	Not used	N/A
ENOTES	comment field	N/A
Units	Equipment namplate units flag	1 = kW, 2 = HP, 3 = kBtuh

EpwrRat	Not used	N/A
UseFactor	Fraction of time equipment in use	N/A

Table 56: tbSpTypEq

Field Heading	Value	Comments
siteid	RLW SIte ID	N/A
Number	Number used to reference definition of typical loads	N/A
Name	Typical equipment survey area description	N/A
FLRAREA	Floor area surveyed to establish typical density	N/A

Table 57: tbSpTypEqRef

Field Heading	Value	Comments
SITEID	RLW SIte ID	N/A
TESNotes	Notes on TES installation	N/A

Table 58: TESsup

Field Heading	Value	Comments
SITEID	RLW Site ID	N/A
Name	Transformer name	N/A
Locate	Transformer location	N/A
Qty	Quantity	N/A
Manuf	Manufacturer	N/A
Model	Model number	N/A
kVA	kVA rating	N/A
TempRise	Temperature rise (deg C)	N/A
Fan	Mechanical cooling	N/A

	fan flag	
M94	Measure flag from '94 PGE/SCE survey data	N/A
bOld	Old Construction?	N/A

Table 59: Trnsfrmr

Field Heading	Value	Comments
siteid	RLW SIte ID	N/A
spc_num	Space ID code (1-30)	N/A
zone	Zone ID	N/A
spc_nme	Space name	N/A
spc_oc	Space occupancy code	N/A
spcArea	Space area (SF)	N/A
sCorPct	Percent of total space area that is corridor or utility	N/A
spc_mlt	Space multiplier	N/A
sEqCalc	Miscellaneous equipment survey assignment reference number	N/A
lt_msr	LPD measure flag	N/A
Tlr_ALPD	Allowed lighting power in watts from tailored lighting compliance	N/A
HWFlow	DHW flow rate (gal/min/sf), from keyOcc2	N/A
LtgIsOld	Flag indicating whether lighting system in space is old.	N/A
LPD	Lighting power density for space - can be used instead of surveying fixtures.	N/A

MaxPeople	Maximum number of people in this space	N/A

Table 60: tSpace

Field Heading	Value	Comments
siteID	RLW Site ID	N/A
vSys	Virtual ID code	N/A
SysName	Virtual system name	N/A
SAcontrol	Supply air control	1=fixed, 2=OA temp, 3=zone temp
Q56SET	Cooling supply air temperature setpoint	N/A
CO2Control	CO2 control used	N/A
SAFlowCont	How Flow rate determined for control Duct Static; Measured	N/A
airFlow, DK		N/A
EMSSAContr	Supply air controlled by EMS	N/A
EMSSAFlowC	Supply air Flow controlled by EMS	N/A
EMSCO2Cont	CO2 Control by EMS	N/A
OptimumFan	Optimimum fan start employed in building	N/A
FanSysEMS	Fan Ssytem controlled by EMS?	N/A
MaxHumid	If humidity control, % maximum	N/A
NightCtrl	Night fan control	1 = Stay off, 2 = Cycle on any
DuctNotes	Notes regarding overall duct system	N/A

Table 61: vSystems

Field Heading	Value	Comments

SITEID	RLW Site ID code	N/A
VT1TYPE	Vertical transportation type code	1 = Elevator, 2 = Escalator
VT1QTY	Vertical Transportation quantity	N/A
VT1HP	Vertical Transportation motor hp	N/A
VT1NOFL	Elevator number of floors	N/A
VT1WDTH	Escalator width	N/A
VT1RISE	Escalator Rise	N/A
VT1RUN	Escalator Run	N/A
STATUS	Not used	N/A

Table 62: vt_Trns

Field Heading	Value	Comments
SITEID	RLW SIte ID	N/A
ZONE	Zone ID	N/A
zName	Zone name	N/A
ZEXPOSE	Zone by exposure status flag	1 = yes, 2 = no
ZMULT	Zone multiplier	N/A
vsys	Virtual system assignment	N/A
Area	Area assignment	N/A

Table 63: zones1

Field Heading	Value	Comments
SITEID	RLW Site ID	N/A
ZONE	Zone ID	N/A
ZS1CODE	Zone level HVAC system type code	1= Basebd or rad heat, 2= 2 pipe fc, 3= 4 pipe fc, 4=

	type code	2 pipe induc, 5= 4 pipe induc, 6= Unit htr, 7= Unit vent, 8= std VAV, 9= Series VAV, 10= Parall VAV, 11= Comp room unit, 12= Exh fan
ZS1QTY	Zone system quantity	N/A
ZS1HP	Zone system fan hp	N/A
ZS1HEAT	Zone system heat source	0 = DK, 1 = Electric, 2 = Other, 3 = None
ZS1KW	Zone system heat kW	N/A
STATUS	Not used	N/A
ZS1CFM	Zone system CFM for exhausts fans, unit ventilators	N/A

Table 64: zones2

The MBSS Fortran Software System[1]

The primary purpose of this section is to establish the basic concepts and terminology of model-based statistical sampling – Fortran version (MBSS - Fortran). We will discuss load research and related applications of MBSS- Fortran, describe the study life cycle that will be discussed throughout this book, explain how MBSS- Fortran is used through the various steps of a study and explain how to run several demonstrations of the MBSS- Fortran software.

Model based statistical sampling (MBSS- Fortran) is a statistical methodology for studying a large population by collecting data in a carefully selected sample. For example, in a typical load research study, time-of-use meters would be placed on a sample of accounts to describe the load profile of all accounts in a rate class.

MBSS builds on conventional finite population sampling theory as developed in standard references such as Cochran [1], but MBSS- Fortran goes beyond the standard theory. MBSS- Fortran is particularly tailored to applications such as load research directed to collecting highly quantitative information. The theory of MBSS- Fortran is developed in Wright [6, 8] and Sarndal, et. al. [4]. Applications are discussed in Godfrey, et. al. [2], McCarthy, et. al. [3], EPRI [4], Wright [7] and Wright, et. al. [9].

Making MBSS – Fortran Files

Preparing your MBSSPOP file

One of the features of MBSS- Fortran is its access to the population data base, MBSSPOP. At the sample design stage, you will need to prepare the MBSSPOP file for the target population. This file gives MBSS information about the distribution of the stratification variable. In load research and engineering modeling applications, the stratification variable is usually annual use. However, in DSM applications, the target population is usually a set of program participants listed in the program tracking system, and the stratification variable is the estimated energy or demand savings of each project.

In creating an appropriate version of MBSSPOP for your own application, some of the following questions may arise.

Question: *How do I start?*

You will need to create a data base listing each unit in the population. This data base, called the sampling frame, should include the value of the stratification variable, any sector variables, and any appropriate identification variables such as account numbers.

[1] Source: MBSS User's Guide/Reference Manual

In a traditional class load research study, your target population would be the set of accounts in a rate class, and the stratification variable would probably be the annual use of each account. You would create a sampling frame by using your billing system to create a file of all accounts in the rate class, together with their annual use, and account number. You might add other potential sector variables identifying market segments, geographical regions, operating companies, etc.

In some cases your sampling frame may contain a relatively small number of units, i.e., less than 2,000 accounts. In this case, you can use the data directly in MBSSPOP. Otherwise, the sampling frame must be summarized into a bin frequency distribution such as MBSSPOP.DEM. A SAS program, called BINS.SAS, can be used for this purpose. BINS.SAS is distributed with MBSS.

Question. *How do I use BINS.SAS?*

Print out the file or look at it in your word processor. You will find instructions for modifying the program for your application. You will want to give the appropriate format for reading in the annual use of each account from your sampling frame. You may want to specify a particular class or sector variable. This variable should take integer values in your sampling frame, i.e., 1, 2, etc. Depending on your application, you may want to change the scale of measurement, e.g., from kWh to MWh. Finally, you may want to change the number of bins to be produced for each class. Of course, you will need to have SAS to run this program. Your output will be written to a file named mbss_pop. The results will be similar in format to demo_pop but the number of accounts per bin will decrease as the maximum value increases.

Question. *Should I include accounts who joined the system recently and do not have a full year of use?*

A common approach is to exclude such accounts from the target population. But we like to keep the number of exclusions as small as possible. So we recommend that you estimate each account's annual use by dividing the account's total use by the number of billing days and then multiplying by 365.

Question. *Does the estimation of annual use as just discussed introduce a bias into the ratio estimate of total demand?*

According to statistical theory, you will not introduce any bias as long as you calculate annual use the same way in both the load research sample and the population.

Question. *What do you do about accounts with zero annual use?*

We usually drop them–they cause a whole host of problems.

Question. *Can I substitute some other variable for annual use?*

Sure, you can use any variable known for each customer in your target population. For example, if your company is summer peaking you might try using summer use instead of annual use. Your objective is to get a variable that is highly correlated with your target demands. We encourage you to experiment with various alternatives.

But remember to be consistent between the load research sample and the population. You might create a bias, for example, by calculating summer use on a calendar basis for the sample and on a billing cycle basis for the population.

Question. *Do I need to have a segment or class variable?*

No. The primary purpose of the segment or class variable is to allow you to investigate different subdomains of the population, and to run your job in batch mode as discussed in Chapter 5. If you do provide a class variable, use a one or two digit integer to identify each class. Character-valued class names, such as R1 or SC2, should be recoded as simple integers such as 1 and 2.

Question. *Do I need to have the population data in a special order?*

If you prepare your data using BINS.SAS, your MBSSPOP file will be sorted appropriately. If you are using your own MBSSPOP file, you need to be aware of the order of cases and variables in your file.

The cases in your file should be sorted by increasing values of the stratification variable, e.g., increasing annual use. If you set up a sector variable, your cases should be sorted by sector and then annual use within sector.

MBSS is flexible about the order of your variables. You must specify the labels to MBSS in the order that the corresponding variables appear in MBSSPOP. For example if you specify the variables as 27 25 26 29 then variable 27 refers to the first column in your file, 25 to the second column, etc.

Question. *How does free format input work?*

Free format input is very convenient and can be used in most applications. However, the following restrictions must be honored. These rules apply to the sample data base as well as the population data base.

Each new case (bin or account) must start on a new line. If there are too many variables to fit on a single line, the case can extend over several lines. However, the value of a variable must not be split between lines and each new case should start on a new line.

Within each line, the values of the variables can be separated by commas, by one or more spaces, or by tabs.

Decimal points must be used for fractional values. If a decimal point is omitted, the value will be read as a whole number.

A value cannot be omitted. If necessary, a missing value can be represented by a special value such as -9999999 or 9999999. The missing data code must be beyond the range of the variables. The SAS missing data code "." is not allowed.

Only numeric values are allowed. Customer ID's or sector names that include alphabetical characters are not allowed.

Question. *I have a standard report generator on my system to produce a bill frequency distribution. Can I use its output to create my MBSSPOP file?*

Probably, as long as it provides the upper bound of each bin, the mean or total use of the accounts in each bin, and the number of accounts in each bin. You may want to import the data into a spread sheet and then reformat the information so that it is similar to MBSSPOP.DEM. See Section 2.1.

Question. *What file do I use for my own population data base?*

By default, MBSS assumes the population data base is always in a file named MBSSPOP. You can use the control option on the main menu of MBSS to name a special file if you wish. But we recommend you use MBSSPOP to hold the population data for your current application. Of course you must remember to save the data in another file before you move to a new application. The same goes for MBSSSAM.

Question. *Ok, I have my MBSSPOP file. What next?*

You can proceed directly with sample design as shown in Sections 2.2 - 2.6. Alternatively, you may want to collect prior sample data to help with the sample plan. Or you may be interested in analyzing the sample data for its own sake.

Preparing your MBSSSAM file

Now we assume you have collected sample data. To analyze it, either for its own sake or to develop a new sample design, you must prepare your MBSSSAM file. If you want, you can use MBSS to analyze a full year of hourly load data, i.e., 8,760 hours. But you will need the batch processing methods discussed in Section 5.4.

In this section, we will assume that your application is simpler, focused on a few key demand characteristics, i.e., demands over a few key periods such as your system's peak hours. Then, of course, MBSSSAM should include the measured values of your demand variables for each customer in your sample. In addition to the demand variables you choose, MBSSSAM must include the value of your stratification variable (e.g., annual use). It may also include a class or sector variable and possibly a stratum id and case weight.

The following questions first deal with the demands, then turn to the annual use, weight, and class variables.

Question: *How many demand variables can MBSS handle?*

The limit depends on the amount of computer memory you have available and how your version of MBSS is configured. The standard version handles up to 60 variables in MBSSSAM. You will generally want to include a stratification variable such as annual use, a class variable, and perhaps a weight variable. So you will be able to analyze up to 57 demand variables at one time.

However, you can analyze as many sets of demand variables as you like. For example, MBSS is designed to analyze twenty-four hourly demands for each of several day types or for all 365 days for each of several rate classes. In practice, you might analyze the peak day and the typical summer and winter week days. You can keep each class and day type in a separate file and use the methods discussed here. But it is much easier to use a class variable to distinguish the day types as well as the classes as discussed in Section 5.4.

Question: *Are there any restrictions on how I label my variables in the sample data base?*

The main requirement is that all explanatory variables, such as annual use, be labeled identically in the sample and population data bases. Thus, in Chapter 2 annual use was labeled 26 in both MBSSSAM and MBSSPOP. Usually you will want to do the same with the weight and class variables, but this is not a requirement. Otherwise you are free to use any labels from 1 to 90. However, if you are analyzing 24-hourly demands, you will probably find it convenient to label the variables 1-24.

Variable 91 is reserved for a variable that is always equal to 1.0, primarily for use in regression models. Variable 99 is equal to the case number, useful in listing the data. These two variables are created within MBSS and can be used in both the sample and population data bases. Variable 92 is reserved for a calculated stratum identifier and variable 93 is reserved for a calculated weight.

Question. *I want to analyze hourly demands but I have fifteen-minute measurements. How do I calculate a customer's demand during a given hour?*

You have to be careful. For example your measurements may be either in kW or in kWh. If your measurements are in kW, then the demand for a particular hour is the average of the kW measurements during each 15-minute period within the hour. If your measurements are in kWh, then the demand for a particular hour is the sum of the kWh measurements during each 15-minute period within the hour. If you are in doubt, validate your calculations using a customer's billing data for the month or year. If you get it wrong you will be off by a factor of 4 or 1/4.

Question. *I can't decide whether to work with a day type such as the average August weekday or a single particular day such as the peak day in August. What do you advise?*

Your choice will depend on circumstances. But you should be aware that you may be able to obtain more reliable results for a day type than for an individual day. When the target demand is an average over several days it is likely to have less variation from account to account than the demand on a single day. This is especially true for residential and small general service accounts, less true for large commercial or industrial accounts.

Question. *I want to analyze hourly demands for a particular day type such as the average August weekday. How do I prepare the sample data?*

You should calculate the average August weekday hourly loads for each individual account in your sample. We usually use SAS to carry out this type of data preparation.

Question. *What if the customer has some missing demand measurements?*

Some companies estimate the missing measurements by analyzing the customer's pattern of use. If you have estimated values, you probably want to use them in calculating the average hourly load for the customer. Otherwise we recommend you compute the average of the available measurements. For each account, drop the days with missing data and using the remaining days to calculate the average hourly load for the customer.

Question. *What if I am analyzing a single day, such as the summer peak day, and a load research customer has some missing data for this day?*

We recommend you drop the customer from the sample for that day.

Question. *What about annual use in MBSSSAM?*

Assuming you wish to use annual use for stratification or ratio expansion, then MBSSSAM must include the annual use of each sample customer. Generally you would want this to reflect the customer's use in the year corresponding to the demands in your data. In principle, you should retrieve the customer's annual use from the billing system in the same way you created the population billing file. In practice, it is sometimes easier to calculate annual use from the load research data itself.

