Asset Management

Technical Standard

TS 0131 – Asset and Location Hierarchy Data

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Application & Interpretation of this Document

It is the responsibility of the users of this Standard to ensure that the application of information is appropriate and that any designs based on this Standard are fit for SA Water's purposes and comply with all relevant Australian Standards, Acts and regulations.

Users of this Standard accept sole responsibility for interpretation and use of the information contained in this Standard. Users should independently verify the accuracy, fitness for purpose and application of information contained in this Standard.

Only the current revision of this Standard should be used which is available for download from the SA Water website.

Significant/Major Changes Incorporated in This Edition

This document has been renamed to better reflect the content and intent of the document in superseding the former TS 149. It also provides updated naming conventions, figures and tables throughout.

Document Controls

Revision History

Revision	Date	Author	Comments
1.0	26 May 2016	Sasha Keregdjarto	Document number previously TS 0149.
1.1	28 April 2017	David Parsons	Added Naming Convention, section 5, and defined Facility Naming Convention, section 5.1
1.2	26 October 2020	David Parsons	Added Asset Naming Convention, section 5.2
1.3	28 January 2021	Sasha Keregdjarto	Some paragraphs updated to be more specific 4.1.3, 4.1.4. Wording of attributes changed to specification. Added new images. Comments added to section 4.1, 4.1.1. Figure 4 and 5 added.
1.4	15 April 2021	David Parsons	Updated requirements related to mandatory fields, added clarification to comments.

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Role	Signature and Date
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1 Introduction

SA Water is responsible for operation and maintenance of an extensive amount of engineering infrastructure.

This standard has been developed to assist in the design, maintenance, construction, and management of this infrastructure.

1.1 Purpose

The purpose of this standard is to describe the key data required to ensure that all SA Water assets are correctly identified, labelled, and recorded.

1.2 Glossary

The following glossary items are used in this document:

Term	Description
AIM	Asset Information Management
SA Water	South Australian Water Corporation
TG	SA Water Technical Guideline
TS	SA Water Technical Standard

1.3 References

1.3.1 Australian and International

The following table identifies Australian and International standards and other similar documents referenced in this document:

Number	Title

1.3.2 SA Water Documents

The following table identifies the SA Water standards and other similar documents referenced in this document:

Number	Title
TS 0112	Process and Instrumentation Diagrams (P&ID)
TS 0133	Requirements for Asset Labelling

1.4 Definitions

The following definitions are applicable to this document:

Term	Description
SA Water's Representative	The SA Water representative with delegated authority under a Contract or engagement, including (as applicable): • Superintendent's Representative (e.g. AS 4300 & AS 2124 etc.) • SA Water Project Manager • SA Water nominated contact person
Responsible Discipline Lead	The discipline expert responsible for TS 0131 defined on page 3 (via SA Water's Representative)

2 Scope

This document describes the technical standard for asset data to be provided to SA Water in relation to new assets created as part of a capital project. The document describes the data required and the structure and format it shall be supplied in.

The format for supplying asset data is an Excel spreadsheet, which contains the following work sheets:

- Asset Input worksheet
  - Lists the assets being created as part of the capital project and associated data, such as model, manufacturer, serial numbers etc.
- Specification Input worksheet
  - Contains specification data for each of the assets listed in the hierarchy.
- Maintenance Input worksheet
  - Contains the manufacturer's maintenance requirements.

3 Introduction to Location Hierarchies

3.1 General

Location hierarchies are a method for recording physical assets in a set of logical groupings and sub-groupings. Location hierarchies allow for easy identification and finding of assets. They also allow for aggregated and detailed analysis of asset performance at various levels, from the facility level down to the individual equipment item level.

Location hierarchies are stored in SA Water's primary Works & Asset Management system (IBM's Maximo).

3.2 Location Hierarchy Terminology

Table 1 - Location Hierarchy Terminology

Terminology	Usage/ Meaning
Asset	A single piece of equipment or a single structure, for example Pump, Motor, Valve, Building, Dam Wall, Tank Structure, Pipework, Maintenance Hole
Facility	A unique installation with a single purpose, for example Pump Station, Water Treatment Plant, Tank
Intermediate Location	The logical grouping of assets in hierarchy, for example Pump Set, Chemical Dosing System, Switchboard
Location	The logical address of assets in the hierarchy for example Pump, Motor, Gearbox, Motor Controller, Valve
Location Hierarchy	A collection of individual Assets represented in logical groups
Classification	Denotes the type of asset, facility, group, and location
Failure Codes	A set of Problem, Cause and Remedy codes used to report the nature or asset failures and what was done to rectify the problem
Failure Class	Each type (Classification) of Asset is associated with a set of relevant failure codes, for example MECHELEC, VALVE, CIVIL, WMAIN
Specification	A specification is a piece of data recorded against an Asset which describes the characteristics and attributes of the asset. A specification can be either numerical or textual, for example the voltage rating of a motor is a numerical specification, while the attribute which describes how a motor is cooled is a textual specification.

Terminology	Usage/ Meaning
Preventive Maintenance (PM)	Preventive Maintenance (PM) is a scheduled task which is to be performed on an asset at regular intervals. PM tasks are scheduled within Maximo, which then creates Work Orders instructing operators to perform the task.

3.3 Location Hierarchy Structure

Location hierarchies can be thought of as a being similar to a file system structure on a computer, where the Facility, Intergroup and Location levels represent the folders, and the assets represent the files. However, for each Location there is only one Asset.

