

What is an Asset Inventory..?



This series of Building Asset Management bulletins form part of a 3-year research project for corporations and managers. The bulletins provide a common understanding of the language and terms that relate to the best practices of the maintenance, repair and long-term planning for the renewal of the common property and common assets. The bulletins will be posted on the CHOA website for public access. The bulletins have been produced in partnership with CHOA, RDH Building Engineering Ltd. and the Real Estate Foundation of BC.

1. Introduction

The first information bulletin introduced the concept of “asset management” and the second bulletin provided an outline of the different types of physical systems within a building. In this bulletin we turn our attention to the development of an inventory of the assets, which is a critical building block for a variety of asset management tasks, including operations, maintenance and renewals planning.

2. Purpose of the Asset Inventory

A typical building is made up of many hundreds of different types of assets, including elements such as roofs, windows, doors, boilers, light fixtures, pumps, fans, floor finishes, fire extinguishers, emergency exit signs, elevators, smoke detectors and the list goes on.

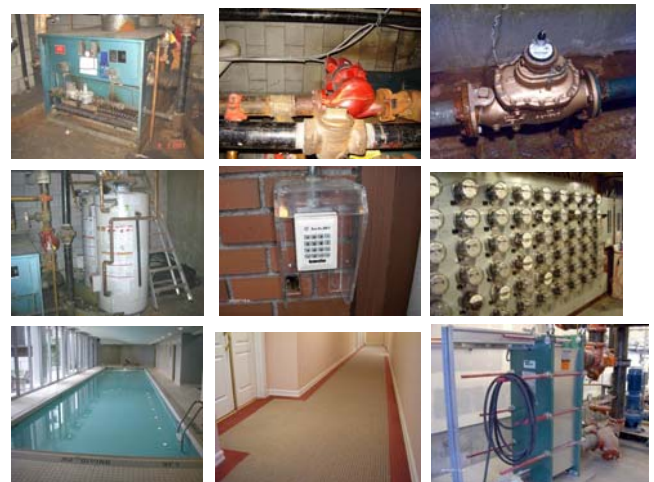
An inventory is an organized list of the major common property assets in a building. It includes useful reference information about the basic attributes of each asset, such as their type, age, installation cost, warranty expiration date, estimated useful service life and location within the building.

To illustrate the importance of an asset inventory, let’s consider the following scenarios:

- *“Our roof is leaking but we don’t know what type of roof we have.”* (The inventory would tell us the type of roof on our building).

- *“Our boiler is starting to give us problems but we don’t know whether it is still covered under warranty”.* (The inventory would give us the warranty expiration date).
- *“Nobody knows when that noisy fan was last replaced. We are just waiting for it to stop working before we do anything”.* (The inventory tells us the age of our assets).
- *“We are thinking about replacing some of the lighting in our garage but we do not know how many fixtures there are”.* (The inventory gives us a count).

The asset inventory serves as the baseline of reference information that is essential to the owners, property manager, contractors and consultants.



Without a comprehensive, organized and accurate inventory, the owners and their asset management team will not be able to effectively monitor and manage the assets.

Every maintenance plan and reserve fund study starts with the asset inventory as the first step in identify the types of equipment and components in the building.

3. Format of the Inventory

Inventories come in a variety of formats, which differ depending on the level of effort that is made in their development and the purpose for which they are used. When organizing the assets into an inventory there are three common structures:

- **Alphabetical.** In this format, the assets are listed in alphabetical order by their name, from A through Z. For example, boilers, then carpets, fans, pumps, roofs, and so on. While this is very helpful for quickly finding assets in the inventory list, it does not recognize the interrelationships between the assets.
- **Thematical.** In this format, the assets are grouped according to common engineering characteristics. For example, all the mechanical assets are listed together (such as boilers, pumps and fans), then the electrical assets (such as light fixtures, transformers and generators), then the fire protection assets (such as smoke detectors and fire extinguishers).
- **Numerical.** In this format, the assets are listed according to some mathematical logic or ranked by a particular attribute. For example, the assets could be ordered according to their age (youngest to oldest), their replacement value (most expensive to cheapest) or some unique identification number (1,2,3...).