Question. *Can I use monthly use for expansion? How would I prepare the data?*

Yes, but you may not find it effective. You should be aware of several potential problems. First, you may have difficulty getting good measurements of monthly use for your sample accounts from your billing system due to different billing cycles, estimated readings, and other problems. You could calculate each sample account's use for the calendar month from the load data itself. But then you would face the problem of measuring the total use in the population on a comparable calendar-month basis.

Of course, your sample can only be actually stratified by a single stratification variable. So you may still want to stratify by annual use even if you use monthly use in the expansion. If you go this route, you will want your MBSSPOP file to contain information on annual use for calculating the weight variable, and on the use in each month for use in ratio expansion. You might modify the BINS.SAS job to calculate the average monthly use of the accounts falling in each bin.

After all this work, please be aware that we find that monthly use usually provides very little improvement in statistical precision beyond annual use.

Question. *Tell me about the stratum ID weight variable.*

If desired, MBSSSAM can include a stratum id and weight variable calculated from the sampling plan originally used to select the load research sample. The weight of each sample customer is based on the stratum that the customer was in at the time of sampling–the weight is the population size of the stratum divided by the final sample size of the stratum after adjusting for refusals, missing data, etc. In practice, however, we usually use MBSS to calculate the stratum ID and sample weight using the current population. See Sections 3.2 and 4.2.

Question. *I have load research data for a simple random sample. What is the easiest way to give each customer the same weight?*

When you read your sample data into MBSS, specify `0` as the weight variable. This will give each sample customer a weight of 1. Technically the weight is defined to be the population size divided by the sample size, but MBSS calculations will automatically adjust the weights for the sizes of the population and the sample. With a weight of 1, however, the sample descriptive statistics procedure will calculate the total value of the specified variable in the sample rather than the sample-based estimate of the population total.

However, you may want to calculate a new weight even with a simple random sample. This is a good way to adjust for nonresponse, missing data, etc., and help match the sample to the current population

Question. *I am trying to put together an MBSSSAM file to help develop a sample design for a new load research study. But my only prior load research data is from a rather poor sample. Is there any sense in using these data to plan the new study?*

We would rather have really good data, but it is often necessary to make do with less-than-ideal data. We have found that a prior sample–sometimes with as few as ten customers–can be helpful in planning a new project. Remember the primary purpose of the load research sample is to estimate the error ratios for demand, and hence to estimate the required sample size. Even a small sample can give you a general idea how much variation you are dealing with. But a small sample will usually work better for a day type than for a single day due to the reduced variation achieved by averaging demands across several days.

Question. *I do not have a prior load research sample, but I do have a number of large customers that are billed from load research-type meters. Can I use these customers to build a MBSSSAM file for planning a sample?*

Even these data may be better than none. Of course you should regard the results with caution, but they may be adequate for an initial sampling plan. Remember the worse that can happen is that your sample may be too large or too small. Regardless, your final results–based on your new, real sample–will be unbiased estimates of the population characteristics. And when you have these new data you will be in a good position to develop more accurate plans for future projects.

Question: *I have end-use-metered data. How should I arrange my MBSSSAM file?*

With conventional load research data, we usually set up MBSSSAM to have 24 hourly measurements in each record or line of data. Different records are used for the different accounts in the sample. Then we usually label the variables 1-24 so that it is easy to read the results of the analysis.

By contrast with end use metered data, we usually have hourly measurements for one or more end uses plus the total load. We often create an additional variable, called the residual load, as the difference between the total load and the sum of the measured end uses. So we end up with the following variables: the total load, each of the measured end use loads, and the residual load.

In this case, we often arrange the data in MBSSSAM so that each record or line of data provides the measured values of these variables for a single particular hour. Different records are used for the different accounts in the sample. Then variable 1 denotes the total load, variable 2 the first end use, etc.

Question: *Another question about end-use-metered data. With the approach you have just described, I can provide all of the end use data for a single hour. But what do I do if I am interested in more than one hour?*

Use the 'period' part of the class variable to identify each hour. For example, if you are analyzing 8760-hour data, the period would take values from 0001 to 8760. If you were analyzing 24-hour data for each of 24 day types, the period would take values from 001 to 576. The class variable is discussed in depth in Section 5.4.

Question: *Using MBSSSAM sounds good but I am under a tight time constraint. I have to draw my sample and start the field work very soon and I do not have time for much data preparation. So I need to develop my sample design as quickly as possible.*

Then forget the MBSSSAM file. Prepare your MBSSPOP file as described in Section 6.2 and then estimate your error ratio as discussed in Sections 1.4 and 2.5. Finally develop your sample design as shown in Section 2.6.

Running MBSS – Fortran with the supplied database

To run MBSS-Fortran, simply right-click on the MBSS Fortran icon and choose Properties. In 'Start-in', enter in the directory path for the MBSSPOP and MBSSSAM files provided. Press OK and start MBSS-Fortran by clicking on the icon. Once the program is running, simply choose options 6, then option 1 then option 2. Your results files will be outputted in the same directory as your MBSSPOP and MBSSSAM files.

Energy Results

The energy results generated by each set of pop, sam, and cmd files are described below.

npbar	Non-participant as-built savings results by building type
npbarU	Non-participant as-built savings results by building type and utility
partall	Participant as-built savings results, all runs, whole building savings for performance projects not disaggregated into end uses
partallU	Participant as-built savings results by utility, all runs, whole building savings for performance projects not disaggregated into end uses
partmo	Participant as-built savings results, measures only, whole building savings for performance projects not disaggregated into end uses
partmoU	Participant as-built savings results by utility, measures only, whole building savings for performance projects not disaggregated into end uses
partallbar	Participant as-built savings results, all runs, whole building savings for performance projects disaggregated into end uses
partallbarU	Participant as-built savings results by utility, all runs, whole building savings for performance projects disaggregated into end uses
partallbarBLDG	Participant as-built savings results by building type, all runs, whole building savings for performance projects disaggregated into end uses
partallbarBLDGU	Participant as-built savings results by utility and building type, all runs, whole building savings for performance

	projects disaggregated into end uses

Table 65: Energy Results - Gross Savings Result

freeall	Participant net savings results, all runs, whole building savings for performance projects *not* disaggregated into end uses
freeallbar	Participant net savings results, all runs, whole building savings for performance projects disaggregated into end uses
freeallbarBLDG	Participant net savings results by building type, all runs, whole building savings for performance projects disaggregated into end uses
freeallbarU	Participant net savings results by utility, all runs, whole building savings for performance projects disaggregated into end uses
freemo	Participant net savings results, measures only, whole building savings for performance projects *not* disaggregated into end uses
freemoBLDG	Participant net savings results by building type, measures only, whole building savings for performance projects *not* disaggregated into end uses
freemoU	Participant net savings results by utility, measures only, whole building savings for performance projects *not* disaggregated into end uses
spillDofD	Non-participant spillover results by building type, differences-of-differences + spillover adjustment methodology
spillDofDU	Non-participant spillover results by building type and utility, differences-of-differences + spillover adjustment methodology
spillSR	Non-participant spillover results by building type, self-report methodology
spillSRU	Non-participant spillover results by building type and utility, self-report methodology

Table 66: Energy Results - Net Savings

Demand Results

The demand results generated by each set of pop, sam, and cmd files are described below.

npbar	Non-participant as-built savings results by building type
npbarU	Non-participant as-built savings results by building type and utility
partall	Participant as-built savings results, all runs, whole building savings for performance projects *not* disaggregated into end uses
partallU	Participant as-built savings results by utility, all runs, whole building savings for performance projects *not* disaggregated into end uses
partmo	Participant as-built savings results, measures only, whole building savings for performance projects *not* disaggregated into end uses
partmoU	Participant as-built savings results by utility, measures only, whole building savings for performance projects *not* disaggregated into end uses
partallbar	Participant as-built savings results, all runs, whole building savings for performance projects disaggregated into end uses
partallbarU	Participant as-built savings results by utility, all runs, whole building savings for performance projects disaggregated into end uses
partallbarBLDG	Participant as-built savings results by building type, all runs, whole building savings for performance projects disaggregated into end uses

Table 67: Demand Results – Gross Savings

freeall	Participant net savings results, all runs, whole building savings for performance projects *not* disaggregated into end uses
freeallbar	Participant net savings results, all runs, whole building savings for performance projects disaggregated into end uses
freeallbarBLDG	Participant net savings results by building type, all runs, whole building savings for performance projects disaggregated into end uses
freeallbarU	Participant net savings results by utility, all runs, whole building savings for performance projects disaggregated into end uses
freemo	Participant net savings results, measures only, whole building savings for performance projects *not* disaggregated into end uses
freemoBLDG	Participant net savings results by building type, measures

	only, whole building savings for performance projects *not* disaggregated into end uses
freemoU	Participant net savings results by utility, measures only, whole building savings for performance projects *not* disaggregated into end uses
spillDofD	Non-participant spillover results by building type, differences-of-differences + spillover adjustment methodology
spillDofDU	Non-participant spillover results by building type and utility, differences-of-differences + spillover adjustment methodology
spillSR	Non-participant spillover results by building type, self-report methodology
spillSRU	Non-participant spillover results by building type and utility, self-report methodology

Table 68: Demand Results – Net Savings

Survey Instruments

Onsite Survey

Site ID # [ ]

Surveyor Name: Building Name:

Date: Primary Contact: Phone:

Building Address:

City Zip

Start Time: Finish Time:

Interview Questions

The following interview questions will be used to help us identify unobservable aspects of your building. These aspects include occupancy history, schedules, and heating and cooling controls. Answers to these questions will be coupled with data collected from our walk-through audit to produce a computer model which simulates the annual energy use of the building.

Building Overview

Q1. What is the overall building floor area? _____SF

Q2. How many floors? _____

Q3. What is the floor area of the new construction?

- ❑ same as overall building floor area
- ❑ _____SF

Q4. Characterize the site by circling the appropriate description:

1. New building ("green field")
2. Alteration of existing building

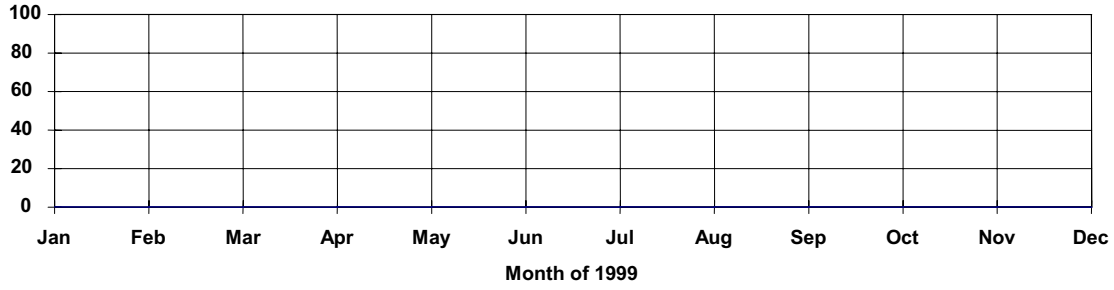
3. Addition to existing building
4. Alteration of existing building and addition to existing building

Q5. Circle the appropriate building type description:

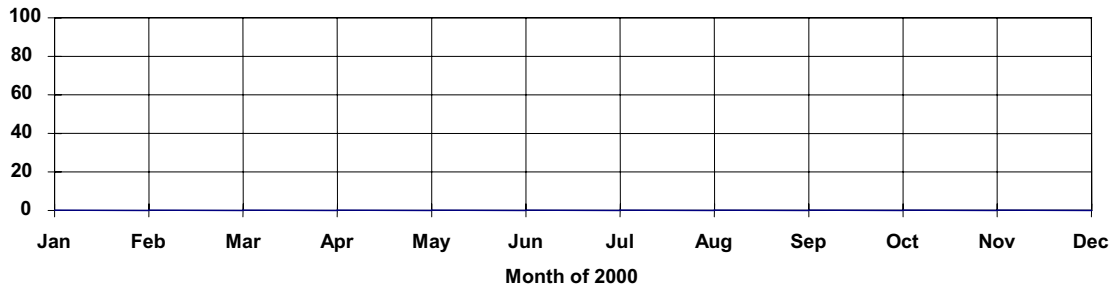
Q10.	Small office	11. Hotel
Q11.	Large office	12. Small school
Q12.	Small retail	13. Large school
Q13.	Multi-story large retail	14. Community college
Q14.	Single story large	15. Large university
Q15.	Grocery	16. Assembly
Q16.	Quick service	17. Hospital
Q17.	Full-service restaurant	18. Lt. Manufacturing
Q18.	Conditioned	19. Bio/Tech Manufacturing
Q19.	Uncond. warehouse	

Building Start-up

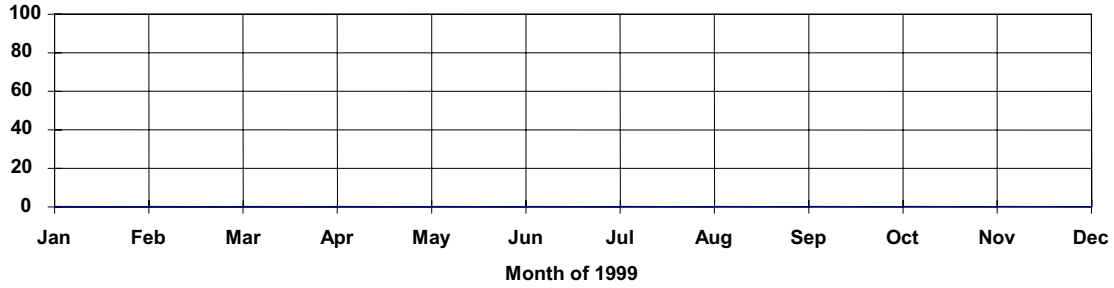
Q6. Draw a line that indicates the percentage of the ***new construction*** that was occupied (% of floor area) for 1999.



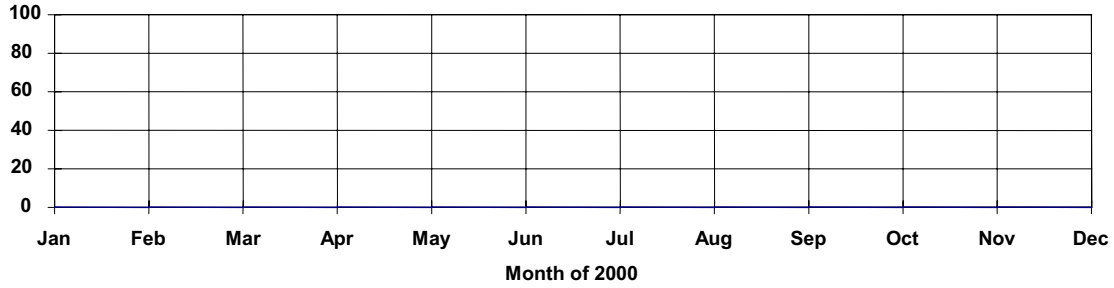
Q7. Draw a line that indicates the percentage of the ***new construction*** that was occupied (% of floor area) for 2000.



Q8. Draw a line that indicates the percentage of the ***new construction*** that was conditioned (% of floor area) during 1999.



Q9. Draw a line that indicates the percentage of the ***new construction*** that was conditioned (% of floor area) during 2000.



Building Areas

Q10. How many individual tenants (businesses) occupy this building? _____

Q11. Do the majority of tenants have their own electric meter? Y N

Q12. Which statement best describes the operation of the building?

