Asset Management Data Standard

AMDS & Uniclass Coding Guidance

Leah Watts

Version 1.0

Copyright information

Copyright ©. This copyright work is licensed under the Creative Commons Attribution 4.0 International licence. In essence, you are free to copy, distribute and adapt the work, as long as you attribute the work to NZ Transport Agency Waka Kotahi and abide by the other licence terms. To view a copy of this licence, visit http://creativecommons.org/licenses/by/4.0/.

Disclaimer

NZ Transport Agency Waka Kotahi has endeavoured to ensure material in this document is technically accurate and reflects legal requirements. However, the document does not override governing legislation. NZ Transport Agency Waka Kotahi does not accept liability for any consequences arising from the use of this document. If the user of this document is unsure whether the material is correct, they should refer directly to the relevant legislation and contact NZ Transport Agency Waka Kotahi.

More information

NZ Transport Agency Waka Kotahi
Published [month and year]

ISBN [number]

If you have further queries, call our contact centre on 0800 699 000 or write to us:

NZ Transport Agency Waka Kotahi
Private Bag 6995
Wellington 6141

This document is available on NZ Transport Agency Waka Kotahi website at www.nzta.govt.nz

Contents

Forward

The Asset Management Data Standard (AMDS) is foundational to the NZ Transport sector, underpinning the management, analysis and reporting of land transport assets now and into the future, but we understand that aligning to other standards assists users in the management of their assets.

Uniclass is a unified classification system which can be used by different parts of the construction industry in various ways. For example, facilities managers and owners might classify their existing asset records, whilst designers and constructors can use Uniclass codes to structure specifications and manage project information.

This guidance provides a framework to enable the recording of Uniclass classifications against the AMDS standard inventory items to ensure consistency across the NZ transport sector.

References

Term	Definition
AMDS	AMDS is a data standard that informs activity management decisions for transport so we can plan and implement activities which deliver services as expected for the cost expected. It is a common language that describes the service, impact, and asset lifecycle across the transport system. The standard will create a structure that will ensure the consistency of collection of data. This will enable Road Controlling Authorities (RCAs), NZ Transport Agency Waka Kotahi and the transport sector to collect better quality data, helping them meet asset management goals. AMDS Framework
Uniclass	Uniclass provides a unified classification system for the construction industry - buildings, landscape and infrastructure could be classified under one unified scheme Uniclass provides a means of structuring project information essential for the adoption of BIM. Information about a project can be generated, used and retrieved throughout the built asset life cycle. Uniclass Framework

Introduction

The Asset Management Data Standard (AMDS) is a data standard that informs activity management decisions for transport so NZ Transport Agency Waka Kotahi can plan and implement activities which deliver services as expected for the cost expected. In digital engineering terms, the AMDS is a defined data structure standard for the delivery of digital asset information.

Having a robust asset management standard is important for infrastructure systems. It enables consistent data structures, describes services, and impacts across the network as well as informing activity management decisions. This ultimately provides a better understanding of assets across its lifecycle and enables efficient operation and maintenance decisions. This standard is a key feature in the wider strategy to future proof NZ Transport Agency Waka Kotahi Data Systems and more importantly help build more resilience to the Road Network in New Zealand.

Purpose of the guidance

This guidance provides a framework to enable the recording of Uniclass classifications against the AMDS standard consistently across the NZ transport sector.

Target audience and users

An RCA or asset manager will be able to specify (e.g. in contracts) that this guidance should be used when capturing new or maintained assets.

The guidance is intended to be used by RCAs, contractors, surveyors and engineers who undertake work on the assets.

Once adopted the guidance should be complied with in its entirety, to secure the benefits of a common framework.

Scope

The guidance is limited to version 1.3 of the AMDS associated with an asset.

Data about the asset itself is excluded from this guidance and is more appropriately defined within the Asset Management Data Standard.

AMDS and Uniclass Structure

AMDS Structure

Assets are either single model entity/components or a conglomeration of multiple model components. A good example of this is a Bridge Asset. Bridges will consist of piles, pile cap, pier, pier cap, bearing, girder, deck, and barriers etc. The way NZ Transport Agency Waka Kotahi currently intends to use the information for Asset Management is as a single asset i.e., Bridge. Similarly, a bridge may consist of multiple model elements across numerous asset classes. This poses challenges to identifying and grouping individual asset elements. Hence, we have identified that there is a need to classify using both asset classification and spatial information.

From the breakdown of asset classes above, we categorised the assets into three levels and they are as below
1. AMDS Class: The highest AMDS asset group which holds multiple Asset Classes (i.e., Structure)

2. Asset Type: An asset which constitutes multiple model components within a subgroup (i.e., Bridge)

3. Asset Element: A single element within a subgroup of components (i.e., Pier)

We have identified that the key asset class to capture on each element is Asset Type for several reasons:

- AMDS Class are a generalised group of assets that can easily be appended to the asset subgroup at the Asset Handover phase by relating the subgroup using an expression.

