

BUILDING MECHANICAL EQUIPMENT
INVENTORY, INSPECTION AND PREVENTIVE MAINTENANCE PROCEDURES

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9. AIR HANDLING SYSTEMS (Equipment #4)	1.01 This section establishes procedural standards for inventory, inspection and routine preventive maintenance of building mechanical equipment (BME) as follows:
10. HEATING SYSTEMS (Equipment #5)	a. A standard Southwestern Bell Telephone Company (SWBT) num- bering plan is established for all BME systems, as well as facilities to supplement the SWBT number with a four-digit local number.
11. DOMESTIC WATER SYSTEMS (Equipment #6)	b. A standard inventory form is established for each numbered BME system.
12. SANITARY PLUMBING SYSTEMS (Equipment #7)	
13. STANDBY POWER SYSTEMS (Equipment #8)	
14. FIRE PROTECTION SYSTEMS (Equipment #9)	

<p>c. Standard routine work "tasks" and frequencies are established for each numbered BME system and their major components. These tasks are further described in the Preventive Maintenance Procedures Handbook.</p>	<p>09 10 11 12 13 14</p>	<p>Fire Protection Fire Detection Electrical Distribution Vertical Transportation Building Alarm Miscellaneous</p>
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1.02 Whenever this section is reissued, the reason(s) for reissue will be given in this paragraph.

1.03 The standards outlined in this practice will be used as the basis for force sizing, force management, productivity evaluation, life cycle costing and system trouble analysis.

2. IDENTIFICATION OF BUILDING MECHANICAL EQUIPMENT SYSTEMS

2.01 In order to provide a standard method for grouping and inventorying, fourteen BME systems have been assigned "Equipment Numbers" as follows:

<u>EQUIPMENT NUMBER</u>	<u>SYSTEM</u>
01	Environmental Cooling
02	Condenser Water
03	Chilled Water
04	Air Handling
05	Heating
06	Domestic (Potable) Water
07	Sanitary Plumbing
08	Standby Power

2.02 During the inventory process, each major piece of equipment in a system shall be identified with an appropriate label showing the equipment number assigned. The SWRT standard number consists of four digits. The first two will be the above mentioned "equipment" numbers, the second two will identify additional systems in the same category. For example, the first "Air Handling" system inventoried would be numbered 04-01, the next system would be 04-02 and so on. The use of this numbering system allows for the addition of BME in a building without breaking the numerical sequence or renumbering existing BME.

2.03 In addition to the four-digit SWRT standard equipment number, there are four supplemental spaces reserved for local Building Operations use. They may be used to detail the type and/or location of equipment as locally desired.

2.04 The numbers placed on the various BME shall be large enough to be easily visible from normal working areas. Several suitable numbering methods are available such as stencils, lamacoid plates, decals, etc. Common sense should be used when attaching these numbers. For

example, an air conditioning system with all of its components in sight from one place would most likely only need the application of its number in one place. On the other hand, if it had a remotely located air cooled condenser, then both the condenser and the associated air conditioning unit would require the same equipment number to be attached.

<u>System Number</u>	<u>Form Number</u>
06	BS-566F
07	BS-566G
08	BS-566H
09	BS-566J
10	BS-566K
13	BS-566N
14	BS-566O

3. FORMS, DESCRIPTION

3.01 The following standard forms have been developed for use with this practice.

3.02 BUILDING MECHANICAL EQUIPMENT INVENTORY RECORD - FORM NUMBER BS-566 AND BS-566A THROUGH BS-566O

These documents will be used when performing the equipment inventory. They allow for customizing the various inspection and maintenance tasks to the specific system being inventoried. Detailed preparation and distribution instructions are provided in Section 4 of this practice. It should be noted that the forms associated with Equipment Numbers 11 and 12 are of a different format which provides for inventory only and not preventive maintenance procedures. The following specific form numbers are related to the individual systems as follows:

<u>System Number</u>	<u>Form Number</u>
01	BS-566A (2 pgs.)
02	BS-566B
03	BS-566C
04	BS-566D
05	BS-566E (2 pgs.)

A blank form is also available - BS-566

3.03 BUILDING MECHANICAL EQUIPMENT PREVENTIVE MAINTENANCE SCHEDULE - FORM NUMBER BS-610 (ALSO KNOWN AS FORM E-10)

This form, which has fifty two vertical columns (one for each week of the year), is prepared from the assignment forms mentioned in the previous section. This document is used to schedule all preventive inspection and maintenance tasks by frequency in each building. Detailed preparation, distribution and use instructions are provided in Section 5 of this practice.

3.04 Nomenclature used on the inventory forms is generally accepted throughout the trades involved. Some local variations may exist. However, experienced inventory personnel will generally comprehend the intent of the form.

4. INVENTORY PROCESS - FORM BS-566

4.01 Inventories should be completed by individuals familiar with buildings and building mechanical equipment systems. It may be desirable to review the mechanical plans for a building prior to and while performing the actual inventory to assure that equipment is not overlooked.

4.02 In general, it will probably be desirable to inventory all equipment in a building on a systems basis; that is, complete all Equipment Number 01 inventory sheets before proceeding to Equipment Number 02, etc. Exhibits of forms 566 and 566A through 566O are found in Attachment 1 at the back of this practice.

4.03 After selecting the appropriate inventory record form, the first step is to assign an equipment number to the system and enter this number in the space provided. See Section 2.02 for instructions on assigning equipment numbers.

4.04 The name of the building in which the system being inventoried is located should be entered in the space provided.

4.05 The year the system being inventoried was installed should be entered in the space provided. If an inordinate amount of time is required to determine this information, enter "UNK" in this space.

4.06 The "Area Code" blank shall always be filled in with the number assigned to the building itself by the Comptrollers force. These numbers are referred to by various designations -- for example, "geographic location code", "land and building code", etc.

4.07 In order to accomplish a uniform, comparative inventory, the following guidelines must be followed. It is important that one "system" results in only one

equipment number. For example, assume that a building had four (4) package air conditioners each containing two or more compressors with air cooled condensers. These systems would be numbered 0101, 0102, 0103 and 0104. The four associated air cooled condensers would be labeled with the same numbers; thus, the new result would be four (4) inventoried systems.