( ) The entire building operates on *basically* the same schedule

( ) There are areas of the building (departments, tenants, etc.) that have *substantially* different operating schedules

Q13. If different areas of the building (departments, tenants, etc.) have *substantially* different operational schedules, divide the building into up to five areas with differing schedules, and provide a name for each area:

1. _____

2. _____

3. _____

4. _____

5. _____

Notes:

❑ **Building-Wide** **- or -**	**Area #___ and Area Name_____**
(fill out only one page)	(fill out one page per area)

Schedules

The following questions will help us establish schedules for the building.

Q14. What would be the best way to group the days of the week to describe the operation of this area? One of the three operation levels must be assigned to each day of the week.

	M	Tu	W	Th	F	Sa	Su	Holiday
Full operation:	❑	❑	❑	❑	❑	❑	❑	❑
Light operation:	❑	❑	❑	❑	❑	❑	❑	❑
Closed:	❑	❑	❑	❑	❑	❑	❑	❑

Q15. Are there any months that this area has higher or lower than normal operating hours? Indicate months of increased or decreased operating hours. Normal (100%) is assumed for blank entries.

	Lighting	HVAC	Equip and Process
	% of Normal	% of Normal	% of Normal
Jan	____%	____%	____%
Feb	____%	____%	____%
Mar	____%	____%	____%
Apr	____%	____%	____%
May	____%	____%	____%
Jun	____%	____%	____%
Jul	____%	____%	____%
Aug	____%	____%	____%
Sep	____%	____%	____%
Oct	____%	____%	____%
Nov	____%	____%	____%
Dec	____%	____%	____%

Q16. Which holidays are observed (check all that apply)

❑ New Years day ❑ MLK day ❑ Presidents' day ❑ Easter_____ days

❑ Memorial day ❑ July 4th ❑ Labor day ❑ Columbus day

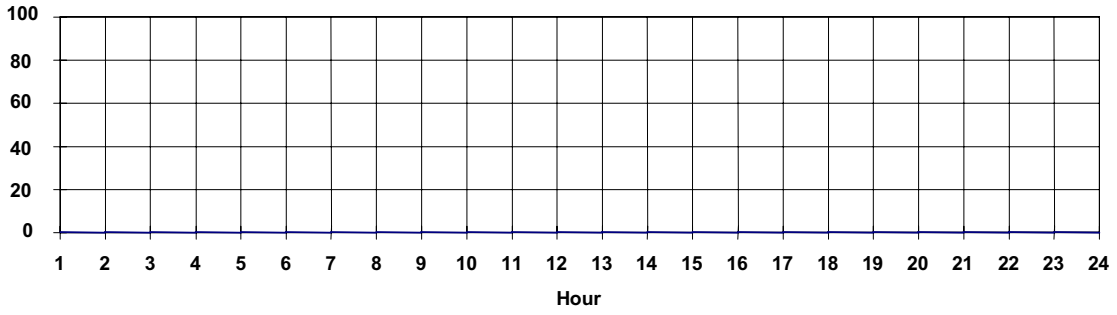
❑ Veteran's day ❑ Thanksgiving ____ days ❑Christmas_____days

Note: Holidays for 2000

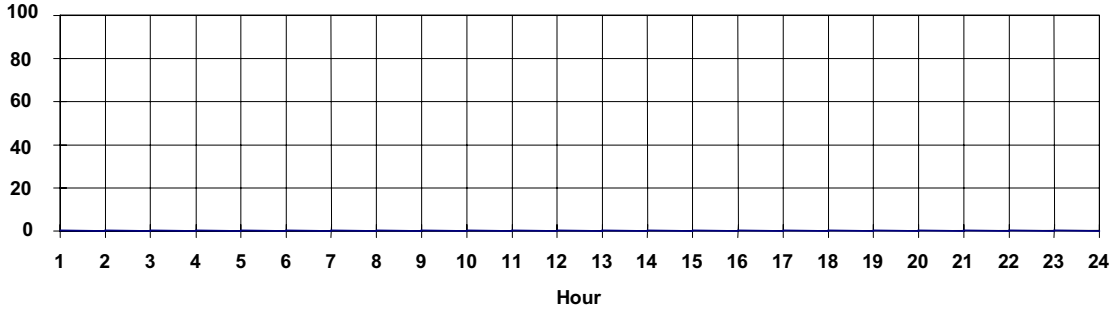
Holiday	Day/Date	Holiday	Day/Date
New Years day	Sat Jan 1	Labor day	Mon Sep 4
MLK day	Mon Jan 17	Columbus day	Mon Oct 9
Presidents' day	Mon Feb 21	Veteran's day	Sat Nov 11
Easter	Sun Apr 23	Thanksgiving	Thur Nov 23
Memorial day	Mon May 29	Christmas	Mon Dec 25
July 4th	Tue Jul 4		

❑ **Building-Wide** **- or -**	**Area #___ and Area Name_____**
(fill out only one page)	(fill out one page per area)

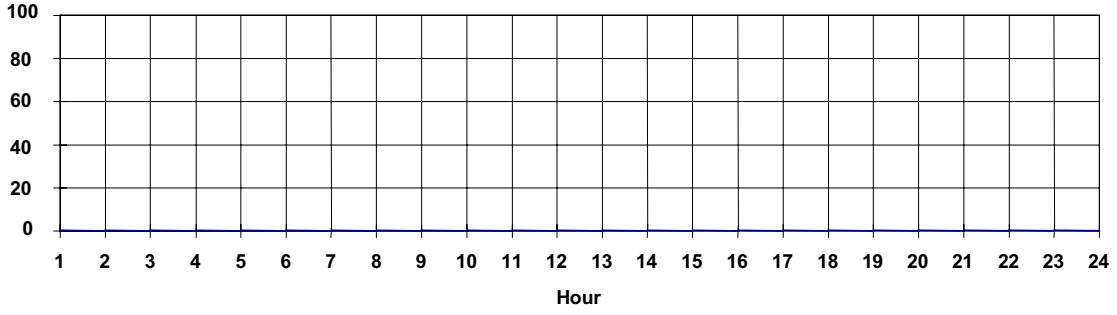
Q17. Draw a line that describes the ***occupancy*** schedule for a ***full operation day***.



Q18. Draw a line that describes the ***occupancy*** schedule for a ***light operation day***.

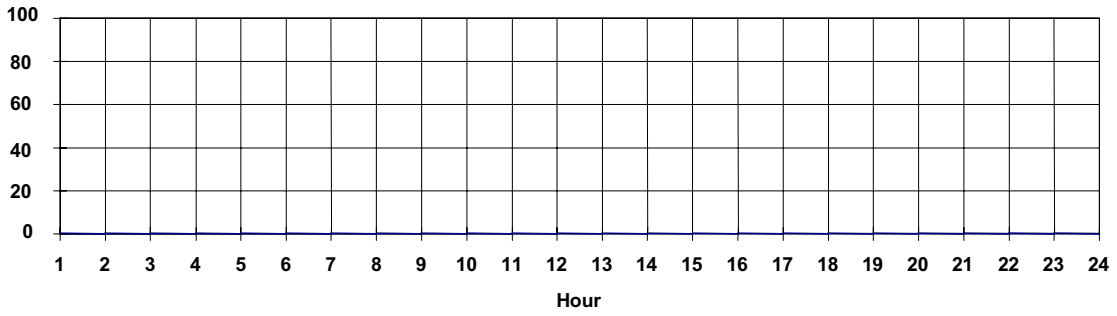


Q19. Draw a line that describes the ***occupancy*** schedule for a ***closed operation day***.

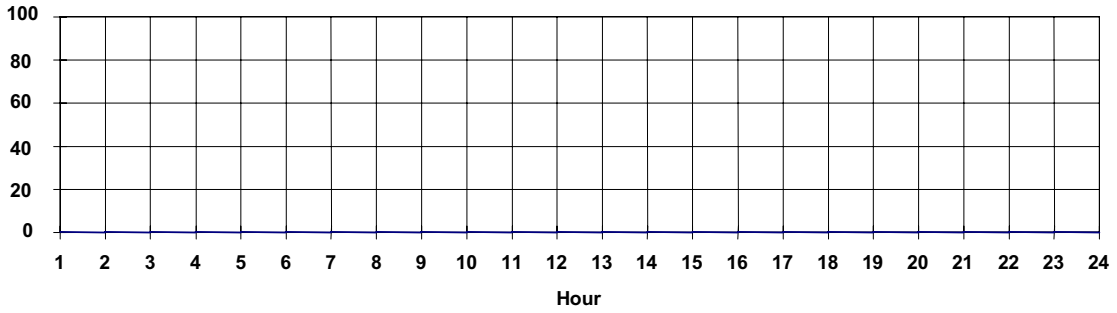


❑ **Building-Wide** **- or -**	**Area #___ and Area Name_____**
(fill out only one page)	(fill out one page per area)

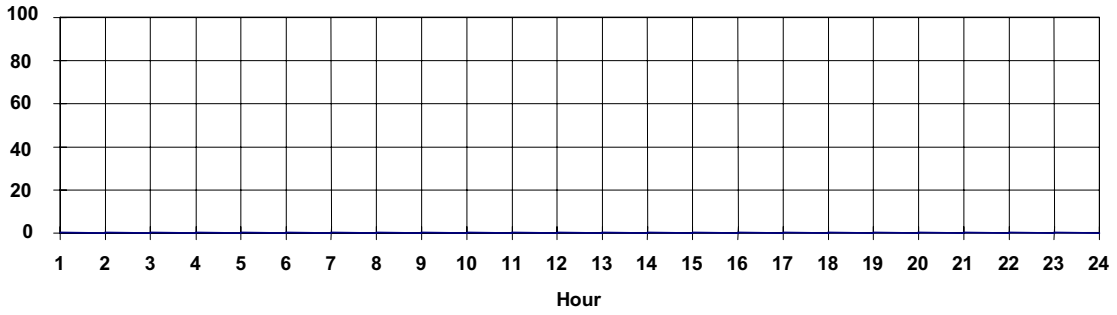
Q20. Draw a line that describes the schedule of use for ***interior lighting*** for a ***full operation day***.



Q21. Draw a line that describes the schedule of use for ***interior lighting*** for a ***light operation day***.



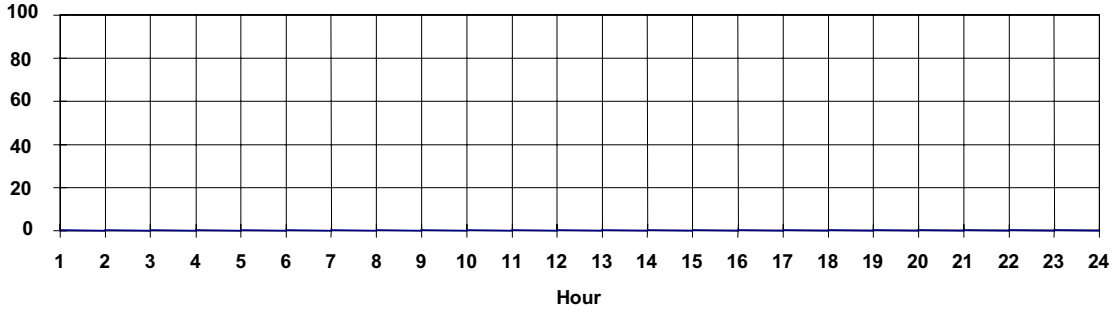
Q22. Draw a line that describes the schedule of use for ***interior lighting*** for a ***closed operation day***.



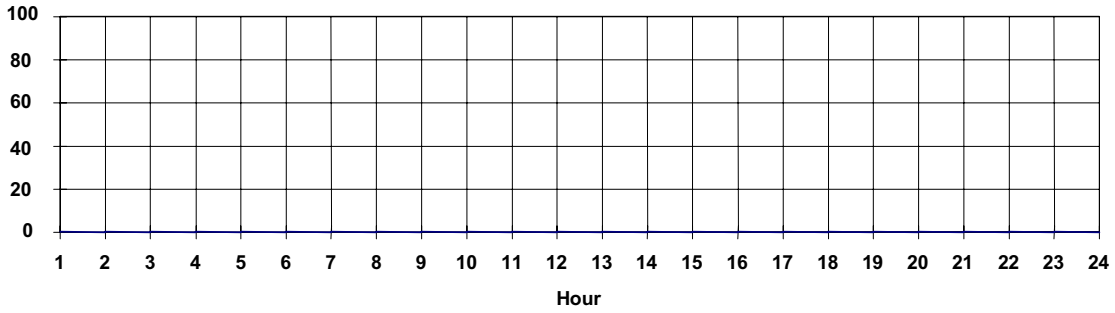
❑ **Building-Wide** **- or -**	**Area #___ and Area Name _____**
(fill out only one page)	(fill out one page per area)

Miscellaneous equipment and plug loads refer to any electrical equipment located in the conditioned space which is not lighting or HVAC

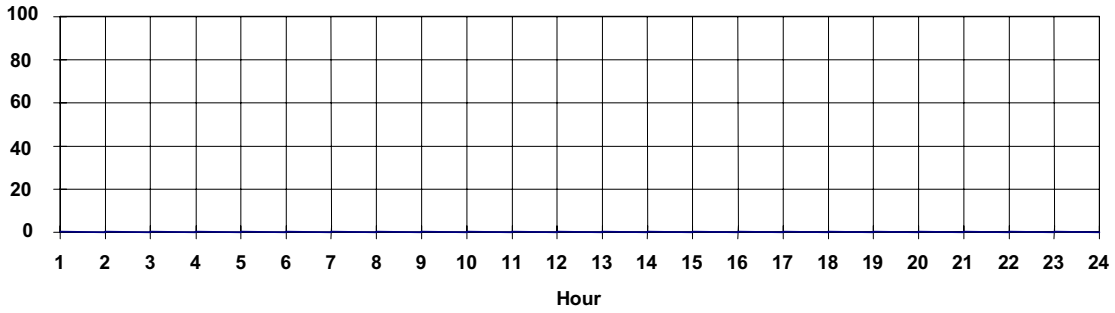
Q23. Draw a line that describes the schedule of use for ***miscellaneous equipment and plug loads*** for a ***full operation day***.



Q24. Draw a line that describes the schedule of use for ***miscellaneous equipment and plug loads*** for a ***light operation day***.



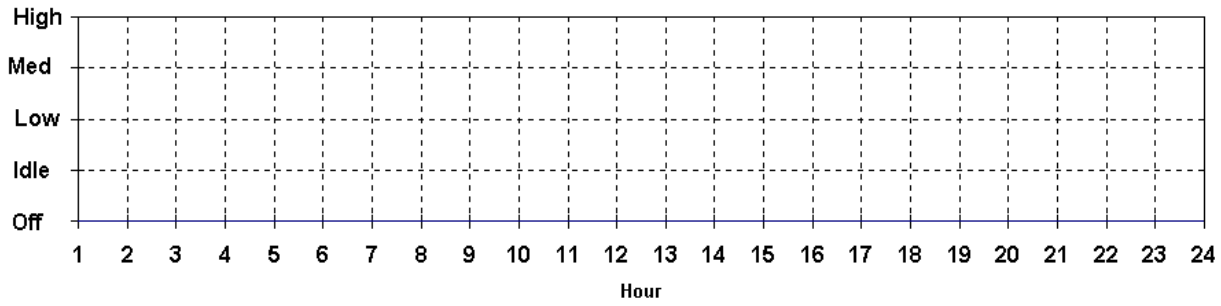
Q25. Draw a line that describes the schedule of use for ***miscellaneous equipment and plug loads*** for a ***closed operation day***.


