Rail Baltica

RBDG-MAN-035-0101

Design Guidelines

Codification & Data Management

24-07-2019

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Connecting Europe Facility

Contents

1. Codification

1.1. Introduction

These standards apply to all BIM models produced within Rail Baltica project.

The intent of these standards is to provide guidelines to ensure that all BIM models and its contents are prepared to be digitally managed with a consistent, standardized and uniform data structure and appearance, so that it can be possible to capture the data information and facilitate the re-use and consumption by any actor or stakeholder involved in the project life cycle. (Design, Construction and Operation)

This document is subject to be updated throughout the life cycle of the Rail Baltica project, therefore at the kick-off meeting before any Design/Construction/Operation stage, the latest version of this document (and any other of the BIM Manual ecosystem) must be confirmed.

1.2. Supporting documents

This codification standards follows the Detailed BIM Strategy defined by the BIM Manual and its supporting documents. The BIM Manual is the ruling document in the hierarchy of the codification standards.

The accompanying documents that support this Codification standards are:

1) The Codification Tables: RBR-DAT-BIM-BMA-0004.xlsx. This spread sheet includes an explanation of the File Naming Convention and the lists of data dictionaries needed for some of the attributes, the ones defined from standardized lists.

   All data provided in the codification tables should be interpreted as a basis for the development of the project, and may be expanded according to the needs of the project with the previous approval or RB-Rail AS.

1.3. File/BIM Models' naming

Following codification will be adopted:

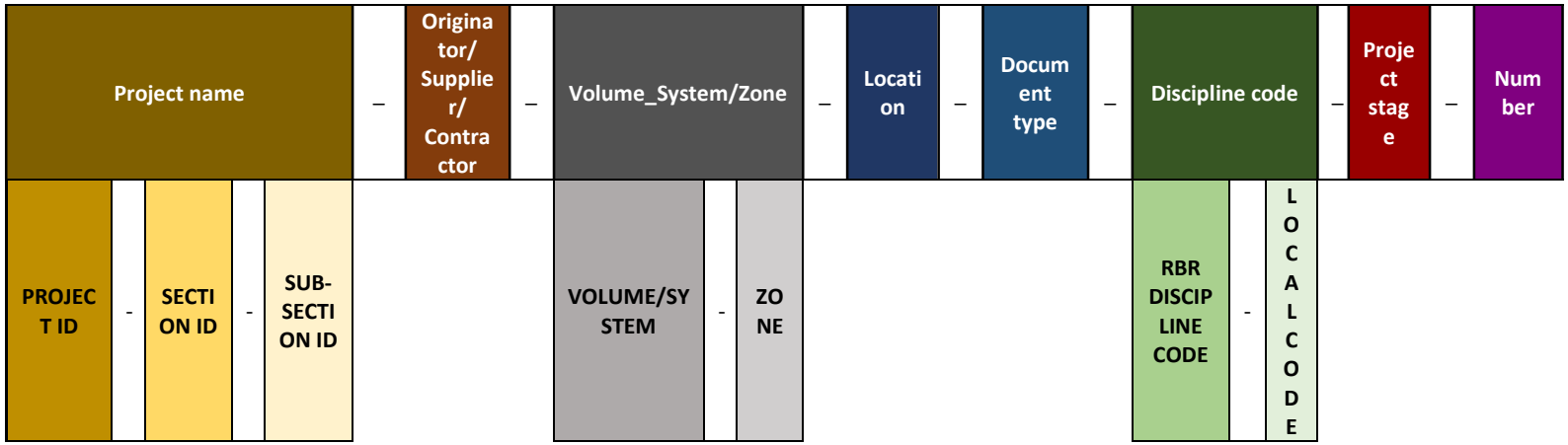


Figure 1: BIM Models' naming

[PROJECT ID]-[SECTION ID]-[SUB-SECTION ID]_[ORIGINATOR]-[VOLUME/SYSTEM]-[ZONE]_[LOCATION]_[DOCUMENT TYPE]_[RBR CODE]-[LOCAL CODE]_[PROJECT STAGE]_[NUMBER]
Example:
RBDTD-EE-DS3-DSP3_RBR_B001-ZZ_ZZZZ_BM_BR-XX_XYZ_00001

Generally, these names are self-explanatory: (See RBR-DAT-BIM-BMA-0004.xlsx for related tables, shall apply and be expanded upon to meet project specific needs.)

- **Project**: Single common project identifier independent and recognizably distinct from any individual organisation's internal job number. It is composed of three fields:
    - **PROJECT ID**: Project name according to DTD TS (eight characters, five+[-]+two)
    - **SECTION ID**: Section Name according to DTD TS (three characters)
    - **SUB-SECTION ID**: Sub-section name according to DTD TS (four characters)
- **Originator**: A unique identifier shall be defined for each organisation on joining the project. The unique identifier should identify the organisation responsible for creating the data. (Three characters)
- **Volume_System/Zone**: the specific Volume_System (Physical sub-division 1, four characters) and Zone (Physical sub-division 2, two characters) of the model the file describes. A matrix of Volumes_Systems and Zones will be created at the project outset by RB Rail AS.
- **Location**: the Location within the model (Physical sub-division 3, four characters). Designed to have a third level of physical division that allows a better location of the model. A matrix of location identifiers will be created at the project outset by RB Rail As.
- **Document Type**: the type of file being developed and used, each file should contain a single type of information for instance a model, drawing, or data file (two characters).
- **Discipline code**: the discipline that the file relates to for instance track design, Overhead Line, structural etc. It is composed of two fields:
    - **RBR Discipline Code:** General discipline codes (two characters).
    - **LOCAL CODE:** Discipline code according to local legislation (two characters).
- **Project Stage:** Abbreviations of the project stages (three characters)
- **Number**: the number of the file within this discipline. (Disciplines can break this serial number into sections to manage aspects such as work packages and is managed by the Project Manager, Project Information Manager or BIM Manager). (five characters)

Note: Volume_System, Zone and Location, defined as manageable spatial subdivision of a project, defined by the "project team" as a subdivision of the overall project that allows more than one person to work on the project models simultaneously and consistent with the analysis and design process.