4.08 Next, enter the number (amount) of each item that exists on the system being inventoried. It is important to account for each and every item that is listed on the inventory form. If an item that requires preventive maintenance and inspection is included in the system under inventory but not preprinted on the form, or included in a related task, you should write it in in one of the vacant spaces provided on the form. The location of items that are not found in the same place as the main system should be entered in the "Notes/Location" column. Realizing that space is limited in this column, you may simply enter "See Note 1" and enter your note on the reverse side of the form in the space provided. If there is any unusual circumstance noticed while performing the inventory, such as the need for a special tool or test equipment, or an inherent safety hazard, etc, enter this information on the reverse side of the inventory form. Relate this information to the task number that it applies to. This note will then be carried forward, so the craftsperson can be informed while being dispatched on this task. When all system items are inventoried, the field portion of the inventory is complete. Before any other

entries are made on the form, a copy should be made and retained in the building for use by the craftsperson performing preventive maintenance tasks.

4.09 Before proceeding with the balance of form preparation, it is a good idea to use a highlighter-type pen through each line on the form that contains an entry in the "Number of Items" column. You will notice that the form has columns provided to assign up to five "tasks" for each item. An "SSV" (System Standard Value) column precedes each task column. Multiply the number of items times the preprinted number in the SSV column and enter the product in the appropriate space in the task column. (If an item contains a preprinted number in more than one task column, the calculation must be made separately for each task.) Some spaces on the form have been shaded. This is intentional. It does not mean that the item related to that space does not require inspection. It does mean that the time to perform that inspection is included with another item, or that the time required to perform the inspection is negligible. Do not enter numbers in any space that has been shaded.

4.10 Items that were written in during the inventory shall not have a SSV assigned to them if they are to be included in a task that has a preprinted number in the task column. However, their inspection and maintenance can be included with the regularly assigned task through the use of a locally devised method. For example, if a central air conditioning system contained an hour meter and local management desired it to be

read on a weekly basis, the following procedure should be followed. Enter the number "1" in the Item Column of the BS-566-A form, write "Meter, Hour" in the Item Column and make no other entries on the form. The method of instructions to the craftsperson to read and record the meter readings must be locally devised. This procedure shall in no way affect the preprinted SSV for the 001 task. Effort should be made to use this method to accomplish local needs rather than through the "Local Instruction" method described in the next paragraph.

4.11 If it is desired to assign "Local Instruction" tasks with locally estimated "SSVs," the following procedure should followed. Both the decision to use this method and the SSV estimates should be the result of a consensus of opinion by the technical experts within the Building Operations group. The number of items and the identity of the item will be written in as described in the previous paragraph. The locally estimated SSV should then be entered in a spare SSV column (use a blank form BS-566 if required). Assign a local task number entered into the space provided at the top of the column. The local task number must be prefixed with the capital letter "L." The total L task value can then be computed as described in Paragraph 4.13 below. The L prefix must be carried forward to the Maintenance Schedule (Form BS-610, E- well as the Force Load and Availability Sheet (Form BS-652, E3). This procedure is necessary due to the fact that L designated preventive maintenance tasks are separately tracked and measured. At the present time, an SSV of "1" should represent one tenth of an hour (six minutes) of estimated performance time.

4.12 A description of each Local Instruction routine, along with its identifying number, shall be on file in the Building Operations office.

4.13 To calculate the "total task value," add each "task" column vertically and enter the sum in the space provided.

4.14 The building copy of all the BS-566 forms should be put in a binder that is kept in a specific location. The binder location must be known to the Building Operations operator so that the craftsperson can be advised of its location when required.

5.0 PREVENTIVE MAINTENANCE
SCHEDULE - Form BS-610, E-10

5.01 This form, titled "Preventive Maintenance Schedule" (Form BS-610, E-10), is prepared using the BME Inventory Record (Form BS-566) as the source document. An example of this form is found in Attachment 2. Its proper preparation is vital to a smooth dispatch operation from the Building Operations group. It should be noted that an entire craftsperson's "route" must be consulted, so as to equalize the estimated preventive maintenance hours for each week of the year.

5.02 The original of this form should be prepared using a soft lead pencil. This will facilitate making additions and deletions in the future.

5.03 Enter the appropriate sheet number, building name and area code in the spaces provided. Next, enter the equipment number for the system which is being scheduled. Then on consecutive lines,

starting with the least often frequency, enter each task number that is related to that system. A description of each required task may be found in the Preventive Maintenance Procedures Handbook.

Skip a line between each piece of equipment. Check the reverse side of the BS-566 form to determine the need for any special dispatch information. If there is special information the craftsperson should be advised of before dispatch, enter a check in the "Special Information" column. Next, enter that special information, related to the Equipment and Task number, on the bottom or reverse side of the E-10 form. This information will be used by the dispatcher to inform the craftsperson of the need for a special tool, test equipment, etc.

5.04 Next, enter the appropriate task total value for each task in the Estimated Time column. The next step is to enter the estimated time in each week number column that it is desired to have that task number achieved. Generally, the less frequent tasks contain the work required on the more frequent tasks. Therefore, there is no need to assign a monthly, quarterly and semi-annual task to the same system to be performed at the same time. For example, on Equipment #4, Air Handling Systems, starting in January, assign monthly Task #029 for two months, then in March assign a quarterly Task #053. April and May should be assigned the monthly Task #029, then the semiannual Task #077 would be assigned in June. The monthly Task #029 would be assigned for July and August, and another quarterly Task #053 in September. The monthly task in October and November, and then the annual

Task #121 along with a semiannual Task #077. Of course the starting month for the assignments will not always be in January. This amounts to eight monthly tasks, two quarterly tasks, two semiannual tasks and one annual task to cover an entire year of inspection and maintenance. It is imperative to keep in mind that the weekly hours of preventive maintenance be kept somewhere near even. The numbers for estimated time at this point represent tenths of hours. That is to say that a number "21" in one of these spaces represents two and one tenths (2.1) estimated hours of preventive inspection and maintenance effort (I&M).