100
80
60
40
20
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Hour

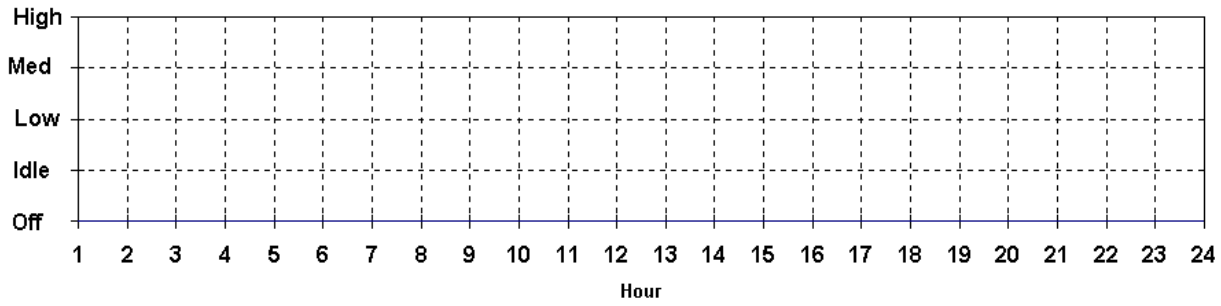
❑ **Building-Wide** **- or -**	**Area #___ and Area Name_____**
(fill out only one page)	(fill out one page per area)

Kitchen Operation

Q26. If the area has a commercial kitchen, draw a line that describes the schedule of use for ***kitchen equipment*** for a ***full operation day***.



Q27. If the area has a commercial kitchen, draw a line that describes the schedule of use for ***kitchen equipment*** for a ***light operation day***.



❑ **Building-Wide** **- or -**	**Area #___ and Area Name_____**
(fill out only one page)	(fill out one page per area)

Room Thermostat Setpoints

Q28. Enter the values for heating and cooling thermostat setpoints during normal (occupied) and setback (unoccupied) periods

Period	**Heating Setpoint**	**Cooling Setpoint**
Occupied		
Unoccupied		

Set CSP to 99 for "off," set the HSP to 45 for "off"

Q29. Are room temperatures in this area controlled by the building EMS? Y N DK

Q30. Does the setback schedule in this area follow the fan on/off schedule? Y N DK

If the answer is N or DK, define the setback schedule below:

Q31. Draw a line that defines the occupied and unoccupied mode for a ***full operation day***. DK

Occupied																								
Unoccupied																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

Q32. Draw a line that defines the occupied and unoccupied mode for a ***light operation day***. DK

Occupied																								
Unoccupied																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

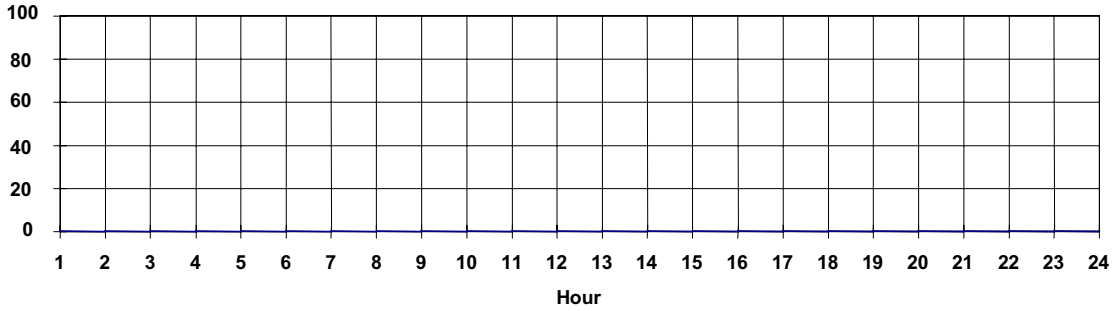
Q33. Draw a line that defines the occupied and unoccupied mode for a ***closed operation day***.
DK

Occupied																								
Unoccupied																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

Exterior Lighting

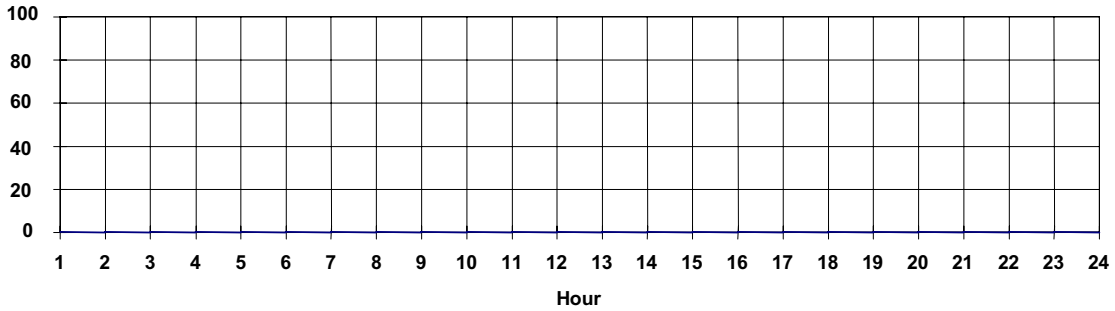
Q34. How are the exterior lights controlled? ❑ Time clock ❑ Photocell ❑ DK

Q35. If the exterior lights are controlled with a time clock, draw a line that describes the schedule

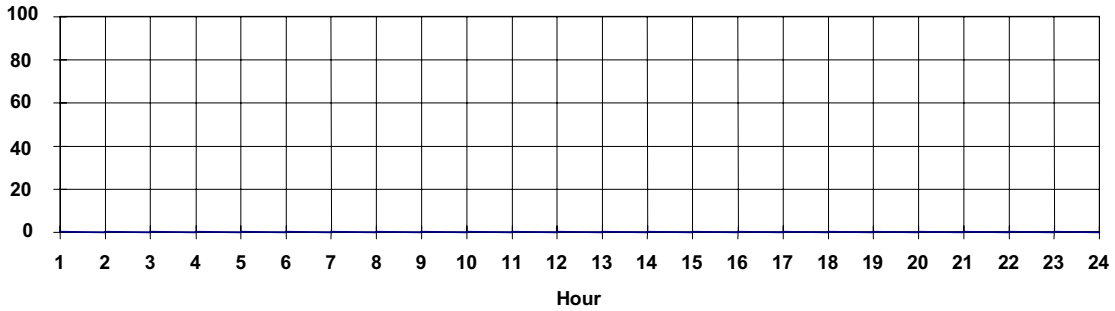


Exterior Miscellaneous Equipment

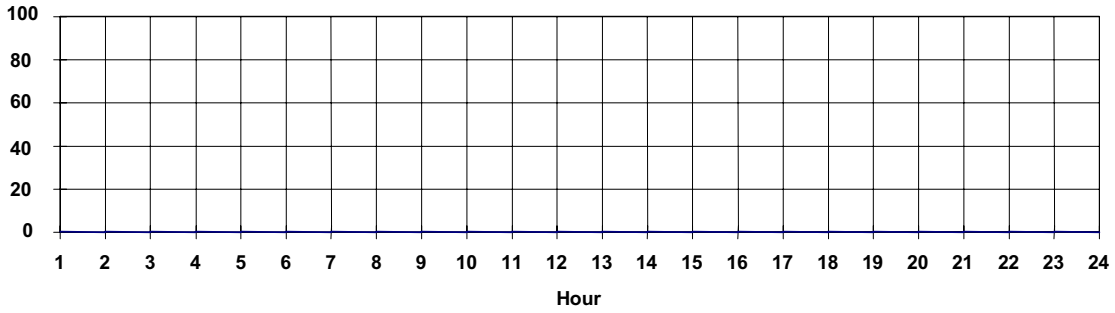
Q36. Provide a schedule for miscellaneous equipment ***not*** in the conditioned space for a ***full operation day***



Q37. Provide a schedule for miscellaneous equipment ***not*** in the conditioned space for a ***partial operation day***



Q38. Provide a schedule for miscellaneous equipment ***not*** in the conditioned space for a ***closed operation day***


100
80
60
40
20
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Hour

Central HVAC Design and Control

The following questions will help us to understand how the HVAC systems operate in the building. (These questions are designed to be answered by someone familiar with the operation of the building mechanical and control systems.)

Q39. Does the building have a central energy management system (EMS)? Y N DK

Q40. If the answer above is yes, did you receive a rebate from your utility company to cover any part of the cost of the EMS? Y N DK

In each question below, indicate if the control action specified is initiated by the central EMS.

Q41. What is the minimum cooling supply air temperature setpoint _____°F DK

Q42. How is the supply air temperature controlled?

- ❑ EMS?
- ❑ Fixed
- ❑ Reset based on outside air temp
- ❑ Reset based on zone temp
- ❑ DK

Q43. What is the condenser water setpoint temperature? _____°F DK

Q44. How is the condenser water setpoint temperature controlled?

- ❑ EMS?
- ❑ Fixed
- ❑ Reset based on outside temp
- ❑ DK

Q45. If the system is VAV, how is the flow rate determined?

- ❑ EMS?
- ❑ Duct static pressure
- ❑ Measured air flow at the zone VAV boxes
- ❑ DK

Q46. Are CO_2 sensors used to control outdoor air quantities? Y N DK ❑ EMS?

Q47. Does the system utilize a humidistat to maintain space humidity? Y N DK ❑ EMS?

Q48. If yes, indicate minimum and maximum relative humidity:

Min RH(%)_____ Max RH(%)_____

Q49. Is the heating system turned off (locked out) on a seasonal basis? Y N DK

Q50. If yes, indicate the months when the heating system is typically available:

J F M A M J J A S O N D DK

Q51. If the building has chillers and cooling towers, is the system equipped with a water-side economizer? Y N DK

Q52. If yes, what type of water-side economizer is used?

❑ Strainer cycle ❑ Thermosyphon ❑ Plate-frame heat exchanger ❑ DK

Q53. Circle the months of the year when the water-side economizer system is typically used:

J F M A M J J A S O N D DK

HVAC Fan System Operation

This section is used to establish the fan system schedule. List the hours that the fans are "on" or "off." "On" indicates occupied mode, where the fans run continuously. "Off" indicates unoccupied mode, where the fans cycle on only if needed to satisfy space temperature needs, or are shut off regardless of space temperature..

Q54. Draw a line that describes the fan system operation for a ***full operation day***:

On																								
Off																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

Q55. Draw a line that describes the fan system operation for a ***light operation day***. DK

On																								
Off																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

Q56. Draw a line that describes the fan system operation for a ***closed operation day***. DK

On																								
Off																								
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

Q57. Is the fan system described above controlled by the building EMS? Y N DK

Q58. Is the fan system described above controlled using an optimum start algorithm?

Y N DK

Note: For fans with optimal start/stop, indicate the building occupancy schedule - e.g. the time when the building needs to be at normal operating temperature.

Q59. List the nighttime (off cycle) control strategy for the fan system described above:

❑ Stay off regardless of room temperature

❑ Cycle on if any room requires heating or cooling

❑ DK

List all air handling units, building areas, and/or packaged HVAC systems that run on this schedule below:

Refrigeration System

Q60. Does the building have a refrigeration system with remote condensers? Y N DK

If no or DK, skip the remaining questions pertaining to refrigeration systems.

Q61. What refrigerants are used in each circuit of the system?

a. Low temp (Ice cream) R-_____ DK

b. Med temp (Frozen food) R-_____ DK

c. High temp (All others) R-_____ DK

Q62. What is the minimum condensing temperature setpoint? _____°F, DK

Q63. What is condenser fan control strategy? ❑ Fixed temp ❑ wet bulb offset ____°F DK

Q64. For each circuit temperature, what type of defrost cycle and defrost control are typically used?

a. Low temp (Ice cream) defrost	❑ electric	❑ hot gas	❑ time off	❑ DK
defrost control	❑ time clock	❑ demand	❑ DK	
b. Med temp (Frozen food) defrost	❑ electric	❑ hot gas	❑ time off	❑ DK
defrost control	❑ time clock	❑ demand	❑ DK	
c. High temp (All others) defrost	❑ electric	❑ hot gas	❑ time off	❑ DK
defrost control	❑ time clock	❑ demand	❑ DK	

Q65. Are the anti-sweat heaters controlled on store humdity? Y N DK

Q66. If Q56 is yes, list setpoints: RH off _____ % RH on_____ % DK

Q67. List the name and phone number of the refrigeration system service company

Name:_____ Phone:_____

Shades and Blinds

Q68. If there are shades or blinds on windows, which ***best*** describes their general use?

- ❑ Always open
- ❑ Always closed
- ❑ Operated by occupants to control comfort
- ❑ Open when space is occupied, closed otherwise

Swimming Pools

Q69. If the building has a heated swimming pool, what water temperature is maintained? _____°F DK

Q70. If the building has a heated swimming pool, is a pool cover used? Y N DK

Q71. If a cover is used, at what time is it normally put on the pool? _____ (military time, blank if DK)

Q72. If a cover is used, at what time is it normally removed from the pool? _____ (military time)

Spas

Q73. If the building has a spa, what water temperature is maintained? _____°F DK

Q74. If the building has a spa, is a cover used? Y N DK

Q75. If a cover is used, at what time is it normally put on the spa? _____ (military time, blank if DK)

Q76. If a cover is used, at what time is it normally removed from the spa? _____ (military time)

Building-Wide Power Generation

Q77. Do you have an emergency back-up generator or cogeneration system? Y N DK

If yes, fill out the supplemental on-site power form

Thermal Energy Storage

Q78. Does the building have a thermal energy storage (TES) system? Y N DK

If yes, fill out the supplemental TES form.

Operations and Maintenance

Q79. Please list any equipment or system operating problems that cause thermal discomfort or excessive energy consumption?

Problem	Equipment and/or Systems Affected
System under or oversized	
Insufficient or excess air flow	
Faulty control sensors	
Improper control sensor installation or location	
Insufficient sensor points for control and/or monitoring	
Improper EMS or control system programming	
Control systems “locked out” (left in manual position)	
Faulty valve or damper linkage or actuator	
Loose fan belts and / or improper alignment	
Improper ductwork installation or leakage	
Leaky valves, pipes, or fittings	
Defective major components (compressors, pumps, fans, etc.)	
Refrigerant leakage	
Fouled evaporative cooler media	
Water treatment problems (corrosion or bacterial growth)	

Other (list)

Code	Equipment/system
1	Air distribution
2	Boiler
3	Chilled water
4	Chillers
5	Condenser water

Code	Equipment/system
6	Cooling towers
7	Daylight control(s)
8	Fans
9	Hot water
10	HVAC

Code	Equipment/system
11	Lighting
12	Occupancy sensor(s)
13	VSDs
14	Other

Built-Up HVAC Systems (Do not enter backup or stand-by equipment)

Chillers/ Large Split DX

❑ Serves more than the surveyed area

	CH-	CH-	CH-
Equipment Name	❑ old? ❑ M?	❑ old? ❑ M?	❑ old? ❑ M?
Location			
Quantity			
Manufacturer			
Model Number			
Serial Number			
Size (tons)			
Chiller Type			
Full-load efficiency	kW/ton COP	kW/ton COP	kW/ton COP
Condenser Type	Air / Water	Air / Water	Air / Water
Air-Cooled Cond. Fan hp			

Enter condenser fan hp only if not included in equipment efficiency rating

Chiiller type: 1=recip; 2=screw/scroll; 3=cent; 4=sngl eff absorp; 5=dbl eff ind fired absorp; 6=dbl eff dir fired absorp; 7=gas eng

Towers/ Evaporative Condensers

	T-	T-	T-
Equipment Name	❑ old? ❑ M?	❑ old? ❑ M?	❑ old? ❑ M?
Location			
Quantity			
Manufacturer			
Model Number			
Rated Capacity (kBtuh)			
Out WB Temp @ rating			
Lv Cond Temp @ rating			

Fan Control	1-Sp / 2-Sp / ❑ M? Pony / VSD	1-Sp / 2-Sp / ❑ M? Pony / VSD	1-Sp / 2-Sp / ❑ M? Pony / VSD
Large Fan hp			
Large Fan motor efficiency	❑ M?	❑ M?	❑ M?
Small fan hp			
Small fan motor efficiency	❑ M?	❑ M?	❑ M?
Spray Pump hp			
Spray Pump motor effic.	❑ M?	❑ M?	❑ M?

