Asset data guide (SM050)

Asset information guidelines

May 2026

ADG Version 1.1

AMDS Version 1.4

NZ TRANSPORT AGENCY
WAKA KOTAHI

Te Kāwanatanga o Aotearoa
New Zealand Government

More information

NZ Transport Agency Waka Kotahi
Published May 2026

ISBN 978-1-991311-91-7

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This manual has been developed with the collaboration of the Road Efficiency Group Te Ringa Maimoa (REG).

These documents are published as a pre-ratification consultation draft. They will remain in draft status for no more than 12 months from April 2026. Feedback can be posted to assetdataguidance@nzta.govt.nz

Asset data guide (SM050)

Chamber information

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Contents

This document is a section of the NZ Transport Agency Waka Kotahi *Asset data guide* (SM050).

What is a chamber?

A chamber is a structure beneath the ground or the road designed to facilitate drainage activities. It typically serves as a junction point for multiple inflow and outflow pipes.

Figure 1: Chamber (drainage) examples

Asset system and related assets

Chambers are usually a component in a stormwater system:

- **Drainage - Pipe**
- **Drainage - Channel**
- **Drainage - Water area**

Asset information

Asset recording

Recording chambers

All chambers shall be recorded in the asset management information system.

Asset recording scenarios

Guidance for adding an asset as well as handling full and partial replacements, relocations, removals, decommissioning, reductions and expansions are provided in the General Asset Guidelines document.

Recording double catchpits – one record or multiple records?

A double catchpit (or double sump catchpit) consists of two standard catchpit chambers installed side-by-side to handle higher stormwater flow rates or to manage runoff at critical low points like road sags.

Two Chambers placed adjacent to each other will usually have a connecting pipe to ensure they work as a single high-capacity system. This asset generally uses a single larger "catchpit lead" or outlet pipe to move captured water into the main stormwater network.

Always record as a single asset. Use the ***number of grate inlet*** attribute to indicate how many grates are associated with the asset.

Figure 2: 2 chambers, 1 record

Figure 3: 1 chamber, 1 record

Locations (spatial and linear)

Preferred/allowed spatial shape

When recording a chamber, the preferred AMDS spatial shape is a point.

Offset and side for chambers located in the middle of dual carriageways

The offset for a chamber (or any single point displacement asset) located on the island of a divided median highway is measured from the centre of the increasing or decreasing section, not the centre of the island. Therefore, if the increasing direction is 7m wide (2 lanes) and there is a chamber on the RHS then the offset is 3.5m and the side is right. However, the offset for a chamber (or any single point displacement asset) located on the island of a decreasing section of divided median highway has an offset of 3.5m and is on the left.

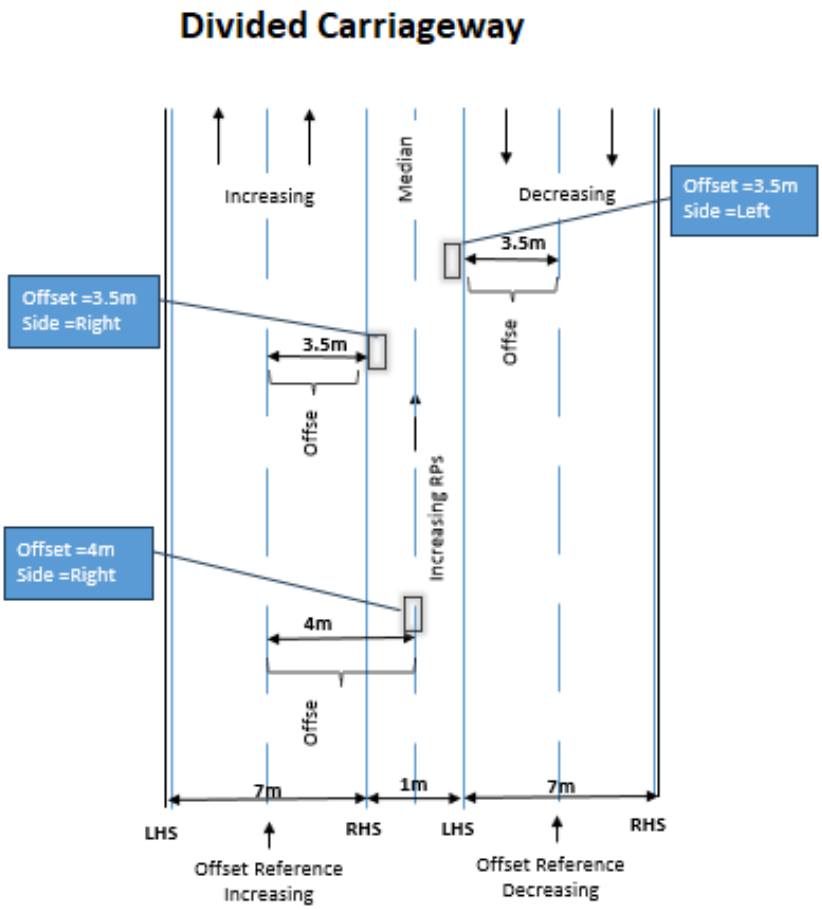

Figure 4: Recording chambers in dual carriageways

Chamber types

Table 1: Chamber types

Type	Description	Photo example
Catchpit (sump)	A stormwater inlet structure, typically fitted with a grate or kerb opening, that traps sediment, debris, and contaminants from road runoff before the water enters the stormwater pipe network.	

Maintenance hole (manhole)	An access chamber on a stormwater pipeline that allows inspection, cleaning, maintenance, and operational access, rather than collection or treatment of runoff.	  
Inspection shaft	A vertical access shaft connected to a stormwater pipeline that provides inspection, monitoring, or maintenance access only, is not designed for man entry, and does not function as a surface inlet or sediment trap.	
Valve pit	A covered chamber constructed to house and provide access to a valve installed on a stormwater pipeline, enabling isolation, control, or diversion of stormwater flows for operational, maintenance, or emergency purposes.	

Meter pit (bulk meter pit)	A meter pit (bulk meter pit) is a covered underground chamber that houses a flow measuring device installed on a stormwater pipe or drain to monitor bulk stormwater volumes or flows for operational, planning, or reporting purposes.	
Wet well (pump pit – wet)	A belowground chamber that receives stormwater inflows and temporarily stores them, forming the flooded suction environment for submersible pumps that lift stormwater to a higher level or discharge point.	
Dry well (Pump pit – dry)	A separate, normally dry chamber within a stormwater pumping station that houses pumps, motors, pipework and valves, isolated from the stormwater being conveyed, which is contained in an adjacent wet well or sump.	

Other attributes

Kerb inlet and grate inlets

The following diagram provides clarity of what a kerb and grate inlets are that can then be used to populate the Boolean attributes ***Grate Inlet?*** and ***Kerb Inlet?***

Figure 5: Examples of a grate inlet and a kerb inlet

Additional resources

The following information is available to support your knowledge of chambers, and what's needed for data collection and management.

Table 2: Additional resources related to chambers

Resource	Description
Asset Management Data Standard (AMDS) inventory standards	You can find the Standard on the AMDS website: Data standard releases
Data collection spreadsheets	AMDS provide data collection spreadsheets to support collecting the right data in a format that can then be imported to your asset management information system. You can find the sheets in the ADG page below under “AMDS data collection sheets” https://www.nzta.govt.nz/roads-and-rail/asset-data-guide/assets
Asset specifications	Official design and/or construction specifications for chambers can be found below: P46 Stormwater management and minor stream diversion design specification

Chamber asset data

The following table provides the key information about what attributes should be collected and managed for this asset.

The table below is from version 1.4 of the AMDS, and it may differ from what you see in your asset management software, depending on what version of the standard the database you are working on has.

There are attributes that are common to most assets. You can find the list and descriptions of these attributes in the General Asset Guidelines document.

Table 3: Key attributes for chambers

Attribute	Status	Type	Description and example.
Stormwater Purpose	Mandatory	List	What is the stormwater reason for the pipe? What function does it serve? examples: surface water collection and conveyance, waterway and crossings, stormwater treatment and bulk management, geotech drainage.
Chamber Type	Mandatory	List	What type of chamber is used? Examples: catchpit (aka sump), maintenance hole (aka manhole), inspection shaft, valve pit.
Chamber Material	Mandatory	List	What is the chamber made of? Examples: concrete, brick, polyethylene (PE).
Construction Method	Mandatory	List	Was the chamber premade or built in situ (built onsite)? examples: premade, in situ.

Chamber Shape	Mandatory	List	What is the shape of the chamber? Examples: circular, square, rectangular (and not a square), ellipse. Note: The shape determines what type of dimensions you need to record.
Cover Type	Mandatory	List	What type of cover does the chamber have? Note: Not referring the roof of the chamber but the lid. examples: solid vented, solid unvented (eg manhole cover), grate.
Cover Class	Mandatory	List	What is the loading class of the cover? Examples: ULS 80kN, ULS 240kN. Note: Refer to AS 3996:2019 standard for further information.
Cover Material	Mandatory	List	What is the grate made of? Examples: concrete, aluminium, ductile iron, cast iron, polyethylene (PE).
Cover Cycle Friendly?	Mandatory	Yes/No	Is the cover of the chamber cycle friendly as reported by manufacturer? Examples: Yes, no, unknown.
Litter Trap?	Mandatory	Yes/No	Does this asset have a device to trap litter?
Litter Trap	Conditional	List	What type of litter trap does this asset have? Required if you select '**Yes**' to '***Litter Trap?***' Examples: floating debris trap, silt trap, filter, gross pollutant trap.
Kerb Inlet?	Mandatory	Yes/No	Is there a kerb inlet for the catchpit? Required for catchpit.
Number Of Kerb Inlet	Conditional	Number	If kerb inlets are present, how many are there?
Grate Inlet?	Mandatory	Yes/No	Is there a grate inlet for the catchpit? Required for catchpit.
Number Of Grate Inlet	Conditional	Number	If grate inlets are present, how many are there?
Is Heritage?	Mandatory	Yes/No	Is the asset a heritage asset? For example, built, archaeological or cultural heritage – pre-1900 or as scheduled by council.
Invert Level	Mandatory	Number (m)	What is the elevation of the lowest point on the inside of the chamber (floor of chamber)? To be provided in NZVD2016. Examples: 150.52m.
Diameter	Conditional	Number (mm)	What is the internal diameter of the chamber? Required if chamber shape is '**Circular**'. Example: 300mm, 1000mm.

Length	Conditional	Number (mm)	What is the internal length of chamber asset? Required if chamber shape is NOT '**Circular**'. Example: 120mm, 1000mm.
Width	Conditional	Number (mm)	What is the internal width of chamber asset? Required if chamber shape is NOT '**Circular**'. Example: 1200mm.

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Channel information

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What is a channel?

A channel is an open asset that collects and moves stormwater from the road and other surfaces.

Figure 1: Channel examples

Asset system and related assets

Channels can exist on their own or be a component in a stormwater system:

- **Drainage - Pipe**
- **Drainage - Headwall**
- **Drainage - Chamber**
- **Traffic Services - Traffic Island**

What is a swale?

A swale is a common term used for a shallow, usually grassed, channel along the side of the road. In AMDS context it is known as an ‘Unlined Channel’.

However, if this is connected to other channels, moves significant volume or collects water from more than the road, it is considered a drain.

What is the difference between a drain and a swale?

Table 1: drain versus swale

Feature	Drain	Swale
Definition	A constructed system (usually pipes or channels) to quickly remove excess water.	A shallow, vegetated depression designed to slow, absorb, and filter water.
Design	Often underground, engineered for rapid water conveyance.	Surface-level, gently sloped, often integrated with landscaping.
Purpose	To manage the flow of water between areas, reducing the risk of flooding, erosion, and water build-up.	To remove water from the road surface and road pavement, manage runoff, promote infiltration, and improve water quality

Do you capture channel assets associated with traffic islands?

When kerb and channel is constructed around traffic islands, record them as a separate asset when they are installed for drainage purposes (such as managing street sweeping).

Asset information

Asset recording

Recording channels

All channels shall be recorded in the asset management information system.

- Lined channels: It is typical for these to vary in type (attributes) along their length – for example, change from kerb and channel to kerb only for short lengths. It is important the major asset type is at least collected in the first instance. If the change in asset type is greater than 20m, then the data should be split accordingly. For example, if a 100m section of kerb and channel had a 15m section of kerb in the middle of it, you may choose not to break the kerb and channel record into 2 sections and add the kerb record.
- Unlined channels: These can vary considerably in depth and offset (attributes) along their length. When surveying channels, take the average of these attributes over a long length (say 100m) to avoid segmenting the data up into small sections.

For assets with a construction date that varies along their length (for example a 200m long kerb and channel asset that has had instances of non-contiguous repairs along its length), then use the age that best reflects the majority of that length. The notes field can be used to provide additional information about the construction date.

For many channel assets, the offset will vary along the length of the road. If the offset changes by more than 20% for a length >100m then consider segmenting the asset where the offset changes. Otherwise simply measure (to 1 decimal place) the closest offset along the length of the asset.

Channel assets either side of driveways

The channel starts and stops either side of the driveway with no cross culvert installed. This should be recorded as 2 channel assets, one each side of the driveway.

Figure 2: Channels either side of a driveway

Asset recording scenarios

Guidance for adding an asset as well as handling full and partial replacements, relocations, removals, decommissioning, reductions and expansions are provided in the General Asset Guidelines document.

Nominal minimum sizes for replacements and other scenarios

Greater of either:

- 100m length
- 50% of the original asset length.

Locations (spatial and linear)

Preferred/allowed spatial shape

When recording a channel, the preferred spatial shape is a linestring.

Offset

Offset is the distance from the centreline to the invert of the channel.

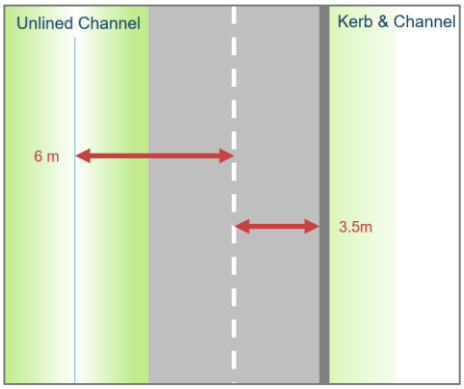

Figure 3: Measuring channel offsets

Historically, channels were loaded with an estimated offset; however, new assets should be measured accurately to 1 decimal place.

Dimensions

Measuring kerb and channel dimensions

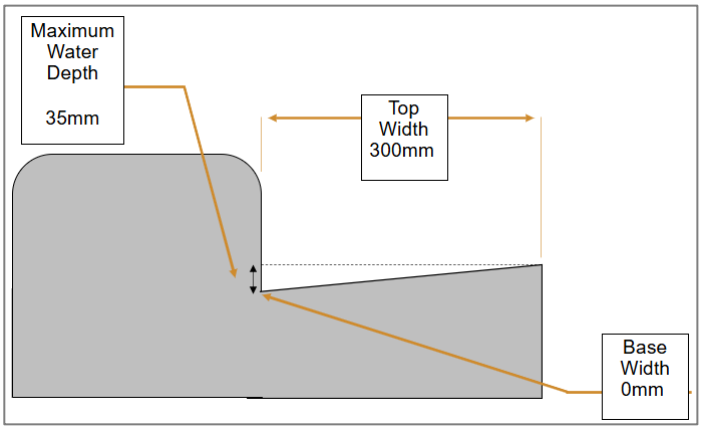

Figure 4: Channel dimensions

Channel types

Table 2: Channel types

Type	Description	Photo example
Road channel	Channel that collects rainwater directly from the road/pavement surface. Located in the road reserve or in close proximity to the road/pavement surface and typically running parallel to the road.	  

Drain	Channel used for bulk conveyance as part of the stormwater system. May collect rainwater from more than just the road/pavement. May have road channels connecting into it. Manmade or heavily altered natural channel.	
Natural waterway	Natural waterway, such as creek, stream, river. May have some manmade features or alterations but overall is largely a natural water/drainage system.	
Geotech channel	Channels that specifically manage groundwater or surface water around geotechnical assets or slopes.	
Flume	Inclined channel commonly used to prevent erosion and direct water flow.	

Additional resources

The following information is available to support your knowledge of channels, and what's needed for data collection and management.

Table 3: Additional resources related to channels

Resource	Description
Asset Management Data Standard (AMDS) inventory standards	You can find the Standard on the AMDS website: Data standard releases
Data collection spreadsheets	AMDS provide data collection spreadsheets to support collecting the right data in a format that can then be imported to your asset management information system.

	You can find the sheets in the ADG page below under “AMDS data collection sheets” https://www.nzta.govt.nz/roads-and-rail/asset-data-guide/assets
Asset specifications	Official design and/or construction specifications for chambers can be found below: P46 Stormwater management and minor stream diversion design specification

Channel asset data

The following table provides the key information about what attributes should be collected and managed for this asset.

The table below is from version 1.4 of the AMDS, and it may differ from what you see in your asset management software, depending on what version of the standard the database you are working on has.

There are attributes that are common to most assets. You can find the list and descriptions of these attributes General Asset Guidelines document.

Table 4: Key attributes for channels

Attribute	Status	Type	Description and example.
Stormwater Purpose	Mandatory	List	What is the stormwater reason for the pipe? What function does it serve? Example: surface water collection and conveyance, waterway and crossings, stormwater treatment and bulk management, geotech drainage.
Channel Type	Mandatory	List	What type of channel is used?
Road Channel Type	Conditional	List	What type of road channel is used? Required if you select **“Road Channel”** as the ***Channel Type***. Example: bund, dished channel, kerb and channel, mountable kerb and channel, slot channel, unlined channel.
Normal State	Mandatory	List	Is there normally water in the channel? At what state? Example: empty, partially full, full.
Channel Material	Mandatory	List	What is the channel made of? Example: concrete, asphalt, rock/stone, soil.
Construction Method	Mandatory	List	Was the channel premade or built insitu (built onsite)? Example: premade, in situ.
Geotech Channel Type	Conditional	List	What type of geotech channel is used?

			Required if you select **"Geotech Channel"** as the ***Channel Type***. Example: counterfort drain, crest Drain, slope Drain.
Has Geotextile?	Conditional	Yes/No	Was a geotextile layer used in the geotech channel? Required if you select **"Geotech Channel"** as the ***Channel Type***.
Has Drainage Chip?	Conditional	Yes/No	Was drainage chip used in the geotech channel? Required if you select **"Geotech Channel"** as the ***Channel Type***.
Is Subsoil Pipe Included?	Conditional	Yes/No	Is there a subsoil pipe buried in the geotech channel? Required if you select **"Geotech Channel"** as the ***Channel Type***. Note: Not required to capture this pipe separately.
Length	Conditional	Number (m)	What is the total surface length of asset (which may follow a curve or natural variation)? Example: 250.55m, 12500.50m.
Top Width	Mandatory	Number (mm)	What is the width of the channel in millimetres (mm) from the top of one side of the channel to the top of the other? Example: 40mm, 1200mm.
Base Width	Mandatory	Number (mm)	What is the width of the asset in millimetres (mm) along the (flat) base of the channel from one side to the other? Use a zero value for channels without a flat base (i.e. V-shaped or curved base) Example: 0mm, 1200mm.
Maximum Water Depth	Optional	Number (mm)	What is the maximum depth of the water when the channel is full? Example: 25mm, 1000mm
Heritage?	Mandatory	Yes/No	Is the asset a heritage asset? For example, built, archaeological or cultural heritage – pre-1900 or as scheduled by council.

Asset data guide (SM050)

Headwall information

May 2026

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AMDS Version 1.4

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Contents

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What is a headwall?

A headwall is a structure used at either end of a culvert to protect the culvert and surrounding soil, and to direct water flow.

Figure 1: Concrete headwall

Figure 2: Gabion headwall

Figure 3: Stone headwall

Asset system and related assets

Headwalls an asset in a stormwater system and are always associated with a pipe:

- **Drainage - Pipe**

Are the wingwall and apron part of the headwall?

The headwall asset captures the headwall, wingwall and apron details in the same asset.

Asset information

Asset recording

Recording headwalls

All headwalls shall be recorded in the asset management information system.

Asset recording scenarios

Guidance for adding an asset as well as handling replacements, relocations, removals and decommissioning are provided in the General Asset Guidelines document.

Refer to pipe information for when a head wall is replaced along with a pipe.

Locations (spatial and linear)

Preferred/allowed spatial shape

When recording a headwall, the preferred spatial shape is point at the location where it connects to the pipe.

Dimensions

Measuring headwall dimensions

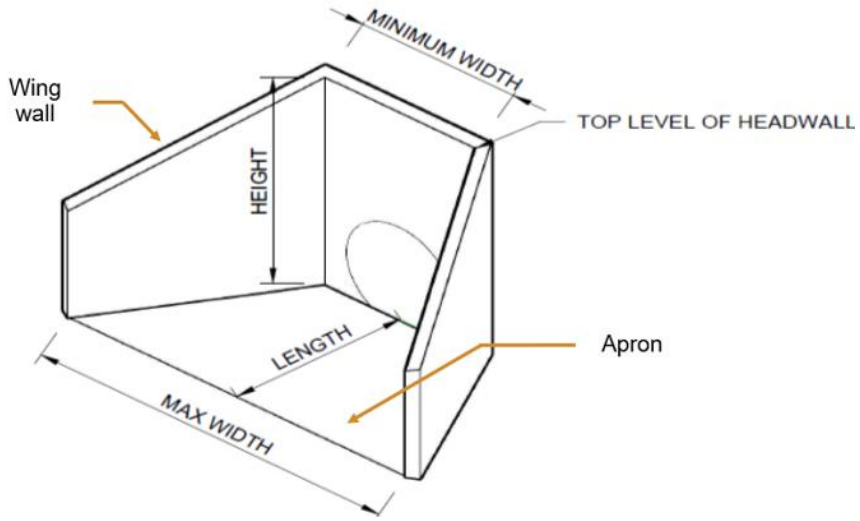

Figure 4: Headwall dimensions

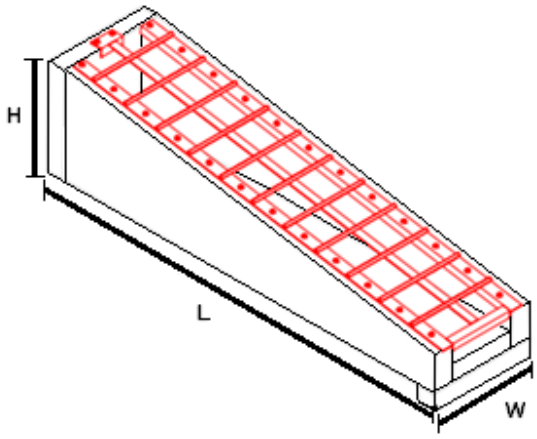

Figure 5: Headwall dimensions

Additional resources

The following information is available to support your knowledge of headwalls, and what's needed for data collection and management.

Table 1: Additional resources related to headwalls

Resource	Description
Asset Management Data Standard (AMDS) inventory standards	You can find the Standard on the AMDS website: Data standard releases
Data collection spreadsheets	AMDS provide data collection spreadsheets to support collecting the right data in a format that can then be imported to your asset management information system. You can find the sheets in the ADG page below under “AMDS data collection sheets” https://www.nzta.govt.nz/roads-and-rail/asset-data-guide/assets
Asset specifications	Official design and/or construction specifications can be found below: Traversable and mountable grates for precast concrete headwalls

Headwall asset data

The following table provides the key information about what attributes should be collected and managed for this asset.

The table below is from version 1.4 of the AMDS, and it may differ from what you see in your asset management software, depending on what version of the standard the database you are working on has.

There are attributes that are common to most assets. You can find the list and descriptions of these attributes in the General Asset Guidelines document.

Table 2: Key attributes for headwalls

Attribute	Status	Type	Description and example.
Stormwater Purpose	Mandatory	List	What is the stormwater reason for the pipe? What function does it serve? Example: Surface water collection and conveyance, waterway and crossings, stormwater treatment and bulk management, geotech drainage.
Headwall Material	Mandatory	List	What is the headwall mainly made of? Example: concrete, sand bags, gabion basket, wood, stone.
Construction Method	Mandatory	List	Was the headwall premade or built in situ (built onsite)? List: premade, in situ.
Is Heritage?	Mandatory	Yes/No	Is the asset a heritage asset? For example, built, archaeological or cultural heritage – pre-1900 or as scheduled by council.
Length	Mandatory	Number (m)	What is the length from the back wall to end of the apron? Example: 2.2m, 1.4m.
Height	Mandatory	Number (m)	What is the height from base of the back wall to the top of the back wall? Example: 1.2m, 2.0m.
Minimum Width	Mandatory	Number (m)	What is the width across the back wall (for a wingwall-shaped headwall)? Example: 1.0m, 2.5m
Maximum Width	Mandatory	Number (m)	What is the width across the front of the apron (for a wingwall-shaped headwall)? Example: 2.4m, 5.5m

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Pipe information

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What is a pipe?

In drainage, a pipe is an enclosed asset used to move water.

Figure 1: Pipe examples

Asset system and related assets

Pipes are usually a component in a stormwater system:

- Drainage - Channel
- Drainage - Headwall
- Drainage - Chamber
- Drainage - Water area
- Drainage - Water structure
- Valve [not available yet].

What is a culvert?

A culvert is a pipe (can be box or circular shape) that channels water under an obstacle (typically a road). Culvert assets are single fully formed, complete units where all barrels (or openings) within the unit have the same details, for example the same material, class etc.

Openings with different sizes, materials, classes, and levels are considered separate pipes. Pipes that can be installed/removed independently (they are not part of one pre-made piece) are also considered separate assets.

What is a major culvert?

Culverts that have a total nominal cross-section area greater than 3.4 square metres are termed a ‘major culvert’ and recorded in the Pipe table.

Table 1: Examples of pipe cross-section nominal area dimensions

Shape	No of units	Dimensions	Area
Circular	1	2000mm diameter	3.14sqm
Circular	1	900mm diameter	0.64sqm
Circular	2	1500mm diameter	3.54sqm
Square	1	1500mm height x 1500mm width	2.25sqm
Square	1	2000mm height x 1500mm width	3.00sqm
Rectangular	1	2000mm height x 3000mm width	6.00sqm
Rectangular	2	1500mm height x 1000mm width	3.00sqm

What is the difference between a box culvert and a bridge?

A box culvert has 2 features that make it not a bridge asset, even though they will usually be managed with bridges (for example, in a bridge inspections programme):

- Box culverts are fully enclosed so must have a formed base (usually concrete and precast as a single unit).
- Box culverts usually have a pavement on top of it, whereas a bridge will often have the surface straight on top of the deck.

Asset information

Asset recording

Recording pipes

All pipes shall be recorded in the asset management information system.

Asset recording scenarios

Guidance for adding an asset as well as handling full and partial replacements, relocations, removals, decommissioning, reductions and expansions are provided in the General Asset Guidelines document.

Do I add a pipe asset for each culvert barrel?

If the barrels (or openings) are a different size, material, class and/or level then they must be recorded as separate assets. If a pipe can be installed or removed independently then it also must be recorded as a separate asset.

Examples showing how many assets and why

Table 2: Culvert asset count examples

Example	Description
	One culvert pipe asset, 2 barrels. This is considered a single pipe asset with 2 barrels, because the pipes are identical and joined into the single fully formed piece with the precast wingwall.
	One culvert pipe asset, 2 barrels. This is considered a single pipe asset with 2 barrels, because the central column is fully formed as part of the twin barrel unit (that is, it is not a 2-box culvert butted up alongside against each other). You can't install or remove independently.
	Three culvert pipe assets, all one barrel. This is considered 3 pipe assets because there are 3 pre-cast box culverts butted up alongside each other. They are identical but could be installed and removed independently.

Locations (spatial and linear)

Preferred/allowed spatial shape

When recording a pipe, the preferred spatial shape is a linestring.

Ideally the pipe linestring should be captured from the high-point to low-point direction. This allows the drainage flow direction indication arrows to be shown on a map, providing an understanding of the drainage system.