It is important to remember while assigning tasks, that they be assigned only when it is anticipated that the equipment will be in operation. For instance, air conditioning operational tasks would not be assigned during the winter months if that equipment is normally shut down. The normal frequencies of the tasks can usually be determined by their numbers as follows: 001 to 025 weekly, 026 to 048 monthly, 050 to 074 quarterly, 075 to 099 semiannually. Task 049 is a bimonthly task assigned to Equipment Number 10; 100, 200, 500 series tasks are 1, 2, 5 year frequencies, etc.

5.05 On systems that contain start-up and shutdown tasks and that run year-round, caution must be exercised to determine that all required inspection and maintenance will be performed. It may be necessary to assign the start-up and shutdown tasks to fulfill that need. In the following list, the task numbers that appear after the task description indicate which inspection and maintenance functions are included in the primary task. Therefore, there is no need to assign more than one of those tasks at the same time.

Equipment Number One - Air Conditioning Systems

Central Systems (Reciprocating or Centrifugal)

Task #

001 Monthly I&M - Assign to individual compressors 75 ton and over only
 051 Quarterly I&M 001
 100 Annual Start-up 001, 051
 101 Annual Shutdown
 102 Annual I&M (assign during shutdown period)

Central Systems (Absorption)

Task #

001 Monthly I&M
 057 Quarterly I&M 001
 080 Semiannual I&M 001, 057
 107 Annual Start-up
 108 Annual Shutdown
 109 Annual I&M (assign during shutdown period)

Package Units

Task #

001 Monthly I&M (individual compressors 75 ton and over only)
 027 Monthly I&M of humidifier
 052 Semiannual I&M 027
 101 Annual Shutdown
 110 Annual Start-up 052, 027
 111 Annual I&M (assign during shutdown period)
 500 5 Year Fire Damper I&M

Window Units

Task #

112 Annual I&M

Equipment Number Two - Condenser Water Systems

Task #

028 Quarterly I&M
 113 Annual Start-up 028
 114 Annual Shutdown
 115 Annual I&M (assign during shutdown period)
 116 Condenser Cleaning

Equipment Number Three - Chilled Water Systems

Task #

026 Quarterly I&M
 117 Annual Start-up 026
 118 Annual I&M (assign during shutdown period)
 119 Annual Shutdown

Equipment Number Four - Air Handling Systems

Task #

029 Monthly I&M
 077 Semiannual I&M 029
 121 Annual I&M 029, 077
 500 5 Year Fire Damper I&M

Equipment Number Five - Heating Systems

Task #

002 Monthly I&M
 030 Quarterly I&M 002
 122 Annual I&M (Boiler Waterside)
 123 Annual I&M (Boiler Fireside)
 125 Annual Start-up 002, 030
 126 Annual Shutdown

NOTE: Recognizing that many heating plants are operated under the jurisdiction of state and local codes, the above tasks and frequencies may have to be altered. There is no intent to schedule weekly I&M on all boilers. Local knowledge of individual heating systems should be used to determine the proper frequencies. Generally, the minimum frequencies for steam boilers should be monthly and for hot water boilers, quarterly. Task 122 may be scheduled every 3 years for hot water heating boilers if locally permissible. The above tasks are meant to be applied only to low pressure heating boilers and hot air furnaces. High pressure steam boilers should be operated and maintained as required by local codes and safe working practices.

Equipment Number Six - Domestic Water Systems

Task #

054 Quarterly I&M
 076 Semiannual I&M 054
 103 Annual I&M 054, 076

Equipment Number Seven - Sanitary Plumbing Systems

Task #

- 055 Quarterly I&M
- 078 Semiannual I&M 055
- 105 Annual I&M 055, 078

Equipment Number Eight - Standby Power Systems

Task #

- 033 Quarterly I&M
- 106 Annual I&M 033

Equipment Number Nine - Fire Protection Systems

Task #

- 034 Monthly I&M
- 056 Quarterly I&M 034
- 079 Semiannual I&M 034, 056
- 120 Annual I&M 034, 056, 079
- 200 2 Year I&M
- 501 5 Year I&M
- 1200 12 Year I&M
- 1500 15 Year I&M
- 2500 25 Year I&M

Equipment Number Ten - Fire Detection Systems

Task #

- 049 Semiannual I&M
- 124 Annual I&M
- 400 4 Year I&M

Equipment Number Eleven - Electrical Distribution Systems

Note: Inspection and maintenance procedures for this system are not provided by this practice.

Equipment Number Twelve - Vertical Transportation Systems

Note: Inspection and maintenance procedures for this system are not provided by this practice.

Equipment Number Thirteen - Building Alarm Systems

Task #

- 037 Quarterly Operational Test

Equipment Number Fourteen - Miscellaneous Systems

Note: Inspection and Maintenance tasks must be locally devised. All task numbers used in this system must be prefixed with the capital letter L."

5.06 When the tasks are all scheduled, the schedule(s) for each building must be totaled. The number of tasks per week is developed by adding one in each vertical column that contains a number in a block (space) and entering the total in the space provided at the bottom of each column. Next, add the numbers in each vertical column and enter the sum in space provided at the bottom of each column. Then add each "total" column horizontally and enter the sums in the spaces provided. Using a blank Schedule form, add all the totals from the various pages of the Preventive Maintenance Schedule for the building, and enter the sums in the appropriate spaces. When completed, this form will show, by week number, the number of tasks and the estimated performance time (in tenths of an hour). When the estimated time is entered in the "Estimated Hours Per Year" space, the number should be divided by ten and entered as "hours" for the first time.

This, of course, is accomplished by simple adding a decimal point one place to the left to the sum of the numbers in the weekly hour spaces. (Example: 2247 becomes 224.7 hours.)

5.07 The completed document(s) should be photocopied, the original filed and the copy used for preparation of the Force Load and Availability forms. Future schedule changes should be made to the original and new copies made.

