

TO	Network Wide
FROM	Head of Engineering Standards
DATE	15/04/2024
SUBJECT	ETN-00-05 Chainage Datum and Track Alignment – Requirements Technical Note -
TITLE	ETN-00-05 Technical Note – Chainage Datum and Track Alignment – Requirements v1.0

References

ETD-00-03 Alignment Surveys

Background

This has been required as no ETD-00-03 does not specify how a chainage datum shall be selected and what is an acceptable methodology for propagating chainage on the ARTC Network.

This technical note advises project managers and external track designers of the do's and do not's when changing track alignment that results in a kilometrage change.

Scope

This technical creates additional requirements to ETD-00-03, where a conflict exists between ETD-00-03 and this note, this note shall take precedence.

This technical note applies to all Greenfield and Brownfield/Enhancement works where the alignment of the track is altered in all territories and works undertaken on behalf of ARTC, including Inland Rail.

Selection of Chainage Datum

The origin chainage for a project shall comply with the following:

- Shall be on the low km (city side) of the project works;
- Shall be outside of the project limit of works;
- An existing Tangent Point (TP) Track Alignment Monument, with defined Chainage and Location;
- If this is unavailable, an existing kilometre post is an acceptable datum.

For ARTC, the following are not an acceptable datum:

- KM of an asset from PTV's PASS Assets
- KM of an asset from ARTC's EAMS (Enterprise Asset Management System)
- Assumed or arbitrary chainage datums
- KM2Me derived origins
- Half Kilometre Posts

Propagation of Chainage

Chainage for a project shall always be propagated from the chainage datum in the direction of increasing kilometrage. i.e. from City to Country / in the Down Direction.

Adjustments Resulting from Realignment Works

As per ETD-00-03, The Master Kilometrage for a corridor is the down track in dual track sections, and minor adjustments should be made to keep the kilometrage of the up and down tracks aligned where needed.

When realigning a track, kilometrage adjustments will be required due to the addition or subtraction of track length as a result of the works.

The execution of these adjustments shall abide by the principles below and as appropriate for the project works type.

- Adjustments shall not be placed in horizontal transitions or within 20m of a vertical curve.
- Adjustments shall not be placed in physical structures (retaining walls, bridges, platforms) or yard limits.

Note: Works crossing a state border need to be cognisant that kilometrage is not continuous across all state borders and often is the convergence of different kilometrages in opposite incrementing directions. Where this occurs, it will be necessary to have two chainage datums, one for each state, respecting the current incrementing kilometrage directions.

New Track Design Principles (Greenfields)

- Selection of chainage datum and propagation of chainage shall abide by the specification above.
- Design shall be compliant with the requirements of ETD-00-03 and the additions to Diagram 7 in the appendix of this technical note.
- KM Posts shall be monumented and contain no more than 20m of adjustment between posts.
- In single line tracks (such as Illabo to Stockinbingal) adjustments shall be at one end of the new track where it meets an existing corridor resulting in a major km equality and signposted km change board.

Track Realignment and Curve Easing (Brownfields)

In Brownfields/Enhancement works, adjustments shall be located

- at an existing kilometre post in tangent track; otherwise
- on tangent track of at least 100m in length.

An adjustment shall not be placed on a kilometre post is located on a curve element (curve or transition curve) or within 20m of a vertical curve.

In this case, the kilometre post shall be relocated as per the new design, placing the new km post within 980m and 1020m of the preceding post, and the adjustment resolved as per the above.

Where the resulting positive or negative adjustment is greater than 40m, the need for a km change board shall be discussed with the parties specified in the Approval of Chainage and Datums section below.

Horizontal Track Slews

Where the enhancement only consists of a horizontal track slew resulting in less than 4m of total linear adjustment, ARTC's preference is that kilometre posts be maintained in their current linear position and adjustments located at the kilometre posts.

Alignment Monumentation and enhancement

To improve ARTC's alignment management, the following monumentation shall be installed as part of any Greenfield, Brownfield or Enhancement works as per Section 5: Track Geometry, ETD-00-03 and ETD-00-04.

- Installation of Track Alignment Monuments, refer to Section 5: Track Geometry.
- Installation of Curve Monuments, refer to ETD-00-04.
- Installation or realignment of Kilometre posts, where the project impacts the location of Kilometre posts, new kilometre posts shall be installed as per the designed kilometrage. The requirement for Kilometre posts on the network is mandated by ETF-11-01.

Approval of Chainage and Datums

The projects shall seek approval from the following ARTC Chainage SME's at Reference Design but no later than Detailed Design 10% stage.

- Linear Referencing System Lead, Interstate
- Survey Coordinator, Hunter Valley

Approval shall be of;

- Chainage Datum
- Adjustment Locations
- Monumentation Plan

The project shall supply the following survey data required to assist in the approval consisting of;

- locating the KM Posts within the Project area to ensure current local relativity can be validated with ARTC asset capture records.
- Coordinates of the limit of planned works
- Current stage adjustment location and quantity

Project Examples and Expected Outcomes:

Project sites of significant distance

Example:

A2I project contains dual track slews from Junee to project interface with I2S and is approximately 14kms in length.

Expected Outcome:

It would be expected that the chainage datum is taken from the up end (city side) of the limit of works on the down track, ideally from a known TP, if not from the closest km post.

The project would then propagate this chainage through the design, making minor adjustments where necessary, to keep parallel tangent kilometrage in sync, as per ETD-00-03.

If the slew is deemed minor, laterally sub two metres, and does not contain curve easing or realignment, any other necessary adjustments should be rationalised at tangential km posts and the up end limit of works.

If the work contains major curve easing or track straightening, km posts shall be adjusted as necessary, and an adjustment placed at the down end limit of works.

The projects proposal for multiple adjustment points within project area to rationalise adjustments shall be reviewed and approved by the parties mentioned in the approval of chainage and datums section of this tech note.

Abutting Project Sites

Example:

Two projects have adjacent sites where the adjustment point of the first (lower KM) site would be after the datum (and therefore within the project KMs) of the second site. (E.g. A2I Riverina Hwy/Albury Yard sites).

Expected Outcome:

Projects shall determine a shared chainage datum. Suggest projects being able to combine sites for adjustment purposes.

Additional Adjustment diagrams

The following diagrams are in addition to those in Diagram 7 – Kilometrage Adjustments in ETD-00-03.

Positive Adjustment (Short Adjustment)

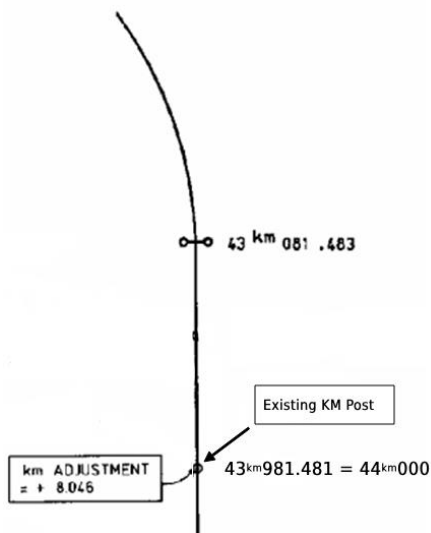
Brownfield/Enhancement Preference

Instantaneous jump forward at next available tangent Full km post.

In the below;

Back Station: 43981.481

Ahead Station: 44000.000



Negative Adjustment (Long Adjustment)

All works