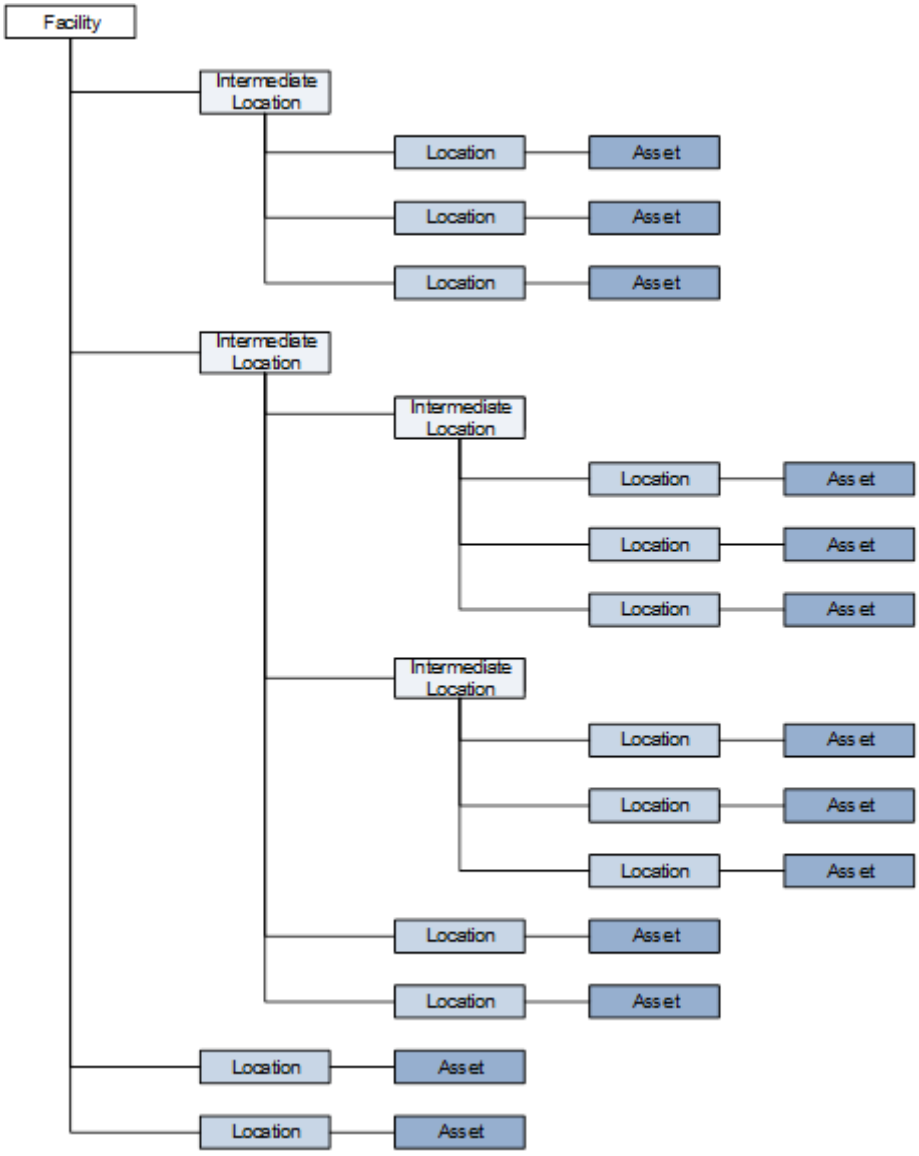


Figure 1 - Location Hierarchy Structure

As with a computer file system, location hierarchies can be structured to as many levels as is required depending on the complexity of the facility to be represented, and as such Intermediate Location can contain further groupings within them. As there is a one-to-one relationship between a Location and an Asset, the Asset can largely be ignored when initially developing a location hierarchy.

3.4 Location Hierarchy Representation in Maximo

All levels of the hierarchy are assigned a unique identifier in Maximo, and the location hierarchy is represented by using a Parent/Child structure. A structured numbering system is also used to represent the hierarchy.

3.4.1 Facility Identifiers

The facility identification incorporates SA Water's Non-Pipe Asset Identifier along with the first 2 letters of the suburb or township the facility is located in. For example, a new pump station build in Adelaide would be assigned the first 2 letters, AD, followed by the next number in the Non-Pipe Asset Register sequence – at the time of writing this document it would be 40156. The facility identifier is therefore AD40156.

3.4.2 Intermediate Location and Location Identifiers

Intermediate Location and Locations are identified by the facility identifier, followed by a decimal point and a series of numbers which represent the position and level within the hierarchy. The numbering starts at "01" for the first level, and a further 2 digits are added for each subsequent level. For example, the first level of AD40156 would be represented by AD40156.01, AD40156.02, AD40156.03 etc. If AD40156.01 is an Intermediate Location, it will have children represented by AD40156.0101, AD40156.0102, AD40156.0103. This is represented visually in Figure 2, where each of the additional digits have been shown in bold to highlight how the numbering is "built up" progressively for each level of the hierarchy.

3.4.3 The Parent / Child Structure

Further to the standardised numbering system, a Parent / Child structure is also used to represent the hierarchy in Maximo. Referring to Figure 2, AD40156 has 4 children – AD40156.01, AD40156.02, AD40156.03 and AD40156.04. In Maximo, this relationship is represented by the "parent" field – so each of the children will refer to their parent, AD40156. Similarly, AD40156.020203 will refer to its parent, AD40156.0202, etc.

3.5 The Location / Asset Relationship

To understand the relationship between a Location and an Asset, an analogy which can be used is to think of Locations as an address, where the Facility can be thought of as a suburb and an Intermediate Location can be thought of as a street. The Asset can then be compared to the house at that address. The asset can be replaced, while the address stays the same – to continue with the analogy, a house can be demolished and a new house built, however the address does not change. This allows a history to be recorded against the Location, and when an Asset is rotated or disposed of the history of the Location is not lost.

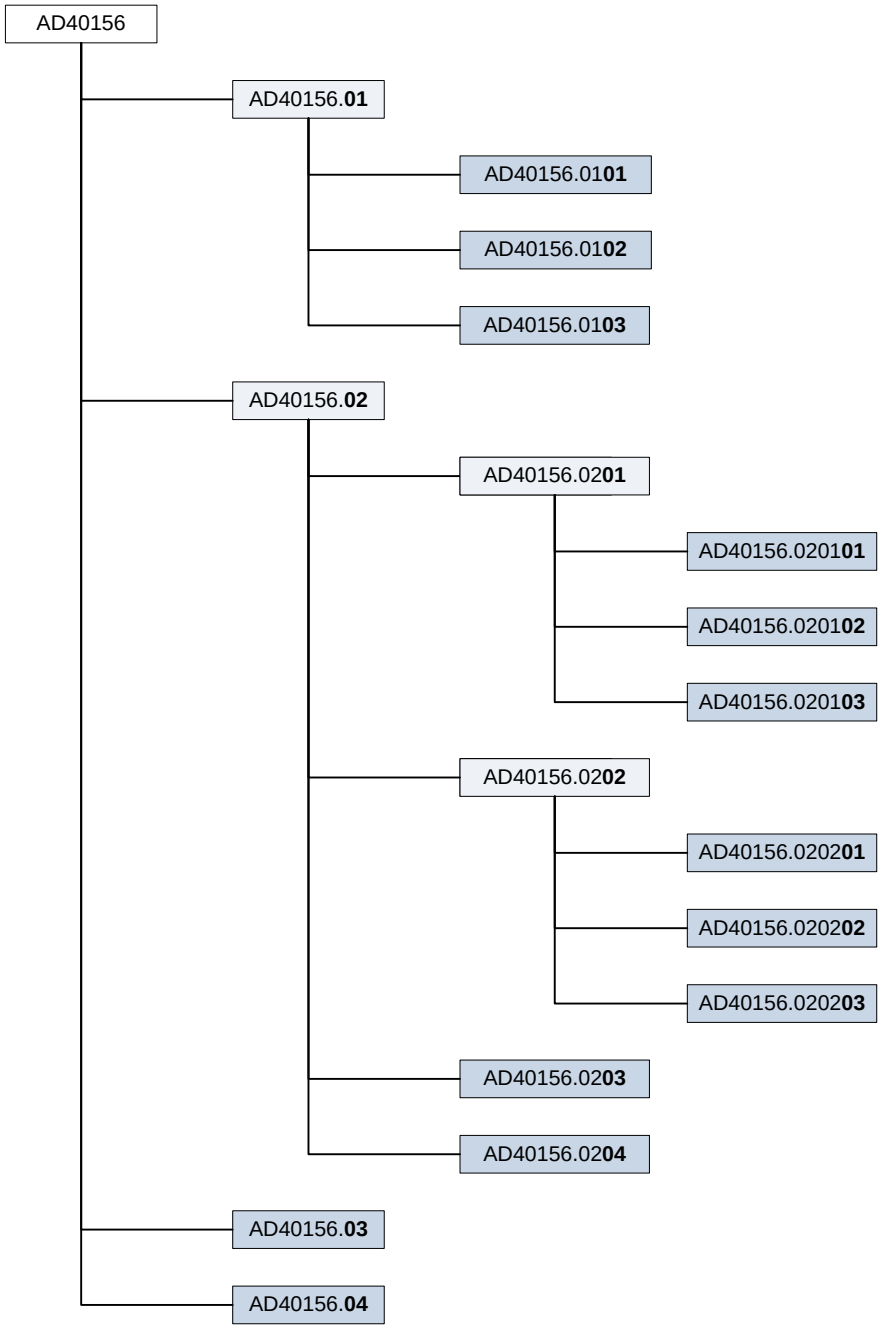


Figure 2 - Identification and Numbering System for Location Hierarchies

3.6 Introduction to Classifications

Classifications are a set of standardised descriptors for Facilities, Intermediate Location, Locations and Assets. Classifications are used to define the type of asset, and the specification which are associated with each particular type of asset.