6.0 ENVIRONMENTAL COOLING SYSTEMS Equipment #1

6.01 This inventory record form consists of two pages, page one for central systems and page two for package and window units. A central system consists of refrigeration equipment that does not contain its own air handling equipment. The exception to this would be small (under 75 ton) remotely located air cooled condensing units that supply a dx coil in a fan coil unit. These should be inventoried as a package unit. Central systems may be of the reciprocating, centrifugal or absorption type. Where more than one compressor serves the same chiller or coil bundle, only one inventoried system exists. An example of this type central system would be a factory packaged chiller containing one chiller, three compressors and one condenser. The unit would be inventoried as one inventoried system. Conversely, three compressors, each containing its own chiller, supplying a common chilled water system would be inventoried as three inventoried systems.

6.02 Package units normally contain their compressors, condensers (water cooled), coil, fan and controls in one factory packaged enclosure. Air cooled package units are the same with the exception of a remotely located air cooled condenser. As mentioned in the above paragraph, an exception to this would be the type of system that contains two packages: one being a fan coil unit, the other being a condensing unit (usually air cooled) that is remotely located. This type unit is normally supplied as one system with two enclosures. A package unit that contains all its components in addition to a gas or oil fired heat exchanger should be inventoried as a package unit. The associated heating equipment should be written in on the inventory record and the required tasks assigned from equipment number five.

6.03 Window units, through the wall units, console units, etc, are generally easy to classify. The small heat pumps that are comparable in size to this type unit should also be inventoried in this category. In buildings where large numbers of window units exist, it is not necessary to prepare an inventory sheet for each unit. The total number of units existing must be entered in the "number of items" column. Then, on the reverse side list the location and specific equipment number for each unit. Each unit must be numbered individually. See Section 2.02.

7.0 CONDENSER WATER SYSTEMS Equipment #2

7.01 Normally, there will be a cooling tower or evaporative condenser constituting the base for this system. Two exceptions to this would be a system

that contained a water cooled condenser supplied with domestic water to waste or a system that is using well (or pond) water supplied by a pump. Where more than one cooling tower is serving the same condenser piping loop, the following inventory method should be used. Assign a system number to one tower (02-01), inventory that tower and all the common system items. The next tower on the same system would then be assigned a system number (02-02) and only the items related to that tower would be inventoried such as the tower, fan, fan controller, float valve, etc. All of the condensers should be inventoried with the common equipment system. Their individual location may be listed on the reverse side of the inventory record.

8.0 CHILLED WATER SYSTEMS Equipment #3

8.01 This system includes all pumps, coils, controls and associated items that relate to a common chilled water piping loop. It is possible that more than one Environment Cooling System (Equipment #1) supplies chilled water to one chilled water system. In some cases, there may be one or more pumps that can be valved to circulate either chilled water or condenser water. These pumps may be inventoried on either Equipment #2 or #3 as long as they are inventoried on only one system. In other cases, a common pump may circulate chilled water in the cooling season and heated water in the heating season. These pumps may be inventoried on either Equipment #3 or #5 as long as they are inventoried on only one system.

9.0 AIR HANDLING SYSTEMS Equipment #4

9.01 Primarily, this system includes fans of all kinds, except those in package A/C units. Since it is "systems" that are being inventoried, some thought must be expended to relate individual fans to the system, if any, to which they are associated. Assume a typical system with a supply air fan, a return air fan and an exhaust air fan all connected to the same duct work system. They would result in one inventoried system. A through-the-wall exhaust fan that is not connected by duct work, but is connected to the main air handling system by controls should be included in the inventory of the main air handling system. Again, this would result in one inventoried system. If the same through-the-wall exhaust fan was not either duct work or control wise connected to the main air handling system, it would be assigned a separate equipment number. Eliminate all PM work from fractional horsepower (less than 1 HP) exhaust fans such as those found in restrooms, lounges, conference rooms, etc.

Fan coil units are easily identified. They often contain a fan, chilled water coil and filters, sometimes a humidifier. An exception to this would be the type of system described in the definition of Environmental Cooling Systems, where a fan coil unit dx coil is supplied by a remote condensing unit. This type equipment would be inventoried as a package unit (Equipment #1). Wall mounted humidifiers should be inventoried as a component of the air handling system that supplies the space where they are installed, not as a separate system.

Usually, kitchen and toilet exhaust fans will result in one inventoried system for each fan. The exception to this would be if multiple fans were connected to the same duct work. In this case, the "system" would be considered the duct work and the fans would be inventoried under one "system" number.

Control air compressors should be inventoried as a component of a system they serve, not as a system in themselves.

10.0 HEATING SYSTEMS
Equipment #5

10.01 This inventory record form consists of two pages. The nomenclature in the "item" column is the same on both pages. Therefore, it is helpful to insert carbon paper between the two pages before performing the physical inventory. The carbon should be removed as soon as the entries in the "item" column are completed.

The following items on this inventory record may constitute a "system": A heating boiler, a hot air furnace, a "fired" space heater or a space heater (with fan) that contains an electric heating element. A unit heater (unfired) should be inventoried as a component of the system that supplies its heating medium (steam or hot water). Where installations contain more than one boiler (steam or hot water) connected to the same piping system, the following inventory method should be used. Inventory the first boilers (05-01) equipment and all the components common to the system as a part of one system. Assign an additional Equipment # (05-02) to the second boiler and inventory only those components that are unique to this boiler. A third boiler and so on would be treated the same as the second boiler.

11.0 DOMESTIC WATER SYSTEMS
Equipment #6

11.01 Each domestic hot water heater should be inventoried as a separate system. Hot water circulating pumps should be a component of a system unless the water they circulate is supplied by a coil (or other heat exchanger) from a heating boiler, the pump(s) would then constitute the basis for an inventoriable system.

Do not include drinking water coolers in the PM program. Central systems should be classified as a miscellaneous system and appropriate local instruction tasks may be provided.

Water supply pump(s) should be inventoried as only one system if there is one water storage tank and water distribution system. A water conditioner or air compressor would be a component of an inventoried system. Water conditioners and softeners should be classified as miscellaneous systems and appropriate local instruction tasks may be provided.