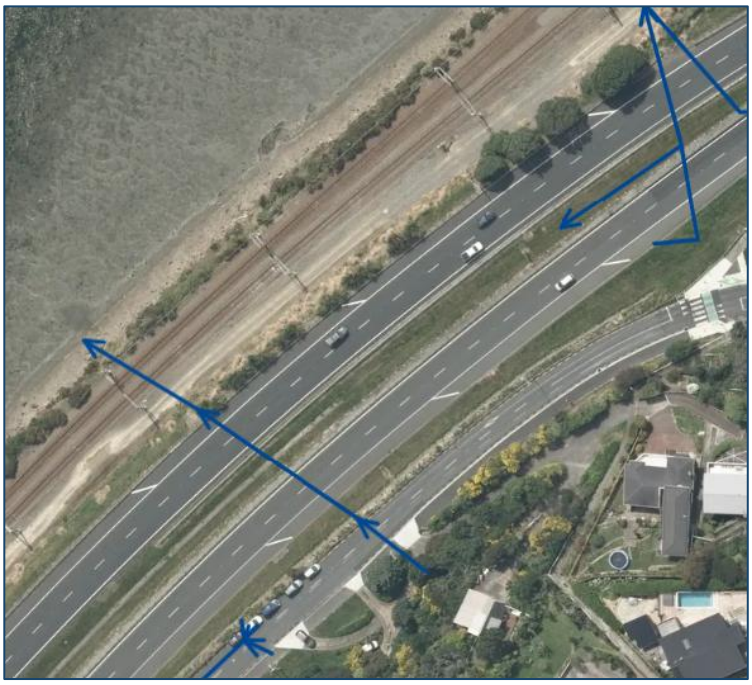


Figure 2: Pipe flow direction

Determine the route position of a culvert that crosses the road on an angle?

If a culvert crosses a road perpendicular to the road centreline, then the start and end locations will be the same.

When the culvert crosses the road at an angle to the road centreline then the start location will be the first inlet or outlet that is encountered on the left-hand side when traveling in the increasing direction. This is shown in Figure 3.

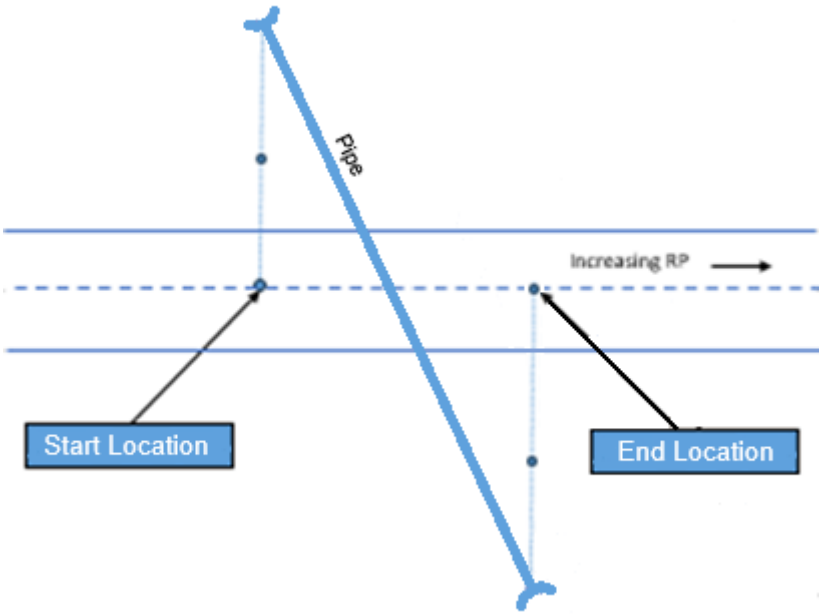


Figure 3: Cross road pipe start and end locations

Dimensions

Nominal diameter

For circular assets, the nominal diameter of the pipe, for example 225mm PVC pipe, is measured from the inside of the pipe barrel.

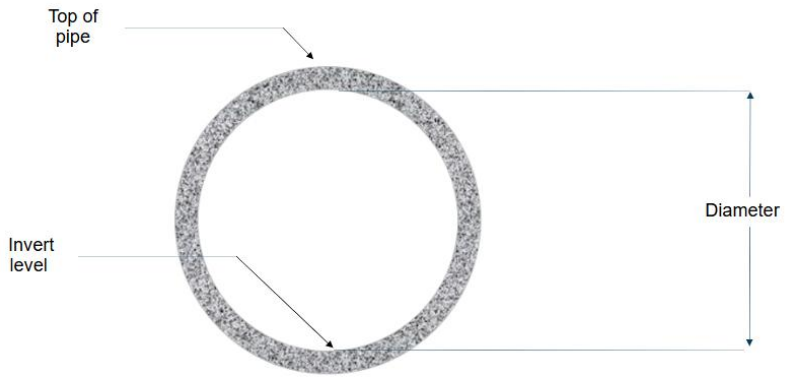


Figure 4: Pipe cross-section – measuring invert level

Pipe width and pipe height

For non-circular assets, these attributes are for the internal width and height of the pipe.

Horizontal length

The length of the pipe measured as the horizontal distance from the one end of the physical pipe to the other – this is the length of the pipe measured in a direct line (as the crow flies) from the one end of the physical pipe to the other

Actual length

The absolute length of the pipe measured from the one end of the physical pipe to the other, which may be greater than the horizontal length due to indirect path or slope.

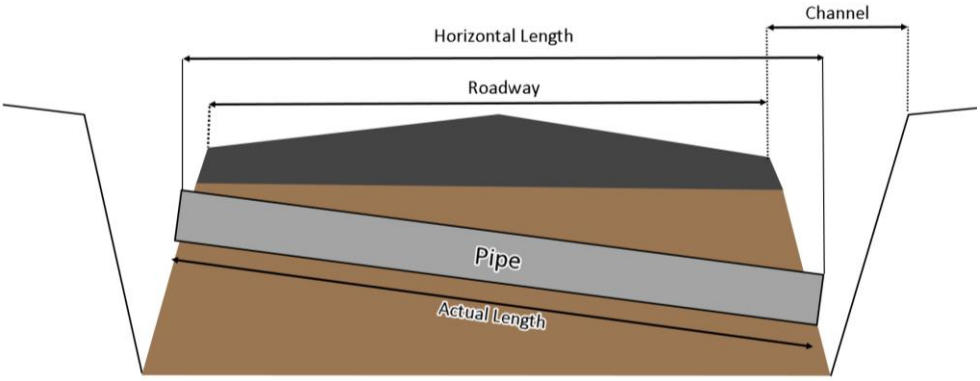
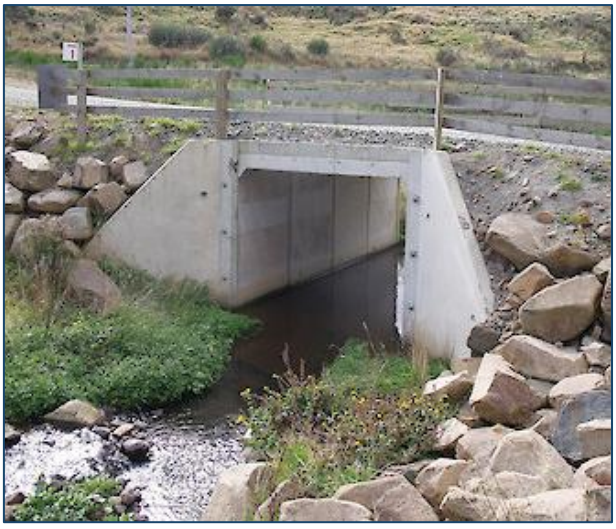


Figure 5: Example of horizontal length and actual length

Pipe types

Table 3: Pipe types (primary purpose)

Type	Description	Photo example
Connection pipe	Catchpit (sump or mudtrap) connection pipe. Also referred to as ‘Catchpit lead’.	

		
Main	Regular collection or distribution main	
Culvert	Conduit that channels water under an obstacle (typically a road)	

Side culvert	Conduit for water passage under a driveway, vehicle or other crossing, parallel or adjacent to the road

Subsoil drain	Subsoil drain/perforated pipe/field tile used to drain groundwater Underground drain/perforated pipe/field tile used to drain groundwater.	
Lateral	A customer or service connection pipe that conveys stormwater from a private property or local inlet into a main drainage pipe.	 

Other attributes

Fish passage data

A fish passage is an addition to a culvert to facilitate fish migration. It is mandatory to indicate if one is present in the pipe and if it is, where within the pipe it's located and its installation date.

Examples of what this may look like are shown in the figure below:

Figure 6: Fish passage examples in culverts

Additional resources

The following information is available to support your knowledge of pipes, and what's needed for data collection and management.

Table 4: Additional resources related to pipes

Resource	Description
Asset Management Data Standard (AMDS) inventory standards	You can find the Standard on the AMDS website: Data standard releases
Data collection spreadsheets	AMDS provide data collection spreadsheets to support collecting the right data in a format that can then be imported to your asset management information system. You can find the sheets in the ADG page below under "AMDS data collection sheets" https://www.nzta.govt.nz/roads-and-rail/asset-data-guide/assets
Asset specifications	Official design and/or construction specifications for this asset can be found below: P46 Stormwater management and minor stream diversion design specification Pipe culvert construction F2 Pipe subsoil drain construction Corrugated plastic pipe subsoil drain construction

Pipe asset data

The following table provides the key information about what attributes should be collected and managed for this asset.

The table below is from version 1.4 of the AMDS, and it may differ from what you see in your asset management software, depending on what version of the standard the database you are working on has.

There are attributes that are common to most assets. You can find the list and descriptions of these attributes in the General Asset Guidelines document.

Table 5: Key attributes for pipes

Attribute	Status	Type	Description and example
Stormwater Purpose	Mandatory	List	What is the stormwater reason for the pipe? What function does it serve? Examples: surface water collection and conveyance, waterway and crossings, stormwater treatment and bulk management, geotech drainage.
Pipe Type	Mandatory	List	What is the type of the pipe?
Pipe Flow Type	Optional	List	What is the pipe flow type? That is, what force moves the fluid in the pipes? Examples: gravity, pressure, siphon, vacuum.
Pipe Shape	Mandatory	List	What is the shape of the pipe? Examples: circular, arched, rectangular. Note: The shape determines what type of dimensions you need to record.
Pipe Material	Mandatory	List	What is the pipe made of? Examples: concrete, polyvinyl chloride, Steel – galvanised.
Pipe Material Subset	Conditional	List	What is the pipe made of? Required depending on your selection in Pipe Material, you may need to add more material detail by making another selection. Examples: • Concrete – steel reinforced Concrete • Polyethylene – PE80 • Polyethylene – PE100.
Pipe Class	Mandatory	List	What is the class of the pipe? This is either the load class, stiffness class or pressure class depending on the type of pipe. Examples: Class 3 (load class), 2,000 N/m/m (stiffness class), 0.45 MPa (pressure class) Notes: • Concrete pipes typically use the load class. • PE and PVC gravity pipes typically use the stiffness class.

			• PE and PVC pressure pipes typically use the pressure class.
Has Joint?	Conditional	Yes/No	Is the pipe joined or connected to another pipe? Required if '***Pipe Type***' is not **'Culvert'**, **'Side Culvert'**, '**Pathway Culvert'**.
Joint Type	Conditional	List	What type of joint was used to join the pipes? Required if you select **Yes** to '***Joint?***' Examples: rubber ring joint, butt fusion weld joint (PE), push fit.
Pipe Above/Under Ground	Mandatory	List	Is the pipe above, below, or partially below ground? Required if '***Pipe Type***' is not **'Culvert', 'Side Culvert', 'Pathway Culvert'**.
Pipe Outfall?	Mandatory	Yes/No	Is the pipe an outfall? That is, is it the last pipe discharging directly into a waterway? Required if '***Pipe Type'*** is not **'Culvert', 'Side Culvert', 'Pathway Culvert'.**
Has Geotextile?	Conditional	Yes/No	Is a geotextile layer included as part of the pipe? Required if ***'Stormwater Purpose'*** is **'Geotech Drainage'**.
Has Drainage Chip?	Conditional	Yes/No	Is there a drainage chip layer included as part of the pipe? Required if ***'Stormwater Purpose'*** is **'Geotech Drainage'**.
Is Heritage?	Mandatory	Yes/No	Is the asset a heritage asset? For example, built, archaeological or cultural heritage – pre-1900 or as scheduled by council.
Number of Uniform Barrels	Conditional	Number	How many uniform inlet/outlet barrels are there in the culvert? A culvert pipe asset is a single fully formed, complete unit where all barrels (or openings) within the unit have the same details, eg same material, class etc. Openings with different sizes, materials, classes, and levels are considered separate pipes. Pipes that can be installed/removed independently (that is, they are not part of one pre-made piece) are also considered separate pipe assets. Required if **Pipe Type** is '***Culvert***' or '***Side Culvert'***.

Culvert Number	Conditional	Text	What is the number of the culvert? Notes: • Optional for non-state highway networks. • For state highway networks, enter the number of the culvert, number the culverts consecutively between reference stations, eg 1, 2, 3 etc. Additional culverts placed at a later date in between existing culverts shall be decimalised, eg 3.1, 4, 5, 5.1 etc. Required if ***Pipe Type*** is '**Culvert**' and ***Asset Owner Organisation*** is **'Waka Kotahi NZ Transport Agency'**
Grate	Conditional	List	Does the Culvert have a grate at either end? Required if ***Pipe Type*** is **'Culvert'** or '**Side Culvert'**. List: none, upstream only, downstream only, both ends.
Culvert Marker Count	Conditional	Number	How many culvert marker posts have been installed for this culvert? Required if ***Pipe Type*** is '**Culvert**'. Example: 0, 1, 2.
Has Headwall?	Conditional	List	Does the culvert have a headwall? Required if ***Pipe Type*** is '**Culvert**' or '**Side Culvert'**. List: none, upstream only, downstream only, both ends.
Access Method	Conditional	List	How is the culvert accessed? For example to inspect it. Required if ***Pipe Type*** is '**Culvert**'. Examples: scaffold, rope access, waders, no equipment required, other.
Access Notes	Optional	Text	Provide any additional notes, explaining the access for the asset, eg where the ladder is located, traffic management requirements etc.
Carried Atop Function	Conditional	List	What are the functions that are carried over the top of the culvert? Your selection here will drive what other fields are required. Required if ***culvert area*** is >=3.4m^2. Examples: highway, local road, bus lane, footpath, power mains, gas mains.
Design Loading	Optional	List	What is the design loading of the bridge as described by the Bridge Descriptive Inventory? Examples: traction engine, H20 S16, HN HO 72.
Expected End of Life	Conditional	Number (year)	What is the expected decommissioning year of the culvert? This can change over time. Required if ***culvert area*** is >=3.4m^2. Example: 2100.

Axle Weight Limit	Conditional	Number (kg)	What is the maximum weight allowed per axle for heavy vehicles? Enter 0 if no restriction. Required if ***culvert area*** is >=3.4m2 and crossed function is a type of road. Examples: 0kg, 7,300kg, 6,500kg.
Gross Weight	Conditional	Number (kg)	What is the maximum weight overall for heavy vehicles? Enter 0 if no restriction. Required if ***culvert area*** is >=3.4m^2 and crossed function is a type of road. Examples: 0kg, 6000kg, 25000kg.
Speed Limit	Conditional	Number (km/hr)	What is the maximum speed allowed for heavy vehicles? Enter 0 if no restriction. Required if ***culvert area*** is >=3.4m^2 and crossed function is a type of road. Examples: 0km/hr, 50km/hr, 10km/hr.
Upstream Invert Level	Optional	Number (metres)	What is the elevation of the lowest point on the inside of the pipe (floor of pipe) at the upstream end? Example: 105.6m Note: elevation in metres from sea level
Downstream Invert Level	Optional	Number (metres)	What is the elevation of the lowest point on the inside of the pipe (floor of pipe) at the downstream end? Example: 105.2m Note: elevation in metres from sea level
Horizontal Length	Mandatory	Number (m)	The length of the pipe measured as the horizontal distance from the one end of the physical pipe to the other. This is the length of the pipe measured in a direct line (as the crow flies) from the one end of the physical pipe to the other. Example: 10.0m, 102.5m
Actual Length	Optional	Number (m)	The absolute length of the pipe measured from the one end of the physical pipe to the other that may be greater than the horizontal length. May be more than the horizontal length due to indirect path or slope. Example: 5.2m, 121.2m
Nominal Diameter	Conditional	Number (mm)	What is the diameter of the pipe? Required if ***Pipe Shape*** is '**Circular**'. Example: 300mm, 1000mm
Height	Conditional	Number (mm)	What is the internal height of the pipe asset? Required if ***Pipe Shape*** is NOT '**Circular**'. Example: 120mm, 1000mm

Width	Conditional	Number (mm)	What is the internal width of the pipe asset? Required if ***Pipe Shape*** is NOT '**Circular**'. Example: 1200mm
Culvert Area	Conditional	Number (m2)	What is the total open area of the culvert? This is the combined area of all openings in all culvert pipe units if there are more than one. Required if ***Pipe Type*** is '**Culvert**' or '**Side Culvert'**.
Has A Fish Passage Feature?	Conditional	Yes/No	Does the culvert include a specifically designed and constructed fish passage feature? Required if ***Pipe Type*** is '**Culvert'**.
Conveys Fresh Water?	Conditional	Yes/No	Does the pipe allow movement of freshwater? Required if ***Pipe Type*** is '**Culvert**'.
Outlet Drop Height	Conditional	Number (m)	What is the height of the drop from the outlet of the culvert to the ground? Required if ***Conveys Fresh Water?*** is **TRUE**.
Outlet Undercut Length	Conditional	Number (m)	How far does the outlet of culvert stick out from the bank? Required if ***Conveys Fresh Water?*** is **TRUE**.
Average Water Depth	Conditional	Number (m)	What is the average water depth inside the culvert? Required if ***Conveys Fresh Water?*** is **TRUE**.
Average Water Velocity	Conditional	Number (m/s)	What is the average water speed in the culvert? Required if ***Conveys Fresh Water?*** is **TRUE**.
Downstream Low-velocity Zone?	Conditional	List	Is there a low velocity recirculation zone downstream of the culvert? This includes pools, backwaters, water within dense beds of water plants, water behind cobbles or boulders etc. Sediment settles into these zones due to low water speed. Required if Conveys Fresh Water is True. Example: yes, No, Unknown.
Bed Substrate	Conditional	List	What is the material that makes up the bed of the structure, eg sand, silt, gravel) Required if ***Conveys Fresh Water?*** is **TRUE**. Example: gravel, bare, sand/silt.
Remediation Feature?	Conditional	List	Does the culvert have any remediation features? Such as baffles or spat rope. Required if ***Conveys Fresh Water?*** is **TRUE**. Example: yes, no, unknown.
Wetted Margin?	Conditional	List	Does the culvert have a wetted margin? This is an area that has shallow water that flows at low velocity, is at the edges of the water flow, is continuous over the length of the

			culvert, and is suitable for the passage of climbing species of fish. Required if ***Conveys Fresh Water?*** is **TRUE**. Example: yes, no, unknown.
Culvert Slope	Conditional	List	Is the slope of the culvert steeper, the same or less than the stream? Required if ***Conveys Fresh Water?*** is **TRUE**. Example: steeper than stream, same as stream, less than stream
Culvert Alignment	Conditional	List	How does the culvert align in direction to the stream? Required if ***Conveys Fresh Water?*** is **TRUE**. Example: curved in, straight out; straight in and out, straight in, curved out

Asset data guide (SM050)

Water area information

May 2026

ADG Version 1.1

AMDS Version 1.4

This manual has been developed with the collaboration of the Road Efficiency Group Te Ringa Maimoa (REG).

Contents

This document is a section of the NZ Transport Agency Waka Kotahi *Asset data guide* (SM050).

What is a water area?

A water area is an area that collects water for stormwater treatment and bulk management purposes, such as a basin, pond, or wetland.

Figure 1: Water area examples

Asset system and related assets

Water areas can exist on their own or be a component in a stormwater system:

- Drainage - Chamber
- Drainage - Channel
- Drainage - Headwall
- Drainage - Pipe
- Drainage - Water structure

Asset information

Asset recording

Recording water areas

All water areas shall be recorded in the asset management information system.

Asset recording scenarios

Guidance for adding an asset as well as handling replacements, relocations, removals and decommissioning are provided in the General Asset Guidelines document.

Locations (spatial and linear)

Preferred/allowed spatial shape

When recording a water area, the preferred AMDS spatial shape is a polygon.

Water area types

Table 1: Water area types

Type	Description	Photo example
Basin	Dry basin or pond basin to improve/ameliorate and/or treat stormwater flows	
Wetland	Densely vegetated and normally inundated system with permanent (or seasonal) surface or subsurface flow	

Additional resources

The following information is available to support your knowledge of water areas, and what's needed for data collection and management.

Table 2: Additional resources for water areas

Resource	Description
Asset Management Data Standard (AMDS) inventory standards	You can find the Standard on the AMDS website: Data standard releases
Data collection spreadsheets	AMDS provide data collection spreadsheets to support collecting the right data in a format that can then be imported to your asset management information system. You can find the sheets in the ADG page below under “AMDS data collection sheets” https://www.nzta.govt.nz/roads-and-rail/asset-data-guide/assets
Asset specifications	Official design and/or construction specifications for water area assets can be found below Stormwater management

Water area asset data

The following table provides the key information about what attributes should be collected and managed for this asset.

The table below is from version 1.4 of the AMDS, and it may differ from what you see in your asset management software, depending on what version of the standard the database you are working on has.

There are attributes that are common to most assets. You can find the list and descriptions of these attributes in the General Asset Guidelines document.

Table 3: Key attributes for water areas

Attribute	Status	Type	Description and example.
Stormwater Purpose	Mandatory	List	What is the stormwater reason for the pipe? What function does it serve? Examples: surface water collection and conveyance, waterway and crossings, stormwater treatment and bulk management, geotech drainage.
Water Area Type	Mandatory	List	What type of water area is used?
Normal State	Mandatory	List	Is there normally water in the water area? At what state? Examples: empty, partially full, full.
Edge Material	Optional	List	What material was used to construct the edge of the water area? Examples: soil, aggregate, rock.
Base Material	Optional	List	What material makes up the base of the water area? If base is lined, then what is the lining material? Leave blank if none. Examples: clay, rock, concrete, plastic.
Filtration Material	Optional	List	What material was used to filter the water? Leave blank if none. Examples: soil, aggregate, geotextile.
Trees/Shrubs?	Mandatory	Yes/No	Are there any tree or shrub plantings in the water area?
Maintained Ground Cover Type	Optional	List	What is the type of organic ground cover (e.g. grass or mulch) that needs managing on the water area? Examples: grass, mulch, planted.
Heritage?	Mandatory	Yes/No	Is the asset a heritage asset? For example, built, archaeological or cultural heritage – pre-1900 or as scheduled by council.
Full Area	Mandatory	Number (m2)	What is the surface area of the water area the storage system has when at full capacity? Example: 250m^2.

Full Volume	Mandatory	Number (m3)	What is the volume of the water area the storage system when at full capacity? Example: 1500m^3.
Maximum Water Depth	Optional	Number (m)	What is the maximum depth of the water area? Example: 10.55m.

Asset data guide (SM050)

Water structure information

May 2026

ADG Version 1.1

AMDS Version 1.4

This manual has been developed with the collaboration of the Road Efficiency Group Te Ringa Maimoa (REG).

Contents

This document is a section of the NZ Transport Agency Waka Kotahi *Asset data guide* (SM050).

What is a water structure?

A water structure is any structure that has a stormwater purpose and does not have a dedicated table.

Figure 1: Water structure examples

Asset system and related assets

Water structures can exist on their own but are usually a component in a stormwater system:

- Drainage - Channel
- Drainage - Headwall
- Drainage - Pipe
- Drainage - Water structure

Asset information

Asset recording

Recording water structures

All water structures shall be recorded in the asset management information system.

Asset recording scenarios

Guidance for adding an asset as well as handling replacements, relocations, removals and decommissioning are provided in the General Asset Guidelines document.

Locations (spatial and linear)

Preferred/allowed spatial shape

When recording a water structure, the preferred AMDS spatial shape depends on the type of asset.

The allowed shapes are polygon, linestring and point.

Water structure types

Table 1: Water structure types

Type	Description	Photo example
Rain garden	A rain garden is a shallow, landscaped depression designed to collect, hold, and absorb rainwater runoff from the road. It uses plants and engineered or natural soils to slow down water, filter pollutants, and allow more water to soak into the ground rather than flowing into stormwater drains	 
Soak hole	A soak hole is an underground structure designed to absorb stormwater and allow it to drain naturally into the surrounding soil.	

Debris preventer	A debris preventer is a stormwater control device designed to stop solid materials like leaves, litter, branches, and sediment from entering or blocking stormwater drains, ensures that water can continue to flow freely while trapping debris that would otherwise cause blockages or pollute waterways.	
Energy dissipator	An energy dissipator is a stormwater control structure used to reduce the velocity and erosive force of flowing water, especially at the outlet of pipes, culverts, drains, or spillways. By slowing water down, it prevents scour, erosion, and damage to downstream channels or embankments.	
Flow controller	A flow controller is a stormwater device designed to regulate and limit the rate of water discharge from a detention system, storage tank, or drainage structure. It ensures that outflow is released at a controlled, pre-set rate preventing downstream flooding, protecting pipe capacity, and supporting compliance with stormwater design requirements.	
Bore	A bore is a narrow, deep hole drilled into the ground to access groundwater stored in underground aquifers. It is typically lined with casing (steel or PVC) and fitted with screens that allow water to enter while keeping soil and sediment out.	

Fish passage	A specifically constructed fish passage that is its own asset (e.g. a fish ladder bypass) and not part of another asset (e.g. not part of a culvert).	
Sand filter	Stormwater treatment device that removes suspended solids, pollutants, and debris from runoff by filtering the water through a layer of sand. It is commonly used to improve water quality before discharging into natural waterways or downstream systems.	
Storm filter	Stormwater treatment system that manages and treats runoff, preventing pollutants from entering local waterways. These systems consist of elements such as forebays for sediment capture and storm filter cartridges filled with specialized media, which work together to effectively remove sediments, oils, and heavy metals, thereby enhancing water quality and protecting surrounding ecosystems.	

Additional resources

The following information is available to support your knowledge of water structures, and what's needed for data collection and management.

Table 2: Additional resources related to water structures

Resource	Description
Asset Management Data Standard (AMDS) inventory standards	You can find the Standard on the AMDS website: Data standard releases
Data collection spreadsheets	AMDS provide data collection spreadsheets to support collecting the right data in a format that can then be imported to your asset management information system. You can find the sheets in the ADG page below under “AMDS data collection sheets” https://www.nzta.govt.nz/roads-and-rail/asset-data-guide/assets
Asset specifications	Official design and/or construction specifications for water structures can be found below: Fish passage guidance for state highways

Water structure asset data

The following table provides the key information about what attributes should be collected and managed for this asset.

The table below is from version 1.4 of the AMDS, and it may differ from what you see in your asset management software, depending on what version of the standard the database you are working on has.

There are attributes that are common to most assets. You can find the list and descriptions of these attributes in the General Asset Guidelines document.

Table 3: Key attributes for water structures

Attribute	Status	Type	Description and example.
Water Structure Type	Mandatory	List	What type of water structure is used? Examples: rain garden, soak hole, energy dissipator, bore, fish passage.
Stormwater Purpose	Mandatory	List	What is the stormwater reason for the pipe? What function does it serve? Examples: surface water collection and conveyance, waterway and crossings, stormwater treatment and bulk management, geotech drainage.
Water Structure Material	Mandatory	List	What is the water structure made of? Examples: concrete, asphalt, rock.
Construction Method	Mandatory	List	Was the water structure premade or built in-situ (built onsite)? Examples: premade, in situ.
Longest Side Length	Mandatory	Number (m)	How long is the longest side of the water structure? Length of the longest side of the water structure in metres (m). For circular assets, record the diameter. Example: 250.55m, 12500.50m.
Heritage?	Mandatory	Yes/No	Is the asset a heritage asset? Built heritage, archaeological or cultural heritage - pre 1900 or as scheduled by council, registered in the national Heritage NZ register, listed as an Engineering New Zealand Engineering Heritage item, identified by iwi, hapu as significant or listed in NZTA's heritage register.