If one fan motor per tower or cell, enter size and efficiency under "Large fan." If two motors, indicate size and efficiency of both motors.

Built-Up HVAC Systems (cont.) (Do not enter backup or stand-by equipment)

Heating System

	HS-	HS-	HS-
Equipment Name	❑ old? ❑ M?	❑ old? ❑ M?	❑ old? ❑ M?
Location			
Quantity			
Capacity	KW / kBtuh	KW / kBtuh	KW / kBtuh
Type	Steam / HW / Duct Htr	Steam / HW / Duct Htr	Steam / HW / Duct Htr
Fuel	Electric / Other	Electric / Other	Electric / Other
Efficiency (%)			

Pumps

Pump	Name	Old Const?	HP	Motor effic %	M?	Control	M?	EMS?	Location	Loop	Use
P-		❑			❑	CV / VSD	❑	❑		CHW / Cond / HW	Pri / Sec
P-		❑			❑	CV / VSD	❑	❑		CHW / Cond / HW	Pri / Sec
P-		❑			❑	CV / VSD	❑	❑		CHW / Cond / HW	Pri / Sec
P-		❑			❑	CV / VSD	❑	❑		CHW / Cond / HW	Pri / Sec
P-		❑			❑	CV / VSD	❑	❑		CHW / Cond / HW	Pri / Sec
P-		❑			❑	CV / VSD	❑	❑		CHW / Cond / HW	Pri / Sec
P-		❑			❑	CV / VSD	❑	❑		CHW / Cond / HW	Pri / Sec
P-		❑			❑	CV / VSD	❑	❑		CHW / Cond / HW	Pri / Sec
P-		❑			❑	CV / VSD	❑	❑		CHW / Cond / HW	Pri / Sec
P-		❑			❑	CV / VSD	❑	❑		CHW / Cond / HW	Pri / Sec

Built-Up HVAC Systems (cont.) (Do not enter backup or stand-by equipment)

Central Air Handlers

Name	AH-	AH-	AH-
Equipment Name	❑ old? ❑ M?	❑ old? ❑ M?	❑ old? ❑ M?
Location			
Quantity			
Type (circle one)	Single Duct Dual Duct Multi-Zone	Single Duct Dual Duct Multi-Zone	Single Duct Dual Duct Multi-Zone
Evaporative System Type (circle one)	None / Direct ❑M? Ind / Ind-Dir	None / Direct ❑M? Ind / Ind-Dir	None / Direct ❑M? Ind / Ind-Dir
Supply Fan Type (circle one)	CV / VAV	CV / VAV	CV / VAV
Supply Fan Control (circle one)	CV: Constant / Cycles VAV: VSD / ❑M? Inlet / Discharge	CV: Constant / Cycles VAV: VSD / ❑M? Inlet / Discharge	CV: Constant / Cycles VAV: VSD / ❑M? Inlet / Discharge
EMS control of supply fan?	❑	❑	❑
Supply Fan Flow Rate (cfm)			
Supply Fan Motor HP			
motor efficiency	❑M?	❑M?	❑M?
Return/ Relief Fan HP			
motor efficiency	❑M?	❑M?	❑M?
OA Control (circle one)	Fixed / Temp / ❑M? Enthal	Fixed / Temp / ❑M? Enthal	Fixed / Temp / ❑M? Enthal
EMS control of OA?	❑	❑	❑
Min OA Fraction			

Packaged HVAC Systems

	AC-	AC-	AC-
Equipment Name	❑ old?	❑ old?	❑ old?
Location			
Quantity			
Type Code			
Manufacturer			
Model No. (outdoor - all)			
Model No (indoor if split)			
Cooling Capacity (ton)			
Cooling Efficiency (circle units)	EER ❑M? SEER	EER ❑M? SEER	EER ❑M? SEER
Supply CFM			
Heating Fuel (circle one)	Elec / Other	Elec / Other	Elec / Other
Heating Capacity (kBtuh) (heating capacity for heat pumps is for compressor only)			
Heating Efficiency (circle COP or HSPF for heat pumps, AFUE for gas heat)	COP ❑M? HSPF AFUE	COP ❑M? HSPF AFUE	COP ❑M? HSPF AFUE
Condenser Type (circle one)	Dry Coil / Evap. Cond. ❑M? Pad pre-cooler	Dry Coil / Evap. Cond. ❑M? Pad pre-cooler	Dry Coil / Evap. Cond. ❑M? Pad pre-cooler
Evaporative System Type (circle one)	None / Direct ❑M? Ind / Ind-Dir	None / Direct ❑M? Ind / Ind-Dir	None / Direct ❑M? Ind / Ind-Dir
System Type (circle one)	CV / VAV	CV / VAV	CV / VAV
Supply Fan Control (circle one)	CV: Constant / Cycles VAV: VSD / ❑M? Inlet / Discharge	CV: Constant / Cycles VAV: VSD / ❑M? Inlet / Discharge	CV: Constant / Cycles VAV: VSD / ❑M? Inlet / Discharge
EMS control of Supply Fan?	❑	❑	❑
Supply Fan HP			
Return/Relief Fan HP			
OA Control	Fixed / Temp ❑M? Enthal	Fixed / Temp ❑M? Enthal	Fixed / Temp ❑M? Enthal
EMS control of OA?	❑	❑	❑
Min OA Fraction			

Type Code	Description	Type Code	Description	Type Code	Description
1	Single Package Rooftop AC	5	PTAC	9	Water Loop Heat Pump
2	Single Package Rooftop Heat Pump	6	PTHP	10	Dual Fuel Heat Pump
3	Split System AC	7	Window/Wall AC Unit	11	Evaporative System
4	Split System Heat Pump	8	Window/Wall HP		

Ducts

System	Location	Avg. Dia or L x W (in)	Lineal Ft	Construction	R-Value	Notes
	❑ Plenum ❑ Outside			❑ Sheet Metal ❑ Flex ❑ Fiberglass ❑ Duct Board		
	❑ Plenum ❑ Outside			❑ Sheet Metal ❑ Flex ❑ Fiberglass ❑ Duct Board		
	❑ Plenum ❑ Outside			❑ Sheet Metal ❑ Flex ❑ Fiberglass ❑ Duct Board		
	❑ Plenum ❑ Outside			❑ Sheet Metal ❑ Flex ❑ Fiberglass ❑ Duct Board		
	❑ Plenum ❑ Outside			❑ Sheet Metal ❑ Flex ❑ Fiberglass ❑ Duct Board		
	❑ Plenum ❑ Outside			❑ Sheet Metal ❑ Flex ❑ Fiberglass ❑ Duct Board		
	❑ Plenum ❑ Outside			❑ Sheet Metal ❑ Flex ❑ Fiberglass ❑ Duct Board		
	❑ Plenum ❑ Outside			❑ Sheet Metal ❑ Flex ❑ Fiberglass ❑ Duct Board		
	❑ Plenum ❑ Outside			❑ Sheet Metal ❑ Flex ❑ Fiberglass ❑ Duct Board		

Zone _____

Name ____________________ Zone Multiplier _______ HVAC zoning by exposure? Y N

Exterior Walls

Assembly Name	Old Const?	Type Code	Insul R or U-value	HC	M?	Orientation (N, NE, E, ,NW)	H (ft)	W (ft)
	❑		R U		❑			
	❑		R U		❑			
	❑		R U		❑			
	❑		R U		❑			
	❑		R U		❑			
	❑		R U		❑			
	❑		R U		❑			
	❑		R U		❑			
	❑		R U		❑			

Height and width are gross dimensions, including windows

Enter “0” for R-value if uninsulated, leave blank if unknown

	Wall Construction Type
1	Face Brick + Brick
2	Face Brick + Poured Concrete
3	Face Brick + Concrete Block

	Wall Construction Type
4	Poured Concrete + Finish
5	Concrete Block + Finish
6	Wood Frame Wall

	Wall Construction Type
7	Metal Frame Wall
8	Curtain Wall
9	Open

Roof

Assembly Name	Old	Type Code	Surf Code	Surf Color	Aged Reflec	Aged Emitt	Ceil Insul	Roof Insul	M	H (ft)	W (ft)	Plen H (ft)	Plen Wall R	Ret Air
	❑						R U	R U	❑					❑
	❑								❑					❑
	❑								❑					❑
	❑								❑					❑

Height and width are gross dimensions, including skylights

Enter “0” for R-value if uninsulated, leave blank if unknown

	Roof Construction Type

	Roof Surface

	Roof Surface

10	**Concrete Deck Roof.**
11	**Wood Frame Roof**
12	**Metal Frame Roof**

1	**Paint**
2	**Elastomeric coating**
3	**Single ply membrane**

4	**Metal roofing**
5	**Asphalt shingles or roll**
6	**Gravel (ballast)**

Zone _____ (contd)

Window/Skylight Types

Ref. No.	Assembly Name	No. Panes	Glazing Type	Frame Type	Features (circle)	Meas.Trans.	SHGC	U- value
1	❑ old? ❑ M?				Low e / gas fill			
2	❑ old? ❑ M?				Low e / gas fill			
3	❑ old? ❑ M?				Low e / gas fill			
4	❑ old? ❑ M?				Low e / gas fill			
5	❑ old? ❑ M?				Low e / gas fill			
6	❑ old? ❑ M?				Low e / gas fill			
7	❑ old? ❑ M?				Low e / gas fill			
8	❑ old? ❑ M?				Low e / gas fill			
9	❑ old? ❑ M?				Low e / gas fill			
10	❑ old? ❑ M?				Low e / gas fill			

	Glass Type
1	Clear
2	Tinted
3	Reflective
4	Fritted (diffusing)

	Plastic Type
5	Clear Plastic
6	Tinted Plastic
7	White Plastic
8	Translucent

	Window Frame Type
1	Standard Metal Frame
2	Thermally Broken Frame
3	Wood/Vinyl Frame

	Skylight Frame Type
4	Standard Metal Frame w/ Curb
5	Thermally Broken Frame w/ Curb
6	Standard Metal Frame w/o Curb
7	Thermally Broken Frame w/o Curb

Window/Skylight Geometry

Ref No. (from above)	Orient (N, NE, .. H)	H (ft)	W (ft)	Qty	Int. Shade Type	Otr Ex Shd%	Window OH Offset	Window OH Proj	Skylight Shape

Otr Ex Shd% refers to exterior shading from adjacent buildings, building self-shading, thick vegetation, hillsides etc.

Interior Shade Type: 1 = Blinds; 2 = Light Shades or Drapes; 3 = Dark Shades or Drapes

Skylight Shape: 1 = Domed; 2= Flat; 3= Pyramid; 4= Ridge; 5= Vault

Zone _____ (contd)

Zone-Level HVAC Equipment (Not Central, Not Packaged)

Name	Type Code	Quantity	Fan Hp	CFM	Heat Source	kW (If elec. heat)
					None / Elec. / Other	
					None / Elec. / Other	
					None / Elec. / Other	
					None / Elec. / Other	
					None / Elec. / Other	
					None / Elec. / Other	
					None / Elec. / Other	
					None / Elec. / Other	
					None / Elec. / Other	
					None / Elec. / Other	
					None / Elec. / Other	

Zone-Level HVAC Equipment

Type Code	Zone-Level HVAC Equipment Description
1	Baseboard or radiant heater
2	Two-pipe fan coil
3	Four-pipe fan coil
4	Two pipe induction terminal
5	Four pipe induction terminal
6	Unit heater

Type Code	Zone-Level HVAC Equipment Description
7	Unit ventilator
8	Non-powered VAV terminal
9	Series fan-powered VAV terminal
10	Parallel fan-powered VAV terminal
11	Computer equipment cooler
12	Exhaust fan

Space _____

Name __________________ Floor Area_________SF

Corridor/Restroom/Support Area______% Space Multiplier______

Circle appropriate occupancy code: LPD Measure ❑

1 Auditorium
2 Church /chapel
3 Convention, meeting
4 Courtroom
5 Exhibit
6 Main entry lobby
7 Motion picture theater
8 Performance theater
9 Bars, lounge, casino
10 Dining
11 Kitchen
12 Bank/financial institution
13 Medical / clinical office
14 Office - Other
15 Computer center
16 EEG/EKG/MRI/Radiation
17 Hospital - Emergency
18 General hospital area
19 Hospital laboratory
20 Patient room/ nursery
21 Therapy (OT, PT)
22 Pharmacy
23 Radiology
24 Recovery
25 Surgical & OB suite
26 Hotel function
27 Hotel guest room
28 Hotel lobby
29 Barber, beauty shop
30 Bowling alley
31 Coin op laundry
32 Comm'l dry cleaners
33 Grocery
34 Mall, arcade, atrium
35 Retail, whlse sales flr
36 Classroom
37 Day care
38 Dormitory
39 Gymnasium
40 Library
41 Locker room
42 School shop
43 Swimming pool
44 Aircraft hanger
45 Auto repair workshop
46 General C&I work
47 Precision C&I work
48 Storage, warehouse
49 Other (Describe)

Lighting

Name	Fixture Code	Fixture Count	Fixture Type	Controls (circle all that apply)		% fix ctrl	% ctrl oper
				1 / 2 / 3 / 4	❑ EMS? ❑ M?		
				1 / 2 / 3 / 4	❑ EMS? ❑ M?		
				1 / 2 / 3 / 4	❑ EMS? ❑ M?		
				1 / 2 / 3 / 4	❑ EMS? ❑ M?		
				1 / 2 / 3 / 4	❑ EMS? ❑ M?		
				1 / 2 / 3 / 4	❑ EMS? ❑ M?		
				1 / 2 / 3 / 4	❑ EMS? ❑ M?		
				1 / 2 / 3 / 4	❑ EMS? ❑ M?		
				1 / 2 / 3 / 4	❑ EMS? ❑ M?		
				1 / 2 / 3 / 4	❑ EMS? ❑ M?		
				1 / 2 / 3 / 4	❑ EMS? ❑ M?		
				1 / 2 / 3 / 4	❑ EMS? ❑ M?		