12.0 SANITARY PLUMBING SYSTEMS
Equipment #7

12.01 For both sewage ejectors and sump pumps, the determination of "system" is made by the number of pits (sumps). That is, two pumps in one pit is one system. Air compressors should be inventoried as a component of the "system" they serve. Floor drain traps not related to a building sump pit should be inventoried as a "system." That is, one system for all floor drains that requires periodic attention. The floor drain traps associated with inventory are intended to cover only those seldom used traps that, if dry, could allow sewer gas to enter the building from the sanitary sewer system.

13.0 STANDBY POWER SYSTEMSEquipment #8

13.01 All emergency battery-powered lights that are maintained by Building Operations should be inventoried as one system in each building. Emergency generator sets that are maintained by Building Operations should also be inventoried in this system; these will require the "write-in" procedure and the assignment of "local instruction" tasks.

14.0 FIRE PROTECTION SYSTEMSEquipment #9

14.01 A standpipe and sprinkler system that shares common piping should be inventoried as one system. If the piping (other than basic supply) is separate, each system should be separately inventoried. The fire pump (if any) should be inventoried as a component of a system.

Each extinguisher system (Halon 1301 or CO₂ flooding) should be inventoried as a separate system.

Portable fire extinguishers should not be included in this inventory.

Fire shutters (do not confuse with fire dampers) should be inventoried as one system for the entire building.

15.0 FIRE DETECTION SYSTEMSEquipment #10

15.01 The determination of what constitutes one system is based on what terminates to a common panel. If all detectors, zones, etc, terminate at one common panel, there is only one inventoried system in the building.

16.0 ELECTRICAL DISTRIBUTION SYSTEMSEquipment #11

16.01 The inventory record for this system consists of two pages. The first covering the main entrance equipment; the second, an inventory of branch distribution panels. The maintenance and inspection of this equipment should be performed per manufacturer's recommendations.

17.0 VERTICAL TRANSPORTATION SYSTEMSEquipment #12

17.01 This inventory record is designated to be applied to one elevator. Therefore, each elevator in a building will be one inventoried system. The maintenance and inspection of this equipment should be performed per manufacturer's recommendations and applicable local codes.

18.0 BUILDING ALARM SYSTEMSEquipment #13

18.01 Generally, all building equipment/environment alarms in a building will be inventoried as one system. The exception to this would be when the alarms do not share common transmittal equipment.

19.0 MISCELLANEOUS SYSTEMSEquipment #14

19.01 This record is to be used to inventory equipment that requires periodic inspection and maintenance that cannot be included in systems one to thirteen. All task related to this equipment will be local instructions. Therefore, all task numbers must be preceded with the capital letter "L". (See 4.11)



Building Mechanical Equipment Inventory Record

BS-566-A
(11-80)

Environmental Cooling System Package

Building Name		Area Code	Year Installed				Equip. No.					
							System		Local			
							0	1				
No. Of Items	Item	Notes/Location	SSV	Task 027	SSV	Task 052	SSV	Task 101	SSV	Task 111	SSV	Task 110
	Unit, Package A/C*				1				4		5	
	Compressor											
	Open Type						7		4		2	
	Semi-Hermetic						10		4		2	
	Hermetic (Can type)						10				2	
	Motor, Comp., Drive											
	Open Type								4			
	Belts, Drive (Sets)	SSV = 1 Per Set		1							1	
	Thermostat			1							1	
	Control, Capacity										1	
	Switch, Oil Failure										1	
	Switch, Hi-Lo Pressure										1	
	Switch, Lo Pressure										1	
	Switch, Hi Pressure										1	
	Relay, Time Delay											
	Mtr./Brg. Temp. Sensor											
	Time Clock			1							1	
	Fan, Air											
	Motor, Fan								3			
	Belts, Drive (Sets)	SSV = 1 Per Set									1	
	Firestat										1	
	Freezestat (Duct)										1	
	Damper, Mtrizd./Grav.										1	
	Valve, Power Oper.								1		1	
	Filter, Air	SSV = 1 Per Bank		1		1						
	Pump, Condensate			1					1		1	
	Humidifier		1	1							1	
	Humidstats		1	1							1	
	Condenser, Air Cooled			1		3			1		1	
	Motor, Cond. Fan								4			
	Dampers, Motorized						1		2		1	
	Control, Head Pressure						1				1	
	Belt, Drive (Sets)	SSV = 1 Per Set		1							1	
	Penum									1		
	Ductwork									1		
	Coil, Heating									1		
	Coil, Cooling									1		
	Coil, Electric Heat									1		
		Task Total Value										
			SSV	Task								
				500								
	Damper, Fire		2									
			SSV	Task								
				112								
	Unit, Window A/C		10									
	Unit, Thru Wall A/C		10									
		Task Total Value										

* Includes Heat Pumps Over 36 MRT11/HR



Building Mechanical Equipment Inventory Record

BS-566B
(1-81)

Condenser Water System

Building Name	Area Code	Year Installed	Equip. No.	System	Local
				0 2	

No. Of Items	Item	Notes/Location	Task 028		Task 115		Task 113		Task 114		Task 116	
			SSV		SSV		SSV		SSV		SSV	
	System, Cond. Wat.											
	Tower, Wat. Cool. Or		3		1		10		10			
	Evap. Condenser		3		1		10		10			
	Brgs., Fan	SSV = 1 Per 2 Brgs.	1				1					
	Motor, Elec.				4							
	Belt, Drive (Sets)	SSV = 1 Per Set	1		1		1					
	Reducer, Gear		1		5							
	Incraser, Speed		1		5							
	Tank, Wat. Storage						1		5			
	Float, Twr. Mk. Up.		1		1		1					
	Switch, Elec. Float				1		1					
	Control, Twr. Fan		1		1		1					
	Ductwork				1							
	Damper, Mtrized.				3		2					
	Pump, Cond. Water		1		1		1					
	Motor, Electric				4							
	Pressuretrol		1		1		1					
	Switch, Flow		1		1		1					
	Valve, Wat. Relief		1				1					
	Strainer, Water				2							
	Valve, Manual (Over 2")				1							
	Vent, Automatic Air						2					
	Heater, Tower Sump						1					
	Heat, Trace						1					
	Condenser, Rem. Head										60	
	Condenser, Weld. Head										20	
	Equip. Wat. Treatment											
	Open System		4				5		5			
	Closed System		2				5		5			
		Task Total Value										