Example:

XXXXX-XX-DD1-DDT1_AEC_E001-SS_0000_BM_AR-XX_DTD_00001_001

Project ID: XXXXX-XX

Section ID: DD1

Sub-Section ID: DDT1

Originator: AEC=AECOM

Volume_System/Zone: E001SS, E001=Station number 1, SS=Substructure

Location: 0000=No location applicable

Type: BM=BIM Model

RBR discipline Code: AR=Architectural

Local Code: XX

Project Stage: DTD

Number: 00001

1.4. BIM Models' Attributes codification.

The attribute codification depends on who defines the attribute: (See RBR-DAT-BIM-BMA-0004.xlsx for related tables, shall apply and be expanded upon to meet project specific needs.):

- **Mandatory attributes defined by RB Rail AS** for the defined BIM Cases of the project, defined by RB Rail AS, will have the following schema:

  RBR-[attribute description**]**

- **Custom attributes defined by the Service Provider / Supplier** for their needs, will be named as follow:

Originator: the name of the designer/contractor who created the attribute.

Group: code to identify similar characteristics.

Description: Brief summary of identifying characteristics.

See example below:

Figure 2: Models Codification

AAA-GGG-[attribute description**]**

RBR-Project

Example: ORG-HVA-Air flow

It is an attribute for HVAC used to define the air flow by the originator ORG

1.5. BIM Models' objects'/elements' codification (Naming)

The Objects/Elements naming conventions developed are based in four main fields: (See "RBR-DAT-BIM-BMA-0004_CodificationTables.xlsx")

- **Originator:** the name of the designer/contractor who created the attribute.
- **Discipline:** the discipline code (RBR-Discipline_Code) that the file relates to for instance track design, Overhead Line, structural etc.
- **Object category code:** code to identify similar object characteristics.
- **Description:** Brief summary of identifying characteristics.

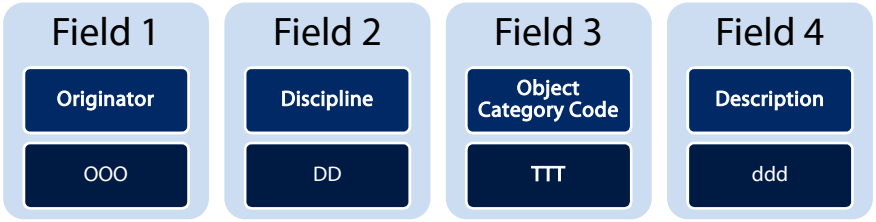


Figure 3: Objects Codification

OOO-DD-TTT-[Object description]

Example: ORG-DR-MHL-Precast manhole 500x500x500

It is a drainage element, of manhole type, created by ORG described as a precast manhole of 500x500x500

Example: AEC-CV-CBM-1000x1000 Box Girder

It is a Civil element, of type concrete beam, created by AEC and described as a box girder of 1000x1000

1.6. BIM Model's objects'/elements' classification

It is important to define some terms before entering the classification: (See "RBR-DAT-BIM-BMA-0004_CodificationTables.xlsx")

- **Object/Element Type** = A catalogue item where the properties for that item are the same for all occurrences of that asset
- **Object/Element Instance** = An item from a catalogue that is installed in your facility where the properties for that asset are unique to its installation

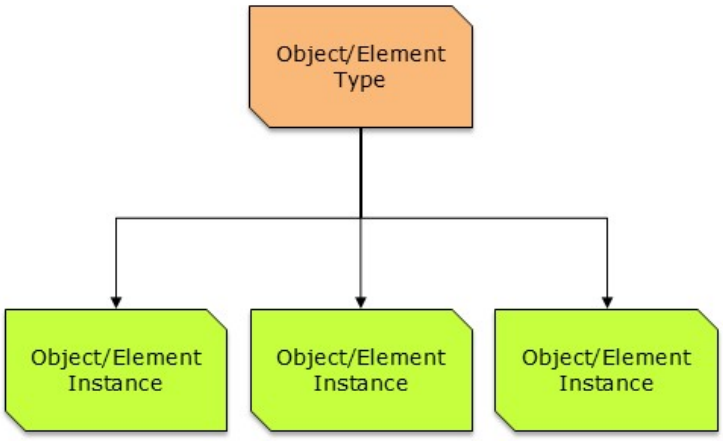


Figure 4: Types and Instances

Each and every BIM object/element (instance) must be coded and classified according to “UNICLASS 2015” table “Pr Products”.

To achieve this, each object / element will have a attribute called "**RBR-Pr_code**" that will be completed with the corresponding code from the "UniClass 2015, Pr Products" table.