Asset data guide (SM050)

Gantry information

May 2026

ADG Version 1.1

AMDS Version 1.4

This manual has been developed with the collaboration of the Road Efficiency Group Te Ringa Maimoa (REG).

Contents

This document is a section of the NZ Transport Agency Waka Kotahi *Asset data guide* (SM050).

What is a gantry?

A gantry is a support structure to mount signs and other assets (e.g. safety camera) over the road and passing vehicles.

Asset systems and related assets

A gantry is the primary asset in a non-electronic sign system and M&E systems.

- Traffic services - Non-electronic sign
- Camera [not available yet]
- Electronic sign [not available yet]

Asset information

Asset recording

Recording gantries

All gantries shall be recorded in the asset management information system.

Asset recording scenarios

Guidance for adding an asset as well as handling replacements, relocations, removals and decommissioning are provided in the General Asset Guidelines document.

Locations (spatial and linear)

Preferred/allowed spatial shape

When recording a gantry, the preferred spatial shape is a polygon.

Note that this is changing in version 1.5 of AMDS to a linestring along the length of the gantry.

Gantry types

Table 1: Gantry types

Type	Description	Photo example
Pipe	Hollow or tubular section that acts as a support.	

Truss	Structural member usually fabricated from straight pieces of metal to form a series of triangles lying in a single plane.	

Other attributes

Gantry shape

Table 2: Gantry shape

Shape	Description	Photo example
Single portal	A gantry that spans from one shoulder to the other side of the road or from one shoulder to the road median. Two supports.	
Twin portal	A gantry that spans from one shoulder on one side to the median and then again to the shoulder on the other side of the road. Three supports.	
Cantilever	A gantry that extends horizontally and is supported at only one end. One support.	

T-shaped	Gantry that extends horizontally on both sides of a central pole. One support	
Suspended	Gantry which doesn't have vertical support, e.g. gantry suspended from tunnel ceiling. No supports.	

Additional resources

The following information is available to support your knowledge of gantries, and what's needed for data collection and management.

Table 3: Additional resources related to gantries

Resource	Description
Asset Management Data Standard (AMDS) inventory standards	You can find the Standard on the AMDS website: Data standard releases
Data collection spreadsheets	AMDS provide data collection spreadsheets to support collecting the right data in a format that can then be imported to your asset management information system. You can find the sheets in the ADG page below under “AMDS data collection sheets” https://www.nzta.govt.nz/roads-and-rail/asset-data-guide/assets
Asset specifications	Official design and/or construction specifications for gantries can be found below Specifications for ITS Support Gantry

Gantry asset data

The following table provides the key information about what attributes should be collected and managed for this asset.

The table below is from version 1.4 of the AMDS, and it may differ from what you see in your asset management software, depending on what version of the standard the database you are working on has.

There are attributes that are common to most assets. You can find the list and descriptions of these attributes in the General Asset Guidelines document.

Table 4: Key attributes for gantries

Attribute	Status	Type	Description and example.
Primary Function	Mandatory	List	What is the main reason for the gantry? Examples: Variable Message Sign Support, Lane Control Signal Support, Non-Electrical Sign Support.
Gantry Shape	Mandatory	List	What is the shape of the gantry? Examples: single portal, cantilever, T-shaped, suspended, twin portal
Gantry Construction Type	Mandatory	List	What type of construction was used in the gantry? Examples: Pipe (hollow or truss sections), Truss.
Gantry Side	Optional	List	What side of the road is the gantry located? Examples: Left (e.g. for a Cantilever shape), Right, Centre (e.g. for a cantilever or T-Shape), Both, Full Width.
Material	Mandatory	List	What is the gantry made of? Examples: Steel - Galvanised, Steel - Ungalvanized.
Is Footing Bolted?	Mandatory	Yes/No	Is/are the gantry footings bolted to the surface?
Asset Design Life	Mandatory	Number (years)	What is the expected life of the asset?
Gantry Span	Mandatory	Number (m)	What is the total length of the gantry across the road? Examples: 40.85m, 5.85m.
Gantry Height	Mandatory	Number (m)	What is the total height of the gantry from the top of the gantry to the road? The acceptable range changes based on the surface material. Examples: 8.30m, 12.85m.
Clearance	Mandatory	Number (m)	What is the total height from the bottom of the gantry (including any attached assets, e.g. signs) to the road? i.e. the minimum length in which a vehicle can pass underneath.

Asset data guide (SM050)

Mast information

May 2026

ADG Version 1.1

AMDS Version 1.4

This manual has been developed with the collaboration of the Road Efficiency Group Te Ringa Maimoa (REG).

Contents

This document is a section of the NZ Transport Agency Waka Kotahi *Asset data guide* (SM050).

What is a mast?

A mast is a tall upright post or slender object on land, especially a CCTV mast or similar.

Figure 1: Examples of masts

Asset systems and related assets

A mast is a component of an ITS system.

Related assets:

- Camera [not available yet]
- Enclosure [not available yet].

What is the difference between a mast and a pole structure?

A mast is a specialised type of pole structure designed for considerable height and specific operational purposes, typically featuring additional hardware to improve serviceability and stability. Unlike standard poles, masts are primarily used for the high-elevation installation of equipment that requires broad coverage, such as lighting, surveillance, or communications systems. Examples of assets that fall under this category include high masts, CCTV masts, and communication masts, each tailored to support their designated equipment and operational requirements.

Asset information

Asset recording

Recording masts

All masts shall be recorded in the asset management information system.

Asset recording scenarios

Guidance for adding an asset as well as handling replacements, relocations, removals and decommissioning are provided in the General Asset Guidelines document.

Locations (spatial and linear)

Preferred/allowed spatial shape

When recording a mast, the preferred spatial shape is a point.

Additional resources

The following information is available to support your knowledge of masts, and what's needed for data collection and management.

Table 1: Additional resources related to masts

Resource	Description
Asset Management Data Standard (AMDS) inventory standards	You can find the Standard on the AMDS website: Data standard releases
Data collection spreadsheets	AMDS provide data collection spreadsheets to support collecting the right data in a format that can then be imported to your asset management information system. You can find the sheets in the ADG page below under “AMDS data collection sheets” https://www.nzta.govt.nz/roads-and-rail/asset-data-guide/assets

Mast asset data

The following table provides the key information about what attributes should be collected and managed for this asset.

The table below is from version 1.4 of the AMDS, and it may differ from what you see in your asset management software, depending on what version of the standard the database you are working on has.

There are attributes that are common to most assets. You can find the list and descriptions of these attributes in the General Asset Guidelines document.

Table 2: Key attributes for masts

Attribute	Status	Type	Description and example.
Mast Primary Function	Mandatory	List	What is the main function/purpose of the mast? Examples: light unit support, sign (electrical), CCTV, non-electrical sign support.
Pole Type	Mandatory	List	What is type of mast is used? Examples: Type: Fixed — Description: Fixed upright mast.

			Hinged	A mast that has a hinge unit incorporated allowing it to bend at a point.
			Sectional	A mast that is made up of different sections connected together.
			Lattice	A mast that is a freestanding with a vertical framework.
Material	Mandatory	List	What is the mast made from (not what it is mounted on)? Examples: steel – galvanised, steel – ungalvanised.	
Has Guy Wires?	Mandatory	Yes/No	Does the mast have guy wires to support the mast?	
Footing Bolted?	Mandatory	Yes/No	Is the mast's footing bolted to the surface?	
Height	Mandatory	Number (m)	What is the total height of the mast? Examples: 40.85m, 25.85m.	
Side	Optional	Yes/No	Side of the road where asset is located.	

Asset data guide (SM050)

Pavement system

May 2026

ADG Version 1.1

AMDS Version 1.4

This manual has been developed with the collaboration of the Road Efficiency Group Te Ringa Maimoa (REG).

This document is a section of the NZ Transport Agency Waka Kotahi *Asset data guide* (SM050).

What is a pavement?

A pavement system consists of the different layers that make up the pavement:

- surface layer
- pavement layer
- subgrade layer.

A pavement is a durable, engineered structure designed to enable the safe and efficient movement of people and vehicles. It consists of multiple layers: a hard surface layer (such as chipseal, asphalt or concrete) placed over structural layers of aggregate (base and sub-base), all supported by the natural ground or subgrade. Its primary functions are to provide a smooth, stable surface for users and to distribute traffic loads to the underlying subgrade without exceeding its strength.

All three assets will be included for a new roadway, however for resurfacing you may only need to add the surface asset.

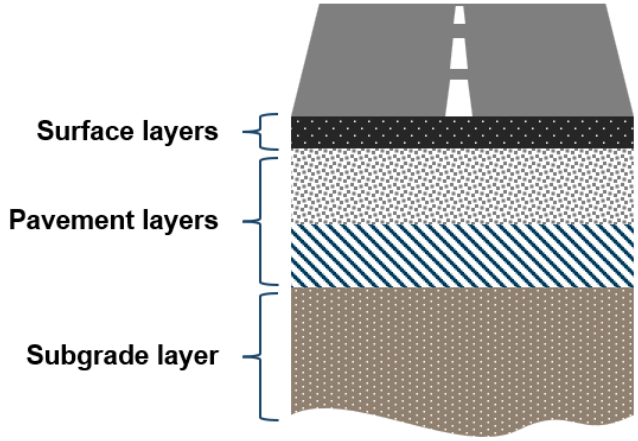


Figure 1: The layers that make up a pavement

For a sealed road, the pavement includes a surface layer on top of the pavement layers and subgrade.

For an unsealed road, the pavement includes just the pavement layers on top of the subgrade. RCAs may specify that they will capture a metal wearing course as a surface layer.

Related assets

The following assets can be components of pavement system. Click the links to read more information on these assets.

Table 1: Related assets

Asset name	Asset description
Surface layer	The layer in direct contact with traffic loads.
Pavement layer	Combination of subbase, base course, aggregates placed on a subgrade layer to support the traffic load and distribute it to the roadbed.
Subgrade	The native or stabilised ground material under the constructed pavement and surface layers.

Asset information

Asset recording

Recording surfacing, pavement and subgrade layers

This applies to surface layer and pavement layer records. It may not apply directly to subgrade records.

All pavement layers larger than the following sizes should be recorded in the asset management information system.

- If full carriageway width – 50m length.
- If not full carriageway width – 250m^2 surface area.

Pavement layers less than these sizes should be recorded as an asset if it relates to short road section like a ramp, roundabout, car park, cul-de-sac heads, special intersection treatment, intersection apron or bus stop and other high value treatments (e.g. OGPA surface).

For new roads with complicated surfacing and/or pavement layers used, it is good practice to record all the assets created, irrelevant of their size.

Any pavement layers not recorded as an asset (usually small amounts created under a maintenance contract) shall be considered maintenance and have a maintenance activity record created.

Changing surfacing, pavement and subgrade layers

Existing layers should never be modified let alone extended. The only change will be if a layer is removed during a renewal or improvement works. In this case the existing layer would be split so that an existing layer can be retained and the section removed can be marked as removed in the database.

In AWM this is handled for you with Pavement Manager.

Surfacing, pavement and subgrade layers over more than one database road

This applies when a layer physically is constructed across a change of road in your database. In AWM this is represented by a change in Road ID and for state highways this is also a change in State Highway Reference Station (RS).

This occurs frequently, as many change in Road IDs fall at busy intersections and on bridge abutments, which are frequently resurfaced and the layers span across the two database roads.

For these sites you must create two layer records, one for each of the two Road IDs.

Existing surfacing, pavement and subgrade layers

Since it is impossible to verify the composition of the layers beneath the top surface layer once it has been sealed, it is critical that this information is provided or recorded at the time of construction.

A further source of valuable information on pavement strength and layer depth is the information obtained when test-pits or other non-invasive tests are carried out.

How to create pavement system data

Adding pavement system records is a specialist area. Refer to your asset management information system software training for information on how to create pavement system records.

System diagrams and scenarios

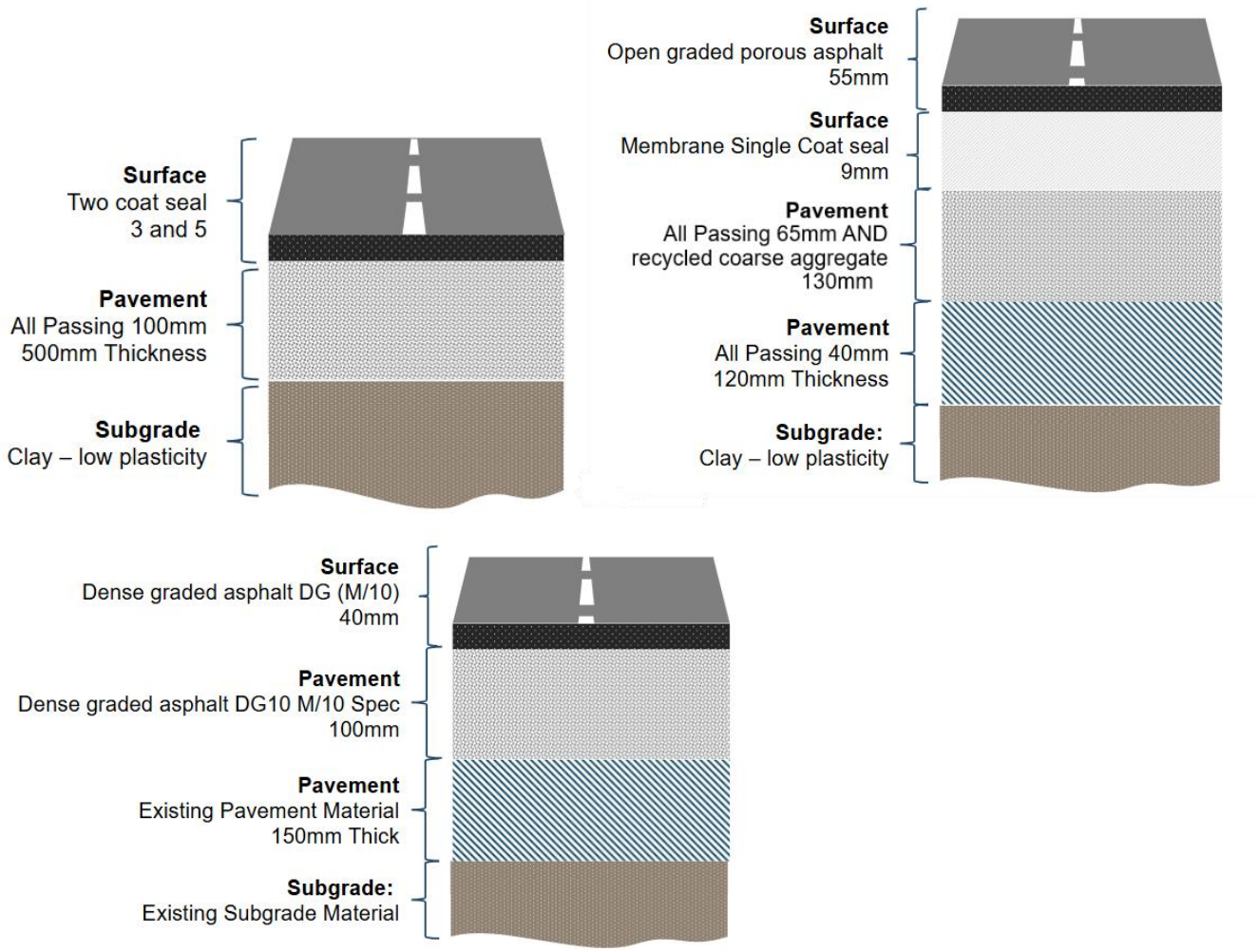


Figure 2: Examples of pavement systems (layers not to scale)

Recording layer widening

The Left Hand Side Offset of the existing layer records may need to be updated when there has been some sort of widening activity. For example, if you construct a new 3.5m wide Left Hand (Increasing Direction) Passing Lane on an existing 7m wide road, then the passing lane layer will have:

- ***Left Hand Side Offset*** = "**0m**"
- ***Layer Average Width*** = "**3.5m**".

And the existing layer that runs concurrently with the passing lane will have a revised:

- ***Left Hand Side Offset*** = "**3.5m**"
- ***Layer Average Width*** = "**7.0m**".

Do not use negative offsets to indicate the widening but ensure that all underlying layers are manipulated to match the new offsets resulting from the construction of the passing lane.

If a new 3.5m wide Right Hand (Decreasing Direction) Passing Lane is to be constructed on the right hand side of a 7m wide road then the passing lane will have:

- ***Left Hand Side Offset*** = "**7m**"
- ***Layer Average Width*** = "**3.5m**".

All of the other records will remain unchanged, see diagram below:

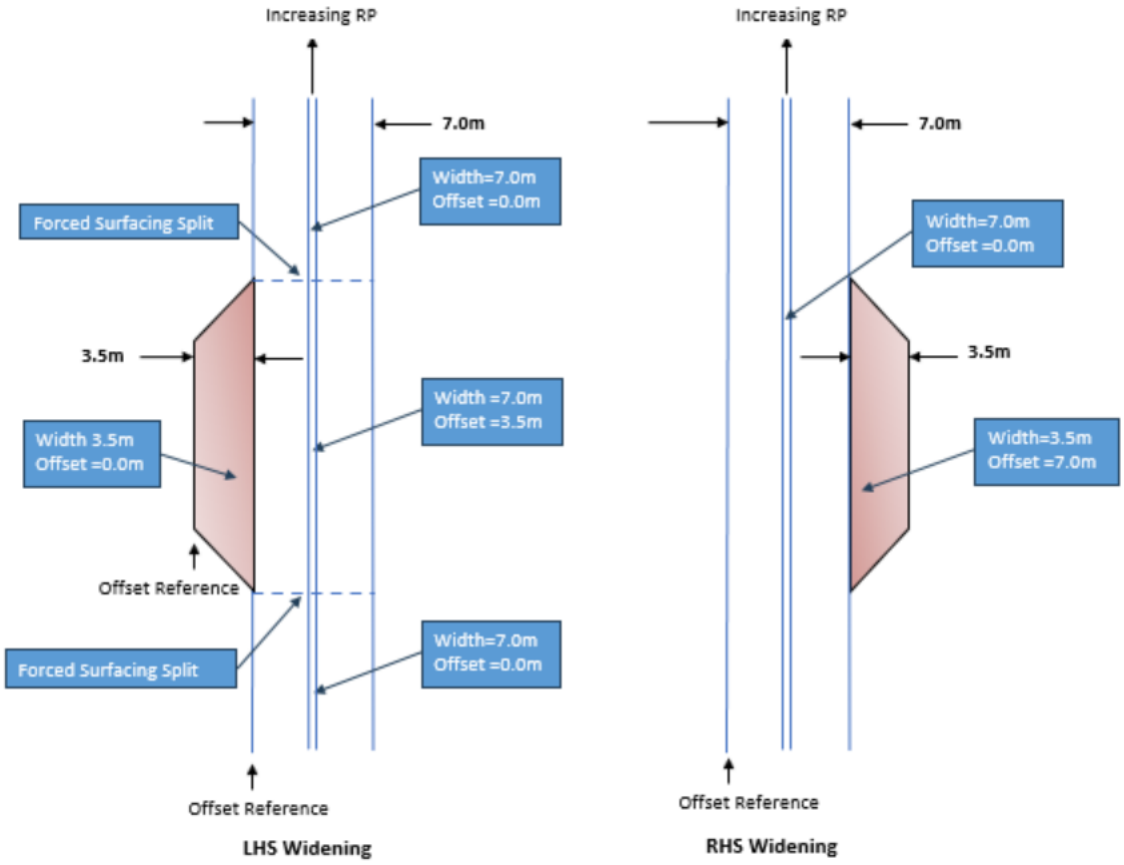


Figure 3: Examples of layer widening

Dealing with left hand side offset

The left hand side offset of a layer is simply the distance from the left hand edge of the carriageway to the left hand edge of the surfacing or pavement. The offset, combined with the seal width, is used to define the location of the pavement and surface on the carriageway and indicate what portion of the carriageway has been covered, as shown below.

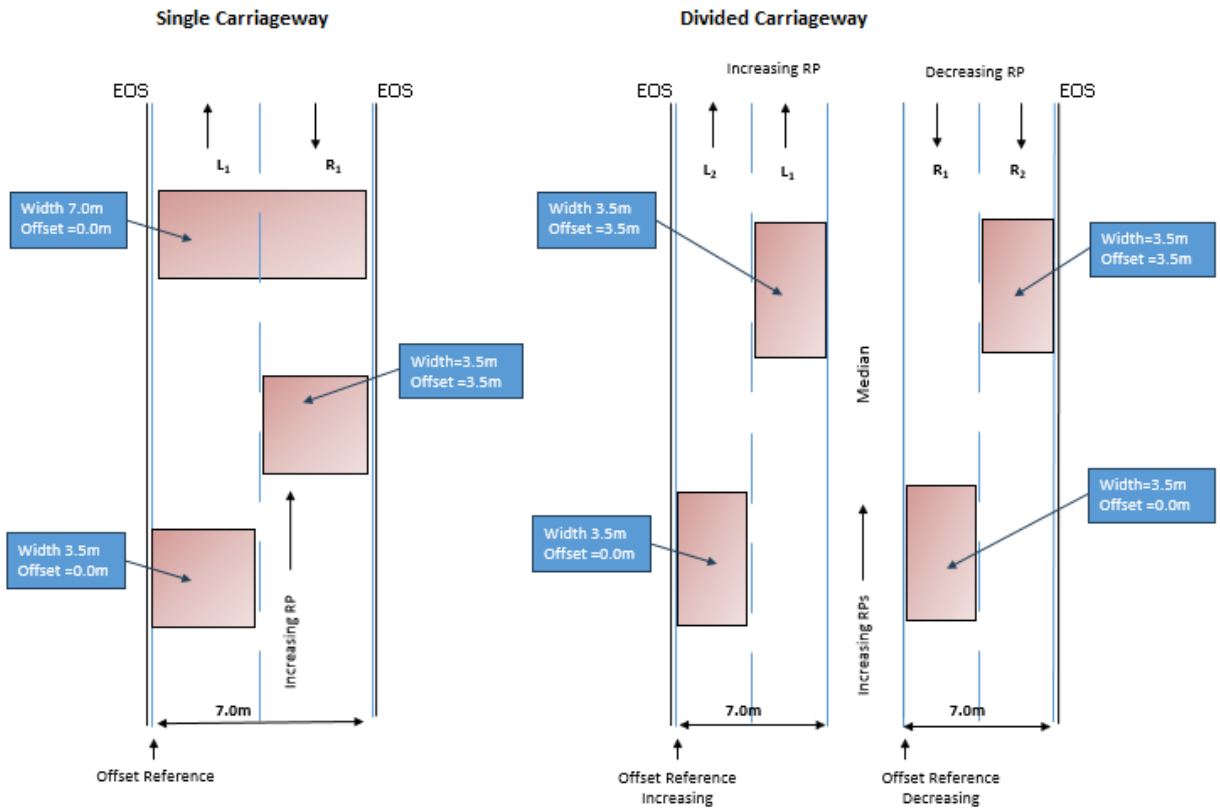


Figure 4: Offset and seal width indicate location of surfacing

Dealing with multi-layered pavement

Typically, most pavements comprise more than one layer, for example prepared subgrade (bottom layer), GAP65 (subbase) and GAP40 (basecourse). The subgrade is at the bottom, captured in the Subgrade (AMDS) table; the GAP65 is on top of the subgrade and the GAP40 is between the GAP65 and the 1st Coat Seal or membrane.

If you are using AWM, the software determines the order of layers by their dates, so the older the layer the lower it sits relative to surrounding layers. The youngest layer sits on top. Even if you place both GAP40 and GAP65 on the same day, you can nominate the GAP40 to be the top layer by assigning it a younger date in relation to the GAP65 (one day younger will suffice).

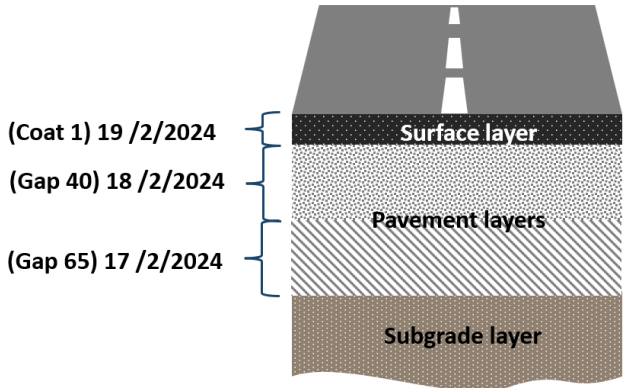


Figure 5: Example pavement layers

Asset data guide (SM050)

Surface layer information

May 2026

ADG Version 1.1

AMDS Version 1.4

This manual has been developed with the collaboration of the Road Efficiency Group Te Ringa Maimoa (REG).

This document is a section of the NZ Transport Agency Waka Kotahi *Asset data guide* (SM050).

What is a surface layer?

The surface layer is the layer of the road that is in direct contact with traffic loads.

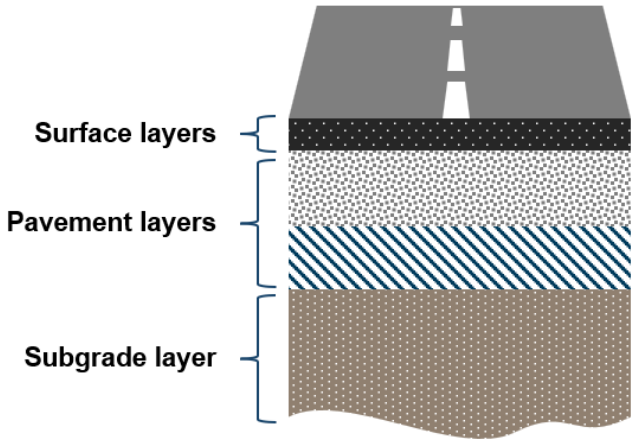


Figure 1: Layers of a road

Asset system and related assets

A surface layer is a component of the pavement system.

- Roadway - Pavement layer
- Roadway - Subgrade

When is an asphaltic concrete (AC) layer a pavement?

When asphaltic concrete layers are greater than 80mm or designed as a structural layer, they are recorded in the pavement table. However, asphalt wearing course surfaces up to 80mm that are not designed to be structural are recorded in the surfacing table.

Refer to NZTA M10 *Specification for dense graded asphaltic concrete* for typical layer thicknesses for wearing course surfacing.

Asset information

Asset recording

Refer to Roadway - Pavement system for common guidelines for the recording of surface, pavement and subgrade layers.

Locations (spatial and linear)

Preferred/allowed spatial shape

When recording a surface layer, the preferred AMDS spatial shape is a polygon.

In AWM the polygon is a calculated shape based on centreline length and width.

Dimensions

Layer average width

Surface layer average width is the average of several measurements from the left hand (LH) edge of seal to the right hand (RH) edge of seal. Surfaces that span one or more intersections can have a greater nominal width than the surrounding carriageway sections as intersections are typically wider.

Note that, if a surfacing width varies by more than 1.4m over a length greater than 100m, then a separate surfacing record should be created for that length.