Lighting Control Codes
1 = Occupancy sensor 2 = Daylight - contin. dimming 3 = Daylighting - stepped 4 = Lumen maintenance
Fixture Type Codes
1 = Rec 2 = Dir 3 = Ind 4 = Ind-Dir 5 = Plug-in Task 6 = Furn. Int. Task. 7 = Exempt

Miscellaneous Equipment and Plug Loads

❑ Use typical value: 1 2 3 4 ❑ Define additional or unique loads (use next page)

Space _____ contd

Miscellaneous Equipment and Plug Loads

❑ **Use typical value: 1 2 3 4 plus additional loads listed below:**

❑ **Define unique loads for this space only**

Name	Equip. Code	Count	kW/ Unit or	Motor HP or	kBtuh Input	Under Hood?
						Y / N
						Y / N
						Y / N
						Y / N
						Y / N
						Y / N
						Y / N
						Y / N
						Y / N
						Y / N
						Y / N

Equipment - Record kW for equipment without default or if default is not appropriate

	Equipment Description	Equip Code	Default kW
General	Personal Computer w/ Monitor	1	0.5
	Terminal	2	0.15
	Laser Printer	3	0.85
	Copier	4	1.4
	Fax Machine	5	0.1
	Mini-Computer + Periph	6	1.0
	Main Frame Computer +	7	

	Equipment Description	Equip Code	Default kW
Grocery	Meat Grinder	19	7.
	Meat Saw	20	2.5
	Meat Slicer	21	0.25
	Wrapper	22	0.9
	Check stand	23	1.5
Hospital	Laboratory Equipment	24	
	Monitoring, Life Support	25	1.1

	Periph		
	Microwave	8	1.7
	Misc. Appliance	9	
	Television	10	0.15
	Washer	11	0.5
	Dryer	12	4.
	Cash Register	13	0.15
	Box Crusher	14	10.
	Gasoline pump	15	0.7
	ATM	16	.5
	Video game	17	.5
	Exercise equipment	18	.5

	EEG	26	1.1
	EKG	27	1.1
	MRI	30	26.
	X-ray machine	31	5.
	Radiation Therapy Machine	32	10.
Indust	Air Compressor	33	
	Welder	34	
	Battery Charger	35	1.5
	Machine Tools	36	
	Motor	37	
Misc.	Other	38	

Typical Miscellaneous Equipment and Plug Loads 1 2 3 4

Floor area surveyed _____ SF

Name	Equip. Code	Count	kW/ Unit or	Motor HP or	kBtuh Input	Under Hood?
						Y / N
						Y / N
						Y / N
						Y / N
						Y / N
						Y / N
						Y / N
						Y / N
						Y / N
						Y / N
						Y / N

Equipment - Record kW for equipment without default or if default is not appropriate

	Equipment Description	Equip Code	Default kW
General	Personal Computer w/ Monitor	1	0.5
	Terminal	2	0.15
	Laser Printer	3	0.85
	Copier	4	1.4
	Fax Machine	5	0.1
	Mini-Computer + Periph	6	1.0
	Main Frame Computer + Periph	7	

	Equipment Description	Equip Code	Default kW
Grocery	Meat Grinder	19	7.
	Meat Saw	20	2.5
	Meat Slicer	21	0.25
	Wrapper	22	0.9
	Check stand	23	1.5
Hospital	Laboratory Equipment	24	
	Monitoring, Life Support	25	1.1

	Microwave	8	1.7
	Misc. Appliance	9	
	Television	10	0.15
	Washer	11	0.5
	Dryer	12	4.
	Cash Register	13	0.15
	Box Crusher	14	10.
	Gasoline pump	15	0.7
	ATM	16	.5
	Video game	17	.5
	Exercise equipment	18	.5

	EEG	26	1.1
	EKG	27	1.1
	MRI	30	26.
	X-ray machine	31	5.
	Radiation Therapy Machine	32	10.
Indust	Air Compressor	33	
	Welder	34	
	Battery Charger	35	1.5
	Machine Tools	36	
	Motor	37	
Misc.	Other	38	

Refrigerated Cases

Zone: ____

Name	Type	Qty	Unit Dim. (ft, CF)	Walk-in SF	Product	Comp Loc	Door type (Reach-in)	Lights	EE Mtr	LSHX
						Int / Rem	❐	❐	Y / N ❐	Y / N ❐
						Int / Rem	❐	❐	Y / N ❐	Y / N ❐
						Int / Rem	❐	❐	Y / N ❐	Y / N ❐
						Int / Rem	❐	❐	Y / N ❐	Y / N ❐
						Int / Rem	❐	❐	Y / N ❐	Y / N ❐
						Int / Rem	❐	❐	Y / N ❐	Y / N ❐
						Int / Rem	❐	❐	Y / N ❐	Y / N ❐
						Int / Rem	❐	❐	Y / N ❐	Y / N ❐
						Int / Rem	❐	❐	Y / N ❐	Y / N ❐
						Int / Rem	❐	❐	Y / N ❐	Y / N ❐
						Int / Rem	❐	❐	Y / N ❐	Y / N ❐
						Int / Rem	❐	❐	Y / N ❐	Y / N ❐
						Int / Rem	❐	❐	Y / N ❐	Y / N ❐
						Int / Rem	❐	❐	Y / N ❐	Y / N ❐
						Int / Rem	❐	❐	Y / N ❐	Y / N ❐

Enter SF for walk-in or walk-in/reach-in only

Type Code	Case Description	Unit Dim.	Default kW/unit
1	Island, open, single-level narrow	ft	0.1
2	Island, open, single-level wide	ft	0.1
3	Island, open, island, single level double	ft	0.2
4	Island, closed, single-level narrow	ft	0.1
5	Island, closed, single-level wide	ft	0.1
6	Island, closed, single level double	ft	0.2
7	Open Single-deck	ft	0.3
8	Open Multi-deck	ft	0.3
9	Reach-in Multi deck	ft	0.3
10	Closed rear-entry multi-deck	ft	0.03
11	Curved glass rear entry multi deck	ft	0.06
12	Walk-in / Reach-in	ft	0.3
13	Walk-in	ft	0.015
14	Under counter Reach-in	CF	0.03
15	Blast Chiller	CF	0.03
16	Ice Maker	CF	0.04
17	Residential Reach-in Refrigerator	CF	0.03
18	Residential Reach-in Freezer	CF	0.03
19	Residential Closed Coffin Freezer	CF	0.03

Product Code	Product
1	Ice Cream
2	Frozen Food
3	Fresh Meat
4	Deli
5	Dairy/Beverage
6	Produce

Door Code	Door Type
1	Single glazed
2	Double glazed
3	Triple glazed, no heater controls
4	Triple glazed, w/ heater controls
5	Triple glazed, no heaters
6	Quadruple glazed, no heater controls
7	Quadruple glazed, w/ heater controls
8	Quadruple glazed, no heaters

Light Code	Lighting Type
1	None

20	Refrigerated Vending Machine	CF	0.03
21	Water cooler	each	0.5
22	Slurpee, frappaccino machine	each	
23	Other	kBtuh	

2	T-12 w/ magnetic ballast
3	T-12 w/ electronic ballast
4	T-8

Refrigeration Plant

Compressors / Compressor Racks

Name	Make	Model	Old Const?	Comp Code	Circuit	AHU Ht. Rec
CR-			❑		LT / MT / HT	Y / N
CR-			❑		LT / MT / HT	Y / N
CR-			❑		LT / MT / HT	Y / N
CR-			❑		LT / MT / HT	Y / N

LT circuit is for ice cream cases (product code 1), MT is for frozen food cases (product code 2) and HT is for all others

Supply evaporator tons and rack suction temperature (SST) if known

Comp Code	Compressor type	Comp Code	Compressor type
1	Stand-alone	3	Parallel equal multiplex
2	Stand-alone w/ VSD	4	Parallel unequal multiplex

Refrigeration Condenser

	RC-	RC-	RC-	RC-
Equipment Name				
Old Construction?	❑	❑	❑	❑
Location				
Quantity				
Type	Air / Water	Air / Water	Air / Water	Air / Water
Manufacturer				
Model Number				
Compressors served				
Rated Cap (kBtuh)				
Outdoor Temp @ rating	WB DB	WB DB	WB DB	WB DB
Cond Temp @ rating				
Fan Control	1-Sp / 2-Sp / Pony VSD	1-Sp / 2-Sp / Pony VSD	1-Sp / 2-Sp / Pony VSD	1-Sp / 2-Sp / Pony VSD
Large Fan hp				
Large Fan motor effic				

Small Fan hp				
Small Fan motor effic				
Spray Pump hp				
Spray Pump motor effic				

If one fan motor per tower or cell, enter size and efficiency under "Large fan." If two motors, indicate size and efficiency of both motors.

Foodservice

Zone: _______

Kitchen Equipment

Appliance Name	Qty	Type Code	Fuel	KW or	Volts / Amps or	kBtuh Input or	Trade Size	Hi-Effic	Hood	M
			Elec. / Other		/			Y / N	Y / N	❑
			Elec. / Other		/			Y / N	Y / N	❑
			Elec. / Other		/			Y / N	Y / N	❑
			Elec. / Other		/			Y / N	Y / N	❑
			Elec. / Other		/			Y / N	Y / N	❑
			Elec. / Other		/			Y / N	Y / N	❑
			Elec. / Other		/			Y / N	Y / N	❑
			Elec. / Other		/			Y / N	Y / N	❑
			Elec. / Other		/			Y / N	Y / N	❑
			Elec. / Other		/			Y / N	Y / N	❑
			Elec. / Other		/			Y / N	Y / N	❑
			Elec. / Other		/			Y / N	Y / N	❑

Hoods

Name	Type	Size (SF)	Flow (cfm)	Fan hp	Makeup Air Source
	Canopy / Island Canopy / Backshelf				Cond / Uncond
	Canopy / Island Canopy / Backshelf				Cond / Uncond
	Canopy / Island Canopy / Backshelf				Cond / Uncond
	Canopy / Island Canopy / Backshelf				Cond / Uncond
	Canopy / Island Canopy / Backshelf				Cond / Uncond
	Canopy / Island Canopy / Backshelf				Cond / Uncond

Type Code	Description	Trade size	Default kW/unit
1	Broiler (include	ft	1.7

Type Code	Description	Trade size	Default kW/unit
15	Oven, convection, combi, or	doors	3.8

	cheesemelter)		
2	Char Broiler	ft	3.7
3	Griddle, single sided	ft	4.5
4	Griddle, clam shell	ft	7.5
5	Fryer, countertop	lb	0.3
6	Fryer, free-standing	lb	0.3
7	Fryer, pressure	lb	0.3
8	Fryer, donut	lb	0.3
9	Kettle, Pasta cooker	qt	0.25
10	Heat lamps	lamps	0.5
11	Range top	ft	5.
12	Oven, pizza or bake	decks	7.
13	Oven, conveyor	decks	13.
14	Oven, range	ft	2.

	retherm		
16	Food warmer	ft	0.6
17	Heated display case	ft	0.5
18	Microwave oven		1.7
19	Toaster, pop-up		1.8
20	Toaster, conveyor		4.6
21	Coffee pot	burners	1.
22	Steam table	ft	0.6
23	Dishwasher, single tank	racks/hr	0.3
24	Dishwasher, conveyor	racks/hr	0.1
25	Steam jacketed kettle	qt	0.4
26	Braising pan/skillet	qt	0.1
27	Other	kW	

Hot Water

Conventional Water Heating Equipment

Name	Location	Type Code	Old Cost?	Storage Cap (gal)	Fuel	Effic	Pump hp	M?
			❑		Elec / Other			❑
			❑		Elec / Other			❑
			❑		Elec / Other			❑
			❑		Elec / Other			❑

Solar Water Heating Equipment

Name	Location	System Type Code	Collector Area (SF)	Tilt (deg, horiz =0)	Storage Cap (gal)	M?
						❑
						❑
						❑

Pools/ Spas

Name	Location	Surface Area (SF)	Filter Motor hp	Heating System
	Outside / Inside			None / PH-___
	Outside / Inside			None / PH-___
	Outside / Inside			None / PH-___
	Outside / Inside			None / PH-___

Pool/Spa Heating System

Name	Location	Fuel Code	Effic	Solar Collector Type	Collector Area (SF)	Tilt (deg, horiz =0)	Heat Recovery	M?
PH-1		Elec / Other		Glazed / Unglazed			Y / N	❑
PH-2		Elec / Other		Glazed / Unglazed			Y / N	❑
PH-3		Elec / Other		Glazed / Unglazed			Y / N	❑
PH-4		Elec /		Glazed /			Y / N	❑

		Other		Unglazed				

WH Type Code	Water Heater Description
1	Storage
2	Instantaneous
3	Heat Pump

SWH Type Code	Solar Water Heater Description
1	Active flat plate
2	Passive flat plate
3	Integral Collector/Storage
4	Active evacuated tube
5	Active concentrating E-W tracking
6	Active concentrating N-S tracking

Miscellaneous

Interior Transformers

Name	Location	Qty	Manuf.	Model No.	kVA	Temp Rise (°C)	Cooling Fan?
							Y / N
							Y / N
							Y / N
							Y / N
							Y / N
							Y / N
							Y / N
							Y / N
							Y / N
							Y / N
							Y / N
							Y / N

Verify for participants receiving incentive only

Vertical Transportation

				Elevator	Escalator		
Name	Type	Qty	Motor hp	Number of Floors	Width (ft)	Rise (ft)	Run (ft)
	Elev / Esc						
	Elev / Esc						
	Elev / Esc						
	Elev / Esc						
	Elev / Esc						
	Elev / Esc						

Exterior Lighting

Name	Old Const ?	Fixture Code	Count	M?
	❑			❑
	❑			❑
	❑			❑
	❑			❑
	❑			❑
	❑			❑
	❑			❑
	❑			❑
	❑			❑
	❑			❑
	❑			❑
	❑			❑

Collect only if connected to electric meter serving occupied space

Miscellaneous Exterior Electric Loads

Name	Equip Code	Quantity	kW/unit or	Hp/unit

Collect only if connected to electric meter serving occupied space

Equipment Description	Equipment Code	Default kW
Misc. Appliance	1	
Washer	2	0.5
Dryer	3	4.
Cash Register	4	0.15
Box Crusher	5	10.
Gasoline pump	6	0.7
Air Compressor	7	

Equipment Description	Equipment Code	Default kW
Welder	8	
Battery Charger	9	1.5
Machine Tools	10	
Motor	11	
Refrig vending machine	12	
Ice merchandizer	13	
Other	14	

Incidents

Circle any incidents as applicable:

1 None to report appointment
2 Complaint about rates reason(s))
3 Complaint about energy costs or lack of savings
4 Complaint about outages or power quality
5 Complaint about technology reliability
6 Complaint about utility customer service
7 Contact person unavailable or unaware of survey
8 Customer expressed dissatisfaction with survey (list
9 Property damage occurred during on-site survey
10 Personal injury occurred during on-site survey
11 Other (list)

Title 24

Circle the method used for Title 24 compliance?

Envelope (ENV):	❑ Component	❑ Overall envelope	❑ Performance	❑ DK
Mechanical (MECH):	❑ Prescriptive	❑ Performance	❑ DK	
Lighting (LTG):	❑Complete building	❑ Area category	❑ Tailored	❑ Performance

- If new construction complied using the ***performance method***, or ***tailored lighting*** approach, copy the PERF or LTG compliance reports, or obtain the name and phone number of the firm that did the compliance analysis:

  Name:

  Phone:

Meters

Meter Number	Surveyed Space kWh / Metered Space kWh (%)	Meter Location

❑ Some or all meter information not available

Notes:

System / Zone Association Checklist

DOE-2 "Virtual" System ----→	1	2	3	4	5	6	7	8	9	Zonal HVAC only	Uncond
Packaged HVAC											
AC-1											
AC-2											
AC-3											
AC-4											
AC-5											
AC-6											
AC-7											
AC-8											
AC-9											
AC-10											
AC-11											
AC-12											
AC-13											
AC-14											
AC-15											
AC-16											
AC-17											
AC-18											
AC-19											
AC-20											
Air Handlers											
AH-1											
AH-2											
AH-3											
AH-4											
AH-5											
AH-6											
AH-7											
AH-8											
AH-9											
AH-10											
AH-11											
AH-12											
AH-13											
AH-14											
AH-15											
AH-16											
AH-17											
AH-18											
AH-19											
AH-20											
Zone 1											
Zone 2											
Zone 3											
Zone 4											
Zone 5											
Zone 6											
Zone 7											
Zone 8											
Zone 9											

Zone 10											

Check 'Zonal HVAC only' if zone is conditioned only by baseboard, radiant, or unit heaters, or unit ventilators.