Example:

ORG-DR-MHL-Precast manhole 500x500x500

RBR-Pr_code=Pr_65_52_01_20

Commonly, to get some element rightly modelled, it is necessary to include within the model some auxiliary elements, those auxiliary elements that are not part of the design itself and should not be taken into account will be coded as **Pr_00_00_00_00** (note: “0” is “zero”)

1.7. Room Naming/Space Naming

Following codification will be used: (See “RBR-DAT-BIM-BMA-0004_CodificationTables.xlsx”)

AA_classCode_BBB

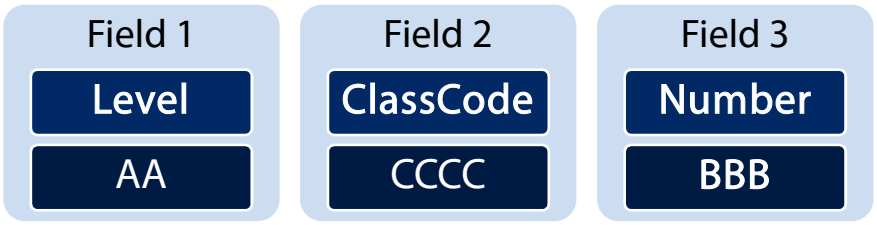


Figure 5: Room/Space Naming

AA= Level code (see Level Naming)

ClassCode= Class Code based on codification tables (variable length)

BBB = Three digit integer number

Example: 01-VIP-002

This a room, placed at Level 01 above ground surface, classified as “Vehicle inspection pits”, room number 002

Rooms and spaces must be codified according to Unicalss2 SL tables, these codes will be stored in the attribute “RBR-RSClassification”

The “RBR-RSClassification” value for the previous example is: SL_20_45_95

1.8. Material Naming

Materials must be named according to the following criteria:

Material naming consists of two fields:

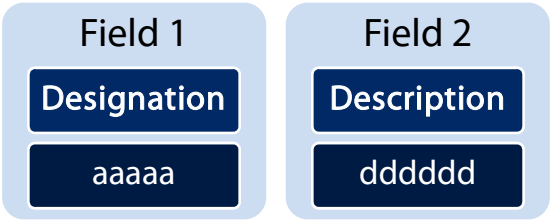


Figure 6: Material Naming

- **Designation:** according to the European Standard (EN, Eurocodes…) whenever there is an European standard.
- **Description:** Brief description of the material

Examples:

S275_StructuralSteel → (Eurocode 3)

C30_Concrete →(Eurocode 2)

B500A_ReinforcementSteel →(Eurocode 2)

C22_Timber→ (Eurocode 5)

The use of any material within the project must be previously approved by RB Rail As, during the coordination meetings.

Elements within the model will have two parameters related with the material naming (See BIM Objects Attribute Matrix: RBR-DAT-BIM-BMA-0005.xlsx document for attributes):

RBR-Material_designation= Designation (Material Naming field)

RBR-Material_Description= Description (Material Naming field)

1.9. Level Naming (BIM Models)

The levels correspond to the level of the project and must follow the following typography:

2 digits	Level
00	Without reference
NT	Roofing
TR	Top of Rail
XX	Level XX above LL
MX	Mezzanine level x
LL	Level coincident with the ground surface, land level.
SX	Level X below Ground Level

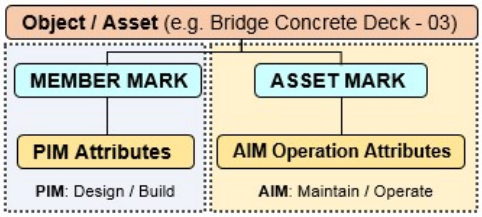
Table 1: Levels naming

2. Data Management

Attributes are data fields populated with pieces of information attached to each BIM object to provide different types of information, like physical/geometrical characteristics, classification codes, locations, relationships, or data related to the BIM use cases, for instance.

Attributes are divided into groups according to their subject and the gathering of information is gradual according to the scope/purpose of the project lifecycle stages, and it is defined depending on the LoI (Level of Information).

BIM Objects Attribute Matrix: RBR-DAT-BIM-BMA-0005.xlsx is the spreadsheet that includes the list of data attributes to be populated in the BIM objects and the definition of when those attributes must be populated during the project lifecycle.