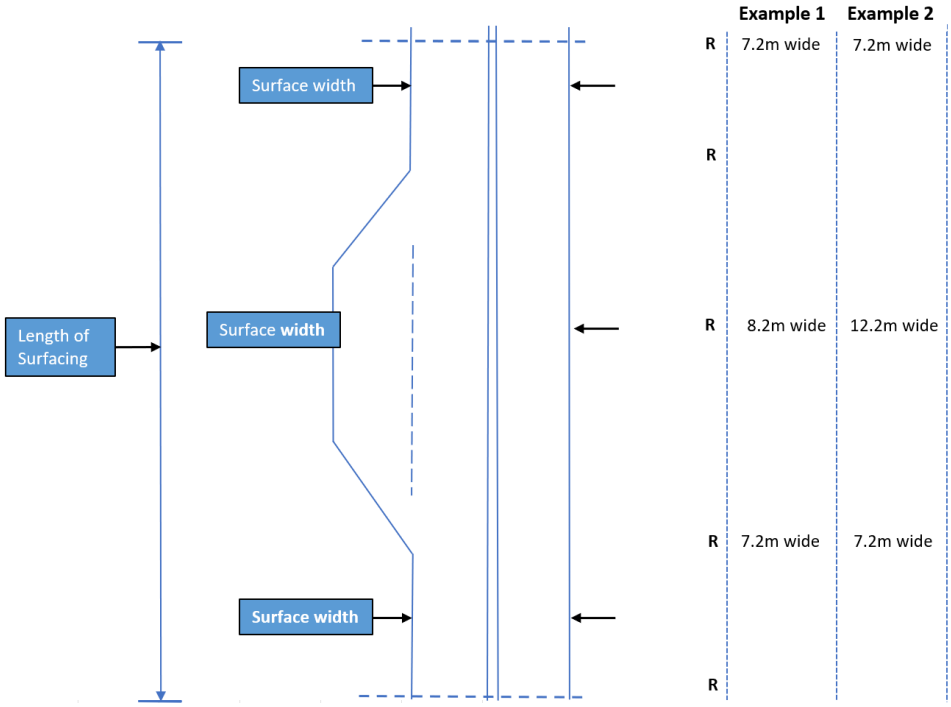


Figure 2 Surface Width Definition for varying width seals

Table 1: Layer average width definition for varying width seals

Details	Surface record	RPs	Layer average width
Example site 1	1	0–300	7.53m
Example site 2	2A	0–75	7.2m
	2B	75–225	12.2m
	2C	225–300	7.2m

In example 2, the surface width has varied by more than 1.4m over a 100m length, therefore three records must be captured.

Dealing with variances in width when the sealed area has a mixture of widths

Layer average width is the average surface width only, regardless of smaller shape changes. These are captured as part of the extra area and total sealed area details.

The field ‘Total Area’ is the correct attribute to store the sum of the detailed areas.

Other attributes

Surface function

Table 2: Surface functions

Function	Description
1st Coat	A First Coat Seal is the initial chipseal layer applied directly onto new pavement. It should be recorded 1–15 days after the pavement date and provides the first waterproofing layer for the surface.
2nd Coat	A Second Coat Seal is the follow-up layer applied after the First Coat. For chip sealed surfaces, it must be recorded 6–36 months after the First Coat Seal.
Enrichment	A light application of binder, with no aggregate applied, sprayed over a surface that is losing chip or have hard/brittle binder (not always aged). Can support traffic within a day or 2. The binders used are usually emulsions with low bitumen contents. Also known as Fog Coat.
Membrane Seal	A Membrane Seal is a chipseal waterproofing layer placed over pavement and then covered by asphalt. It provides waterproofing and crack-mitigation beneath the asphalt.
Reseal	A Reseal is any chipseal applied to a surface that has already been sealed. It is used when the existing surfacing is showing, or is likely to show, signs of distress.

Dealing with removal dates in the surface layer

Do not delete surface records from the database.

The removal date is a flag that differentiates between surfaces that are currently on the network from those that have been removed as part of pavement renewal activity or milling during resurfacing. This does not apply to partial key-in milling (at start/end and edges), but it does apply to full lane or road width milling.

The removal date must be populated for surfaces that are physically removed from the network or become part of the pavement structure during pavement renewal activity.

Most removed surfaces do not coincide exactly with the area of pavement renewal, so you may have to split historical records into two or more records and apply the removal date only to that part of the surface which has been removed due to pavement renewal activity. This also applies to the extent of milled areas that do not coincide with the extent of the existing surface layers (length and width).

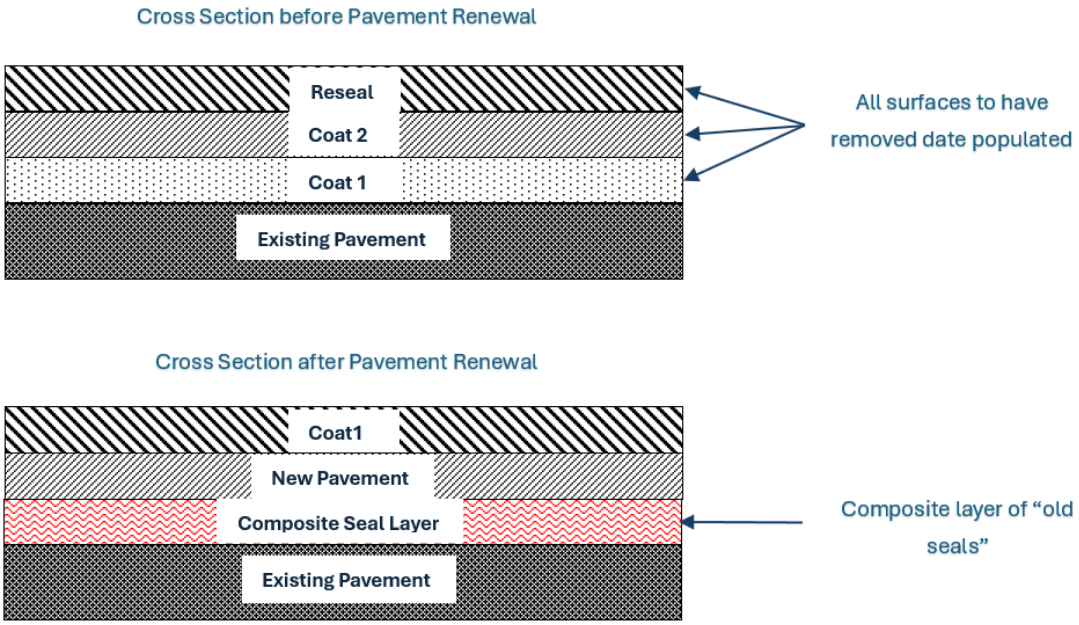


Figure 3: Cross-sections of pavement and top surface before and after pavement renewal

When milling of existing surfaces occurs, the number of existing surface layers that require the removal date to be populated is dependent on the depth that was milled.

The surface records will be removed in date order (newest to oldest), until the depth is achieved. For example, if 30mm of existing surface layers have been milled prior to resurfacing and the asset record shows an existing top surface of 25mm depth (layer 1), followed by another 30mm layer (layer 2), only layer 1 is flagged as removed. Even though the milling record indicates 5mm of layer 2 has been removed, splitting the record to remove 5mm is not practical or sensible. The record for this layer (layer 2) is not updated.

Where the remaining depth of the existing surface layer is less than 15mm, due to the milling treatment depth, the surface record will have the removal date populated.

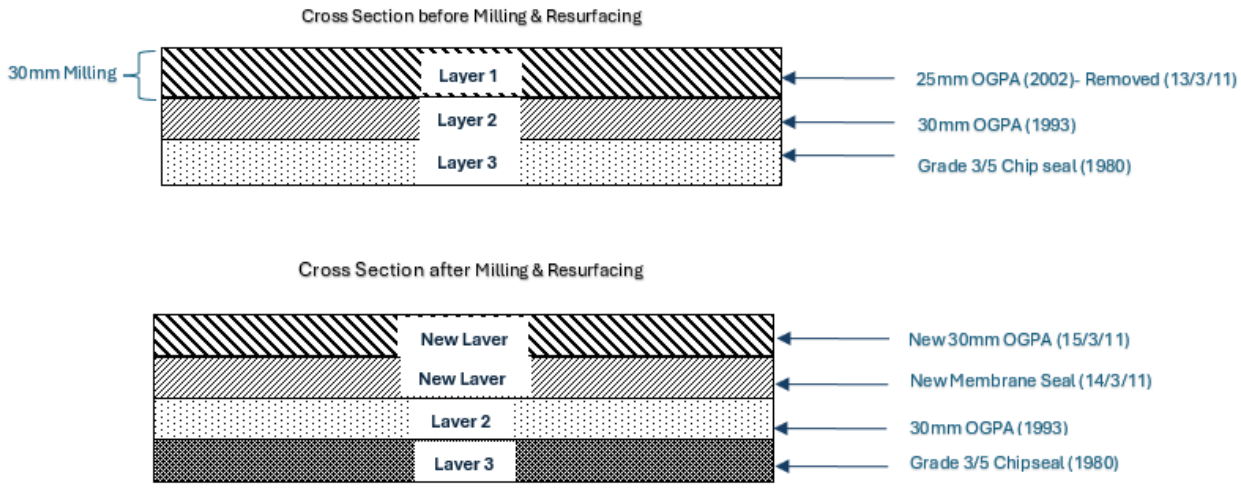


Figure 4: Cross-sections of surface structure before and after milling prior to resurfacing

Surface design life

This is the expected life (in years) of the surface at the time of design and is site specific. It is determined by the surfacing designer (it is not the default life). This should not be changed during the life of surface.

Under AMDS if the ***Surface Material Category*** is **"chipseal**" and ***Surface Function*** is **"1st coat"** then ***asset design life*** must be less than 4 years.

Recycled aggregate

If a surfacing includes a recycled product (as either an additive, aggregate or polymer) enter ***Includes Recycled Aggregate?*** = "**True**".

The recycled aggregate refers to the type of product used, for example, reclaimed asphaltic pavement (RAP) is used in asphalt mixes. Melter slag aggregate is a product used in asphalt mixes and as a sealing chip. When recycled components are used as additives (such as plastic milk bottles, PET) these are entered as the additive and the recycled component. If more than one recycled component is used, enter the major component. Other recycled components can be recorded in the notes field.

Chip grade

Dealing with chip grade where there are different chip sizes

There are three different attributes to record chip grade:

- ***Largest or only chip grade*** – to record the grade of the largest chip size used
- ***Second chip grade*** – grade of smaller chip used on multiple chip seals, including cape seals
- ***Third chip grade*** – grade of 3rd (smallest) chip used on multiple coat seals.

Surface binder

The field ***Surface binder*** only refers to the base bitumen used in the surfacing. This will include the ranges of standard emulsion (E60/70) and binder performance grades (such as P52, PG58 G). It also includes epoxy resin and polyurethane used as base binders in high skid surfacing types.

Multi grade binders, as allowed in the M01-A specification, are captured as base binder type 'Multi Grade Binder' (MGB).

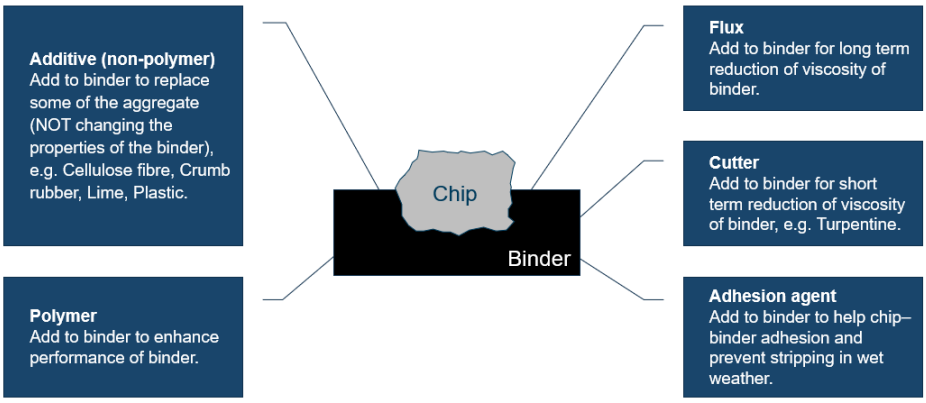


Figure 5: Binder attributes

Recording additives or polymers

If an additive has been used on a specific surface layer, follow these steps to populate the right attributes and data tables:

- In the **Surface Layer (AMDS)** table set ***Additive Used?*** = "**Yes**".
- While in the surface layer record, open Asset Hierarchy and click on 'Add' to create an **Additive Details** record.
- Select '**Additive Details**' to add to the record and then select '**Component'** as the link type.
- Complete the **Additive Details** record and save.
- If two or more additives are used, add further additive detail records to the surface layer to reflect what was constructed.

Recording adhesion agents

If an adhesion agent has been used on a specific surface layer, follow these steps to populate the right attributes and data tables:

- In the **Surface Layer (AMDS)** table set ***Adhesion Agent Used?*** = "**Yes**".
- While in the surface layer record, open Asset Hierarchy and click on 'Add' to create an **Adhesion Agent Details** record.
- Select '**Adhesion Agent Details**' to add to the record and then select "**Component**" as the link type.
- Complete the **Adhesion Agent Details** record and save.
- If two or more adhesion agents are used, then add further additive detail records to the surface layer to reflect what was constructed.

Polished stone value (PSV)

For multiple chip or mix grades, the ***Polished stone value*** to be entered is the value (PSV) of the largest grade chip or aggregate in the top wearing course.

No PSV values are required for membrane or prime coat surface records.

Scenarios

Sandwich seal

A ***surface material*** = “**sandwich seal**” is used to absorb excess binder on a flushed seal. It is a two-layer chipseal where the 1st sealing chip is applied to the existing surface without a binder, then followed by a binder coat and a second coat of a smaller sealing chip. It is used to treat existing flushed pavement surfacing.

Combination seal

A ***surface material*** = “**combination seal**” uses a sandwich seal in the wheel paths and a voidfill seal outside the wheel paths in the un-trafficked areas.

Another option for combination seal is a two-coat seal applied full width as the second layer, or when various chip aggregate grades are applied in a single application.

Combination seals are used in areas of flushing and/or rutting in the wheel paths as a result of heavy traffic loading.

Two-coat chip seals

Surface material = “**two coat**” chip seals are commonly entered into the surface layer table as ***surface function*** = “**2nd Coat**”. This is incorrect unless the second coat is a second coat. Record reseals with surface function ‘Reseal’ and use the field ’Surface Material’ to correctly attribute Single Coat Seal and Two Coat Seal.

Applying a voidfill to a first coat

The voidfill is recorded as the second coat ***Surface Function*** = “**2nd Coat**” and the next waterproofing layer will be ***Surface Function*** = "**Reseal**".

Membrane seal

Membrane seals are a chip seal waterproofing layer, covered by an asphalt surfacing. In this situation ***surface function*** = “**Membrane Seal**” should be used for the waterproofing layer and ***surface function*** = “**2nd Coat**” for the asphalt surface recorded as a separate surface layer. For new pavement and area wide rehabilitation treatments only.

A membrane surface layer cannot be the top surface layer.

Geotextile seals

When a geotextile material is used in surfacing, it shall be recorded as its own surface layer record with ***Surface Material*** = “**Geotextile Seal**”.

A geotextile seal is surfacing made up of two surface layer records, where a geotextile fabric is applied on top of the first layer of binder, and a conventional surface material is placed over the fabric.

Additional resources

The following information is available to support your knowledge of surface layers, and what's needed for data collection and management.

Table 3: Additional resource for surface layers

Resource	Description
Asset Management Data Standard (AMDS) inventory standards	You can find the Standard on the AMDS website: Data standard releases
Data collection spreadsheets	AMDS provide data collection spreadsheets to support collecting the right data in a format that can then be imported to your asset management information system. You can find the sheets in the ADG page below under “AMDS data collection sheets” https://www.nzta.govt.nz/roads-and-rail/asset-data-guide/assets
Asset specifications	Official design and/or construction specifications for surface layers can be found below: Pavement Surface reseal reason based on: Chip sealing in New Zealand, Chapter 6: Practice Note 1 Mix designation number based on: NZTA M10: 2020 Specification for dense graded asphaltic concrete Chip grade based on: Specification for sealing chip M01-A Asphalt Binders https://nzta.govt.nz/resources/asphalt-binders

Surface layer asset data

The following table provides the key information about what attributes should be collected and managed for this asset.

The table below is from version 1.4 of the AMDS, and it may differ from what you see in your asset management software, depending on what version of the standard the database you are working on has.

There are attributes that are common to most assets. You can find the list and descriptions of these attributes in the General Asset Guidelines document.

Table 4: Key attributes for surface layers

Attribute	Status	Type	Description and example.
Road	Mandatory	UUID/ List	The Road ID/Name.
Start	Mandatory	Number (m)	Distance from the road origin to the start of the layer, along the road centreline.
End	Mandatory	Number (m)	Distance from the road origin to the end of the layer, along the road centreline.

Left Hand Side Offset	Mandatory	Number (m)	What is the distance from the left-hand side of seal edge to left hand side of the layer (can be negative).? Examples: 5.1m, -2.2m
Layer Average Width	Mandatory	Number (m)	The average width of the layer.
Surface Function	Mandatory	List	What type if seal is this? What is its function? Examples:1st Coat, 2nd Coat, Membrane Seal, Reseal.
Reseal Reason	Conditional	List	What is the main reason for the reseal? Required if Surface function is 'Reseal' or 'Enrichment'. Examples: Cracking, Flushing, Holding Seal, Polished, Ravelling, Scabbing, Special Surfacings. Note: Look at 'Primary reason for surfacing as per Chipsealing in New Zealand Chapter 6: Practice Note 1' for explanation of reseal reasons.
Surface Material	Mandatory	List	What type of material was used for the layer? Examples: Single coat seal, Open graded porous asphalt. Stone pavers, Combination seal. Note: The material you select determines: • what other information is required (eg chip size, 2nd chip size, or layer thickness (required for non-chip seal surfaces)) • check if it can be used for that function (eg some materials are inappropriate for 1st Coats) • acceptable value ranges (eg chip size, thickness) • confirm if ALD should be used to calculate the thickness of the layer. Check the AMDS for a full list of surface materials, their descriptions, acceptable thickness range etc: Asset Management Data Standard
Material Source	Mandatory	List	What is the source of the aggregate for chips or mix used? If multiple, then what is the source of the largest sized chip mix? Example: Awapuni Quarry.
Surface Specification	Mandatory	List	What design specification was used for the pavement layer? Examples: • NZTA P3 First coat sealing • NZTA P11 Open Graded Porous Asphalt • Contract specific.
Polished Stone Value (PSV)	Conditional	Number (PSV)	How will largest grade chip or uppermost layer a stone polish under standard conditions? Required if 'Surface Material PSV Required?' is TRUE.
Mix Designation Number	Conditional	List	What is the Design mix number? For example record '10' for AC10 as per M10 specification) Required if Material type is a type of asphalt. Examples: 7, 10, 14, 20, 28.

Slurry Type	Conditional	Number (1-4)	What type of aggregate grading was used for the Slurry Seal? Required if Surface Material is 'Slurry Seal' Note: Type 1 (nominal 3mm maximum size) through to Type 4 (nominal 10mm maximum size).
Asset Design Life	Mandatory	Number (years)	What is the expected life of the asset? For first coats, this must be less than 4 years.
Largest Or Only Chip Grade	Conditional	List	What is the grade of the largest chip size used? Required if surface material is a type of chipseal. Examples: 2, 3, 4, 5, 6
Second Chip Grade	Conditional	List	What is the grade of the next smallest chip used on multiple chip seals? Required if surface material is a Racked in seal, Sandwich seal, Two coat seal, or Three coat seal. Examples: 3, 4, 5, 6
Third Chip Grade	Conditional	List	What is the grade of the next smallest chip used on multiple chip seals? Required if surface material is a three coat seal. Examples: 4, 5, 6
Includes Recycled Aggregate?	Mandatory	True/False	Was any of the aggregate used in the surface layer recycled?
Recycled Aggregate Percentage	Conditional	Number (%)	How much of the aggregate used was recycled? Required if recycled aggregate was used. Example: 10%
Recycled Aggregate Type	Conditional	List	What type of recycled aggregate was used? Required if recycled aggregate was used. Examples: Reclaimed Asphaltic Pavement, Slag, Marginal Aggregate.
Surface Binder	Mandatory	List	What is the base binder used to bind chips and existing road surface? Note: Polymer modification of the binder is record later. Examples: Bitumen 130/150, Emulsion 130/150, Epoxy Resin, Polyurethane.
Application Rate	Conditional	Number (litres per square metre)	What is the Residual bitumen application rate? How many litres of bitumen were used per square metre of seal? Required if Surface material is a type of chipseal.
Is Cutter Used?	Mandatory	True/False	Was a cutter used to thin/dilute the binder and make it more workable in shorter term?
Cutter Type	Conditional	List	What type of cutter was used?

			Required if cutter was used. Examples: kerosene, other cutter type.
Cutter Quantity	Conditional	Number (parts per hundred)	How much cutter was used? Required if cutter was used. Example: 5pph.
Is Flux Used?	Mandatory	True/False	Was flux added to the binder to make it more workable long term? That is, to thin it and reduce the binder's viscosity long term (its resistance to change shape and/or it's resistance to flow/move)?
Flux Quantity	Conditional	Number (parts per hundred)	How much flux was in the binder (parts per hundred)? Required if flux is used. Example: 5pph (Max is 9pph).
Is Additive Used?	Mandatory	True/False	Was a non-polymer additive (eg crumb rubber) used in the binder to replace some of the aggregate (as opposed to modifying the properties of the binder itself). If YES, you need to add and link a Surface Additive Details component (see below).
Is Adhesion Agent Used?	Mandatory	True/False	Was an adhesion agent added to the binder to help with chip–binder adhesion and to prevent stripping in wet weather? Also known as anti-stripping agent. If YES, you need to add and link a Surface Adhesion Agent Details component (see below).
Is Polymer Used In Binder?	Mandatory	True/False	Was a polymer used in the binder to enhance performance of binder? Notes: use the largest component if more than one type of polymer used.
Polymer Type	Conditional	List	What type of polymer was used in the binder? For more than one, select the largest component. Required if polymer was used in binder. Examples: Emulsiphalt 373, Flexiphalt 160A, PAVEflex SBR Low Modified 180/200 Emulsion, Road Science RS 1 Improved Seal.
Polymer Percentage	Conditional	Number (%)	How much of the total binder is made up of the polymer? Required if polymer was used in binder. Example: 5%
Measured Thickness	Conditional	Number (mm)	How thick is this surface layer? Required for any non-chip seal material type like asphaltic mixes. The thickness is validated against the material type, eg dense graded asphalt AC(M/10) must be within 35mm (min) to 168 (mm). Examples: 45mm.

Calculated Thickness	Conditional	Number (mm) *Calculated when saved or imported.*	What is the calculated thickness of this surface layer? This is only required for chipseals. Thickness is calculated using the average linear dimension value of the chip grades used. Notes: • Some types of chip seal will have a calculated thickness of zero because the chips fit into the existing profile and do not increase thickness • This is calculated when saved or when imported.
Length	Mandatory	Number (m)	Total length of the surface layer, can be derived geospatially.
Area	Mandatory	Number (m2)	The area of the surface layer. Auto calculated from geometry.
Extra Area?	Mandatory	True/False	Is there any extra area to be accounted for? For example, passing bay, wider areas, etc.
Extra Area	Conditional	Number (m2)	The area of the extra area of the surface layer.
Total Area	Mandatory	Number (m2)	The sum of the area and the extra area.
Lane Coverage	Mandatory	Number	How many lanes are covered by the layer? Excluding slipways and shoulders.
Construction Date	Mandatory	Date	What is the date the asset was installed?
Is Layer Removed?	Mandatory	True/False	Has this layer been removed?
Date Removed	Conditional	Date	Required if 'Is Layer Removed' is true.

Additive details asset data

If additives were used in the surface layer's binder (that is, you answered YES to 'Is Additive Used?') then you must capture the details of at least one additive. There can be multiple additive records. The records should be linked to the surface layer in the asset hierarchy.

Table 5: Key attributes of additive details

Attribute	Status	Type	Description and example.
Additive Type	Conditional	List	What type of non-polymer additive (eg crumb rubber) was used in the binder? Required if additive was used. Examples: cellulose fibre, crumb rubber, lime, plastic.
Additive Quantity	Conditional	Number (parts per hundred)	How much non-polymer additive (eg crumb rubber) was used in the binder? Required if additive was used. Example: 6pph.

Additive Recycled?	Conditional	True/False	Was the additive a recycled material? Required if additive was used.

Adhesion agent details asset data

If adhesion agents were used in the surface layer's binder (that is, you answered YES to 'Is Adhesion Agent Used?') then you must capture details of at least one adhesion agent. There can be multiple adhesion agent records. The records should be linked to the surface layer in the asset hierarchy.

Table 6: Key attributes of adhesion agent details

Attribute	Status	Type	Description and example.
Adhesion Agent	Conditional	List	What type of adhesion agent was added to the binder? Required if adhesion agent was used. Examples: Aggbind 60, Duomeen T(Paste), Wetfix BE, Redicote N182.
Adhesion Agent Quantity	Conditional	Number (parts per hundred)	How much adhesion agent was used in the binder? Required if adhesion agent was used. Example: 3pph

Asset data guide (SM050)

Pavement layer information

May 2026

ADG Version 1.1

AMDS Version 1.4

This manual has been developed with the collaboration of the Road Efficiency Group Te Ringa Maimoa (REG).

This document is a section of the NZ Transport Agency Waka Kotahi *Asset data guide* (SM050).

What is a pavement layer?

The pavement layer is the combination of subbase, basecourse and aggregates placed on a subgrade layer to support and distribute the traffic load to the roadbed.

For a sealed road, the pavement includes a surface layer on top of the pavement layers and subgrade.

For an unsealed road, the pavement includes just the pavement layers on top of the subgrade. RCAs may specify that they will capture a metal wearing course as a surface layer.

Diagrams

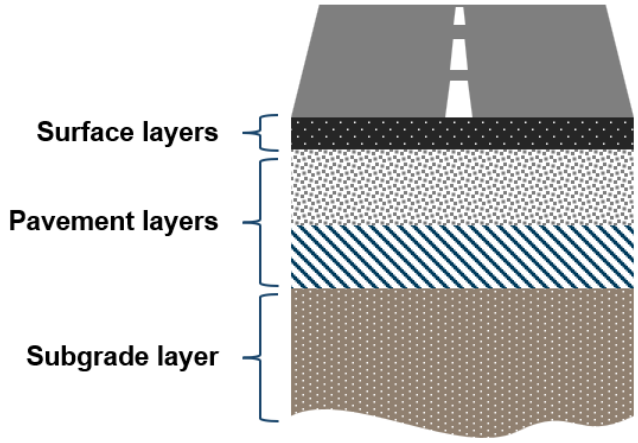


Figure 1: Example of pavement layers

Asset system and related assets

A pavement layer is a component of the pavement.

- Roadway - Surface layer
- Roadway - Subgrade

Asset information

Asset recording

Refer to Roadway - Pavement system for common guidelines for the recording of surface, pavement and subgrade layers.

Locations (spatial and linear)

Preferred/allowed spatial shape

When recording pavement layers, the preferred AMDS spatial shape is a polygon.

In AWM the polygon is a calculated shape based on centreline length and width.

Other attributes

Pavement layer with two pavement materials

A single pavement layer record can have a mix of two pavement materials. You specify the material type, source and mix percentage of each material in that pavement layer.

Recording sub-base and basecourse

Capture each discrete layer separately to reflect the work taken at that time and the planned function of the layer, for example a sub-base layer of 180mm and a basecourse layer of 190mm.

Pavement Layer Removed? and Removed Date

If the pavement material has been removed or stabilised during pavement construction, then it will need to be tagged as removed in the asset management system. This is done by setting ***Pavement Layer Removed?*** To "**TRUE"** and populating the ***Removal Date*** field with the date that the pavement layer material was removed. Typically, this is at least 1 day before the new pavement layer date.

For AWM users, this is generally done using Pavement Management, such as when a pavement has been stabilised. Pavement Management will tag the previously unbound layers as removed and add a new stabilised layer with material type 'composite'.

Do not delete records from the Pavement Layer table.

Recording California Bearing Ratio

Recording the California Bearing Ratio (CBR) is important because pavement designers rely on this information to assess moisture sensitivity, seasonal performance risk, and to select appropriate pavement thicknesses and treatments. CBR is expressed as a percentage.