Every Location and Asset must be classified – it is a mandatory field in Maximo 7. Each classification is represented by a classification ID which is a short unique identifier. There are approximately 400 unique classifications, and thus not all classifications will be described in this document.

4 Constructing and Supplying Location Hierarchies

4.1 Required File Format for Location Hierarchies

As explained in Clause 3, all asset data shall be supplied to SA Water in an Excel spreadsheet, consisting of three worksheets. The first of these worksheets, the Asset Input worksheet, is for the location hierarchy and associated asset data, such as make, model and serial number.

When a capital project necessitates the need for an asset data update, there are two methods for determining the new assets and their hierarchy to be included in the Asset Input worksheet. For projects where there are existing assets being upgraded or replaced, the existing assets are extracted from Maximo. For greenfields projects, hierarchy templates are developed for inclusion.

Once the new assets, as well as those to be replaced or removed, have been included in the Asset Input worksheet further columns are added to capture the associated data such as make, model, serial number. Once this process is completed, the Specification Input worksheet as well as Maintenance worksheets can be generated to record all the required asset data.

4.1.1 The Asset Input Worksheet

Table 2 lists the column headers required in the Asset Input worksheet.

Table 2 - Asset Input Column Headings

Column Heading	Column Description and Use	Mandatory
Location Description	This is the description that will appear on work orders, reports and search results. See Section 5 of this document for naming conventions to be applied.	Yes
Classification	This is used to group similar locations together by classifying them as the same type, for example "Pump", "Tank Structure", "Building". The classification selected also determines which Specifications are applicable to this location. It also determines which locations are added when using the "Add Common Children" function. When selecting a classification refer to the Asset Information Standards document for guidance.	Yes
Status	The status of the location, which can be one of: **Planned** This location and its asset are yet to be delivered / constructed. By creating a Planned location record information can be collected during the construction phase **In Service** The location and its associated assets are operational. **Not in Use** The location and its associated assets are not currently in use or operating but can be returned to service if required. **Abandoned**	Yes

Column Heading	Column Description and Use	Mandatory
	The location and its associated assets are no longer in use and cannot be returned to service, typically due to physical disconnection from the network (i.e., an airgap exists). This status is synonymous with **Decommissioned.** Some maintenance may still be required for abandoned locations – for example maintaining land and safety. **Sold/Transferred.** Sold to a third party and no longer SA Water's responsibility **Leased** Leased to a third party. **Removed** The assets at this location have been physically removed, decommissioned, and demolished.	
Location ID	The unique identifier for the location record. Location identifiers are assigned automatically when a location is loaded into Maximo after using the "New Location" option, with the exception of a facility type location which uses the location ID that is specified. A temporary location ID is assigned automatically when using the "Add Location" add-in function. This temporary ID must be unique. It will be replaced by a formal Maximo ID upon loading, and all references within the spreadsheet will be updated with the new ID.	Yes
Location Change Type	**New Location** A new location will be created in Maximo. The Location ID for a new location will be automatically assigned when using the Add Location function. Alternately, a temporary ID can be entered. The temporary ID can take any form but must be unique within the spreadsheet. At the time of loading a new location ID will be assigned by Maximo and the temporary ID will be replaced, and all other references within the spreadsheet will also be updated. **Update Location** Update the existing location record. If the existing location record is not found using the specified Location ID an error will be shown upon loading. **Delete Location** **This is to be used to correct data errors only.** Use the "Removed" status for decommissioned locations. Existing data, such as work orders, must be mapped to another location, specified in the "Location ID to move existing data to (for Delete Location change)" column.	Yes
Location Formal Name	The Formal Name for the location which will be used for physical labelling. Refer to section 5.1 of this document for guidance on what to enter in this column.	Yes
Location Commissioning Date	The date this location was first commissioned and brought into service. In some cases an asset location may be created but no asset is installed by the project – for example pipework is put in place for a pump to be installed in the future. In this case, the location will be considered commissioned at this	Yes

Column Heading	Column Description and Use	Mandatory
	point in time, however no asset record will be created until an asset is installed to this location.	
Location Capital Project ID	The capital project this location was delivered by. Example (C1234) The Project ID, also known as the C-Number or Project Number, is a way to group Outputs financially.	Yes
Location Capital Unique ID	The capital output ID associated to this location. Example (A0021-0045)	Yes
Drawing Number	The P&ID drawing number, for Process and Instrumentation drawings, or single line drawing (SLD) for Electrical drawings.	Yes
Drawing Tag	The specific tag for this location and asset, in relation to the specified Drawing Number.	Yes
Label Required	Select Yes if this location can be physically labelled. By selecting Yes, this location will appear in the Label Schedule when it is generated.	Yes
Label Applied Date	The Date the Physical Label was applied at this location.	Yes if Labelled Required is Yes
Workgroup	The depot / operational area responsible for operating and maintaining this location. Note that this is automatically set by Maximo based on boundaries on a map (stored in the GIS/AquaMap) and is included for informational purposes only. The automatically assigned work group can be over-ridden by selecting "Yes" in the "Work Group Overridden" column and choosing a different work group.	No
Asset	The unique identifier for the asset currently assigned to this location. The asset identifier is assigned automatically by Maximo when the asset is created at the time of loading. Before loading the new asset, a temporary ID is assigned within the spreadsheet. This temporary ID can take any form but must be unique within the spreadsheet. References to this temporary ID, such as in the Specification Input sheet, will be updated during loading. (e.g. ID.42568)	Yes
Asset Change	This instructs the system on how this record should be processed: **New Asset** Create a new asset record in this location – this is the option to select when delivering brand new assets. **Update Asset** Update the existing asset record in this location. **Delete Asset** Delete the asset record from this location. **Replaced Asset (Old Asset Disposed)** Create a new asset in this location and move the existing asset to the "Disposed" location. Use this option when the old asset is disposed of with no value. **Replaced Asset (Old Asset Salvaged)** Create a new asset in this location and move the existing asset to the "Salvaged" location. Use this option when parts of the old asset are recovered or sold for some value. **Moved Asset (Specify New Location)**	Yes

Column Heading	Column Description and Use	Mandatory
	Use this option when an asset is physically moved from one location to another. Specify the destination location in the "Asset Move To Location" column, along with a date that the asset was moved in the "Asset Move Date" column. An optional remark about this movement can be included in the "Asset Move Memo" column.	
Asset Description	This is the description of the asset that will appear on work orders, reports and search results. Enter a meaningful description of the asset. Refer to Section 5 of this document for naming conventions.	Yes
Asset Classification	This is used to group similar assets together by classifying them as the same type, for example "Pump", "Tank Structure", "Building". The classification selected also determines which Specifications are applicable to this asset. When selecting a classification refer to the Asset Information Standards document for guidance. In most cases the Location Classification and Asset Classification will be the same.	Yes
Asset Status	The status of the asset, which can be one of: **Planned** This location and its asset are yet to be delivered / constructed. By creating a Planned asset record information can be collected during the construction phase **In Service** The asset is operational. **Not in Use** The asset is not currently in use or operating but can be returned to service if required. **Abandoned** The asset is no longer in use and cannot be returned to service, typically due to physical disconnection from the network (i.e. an airgap exists). This status is synonymous with **Decommissioned.** Some maintenance may still be required for abandoned assets – for example maintaining land and safety. **Sold/Transferred** Sold to a third party and no longer SA Water's responsibility **Leased** Leased to a third party. **Removed**	Yes