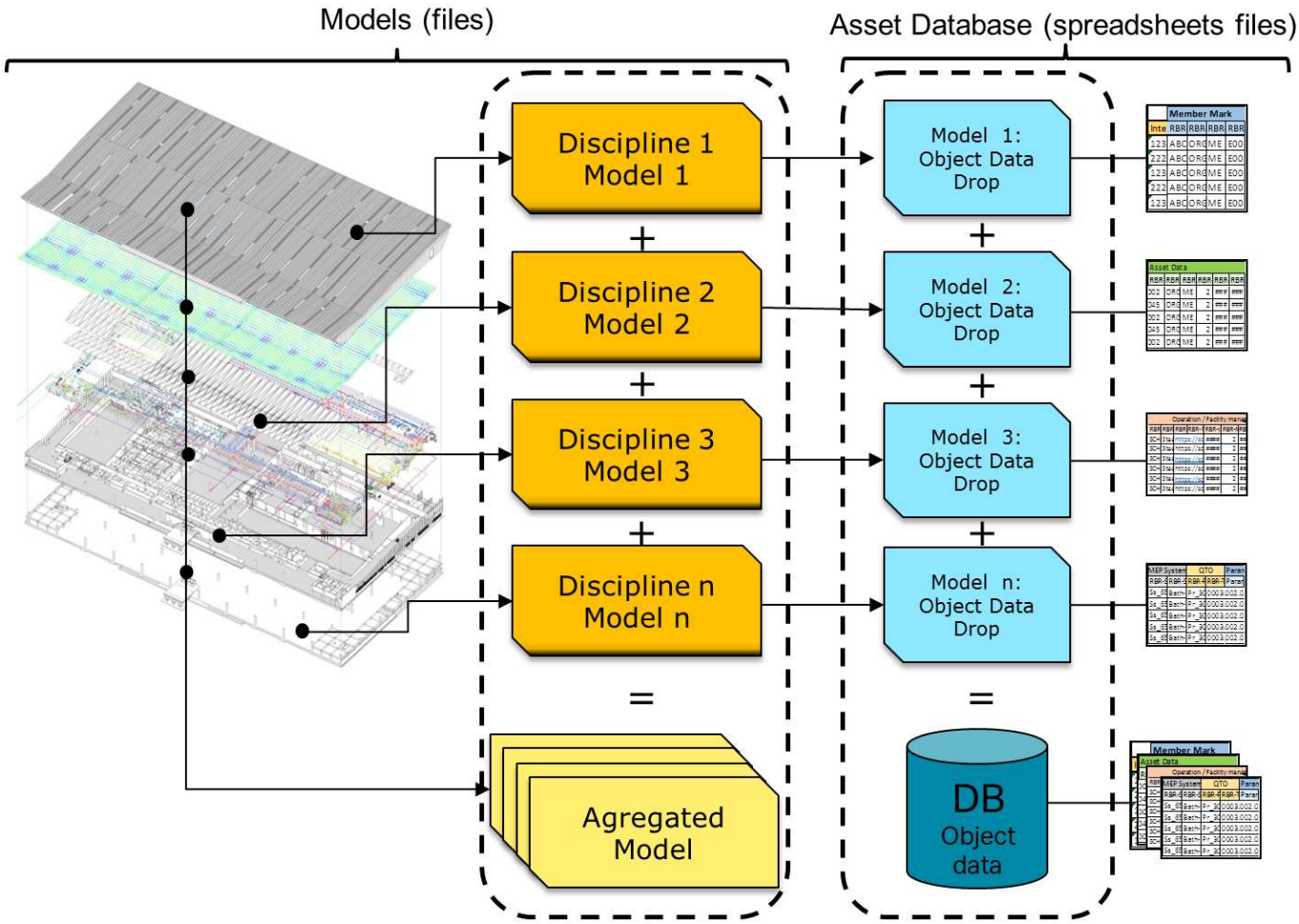
2.1. Information Lifecycle through PIM and AIM (data)

The Information Lifecycle is introduced in the BIM Manual's "Information Lifecycle through PIM and AIM" chapter within the "BIM Delivery Process" Section. This chapter describes how the information is stored in those two phases the process of migration between them.

2.1.1. PIM storage and data structure

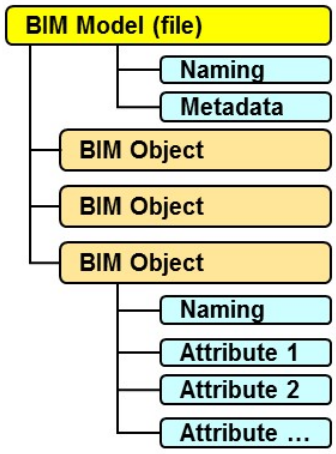
As described in the "Life cycle approach" chapter within the BIM Manual's "BIM Delivery Process" Section, the Project Information Model (PIM) that exists during the Design and Construction stages, is stored collaboratively within one or various Common Data Environments (CDE), having a **file based approach**.

The file based approach means that the information, no matter the source, is stored in the shape of files. Those files are reports, documents, drawings, BIM models and their data extractions (the data drops).

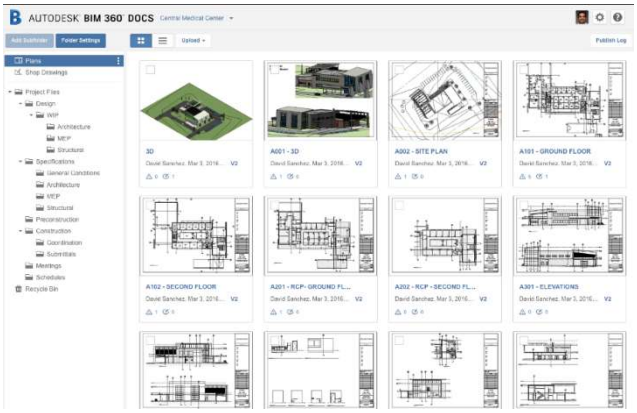


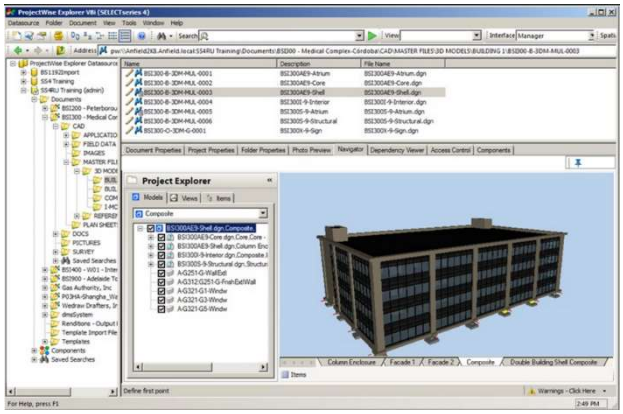
Among those files, the data drops (the data extraction from the BIM models) take a key role in the life cycle because will be used as the means to carry out the migration from the PIM to the AIM. For further details about the files, see "Model Delivery Plan" Section within the BIM Manual.