Contact your local civil testing laboratory for guidance on sample size and sample collection requirements.

Recording stabilisation of a pavement layer

If a stabilising agent has been used on a specific pavement layer, then follow the following steps to populate the right attributes and data tables:

- In the Pavement Layer (AMDS) table set ***Stabilising Agent Used?*** = "**Yes**".
- Construction Date set to the date that the pavement was stabilised (as opposed to when the pavement layer granular material was placed).
- The stabilising information then needs to be recorded in the Stabilisation Details table.
- While in the pavement layer record, open Asset Hierarchy and click on 'Add' to be able to add a Stabilising Agent Details record.
- Select 'Stabilising Agent Details' to add to the record and then select 'Component' as the link type.
- Complete the stabilising agent details record and save.
- If two or more stabilising agents are used, then add further stabilising agent detail records to the pavement layer to reflect what was constructed.

What to do when a pavement layer has been stabilised but there is no data in the database to add the stabilising details to?

In this situation, you will need to add an estimated layer to the **Pavement Layer** table, and you can then add the stabilised details in the **Stabilising Agent Details** table.

Pavement Layer *Accuracy* is an attribute you can use to show the record is estimated. This is not available in AMDS v1.4 but is coming in AMDS version 1.5. If you don't have this attribute, your RCA may choose to create this as a custom attribute prior to AMDS v1.5 upgrade.

Set the **Pavement Layer *Accuracy*** = "**Estimate"**; use a default date of **Pavement Layer *Construction Date*** = **"01/01/xxxx"**, including specifying the year. The year can be assumed as 25 years before stabilisation, for example if stabilisation has been done in 2012, the default date would be 01/01/1987. Add additional information in the notes field to provide any other relevant information.

Example 1: AWPT (area wide pavement treatment) with stabilisation from RP0 to RP1000

You have ripped up and removed the existing surface, adding 100mm of new pavement material (GAP40). There is no existing Pavement Layer data in the database. Your Pavement Layer table was originally blank, but will look like the below once the estimated record is added:

Table 1: AWPT (area wide pavement treatment) with stabilisation from RP0 to RP1000

Start	End	Construction date	Accuracy	Primary material	Thickness	Stabilising agent used?
0	1000	1/1/2005	Estimate	Unknown	100	
0	1000	17/2/2005	Known	Graded All Passing 40mm	100	Y

Add Stabilising agent details in the Stabilising agent table against the new record

Notes:

- you will also have to remove the surfacing(s) that runs concurrently with the AWPT.
- estimated/Unknown is a non AMDS field in AMDS version 1.3 and 1.4 but has been added in version 1.5.

Example 2: Left Hand Side (LHS) seal widening from RP300 to RP600.

You are seal widening from RP300 to RP600 at an average width of 3.5m using 150mm of GAP65 and 100mm of GAP40. There is currently a pavement layer record from RP0 to RP1000 as shown in the following table:

Table 2: Left Hand Side (LHS) seal widening from RP300 to RP600 before

Start	End	Construction date	Primary material	Thickness	Width	Left hand side offset
0	1000	15/2/1990	Graded All Passing 65mm	150	10	0
0	1000	17/2/1990	Graded All Passing 40mm	100	10	0

Once you have added the widening layer to the database your layer data should look like this:

Table 3: Left Hand Side (LHS) seal widening from RP300 to RP600 after widening layer added

Start	End	Construction date	Primary material	Thickness	Width	Left hand side offset
0	1000	15/2/2005	Graded All Passing 65mm	150	10	0
0	1000	17/2/2005	Graded All Passing 40mm	100	10	0
300	600	15/2/2005	Graded All Passing 65mm	150	3.5	0
300	600	16/2/2005	Graded All Passing 40mm	100	3.5	0

300	600	15/2/1990	Graded All Passing 65mm	150	10	3.5
300	600	17/2/1990	Graded All Passing 40mm	100	10	3.5
600	1000	15/2/1990	Graded All Passing 65mm	150	10	0
600	1000	17/2/1990	Graded All Passing 40mm	100	10	0

Note that there are now 8 rows of data where there was originally 2. As you will also be sealing the widening, the same propagation of data must take place in the Surface Layer table.

Changing existing pavement layer data when loading new data

New pavement layer data (excluding overlays) must be integrated with existing records, especially when stabilising an existing layer or performing left-hand side (LHS) widening.

Scenarios

Some examples of pavement system composition are shown below.

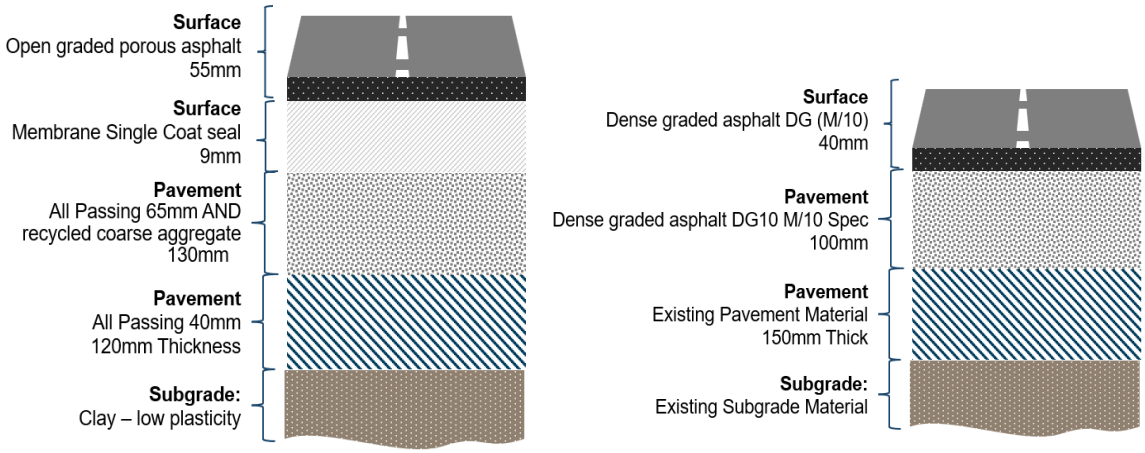
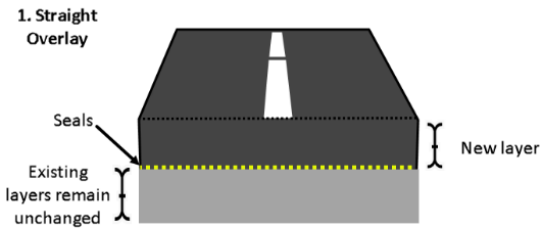
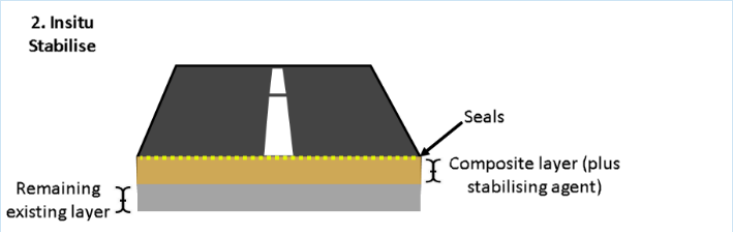
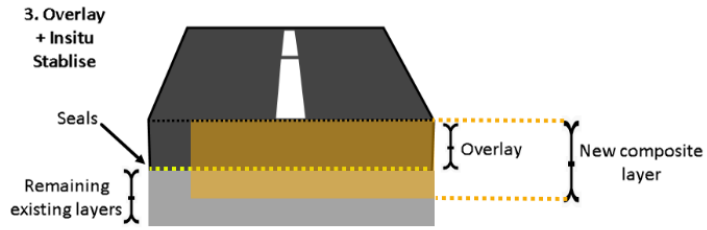
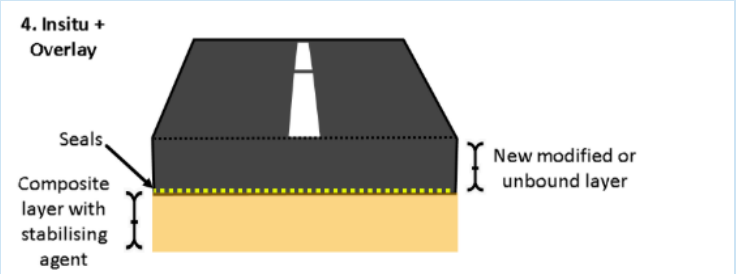


Figure 2: Examples of pavement system composition (layers not to scale)

Recording an overlay

An overlay is simply new pavement material placed over the top of an existing road surface. In this situation, the pavement layer data can be simply added to the database.

Table 4: Overlay examples

Overlay	Description
	Straight overlay: • Existing pavement layer stays in place • A new surfacing layer is added on top
	In situ stabilise: • The existing layer is milled/removed to the required depth. • A new stabilised composite layer is created using a stabilising agent.
	Overlay plus in situ stabilise • The existing layer is removed (depth varies but structure unchanged). • A stabilised composite layer is constructed. • A thin overlay is placed on top.
	In situ plus overlay • A stabilised composite layer is formed • An overlay is added on top.

For state highways

As the surface data has not been removed, there is no need to tag the surface removal date for the corresponding surface; however, there should be a new layer added to the pavement layer table indicating the length of composite material, representing the surfacing layers that now form part of the pavement.

If the existing surfacing is removed (for example by milling) before the overlay is added, the surface removal date for the existing surfacing record needs to be updated. Then add the overlay in the pavement layer table and add the new surfacing in the carriageway surfacing table.

For local authorities

Although the surfacing data has not been physically removed, it is no longer acting as a surface (that is, it is now part of the pavement layer), therefore all the surfaces under the overlay need to have a surface removal date entered.

If the total combined depth of surfacing under the granular overlay exceeds 50mm, then a new pavement layer record needs to be added to the pavement layer table. Use the pavement material code “Existing seal layers” for this layer.

Recording rip and remake

A rip and remake does not alter the pavement layer data unless the top layer is significantly changed in thickness or stabilised, but the surface layer should have the ***Surface Layer Removed?*** = “**Yes**” and have the removal date populated.

Additional resources

The following information is available to support your knowledge of pavement layers, and what's needed for data collection and management.

Table 5: Additional resources related to pavement layers

Resource	Description
Asset Management Data Standard (AMDS) inventory standards	You can find the Standard on the AMDS website: Data standard releases
Data collection spreadsheets	AMDS provide data collection spreadsheets to support collecting the right data in a format that can then be imported to your asset management information system. You can find the sheets in the ADG page below under “AMDS data collection sheets” https://www.nzta.govt.nz/roads-and-rail/asset-data-guide/assets
Asset specifications	Official design and/or construction specifications for pavement layer can be found below: Pavement

Pavement layer asset data

The following table provides the key information about what attributes should be collected and managed for this asset.

The table below is from version 1.4 of the AMDS, and it may differ from what you see in your asset management software, depending on what version of the standard the database you are working on has.

Capture each discrete pavement layer separately. One pavement layer can have a mix of two materials.

There are attributes that are common to most assets. You can find the list and descriptions of these attributes in the General Asset Guidelines document.

Table 6: Key attributes for pavement layers

Attribute	Status	Type	Description and example.
Road	Mandatory	UUID/ List	The Road ID/Name.
Start	Mandatory	Number (m)	Distance from the road origin to the start of the layer, along the road centreline.
End	Mandatory	Number (m)	Distance from the road origin to the end of the layer, along the road centreline.
Left Hand Side Offset	Mandatory	Number (m)	What is the distance from the left-hand side of seal edge to left hand side of the layer (can be negative).? Examples: 5.1m, -2.2m
Width	Mandatory	Number (m)	The average width of the layer. Examples: 5.1m, 6.2m
Pavement Design Specification	Mandatory	List	What design specification was used for the pavement layer? Examples: • No Specification • NZTA B2 Construction of Unbound Granular Pavement Layers • NZTA B5 In-situ Stabilisation of Modified Pavement Layers.
Traffic Design Loading	Mandatory	Number (Million estimated standard axles)	What is the estimated/designed equivalent standard axles of the pavement layer over its life? Example: 10 million estimated/designed equivalent standard axles.
Unconfined Compressive Strength (UCS)	Conditional	Number (MPa)	The UCS test is used to characterise stabilised materials as either lightly bound or bound and then to support the design of bound pavements, using the UCS/modulus conversation (E=1000*UCS MPa). Example: 40Mpa Required if '***Is Stabilising Agent Used?***' is **TRUE**
California Bearing Ratio	Conditional	Number (%)	What is the California Bearing Ratio measure of the pavement layer's strength? Required if '***Is Stabilising Agent Used?***' is **FALSE**
Is Stabilising Agent Used?	Mandatory	True/False	Did you mix chemical additives with pavement layer to improve the properties? For example to bind aggregate. If true, you need to add and link a Pavement Stabilising Agent details component (see below).
Primary Material	Mandatory	List	What is the primary type of material for the layer?

			Examples: All Passing 20mm, Dense Graded Asphalt AC10 M/10 Spec. Notes: • Only use a raw material type (eg Bedding Sand) if not part of a grade envelope or mix type such as All Passing 20mm. • Check the AMDS for a full list of pavement materials and acceptable thickness range etc. Pavement Materials are found in AMDS Common. • Recycled materials are available, eg Recycled asphalt pavement (RAP) or Glenbrook Smelter Slag. • The AMDS is on website: Asset Management Data Standard
Primary Material Source	Mandatory	List	What is the main source (by volume) of primary material/aggregate used? Note: • Use 'Local offsite' as the source for most recycled materials. • Use 'Exposed existing' for reused pavement and surface layers, e.g. as part of rehabilitations. Example: Awapuni Quarry.
Secondary Material Used?	Conditional	True/False	Has a secondary material been added to this pavement layer?
Secondary Material Type	Conditional	List	What is the secondary type of material for the layer?
Secondary Material Percentage	Conditional	Number (%)	How much of this total layer material is made up of the secondary material?
Secondary Material Source	Conditional	List	What is the main source (by volume) of secondary material/aggregate used?
Thickness	Mandatory	Number (mm)	How thick/deep is this pavement layer? Note: This is checked against the material type to make sure the thickness is within a suitable range. Example: 200mm
Layer Lane Coverage	Mandatory	Number	Number of lanes covered by the layer, excluding slipways and shoulders.
Length	Mandatory	Number (m)	What is the total length of the pavement layer? It can be derived geospatially.
Area	Mandatory	Number (m2)	What is the area of the pavement layer? Auto calculated from geometry.
Extra Area?	Mandatory	True/False	Is there any extra area to be accounted for? For example: passing bay, wider areas, etc
Extra Area	Conditional	Number (m2)	The area of the extra area of the pavement layer where present.

Total Area	Mandatory	Number (m2)	The sum of the Area and the Extra Area.
Construction Date	Mandatory	Date	What is the date the asset was constructed?
Is Layer Removed?	Mandatory	True/False	Has this layer been removed?
Date Removed	Conditional	Date	Required if Is layer Removed is Yes.

Pavement stabilising agent(s) asset data

If stabilising agents were used on the pavement layer (that is, you answered True to Is Stabilising Agent Used?), then you must capture details of at least one agent. There can be multiple stabilising agent records.

The records should be linked to the pavement layer in the asset hierarchy.

Table 7: Key attributes for pavement stabilising agents

Attribute	Status	Type	Description and example.
Stabilising Agent Type	Conditional	List	What was the stabilising agent used? Required if you select Yes to 'Is Stabilising Agent Used?'. Examples: Bitumen, Cement, Durabind, Lime.
Stabilising Agent Percentage	Conditional	Number (%)	How much of the layer material is made up of the stabilising agent? Example: 5%

Asset data guide (SM050)

Subgrade information

May 2026

ADG Version 1.1

AMDS Version 1.4

This manual has been developed with the collaboration of the Road Efficiency Group Te Ringa Maimoa (REG).

Contents

This document is a section of the NZ Transport Agency Waka Kotahi *Asset data guide* (SM050).

What is a subgrade?

The native or stabilised ground material under the constructed pavement and surface layers.

Diagrams

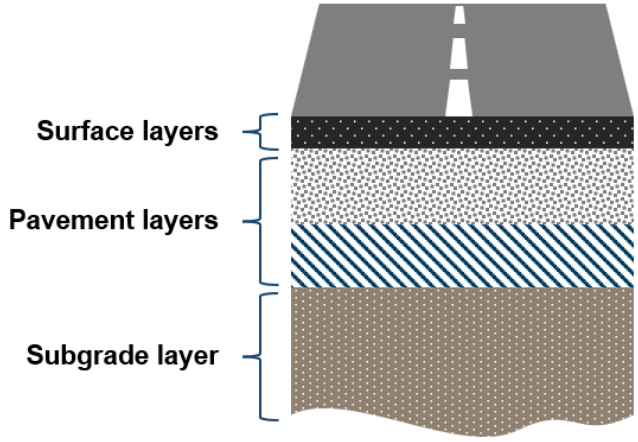


Figure 1: Layers of a pavement

Asset system and related assets

A subgrade is a component of the pavement system.

- Roadway - Surface layer
- Roadway - Pavement layer

Asset information

Asset recording

Refer to Roadway - Pavement system for common guidelines for the recording of surface, pavement and subgrade layers.

Recording subgrade layers

Subgrade isn't expected to change over time like pavement and surface layers but is easier to consider it as a distinct layer from pavement.

In AWM the subgrade is not recorded in the pavement management tool. It needs to be added separately.

You can have multiple subgrade records where stabilising agents are used and there are different CBR (California bearing ratio) strength ratings per layer.

Dealing with multiple subgrades

Capture each discrete subgrade separately. You can have multiple subgrades, for example:

- a 300mm subgrade improvement layer (with stabilising agent and CBR of 15%)
- a (no thickness) subgrade with a CBR of 5%.

Locations (spatial and linear)

Preferred/allowed spatial shape

When recording a subgrade, the preferred AMDS spatial shape is a polygon.

In AWM the polygon is a calculated shape based on centreline length and width.

Dimensions

Layer average width

Subgrade width is not a single fixed dimension; it is determined by the total width of the overlying pavement structure, including traffic lanes, shoulders, and any required drainage or construction clearances. As a general rule, the subgrade must be wide enough to fully support the pavement layers above it.

The ***Layer average width*** is the average of several measurements from the left hand (LH) to right hand (RH) edge of the layer.

Dealing with variances in width when the sealed area has a mixture of Width

Layer average width is the average surface width only, regardless of smaller shape changes. These are captured as part of the extra area and total sealed area details.

The ***Total Area*** is the correct attribute to store the sum of the detailed areas.

Other attributes

Recording California Bearing Ratio

Recording the ***California Bearing Ratio*** (CBR) is important because pavement designers rely on this information to assess moisture sensitivity, seasonal performance risk, and to select appropriate pavement thicknesses and treatments. CBR is expressed as a percentage.

Contact your local civil testing laboratory for guidance on sample size and sample collection requirements.

Additional resources

The following information is available to support your knowledge of subgrade, and what's needed for data collection and management.

Table 1: Additional resources related to subgrade

Resource	Description
Asset Management Data Standard (AMDS) inventory standards	You can find the Standard on the AMDS website: Data standard releases
Data collection spreadsheets	AMDS provide data collection spreadsheets to support collecting the right data in a format that can then be imported to your asset management information system. You can find the sheets in the ADG page below under “AMDS data collection sheets” https://www.nzta.govt.nz/roads-and-rail/asset-data-guide/assets
Asset specifications	Official design and/or construction specifications for subgrade can be found below:

Subgrade asset data

The following table provides the key information about what attributes should be collected and managed for this asset.

The table below is from version 1.4 of the AMDS, and it may differ from what you see in your asset management software, depending on what version of the standard the database you are working on has.

There are attributes that are common to most assets. You can find the list and descriptions of these attributes in the General Asset Guidelines document.

Table 2: Key attributes for subgrade

Attribute	Status	Type	Description and example
Road	Mandatory	UUID/ List	The Road ID/Name
From Distance	Mandatory	Number (m)	Displacement from the road origin to the start of the object, along the centreline of the road.
To Distance	Mandatory	Number (m)	Displacement from the road origin to the end of the layer, along the centreline of the road.
Left Hand Side Offset	Mandatory	Number (m)	What is the distance from the left-hand side of seal edge to left hand side of the layer (can be negative)? Examples: 5.1m, -2.2m Note for AWM users: attribute is named “Offset”
Subgrade Material	Mandatory	List	What is the subgrade primarily made up of? Examples: Clay-High plasticity, Sand, Silt–High plasticity, Pumice.
Stabilising Agent Used?	Mandatory	True/False	Did you mix chemical additives with the Subgrade to improve its properties? E.g. to bind aggregate, mitigate sweeling clay or to dry it.
Stabilising Agent	Conditional	List	What was the stabilising agent used? Required if you select Yes to ‘Is Stabilising Agent Used?’. Examples: Bitumen, Cement, Durabind, Lime.
Thickness	Conditional	Number (mm)	How thick is the stabilised Subgrade? Required if a stabilising agent was added to the subgrade, e.g. Subgrade improvement layer is stabilised at 15% CBR to 300mm.
California Bearing Ratio	Mandatory	Number (%)	What is the Californian Bearing Ratio measure of the Subgrade’s strength?

Layer Lane Coverage	Mandatory	Number	How many lanes are covered by the layer? Excluding slipways and shoulders.
Layer Average Width	Mandatory	Number (m)	The average width of the layer.
Length	Mandatory	Number (m)	What is the total length of the subgrade layer? It can be derived geospatially.
Area	Mandatory	Number (m2)	What is the area of the pavement layer? Calculated from geometry.
Extra Area?	Mandatory	True/False	Is there any extra area to be accounted for? i.e.: passing bay, wider areas, etc
Extra Area	Conditional	Number (m2)	The area of the extra area of the pavement layer where present.
Total Area	Mandatory	Number (m2)	The sum of the Area and the Extra Area.

Asset data guide (SM050)

Stopping place information

May 2026

ADG Version 1.1

AMDS Version 1.4

This manual has been developed with the collaboration of the Road Efficiency Group Te Ringa Maimoa (REG).

Contents

This document is a section of the NZ Transport Agency Waka Kotahi *Asset data guide* (SM050).

What is a stopping place?

A stopping place is any area that a vehicle might reasonably stop at for safety or recreation, such as maintenance pads, stopping bays, rest areas, waste disposal points.

Examples of stopping places are shown below.

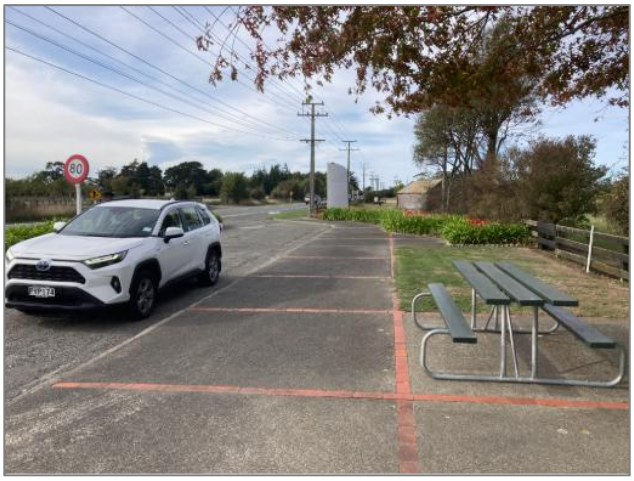


Figure 1: Rest area

Figure 2: Stopping bay

Asset system and related assets

A stopping place is a defined area and may have some of the following assets associated to it:

- Rubbish bin [not available yet]
- Seating [not available yet]
- Shelter [not available yet]
- **Traffic services - Marking**
- **Traffic services - Non-electronic sign**
- Wheel stops [not available yet]
- **Traffic services - Rail**
- Bollard [not available yet]
- Pole [not available yet]
- Luminaire [not available yet]

Asset information

Asset recording

Recording stopping places

All stopping places shall be recorded in the asset management information system.

Assets found within the stopping place should be captured separately.

Asset recording scenarios

Guidance for adding an asset as well as handling replacements, relocations, removals and decommissioning are provided in the General Asset Guidelines document.

Locations (spatial and linear)

Preferred/allowed spatial shape

When recording a stopping place, the preferred AMDS spatial shape is a polygon.

The allowed shapes are polygon and point.

Additional resources

The following information is available to support your knowledge of stopping places, and what's needed for data collection and management.

Table 1: Additional resources related to stopping places

Resource	Description
Asset Management Data Standard (AMDS) inventory standards	You can find the Standard on the AMDS website: Data standard releases
Data collection spreadsheets	AMDS provide data collection spreadsheets to support collecting the right data in a format that can then be imported to your asset management information system. You can find the sheets in the ADG page below under “AMDS data collection sheets” https://www.nzta.govt.nz/roads-and-rail/asset-data-guide/assets

Stopping place asset data

The following table provides the key information about what attributes should be collected and managed for this asset.

The table below is from version 1.4 of the AMDS, and it may differ from what you see in your asset management software, depending on what version of the standard the database you are working on has.

There are attributes that are common to most assets. You can find the list and descriptions of these attributes in the General Asset Guidelines document.

Table 2: Key attributes for stopping places

Attribute	Status	Type	Description and example

Stopping Place Type	Mandatory	List	What is the main type of stopping place? Examples: Rest Area, Disposal Point, Stopping Bay, Public Parking Area
Has a Stock Effluent Disposal?	Conditional	True/False	Does the stopping place have a stock effluent disposal facility?
Waste Disposal Point?	Conditional	True/False	Does the stopping place have a facility for disposing of waste from camper vans and caravans?
Has Toilets?	Conditional	True/False	Does the stopping place have toilet facilities?
Has Truck Parking?	Conditional	True/False	Does the stopping place allow for dedicated truck parking?
Has Truck & Trailer Parking?	Conditional	True/False	Does the stopping place allow for dedicated truck and trailer parking?
Has Campervan Parking?	Conditional	True/False	Does the stopping place allow for caravan parking?
Has Lookout?	Conditional	True/False	Does the stopping place have a lookout facility (eg fencing, platform etc)?
Is Emergency Stopping Bay?	Mandatory	True/False	Does the stopping place have a dedicated emergency stooping area (eg for vehicle breakdowns etc)?
Is Heritage?	Mandatory	True/False	Is the asset a heritage asset? For example, built, archaeological or cultural heritage – pre-1900 or as scheduled by council.

Asset data guide (SM050)

Barrier system overview

May 2026

ADG Version 1.1

AMDS Version 1.4

This manual has been developed with the collaboration of the Road Efficiency Group Te Ringa Maimoa (REG).

Contents

This document is a section of the NZ Transport Agency Waka Kotahi *Asset data guide* (SM050).

What is a barrier system?

