Asset Information Management Framework

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1 Purpose

This Asset Information Management Framework details the framework being used by Crossrail to specify, acquire and manage good quality asset information. It is based upon good practice approaches to asset information management, which will enable asset information deliverables to be delivered in a cost effective and timely manner.

1.1 Principles

This Framework has been developed based upon a number of key principles:

- Asset information is a key input to a number of Crossrail processes and systems;

- Asset information is a key enabler for short and long term asset management approaches by the Infrastructure Managers and should be provided in formats and timescales that support these objectives;

- The provision of asset information is a process that runs throughout the duration of an engineering project;

- Asset information, if not gathered at the appropriate point in a project, will be more expensive and difficult to retrospectively gather and cannot be fully utilised during the project lifecycle phase;

- Information provision processes shall be managed, assured processes with progress and issues visible to relevant stakeholders;

- Good practice approaches to asset information have been adopted where relevant and adapted to the requirements of Crossrail;

- Optimised processes and information delivery mechanisms should allow the overall cost of asset information provision to be delivered at optimum cost yet maintaining a world class standard of quality for the complete suite of asset information gathered;

- TfL require detailed information on the assets that have been provided as part of the Crossrail Programme.

1.2 Updates

This document will be reviewed and updated normally on a 6 monthly basis, but no longer than annually.

Please note – This document was formerly known as the Asset Information Management Plan. To avoid confusion with documents in the Crossrail CMS, from Revision 9 onwards this document is known as the Asset Information Management Framework.

2 Scope

The Crossrail Programme includes all the works and activities necessary for Crossrail Limited (CRL) to construct and commission a new railway from Reading and Heathrow in the west to Shenfield and Abbey Wood in the east.

This Framework covers the provision of asset information from the Central Section Works (CSW) of the Crossrail Programme which includes Facilities such as, Stations, Portals, Shafts,

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Comms & Control, Control Centres, Depot, Sidings, Signalling & Train Control, Track, Tunnels, Power and Rolling Stock (Train Control assets only).

Asset information arising from permanent assets which are being handed over to LU or RfL as part of Crossrail Programme of works are covered in the scope of this Framework. LU, NR or similar Interface Works which do not form part of the Crossrail Programme of works are out of scope.

The term asset information is used as a generic term for:

- Asset inventory;
- Classification of assets;
- Attributes of these assets;
- Location and spatial information of assets;
- Relationships between assets;
- Design models (including schematics, 2D, 3D and 4D CAD models and related data);
- Documents, drawings and records of assets and systems including test certificates, Operation and Maintenance Information and Health and Safety File information; and
- Photographs.

Asset information is being created as part of an overall BIM environment, as detailed in the Crossrail BIM Principles document (CR-XRL-Z3-RGN-CR001-50005).

The principal Industry Partners are:

- Transport for London (TfL)
- **Rail for London (RfL)
- Network Rail (NR);
- **London Underground Limited (LUL);
- Canary Wharf Group (CWG);
- Bombardier; and
- Contractors – this includes Framework Design Contractors (FDC), Design and Build Contractors and Construction Contractors.

This Framework is applicable to all the above parties when engaged in CSW delivery activities.

**these Industry Partners are also the key Crossrail Infrastructure Managers.

2.1 Out of Scope

- Management and utilisation of asset information once transferred to the Infrastructure Managers;
- LU, NR or similar Interface Works which do not form part of the Crossrail Programme of works and are not delivered to LU or RfL as permanent CRL assets; and
- Information relating to Over Site Developments (OSD) and street works.

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3   Definitions, Acronyms and Abbreviations

For an explanation of the Definitions, Acronyms and Abbreviations used in this document and by CRL when describing asset information related activities please refer to the Asset Information Glossary (CRL1-XRL-Z3-GUI-CR001-50012).

The term *Contractor* is a collective term in this Framework used to refer to Framework Design Contractors, Design and Build Contractors, Construction Contractors or any other Contractor responsible for the design, build, creation, installation and commissioning of assets for the Crossrail programme.