It is important to mention that the information is not only stored in the files themselves (for instance with the file naming and the metadata, stored within the CDE) but inside the existing BIM objects located in the BIM models. Some BIM objects are elements, spaces, rooms, facilities, equipments, furnitures, alignments, corridors… modelled in the BIM models. All those objects will have their own naming (called Member Mark in the Rail Baltica PIM) and attributes with the information requested by RB Rail AS, the local implementing bodies or the Infrastructure Managers. For further details of the BIM objects, see "BIM objects' definition" Section of the BIM Manual.



As mentioned, the files are stored (and shared) in the Common Data Environment (CDE), which is described in the "Rail Baltica CDE" Section of the BIM Manual. Under these lines, two examples of CDEs are shown, Autodesk BIM 360 and Bentley ProjectWise.





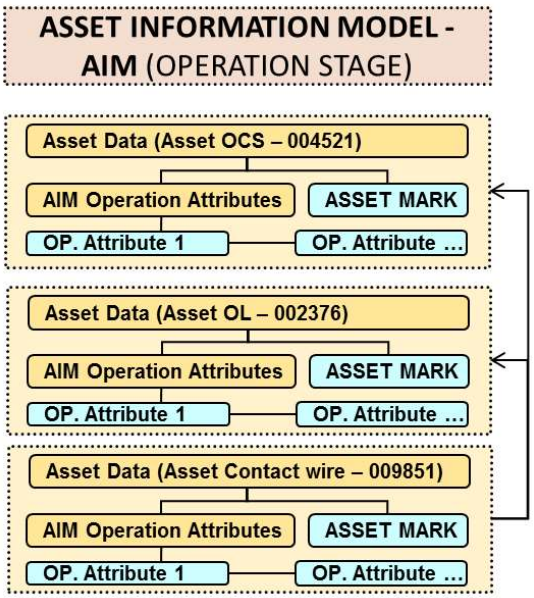
2.1.2. AIM storage and data structure

As described in the "Life cycle approach" chapter within the BIM Manual's "BIM Delivery Process" Section, the Asset Information Model (AIM) that exists during the Operation & Maintenance stage, is stored within one or various environments with different capabilities. One of them is the Common Data Environment (CDE), having a file-based approach with the same structure (if not strictly the same environment) and data of the As-Built documentation; and an Asset Register, having a data-based approach.

The AIM CDE will not be described because it follows the same rules of the PIM CDE, being only different on the data stored, the AIM CDE stores the As-built documentation (final version of models, drawings, documents and reports) and nothing else, whilst the PIM CDE stores the different versions of the documentation, (Master Design stage, Detailed Design Stage, Construction stage… and its sub stages, 20%-40%-60%.....)

The same CDE can be used for both PIM & AIM, but depending on RB Rail AS, different CDEs could be used if there is the intention to have it split, for instance having a CDE for PIM and another one for AIM purposes. RB Rail AS will drive a CDE/Asset Register Technology Implementation and will define their environments to the different actors involved.

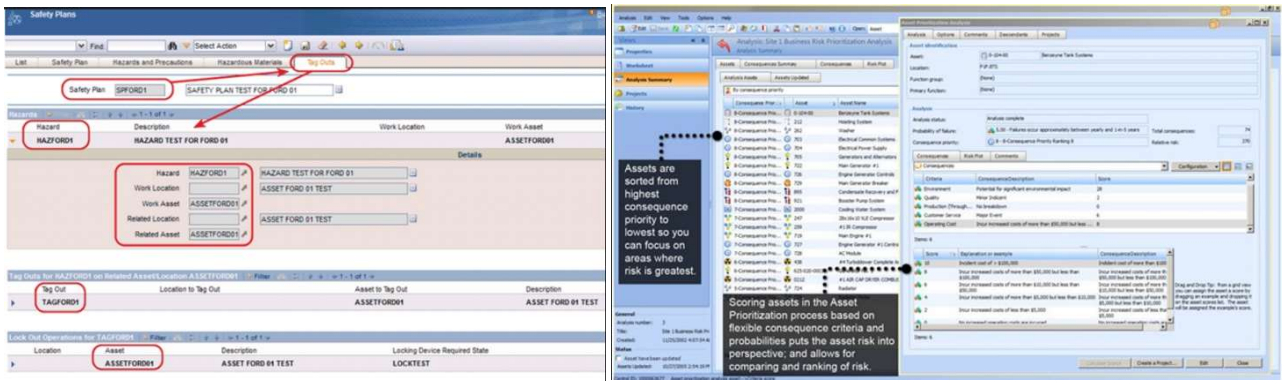
The data-based approach means that the information, no matter the source, is stored in the shape of data and tables. Those database tables can be more or less *basic* or *flexible*, depending on the relationships that have the databases between them, whether simple parent-child or capable to support many more fields and have multiple parents. It is not the scope of the BIM Strategy to describe or define in depth the databases because each Infrastructure Manager will create their own database according to their needs.



The AIM databases are structured by mean of Assets related to the infrastructures to be managed, operated and maintained. For further details see BIM Manual's "Information and Codification principles" Section. In the diagram above, an example of an asset hierarchy proposed in this BIM Strategy is shown. This Asset structure includes hierarchies of assets, having each asset a naming (called Asset Mark in Rail Baltica AIM) and a set of Operation Attributes. These Attributes will be defined by each Infrastructure Manager for the Infrastructure Assets that the Infrastructure Manager wants to manage digitally. That definition will be included in the AD4s. (Asset Data Dictionary Definition Document, which will be included within tabs in the spreadsheet RBR-DAT-BIM-BMA-0005_BIM_Objects_Attributes_Matrix)

It is important to mention that the information stored in the AIM should be defined according to specific tasks or decision-makings to be performed by the consumer of the data, therefore, the information stored in the Asset Register is part of the existing in the PIM attributes (gathered during the Design and the Constriction), plus some new information gathered during the operation, such as schedules, warranties, manuals, supplier websites, product brand & models, or dates for instance…

As mentioned, the databases are stored in the Asset Register/s. Under these lines, two examples of Asset Register are shown, IBM Maximo and Bentley AssetWise.