A barrier system is a physical structure, made up of a combination of assets, designed to safely contain and redirect vehicles. You'll see them being used to:

- minimise the risk of vehicles crossing the centre lines or leaving the carriageway
- shield vehicles from hazards such as trees, streetlights, gantries, sheer drops, etc
- protect vulnerable road users

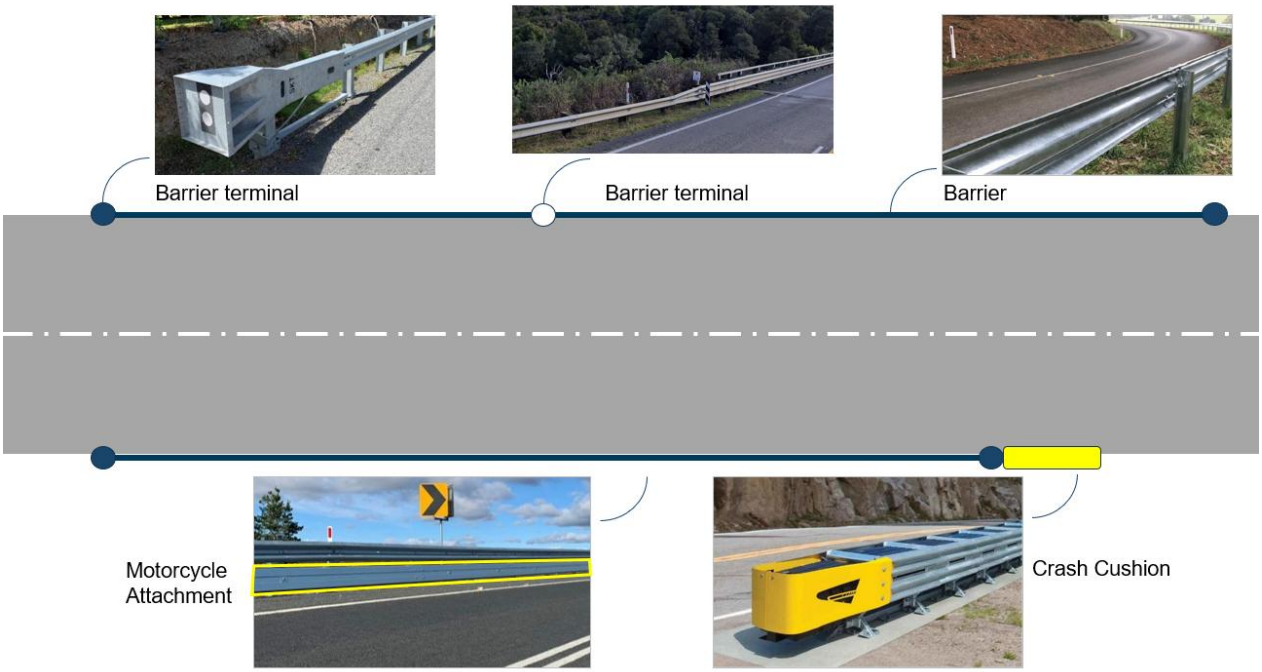


Figure 1: Examples of barrier assets

The assets listed in Table 1 can be components of a barrier system. Click the links to read more information on these assets.

Table 1: Components of a barrier system

Asset name	Asset description
Barrier	A barrier is the primary asset within a road safety barrier system designed to take impact from vehicles along a horizontal line and safely contain and redirect them.
Barrier terminal	Barrier terminals are mandatory components of a barrier system. They are designed to absorb impact and safely redirect vehicles and prevent them from vaulting, spearing, or rolling over after impact. Barrier terminals are components of a barrier. They are assets with their own location but should not exist without linking to a barrier. A barrier system **must** have a terminal asset at each end, except for bridge barriers, concrete barriers and gates.
Crash cushion	Crash cushions are optional attachments in a barrier system. They are barriers designed to take a direct impact. Typically used on barrier terminal, they can also be used on gantry poles, around poles, trees etc.

	They are assets with their own location and can exist without linking to a barrier.
Motorcycle attachment	Motorcycle attachments are optional attachments in a barrier system. They are safety rails designed to redirect a rider along the barrier and away from the guardrail posts if they come off their motorbike. Motorcycle attachments are components of a barrier. They are assets with their own location but should not exist without linking to a barrier.

How to create barrier system data

When recording the assets that belong to a barrier system, the recommended approach is:

1. Create **barrier terminal** asset records (one for each end of each barrier asset when required).
2. Create **motorcycle attachment** asset record(s) if required.
3. Create **crash cushion** asset record(s) if required.
4. Create **barrier** asset records, and:
    a. when required, in the **barrier terminal** attributes, lookup and associate the barrier terminal to the barrier record.
    b. when required, set ***has motorcycle attachment*?** to **"yes"** and in Motorcycle Attachment, lookup and associate the Motorcycle Attachment to the Barrier record.
5. If a crash cushion is located at the end of the barrier system, use the Asset Hierarchy to link the **crash cushion** asset record(s) to the **barrier** record.

System diagrams and scenarios

The following diagrams show some of the different combinations and arrangements of assets that can make up a barrier system.

Single barrier with barrier terminals

The most common arrangement where you have a barrier with a barrier terminal at each end.

Figure 2: Single barrier with a terminal end

Creating the data for this scenario

1. This scenario requires one **barrier** record and one **barrier terminal** record for each end of the barrier.
2. Create the terminal records first and then they can be used in the ***terminal one id*** and ***terminal two id*** attributes when you create the barrier record.
3. The terminal shall be represented by a point spatially located at the start and end of the barrier linestring.

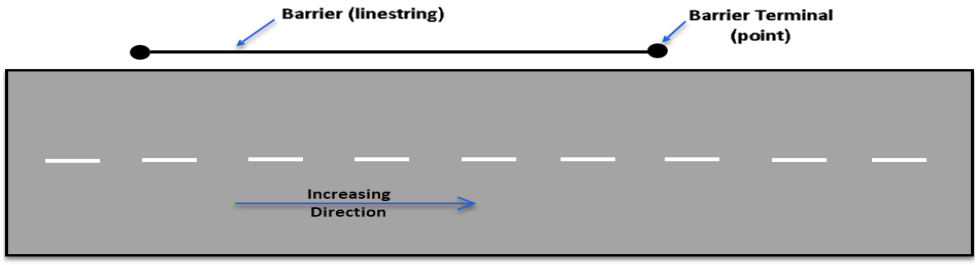


Figure 3: Map view of the data created for this scenario

Semi-rigid to rigid Thrie-beam transition

Barrier systems can contain more than one barrier, whether different barrier types or the same type but with a different age or other attributes. In this scenario we have three types of barriers within a single barrier system.

Figure 4: Example of different barrier assets in the same system with 'dummy' terminals

Creating the data for this scenario

1. This scenario requires three barrier and four **barrier terminal** records to make up the barrier system.
2. Every **barrier** record in this scenario requires a barrier terminal associated with each end of the barrier record.
3. Where the change occurs from one type of barrier to another, you create a 'dummy' terminal. The dummy barrier terminal record requires the following attributes set:
    a. ***true terminal*** set to "**no**".

b. ***barrier terminal type*** to "**mid rail join**".
c. The dummy **barrier terminal** records will act as the end terminal for one **barrier** record and then as the start terminal for the next **barrier** record.

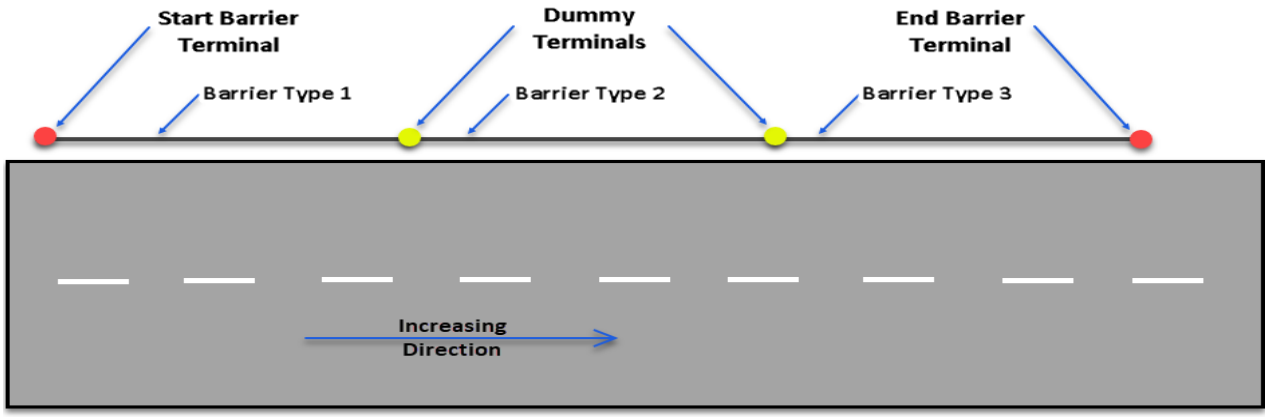


Figure 5: Map view of the data created for this scenario

Barriers with a motorcycle attachment

A barrier that has a motorcycle attachment fixed to it to provide added protection to motorcyclists.

Figure 6: A barrier with a motorcycle attachment

Creating the data for this scenario

1. This scenario requires one **barrier**, two **barrier terminal** and one **motorcycle attachment** records.
2. Create the **barrier terminal** and **motorcycle attachment** records first and then they can be used in the associated attributes when you create the barrier record.
3. The **motorcycle attachment** is in the same spatial location as the **barrier** record but may only extend for part of the length. If this is being created using linear referencing, then the offset shall be the same as the **barrier** record.
4. When viewing on the map it is best to place the **motorcycle attachment** as the upper map layer so that it can be viewed on top of the **barrier** record and use a contrasting colour (like yellow on red for the barrier).

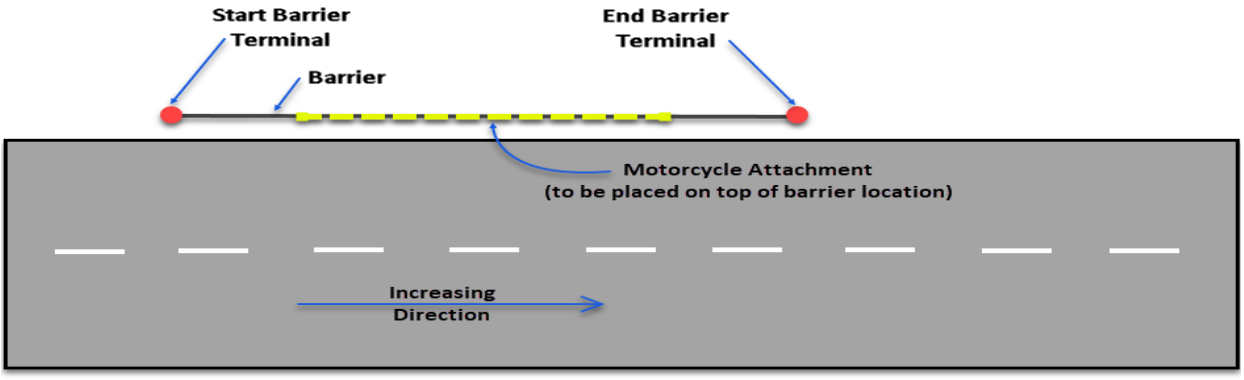


Figure 7: Map view of the data created for this scenario

Crash cushion and barrier between two different roads (carriageways)

Crash cushions are often located where a road splits (e.g. motorway offramps). In this scenario the **crash cushion** is located at the point where the offramp separates from the motorway and connects to two guardrail barriers.

Figure 8: A crash cushion and barriers between two different roads (carriageways)

Creating the data for this scenario

1. This scenario requires two **barrier** records, one **crash cushion** and four **barrier terminal** records (we will assume that the two guardrails end with a standard end terminal).
2. Create the four **barrier terminal** records first so that they can be used when creating the **barrier** records.
3. The two start barrier terminals (at the end of the crash cushion) need to be ‘dummy’ terminals. Set the following attributes for the dummy barrier terminal records:
    a. ***true terminal*** set to "**no**".
    b. ***barrier terminal type*** to "**none**".
4. Create the two **barrier** records, one on the motorway and one on the offramp. Insert the barrier terminals into the start the barrier terminal attributes.

5. Create the **crash cushion** record on the motorway as this is the higher road hierarchy.
6. While in each of the barrier asset records, use the asset hierarchy feature in AWM to select 'link' and then follow the prompts to link the crash cushion asset, using the ***link type*** = **"component"**. This will show that the crash cushion is associated with barriers.

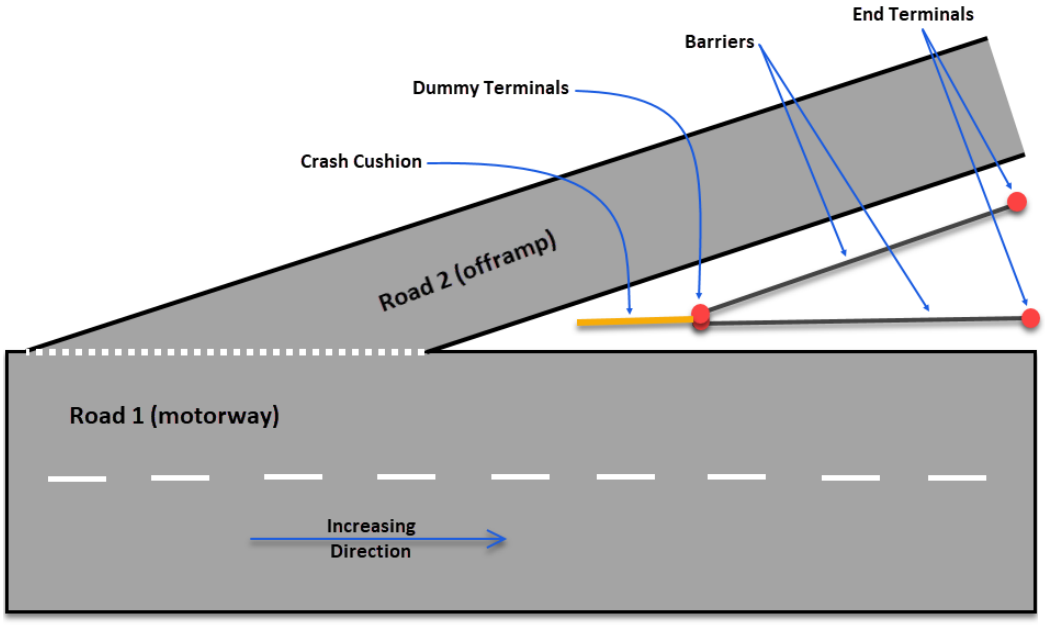


Figure 9: Map view of the data created for this scenario

Asset data guide (SM050)

Barrier asset information

May 2026

ADG Version 1.1

AMDS Version 1.4

This manual has been developed with the collaboration of the Road Efficiency Group Te Ringa Maimoa (REG).

Contents

This document is a section of the NZ Transport Agency Waka Kotahi *Asset data guide* (SM050).

What is a barrier?

A barrier is the primary asset within a road safety barrier system designed to take impact from vehicles along a horizontal line and safely contain and redirect them.

Figure 1: Two views of a barrier

Asset systems and related assets

A barrier is the primary component in a **Barrier system**.

- **Traffic services - Barrier terminal**
- **Traffic services - Crash cushion**
- **Traffic services - Motorcycle attachment**

Differences between a barrier and a rail

A barrier is primarily designed to take an impact from vehicles. Rails (including both sight rails and handrails) are used primarily to support pedestrians and are not designed to take an impact from a vehicle. They are not barriers and should be managed in the Rail table.

When is a bridge rail a type of barrier?

A bridge rail is a type of barrier when it is designed to stand up to the impact from a vehicle. In this case it should be recorded in the barriers table.

If it is not designed for vehicle impact, then it is a type of rail and should be recorded in the rail table.

Differences between a barrier and a retaining wall

Some concrete barriers retain earth behind them as seen in Figure 2. These barriers are therefore acting as a retaining wall and should be recorded and managed as a retaining wall in your asset information management system.

Figure 2: Concrete retaining wall acting as a barrier

Asset information

Asset recording

Recording barriers

All barriers shall be recorded in the asset management information system.

Asset recording scenarios

Guidance for adding an asset as well as handling full and partial replacements, relocations, removals, decommissioning, reductions and expansions are provided in the General Asset Guidelines document.

Nominal minimum sizes for replacements and other scenarios

Greater of either:

- 20m length
- 50% of the original asset length.

Asset specific guidance

1. When a barrier terminal is mandatory for the barrier type and you are connecting barriers of the **same** type together, create a 'dummy' barrier terminal at the end of the first barrier. It will also act as the barrier terminal at the start of the next barrier record. Configure the dummy barrier terminal as follows:
    a. ***True Terminal*** = "**No**"
    b. ***Barrier Terminal Type*** = **"None**"
2. When a barrier terminal is mandatory for the barrier type and you are connecting barriers of **different** types together (eg. concrete to wire rope), create a 'dummy' barrier terminal at the end of the first barrier. It will also act as the terminal at the start of the next barrier record. Configure the dummy barrier terminal as follows:
    a. ***True Terminal*** = "**No**"

    b. ***Barrier Terminal Type*** = "**Mid Rail Join**"
3. If one or both barrier terminals have been changed during a scenario where the barrier is changed, then replace the existing barrier terminal and update the barrier record to connect to the new barrier terminal records.
4. Where a barrier has been split or extended during an asset record creation process, then at the locations where the assets connect, create a barrier terminal and configure it as a dummy terminal where for **Barrier Terminal** record set:
    a. ***True Terminal*** = "**No**"
    b. ***Barrier Terminal Type*** = "**None**"

Locations (spatial and linear)

Preferred/allowed spatial shape

When adding a barrier, the preferred spatial shape is a linestring.

The barrier linestring extends to the end of the terminal (when applicable) to represent the full length of protection provided by the barrier.

Railing style

Table 1: Rail style values

Type	Description	Category	Photo example
Wire rope	A flexible barrier created from wire ropes and posts. This barrier dissipates crash impact energy through deflection of the barrier, resulting in lower impact forces on the vehicle and its occupants.	Flexible	
W-beam	A metal barrier with W shaped cross-section. This barrier deflects impact energy during re-direction, transmitting it to vehicles and occupants at a level lower than rigid systems but higher than flexible systems.	Semi-rigid	
Thrie-beam	A type of W-beam barrier with a deeper, three-humped profile, designed to provide higher containment levels and greater performance, especially for heavier vehicles.	Semi-rigid	

Concrete barrier	A barrier made of concrete. Concrete barriers are designed to have no deflection under impact, which means they transmit higher impact energy to the impacting vehicle and its occupants.	Rigid	
Bridge barrier	Road safety barriers specifically designed for use on structures such as bridges. These can range from proprietary steel or aluminium systems to modifications of standard W-beam, Thrie-beam, or concrete barriers. If there is a rail attached to the top of a concrete barrier this can be treated as a single barrier asset. See NZTA M23 Appendix B: rigid and bridge barrier systems.	Rigid	  
Aesthetic	Road safety barriers that incorporate timber facings over steel rails and posts to offer a more visually appealing design compared to conventional steel systems. They typically have reduced safety performance or lack crashworthy end terminals.	Aesthetic	
Gate	Note: moved to Gate table in version 1.5 of AMDS	Gate	

Other attributes

Post attached to multiple barriers

This attribute shall be set to “Yes” when there is a barrier rail attached to either side of the post, as seen in Figure 3.

Figure 3: Barrier with rails on both side of the posts

Additional resources

The following information is available to support your knowledge of barriers, and what's needed for data collection and management.

Table 2: Additional resources related to barriers

Resource	Description
Asset Management Data Standard (AMDS) inventory standards	You can find the Standard on the AMDS website: Data standard releases
Data collection spreadsheets	AMDS provide data collection spreadsheets to support collecting the right data in a format that can then be imported to your asset management information system. You can find the sheets in the ADG page below under “AMDS data collection sheets” https://www.nzta.govt.nz/roads-and-rail/asset-data-guide/assets
Asset specifications	Official design and/or construction specifications for barriers and barrier system assets can be found below: https://www.nzta.govt.nz/resources/road-safety-barrier-systems

Barrier asset data

The following table provides the key information about what attributes should be collected and managed for this asset.

The table below is from version 1.4 of the AMDS, and it may differ from what you see in your asset management software, depending on what version of the standard the database you are working on has.

There are attributes that are common to most assets. You can find the list and descriptions of these attributes in the General Asset Guidelines document.

Table 3: Key attributes for barriers

Attribute	Status	Type	Description and examples
Lane Location	Mandatory	List	What is the location of the barrier relative to the lanes of the road? Examples: median, roadside.
Placement	Mandatory	List	What is the asset in, on, or attached to? Note: Your selection may mean that, you will need to add an asset hierarchy and link the luminaire to something. Examples: ground, bridge, NZTA ground beam, retaining wall.
Length	Mandatory	Number (m) *Calculated*.	What is the distance covered from start to finish of a barrier? This is calculated from points on the map. Example: 1000m
Height	Mandatory	Number (m)	What is the height from the top of the barrier to the ground? Example: 1.0m
Barrier Type	Mandatory	List	What is the type of barrier used? Examples: Mashflex Wire Rope, Sentry Thrie-Beam, New Jersey Barrier.
Railing Style	Mandatory	List	The style of construction of the barrier See above section on barrier types.
Railing Make	Mandatory	List	The model or manufacturer of the railing barrier
Primary Barrier Rail Material	Mandatory	List	What is primary material that the rail is made from? Examples: steel, concrete, wood, aluminium.
Primary Barrier Post Material	Conditional	List	What is primary material that the posts are made from? Examples: steel, concrete, wood, aluminium.
Post Spacing	Conditional	Number (m)	What is the average distance between posts along the barrier? Required if the type of barrier has posts.

Post Attached To Multiple Barriers?	Conditional	Yes/No	Do the posts have barrier rails attached to both sides? Required if the type of barrier has posts that have rails either side.
Ground Fix Method	Mandatory	List	What was the method used to mount the barrier to the ground, or other structure? Required if the barrier is mounted on ground or a retaining wall. Examples: driven post, socket encased in concrete.
Terminal One ID	Mandatory	Lookup asset	What is the asset ID of the start barrier terminal? Note: Terminals can be associated with more than one barrier asset (ie in-between terminals).
Terminal Two ID	Mandatory	Lookup asset	What is the asset ID of the end barrier terminal? Note: Terminals can be associated with multiple barriers (ie in-between terminals).
Has Motorcycle Attachment?	Mandatory	Yes/No	Does the barrier have any specific motorcycle hardware attached? For example, to prevent them sliding under barrier.
Motorcycle Attachment ID	Conditional	Lookup asset	What is the asset ID of the motorcycle attachment? Required if you select ‘YES’ to ‘Has Motorcycle Attachment’.

Asset data guide (SM050)

Barrier terminal asset information

May 2026

ADG Version 1.1

AMDS Version 1.4

This manual has been developed with the collaboration of the Road Efficiency Group Te Ringa Maimoa (REG).

Contents

This document is a section of the NZ Transport Agency Waka Kotahi *Asset data guide* (SM050).

What is a barrier terminal?

A barrier terminal is a specialised asset that prevents head on impacts with the barrier. It is designed to absorb impact and safely redirect vehicles, preventing them from vaulting, spearing, or rolling over after impact. It may also provide an anchorage for the barrier system.

They are installed at the end of a barrier where there is no connection to a parapet or transition to another barrier.

They are assets with their own location but shouldn't exist without linking to a barrier.

Figure 1: TREND median end terminal

Asset systems and related assets

Barrier terminals are components of a **Barrier system**.

As part of a barrier system, most barrier types require a barrier terminal asset at each end. Bridge barriers, concrete barriers and gates do not require barrier terminals at both ends.

- **Traffic services - Barrier**
- **Traffic services - Crash cushion**
- **Traffic services - Motorcycle attachment**

Asset information

Asset recording

Recording barrier terminals

All barrier terminals shall be recorded in the asset management information system.

Asset recording scenarios

Guidance for adding an asset as well as handling replacements, relocations, removals and decommissioning are provided in the General Asset Guidelines document.

Locations (spatial and linear)

Preferred/allowed spatial shape

When recording a barrier terminal, the preferred and allowed spatial shape is a point. This point should be located at the start of the start terminal and the end of the end terminal from the driving direction.

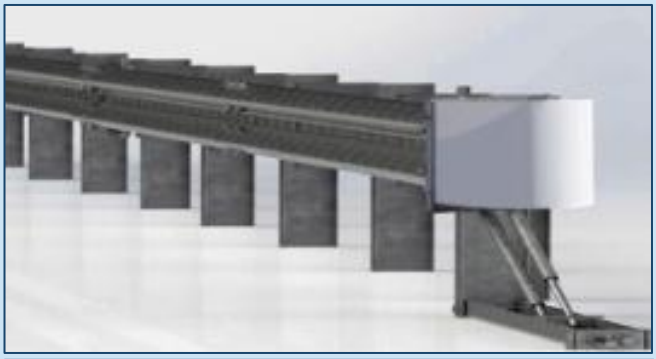
The barrier terminal shall have the same linear location as the start and end of the barrier record respectively.

Barrier terminal types (examples)

This table provides a subset of the available options in the ***barrier terminal types*** value list.

Table 1: Barrier terminal types

Type	Description	Photo example
TREND median end terminal	For use with double-sided W-beam median guardrail.	
Trailing terminal	Only to be used to anchor the end of a semi-rigid W-beam barrier system.	

MSKT end terminal	For use with W-beam guardrail	 
MAX-Tension end terminal system	For use with W-beam guardrail	 

Other attributes

True terminal

When a barrier terminal is required for the given ***Barrier Rail Style*** and you are joining two barriers together, create a ‘dummy’ barrier terminal at the end of the first barrier. It will also act as the terminal at the start of the next barrier record. Configure it as follows:

- For the **Barrier Terminal** set ***True Terminal*** to “**No**”
- For the **Barrier Terminal** set ***Barrier Terminal Type*** to “**Mid Rail Join**”

Reflectorised disks

If there are reflectors on the end of a barrier terminal, as seen in Figure 2, set:

- ***Reflectorised Disks?*** = "**Yes**".

The shape of reflectors may vary.

Figure 2: Example of reflectorised disks

These reflectors do not need to be recorded as separate sign assets.

Additional resources

The following information is available to support your knowledge of barrier terminals, and what's needed for data collection and management.

Table 2: Additional resources related to barrier terminals

Resource	Description
Asset Management Data Standard (AMDS) inventory standards	You can find the Standard on the AMDS website: Data standard releases
Data collection spreadsheets	AMDS provide data collection spreadsheets to support collecting the right data in a format that can then be imported to your asset management information system. You can find the sheets in the ADG page below under "AMDS data collection sheets" https://www.nzta.govt.nz/roads-and-rail/asset-data-guide/assets
Asset specifications	Official design and/or construction specifications for barriers and barrier system assets can be found below: https://www.nzta.govt.nz/resources/road-safety-barrier-systems

Barrier terminal asset data

The following table provides the key information about what attributes should be collected and managed for this asset.

The table below is of version 1.4 of the AMDS and it may differ from what you see in your asset management software, depending on what version of the standard the database you are working on has.

There are attributes that are common to most assets. You can find the list and descriptions of these attributes in the General Asset Guidelines document.

Table 3: Key attributes for barrier terminals

Attribute	Status	Type	Description and examples
True Terminal?	Mandatory	Yes/No	Does the Barrier structure truly end at this Terminal (TRUE) or does this represent a point where two barriers connect end to end as part of a single continuous barrier length (FALSE)?
Barrier Terminal Type	Mandatory	List	What is the type of barrier terminal? Examples: MashFlex, curved RSB-2 guardrail, none (choose when there is no physical end terminal hardware attached).
Other Connected Asset ID	Optional	UUID	If the barrier terminal connects to a non-barrier asset such as a Crash Cushion, use the UUID of that asset. Note that this is not required for connecting barriers end to end as those will share the same Barrier Terminal ID.
Reflectorised Disks?	Mandatory	Yes/No	Does the terminal have reflectors attached?
Faces Oncoming Traffic?	Conditional	Yes/No	Does the terminal face oncoming traffic? Set this attribute to "**Yes**" when the terminal faces oncoming traffic is in the adjacent lane.

Asset data guide (SM050)

Crash cushion asset information

May 2026

ADG Version 1.1

AMDS Version 1.4

This manual has been developed with the collaboration of the Road Efficiency Group Te Ringa Maimoa (REG).

Contents

This document is a section of the NZ Transport Agency Waka Kotahi *Asset data guide* (SM050).

What is a crash cushion?

A crash cushion (also known as impact attenuator) is a safety device designed to take a direct impact. Its function is to protect motorists and reduce the damage to structures and vehicles resulting from a motor vehicle collision. It's typically used on barrier terminals, gantry poles, around poles or trees and is normally facing on-coming traffic.

They are assets with their own location and can exist without linking to a barrier.