4   Relationship to other Crossrail documents

The Asset Information Management Framework is a component of the overall Crossrail Management Plan (CR-XRL-O4-GPG-CR001-00001) and, in turn, the Technical Management Plan (CR-XRL-N2-GPL-CR001-00007).

Asset information and the activities described in this Asset Information Management Framework will also support other Crossrail activities detailed in the Crossrail Management Plan and other activities not necessarily detailed in the above documents.

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In turn, the Asset Information Management Framework is supported by a number of other documents and deliverables:

Document	eB Document Number
Crossrail BIM Principles document	CR-XRL-Z3-RGN-CR001-50005
GIS Business Development Plan 2013 – 2015 (Under Review)	CRL1-XRL-G-STP-CR001-50002
Asset Information Governance Group Terms of Reference	CRL1-XRL-Z-STP-CR001_Z-50005
Works Information 2B, Civils (13.5)	
Works Information 2B, Systems (29.2.10)	
Asset Identification Standard	CRL1-XRL-O6-STD-CR001-00031
Asset Naming and Labelling Convention	CRL1-XRL-Z3-ADDSD-CR001-50413
Asset Data Dictionary	AIM-ADD-001
Asset Data Dictionary Master Configuration	CRL1-XRL-Z3-ADDSD-CR001-50186
AIMS Equipment Request Process	CRL1-XRL-Z3-GPS-CR001-50009
CAD Standards	CR-STD-005
Information Security Management Guide	CRL1-XRL-Z3-GUI-CR001-50027
Asset Information Glossary	CRL1-XRL-Z3-GUI-CR001-50012
Asset Information Provisioning Procedure	CRL1-XRL-Z3-GPD-CR001-50004
Document Management Procedure	CRL1-XRL-Z3-GPD-CR001-50001
Asset Information Fundamentals	CRL1-XRL-Z3-GPD-CR001-50007

5   Requirements

This Framework has been developed taking into account relevant requirements of the Crossrail programme.

5.1   Asset Information Requirements

Listed in the table below are the main asset information requirements, based on good practice approaches that Crossrail should fulfil along with a brief description of the way the requirement is, or will be, fulfilled.

No.	Requirement	Fulfilled by
1.	There shall be clear specification, management and oversight of the acquisition, storage and utilisation of Asset Information	CRL have a Technical Information Department who oversee the overall specification, creation and usage of all forms of asset information and the systems and processes used to achieve this. The department includes the Asset Information & Configuration Management Team, CAD team, GIS team, Information & Compliance team and Information Applications team.

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No.	Requirement	Fulfilled by
2.	There shall be clear oversight of design related information	The CAD team to oversee both the configuration and usage of the shared Crossrail ECMS (Electronic CAD Management System) environment and the CAD data itself. The Information Applications team are responsible for compliance of design related information in accordance with the Crossrail Standards Baseline and associated requirements. Some of these requirements are automatically checked within the CAD environment.
3.	There shall be clear oversight of document based information	The Information & Compliance team oversee the configuration, usage and compliance of the Bentley eB system to specify, acquire and manage document based information
4.	There shall be clear oversight of geospatial information	The GIS team to oversee the development and usage of the GIS system and the usage of GIS data
5.	There shall be clear oversight of asset inventory information and configuration management information	The Asset Information & Configuration Management Team shall ensure that the requirements for establishing and maintaining asset information shall be based upon the Crossrail Standards Baseline and the Asset Management & Traceability requirements.
6.	There shall be clear oversight of the process for providing asset inventory information	The Asset Information Provision Team is responsible for ensuring relevant contractors populate Asset Data Collection Spreadsheets The Asset Information Provision Team monitor and manage the process of asset information provision and ensure that data consistent with Crossrail requirements is supplied consistently, and is compliant with the Asset Management & Traceability Baseline (AKA Asset Data Dictionary Master Configuration). The Configuration Management Team is responsible for importing and exporting data from AIMS, AIMS system configuration, making status reports available and configuration of asset tags and related information once passed from contractor to employer.
7.	Access to create and edit assets in AIMS will be tightly controlled	The Asset Information & Configuration Management Team will be the only team allowed to create assets and edit asset hierarchies in AIMS in order to maintain the quality and consistency of the information in AIMS
8.	There shall be clear business ownership of the AIMS system	The Asset Information & Configuration Manager is responsible for the overall management and development of AIMS
9.	Information providers shall be given clear guidance over what information they shall provide and to what timescales	The Asset Information Provision Team shall provide Contractors with requests to supply asset information, details of the asset information to be supplied and the timescales for provision. For documents, the Master Deliverable Lists (MDL) for each Contract will detail what needs to be provided and when
10	Asset information shall be provided in a timely manner and in an agreed format	The Contractor shall provide the requested asset information in the format requested and to the required timescales to allow AIMS to be updated to reflect assets either under construction or as built. The Asset Information and Configuration team shall provide overall forecasts and monitoring for asset information provision across the Programme

