

Standard

S1035 A4 Location Coding System

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1 Purpose

The purpose of this standard is to define how the Location Coding System (LCS) works. It explains the rules for generating and applying the codes.

Note: London Tramlink has its own separate LCS convention (refer to LT-IMS-ENG-060).

2 Scope

This standard applies to anyone needing to understand the LCS coding convention.

This standard is for reference when assigning a Location Code to a new or relocated rail company asset. Location Codes are mandated by a number of standards and processes. For instance, [S1041](#) 'Engineering Asset Information' requires that LCS is used in the Asset Register to define each asset's location and [S1037](#) 'Computer Aided Design (CAD) Data' requires that LCS is used in file naming, to indicate the location referred to by the model/drawing.

3 Requirements

3.1 General

- 3.1.1 The LCS is essentially a linear referencing system for identifying locations relative to established datums on the track centreline. Hence, it applies to TfL's rail company assets only.
- 3.1.2 The system comprises a string of four separate codes known as 'levels' (see Fig 2).
- 3.1.3 The first code (Level 1), identifies major 'nodes' on the network (e.g. stations) and also the sections of track between the nodes (see Fig. 1 below).

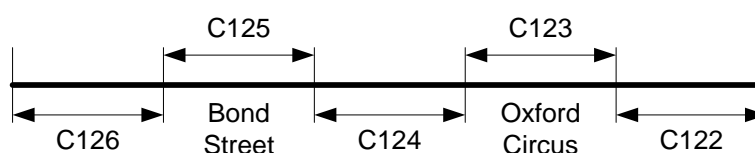


Figure 1 Example of Level 1 Codes

- 3.1.4 Nodes shall be odd number Level 1 codes, track sections between nodes shall be even number Level 1 codes (see example in Fig. 1 above).
- 3.1.5 The extent of the level 1 code area for station nodes is defined by the demise of the building (for London Underground this is described in the LU Property Schedules and Plans). Also Known as the 'Station Envelope'.
- 3.1.6 The extent of the level 1 code area for sections of track is the Operational Boundary of the track (usually defined by a fence restricting access).
- 3.1.7 Level 1 codes shall run sequentially, with numbers increasing in a south or west direction.
- 3.1.8 The number "001" is reserved to refer to the entire line (e.g. "C001" means the entire Central line).
- 3.1.9 Any new branch or extension shall be numbered starting with a new block of 10.