Column Heading	Column Description and Use	Mandatory
	The assets at this location have been physically removed, decommissioned, and demolished.	
Manufacturer Name	The manufacturer of the asset, for example "Toyota" or "Grundfos".	Yes where applicable
Model	The asset model name / number / code For example "Corolla", "KE-15"	Yes where applicable, acknowledging not all assets will have a specific model
Serial #	The manufacturers unique serial number attached to this asset, for example "SN5443621".	Yes where applicable, acknowledging not all assets will have a manufacturer's serial number
Vendor Name	The vendor the asset was procured through.	Yes
Installed By	The primary contractor responsible for the installation of the asset	Yes
Asset Installation Date	The date the asset was first installed. For rotating assets this is not always the date the asset was moved into this location.	Yes
Warranty Expiration Date	The date the warranty for this asset expires. This is the Vendor or Manufacturer's warranty period, not the project's Defect Liability Period.	Yes for assets which are covered by a Vendor Warranty.
Purchase Price	The cost of purchasing, installing, and commissioning the asset as part of capital delivery works. Includes overheads such as project management, design etc. and for project delivering multiple assets, these costs should be distributed across the assets.	No
Free Asset	Denotes whether this asset was gifted to the corporation, for example via major land developments.	Yes
Asset Capital Project ID	The Capital Project ID (C-Number) e.g. C1234 The Project ID, also known as the C-Number or Project Number, is a way to group Outputs financially.	Yes
Asset Capital Project Unique ID	The Capital Project Unique ID from Insight (Output ID) e.g. A0021-1205	Yes
Asset Move To Location	The new location for this asset	No
Asset Move Date	The date the asset was moved to the new location.	No
Asset Move Memo	An optional memo with information about the asset movement	No

Column Heading	Column Description and Use	Mandatory
Condition Grade	Condition grades can be updated when assets are being renewed. This is only required for existing assets that have had a change in condition due to capital works. **Excellent** Asset is as new. **Very good** Some deterioration away from new **Good** Satisfactory condition, moderate deterioration but is still able to function. **Poor** Showing signs of deterioration will require remedy soon but does not require action immediately. **Very poor** Serious condition degradation, urgent remedial action required.	Yes For all new assets the default will be Excellent. For rehabilitation choose the level condition that the rehabilitation has brought the asset to.
Condition Comment	A comment about the condition of the asset, only required for Poor and Very Poor ratings.	Yes for asset with Poor or Very Poor condition
Condition Date	The approximate date the condition was assessed, or capital works were completed. Only required a condition grade is entered.	Yes

4.1.2 Filling in the Asset Input Worksheet

The Asset Input worksheet has been developed to assist with entering data consistently and easily. The following guidelines should be followed when entering information into the template.

4.1.2.1 Adding New Assets to an Existing Hierarchy

Use the Criteria for Recording Assets reference sheet to determine whether specific assets should be included in the hierarchy. Refer to the Asset Information Standards document to determine the appropriate parent location for each asset. Once this has been determined, the asset can be added to the hierarchy.

Criteria for Recording Assets

Use the table below as a guide for including assets and groups in the Asset Input worksheet

For each asset first check the critical asset criteria. If any of these conditions are met, then the asset is included in the hierarchy. If none of the critical asset criteria is met, find the asset in the Class Specific Inclusion Criteria. If any of the criteria are met, then the asset or group should be included in the hierarchy. For a group, sum up the assets cost, power and size and check these against the inclusion criteria.

The identification of groups and assets may not be immediately obvious, and if clarification is required contact SA Water IMD AM Asset Information Management for assistance. Refer to Asset Information Standards for more

Critical Asset Criteria (Step 1)

Assets which meet any of the criteria for a critical asset should always be included in the Asset Input sheet.
The Critical Asset Criteria overrides any other class specific criteria, and apply if an asset:

- **Has statutory or calibration maintenance requirements**
- **Represents a single point of process failure (ie asset failure causes a safety or environmental hazard, interruption to production and supply or causes other critical assets to fail)**
- **Has specific compliance or licensing requirements**
- **Is a safety device**
- **Replacement time is more than 2 months and no stand-by available**

Class Specific Asset Inclusion Criteria (Step 2)

Classification	Type	Include if Cost >=	or Size / Power >=	or Other criteria	Split into	Notes
Aerator Set	Group	$1,000	15kW	Has components with maintainable coupling	Aerator / Motor / Gearbox / Support	
Ammoniator Set	Group	$1,000			Refer to Asset Information Standards for more details	
Biological Filter	Group	$1,000			Refer to Asset Information Standards for more details	
Bioreactor	Group	$1,000			Refer to Asset Information Standards for more details	
Blower Set	Group	$1,000			Refer to Asset Information Standards for more details	
Building	Group	$1,000	2m x 2m		Building Structure / Lighting / Air Conditioning / Ventilation Fan	

Figure 3 - Example of criteria for recording assets

1. Find and select the appropriate parent asset for the new asset, in this case the Building. Locate the "Add-ins" menu in the Excel Ribbon Bar. Use the Add Location button to add a new location. If you cannot see the "Add-ins" menu, ensure macros are enabled in Excel (seek help from your IT department if you are unable to enable macros)
2. A prompt to select the classification of the new location will appear. Select an appropriate classification from the list.
3. A new location record will be created and assigned a temporary ID. If the classification selected is an "Asset Class" type of location, a new asset record is also created with its own temporary asset ID.

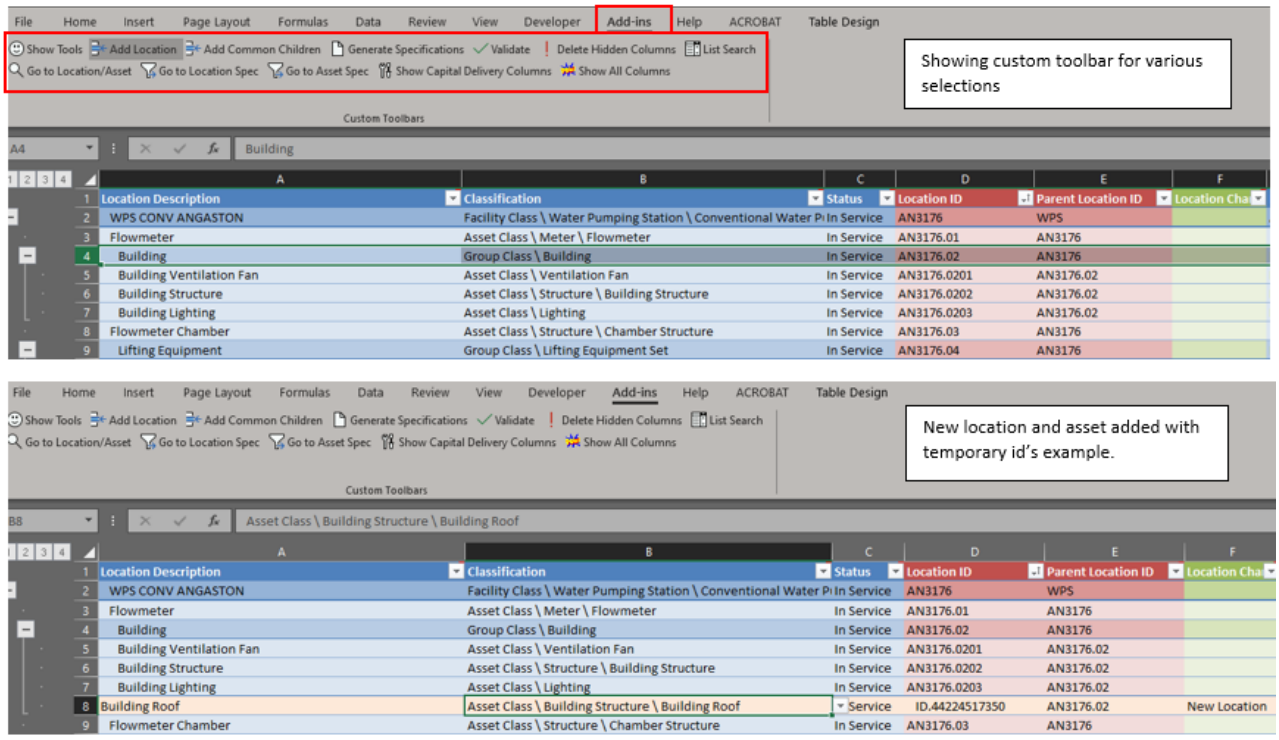
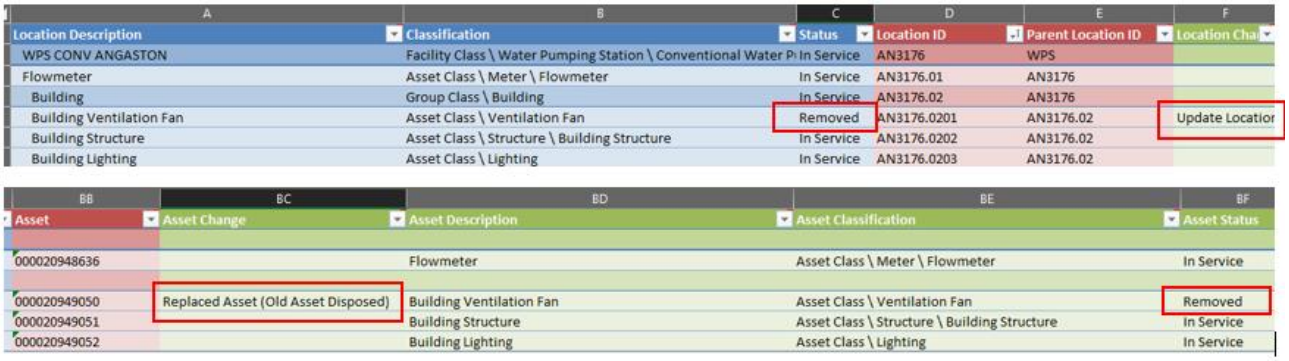