Bell System

Building Mechanical Equipment Inventory Record

Chilled Water Systems

Building Name			Area Code		Year Installed		Equip. No.		System		Local	
							013					
No. Of Items	Item	Notes/Location	SSV	Task 026	SSV	Task 119	SSV	Task 118	SSV	Task 117	SSV	Task
	System, Chilled Water	Total Pump H.P.	2		3		3					
	Pump		1						1			
	Glands, Packing		1				4					
	Seals, Mechanical											
	Motor, Pump								4			
	Strainer, Water								2			
	Valve, Manual (Over 2")	SSV = 1 Per Two Valves							1			
	Valve, Water Relief											
	Pressuretrol		1						1			
	Switch, Flow		1						1			
	Vent, Automatic Air								1			
	Tank, Expansion		1						5			
	Feeder, Water		1						2			
	Valve, Press. Reduc.		1						1			
	Equip. Water Treat.		4		2		2		5			
	Equip. Strainer Cycle		1		2		1		10			
	Coil, Chilled Water						4*					
		Task Value										

*Assign This Value If Coils Are To Be Flushed With Anti-Freeze

Bell System
Air Handling Systems

Building Mechanical
Equipment Inventory Record

BS-566-D
 (3-81)

Building Name		Area Code	Year Installed		Equip. No.		System		Local			
					014							
No. Of Items	Item	Notes/Location	SSV	Task 029	SSV	Task 053	SSV	Task 077	SSV	Task 121	SSV	Task 500
	Fan, Supply Air				1		1		1			
	Fan, Return Air				1		1		1			
	Fan, Exhaust Air				1		1		1			
	Unit, Fan Coil				1		1		3			
	Motor, Fan								4			
	Belt, Drive (Sets)	SSV = 1 Per Set			1		1		1			
	Filter, Air	SSV = 1 Per Bank			1		1		1			
	Ductwork								2			
	Plenum, Air Handling								2			
	Intake, Outside Air								1			
	Damper, Motorized								4			
	Firestat								1			
	Freezestat, Duct								1			
	Coil, Heating								1			
	Coil, DX Cooling								1			
	Coil, Electric Htg.								1			
	Ductwork, Kitchen Exh.						1		1			
	Filter, Grease	SSV = 5/4 Filters	5		5		5		5			
	Humidifier		1		1		1		1			
	Pump, Hum. Spray						1		4			
	Motor, Pump								4			
	Coil, Steam Humid.								1			
	Coil, Elec. Humid.								1			
	Compressor, Cont. Air		1		1		6		6			
	Motor, Comp.								4			
	Belt, Drive (Sets)	SSV = 1 Per Set			1		1		1			
	Control, (Auto								1			
	Start, & Stop, Altern. Sw)											
	Tank, Air Storage		1		1		1		1			
	Valve, Relief Air								2			
	Dryer, Control Air								1			
	Control, Temp								1			
	Control, Rel. Hum.								1			
	Control, Misc.								1			
	System, Smoke Cont.	SSV = 3 Per Zone										
	And/Or Evacuation											
	Damper, Fire										2	
	Task Total Value											



Building Mechanical Equipment Inventory Record

BS-566-E
(3-81)

Building Name	Area Code	Year Installed	Equip No.	System	Local
				0 5	

No. Of Items	Item	Notes/Location	Task 002		Task 030		Task 126		Task 123		Task 122	
			SSV	Task	SSV	Task	SSV	Task	SSV	Task	SSV	Task
	Plant, Heating											
	Boiler, Steel		3		3		5		60			20
	Boiler, Cast Iron		3		3		5		60			20
	Furnace, Hot Air						2		20			
	Heater, Space (Fired)						2		20			
	Heater, Space (Elec)						1		5			
	Burner, L.P. Air Atom.				1				11			
	Burner, H.P. Atom Or Gun								11			
	Burner, Rotary Cup				1				11			
	Burner, Power Gas								11			
	Burner, Atmos. Gas								2			
	Element, Blr. Elec.								1			
	Valve, Boiler Relief											
	Control, Water Level		1		1							5
	Pressuretrol				1							
	Aquastat				1							
	Control, Combustion				1				2			
	Pilotstat, Gas Safety				1							
	Switch, Lo Draft				1				1			
	Switch, Air Proving				1				1			
	Switch, Fuel Temperature											
	Switch, Fuel Pressure											
	Relay, Non-Recycle Lgn.											
	Detector, Smoke				1				1			
	Switch/Control (Other)											
	Valve, F.O. Solenoid				1				4			
	Valve, Gas Solenoid				1							
	Valve, Manual (Over 2")											1
	Valve, Power Operated											
	Valve, Water Relief											
	Valve, Wat. Press. Reduc.											2
	Heater, Unit								2			
	Pump, Fuel Oil (Not Integral To Burner)				1							
	Strainer #4 Fuel Oil				1							
	Pump, Condensate Return				1							
	Tank, Condensate Return											4
	Intake, Boiler Rm. Air				1							
	Fan, Draft				1				1			
	Pump, H.W. Circulating				1							
	Tank, Water Expansion				1							
	Strainer, Water											2
	Trap, Steam (Except Radiator)											1
	Trap, Steam, Radiator											
	Tank, Fuel Oil Storage				1				5			
	Equipment Wat. Treat.				4		4					
	Thermostats, Space											
	Vent, Automatic Air											
	Belts, Drive (Sets)				1							
	Task Total Value											

Steam
 Hot Water
 Fuel Type _____



Heating Systems

Building Mechanical Equipment Inventory Record

BS-566-E
(3-81)