3.1.10 Level 1 codes are issued by TfL Engineering and published on the intranet.

3.1.11 Once a location code has been issued it shall not be withdrawn, reallocated or changed.

3.2 Code structure

3.2.1 The code structure, illustrated below in Fig 2, consists of 4 code 'levels' plus track metreage and offset.

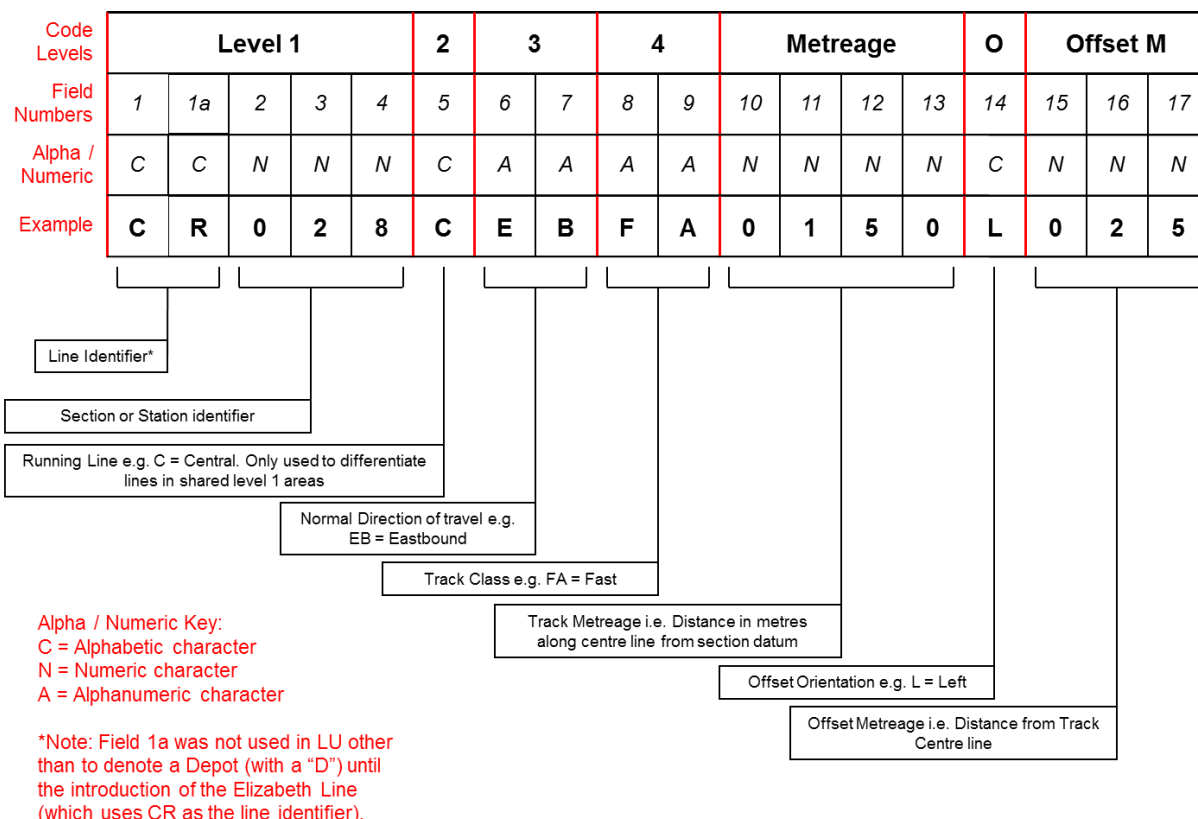


Figure 2 Linear Referencing Code Structure

- 3.2.2 Locations shall be measured from the Level 1 boundary datum point (see 3.2.9) in the direction of normal running.
- 3.2.3 All track metreages shall be to the nearest metre.
- 3.2.4 The field for 'Offset' (field #14) shall be "L" (left) or "R" (right), facing in the direction of normal running.
- 3.2.5 Level 2 codes shall be a single character, assigned by TfL Engineering
- 3.2.6 Level 3 codes shall be two characters, assigned as shown in the table below:

Code	Description
WB	Westbound
IR	Inner Rail
NB	Northbound
DN	Down
OR	Outer Rail
UP	Up
SB	Southbound
EB	Eastbound
RD	Road
SL	Single Line
(nn)	Points number (used for crossover routes only)

- 3.2.7 Level 4 codes shall be two alphanumeric characters, assigned as shown in the table below:

Code	Description
LO	Local
FA	Fast
MA	Main
BA	Bay
TP	Third Party (e.g. Network Rail)
(nn)	Road number
(xx)	From and To sections of points (e.g. AB). Used for crossover routes only

Note: Coding for crossover routes is further explained in section 5.3

- 3.2.8 For London Underground the exact easting and northing coordinates of LCS boundary datums (relative to the London Survey Grid) are established and managed by the Land Survey team and published on the intranet. Marker plates are used as a visual reference on the track to show LCS boundaries and set distances of 20 and 100 metres from those boundaries. In the event of an LCS marker plate being disturbed due to maintenance work etc. it must be replaced in accordance with the General Technical Specification for LCS plates (available from Land Survey).