Figure 1: Examples of crash cushions

Diagrams

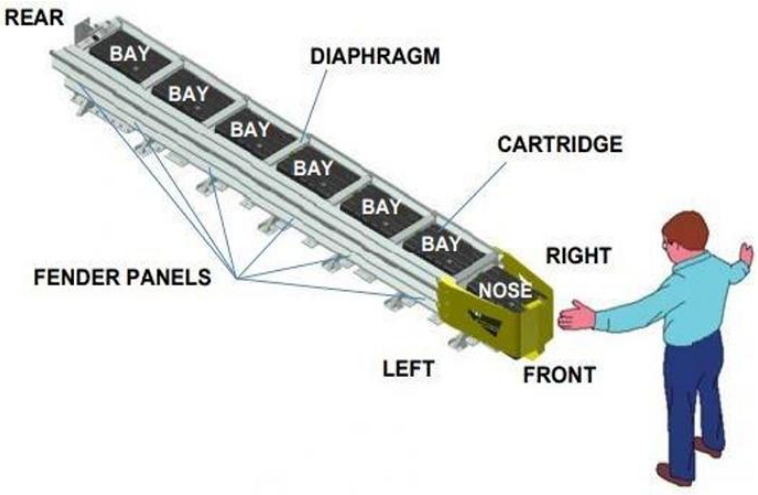


Figure 2: Diagram of a typical crash cushion

Asset systems and related assets

Crash cushions are components of a **Barrier system**

- **Traffic services - Barrier**
- **Traffic services - Barrier terminal**
- **Traffic services - Motorcycle attachment**

Asset information

Asset recording

Recording crash cushions

All crash cushions shall be recorded in the asset management information system.

Asset recording scenarios

Guidance for adding an asset as well as handling replacements, relocations, removals and decommissioning are provided in the General Asset Guidelines document.

Locations (spatial and linear)

Preferred/allowed spatial shape

When recording a crash cushion asset, the preferred spatial shape is a linestring.

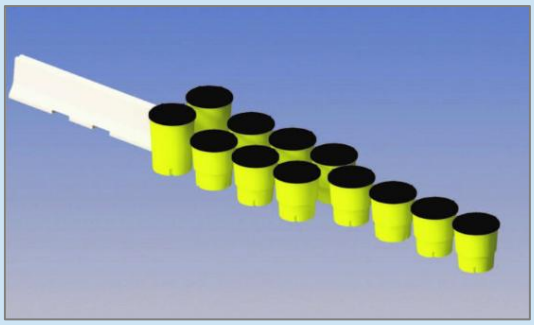
Note that the spatial shape is changing to point in version 1.5 of AMDS.

Crash cushion types

Table 1: Crash cushion types

Type	Description	Photo example
Hercules	For use with permanent F-shape rigid concrete barriers.	

Quadguard M10 Quadguard M Wide	For use with permanent F-shape concrete barriers, Thrie-beam guardrail and EzyGuard HC semi-rigid barrier with the appropriate transition (may only be connected to Thrie-beam guardrail or EzyGuard HC where reverse impacts are highly improbable, and a risk assessment has been completed and steps undertaken to mitigate any risks identified).	
SCI-100 Smart Cushion	For use with permanent F-shape concrete barriers and Thrie-beam guardrail	 
Universal Tau-M	For use with permanent F-shape concrete barriers and Thrie-beam guardrail	

Raptor 300 Raptor 600	The RAPTOR ® is a compact crash cushion made from durable HDPE which can be installed at sites that are lacking space to protect objects in the traditional manner. The system consists of 2 pieces which connect and provide protection from a rigid object such as a pole or tree that is positioned within the central void. The RAPTOR® 600 has been tested to MASH Test Level 1. The 300 and 600 refer to the size of the void in the middle of the crash cushion so that it can fit around different sized hazards.	
Steel drum	A series of cylindrical steel drums arranged in a line or cluster. An older, legacy crash cushion system.	
Great System Crash Unit	The G-R-E-A-T (Guardrail Energy Absorbing Terminal) crash cushion system features foam cartridges within bays that absorb energy during impacts.	

Additional resources

The following information is available to support your knowledge of crash cushions, and what's needed for data collection and management.

Table 2: Additional resources related to crash cushions

Resource	Description
Asset Management Data Standard (AMDS) inventory standards	You can find the Standard on the AMDS website: Data standard releases
Data collection spreadsheets	AMDS provide data collection spreadsheets to support collecting the right data in a format that can then be imported to your asset management information system.

	You can find the sheets in the ADG page below under “AMDS data collection sheets” https://www.nzta.govt.nz/roads-and-rail/asset-data-guide/assets
Asset specifications	Official design and/or construction specifications for these assets can be found in the locations below. https://www.nzta.govt.nz/resources/road-safety-barrier-systems

Crash cushion asset data

The following table provides the key information (metadata) about what attributes should be collected and managed for this asset.

The table below is of version 1.4 of the AMDS and it may differ from what you see in your asset management software, depending on what version of the standard the database you are working on has.

There are attributes that are common to most assets. You can find the list and descriptions of these attributes in the General Asset Guidelines document.

Table 3: Key attributes for crash cushions

Attribute	Status	Type	Description and example
Lane Location	Mandatory	List	What is the location of the crash cushion on the road? Examples: median, roadside.
Placement	Mandatory	List	What is the asset in, on, or attached to? Note: Your selection may mean that, you will need to add an asset hierarchy and link the crash cushion to something. Examples: attached to barrier, attached to tree.
Crash Cushion Type	Mandatory	List	What is the type of crash cushion used?
Length	Mandatory	Number (m)	What is the length of the crash cushion structure? This value is pre-populated based on the selection made for ***Crash Cushion Type***. Populate manually for non-standard crash cushions.
Width	Mandatory	Number (m)	What is the width of the crash cushion from one side to the other? This value is pre-populated based on the selection made for ***Crash Cushion Type***. Populate manually for non-standard crash cushions.

Asset data guide (SM050)

Motorcycle attachment information

May 2026

ADG Version 1.1

AMDS Version 1.4

This manual has been developed with the collaboration of the Road Efficiency Group Te Ringa Maimoa (REG).

Contents

This document is a section of the NZ Transport Agency Waka Kotahi *Asset data guide* (SM050).

What is a motorcycle attachment?

Motorcycle attachments are a physical type of barrier, designed to redirect a motorcycle rider along the main barrier and away from the guardrail posts if they come off their motorcycle.

Motorcycle attachments are part of providing Continuous or Discontinuous Motorcyclist Protection System (CMPS) as defined in NZTA specification for Road Safety Barrier Systems (M23).

They are assets with their own location but shouldn't exist without linking to a barrier.

Figure 1: Motorcycle attachment beneath a guardrail

Asset systems and related assets

Motorcycle attachments are components of a **Barrier system**.

- **Traffic services - Barrier**
- **Traffic services - Barrier terminal**
- **Traffic services - Crash cushion**

Asset information

Asset recording

Recording motorcycle attachments

All motorcycle attachments shall be recorded in the asset management information system.

Asset recording scenarios

Guidance for adding an asset as well as handling replacements, relocations, removals and decommissioning are provided in the General Asset Guidelines document.

Locations (spatial and linear)

Preferred/allowed spatial shape

When recording a motorcycle attachment, the AMDS preferred spatial shape is a linestring.

Motorcycle attachment types

Table 1: Motorcycle attachment types

Type	Style	Photo example
Biker-shield Motorcycle Protection Rail	Continuous	
Ingal Motorcyclist Protection Rail	Continuous	
Rider Pro MPR	Discontinuous (updated to Continuous in version 1.5 of AMDS)	
Stack cushion	Discontinuous	

Additional resources

The following information is available to support your knowledge of motorcycle attachments, and what's needed for data collection and management.

Table 2: Additional resources related to motorcycle attachments

Resource	Description
Asset Management Data Standard (AMDS) inventory standards	You can find the Standard on the AMDS website: Data standard releases
Data collection spreadsheets	AMDS provide data collection spreadsheets to support collecting the right data in a format that can then be imported to your asset management information system. You can find the sheets in the ADG page below under “AMDS data collection sheets” https://www.nzta.govt.nz/roads-and-rail/asset-data-guide/assets
Asset specifications	Official design and/or construction specifications for motorcycle attachments can be found below: https://www.nzta.govt.nz/resources/road-safety-barrier-systems

Motorcycle attachment asset data

The following table provides the key information about what attributes should be collected and managed for this asset.

The table below is of version 1.4 of the AMDS, and it may differ from what you see in your asset management software, depending on what version of the Standard the database you are working on has.

There are attributes that are common to most assets. You can find the list and descriptions of these attributes in the General Asset Guidelines document.

Table 3: Key attributes for motorcycle attachments

Attribute	Status	Type	Description and example
Motorcycle Attachment Type	Mandatory	List	What is the type of attachment used? The list is of system accepted for use by Waka Kotahi. Examples: Biker-Shield Motorcyclist Protection Rail, Ingal Motorcyclist Protection Rail, Stack Cushions.
Length	Mandatory	Number (m) *Calculated*	What is the distance covered from start to finish of the attachment? This is calculated from points on the map. **Example**: 1000m

Asset data guide (SM050)

Delineator information

May 2026

ADG Version 1.1

AMDS Version 1.4

This manual has been developed with the collaboration of the Road Efficiency Group Te Ringa Maimoa (REG).

Contents

This document is a section of the NZ Transport Agency Waka Kotahi *Asset data guide* (SM050).

What is a delineator?

A device used to highlight a hazard on the road such as the edge of road, separation between traffic lanes/modes. Devices can consist of marker pegs, posts/hit sticks.

Figure 1: Examples of delineators

While vertical posts as delineators are common, a delineator asset can also have a horizontal component as shown in the following figure.

Figure 2: Examples of delineators with a horizontal component (image source https://www.vanguardgroup.co.nz/product/flexible-traffic-separator/)

Asset system and related assets

There are no related assets that need to be referenced for delineators.

Asset information

Asset recording

Recording delineators

Delineators shall be recorded as a group of assets in the asset management information system with the number of individual assets (e.g. posts) recorded as an attribute of the asset record.

During projects and other works

Delineators are often removed and/or modified during short- and long-term works. Standard practice is that the temporary arrangements during the projects are not reflected in the asset information management system and any asset additions, modifications or removals are all processed at the completion of the works.

Asset recording scenarios

Guidance for adding an asset as well as handling full and partial replacements, relocations, removals, decommissioning, reductions and expansions are provided in the General Asset Guidelines document.

Nominal minimum sizes for replacements and other scenarios

- 50% of the original asset length

Locations (spatial and linear)

Preferred/allowed spatial shape

When recording a delineator, the preferred AMDS spatial shape is a linestring.

The delineation asset (shown by the linestring) includes the full length of a continuous string of posts.

A separate delineation asset (shown by the linestring) is required where there is a change in delineator type or where there is a significant visual gap in line of posts.

Delineator types (post types)

Table 1: Post types

Post type	Description	Photo example
Edge marker	Flat panel indicating road alignment and boundaries, particularly in low-visibility conditions	

Circular – hollow	Hollow circular cross-sectional area	
Circular – solid	Solid circular cross-sectional area	
T-shaped	T-shaped, typically hollow cross-sectional area	

Panel shaped	Flat panel, either hollow or solid cross-sectional area	
Cross shaped	Cross shaped or four-pointed cross-sectional area	

Other attributes

Delineator position

Describes the position within the road corridor (relative to vehicle lanes) where the delineator is installed.

The following three figures provide diagrams for the three available value list options.

Figure 3: Delineator position – edge (separating the road from off road, including for when a cycleway is on the side of the road)

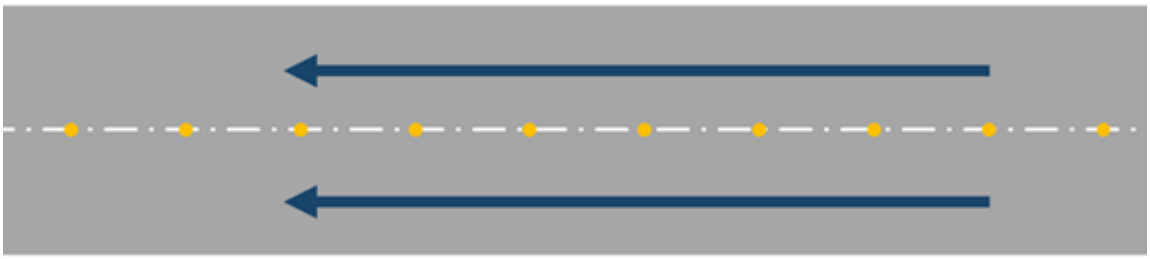


Figure 4: Delineator position – offset (separating same direction lanes of traffic from each other)

Note that offset in this context is different from the distance from the centreline.

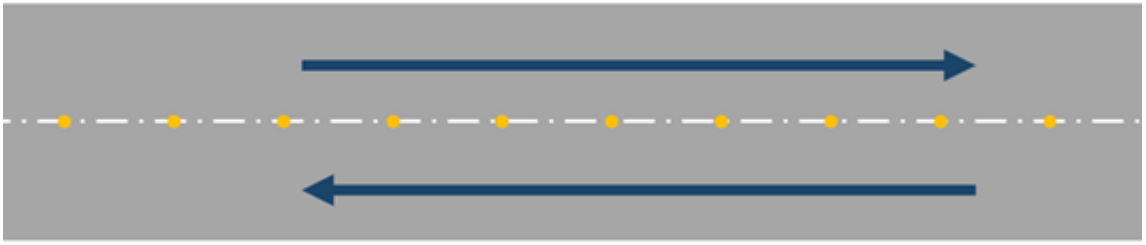


Figure 5: Delineator position – centre (separating lanes from each other)

Scenarios

Delineators attached to barriers

To provide further delineation, delineator posts can be attached to barriers as seen in the following figure.

These shall be managed as a separator linear delineator asset record following the same alignment as the barrier record.

Figure 6: Delineator attached to barrier

Additional resources

The following information is available to support your knowledge of delineators, and what's needed for data collection and management.

Table 2: Additional resources related to delineators

Resource	Description
Asset Management Data Standard (AMDS) inventory standards	You can find the Standard on the AMDS website: Data standard releases
Data collection spreadsheets	AMDS provide data collection spreadsheets to support collecting the right data in a format that can then be imported to your asset management information system. You can find the sheets in the ADG page below under “AMDS data collection sheets” https://www.nzta.govt.nz/roads-and-rail/asset-data-guide/assets
Asset specifications	Official design and/or construction specifications for delineators can be found below: Traffic control devices manual: Edge marker posts Cycling Network Guidance: Choice of separator or protection

Delineator asset data

The following table provides the key information about what attributes should be collected and managed for this asset.

The table below is from version 1.4 of the AMDS, and it may differ from what you see in your asset management software, depending on what version of the standard the database you are working on has.

There are attributes that are common to most assets. You can find the list and descriptions of these attributes in the General Asset Guidelines document.

Table 3: Key attributes for delineators

Attribute	Status	Type	Description and example.
Post Type	Mandatory	List	What is the type of delineator post used?

Attribute	Status	Type	Description and example.
			Examples: Edge Marker, Circular – Hollow, T-Shaped, Panel Shaped.
Position	Mandatory	List	What is the position of the delineator posts on the road and/or what is the delineator separating?
Post Colour	Mandatory	List	What is the main colour of the posts? Examples: white, yellow, orange.
Number Of Posts	Mandatory	Number	How many posts have been installed? Example: 50
Post Spacing	Mandatory	Number (m)	What is the average distance between delineator posts? Example: 3.5m
Is Reflective?	Mandatory	True/False	Do the delineator posts have reflective devices or sections on them?
Has Horizontal Delineator Component?	Mandatory	True/False	Does the delineator have a horizontal component (not only vertical posts)? For example, modular, rubber, low-height devices used to separate lanes of traffic.
Length	Mandatory	Number (m) *Calculated*.	What is the distance from the beginning of the delineator posts to the end? This is calculated from points on the map. Example: 500.5m
Post Height	Mandatory	Number (m)	What is the height of an individual post? Example: 1.1m

Asset data guide (SM050)

Marking information

May 2026

ADG Version 1.1

AMDS Version 1.4

This manual has been developed with the collaboration of the Road Efficiency Group Te Ringa Maimoa (REG).

Contents

This document is a section of the NZ Transport Agency Waka Kotahi *Asset data guide* (SM050).

What is a marking?

A marking is any kind of device or material (most typically paint) that is used on the road surface to communicate information to drivers, cyclists and pedestrians.

Figure 1: Examples of markings

Asset system and related assets

There are no related assets that need to be referenced for markings.

Asset information

General Information

The *Traffic control devices manual* (TCD manual) is the key reference document. It replaces the old *Manual of traffic signs and road markings* MOTSAM. The TCD manual describes each type of marking's design, installation, dimensions, when to use, and level of markings required etc.

TCD only has a few codes so you must search by marking name. If you are an Asset & Work Manager (AWM) user, when you select the marking name, it populates other attributes (colour, reflectivity, etc).

Marking types have marking group to assist suppliers in scoping work and contract.

Asset recording

Recording markings

All markings shall be recorded in the asset management information system.

Markings are one of the few asset types that need to be managed as point, polyline and polygon assets,

There are two key types of markings that relate to durability. Durability is defined in the NZTA M07 Specification for Road Marking Materials, with values of Normal, Extended and Long:

1. Short Life: Standard painted markings that generally wear out over one to two years and then are painted over (re-painted) as an operational activity. Durability = Normal.
2. Long Life: Longer life markings shall be expected to last a number of years and include High Performance Markings (HPM), raised pavement markers (RPMs) and Audio-Tactile Profile (ATP) markings. Durability = Extended and Long.

During projects and other works

Markings are often removed and / or modified during short and long term works. Standard practice is that the temporary arrangements during the projects are not reflected in the asset information management system and any asset additions, modifications or removals are all processed at the completion of the works.

Asset recording scenarios

Guidance for adding an asset as well as handling full and partial replacements, relocations, removals, decommissioning, reductions and expansions are provided in the General Asset Guidelines document.

Nominal minimum sizes for replacements and other scenarios

For short life linear assets, greater of either:

- 1,000m length
- 50% of the original asset length

For long life linear assets, greater of either:

- All changes shall be recorded (no minimum length)

Replacing short life markings (including repaint)

Short life markings are repainted / remarked on a high frequency basis as a maintenance activity. So technically they are not replaced but painted over.

To record the remark date, the RCA should create a custom attribute called ***remark date*** and then update this each time that the marking is repainted. This allows the ***install date*** to be kept as the original installation date (the first time it was marked).

Long life markings need to be managed more like other asset types and have an asset record that is replaced when it has been re-painted or replaced after the pavement has been replaced.

Replacing long life markings (full)

If a full marking replacement is required, then replace the existing asset record.

Locations (spatial and linear)

Preferred/allowed spatial shape

When recording a marking the preferred AMDS spatial shape will depend on the type of marking.

As per Figure 2, the recommended spatial shape for different marking types can be found the recommended spatial shapes for different marking types can be found in the Asset Management Data Standard (AMDS) under the lookup ***vlMarkingType***.

Marking shape type

Polygon – flush median, parking spaces, chevrons, shoulder markings

Linestring – centreline, no-passing, raised pavement markers.

Point – right hand turn, give way triangle, cycle symbol, messaging

Figure 2: Example marking shapes

Marking types (marking group attribute)

Table 1: Marking types

Type	Description	Photo example
Continuous line	Delineation markings in-between intersections, edge lines, centrelines, cycle lane lines, no passing lines.	
Dashed line	Dashed delineation markings between intersections. Dash dimensions are indicated in the description, e.g. (13x7), (1x2).	

Diagonal marking	Painted diagonal markings, eg diagonal markings, chevrons, painted islands, kee cross hatching.	
Intersection delineation	Intersection delineation, eg multipurpose continuity lines, lane lines, approach lines.	
Messaging	Painted lettering marking. The marking type is named after the marking legend eg STOP, BUS.	
Miscellaneous marking	Other painted markings like pedestrian crossings, parking bays, speed humps, right turn bays.	

Symbol	Painted symbols.	
Audio-tactile	Markings designed to make alert the driver (with sound and feel) when a vehicle drives over it. Typically plastic lumps.	
Raised pavement marker	Markers raised over the pavement to improve visibility over a traditional painted marking. Also known as cat's eyes etc.	 

Scenarios

Recording a right turn bay (RTB)

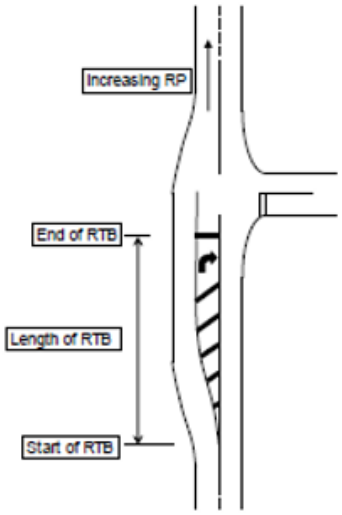


Figure 3: Measuring a right turn bay

The right turn bay (RTB) is a composed flush median, arrow, centrelines and limit lines. However, there is a RTB code, which includes all of the individual markings as a complete unit. Measure the RTB from start of flush median marking to the give-way limit line, and vice versa for RTBs in the decreasing lane.

Figure 4: Measuring a right turn bay in a flush median

Recording painted shoulders

The following diagram shows how painted shoulders should be collected. Enter the numbers of bars in the ***Marking Count*** field of the **Marking** Table. The ***geometry*** field needs to be set to polygon.

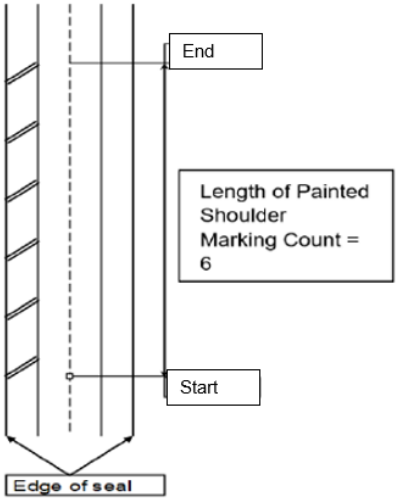


Figure 5: Recording painted shoulders

Recording raised reflectorised pavement markers (RRPM) (cat eyes)

RRPMs are recorded in the markings table as a linestring asset.

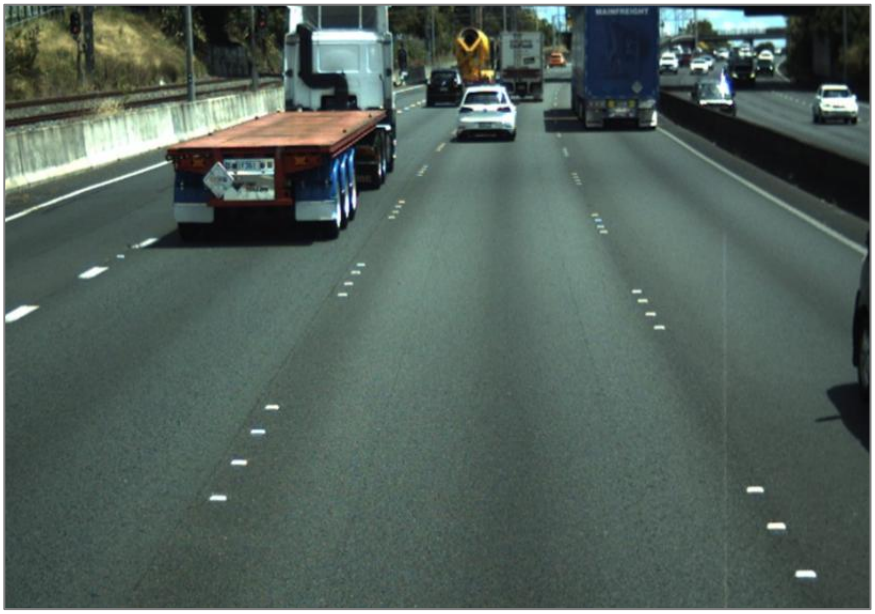


Figure 6: Example of raised reflectorised pavement markers

Additional resources

The following information is available to support your knowledge of markings, and what's needed for data collection and management.

Table 2: Additional resources related to markings

Resource	Description
Asset Management Data Standard (AMDS) inventory standards	You can find the Standard on the AMDS website: Data standard releases
Data collection spreadsheets	AMDS provide data collection spreadsheets to support collecting the right data in a format that can then be imported to your asset management information system. You can find the sheets in the ADG page below under “AMDS data collection sheets” https://www.nzta.govt.nz/roads-and-rail/asset-data-guide/assets
Asset specifications	Official design and/or construction specifications for markings can be found below: Traffic control devices manual Specification for Road Marking Materials NZTA-M07

Marking asset data

The following table provides the key information about what attributes should be collected and managed for this asset.

The table below is from version 1.4 of the AMDS, and it may differ from what you see in your asset management software, depending on what version of the standard the database you are working on has.

There are attributes that are common to most assets. You can find the list and descriptions of these attributes in the General Asset Guidelines document.

Table 3: Key attributes for markings

Attribute	Status	Type	Description and example
Side	Mandatory	List	What part of the road is the marking located on? Example: Left, Right, Both, Centre.
Marking Group	Mandatory	List	What group does the marking belong to? The marking group can be used to narrow down the marking type but is optional. You can choose the marking type directly.
Marking Type	Mandatory	List	What type of marking was added? Selecting a marking type prepopulates several fields where possible, including Colour and Reflectivity. Examples: Centreline 100mm, Continuity line 200mm (1x3), BUS LANE, Profiled Centreline 100mm (3x7), Give Way Triangle. For the full list of marking types, open the marking standard at: Asset Management Data Standard

Marking Colour	Mandatory	List	What is the colour of the marking? Examples: White, Yellow, Green (cycle lanes), Red (speed changes, thresholds, speed bumps), Blue (parking), White AND Yellow.
Is Reflective?	Mandatory	True/False	Is the marking reflective or not?
Durability	Mandatory	List	How long is the marking intended to last, eg before repainting. List: Standard, Extended or Long-life.
Marking Treatment	Mandatory	List	What type of treatment does the marking have?
Marking Material	Mandatory	List	What is the marking made from?
Standard Marking Message	Conditional	True/False	Does the marking have the standard message for the marking type? For example for BUS STOP marking type, does it say BUS STOP or something different? Required if marking group is Messaging.
Non-standard Marking Message	Conditional	Text	What does the Message Marking say? Required if Standard Marking Message is No.
Length	Mandatory	Number (m)	What is the (maximum) distance the line marking covers along the direction of vehicle travel. Notes: This is calculated. In the case of dashed lines, this is the entire length of line, not an individual dashed line. Example: 100.5m, 1525.5m.
Marking Count	Conditional	Number	How many individual stripes or bars are within the marking (eg painted shoulder)? Required for point or polygon shaped markings.
Individual Length	Conditional	Number (m)	What is the length of an individual marking? Required for point or polygon shaped markings where the Marking Count is greater than 1. Example: 8.8m, 10.5m.
Spacing	Conditional	Number (m)	What is the length of the space between markings (flush median)? Required for point or polygon shaped markings where the Marking Count is greater than 1.

Asset data guide (SM050)

Non-electronic sign information

May 2026

ADG Version 1.1

AMDS Version 1.4

This manual has been developed with the collaboration of the Road Efficiency Group Te Ringa Maimoa (REG).

Contents

This document is a section of the NZ Transport Agency Waka Kotahi *Asset data guide* (SM050).

What is a non-electronic sign?

Non-electronic signs are static signs and do not use electronic technology to enhance them.

Figure 1: Examples of non-electronic signs

Diagrams

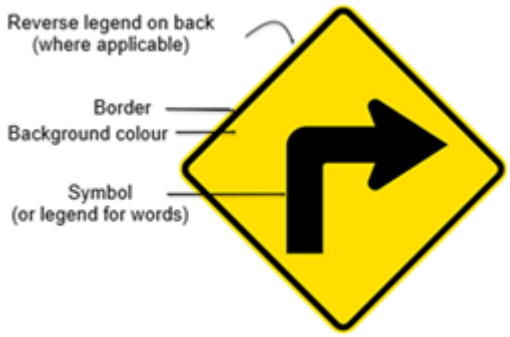


Figure 2: Non-electronic sign attribute descriptions (TCD Manual)

Asset system and related assets

A non-electronic sign is the primary asset in a non-electronic sign system.