- Asset Type is the asset group that NZ Transport Agency Waka Kotahi intends to use to manage their asset and aligns with the AMDS schema.

- Asset Elements are single element assets to which there are many and are generally already captured within the AMDS schema (i.e. PavementType).

Each asset type shown [here](#) has a specific AMDS attribute schema. Many of the fields are common across all asset types however each one must be kept separate in the first instance to manage individual elements within their class and their unique attribute fields. This is so that we can provide specific attribute workflows to each discipline.

An asset unique number/asset ID should be generated for each element post Issue for Construction (IFC) from the design models. It is acknowledged that there will be numerous design changes and iterations prior to the IFC gate, hence it will be logical to generate asset IDs at the end of IFC model production. Assets generated at this stage will be recorded and changes will be monitored for modifications. If assets are removed, added, changed, or remodelled in construction a new asset ID may be generated. The intention is to carry the asset ID over from design into construction wherever possible. Querying asset IDs within the database and using spatial verification tools will enable a project to automate and bulk append a large proportion of the required attribute fields to each element for the Asset Information Model (AIM) handover. There may still be a small proportion of assets that require manual input; this approach intends to minimise these scenarios.

Capital projects should use this process to manage the creation of the digital AIM for handover. There will be a larger portion of the information handover that will not be included in this model and will be captured in the Handover Management Plan. Additionally, there are BIM enabled functions that are a part of the wider digital aspirations for NZ Transport Agency Waka Kotahi, however these other outcomes are not the focus of this document.

Uniclass Classification

Capital projects may wish to utilise Uniclass 2015, below is a table that summarises the classification types in the Uniclass 2015 standard.

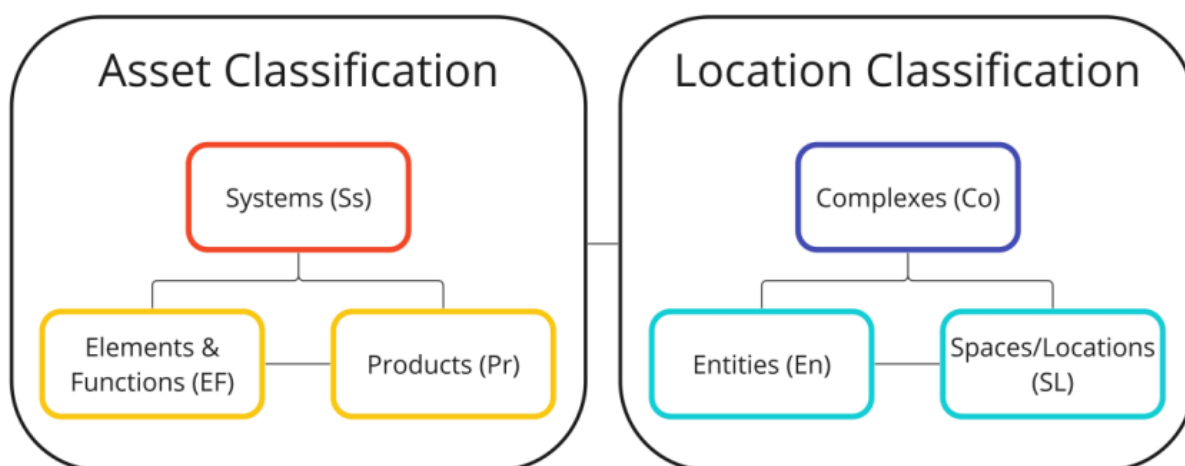| Classification	Sub-classification	Standard
Location		Uniclass 2015, Complexes (Co), Entities (En), Spaces/Locations (SL)
Asset	Type	Uniclass 2015, Elements/Functions (EF) or Products (Pr)
	System	Uniclass 2015, Systems (Ss)

Table: Uniclass Classifications

Figure: Uniclass Asset & Location Classifications. Source: TfNSW Application of Uniclass 2015

Uniclass 2015 Table	Description (*ISO 12006-2:2015*)
Co – Complexes	Aggregate of one or more entities intended to serve at least one function or user activity.
En – Entities	Independent units of the built environment with a characteristic form and spatial structure, intended to serve at least one function or user activity.
SL – Spaces / Locations	Space defined by built or natural environment or both, intended for user activity or equipment.
Ss – Systems	Interrelated products that together perform a defined function.
EF – Elements / Functions	Constituent of an entity with a characteristic function, form, or position.
Pr – Products	Product intended to be used as a construction resource.