Figure 4 - Adding new location and asset to the 'Asset Input Sheet'

4.1.2.2 Marking Existing Assets as Replaced

1. Find the asset record to be marked as replaced in the existing location hierarchy. Seek clarification from Asset Information Management if uncertain of which assets are affected.
2. In the "Asset Change Type" column select an appropriate "Replaced Asset" action. If the asset has been disposed of (demolished, binned) then use the "Disposed" option, if the asset or parts of it were recovered or auctioned use the "Salvaged" option.



A	B	C	D	E	F
Location Description	Classification	Status	Location ID	Parent Location ID	Location Cha
WPS CONV ANGASTON	Facility Class \ Water Pumping Station \ Conventional Water P	In Service	AN3176	WPS	
Flowmeter	Asset Class \ Meter \ Flowmeter	In Service	AN3176.01	AN3176	
Building	Group Class \ Building	In Service	AN3176.02	AN3176	
Building Ventilation Fan	Asset Class \ Ventilation Fan	Removed	AN3176.0201	AN3176.02	Update Locatior
Building Structure	Asset Class \ Structure \ Building Structure	In Service	AN3176.0202	AN3176.02	
Building Lighting	Asset Class \ Lighting	In Service	AN3176.0203	AN3176.02	

BB	BC	BD	BE	BF
Asset	Asset Change	Asset Description	Asset Classification	Asset Status
000020948636		Flowmeter	Asset Class \ Meter \ Flowmeter	In Service
000020949050	Replaced Asset (Old Asset Disposed)	Building Ventilation Fan	Asset Class \ Ventilation Fan	Removed
000020949051		Building Structure	Asset Class \ Structure \ Building Structure	In Service
000020949052		Building Lighting	Asset Class \ Lighting	In Service

Figure 5 - Change Location and Asset status

4.1.2.3 Marking Existing Locations and Assets as Removed

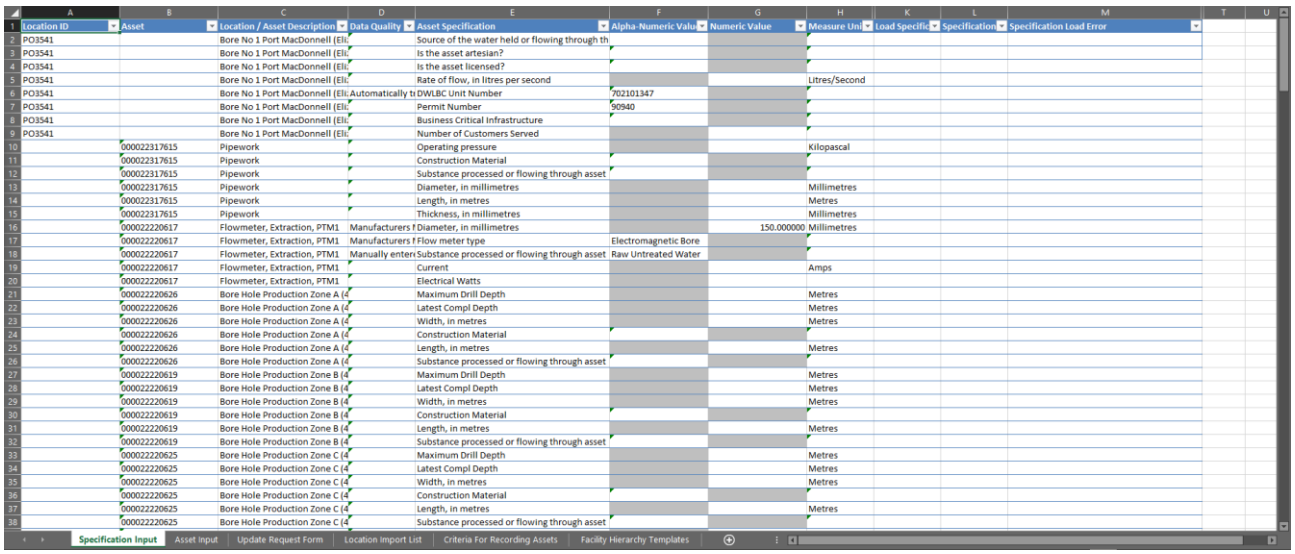
1. Find the location record to be marked as Removed in the existing location hierarchy. Seek clarification from Asset Information Management if uncertain of which assets are affected.
2. In the Location Status column choose "Removed"
3. In the Location Change Type column choose "Update Location"

4.1.3 Filling in the Specification Input Worksheet

The Specification Input worksheet is used to collect data specific to the types of assets which are being added or replaced. As the specifications are specific to the assets, this worksheet can only be generated once the Asset Input worksheet has been updated appropriately.

For each asset complete the required specifications in the Value column. If the specification is not relevant to the particular asset indicate this by entering "N/A" or just leave it BLANK field in the specification 'Comments' column.

Drop-down boxes have been provided where a specification is restricted to a range of set values. If the appropriate value is not available in the drop-down enter the specification in the Comments column.