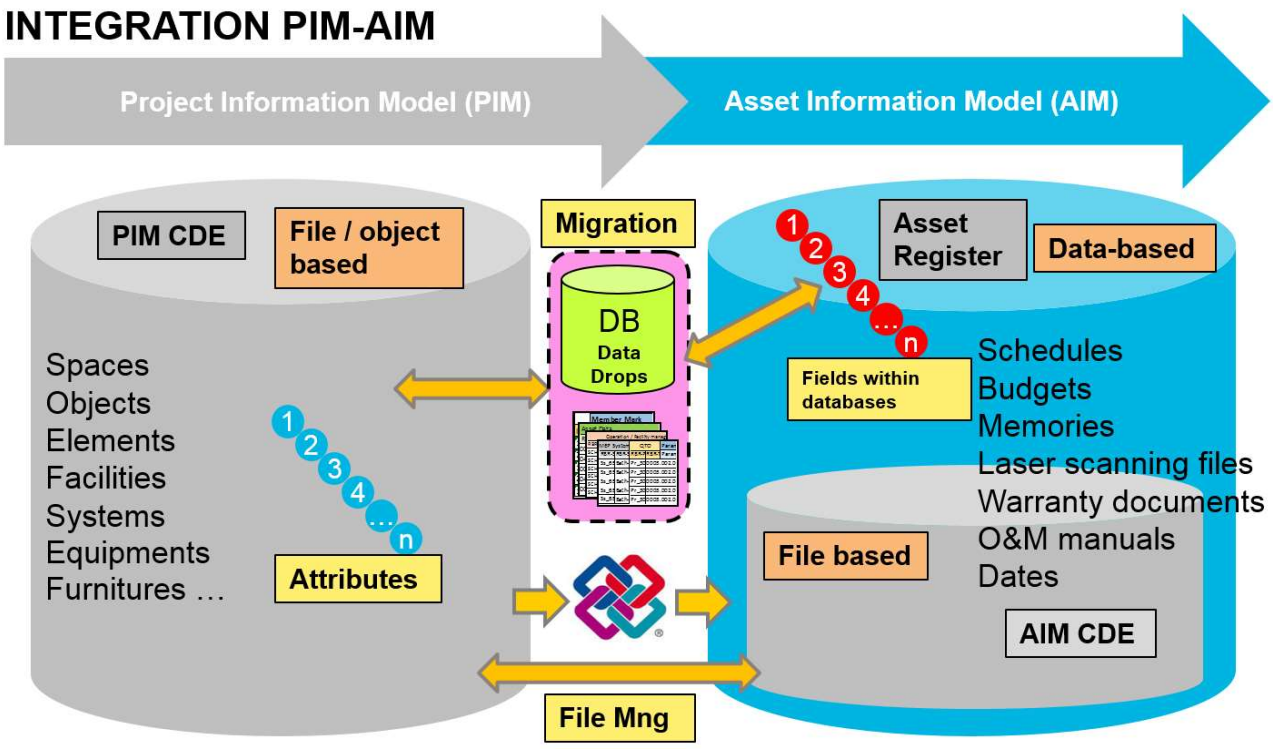
2.1.3. From PIM to AIM: migration process

The Rail Baltica BIM Strategy centers the data exchange in the "Data Drops", the BIM extraction spreadsheets that shall be provided as part of the BIM Model submissions for two reasons:

- By extracting the BIM data to a standardised extraction spreadsheet, the existing data becomes easily accessible to any user, **no matter the BIM maturity level nor the** existence of **BIM Management software** in their computers, because it is assumed that any user will have access to spreadsheet software. (such as Microsoft Excel or OpenOffice)

- By having the BIM data stored within spreadsheets, the eventual **migration from the PIM to the AIM can be perform by simple mapping** , from spreadsheet cells to database fields. Avoiding possible creation issues of IFC / GML or any other open (or proprietary) exchange format.

Having said that, the migration process from the PIM CDE to the AIM Asset Register takes place thanks to the Data Drops spreadsheets, by mapping the data within the spreadsheets to the fields of the Asset Register databases; besides, the migration from the PIM CDE to the AIM CDE is a simple file management, because both are file-based.



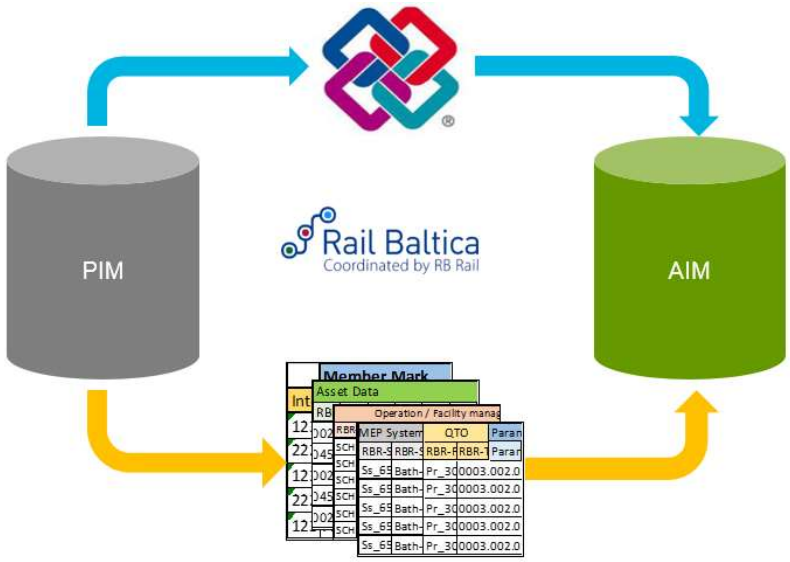
Note: it is worth to mention that even if there is no known Infrastructure Manager, or if the Infrastructure Manager is not interested on leveraging the BIM data, the Data Drops will always have the use of Data Exchange format during the PIM.