metreages and offsets

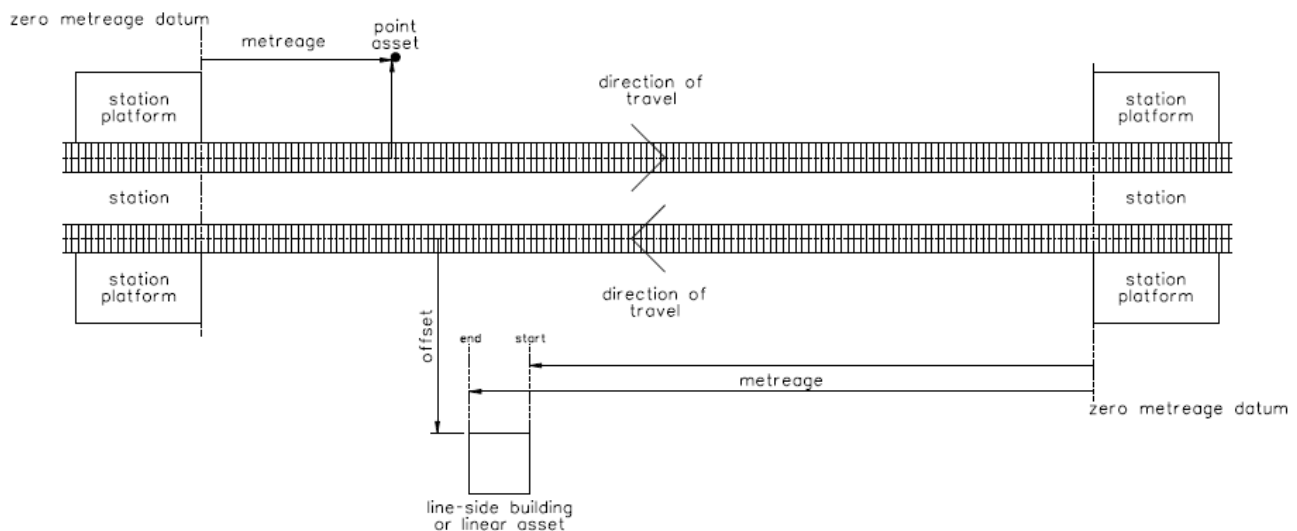


Figure 3 Defining Location

- 3.2.9 Depending on the type of asset, the location can be measured as a single point with one set of metreage and offset values, or as a length, using 2 sets of metreage and offset values (start and end). See Figure 3 above.

3.3 Building Coding System

- 3.3.1 Buildings (structures formally recognised as premises assets) have an additional coding system, with different Level 2 and Level 3 codes, to identify the building and to define the levels and rooms/areas within it. See Fig 4 below.

Code Levels	Level 1					2		3 (SID Code)				
Field Numbers	1	1a	2	3	4	5	6	7	7a	8	9	10
Alpha / Numeric	C	C	N	N	N	N	N	A	C	N	N	N
Example	C	R	0	2	8	0	1	2	b	1	0	7

Line identifier

Section or Station identifier

Incremental number for platform or trackside buildings. Use "00" for stations

Vertical Level e.g. Ground Floor = 1, One Floor above Ground = A

Sub-level indicator (m or b)

Room usage code

Figure 4 Building codes

Note: To be clear - building *locations* are defined in the same way as any other asset, using the code structure described in 3.2. The Building Code system described in this section is for separately identifying the building *number* and/or *areas within* a building.

- 3.3.2 The Level 1 code in the Building Coding System is the same as the Level 1 code in the main Location Coding System, as described in 3.1.3.
- 3.3.3 The level 2 and 3 codes in the Building Coding System are different to the Level 2 and 3 codes in the main Location Coding System
- 3.3.4 The level 2 building code is used to allocate numbers to buildings within a given level 1 area, such that the combination of level 1 and level 2 identifies a unique building (e.g. C124/01 is a different building to C125/01 or C124/02).
- 3.3.5 Stations are uniquely identified by the level 1 code, so they do not require a level 2 code. However, a Separate Building within a station level 1 area (e.g. a signal or P-Way cabin on a platform) does.

- 3.3.6 The level 3 building code identifies a defined area within a building. It is a combination of the floor level and a 'usage' code. This is commonly known as a 'SID code' (Station Area Identification Code) when used in stations. SID codes are issued by the Fire Compliance team in TfL Engineering.
- 3.3.7 Where the level 3 code is used to identify areas within a station, the level 2 code, if required, shall be "00".
- 3.3.8 The first field of the level 3 code denotes the vertical level. Street level shall be "1". Levels above shall be alphabetic starting with "A" and levels below shall be numeric starting with "2". See Fig 4 below for further explanation.