Location ID	Asset	Location / Asset Description	Data Quality	Asset Specification	Alpha-Numeric Value	Numeric Value	Measure Unit	Load Specific	Specification	Specification Load Error
PO3541		Bore No 1 Port MacDonnell (Ell		Source of the water held or flowing through th						
PO3541		Bore No 1 Port MacDonnell (Ell		Is the asset artesian?						
PO3541		Bore No 1 Port MacDonnell (Ell		Is the asset licensed?						
PO3541		Bore No 1 Port MacDonnell (Ell		Rate of flow, in litres per second			Litres/Second			
PO3541		Bore No 1 Port MacDonnell (Ell	Automatically t	DWLBC Unit Number	702101347					
PO3541		Bore No 1 Port MacDonnell (Ell		Permit Number	50940					
PO3541		Bore No 1 Port MacDonnell (Ell		Business Critical Infrastructure						
PO3541		Bore No 1 Port MacDonnell (Ell		Number of Customers Served						
	000022317615	Pipework		Operating pressure			Kilopascal			
	000022317615	Pipework		Construction Material						
	000022317615	Pipework		Substance processed or flowing through asset						
	000022317615	Pipework		Diameter, in millimetres			Millimetres			
	000022317615	Pipework		Length, in metres			Metres			
	000022317615	Pipework		Thickness, in millimetres			Millimetres			
	000022220617	Flowmeter, Extraction, PTM1	Manufacturers f	Diameter, in millimetres		150.000000	Millimetres			
	000022220617	Flowmeter, Extraction, PTM1	Manufacturers f	Flow meter type	Electromagnetic Bore					
	000022220617	Flowmeter, Extraction, PTM1	Manually enter	Substance processed or flowing through asset	Raw Untreated Water					
	000022220617	Flowmeter, Extraction, PTM1		Current			Amps			
	000022220617	Flowmeter, Extraction, PTM1		Electrical Watts						
	000022220626	Bore Hole Production Zone A (4		Maximum Drill Depth			Metres			
	000022220626	Bore Hole Production Zone A (4		Latest Compl Depth			Metres			
	000022220626	Bore Hole Production Zone A (4		Width, in metres			Metres			
	000022220626	Bore Hole Production Zone A (4		Construction Material						
	000022220626	Bore Hole Production Zone A (4		Length, in metres			Metres			
	000022220626	Bore Hole Production Zone A (4		Substance processed or flowing through asset						
	000022220619	Bore Hole Production Zone B (4		Maximum Drill Depth			Metres			
	000022220619	Bore Hole Production Zone B (4		Latest Compl Depth			Metres			
	000022220619	Bore Hole Production Zone B (4		Width, in metres			Metres			
	000022220619	Bore Hole Production Zone B (4		Construction Material						
	000022220619	Bore Hole Production Zone B (4		Length, in metres			Metres			
	000022220619	Bore Hole Production Zone B (4		Substance processed or flowing through asset						
	000022220625	Bore Hole Production Zone C (4		Maximum Drill Depth			Metres			
	000022220625	Bore Hole Production Zone C (4		Latest Compl Depth			Metres			
	000022220625	Bore Hole Production Zone C (4		Width, in metres			Metres			
	000022220625	Bore Hole Production Zone C (4		Construction Material						
	000022220625	Bore Hole Production Zone C (4		Length, in metres			Metres			
	000022220625	Bore Hole Production Zone C (4		Substance processed or flowing through asset						

Specification Input | Asset Input | Update Request Form | Location Import List | Criteria For Recording Assets | Facility Hierarchy Templates

Figure 6 - Screenshot - Asset Specification worksheet in Excel

4.1.4 Filling in the Maintenance Input Worksheet

The Maintenance Input worksheet is used to record any maintenance which is required by the manufacturer to maintain the warranty. Maintenance required to keep the asset under warranty, bespoke assets is the only information that should be recorded in this worksheet – any on-going maintenance or operational tasks should not be recorded in this spreadsheet. Table 6 lists the column headings required in the asset maintenance spreadsheet. Figure 7 shows an example of the maintenance spreadsheet in Excel. Note that where applicable drop-down selection lists have been made available to assist with selecting an appropriate value. Maintenance Input worksheet shall be completed by the contractor (assistance could be provided by Project Manager, Engineer and PM Optimization team)

Table 3 - Column Heading required in the Maintenance Input worksheet

Column Name	Description
Location ID	The ID of the asset the maintenance is to be performed on. This must be the asset ID from the Asset Input sheet.
Location Description	Contains a formula to return the description of the Location ID for visual reference. Do not edit.
Task Frequency	The frequency the tasks should be performed, completed in conjunction with frequency units.
Frequency Units	The units of frequency, for example days, weeks, months, or years.
Task Number	Where there are multiple tasks are associated with a single asset, at the same frequency, the Task Number can be used to maintain the order of the tasks when they appear on a workorder.
Task Description	A brief description of the task to be performed. The description cannot be longer than 100 characters and must only contain alphanumeric characters (abc, 123..) and basic punctuation. Where applicable a manual reference can also be provided here, for example "Change oil as per O&M Manual section 6.8"
Task Duration (Hours)	The estimated duration of the task in hours. Use decimal hours to indicate minutes, for example 0.5 hours is the equivalent of 30 minutes.
Labour Type	The type of labourer required to perform the task.
First Start Date	This is the date when the maintenance task should first be performed. This can typically be calculated from the installation date, plus the maintenance frequency. For example, an asset installed on 1/1/2013, with 6-month maintenance task, should have a first start date of 1/7/2013.
Work Order Group #	This optional column can be used to group multiple assets and maintenance tasks onto a single work order. For example, if there are 4 pumps with the same service requirements and service interval then enter the maintenance for each of these assets and assign the same Work Order Group number. The number can be any number, typically starting at 1 and counting upwards.

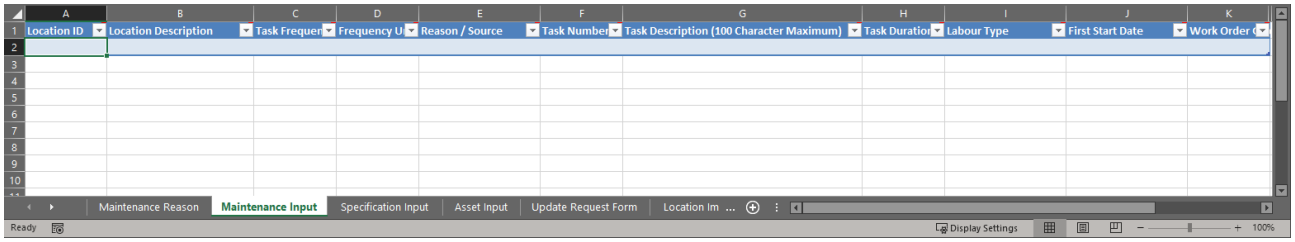


Figure 7 - Screenshot - Maintenance Input worksheet

Location ID	Location Description	Task Frequer	Frequency U	Reason / Source	Task Number	Task Description (100 Character Maximum)	Task Duration (Hours)	Labour Type	First Start Date	Work Order Group #
TE41253.0101	Motor PU01		6 MONTHS	Warranty		Clean motor to ensure adequate ventilation.	1.000000		05/08/2020	
TE41253.0102	Pump PU01		1 YEARS	Warranty		Check mechanical shaft seal if any considerable and increasing leak occurs.	1.000000		05/02/2021	
TE41253.0102	Pump PU01		1 YEARS	Warranty		Remove coupling guards to inject silicon oil on saft if extended period between uses.	1.000000		05/02/2021	
TE41253.0201	Motor PU02		6 MONTHS	Warranty		Clean motor to ensure adequate ventilation.	1.000000		05/08/2020	
TE41253.0202	Pump PU02		1 YEARS	Warranty		Check mechanical shaft seal if any considerable and increasing leak occurs.	1.000000		05/02/2021	
TE41253.0202	Pump PU02		1 YEARS	Warranty		Remove coupling guards to inject silicon oil on saft if extended period between uses.	1.000000		05/02/2021	
TE41253.06	Pipework		1 YEARS	Recommended		Check pipe wall penetration flashing, reapply silicon if required.	1.000000		05/02/2021	

Figure 8 - Example of completed maintenance columns

5 Naming Conventions

5.1 Facility Naming Convention

The facility naming convention attempts to cater for all naming variations, while also providing a stricter set of rules which can be applied to new facilities. Asset Information Management will apply this naming convention when assigning a new facility identifier.