Also, it is important to note that model geometry can be included in the AIM. In order to be able to achieve the geometry migration, models are exported to IFC.

To sum up, the Migration process is based on two sub migrations:

- Data migration: Data mapping from BIM models to the Asset Register. This migration pulls the data rolled up by means of Data Drops (exported from the BIM models) to the Asset Register database.

- 3D geometry migration: BIM object geometries are migrated as objects to be stored within the Asset Register. The link is managed by referring to Object IDs / MemberMark / AssetMark, depending on how the Asset Register manages the BIM object importation. This migration therefore pulls the geometries by means of the IFC files (exported from the BIM models) to the Asset Register database.



These IFC files also contains all the information requested, so depending on the Asset Register / applications used, it could be possible to extract the information from the IFC without needing to use the Data Drops.

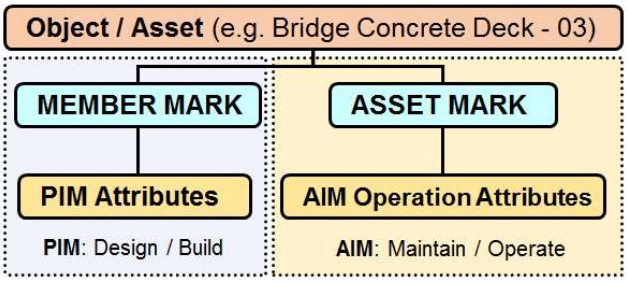
Notes regarding the migration driven only by means of IFC files:

a) If this process is chosen, it is important to be sure that the IFC contain the same information that should be stored within the Data Drops;

b) The process will need to be defined and agreed in the "Information Plan" so that the Supplier can provide the IFCs with the appropriate setup.

2.2. BIM object & Asset naming and identification

The "Information and Codification Principles" Section of the BIM Manual explains the approach to the Component Tag Identifiers (CTI), which is based on two identification marks, the Member Mark and the Asset Mark, used for the PIM BIM objects and the AIM Assets respectively.



This Section provides the information of how those two identification codes are defined, being in both cases a combination of values stored in the Object/Asset attributes.

2.2.1. Member Mark

"Member Mark" is a combination of values which will allow to identify uniquely a BIM object/element and trace it along the project life.

These values will be stored in attributes within the BIM object/element.

Member Mark composition schema:

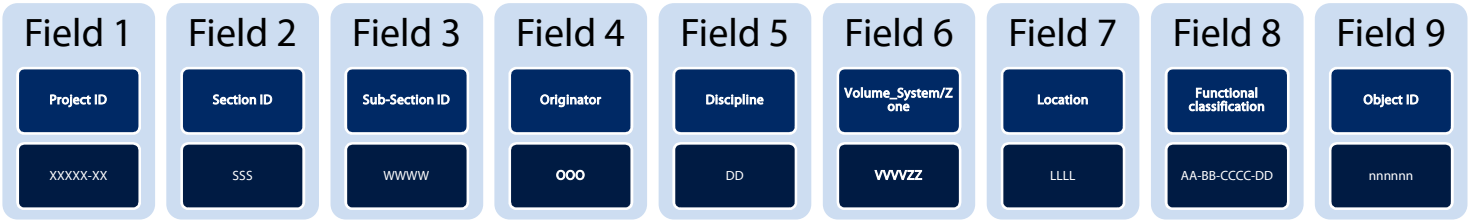


Figure 7: Member Mark Codification

XXXXX-XX-SSS-WWWW-OOO-DD-VVVVZZ-LLLL-FFF-000126

Member Mark attributes: (See "RBR-DAT-BIM-BMA-0004_CodificationTables.xlsx")

- Project ID: [**RBR-Project_ID**] Project name according to DTD TS (eight characters)
- Section ID: [**RBR-Section _ID**] Section Name according to DTD TS (three characters)
- Sub-Section ID: [**RBR-SubSection_ID**] Sub-section name according to DTD TS (four characters)
- Originator: [**RBR-Originator**] A unique identifier shall be defined for each organisation on joining the project. The unique identifier should identify the organisation responsible for creating the data. (Three characters)

- Role: [**RBR-Discipline_Code**] The discipline role that the file relates to for instance track design, Overhead Line, structural etc. (Two characters)
- Volume_System/Zone: [**RBR-VolSysZone**] The specific Volume_System (Physical sub-division 1, four characters) and Zone (Physical sub-division 2, two characters) of the model the file describes
- Location: [**RBR-Location**] The Location within the model (Physical sub-division 3) designed to locate where in the model the object is located. (Four characters)
- Type_Number: [**RBR-Functional_classification**]: Functional classification of the element. (Twelve-thirteen characters, thirteen for rolling material). See asset mark section for further details.
- ObjectID: [**RBR-Object_ID**] Six-digit integer number, unique per object within a BIM model.