Table: Project Specific Definitions of Uniclass

Asset Coding

The benefit of classifying assets by asset type as well as asset location may enable greater efficiency in identifying and ultimately locating assets that could have complex relationships with other asset classes. As shown below, each Asset class has been assigned at least one Asset Classification. However, understanding the relationship between location classes and asset classes supports the future adoption of digital engineering.

Grouping	Asset	Uniclass Asset Code	Products
Roadway			
	Pavement	Ss_30_14_65	
	Surface	Ss_30_14_65_85	
	Subgrade	Ss_30_14_65_83	
	Stopping Place	Ss_25_36_95_96	
	Tree	Pr_45_30_90	
Pathway[1]			
	Pathway	En_80_40	
	Kerb Crossing		
	Berm	SL_32_40_06	
Barrier			
	Barrier	Ss_25_16_73	
	Barrier Terminal	Pr_20_85_07_75	
	Motorcycle Attachment	EF_25_55_30	
	Crash Cushion	Ss_25_16_94	Pr_20_85_07_75
Access Control			
	Bollard	Pr_20_76_08	
	Rail	Pr_20_85_07	
	Cattle Stop	Pr_25_96_35	
	Wall	EF_25_10_30	
	Wheel Stop	Pr_40_70_73_98	
Support Structures			
	Gantry	EF_37_17_35	
	Mast	EF_37_17_50	
	Pole	Pr_20_85_50	
	Outreach	Pr_20_76_64_52	
Geotechnical			
	Ground Treatment	Ss_15_10_30	
	Rockfall Protection	Ss_20_60_30	

---

[1] *Pathway must use the entity location class En_80_40 as Ss_30_14_65 - pavements asset class is already used

Grouping	Asset	Uniclass Asset Code	Products
Drainage			
	Chamber	Ss_50_35_06	
	Channel	Pr_65_52_24	
	Culvert	Pr_65_52_20	
	Headwall	Pr_20_93_37	
	Pipe	Ss_50_70_05_95	
	Valve	Pr_65_54_24	
	Water Area	Ss_50_70	
	Water Structure	Ss_50_70_85	
Traffic Control Device			
	Non Electronic Sign	Pr_40_10_77_72	
	Delineator	Pr_40_10_77_36	
	Markings	Pr_35_31_85_47	
	Traffic Island	Pr_25_30_86_91	
	Road Hump	Pr_25_30_86_83	
Amenities			
	Artwork	Pr_40_50_05	
	Advertising Structure	Ss_75_10_68_02	
	Cycle Amenity	Ss_40_85_72_20	
	Rubbish Bin	Pr_40_50_07_72	
	Planting Structure	Pr_45_63	
	Seating	Pr_40_30_29	
	Shelter	Pr_20_65_78	
	Weight Facility	Ss_50_80_96	
Structure			
	Bridge	Ss_20_50	
	Tunnel	Ss_37_50_92	
	Retaining Wall	Ss_20_60	
	Sea Wall	Ss_25_16_50_80	
Mechanical & Electrical			
	Battery	Pr_60_70_06_07	
	Cable	Pr_65_70_48	
	Camera	Pr_60_75_86	
	Cell	Pr_60_70_65_30	
	M&E Chamber	Ss_37_16_90_63	
	Controller	Pr_75_50_20	
	Convertor	Pr_75_75_90_65	
	Duct	Pr_65_52_61_65	

Grouping	Asset	Uniclass Asset Code	Products
	Electronic Sign	Pr_40_10_77	
	Enclosure	Ss_40_15_35_80	
	Generator	Ss_70_10	
	Invertor	Pr_65_72_43_42	Pr_75_75_90
	Luminaire	Pr_70_70_48	
	Meter	Pr_80_51_51_28	
	Panel	Pr_60_70_22	
	M&E Pipe	Pr_65_52_61_61	
	Radio Equipment	Ss_75_10_70_70	
	Router	Pr_70_75_52_72	
	Sensor	Pr_75_50_76	
	Speaker	Pr_60_75_08_04	
	Switch	Pr_70_75_52_56	
	Switchboard	Pr_60_70_22	
	Telephone	Pr_70_75_88_27	
	Traffic Signal	Ss_75_30_35_88	
	Transformer	Pr_80_51_51_19	
	Tray	Pr_65_70_11_17	
Environment			
	Biodiversity	Ss_45_35_08	
	Resource Efficiency	PC_35_85_47_35	
Waterfront			
	Boat Ramp	SL_32_50	
	Shore Protection	Co_32_55_20	
	Waterfront Structure	SL_32_50	
System			
Network			
	Road	Co_80_35_75	
	Rail	Co_80_50	
	Public Transport	Co_80_35_10	
	Pathway	En_80_40_30	
	Trail	En_80_40_90	
Observation			
	Air Quality	Pm_30_30_03	
	Contaminated Land	Pm_30_20_17	
	Groundwater	Pm_30_20_36	
	Stormwater		