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No.	Requirement	Fulfilled by
11	AIMS shall be configured so that information is acquired and stored in ways that easily support future usage	AIMS shall enable storage and access of the following information to CRL standards which shall be reviewed and accepted by Infrastructure Managers: a) Asset Identification b) Asset Location c) Asset Classification to a Crossrail specific adaptation of the Uniclass standard d) Asset Status e) Asset Criticality f) Asset Attributes specific to the relevant class of asset and consistent with the attributes required by Infrastructure Managers. g) The capability to store identifiers to allow linkage to other information systems
12	There shall be clear specification of the information to be provided	Asset Data Collection Spreadsheets are formatted to present the information requirements specified in the Asset Data Dictionary in a clear and intelligible manner
13	Asset information shall be provided in a timely manner	The Asset Information and Configuration Team will maintain awareness of project progress and will align asset information provision activities with other relevant Crossrail activities. Provision will be specified and controlled using the Asset Information Provision Process
14	Crossrail shall comply with BIM Level 2 (2008 baseline) by 2016	The approach to the specification, acquisition and management of data compliant with BIM is detailed in the Crossrail BIM Principles (CR-XRL-RGN-CR001-50005).
15	All assets shall have a unique Crossrail ID	AIMS configuration ensures that all assets, down to the line replaceable unit, shall have unique identification.
16	Assets shall have a human readable name and number that aligns with numbering in use at adjacent LUL facilities	Assets will have a clear asset name that conforms to the Crossrail Asset Identification Standard. Any asset numbers included in the name shall be based on local numbering conventions agreed with the relevant IM e.g. the first Crossrail escalator being Escalator 6 in the overall station facility.
17	There shall be a clear and unambiguous method for identifying assets when on site	Asset identification shall be achieved through the use of standard format asset/equipment labels which include data matrix bar codes as specified in the Crossrail Asset Identification Standard (CRL1-XRL-O6-STD-CR001-00031). If there is a requirement to utilise RFID tags then these will be detailed in the relevant AD4 document
18	There shall be clear safeguards for asset information that has been exported from Crossrail systems to Contractors to prevent loss or corruption	Throughout the contract, the Contractor shall be responsible for the safe storage and management of any extracts of AIMS supplied to them. They shall maintain suitable controls to prevent the loss, deletion, corruption, unauthorised manipulation or degradation of asset data consistent with current industry good practice
19	There shall be clear ownership and control of asset information by Contractors	The Contractor shall nominate a relevant senior employee as Data Owner who shall be accountable for the management, storage and population of asset data. The Data Owner shall attend, and contribute to, Asset Information Governance Group meetings if requested (see Section.8)
20	Information supplied to Contractors shall be managed securely	Information supplied to Contractors will have adequate controls in place that are consistent with Information Security Management Guide (CRL1-XRL-Z3-GUI-CR001-50027) and that these controls will be reviewed and tested for effectiveness on a regular basis