Plant / System Association Checklist

DOE-2 "Virtual" System ----→

Chillers / AC Compressors									
CH-1									
CH-2									
CH-3									
CH-4									
CH-5									
CH-6									
CH-7									
CH-8									
CH-9									
CH-10									
Towers / Evap. Condensers									
T-1									
T-2									
T-3									
T-4									
T-5									
T-6									
T-7									
T-8									
T-9									
T-10									
Heating Systems									
HS-1									
HS-2									
HS-3									
HS-4									
HS-5									
HS-6									
HS-7									
HS-8									
HS-9									
HS-10									
Pumps									
P-1									
P-2									
P-3									
P-4									
P-5									
P-6									
P-7									
P-8									
P-9									
P-10									
P-11									
P-12									
P-13									
P-14									
P-15									
P-16									
P-17									
P-18									
P-19									
P-20									

Interview "Area" / Audit "Zone" Association Checklist

Areas	1	2	3	4	5
Zone 1					
Zone 2					
Zone 3					
Zone 4					
Zone 5					
Zone 6					
Zone 7					
Zone 8					
Zone 9					
Zone 10					

Space/Zone Association

	Zone									
Space	Z 1	Z 2	Z 3	Z 4	Z 5	Z 6	Z 7	Z 8	Z 9	Z 10
1										
2										
3										
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
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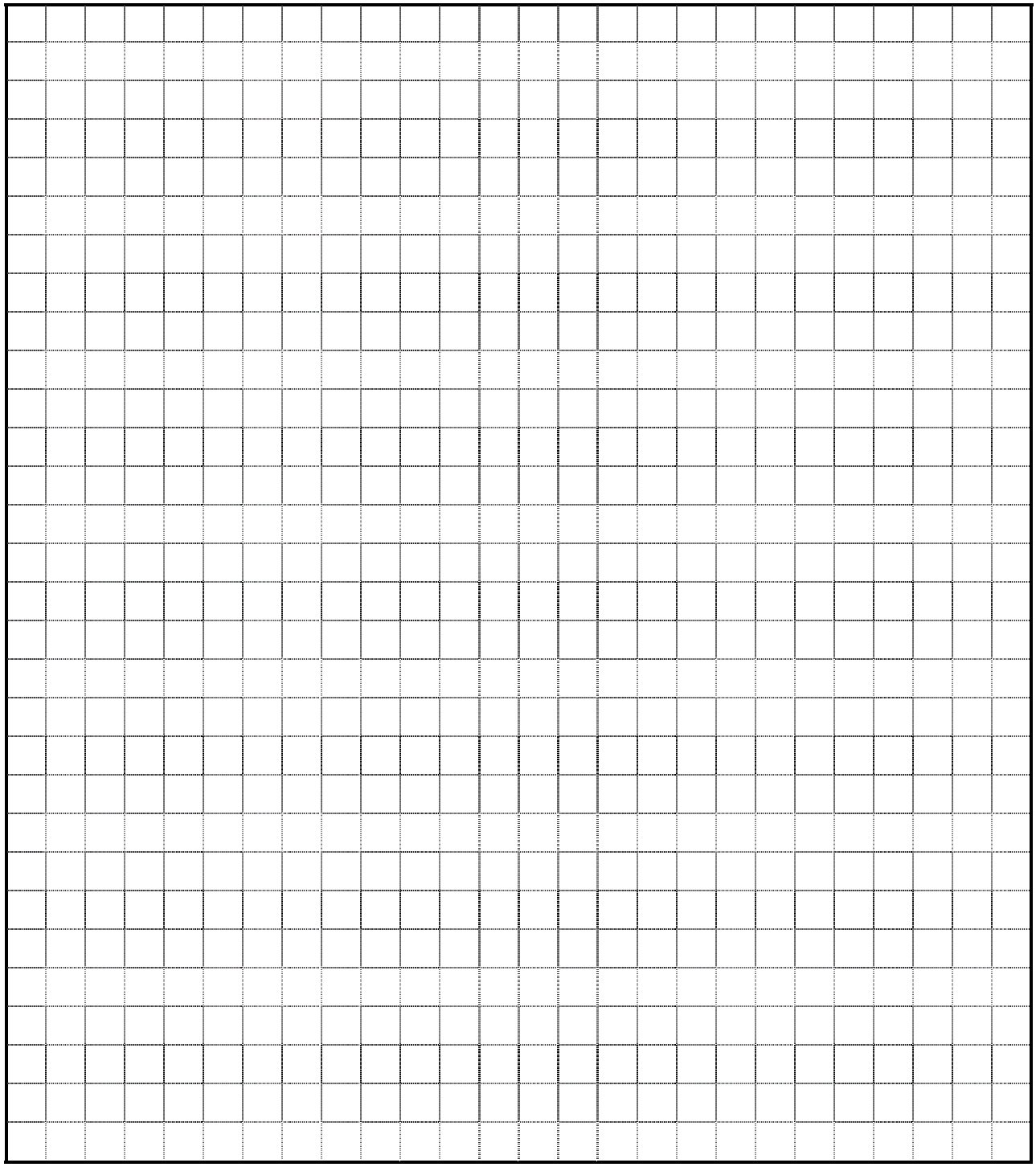
25										
26										
27										
28										
29										
30										

Sketch of Building Floor Plan



Be sure to include dimensions, North arrow, and zone and HVAC equipment locations.

Screener Survey

Site ID: _____

Customer Name: _____

Business Name: _____

Address: _____

Phone: _____

Program Delivery Type: (Systems or Performance)

Contact Log

	Date	Time	By	Who	Result	Comment
1						
2						
3						
4						
5						
6						

Call contact (owner or site manager first) and identify yourself.

Describe the survey project

"We are an independent research organization working on a project funded by the California Public Utilities Commission to perform a research study to understand how new buildings are built. Neither I nor anyone else connected with this study will attempt to sell you anything, and your name and responses will not be used for any purpose other than this study."

Screener

Q1. Are you the owner or the owner's representative of the building at [address]?

01 Yes

02 No **(Get contact info)** **Name:_____**

98 Don't Know **(Get contact info)** **Phone:_____**

99 Refused **(Thank and terminate)**

Q2. Was there a new construction, gut renovation or remodel project at this address that was completed and occupied during 1999 or 2000?

01 Yes

02 No (Confirm, Thank and Terminate)

98 Don't Know (Get contact info) Name:_____

99 Refused (Thank and Terminate) **Phone:_____**

Q3. How would you describe the project at [address]?

01 A new building (brand new construction)

02 First Tenant improvement or newly conditioned space in an existing shell building

03 Renovation or remodel of an existing building

04 Addition to an existing building (Go to Q3a)

05 Renovation and addition (Go to (Q3a)

06 Gut Rehabilitation of existing building

98 Don't know **(Get contact info)** **Name:** _____

99 Refused **(Get contact info)** **Phone:** _____

Q3a. Where in the building was the addition built? **(describe)**

_____
_____
_____
_____

Q4. When was the building completed and opened for occupancy? (Month and Year)

Completed:_____

Opened for Occupancy:_____ (If different from completed date)

Q5. Is the building completely built out?

01 Yes

02 If No, **% Complete_____ Expected Completion Date_____**

If less than 90% ask if we can call them back once the building is completely built-out and occupied. Explain the on-site and the report they will get in return for participating. If non-participant we will call them back after the on-site for some follow up questions.

Q6. Is the building completely occupied?

01 Yes

02 If No, **% Occupied_____**

Q7. Our information shows that this building is an [Type of Building] is this correct?

01 Yes

02 No **(If no, Ask what type of building and primary occupancy type)**

If mixed Occupancy please describe

_____
_____
_____

With your permission we would like to send an engineer/surveyor to your facility. The purpose of the on-site visit is to collect information and data that is required to build a computer simulation model of your building. This information will be used to better understand non-residential new construction in California. The on-site survey usually begins with a meeting between our engineer/surveyor and your facility manager. During this meeting information such as building schedules and control schemes will be discussed and documented. The auditor will then ask to review building plans, if available, and conduct a walk through of the facility to obtain specified measurements and equipment inventories needed for the model. The on-site visit is non-intrusive and normally takes between 3 and 8 hours, depending upon the size and complexity of the building.

For participating, you will receive an energy efficiency report on your building that shows how your building compares to other buildings similar to this one. The on-site can be scheduled at your convenience, when would be a good time for you?

- Appointment Date and Time_____
- Refused

Q8. Do you have as-built building plans available at the site for review?

01 Yes
02 No
98 Don't Know
99 Refused

Q9. Who do you buy your power from?_____

Participants Design Team Survey

Participants

Design Team Questions (Architect/Engineer)

Name:_____ Position:_____

Begin with introductions used in screener.

Q1. Are you familiar with Savings By Design?

01 Yes

02 No

03 Don't Know **(Get contact info)** **Name:**_____

99 Refused **(Thank and Terminate)** **Phone:**_____

If not yes, explain. *"Savings By Design" is the name of an energy efficiency program run by your utility company. It aims to improve the energy efficiency of nonresidential new construction projects."*

Q2. Our records show that your design team participated in the SBD program on [project name]

01 Yes

02 No (**Get contact info)**

98 Don't Know **(Get contact info)** **Name:**_____

99 Refused **(Thank and Terminate)** **Phone:**_____

(If records show that a Design Team Incentive was issued begin at Q3, if no design team incentive was issued begin at Q5)

Q3. Our records show that your design team received a SBD Design Team Incentive on [project name]?

01 Yes

02 No (**Get contact info)**

98 Don't Know **(Get contact info)** **Name:**_____

99 Refused **(Thank and Terminate)** **Phone:**_____

Q4. How important was the incentive in motivating you to participate in the program?

01 Very unimportant
02 Somewhat unimportant
03 Neither important nor unimportant
04 Somewhat important
05 Very important
98 Don't know
99 Refused
50 Other_____
98 Don't know

Q5. Can you recall which method of program delivery was used on this project, was it the…?

01 Whole Building Approach or the,
02 Systems Approach **(Skip to Q11)**
98 Don't Know
99 Refused

Look at sheet to determine if answer provided is correct.

Q6. Did [utility] provide you with whole building computer analysis, also known as Design Analysis, on this project?

01 Yes
02 No (**Skip to Q9)**
98 Don't Know → **Name:**_____
99 Refused **Phone:**_____

Q7. For the following building systems, did the initial design of your building change as a result of the Design Analysis component of SBD?

	Definitely	Probably	Definitely Not
Building System	1	2	3

Q8. How valuable would you describe the Design Analysis component of the SBD program?

01 Very un-valuable
02 Somewhat un-valuable
03 Neither valuable nor un-valuable
04 Somewhat valuable
05 Very valuable
98 Don't know
99 Refused

Skip to Q11

Q9. Was it offered to you as an option on this project?

01 Yes
02 No (**Skip toQ11)**
98 Don't Know
99 Refused

Q10. What were your reasons for not selecting this method of program delivery?

Record Answer Verbatim:_____

Q11. On a scale of 1 to 5, with 1 being very un-influential and 5 being very influential, how would you rate the influence of the following SBD components on the design of this building? Define for customers if they are not aware of the meanings of the following terms.

01	Owner Incentive	1 2 3 4 5 98 99
02	Design Team Incentive	1 2 3 4 5 98 99
03	New Construction Rep. Recommendations	1 2 3 4 5 98 99

Q12. Which member of your design team or contractors, including yourself, was the single biggest advocate for participating in the program? **DO NOT PROMPT, ACCEPT ONLY ONE RESPONSE INDICATE WHICH THE RESPONDENT IS.**

01 Owner/Developer
02 Architect
03 Lighting Designer/Electrical Engineer
04 Mechanical Engineer

05 Energy Manager
06 Manufacturer Rep.
07 Construction Manager
50 Other: _____
98 Don't Know
99 Refused

Q14. Has any component of the SBD program influenced your standard design practice that would lead to more energy efficient building designs on a regular basis?

01 Yes
02 No, **Why?** (**Go To Q16**)
98 Don't Know **(Go To Q16)** **Name:**_____
99 Refused **(Go To Q16)** **Phone:**_____

Why:_____
_____
_____
_____

Q15. If yes, which component was most instrumental in causing this design practice change?

Record Answer Verbatim:_____
_____
_____
_____

Q16. Does your firm advertise energy efficient design practices?

01 Yes
02 No
98 Don't Know
99 Refused

Q17. Does your firm advertise Integrated Design?

01 Yes
02 No
98 Don't Know
99 Refused

(Example of Integrated Design, One common example of an Integrated Design is when the building HVAC system has been sized according to the installed lighting design and building size, rather than only basing the size of the HVAC system on building size.)

Thank you, this concludes our interview. Do you have any questions before we finish?

Participants Building Owner Survey

Participants
Building Owner Questions
Building Classification

Q1. Was this building constructed and owned by a private company or a public agency?

01 Private company
02 Public agency
98 Don't Know
99 Refused

Q2. Was this building constructed to be occupied by the owner of the building, or built by a developer with the intent to lease space?

01 Built to be Owner Occupied
02 Built by a developer with the intent to lease space
03 Built and occupied by developer with intent to lease remaining space
98 Don't Know
99 Refused

Q3. When this building was constructed, what would you say was the most import financial criteria used to make energy efficient investments?

01 Lowest first cost
02 Lowest lifetime cost
03 Simple Payback
04 Return on Investment
05 Net Present Value
06 Other
98 Don't Know
99 Refused

Q4. Did this building use a set of prototype plans?

01 Yes
02 No
98 Don't Know
99 Refused

Q5. Approximately what percentage of your O&M costs are for energy?

ENTER NUMBER:_____

98 Don't Know
99 Refused

Design and Construction Practices

Q6. Did you use an independent architect or designer for this building, i.e., one not employed by the construction firm or general contractor?

01 Yes
02 No
03 DK
04 Other_____
98 DK
99 Refused

Q7. In selecting the Design Team (*e.g., architect, engineer*) (*or general contractor if No on Q6*), did you consider qualifications in energy efficiency? (If yes then explain)

01 Yes (Explain)
02 No
98 DK
99 Refused

Explain:_____
_____
_____
_____

Q8. Did you ask the members of your design team to consider energy efficiency beyond Title 24 requirements? (If yes then explain)

01 Yes (Explain)
02 No
98 DK
99 Refused

Explain:_____
_____
_____
_____

Q9. Are you familiar with the practice of designing new buildings using an Integrated Design approach?

01 Yes (Explain)
02 No (Go To Q11)
98 DK (Go To Q11)
99 Refused (Go To Q11)

Explain:_____
_____
_____
_____

(Example of Integrated Design, One common example of an Integrated Design is when the building HVAC system has been sized according to the installed lighting design and building size, rather than only basing the size of the HVAC system on building size.)

Q10. Did you ask the architect or designer to follow an Integrated Design approach? (If yes then explain)

01 Yes (Explain)
02 No
98 DK
99 Refused

Explain:_____
_____

_____
_____

Q11. Did you solicit competitive bids for the construction of this project?

01 Yes
02 No
98 DK
99 Refused

Q12. Were initial energy-efficiency features changed through value engineering, substitutions or competitive bidding?

01 Yes (Explain)
02 No
98 DK
99 Refused
Explain:_____
_____
_____
_____

Q13. Did you hire an independent construction manager or commissioning agent to help ensure that the final building was in line with the original design intent?

01 Yes
02 No
98 DK
99 Refused

Energy Attitudes

Q14. How would you describe the level of importance of energy efficiency when your company built this building?

01 Very unimportant
02 Somewhat unimportant
03 Neither important nor unimportant
04 Somewhat important
05 Very important
98 Don't know
99 Refused

Q15. How would you describe the level of importance of energy efficiency in the daily operation of this building?