The proposed naming convention takes the form:

[Suburb/Locality] [Facility Class] **[Local Number]** **[Additional Attributes]** ([**Street**])

The naming convention primarily attempts to ensure information displayed consistently and ordered correctly in reports and lists. The convention is prescriptive about the order of items to include in the description, but flexibility is allowed with how the items are described – for example, some areas do not have a suburb, and so a locality or system name may be applied instead, providing this is the first item used in the name.

When this standard is applied, these are some example names:

- Aldinga Beach Submersible Wastewater Pump Station No.109 (Esplanade)
- Aldinga Beach Submersible Wastewater Pump Station No.278 (Rowley Rd)
- Aldinga Pressure Control Installation (Biscay Rd)
- Blair Athol Submersible Wastewater Pump Station (Lionel Ave)
- Crafers Submersible Wastewater Pump Station No.250 (The Crescent)
- Tailem Bend Chlorination Water Dosing Station
- Tailem Bend Chlorination Water Dosing Station No.2 (Frost Rd)
- Tailem Bend Filtration Water Treatment Plant (Princes Hwy)
- Tailem Bend Relift Water Pump Station No.1 (Princes Hwy)
- Tailem Bend Single Elevated Water Storage Tank 0.46ML (Princes Hwy)
- Tailem Bend Water Pump Station (Treated Water) (Princes Hwy)
- Tailem Bend Water Pump Station No.1 (Princes Hwy)
- Tailem Bend Water Pump Station No.2 (Frost Rd)
- Tintinara Chlorination Water Dosing Station
- Willaston Submersible Wastewater Pump Station No.251 (Main North Rd)

5.1.1 Suburb/Locality - Mandatory

All facilities are represented in the corporate geographical information system – that is, a location on a map – and as such the suburb for a facility is typically known. However, in some cases, the suburb name may not be correct, or a more accurate locality is available, and the automatic suburb assignment can be overridden in those circumstances.

5.1.2 Facility Class - Mandatory

The original naming convention proposal included the facility class represented as a code or a descriptor, depending on particular situations. To simplify the application of this rule, the descriptor is always used, for example:

- Submersible Wastewater Pump Station – not SPS or WWPS
- Pressure Control Installation – not WCTRL
- Chlorination Water Dosing Station – not WDS or WTS
- Relift Water Pump Station – not WPS RELIFT
- Single Elevated Water Storage Tank – not WTANK
- Conventional Water Pump Station – not WPS CONV

After applying the rules, it was noted that the term "conventional" added little value – unless otherwise stated a facility is conventional – and as such the term is removed from the

description. For example, "Conventional Water Pump Station" becomes "Water Pump Station".

5.1.3 Local Number - Optional

Operations and field staff may refer to a facility by a local number, for example, the following all have a local number of 11:

- Cannawigara Water Production Bore No.11 (Siding Rd)
- Devon Park Wastewater Fan Stations No.11 (Exeter Tce)
- Kangaroo Flat Pressure Control Installation No.11 (Kangaroo Flat Rd)
- Uley South Water Production Bore No.11 (Flinders Hwy)

Alternately, a local number may be used to differentiate between multiple facilities at a single locality, for example.

- Arthurton Surface Water Storage Tank No.1 9.09ML (Govt Rd)
- Arthurton Surface Water Storage Tank No.2 9.09ML (Govt Rd)
- Arthurton Surface Water Storage Tank No.3 32.5ML (Govt Rd)

5.1.4 Additional Attributes - Optional

This is a provision for any additional attribute's users of the information (i.e. asset management, operations, finance, control centre) require. For example, often for tanks the capacity and elevation are listed, as this assists with identifying the facility in the field. Alternately, additional information about the locality or the function may be provided here. Below are some examples of existing description which contain some additional attribute information, highlighted in yellow.

- Alma Surface Water Storage Tank 0.136ML (North) (Llanelly Rd)
- Alma Surface Water Storage Tank 2.273ML (South) (Govt Rd)
- Arno Bay Booster Water Pump Station Boothby Branch (Pumping Station Rd)
- Auburn Swan Reach Paskeville Water Flowmeter Installation Forward & Reverse
- Bolivar Activated Sludge WWTP High Salinity (Port Wakefield Rd)
- Cadell Water Pump Station (Raw Water) (River Tce)
- Glossop Relift Water Pump Station (Treated Water) (Battams Rd)
- Hope Valley Water Flowmeter Installation Reservoir Inlet Tunnel

5.1.5 Street - Optional

The street can be included in brackets as the last part of the description. Like the suburb it can be automatically derived from a map, however provision is made to allow more accurate street information to be provided.

5.2 Asset Location Formal Naming Convention

The Asset Location naming convention applies to all locations which have a category of Asset Location (ASSETLOC) and is applied to the location's Formal Name field in Maximo. The intent of the naming convention is to ensure the asset can be easily identified and differentiated from other similar assets, while also ensuring the length of the description is short enough to print on physical labels without requiring the full hierarchy to be printed.

Maximo has provision for 2 names or descriptions of the location via the "Description" and the "Formal Name" fields. This standard applies to information entered into the "Formal Name" field.