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No.	Requirement	Fulfilled by
21	There shall be effective control of CRL reference data	If changes are required to CRL standard reference data, then the Data Owner or Contractor shall discuss the proposed change with relevant Technical Information Department staff to confirm whether a change is required, or whether more guidance/training is required. If a proposed change is valid, changes are to be submitted to the CRL change control process as soon as practicable
22	Data provided by Contractors shall be of suitable quality	The Contractor shall ensure that all data population and updates are consistent with CRL quality requirements. This shall include ensuring that the accuracy, validity, precision, completeness and timeliness of asset information comply with CRL standards. Quality will be assured by relevant monitoring and audits
23	Contractors shall demonstrate that they are providing asset information that meets CRL quality criteria	The Contractor shall instigate suitable checks and audits of data quality to demonstrate that CRL standards are being complied with. They shall demonstrate the effectiveness and outputs of these processes to the Project Manager, when requested
24	Information from Interface and Enabling works shall be provided to the relevant Infrastructure Manager	For Interface or Enabling works, the Contractor should follow existing Infrastructure Manager standards and processes
25	There shall be clear recognition that CRL will not exist as an organisation once all the assets are handed over to the Infrastructure Manager(s)	Standards, processes and systems are being developed to support handover to future operators and maintainers of Crossrail. Alignment to IM business change programmes. Note that eB and various other CRL systems may remain 'live' for some time after official handover of Crossrail
26	There shall be recognition that some assets owned by one organisation may be located in premises owned by a different organisation	All assets will be related to an 'Owner' organisation in AIMS which will be based on the 'Crossrail IM Boundaries' document.
27	There shall be allowance for multiple asset identification codes to be utilised for some assets to allow them to appear in more than one organisation's asset registers	AIMS will be configured to support third party asset identification, if required, in addition to an assets unique ID. CRL will not actively ensure uniqueness of these third party asset identifiers
28	There shall be the ability to export and validate all relevant data to the Infrastructure Manager(s) prior to handover of assets	Approach to asset information handover being established to ensure information is available to IMs when required
29	There shall be capability to be able to codify assets against asset location standards in use in NR, RfL, LUL and the CRL programme itself	AIMS can be configured to support different location recording standards
30	There shall be allowance for the fact that assets will be at different stages of their lives	Recognition that some assets will still be in the design stages and designs may not be confirmed for some time, nor will some assets be constructed for some time. Processes and overall approach developed to align to project progress

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Requirements specific to Contractors have been specified in Works Information 2B, however, depending on when a Contract was let, different versions of the clauses may have been used:

- WORKS INFORMATION Volume 2B – General Requirements (Civils), section 13.5 'Asset Management & Traceability'; and
- WORKS INFORMATION Volume 2B – General Requirements (Systems), section 29.2.10 'Asset Management & Traceability'

5.2 Standards

5.2.1 Standards baseline

The Standards for the central section of Crossrail are defined and specified in the Crossrail Standards Baseline. This baseline contains an agreed subset of standards from the Industry Partners and CRL. These standards are fixed in accordance with the Standards Management Procedure (CRL1-XRL-06-GPD-CR001-50001) sections 3.2 and 3.3.

5.2.2 Standard defined approaches not on the Standards Baseline

There are a number of defined standards approaches that are relevant to this Framework, but are not on the Standards Baseline. These include:

- Asset Data Dictionary Master Configuration - CRL1-XRL-Z3-ADDSD-CR001-50186 and all documents referenced
- Asset Naming and Labelling Convention Document - CRL1-XRL-Z3-ADDSD-CR001-50413
- Operation & Maintenance (O&M) Information Requirements - CRL1-XRL-K2-ZTM-CR001-50001

5.2.3 Deviations from Standards

Some deviations from relevant standards will be by agreement with the relevant Infrastructure Manager. Currently agreed deviations are:

- LU Standard 1-035 "Location Coding System" permits the allocation of LCS Level 1 Codes to (i) stations, (ii) the sections of railway between stations, and (iii) depots only. LU has formally issued LCS Level 1 Codes to Crossrail on this basis. Crossrail have also assigned codes to shafts, portals, and other structures that are offset from the railway. LU does not recognise these codes as LCS Level 1 Codes, however LU has no objection to the codes being used.