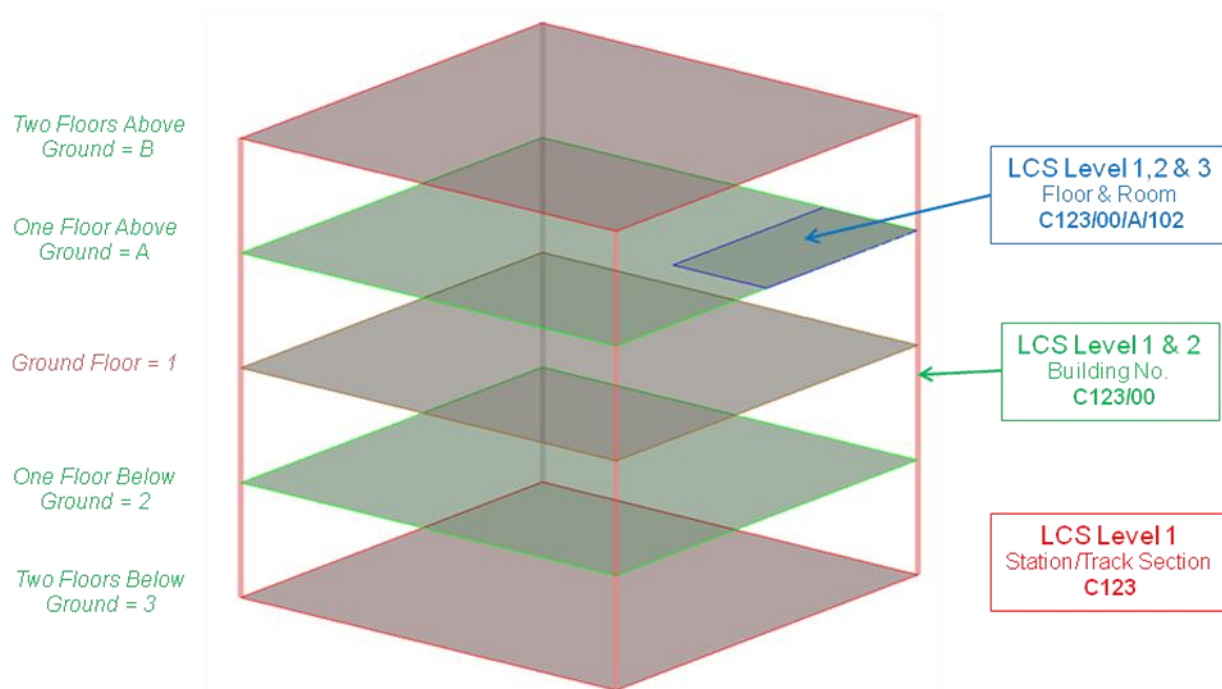


Figure 5 Building levels and rooms example

- 3.3.9 Floor levels can be further sub-divided into 'mezzanine' and 'basement' using an additional character ("m" & "b") in the second field (7a) of the level 3 code. This is used when a floor level within the same vertical space is added to the building at a later stage (or a connecting extension is built, with additional floors). Where only one additional floor level is added, "m" for mezzanine shall be used by default.