Building Name	Area Code	Year Installed	Equip. No.	System	Local
				0,5	

No. Of Items	Item	Notes/Location	SSV		Task		SSV		Task		Task	
				125								
	Plant, Heating											
	Boiler, Steel		3									
	Boiler, Cast Iron		3									
	Furnace, Hot Air		3									
	Heater, Space (Fired)		3									
	Heater, Space (Elec)		2									
	Burner, L.P. Air Atom.		2									
	Burner, H.P. Atom Or Gun		2									
	Burner, Rotary Cup		2									
	Burner, Power Gas		2									
	Burner, Atmos. Gas											
	Element, Bir. Elec.											
	Valve, Boiler Relief		8									
	Control, Water Level		3									
	Pressuretrol											
	Aquastat											
	Control, Combustion		1									
	Pilotstat, Gas Safety		1									
	Switch, Lo Draft		1									
	Switch, Air Proving		1									
	Switch, Fuel Temperature											
	Switch, Fuel Pressure											
	Relay, Non-Recycle Lgn.											
	Detector, Smoke		1									
	Switch/Control (Other)											
	Valve, F.O. Solenoid		1									
	Valve, Gas Solenoid		1									
	Valve, Manual (Over 2")											
	Valve, Power Operated		1									
	Valve, Water Relief											
	Valve, Wat. Press. Reduc.											
	Heater, Unit											
	Pump, Fuel Oil (Not											
	Integral To Burner)											
	Strainer #4 Fuel Oil											
	Pump, Condensate Return		1									
	Tank, Condensate Return											
	Intake, Boiler Rm. Air		1									
	Fan, Draft		1									
	Pump, H.W. Circulating		1									
	Tank, Water Expansion		1									
	Strainer, Water											
	Trap, Steam (Except											
	Radiator)											
	Trap, Steam, Radiator	SSV = 1 Per 5 Traps	1									
	Tank, Fuel Oil Storage		1									
	Equipment Wat. Treat.		4									
	Thermostats, Spec		1									
	Vent, Automatic Air	SSV = 1 Per Set	1									
	Belts, Drive (Sets)		1									
		Task Total Valve										



Domestic Water Systems

**Building Mechanical
Equipment Inventory Record**

Building Name		Area Code	Year Installed		Equip. No.		System		Local			
							0 6					
No Of Items	Item	Notes/Location	SSV	Task 031	SSV	Task 054	SSV	Task 076	SSV	Task 103	SSV	Task
	Heater, Water											
	Gas Fired		1		1		1		1			
	Electric		1		1		1		1			
	Oil Fired		1		1		1		1			
	Valve, Relief (Temp.)		1		1		1					
	Pressure Combination)											
	Safety, Gas Pilot		1		1		1		1			
	Switch, Electric Disc								1			
	Burner, Oil Gun Type								8			
	Thermostat, (Water		1		1		1		1			
	Temperature Control)											
	Pump, Hot Water Circ.		1		1		1		1			
	Strainer, Water								2			
	Valve, Water Relief											
	Pressuretrol								2			
	Control, Pump		1		1		1		1			
	Timeclock						1		1			
	Tank, Water Storage								5			
	Valve, Mixing								1			
	Cooler, Drinking Wat.								3			
	Filter, (Replaceable								2			
	Cartridge Type)											
	Pump, Water Supply		1		1		1		1			
	Strainer, Water								2			
	Valve, Relief											
	Control, Pump		1		1		1		1			
	Float, Pump Control		1		1		1		1			
	Back Flow Preventer								1			
	Tank, Water Storage								5			
	Compressor, Air		1		1		5		12			
	Belt, Drive (Sets)	SSV = 1 Per Set					1		1			
	Control, Auto S/S		1		1		1		1			
	Valve, Pressure Relief								2			
	Tank, Air Storage								3			
	Conditioner, Water		4		4		4		4			
	Valve, Manual (Over 2")	SSV = 1 Per 2 Valves							1			
	Task Total Value											



Building Mechanical Equipment Inventory Record

BS-566G
(1-81)

Building Name	Area Code	Year Installed	Equip. No.	System	Local
				0, 7, 1	

No. Of Items	Item	Notes/Location	SSV	Task 032	SSV	Task 055	SSV	Task 078	SSV	Task 105	SSV	Task
	Pump, Sewage Ejector		1		1		1					
	Motor, Electric								4			
	Tank, Storage								5			
	Bearing, Oil	SSV = 1 Per Pair	1		1		1					
	Compressor, Air		1		1		5		8			
	Motor, Electric								4			
	Tank, Air Storage								3			
	Control, Auto S/S		1		1		1		1			
	Valve, Air Relief								2			
	Belt, Drive (Sets)	SSV = 1 Per Set					1		1			
	Pump, Sump		1		1		1		1			
	Motor, Electric								4			
	Control, Auto S/S		1		1		1		1			
	Pit, Sump								3			
	Bearing, Oil	SSV = 1 Per Pair			1		1					
	Switch, Electric Float								2			
	Float, Water		1		1		1		2			
	Check Valves								1			
	Backflow Preventer								1			
	Traps, Floor Drain				1		1		1			
		Task Total Valve										



Standby Power Systems

Building Mechanical Equipment Inventory Record

BS-566 H
(1-81)

Building Name	Area Code	Year Installed	Equip. No.	System	Local
				0 8	

No. Of Items	Item	Notes/Location	033		106							
			SSV	Task	SSV	Task	SSV	Task	SSV	Task	SSV	Task
	Light, Battery, Emergency		2		3							
	(Wet Cell)											
	Light, Battery, Emergency		1		1							
	(Dry Cell)											
	Task Total Value											



Building Mechanical Equipment Inventory Record

85-566J
(1-81)