These different classification schemes can be used in combination, particularly when the information is recorded in a database, allowing for sorting of the assets by alternate criteria.

5. Information in the Inventory

The information that is captured in an inventory will vary depending on the intended purpose and the nature of the assets.

While there are literally hundreds of pieces of information that can potentially be collected on each asset, the following basic information contains the essentials:

- **Location.** A short description of the position of the asset in or around the building. For example, “*the*

water heaters are located in the mechanical room on the P2 level beside parking stall #35”.

- **Type.** A statement identifying the type of asset. For example, “*gas fired water heaters with 100 gallon tanks”.*
- **Placed in Service Date.** It cannot be overstated how important it is to know the age of each asset. For example, “*the water heaters were replaced in 2003”.* The chronological age of the equipment is useful for ongoing service life planning for the assets. Analysis of the age and lives of assets is discussed in greater detail in one of the upcoming information bulletin.
- **Warranty Expiration Date.** It is essential that the owners and property manager are aware of which assets are still covered under warranty. For example, “*there is a three year warranty on the water heaters”.* Warranty reviews and other warranty related matters are addressed in another information bulletin.
- **Quantity.** The number of assets is useful when calculating the costs for future replacement. For example: “*there are four water heaters”* or “*8,000 square feet of metal roof”* or “*32 fire extinguishers”.* Estimating techniques are discussed in another Information Bulletin.
- **Purchase Cost.** While it is often very difficult to obtain information on the original (or current) cost of the assets, this is one of the most valuable pieces of information for asset management purposes. For example, “*the four water heaters cost \$24,000 when they were all replaced in 2003”.* The replacement cost of each asset helps the owners establish the amount of reserves to set aside. Reserve fund studies will be introduced in another information bulletin.

An inventory can range from a single page in length to many pages, depending on the level of detail that is obtained. While longer and detailed inventory lists may be cumbersome to manage, they can prove extremely helpful when it comes to managing the assets over their service lives.

Over time, the owners and property manager may want to add more information to the inventory to help with ongoing planning and management of the building. Some of the additional fields of information that could be recorded beside each asset are:

- Asset identification numbers
- Service contractors
- Manufacturer’s product literature

- Photos of the assets
- Maintenance logs for each asset

It is strongly recommended that a unique identification number be attached to each asset in the inventory, which will assist with ongoing reference. For example, a building may have three types of roofs and each roof area should be assigned some form of unique identification such as: “*Roof 1*” or “*Southwest Roof*”.

6. Sources of Inventory Information

Information for generating an asset inventory is available from a variety of sources. Some of the more common sources of information are listed below:

- **Construction Drawings.** The original drawings for the building are one of the best sources of information about the assets. For example, the architectural drawings will identify the types of floor finishes in each room and the mechanical drawings will list the various pumps and fans throughout the building.
- **Service Contracts.** Maintenance service agreements often include lists of the equipment that are covered under the contract. HVAC contracts are usually an excellent source of information on the various pumps, fans, boilers and other mechanical equipment in the building.
- **Equipment Lists.** These are usually included as one of the appendices in the service agreements. The site staff may also have lists of the equipment they use to clean the building, such as vacuums, power washers, lawn mowers, etc.
- **Operations & Maintenance Documents (O&Ms).** At the completion of the construction of a new building, or a major renovation project, the building owners should be provided with a package of Operations & Maintenance documentation. These O&Ms typically include, amongst other things, copies of warranty certificates and manufacturers’ product literature.
- **Construction Specifications.** Unfortunately, many building owners do not have a copy of the construction specifications. Therefore, each time a major repair or asset replacement project has been carried out, the owners should ensure that these are kept in a permanent file.

In one of the upcoming Information Bulletins we will explain how consultants collect information on the assets and how this information can then be used to update the asset inventory.

7. Inventory Storage Formats

Asset inventories are typically maintained in one of the following three formats, or a combination thereof:

- **Bookshelves, Binders & Filing Cabinets.** This method retains paper copies of all the documents associated with each asset, which are kept in a series of folders in a filing cabinet or separate tabs within a ring binder.



- **Spreadsheets.** This method stores all the asset inventory data in a series of columns and rows within a spreadsheet or series of spreadsheets. The figure below illustrates how each row in a spreadsheet can represent a different asset and each column an attribute or piece of information associated with the assets.