6   Processes

A number of processes will be utilised to support the specification, acquisition, storage and management of asset information.

Key processes include:

- Asset Information Provisioning Procedure - CRL1-XRL-Z3-GPD-CR001-50004
- O & M Information Provision Procedure (In Development) - CRL1-XRL-Z3-GPD-CR001-50011
- AIMS Equipment Request Process - CRL1-XRL-Z3-GPS-CR001-50009 -
- AIMS Equipment Allocation Process - CRL1-XRL-Z3-GPS-CR001-50011

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- Asset Naming and Labelling Convention Document - CRL1-XRL-Z3-ADDSD-CR001-50413

7 Schedule

An overall Technical Information Department Handover Master Schedule will be developed, monitored and refined to provide an overview of the required information deliverables and the status of these deliverables at any point in the Programme.

Monitoring of progress will be undertaken on a regular basis by the Technical Information Department with further monitoring taking place during AIGG meetings, see Section 8.1.

8 Governance

An Asset Information Governance Group has been established to provide ongoing governance of the standards, provision, storage and usage of asset information by Crossrail. The frequency of meetings is between 1 and 3 months. Meeting frequency will tend to increase as programme delivery activity increases.

The Objective of the Crossrail Asset Information Governance Group (AIGG) is:

"The execution and enforcement of authority over the provision and management of asset information related to the Crossrail programme. These activities will ensure that asset information will support the long term management of these physical assets both whilst under CRL control and subsequently when transferred to the control of the relevant Infrastructure Managers."

See separate AIGG Terms of Reference Document CRL1-XRL-Z-STP-CR001_Z-50005 for information on the scope, attendees, frequency and powers of authority.

8.1 Monitoring

A key aspect of governance, particularly relating to the current point in the programme, will be regular monitoring of all aspects of information provision. This is needed both to support CRL in managing the information provision processes, but also to provide assurance to the Infrastructure Managers that progress is on track and that any emerging issues are identified and addressed promptly.

A range of specific tracking tools are being utilised to monitor information provision. These will be enhanced and adapted over time as understanding develops and to respond to specific issues and requirements.

Checking and reporting of progress on information provision activities will need to be undertaken by the most appropriate staff. Whilst Crossrail Technical Information may be most able to check the volume and validity of information through different reporting tools, CRL Delivery will be most able to check the accuracy and suitability of information. These processes will be reviewed and refined over time in order to improve overall efficiency and effectiveness.

A review of the current status of these tracking tools will be a core part of each AIGG meeting, thereby providing a clear view of the position relating to information provision, identification of potential and actual issues and agreement of mitigation actions.

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9   RACI

A number of different organisations, teams and roles are involved in the specification and provision of asset information. The table below illustrates key Responsibilities, Accountabilities, who is Consulted and who is Informed. This is a generic RACI approach that applies to all types of asset information. Specific roles and responsibilities should be defined in relevant process documentation.

Role/Team	CRL Technical Information	CRL Delivery Central Team	CRL Delivery Site Teams	CRL Central Engineering Group	CRL IT	Crossrail Contractors	Infrastructure Managers
Define generic specification/requirements for information	A/R	C	I	R		C	I/C
Provide relevant systems/tools to support information provision	A/R	I	I		R	I	
Define process to be followed for information provision	A/R	C	C	C		C	I
Define contract specific MDL	I	R	A/R			I	
Provide information according to requirements	R	R	R	I		A/R	
Monitor information provision process	A/R	I	R	I		R	I
Check quality of information	R	A/R	R	R		R	C
Store supplied information	A/R				R		
Transfer information to IM	A/R				R		R

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