No Of Items	Item	Notes/Location	SSV		Task		SSV		Task		SSV		Task	
			003	034	056	079	120							
	System, Sprinkler/Standpipe													
	Valve, Outside Shutoff			1		1		1					4	
	Valve, Wat. Sup. Control			1		1		1					3	
	Valve, Dry Pipe			1		1		1					2	
	Pump, Fire		2		2			2					2	
	Motor, Elec. Pump												4	
	Strainer, Water												2	
	Valve, Check													
	Connection, Fire Dept.			1		1		1					1	
	Tank, Storage			1		1		1					1	
	Switch, Elect. Float												1	
	Float, Water													
	Piping, Standpipe Wet												2	
	Piping, Standpipe Dry												2	
	Piping, Sprinkler Branch												2	
	Head Sprinkler	SSV = 1/3 Heads												1
	Sprinklers, Outside Open												4	
	Valve, Hose												1	
	Hose, Unlined Fire													
	Open Rack												4	
	Enclosed Rack												4	
	Hose, Lined Fire												4	
	Systems, Fire Extinguishing													
	Halon 1301 Flooding				1		1		1				1	
	CO ² Flooding				1		1		1				1	
	Kitchen, Fixed Pipe				1		1		1				1	
	Shutters, Fire												3	
	Task Total Value													
			SSV	Task	SSV	Task	SSV	Task	SSV	Task	SSV	Task	SSV	Task
				200		501		1200		1500		2500		
	Tank, Storage		3											
	Shutters, Fire		4											
	Standpipe, Dry				5									
	Hose, Lined Fire				5									
	Open Rack						5							
	Enclosed Rack							5						
	Head, Sprinkler													3
	Task Total Value													

**BUILDING MECHANICAL EQUIPMENT
RECORD FORM
ELECTRICAL DISTRIBUTION SYSTEM**

Date Installed _____ Equip. Location _____ Area Code _____

Primary Transformer(s)

- Telco Owned
- Power Co. Owned

Switch Gear

- House Service Switchboard
- Wall Mounted Panel

Main Breakers (List Each)

<u>Designation</u>	<u>Manufacturer</u>	<u>Type</u>	<u>Amps</u>

Buss Duct

- Yes Manufacturer _____ No. Of Feet _____
- No

**BUILDING MECHANICAL EQUIPMENT
RECORD FORM
ELECTRICAL DISTRIBUTION SYSTEM**

Date Installed _____ Equip. Location _____ Area Code _____

Branch Panels

<u>Panel Designation</u>	<u>Floor</u>	<u>No. Of Circuits</u>
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

**BUILDING MECHANICAL EQUIPMENT
RECORD FORM
VERTICAL TRANSPORTATION**

Date Installed _____ Equip. Location _____ Area Code _____

Elevator/Escalator _____ Designation _____
(Bank)

Manufacturer _____

Service Passenger Freight

Operation Automatic Manual

Type Electric Hydraulic

Speed _____ Ft./Min.

Duty _____ Lbs.

No. Openings Served _____

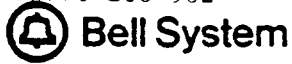
Floors Served _____

Maintained By _____

Type Contract _____

Contract Terms _____

Cancellation Options _____



Building Mechanical Equipment Inventory Record

Building Alarm Systems

Building Name			Area Code		Year Installed		Equip. No.		System		Local	
No. Of Items	Item	Notes/Location	SSV	Task 037	SSV	Task	SSV	Task	1	3		
	Fire Detection (F01)		1									
	Sprinkler Flow (F02)		1									
	Low Standpipe Press. (F03)		1									
	Fire Detection Trouble (F04)		1									
	Explosive Gas Detection (F05)		1									
	Gas Detection Trouble (F06)		1									
	High Temp-Equipment (E01)		1									
	Low Temp-Equipment (E02)		1									
	High Temp-Computer (E03)		1									
	Low Temp-Computer (E04)		1									
	High Temp-Non Equip. (E05)		1									
	Low Temp-Non Equip. (E06)		1									
	High RH - Equip. (E07)		1									
	Low RH - Equip. (E08)		1									
	High RH - Computer (E09)		1									
	Low TH - Computer (E10)		1									
	Central Fan Shutdown (H01)		1									
	Central Refrig. Shutdown (H02)		1									
	Heating Plant Shutdown (H03)		1									
	Package Unit Shutdown (H04)		1									
	P/U Refrig. Shutdown (H05)		1									
	Low Cont. Air Press. (H06)		1									
	Hi Chld. Wat. Temp. (H07)		1									
	Lo Blr. Steam Press. (H08)		1									
	Lo Blr. Wat. Temp. (H09)		1									
	Lo Purch. Stm. Press. (H10)		1									
	Intrusion-Entry Door (S01)		1									
	Unengaged-Strike (S02)		1									
	Intrusion-Perimeter (S03)		1									
	Invalid Crd. Rdr. Attempt (S04)		1									
	Doorbell (S05)		1									
	Comm. Pwr. Fail. (P01)		1									
	Low Voltage (P02)		1									
	Stndby. Pwr. Running (P03)		1									
	Ess Ld. Bus De-Eng. (P04)		1									
	Floor Flood (M01)		1									
	Sump Pump-Hi Level (M02)		1									
	Air Dryer Failure (M03)		1									
	Micro Computer Trbl. (M04)		1									
	Remote Sensor Trbl. (M05)		1									
	Special (M06)		1									
		Task Total Value										

System Notes

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**Instructions for Form E-10
BOCC Building Mechanical Equipment Routine
Maintenance Schedule and Progress Chart**

The information on this form is completed prior to the beginning of each year.

<u>Entry</u>	<u>Information Required</u>
Job No.	Number for each building, assigned consecutively.
Eqp. No.	Inventoried equipment number from BME record.
Description	Description of the inventoried item of equipment.
Location	Location of item of equipment in building (floor no., room no., etc.)
Work Opr.	Two-letter code from BSP Section 770-200-000 (BME Inventory and Routine Maintenance Procedures) describing routine work operation.
Freq.	Frequency of work operation. Denoted by W, M, or A (weekly, monthly, or annual).
No. Items	Number of components of inventoried equipment requiring the performance of a preventive maintenance work operation.
Time	Estimated time to complete each item, in hours and tenths of hours.
Total Time	"Number of Items" column multiplied by "Time" column.
Weeks of the Year	Mark the box(s) corresponding to weeks during the year that the preventive maintenance work is to be done.