Assets	Count	Units	Location
Exterior Enclosure			
Clay brick, exterior	1256	Sq Ft	South elevation
Windows, aluminum	4270	Sq Ft	South elevation
Roof, built up	10000	Sq Ft	
Mechanical			
Boiler, gas fired, 10,000 BTUH, Raypack	1	ea	Basement mechanical room
Circulation pump, 5 HP	2	ea	Basement mechanical room
Water heater, gas fired, Rheem, 115 gallon	2	ea	Rooftop mech. Room

- **Software/Database.** This method uses a relational database to store the information on the assets. Databases are sophisticated tools that provide for more powerful analysis of the assets through sorting and filtering of the data. The figure below includes an example of an asset inventory that includes a photograph of the asset accompanied by other basic reference information, such as the description, location and age of the assets.



Mach 6 [1] Make up Air Unit
 Location: Mounted on main roof.
 Description: Engineered Air, S-280-0, 2700 CFM, 200,000 input BTU, belt-driven, roof mounted, centrifugal fan, gas-fired burner and associated ductwork to supply tempered fresh air and make-up air to the interior of the building.
 Chronological Age: 18 Service Life: 16
 Effective Age: 15 Remaining Service Life: 1



Exec 2 Emergency Generator
 Location: P0 service room at east building.
 Description: Katolight, model D450FNV4, 450 KW, 562.5 KVA, 3 phase, 347/600 volt, 1800 rpm, 6 cylinder diesel synchronous AC generator with two single wall, 1136 litre steel fuel tanks for standby AC power to certain critical fixtures and appliances, such as fire firefighters elevator, fire pump, certain interior light fixtures.
 Chronological Age: 10 Service Life: 35
 Effective Age: 10 Remaining Service Life: 25

Owners and property managers should choose the format that is best suited to their needs and resources. Many buildings start off with a series of filing cabinets that gradually get transformed into spreadsheets and then into a software database. While filing cabinets and spreadsheets will suffice for most smaller buildings, larger condominiums should consider electronic databases.

8. Preparation of an Inventory

The key steps in the inventory preparation and control process are summarized below.

- Develop a plan for the preparation, safekeeping and updating of the asset inventory.
- Determine what types of inventories have previously been prepared for the assets in the building.
- Determine whether the existing inventories are adequate for operations, maintenance, and asset management purposes.
- Gather available reference information (drawings, service contracts, warranty certificates).
- Identify the “gaps” in the information and collect additional information, as required
- Select a means of storing the information (binders and filing cabinets, spreadsheets or database).
- Retain hard copies of the reference information.
- Convert all paper copies of the inventory into electronic copy for long-term archiving purposes.
- Place someone in charge of the safekeeping of the asset inventory.
- Update the inventory from time-to-time to include new information when assets are replaced.

The owners may already have some classification system that they wish to continue using for consistent reference to their assets.

The quality of the inventory can be impacted by various factors, such as the amount of time that is devoted to its development; the skills of the persons involved; and the availability of historical and reference information. With older buildings, it should be anticipated that the quality of reference and historical information might be limited.

When preparing an inventory it is necessary to determine the “granularity” that should be applied to the data being collected. Granularity is the level of detail at which information is viewed and stored -- the more granular the inventory, the smaller the chunks of information.

Information Bulletins

Listed below is a summary of some of the information bulletins that form part of this series.

- **What is asset management?**
- **What is a baseline database?**
- **What are the asset management tools?**
- **How long should our assets be expected to last?**
- **What causes our assets to deteriorate?**
- **What happens when our assets deteriorate?**
- **What is obsolescence and how does it affect us?**
- **How do we identify our short-term, mid-range and long-range needs?**
- **What is a condition assessment?**
- **What is a warranty review?**
- **What is a maintenance review?**
- **What is a maintenance plan?**
- **What is a maintenance backlog and how do we deal with it?**
- **What is a reserve fund study?**
- **What is a funding model?**
- **What are the different maintenance strategies?**
- **How do we track our maintenance & renewals program?**
- **How do we bridge our maintenance plan into a maintenance program**