- Non-electronic sign system [not available yet]
- Road structure - Gantry
- Pole [not available yet]

How to manage multiple signs with a backing board?

As per the picture below, you can have multiple standard TCD signs on a backing board. Follow the following approach for creating an asset record to represent this.

Choose one of the TCD signs and then add in the second one into ‘Legend Text’, with the following attributes as an example:

- ***Legend Text*** = “**[Narrow bridge symbol] + [Symbolic Give way]**”
- ***Notes*** = “**ON WHITE BACKGROUND**”

Figure 3: Sign with a backing board

Are temporary signs managed as an asset?

Temporary traffic signs (those not permanently fixed in place) do not need to be recorded as an asset in the signs table. Examples may be warning signs (eg, road works) regulatory signs (e.g. temporary speed limits) or information signs (e.g. detours, lane shifts).

Are foldable (partially permanent) signs managed as an asset?

A foldable sign that is installed permanently and unfolded and shown under certain conditions or situations, shall be managed as an asset.

Figure 4: Foldable sign

Are bridge end markers and hazard markers managed as signs?

Bridge end markers and hazard markers are considered a sign asset and are recorded in the non-electronic signs table.

Are culvert marker posts managed as a sign?

Culvert Markers are to be recorded using the associated count attribute in the Pipe record.

Are Edge marker posts managed as a sign?

Although edge marker posts are classified as TCD assets, they should be recorded under the Delineator table rather than the signs table.

What to do with signs on other RCA roads?

An RCA's signs can sometimes be located on another RCA's network. Most commonly, this will be NZTA (state highway) signs located on local roads.

To record your assets on someone else's network will require a network record for that road. The ***owned by*** and ***managed by*** attributes need to be correctly populated in the asset record.

If someone else's assets are on your network, then ensure that the ***owned by*** and ***managed by*** attributes are correctly populated. This will help avoid these assets being included in your asset reporting and valuation. This will also apply if the sign is privately owned as opposed to another RCA.

Asset information

Asset recording

Recording signs

All signs shall be recorded in the asset management information system.

Asset recording scenarios

Guidance for adding an asset as well as handling replacements, relocations, removals and decommissioning are provided in the General Asset Guidelines document.

Locations (spatial and linear)

Preferred/allowed spatial shape

When recording a non-electronic sign, the preferred spatial shape is a point normally based on the centre of the sign (e.g. half-way along its length).

It is also acceptable for the location to be at the end of the sign, where it connects to the pole. This will happen automatically when you create a child asset from the parent, the pole in this case.

Dimensions

Recording the width and height

Signs come in different shapes. Use the diagrams below to use the correct method for determining the height and width for the different shapes.

For some signs, like circular, the same dimension (e.g. diameter) is used for both the height and width attributes.

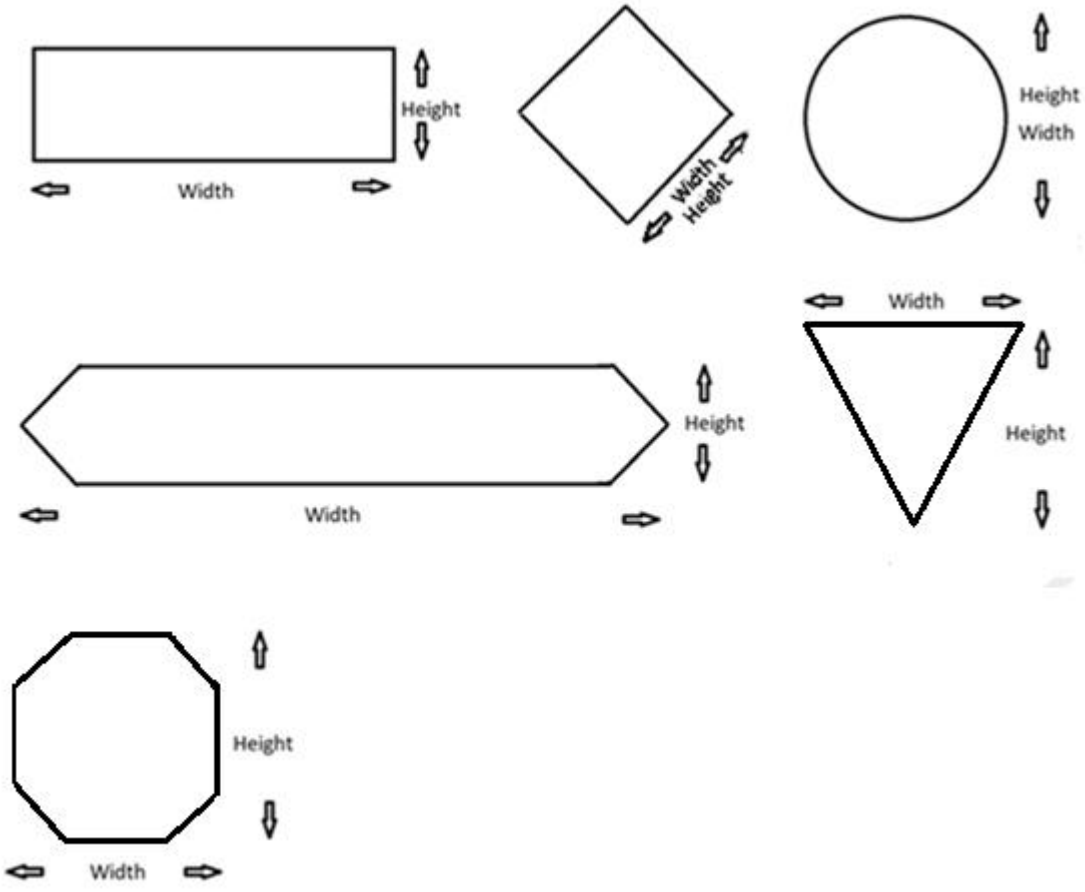


Figure 5: height and width for sign shapes

Recording the mounting height

Measure the height from the ground to the bottom of the sign plate, in metres. Only needs to be recorded where there is a critical clearance requirement, for example for vehicles under a gantry-mounted sign, or for pedestrian clearance.

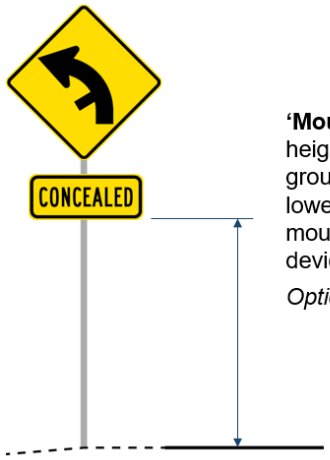


Figure 6: How to measure the mounting height

Measuring the sign offset

The offset is the distance from the centreline of the road to the centre of the post for signs on a single post, or to the centre of the posts/sign for sign stacks.

If the offset is not calculated from the spatial data, then apply one of the standardised offsets:

- 0 m – centre of road
- 6 m – 2-lane road
- 15 m – 4-lane road.

Select the value that most accurately reflects the sign's true position.

Sign types (sign class attribute)

Table 1: Sign classes (for TCD sign types)

Type	Description	Colour	Photo examples
Advisory	A sign that provides road users with information or guidance (including information about destinations, routes, amenities, distances, street names and place names).		 
Guide	A guide sign informs road users of direction, distances, destinations and routes. For example, an advanced direction sign is a sign placed on an approach to, and in advance of, an intersection, junction or interchange, indicating the direction of routes and destinations beyond the intersection, junction or interchange.		

Motorist services	A sign used to identify one or a number of services commonly required by travellers that are depicted by internationally recognised symbols.		
Parking	Defined for signs as relating to the stopping or standing of a vehicle on a road: • On roads with parking meters or vending machines, standing for any period exceeding five minutes • On other roads, stopping or standing of a vehicle (other than picking up/setting down passengers in a loading zone or reserved parking area) on that portion of the road		
Regulatory	A sign that instructs road users by requiring or prohibiting specified actions in using a road. Includes mandatory and prohibitive signs.		
Toll	Signs that relate to a road or part of a road that is subject to tolling under a road tolling scheme pursuant to the Land Transport Management Act 2003.		
Visitor attractions	Also known as tourist signs. While visitor attraction signs are not specifically defined as a road sign type, the TCD glossary refers to tourist attraction as: A permanently established destination or facility that		

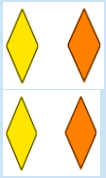
	attracts or is used by visitors to an area, and which is open to the public without prior booking during normal hours. A tourist sign is used to indicate these features.		
Warning	A sign used to indicate actual or potential hazards to road users.		

Table 2: Connection modes

Connection mode	Description
Post count	The number of posts attached to the sign. Used when the sign is attached to post(s) but these posts are not in the Asset Management Information System. Post count should be used when a sign and post have been supplied together as a complete unit, or the post is not captured as a separate pole asset. It is up to an individual road controlling authority as to whether they record a pole as an asset or simply use post count.
Connected to named asset	Sign is attached to another asset in the Asset Management Information System, e.g. poles, gantry, bridge, retaining wall. Poles in the road corridor and owned by parties, that have a sign attached, shall still be recorded in the database with the appropriate ownership recorded. Use the asset hierarchy feature to select ‘link’ and then add the other assets using the link type = ‘attachment’.
Connected to something else	Sign is attached to something that is not in the asset management information system, e.g. a building, into the ground.

Post count

For posts with multiple signs attached, record the post only to one sign (for consistency, make this the sign on top of the stack and in the direction of traffic).

Bridge end markers and culvert markers have ***post count*** = **”0”**.

Additional resources

The following information is available to support your knowledge of non-electronic signs, and what's needed for data collection and management.

Table 3: Additional resources related to non-electronic signs

Resource	Description
Asset Management Data Standard (AMDS) inventory standards	You can find the Standard on the AMDS website: Data standard releases

Data collection spreadsheets	AMDS provide data collection spreadsheets to support collecting the right data in a format that can then be imported to your asset management information system. You can find the sheets in the ADG page below under “AMDS data collection sheets” https://www.nzta.govt.nz/roads-and-rail/asset-data-guide/assets
Asset specifications	Official design and/or construction specifications for non-electronic signs can be found below: Traffic control devices manual Traffic control devices manual: Sign specifications

Non-electronic sign asset data

The following table provides the key information about what attributes should be collected and managed for this asset.

The table below is from version 1.4 of the AMDS, and it may differ from what you see in your asset management software, depending on what version of the standard the database you are working on has.

There are attributes that are common to most assets. You can find the list and descriptions of these attributes in the General Asset Guidelines document.

Table 4: Key attributes for non-electronic signs

Attribute	Status	Type	Description and example
Is TCD Sign Type	Mandatory	True/False	Is this sign regulated in the *Traffic control devices manual* (TCD manual)?
TCD Sign Type Class	Conditional	List	You can use the TCD sign class to refine the list of available TCD sign types.
TCD Sign Type	Conditional	List	If the sign is a TCD device, then you’ll need to select the sign type from this list. Use search terms or the TCD manual to help you select the right sign type. Example: PCH2 - No stopping Clearway single peak period
Non-TCD Sign Type	Conditional	Text	If the sign is not a TCD device, then you’ll need to select a sign from the list and may want to attach a photo for unique signs. Example: Custom street name plates or ‘Welcome to…’ sign.
Sign Legend Description Required?	Mandatory	True/False	Does this sign need the sign legend captured?
Legend Text	Conditional	Text	For certain TCD sign types, you need to record the legend (what is written on sign).
Has Reverse Legend?	Mandatory	True/False	Does the sign have text on the back of it?

Reverse Legend Note	Conditional	Text	If the sign has text on the back, then you'll need to record it.
Background Colour	Mandatory	List	What colour is the sign background? Examples: Yellow, Yellow and Green, White.
Mounting Height To Underside Of Sign	Optional	Number (m)	The height from the ground to the bottom of the sign plate, in metres. Only needs to be recorded where there is a critical clearance requirement, e.g. for vehicles under a gantry-mounted sign, or for pedestrian clearance.
Critical Clearance Requirements?	Mandatory	True/False	Does the height and position of the sign put it at risk of being hit by a vehicle or pedestrian? Example: for vehicles under a gantry-mounted sign, or for pedestrian clearance.
Connection Mode	Mandatory	List	Select what the sign is attached to: • Post count – use when attached to posts that are **not** recorded as separate assets • Attached to named asset – use when attached to other assets, including poles (signpost type and others like streetlights), gantries, or retaining walls. • Attached to something else – use when attached to other non-assets like buildings.
Post Count	Conditional	Number	If 'Post count' is selected, enter the number of posts the sign is connected to.
Attached To Asset ID	Conditional	Lookup asset	If 'Connected to Named Asset' is selected, once you've saved the asset, you'll need to search for and link to the existing asset via Asset Hierarchy. You'll get a warning message if you do not.
Connection Details	Conditional	Text	If 'Connected to Something Else' is selected, describe what the asset is attached.
Height	Mandatory	Number (mm)	Height of sign (only) in mm.
Width	Mandatory	Number (mm)	Width of sign (only) in mm.
Is Sign Large?	Mandatory	True/False	Does the sign have a sign face area 2.025m^2 or greater? Can be calculated.

Asset data guide (SM050)

Rail information

May 2026

ADG Version 1.1

AMDS Version 1.4

This manual has been developed with the collaboration of the Road Efficiency Group Te Ringa Maimoa (REG).

Contents

This document is a section of the NZ Transport Agency Waka Kotahi *Asset data guide* (SM050).

What is a rail?

Rails are primarily designed to provide protection and support for pedestrians. They are used in a variety of ways, including:

- preventing falls from structures such as bridges, culverts and retaining walls
- supporting pedestrians using stairs and ramps
- providing protection and relief around crossings and traffic islands.

Rails can also be used to give vehicle drivers visual cues to warn of upcoming curves or hazards.

Figure 1: Rail examples

Asset systems and related assets

Rails can be both an asset on its own as well as a component in multiple asset systems, including bridge systems, pathway systems, traffic island systems.

A rail can exist on its own and also be a component in a bridge system.

- Traffic services – bridge [not available yet]
- Traffic services – pathway [not available yet]
- **Traffic services - Traffic island**

What is the difference between a rail and a barrier?

Rails (including both sight rails and handrails) are used primarily to support pedestrians and are not designed to take an impact from a vehicle. If it is strong and designed to take an impact from a vehicle then it shall be managed as a barrier asset.

When is a rail managed as a barrier?

The rail shown in the following Figure 2 is integral with the type of barrier and as such is managed as a single barrier asset. Examples are *Heavy traffic (HT) barrier (PA HT and T80 HT).*

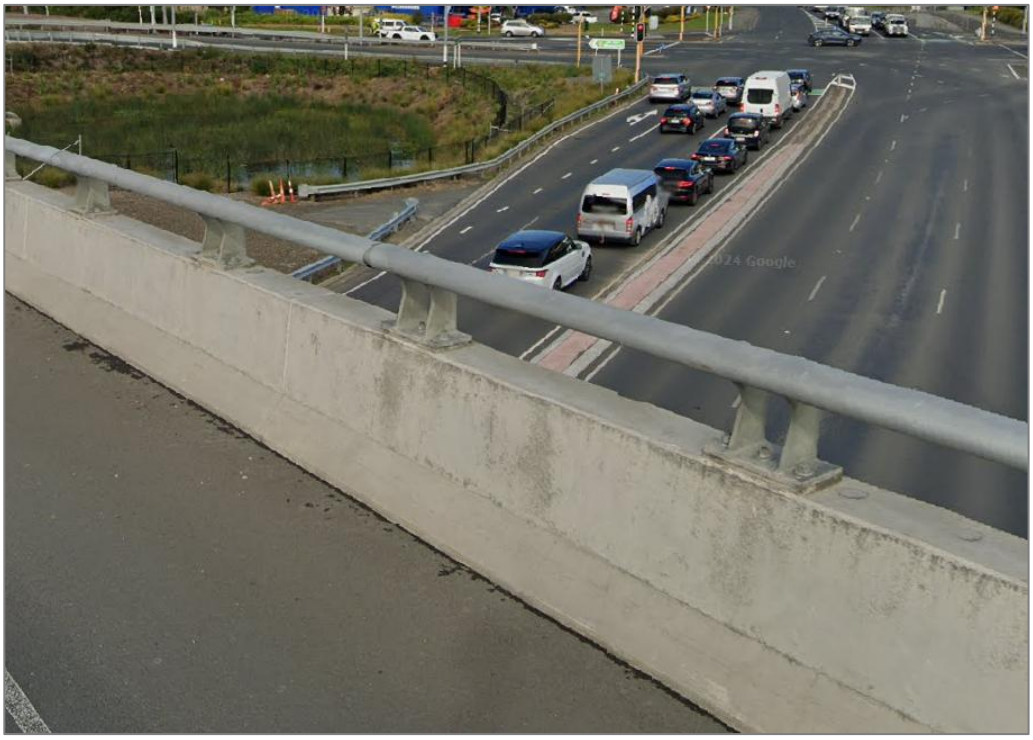


Figure 2 Heavy traffic (HT) barrier (PA HT and T80 HT)

Asset information

Asset recording

Recording rails

All rails shall be recorded in the asset management information system.

Asset recording scenarios

Guidance for adding an asset as well as handling full and partial replacements, relocations, removals, decommissioning, reductions and expansions are provided in the General Asset Guidelines document.

Nominal minimum sizes for replacements and other scenarios

Greater of either:

- 100m length
- 50% of the original asset length.

Locations (spatial and linear)

Preferred/allowed spatial shape

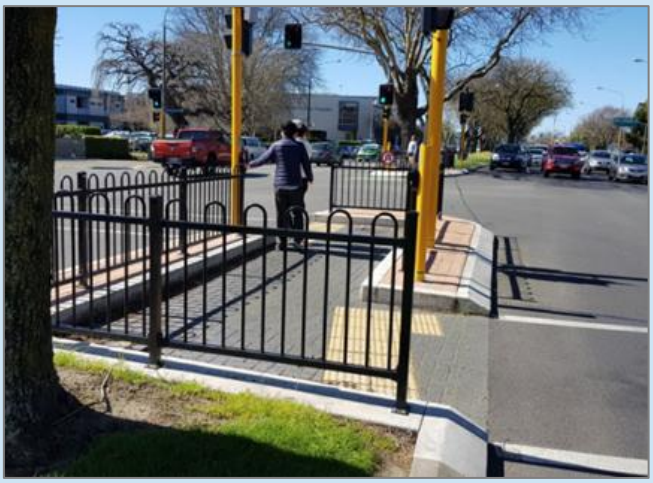
When recording a rail asset, the preferred spatial shape is a linestring along the alignment of the rail.

Rail types (rail type attribute)

Table 1: Rail types

Type	Description	Photo examples
Bridge safety rail	Rail along the edge of a bridge to prevent pedestrians from falling off bridge.	 *(photo: James Wratt)* 
Stairs handrail	Rail designed to be gripped by hand to support pedestrians going up the stairs.	

Ramp hand rail	Rail designed to be gripped by hand to support pedestrians up a ramp.	
Sight rail	Provides a visual cue to vehicle drivers of upcoming curve or hazard but is not designed to take an impact.	
U-rail	Also known as cycle hold rails, pedestrian refuge rails or pedestrian resting rails. These provide a place for pedestrians or cyclists to wait before they can cross a lane, e.g. inside a traffic island. Also commonly used to direct or restrict pedestrian or cyclist access, e.g. direct away from a cable supporting a pole or to slow cyclists entering an accessway.	

Pedestrian crossing rail	Rail placed near or around pedestrian crossings to direct pedestrians into the preferred crossing point.	 *(Photo: Gemma Dioni)*
Pedestrian safety rail	Rail along the edge of a slope or fall to prevent pedestrians from falling.	

Additional resources

The following information is available to support your knowledge of rails and what's needed for data collection and management.

Table 2: Additional resources related to rails

Resource	Description
Asset Management Data Standard (AMDS) inventory standards	You can find the Standard on the AMDS website: Data standard releases
Data collection spreadsheets	AMDS provide data collection spreadsheets to support collecting the right data in a format that can then be imported to your asset management information system. You can find the sheets in the ADG page below under “AMDS data collection sheets” https://www.nzta.govt.nz/roads-and-rail/asset-data-guide/assets
Asset specifications	Official design and/or construction specifications for rail can be found below https://nzta.govt.nz/resources/erection-maint-traffic-signs

Rail asset data

The following table provides the key information about what attributes should be collected and managed for this asset.

The table below is of version 1.4 of the AMDS, and it may differ from what you see in your asset management software depending on what version of the standard the database you are working on has.

There are attributes that are common to most assets. You can find the list and descriptions of these attributes in the General Asset Guidelines document.

Table 3: Key attributes for rails

Attribute	Status	Type	Description and example
Rail Type	Mandatory	List	What is the type of rail?
Rail Material	Mandatory	List	What is the railing made from? Examples: wood, plastic, steel, aluminium.
Post Count	Mandatory	Number	What is the total number of posts that support this rail?
Pole Material	Mandatory	List	What are the poles/posts made from? Examples: wood, plastic, steel, aluminium.
Placement	Mandatory	List	What is the asset in, on, or attached to? Note: Your selection may mean that, you will need to add an asset hierarchy and link the luminaire to something. Examples: Attached to Retaining Wall, In Pavement, In Ground, In Berm.
Height	Mandatory	Number (m)	What is the height from the top of the asset to the ground? Example: 1.4m
Length	Mandatory	Number (m) *Calculated*	What is the distance covered from start to finish of the asset? This is calculated from points on the map. Example: 40m

Asset data guide (SM050)

Traffic island information

May 2026

ADG Version 1.1

AMDS Version 1.4

This manual has been developed with the collaboration of the Road Efficiency Group Te Ringa Maimoa (REG).

Contents

This document is a section of the NZ Transport Agency Waka Kotahi *Asset data guide* (SM050).

What is a traffic island?

A traffic island is a marked-off area with a vertical displacement in centre of or to the side of a road (includes the islands inside of roundabout). It is a solid object that has been strategically designed or placed on the road to control the flow of traffic. They are used as a means of improving the safety and amenity of roads – typically local roads.

Figure 1: Traffic island example

Asset system and related assets

- **Traffic services - Non-electronic sign**
- **Traffic services - Rail**
- Luminaire [not available yet]
- Traffic signal [not available yet]

When to record kerb and channel around traffic islands?

When kerb and channel is constructed around traffic islands, record them as a separate asset when they are installed for drainage purposes (e.g. managing street sweeping).

Asset information

Asset recording

Recording traffic islands

All traffic islands shall be recorded in the asset management information system.

Asset recording scenarios

Guidance for adding an asset as well as handling replacements, relocations, removals and decommissioning are provided in the General Asset Guidelines document.

Locations (spatial and linear)

Preferred/allowed spatial shape

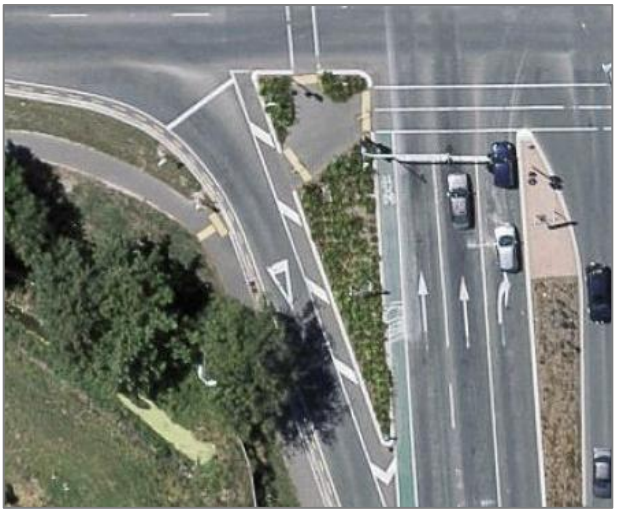
When recording a traffic island, the preferred spatial shape is a polygon.

Traffic island types

The type should be based on the primary purpose of the traffic island.

Table 1: Traffic island types

Type	Description	Photo examples
Splitter	A short island used near intersections to separate opposing traffic	
Median	A long island used to separate lanes of traffic and potentially provide a stopping place for pedestrians	

Rotary	An island typically used within a roundabout intersection or in a cul-de-sac.	
Kerb buildout	An 'island' typically connected to the kerb on the roadside for the purposes of narrowing the roadway	
Slip lane	Separates the slip lane from the main road	

Refuge	An island with a dedicated section or passage for pedestrians to stand on	

Scenarios

Pedestrian refuge

Raised traffic islands that have a flat at grade section between them to allow pedestrians or cyclists to pass through the traffic island.

Each island should be recorded separately to support more accurate quantities for valuations.

Figure 2: Pedestrian refuge

Multiple types within a single traffic island

As seen in the photo below, a single continuous traffic island has sections that can have a type of splitter, median and refuge.

Best practice is to record this as a single asset record and the ***Traffic Island Type*** should be set to the primary purpose. In this case it would be a **"Median"**.

Figure 3: Multiple types in a single traffic island

One or two traffic islands?

As seen in the photo below, some roundabouts have two distinct circles for the overall asset.
Best practice is to record this as a single asset traffic island record with ***Traffic Island Type*** = **"Rotary"**.

Figure 4: One or two traffic islands?

Traffic Island or speed humps?

As seen in the photo below, a roundabout can be made up of paint markings and road humps.

As most roundabouts (other than paint only) are recorded as traffic islands, this can be recorded as a Traffic Island record with ***Traffic Island Type*** = **"Rotary"**.

Alternatively, you could record the four separate road humps which would give a more accurate result for the asset valuation.

Figure 5: Traffic island or road hump?

Additional resources

The following information is available to support your knowledge of traffic islands, and what's needed for data collection and management.

Table 2: Additional resources related to traffic islands

Resource	Description
Asset Management Data Standard (AMDS) inventory standards	You can find the Standard on the AMDS website: Data standard releases
Data collection spreadsheets	AMDS provide data collection spreadsheets to support collecting the right data in a format that can then be imported to your asset management information system. You can find the sheets in the ADG page below under “AMDS data collection sheets” https://www.nzta.govt.nz/roads-and-rail/asset-data-guide/assets
Asset specifications	Official design and/or construction specifications for traffic islands can be found below: Traffic control devices manual

Traffic island asset data

The following table provides the key information about what attributes should be collected and managed for this asset.

The table below is from version 1.4 of the AMDS, and it may differ from what you see in your asset management software, depending on what version of the standard the database you are working on has.

There are attributes that are common to most assets. You can find the list and descriptions of these attributes in the General Asset Guidelines document.

Table 3: Key attributes for traffic islands

Attribute	Status	Type	Description and example
Traffic Island Type	Mandatory	List	What is the type of traffic island?
Shape	Mandatory	List	What is the shape of the traffic island as viewed from above? Examples: Round, Square, Diamond, D Shaped, Long and Narrow, Polygon.
Top Surface Has Concrete?	Mandatory	True/False	Does the surface of the island have a concrete area?
Top Surface Has Blocks/Pavers?	Mandatory	True/False	Does the surface of the island have blocks/pavers?
Top Surface Has Planted Landscaping?	Mandatory	True/False	Does the surface of the island have planted landscaping requiring maintenance?
Top Surface Has Grassed Area?	Mandatory	True/False	Does the surface of the island have a grassed area requiring maintenance?
Top Surface Has Rain Garden?	Mandatory	True/False	Does the surface of the island have a rain garden?
Height	Mandatory	Number (m)	What is the maximum height of the island above the road surface? Example: 0.55m, Maximum: 0.75m
Landscaped Area	Conditional	Number (m^2)	How much of the area of the traffic island is planted landscaping? Required if you select Planted Landscaping as a top surface. Example: 6.5m^2
Length	Mandatory	Number (m) *Calculated*	What is the (maximum) length of the island along the direction of vehicle travel? This is calculated from points on the map. Example: 4.5m
Width	Mandatory	Number (m) *Calculated*	What is the (maximum) width of the island perpendicular to the direction of vehicle travel? This is calculated from points on the map. Example: 2.5m