01 Very unimportant
02 Somewhat unimportant
03 Neither important nor unimportant
04 Somewhat important
05 Very important
98 Don't know
99 Refused

Q16. Does your company have any policy on energy management?

01 Yes
02 No (Skip to 0)
03 Don't know (Skip to 0)
98 Refused (Skip to 0)

Q17. What is your company's policy on energy efficiency? (record response)

_____
_____
_____
_____

Q18. Is the energy performance of the company used in the review of anyone's performance or compensation?

01 Yes
02 No
98 Don't know
99 Refused

Energy Performance

Q19. When this building was built, would you say it…

01 Was just efficient enough to comply with the energy code
02 It was a little better than required by the energy code
03 It was much better than required by the energy code
98 Don't know
99 Refused

Q20. How would you describe the energy performance of this building?

01 It could be much more efficient than it is
02 It could be somewhat more efficient than it is
03 The building is about as efficient as it can be
04 This building is an example of energy efficiency for others to follow
98 Don't know
99 Refused

SBD Program Questions

Q21. Are you familiar with Savings By Design?

01 Yes

02 No **(Get contact info)**

98 Don't Know **(Get contact info)** **Name:**_____

99 Refused **(Thank and Terminate)** **Phone:**_____

If not yes, explain. *"Savings By Design" is the name of an energy efficiency program run by your utility company. It aims to improve the energy efficiency of nonresidential new construction projects."*

Q22. Our records show that your company received a Savings By Design incentive from [utility]?

01 Yes

02 No (Confirm Building Address, ask for someone else, Thank **and Terminate)**

98 Don't Know **(Get contact info)** **Name:**_____

99 Refused **(Thank and Terminate)** **Phone:**_____

Q23. How did you first become aware of the SBD program, services, and owner incentives that were available to you?

01 Utility Representative

02 Previous Utility Program Participation

03 Marketing Material

04 Architect

05 Engineer

06 Web Site

07 Manufacturer Rep.

08 Construction Manager

50 Other: _____

98 Don't Know

100 Refused

Q24. Which member of your project team, including yourself, was the single biggest advocate for participating in the program? **DO NOT PROMPT, ACCEPT ONLY ONE RESPONSE**

01 Owner/Developer
02 Architect
03 Lighting Designer/Electrical Engineer
04 Mechanical Engineer
06 Energy Manager
08 Manufacturer Rep.
09 Construction Manager
50 Other: _____
98 Don't Know
99 Refused

Q25. How important was the dollar incentive paid to you, the owner, in motivating your organization to participant in the SBD program?

01 Very unimportant
02 Somewhat unimportant
03 Neither important nor unimportant
04 Somewhat important
05 Very important
98 Don't know
100 Refused

Q26. Has participation in any component of SBD influenced you to change your standard building practice to lead to more efficient buildings?

01 Yes
02 No, Why? (Skip to Q28)
98 Don't Know **Name:**_____
99 Refused **Phone:**_____

Why:_____

Q27. If yes, which component was most instrumental in causing this design practice change?

01 Owner Incentive
02 Design Team Incentive
03 Design Assistance
04 Design Analysis
05 Other (List)_____
98 Don't know

99 Refused

Record Answer Verbatim:_____

Q28. In a scale of 1 to 5, with 1 being very un-influential and 5 being very influential, how would you rate the influence of the following SBD components on the design of this building?

01	Owner Incentive	1 2 3 4 5 98 99
02	Design Team Incentive	1 2 3 4 5 98 99
03	New Construction Rep. Recommendations	1 2 3 4 5 98 99

Q29. If any, what recommendations would you have to change the SBD program to improve its delivery to customers such as yourself?

Record Answer Verbatim:_____

Do not Read! Either this person or another member of the design team can answer the next five questions. If you feel someone else is more qualified to respond please make a note of it after completing the questions (if the person is able to answer). Have the more qualified person respond to questions, most likely a design team member.

Q30. Let's talk about specific energy efficiency measures included in your project. Did the SBD incentive play a role in influencing you to install the energy efficient measures contracted under the program? **ASK FOR EACH MEASURE LISTED ON MEASURE SHEET. RECORD RESPONSES ON MEASURE SHEET.**

	Definitely Influenced	Possibly Influenced	Did Not Influence
[Measure]	1	2	3

Q31. Which, if any, of these measures would you have installed if the incentives offered through the program were not available? **ASK FOR EACH MEASURE LISTED ON MEASURE SHEET. RECORD RESPONSES ON MEASURE SHEET**

Q33. Have you built any buildings in the recent (recent = last 5 years) past that we could use to compare your construction practices to on this project?

01 Yes

02 No (Skip to Q36)

98 Don't know

99 Refused

Q34. Prior to building this facility, which of these energy efficient measures, if any, have you installed previously? **ASK FOR EACH MEASURE LISTED ON MEASURE SHEET. RECORD RESPONSES ON MEASURE SHEET**

	Yes	No
Measure	1	2

❑ ***No previous construction experience***

(IF NO TO ALL SYSTEMS, Skip to Q36)

Q35. Did you receive any outside funding for these previous energy efficient designs or equipment choices, including other utility program incentives?

01 Yes, Source of funding_____

02 No

98 Don't know

99 Refused

Q36. Would you install efficiency measures similar to those at this facility in the future without an incentive from your utility? **ASK FOR EACH MEASURE LISTED ON MEASURE SHEET. RECORD RESPONSES ON MEASURE SHEET.**

	Definitely	Probably	Definitely Not
MEASURE	1	2	3

Why?

❑ *AS A RESULT OF WHAT YOU HAVE LEARNED IN PAST UTILITY EFFICIENCY PROGRAMS,*

❑ *BECAUSE ITS OUR STANDARD PRACTICE*

❑ *AS A RESULT OF WHAT WAS LEARNED IN THIS PROGRAM*

❑ *BECAUSE THIS QUALITY OF FACILITY IS DESIRED AGAIN*

❑ *OTHER*_____

Q37. Did the Design Team receive a Design Team Incentive on this project?

01	Yes	
02	No	
98	Don't Know	**Name:**_____
99	Refused	**Phone:**_____

Comments:_____
_____

Q38. Could you give me the name and number of the best person to speak with about this project who was a part of the project design team? **Indicate who the person is.**

Construction Manager

Name:_____

Company:_____

Phone**: (**_____**)**_____**-**_____

Architect

Name:_____

Company:_____

Phone**: (**_____**)**_____**-**_____

Engineer

Name:_____

Company:_____

Phone**: (**_____**)**_____**-**_____

Thank you, this concludes our interview. Do you have any questions before we finish?

Non-Participants Design Team Survey

Non-participants

Design Team Questions (Architect/Engineer)

Name:_____ Position:_____

Q1. Are you familiar with Savings By Design?

01 Yes

02 No (Skip to Q4**)**

98 Don't Know **Name:_____**

99 Refused **Phone:_____**

If not yes, explain. *"Savings By Design" is the name of an energy efficiency program run by your utility company. It aims to improve the energy efficiency of nonresidential new construction projects."*

Q2. Were you aware that Design Team Incentives may have been available to your team on [project]?

01 Yes

02 No (Skip to Q4**)**

98 Don't Know **Name:_____**

99 Refused **Phone:_____**

Q3. What were your reasons for not pursuing the SBD Design Team Incentive?

Record Answer Verbatim:_____

Q4. If you had been aware that Design Team incentives were available to you on this project, how likely is it that you would have pursued those incentives by designing your project to perform better than Title 24 by at least 15%?

01 Very unlikely (Why?)

02 Somewhat unlikely (Why?)

03 Neither likely nor unlikely
04 Somewhat likely
05 Very likely
98 Don't know
99 Refused

Why:_____

Q5. SBD also offers Design Assistance and Design Analysis during the early stages of building design. These components of the SBD program provide technical, financial, and energy analysis to help enhance the energy efficiency of the building design. Had you been aware of the SBD program how likely is it that you would have pursued this component of SBD?

01 Very unlikely (Why?)
02 Somewhat unlikely (Why?)
03 Neither likely nor unlikely
04 Somewhat likely
05 Very likely
98 Don't know
99 Refused

Why_____

Q6. During the design of this building did you use a computer simulation model to optimize and enhance the energy performance of this building?

01 Yes
02 No
98 Don't Know
99 Refused

Q7. Is this standard practice or at the request of your clients?

01 Standard Practice
02 Request of Clients
03 Other
98 Don't Know
99 Refused

Q8. When and why did you begin using energy simulation models to optimize and enhance the energy efficiency of your building's designs?

_____
_____
_____
_____

Q9. Does your firm advertise energy efficient design practices?

01 Yes
02 No
98 Don't Know
99 Refused

Q10. Does your firm advertise Integrated Design?

01 Yes
02 No
98 Don't Know
99 Refused

(Example of Integrated Design, One common example of an Integrated Design is when the building HVAC system has been sized according to the installed lighting design and building size, rather than only basing the size of the HVAC system on building size.)

Thank you, this concludes our interview. Do you have any questions before we finish?

Non-Participants Owners Survey

Non-participant Building Owner Survey

RLW_ID: _____

Project: _____

Project Address: _____

Contact Log

	Date	Time	By	Who	Result	Comment
1						
2						
3						
4						
5						
6						

Q1. Was this building constructed and owned by a private company or a public agency?

01 Private company

02 Public agency

98 Don't Know

99 Refused

Q2. Was this building constructed to be occupied by the owner of the building, or built by a developer with the intent to lease space?

01 Built to be Owner Occupied

02 Built by a developer with the intent to lease space

03 Built and occupied by developer with intent to lease remaining space

100 Don't Know

101 Refused

Q3. When this building was constructed, what would you say was the most import financial criteria used to make energy efficient investments?

01 Lowest first cost

02 Lowest lifetime cost

03 Simple Payback

04 Return on Investment

05 Net Present Value

06 Other_____

07 None

98 Don't Know

99 Refused

Q4. Did this building use a set of prototype plans?

01 Yes

02 No

98 Don't Know

99 Refused

Q5. Approximately what percentage of your O&M costs are for energy?

ENTER NUMBER:_____

98 Don't Know

99 Refused

Design and Construction Practices

Q6. Did you use an independent architect or designer for this building, i.e., one not employed by the construction firm or general contractor?

01 Yes
02 No
50 Other: _____

_____

_____

98 DK
99 Refused

Q7. In selecting the Design Team (e.g., architect, engineer) (or general contractor if No on Q6), did you consider qualifications in energy efficiency? **(If yes then explain)**

01 Yes (Explain)
02 No
98 DK
99 Refused

Explain: _____

_____

_____

Q8. Did you ask the members of your design team to consider energy efficiency beyond Title 24 requirements? **(If yes then explain)**

01 Yes **(Explain)**
02 No
98 DK
99 Refused

Explain: _____

_____

_____

Q9. Are you familiar with the practice of designing new buildings using an Integrated Design approach? **(If yes then explain)**

01 Yes (Explain)
02 No
98 DK
99 Refused

Explain: _____

_____

_____

(Example of Integrated Design, One common example of an Integrated Design is when the building HVAC system has been sized according to the installed lighting design and building size, rather than only basing the size of the HVAC system on building size.)

Q10. Did you ask the architect or designer to follow an Integrated Design approach? **(If yes then explain)**

01 Yes **(Explain)**
02 No
98 DK
99 Refused

Explain: _____

_____

_____

Q11. Did you solicit competitive bids for the construction of this project?

01 Yes
02 No
98 DK
99 Refused

Q12. Were initial energy-efficiency features changed through value engineering, substitutions or competitive bidding? **(If yes then explain)**

01 Yes **(Explain)**
02 No
98 DK
99 Refused

Explain: _____

_____

_____

Q13. Did you hire an independent construction manager or commissioning agent to help ensure that the final building was in line with the original design intent?

01 Yes
02 No
98 DK
99 Refused

Energy Attitudes

Q14. How would you describe the level of importance of energy efficiency when your company built this building?

01 Very unimportant
02 Somewhat unimportant
03 Neither important nor unimportant
04 Somewhat important
05 Very important
98 Don't know
99 Refused

Q15. How would you describe the level of importance of energy efficiency in the daily operation of this building?

01 Very unimportant
02 Somewhat unimportant
03 Neither important nor unimportant
04 Somewhat important
05 Very important
98 Don't know
99 Refused

Q16. Does your company have any policy on energy management?

01 Yes
02 No **(Skip to 0)**
98 Don't know **(Skip to 0)**
99 Refused **(Skip to 0)**

Q17. What is your company's policy on energy efficiency? **(record verbatim response)**

Q18. Is the energy performance of the company used in the review of anyone's performance or compensation?

01 Yes

02 No

98 Don't know

99 Refused

Energy Performance

Q19. When this building was built, would you say it…

01 Was just efficient enough to comply with the energy code
02 It was a little better than required by the energy code
03 It was much better than required by the energy code
98 Don't know
99 Refused

Q20. How would you describe the energy performance of this building?

01 It could be much more efficient than it is
02 It could be somewhat more efficient than it is
03 The building is about as efficient as it can be
04 This building is an example of energy efficiency for others to follow
98 Don't know
99 Refused

SBD Questions

Q21. Were you aware of «Utility»'s Savings By Design New Construction energy efficiency program before you began construction?

01 Yes

02 **No** (Skip to Q25)

98 Don't Know

99 Refused

Q22. What were your reasons for not participating in the SBD program?

Record Answer Verbatim:_____

Q23. Did you have any interaction with your utilities New Construction program representative or Savings By Design program material regarding the design and equipment specification on this project?

01 Yes

02 No (Skip to Q25)

98 Don't Know

99 Refused

Record Answer Verbatim:_____

Q24. Please rate the level of influence the new construction rep or program material had on your design and equipment choices for the following end-use categories.

	Definitely Influenced	Possibly Influenced	Did Not Influence
End Use 1	1	2	3

End Use 2	1	2	3
End Use 3	1	2	3
End Use 4	1	2	3
End Use 5	1	2	3
End Use 6	1	2	3

Q25. If you had been aware that cash incentives were available to you on this project, how likely is it that you would have pursued those incentives by designing your project to perform better than Title 24 by at least 10%?

01 Very unlikely

02 Somewhat unlikely

03 Neither likely nor unlikely

04 Somewhat likely

05 Very likely

98 Don't know

99 Refused

Q26. Have you built any buildings in the recent past that we could use to compare your construction practices to on this project?

01 Yes

02 No **(Skip to Q30)**

98 Don't know

99 Refused

Q27. Please rate your level of interaction with «Utility» New Construction efficiency program staff during the design and equipment selection of those projects before this building was designed.

	Significant Interaction	Some Interaction	No Interaction
End Use 1	1	2	3
End Use 2	1	2	3
End Use 3	1	2	3
End Use 4	1	2	3
End Use 5	1	2	3
End Use 6	1	2	3

If no interaction skip to Q30

Q28. Did the <u>prior</u> interaction influence the design and equipment choices of this project.

	Definitely Influenced	Possibly Influenced	Did Not Influence
End Use 1	1	2	3
End Use 2	1	2	3
End Use 3	1	2	3
End Use 4	1	2	3
End Use 5	1	2	3
End Use 6	1	2	3

If no influence skip to Q30

Q29. What would have been done in absence of this influence?

Installed Measure	Measure Installed In Absence of Influence
End Use 1	
End Use 2	
End Use 3	
End Use 4	
End Use 5	
End Use 6	

Q30. Could you give me the name and number of the most influential member of your project design team?

Architect

Name:_____

Company:_____

Phone**:** (_____)_____-_____

Engineer

Name:_____

Company:_____

Phone**:** (_____)_____-_____

Construction Manager

Name:_____

Company:_____

Phone**:** (_____)_____-_____

Thank you, this concludes our interview. Do you have any questions before we finish?