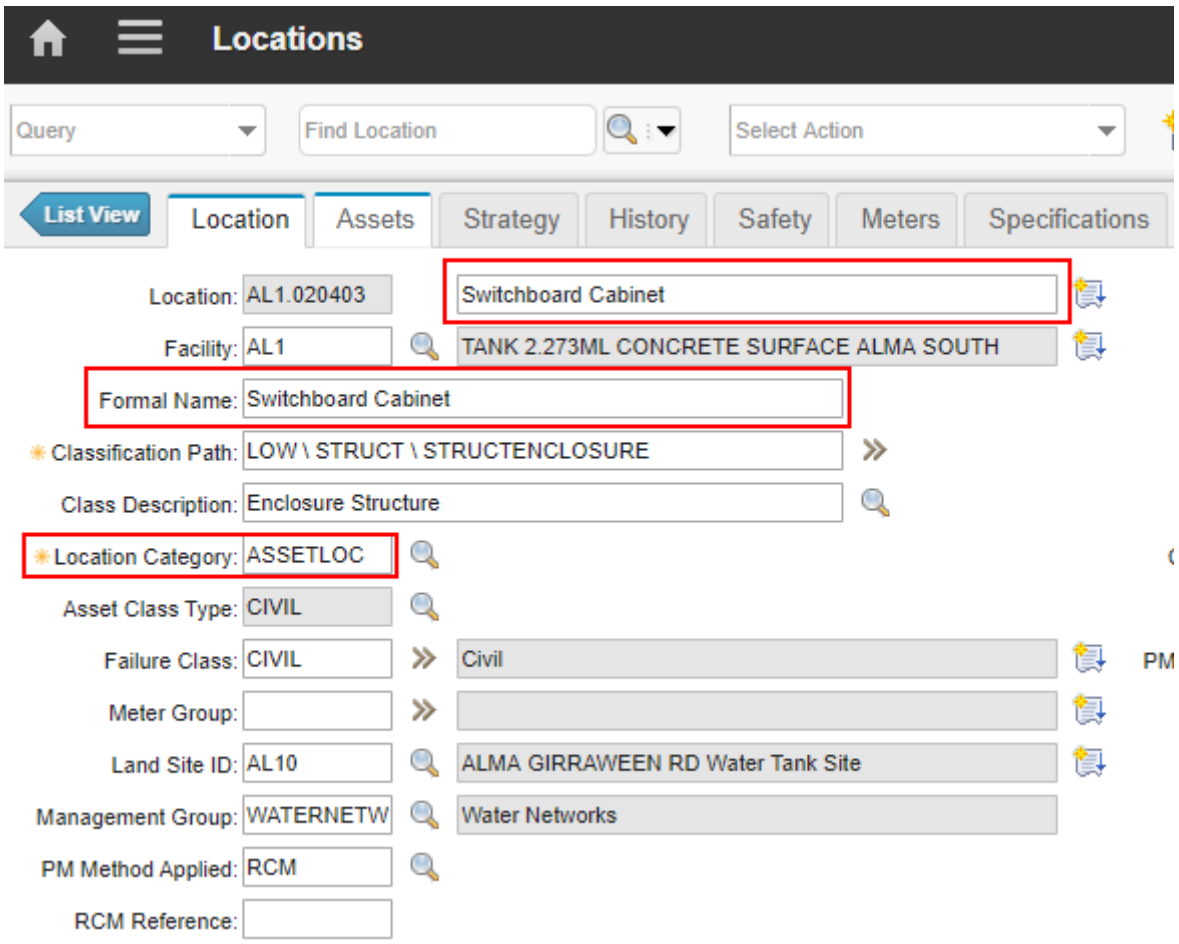


Figure 9 - Maximo showing Description and Formal Name

A	G	H
Location Description	Location Formal Name	Location Category
TANK 2.273ML CONCRETE SURFACE ALMA SOUTH	Alma Surface Water Storage Tank 2.273ML (South) (Range Rd)	Facility Location
Power Supply	Power Supply	Intermediate Location
Switchboard	Switchboard	Intermediate Location
Switchboard Cabinet	Switchboard Cabinet	Asset Location

Figure 10 - Asset input sheet showing Description, Formal Name and Location Category

Traditionally the Description and Formal Name field have contained the same information, with the Description generally being referred to by other systems, reports and applications. Within these reports and applications additional context can be provided to make the description more meaningful. In the example shown in Figure 8 the description of "Switchboard Cabinet" on its own would not necessarily be sufficient for someone to confidently identify the physical asset associated to this record. In this case, additional information from the hierarchy can be presented to provide more context and information about the location and asset. For example, by looking at the location in the hierarchy it is obvious that this is the switchboard cabinet at the Alma Tank facility.

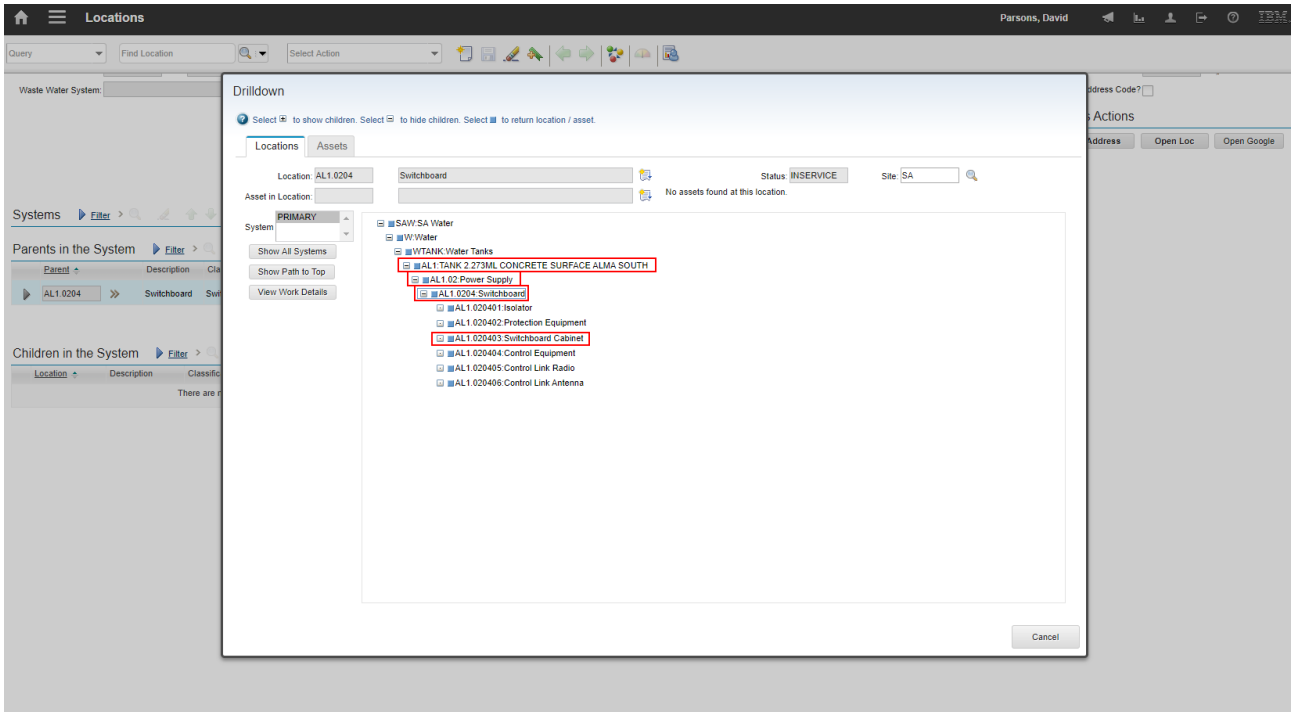


Figure 11 - Example Location Hierarchy Drilldown showing the Location's position in the hierarchy

This information can also be presented as a single line description by prefixing the location's description with its hierarchy ancestors, for example:

Power Supply \ Switchboard \ Switchboard Cabinet

With the advent of physical labelling of the assets it has become evident that the length of this type of description, especially within treatment plants and other complex assets, becomes too long. The below example shows a typical treatment plant asset location description using the full hierarchy:

Disinfection \ Happy Valley Chlorine WDS \ Chlorine Dosing System \ Chlorine Injector System \ Injector Set 3 \ Injector 3

When viewing the description with the context of the hierarchy it is clear which location and asset is being referred to. In some instances, locations have been created with the entire hierarchy included in the description.

For example:

Filtration \ UF Skid No. 1 Glossop \ UF Skid No. 1 Glossop \ Train 1 \ Skid 1 Train 1 Back Pulse Pump Discharge Set \ Skid 1 Train 1 Back Pulse Isolation Valve Set \ Skid 1 Train 1 Back Pulse Isolation Valve Positioner

While this allows a location to be identified without hierarchical context, it creates duplication when the hierarchy is included at each level. As such the Formal Name field will be used to present this type of description, and will be used when labelling asset locations, while the Description field will hold the short form to be used within the context of the hierarchy.

5.2.1 Asset Location Formal Name Length

To ensure the name of an asset can easily fit within the allowed space on a physical label the maximum length allowable is 50 characters. To accommodate this requirement some abbreviations may be used where appropriate and providing the abbreviation is well known and not ambiguous.

5.2.2 Asset Location Formal Name Format

There is no prescribed format for the information to be entered into the Formal Name field, however the following guidelines should be followed.

- Include the parent (or other ancestors, such as grandparent) description before the asset location description.
- Use abbreviations where it is appropriate. Ensure operators and maintainers agree with the abbreviated form and understand its meaning.
- Discard redundant or duplicated information, for example instead of using "Pump Set 1 Pump 1" and "Pump Set 1 Motor 1" use "Pump Set 1 Pump" and "Pump Set 1 Motor".
- Discard redundant words, for example instead of using "Pump Set 1 Isolation Valve Set 1 Isolation Valve" or "Pump Set 1 Isolation Valve Set 1 Isolation Valve Actuator" use "Pump Set 1 Isolation Valve" and "Pump Set 1 Isolation Valve Actuator".
    - Use discretion and engage with operators and maintainers to ensure the description is fit for purpose and understood by all parties who will be using it to identify physical assets.