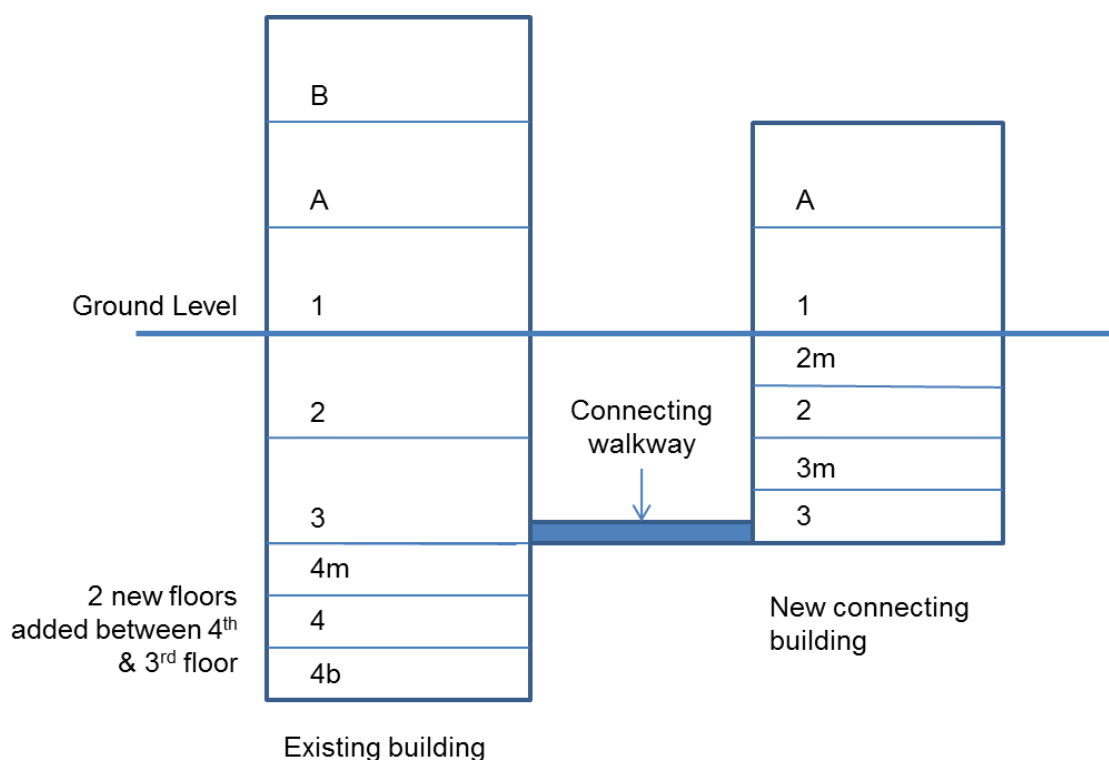


Figure 6 Using extra character to align floors

3.3.10 The level 3 code in the Building Coding System is the only LCS code level which needs an internal delineation when written in documentation etc. The building level and room number shall be delineated by a forward slash (e.g. C/123). This differentiates it from a level 1 code (e.g. C123, Oxford Circus).

3.3.11 On site, the level 3 code is indicated on signage plates as depicted in Fig 7 below.

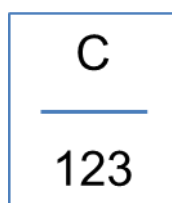


Figure 7 Example sign plate for level 3 (SID) code

Note: Buildings outside the Operational Boundary which are owned by TfL may be allocated an "X" code by Engineering (in the range X001 – X999). This is simply to create a unique identification and does not define the building's location. This is usually done to create a code to enter as 'location' in the asset register if the building, or something contained within the building, needs to be registered as an operational asset.

4 Responsibilities

4.1 Principal Engineer Leader – Digital Systems Integration

- 4.1.1 The Principal Engineer Leader – Digital Systems Integration is the issuing authority and custodian of all LCS codes.

5 Supporting information

5.1 Rules for applying LCS to roads within Depots or sidings

- 5.1.1 A road is defined as a continuous route through points set at 'normal' and terminating at a buffer or toes of an adjacent road or main line.
- 5.1.2 Where 'normals' do not exist, the continuous road follows the lowest numbered road terminating at a buffer or toes of an adjacent road or main line.
- 5.1.3 LCS sections that have buffers at both ends are measured with zero at the start of rail behind the buffer beam and will follow the direction of the nearest main road. Where this rule cannot be applied, the direction of the road is defined as the direction of the incremental increase of the LCS level 1 code.
- 5.1.4 Roads terminating at bufferstops/arrestors will be measured from the toes of the points entering the road at "0" and increasing in length towards the bufferstops/arrestors.
- 5.1.5 Bi-directional and through-running roads in Depots or sidings shall follow the direction of the nearest main road. Where this rule cannot be applied the direction of the road will be defined by the direction of the incremental increase of the LCS level 1 code.

5.2 Rules for applying LCS to roads within stations

- 5.2.1 The start and end locations of roads that run adjacent to a platform but do not have a platform will be defined by the top of ramps or Headwall of the nearest platform in the direction of running (e.g. D203/PEBFA).
- 5.2.2 The direction of the incremental increase of roads at terminating stations is measured from the top of ramp (TOR) or Headwall towards the bufferstop/arrestor.
- 5.2.3 The direction of the incremental increase of roads at terminating stations that have overruns is measured from the top of ramp or Headwall in the direction of normal running.

5.3 Rules for applying LCS to crossover routes

- 5.3.1 Crossover routes are defined by using the Level 3 and 4 codes to identify the number of the points and the direction of travel between the sections of the points. For instance a crossover at points number 67 running from section A to section B would be designated as 67AB (Level 3 = 67, Level 4 = AB). See Fig 6 below:
- 5.3.2 The naming convention for the level 4 code for a crossover route shall follow the most likely order of traversing the crossover. If the crossover is commonly used as a bi-directional crossing then "AB" shall be used.

- 5.3.3 Crossover routes with three digit point numbers (e.g. 228) shall combine the level 3 & 4 codes to show the full point number, together with the suffix "X". For example, 228A to 228B shall be recorded as 228X.
- 5.3.4 Crossover routes between two differently numbered points shall use the last two digits of the 'from' points for the level 3 code and the last two digits of the 'to' points for the level 4 code (e.g. from points 209 to points 210 would be "0910").
- 5.3.5 The running line code for crossover routes shall be the code of the originating LCS for the crossover. For example, crossover route 67A pts on D205/DEBLO to 67B pts on D205/PEBFA shall be assigned a "D" maintainer code and shall be called D205/D67AB. See Fig 8 below:

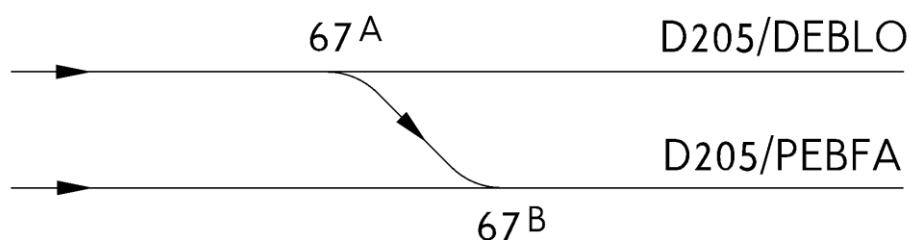


Figure 8 Crossover Route D205/D67AB

5.4 Three Letter Station Codes (TLA)

- 5.4.1 TLAs have been issued in the past by the various different modes (DLR, LU, Tramlink etc.) without reference to each other in most cases, leading to many examples of duplication. However, as they are used in various different travel information and planning systems, both internal to TfL and externally (for instance, they are used by application (app) developers), they cannot be changed retrospectively. They are not part of the Location Coding System, but the requirements for them are included in this standard in order to ensure consistent application in the future.
- 5.4.2 An exercise to map all the TLAs against all the Station names was completed in late 2012 and the result is a tabulated list that is published on the LU LCS intranet site.
- 5.4.3 If a new TLA is required, please advise the Principal Engineer Leader – Digital Systems Integration, who will apply the following rules:
1. If the station name is a single word, the code shall be the first three letters of the station name
 2. If the station name is two words, the code shall be the first two letters of the first word and the first letter of the second word
 3. If the station name is three words, the code shall be the first letter from each word.

- 5.4.4 If the resultant code is already in use (as shown on the published list), then a new code shall be created using the following modified rules:
1. If the station name is a single word, the code shall be the first two letters and the fourth letter of the station name
 2. If the station name is two words, the code shall be the first letter of the first word and the first two letters of the second word
 3. If the station name is three words, the code shall be the first two letters of the first word and the first letter of the second word.
- 5.4.5 If the second attempt still results in an existing code then the Head of Engineering Information shall use a further modification of the above rules, following the same basic principles, until a unique code is created.

6 Person accountable for this document

Name	Job title
John Park	Principal Engineer Leader – Digital Systems Integration

7 Definitions

Term	Definition	Source
Headwall	The point at which the station joins the tunnel in the direction of running; i.e. The wall enclosing the end of platform at the entrance to a tunnel.	Glossary
Building Coding System	A sub-set of LCS to identify buildings and specific areas within them	This standard
Operational Boundary	The boundary of the operational area which contains the track and related systems, structures and installations; normally the site of the fence line.	Glossary
Separate Building	A detached building that has its own walls and roof but may have a common base with another structure.	Glossary
Station Envelope	The area enclosed by the Operational Boundary of a station and including any structure that forms part of, or is integral to the station complex and is directly accessed from the Station Envelope.	Glossary
Track Metreage	The distance in metres from a known datum point to the required measurement point along the centre line of the track.	Glossary
LCS Boundary	The 'zero datum' point from which metreage is measured within a given LCS Level 1 area. This is a fixed point defined by easting and northing coordinates which are established and managed by the Land Survey team.	Glossary
Depot	A Separate Building for the stabling and repair of rolling stock. Note: Depots are outside the scope of ROGS regulations.	Glossary

Printed copies of this document are uncontrolled.

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8 Abbreviations

Abbreviation	Meaning
CAD	Computer Aided Design
LCS	Location Coding System
SID	Station Area Identification
TLA	Three Letter Abbreviation

9 References

Document no.	Title or URL
S1037	Computer Aided Design (CAD) Data
S1041	Engineering Asset Information
LT-IMS-ENG-060	London Tramlink LCS Standard

10 Document history

Issue no.	Date	Changes	Author
A1	October 2007	First authorised for use	
A2	May 2009	Revised following PSC S1-01181 comments	H McCartney
A3	November 2013	Updated to correct minor anomalies and to include rules for allocating LCS to roads. In addition, rules for allocating Three Letter Abbreviations to stations were included and the section on RID codes was removed. Refer to DRACCT Ref No 01925	J Park
A4	August 2018	Revised to extend scope to all of TfL rail assets. Also minor anomalies corrected and rules for naming additional floors in buildings added. Change No. CR-10199.	J Park