The following schema shows the Member Mark composition:

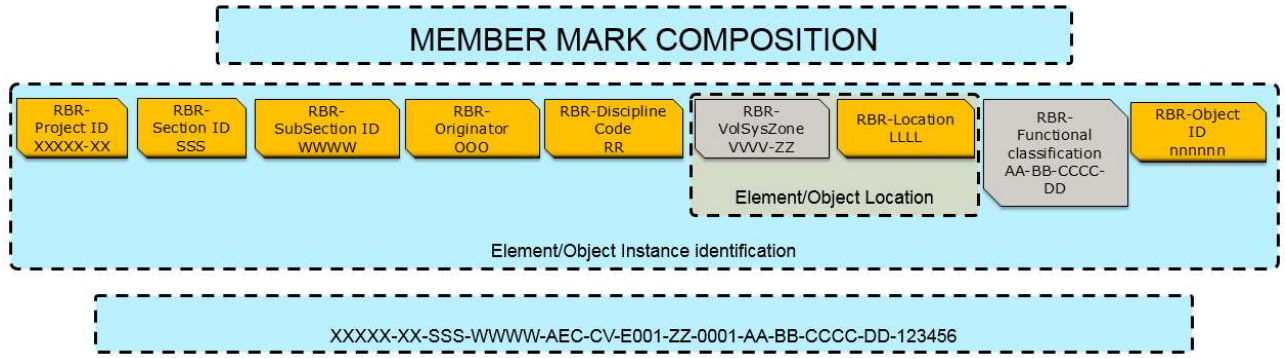


Figure 8: Member mark Composition

All data provided in the codification tables should be interpreted as a basis for the development of the project, and may be expanded according to the needs of the project.

Example:

XXXXX-XX-SSS-WWWW -AEC-EL-E001AG-EPl0- AR-ES-LGTF-BE -125003

Project ID: XXXXX-XX

Section ID: SSS

Sub-Section ID: WWWW

Originator: AEC=AECOM

Discipline: El=Electrical

VolSysZone: E001AG, E001=Station number 1 (VolSys code), AG=Above Ground (Zone code)

Location: EPL0=East Platform

Function: AR-ES-LGTF-BE=Emergency lighting

ObjectID: 125003

For further details about the codification values refer to the "BIM Employer's Information Requirements" Document.

2.2.2. Asset Mark

"Asset Mark" is a combination of values which will allow to identify uniquely a BIM object/element and trace it along the project life.

These values will be stored in attributes within the BIM object/element.

Asset Mark composition schema:

DDD-VVVVZZ-LLLL-AA-BB-CCCC-DD-000126

Asset Mark attributes: (See "RBR-DAT-BIM-BMA-0004_CodificationTables.xlsx")

- AR_ID: [**RBR-AR_ID**] Asset Register ID, Unique Asset register identificator (three characters).
- Volume_System/Zone: [**RBR-VolSysZone**] The specific Volume_System (Physical sub-division 1, four characters) and Zone (Physical sub-division 2, two characters) of the model the file describes
- Location: [**RBR-Location**] the Location within the model (Physical sub-division 3) designed to locate where in the model the object is located. (Four characters)
- Functional classification: [**RBR-Functional_classification**]: The functional classification of the asset, extracted from the Functional classification hierarchy (Variable length). It is composed of:
    - Discipline: Two characters
    - Class: Two characters

- Function: Four characters
- Type: one or two characters, for some assets, where Type code is not needed, a "00" code will be used in order to keep the data structure. For example:
  - CV-DR-DRNG-SU, SU is the Type for a Surface drainage (2 characters)
  - CV-DR-FLDG-00, in this case, for a flood gate the Type is not defined, so "00" is used:

Discipline	Discipline	Class	Asset Class description	Function	Asset Function description	Type	Asset Type description	ISO 12006	Category	RBR-Functional classification	Object description
CV	Civil & Structures	DR	Drainage & Culverts	DRNG	Drainage	SU	Surface	System	Linear	CV-DR-DRNG-SU	Drain-Surface
CV	Civil & Structures	DR	Drainage & Culverts	FLDG	Flood Gate			Product	Non Linear	CV-DR-FLDG-00	Flood Gate
CV	Civil & Structures	DR	Drainage & Culverts	FLUS	Flushing Points			Product	Non Linear	CV-DR-FLUS-00	Flushing Points

- Asset ID: [**RBR-Asset_ID**] Six digit integer number, unique per asset. To be defined during the Operation phase by the Infrastructure Manager, not to be used during the PIM (Project Information Model, Design & Construction)

All data provided in the codification tables should be interpreted as a basis for the development of the project and may be expanded according to the needs of the project.

Asset Mark attributes are AIM attributes, so not all of them will be available during PIM phase.

Note: the Functional classification dictionary must be defined by the Infrastructure Manager. In the spreadsheet "RBR-DAT-BIM-BMA-0004_CodificationTables" a possible Functional Classification dictionary has been included, the NSW Government Asset Standard Authority one. The dictionary will need to be defined only for the assets that the Infrastructure Manager wants to manage digitally. Moreover, those Functional classifications shall have a specific AD4 (see "Asset Data Dictionary Definition Document (AD4)" chapter in this document) defining the attributes requested.

In the example below, a dictionary of Functional classification (taken from the Civils & Structures discipline) is shown, in addition the "AD4_Bridging_Structures" tab with the AD4 list of attributes related (see RBR-DAT-BIM-BMA-0005-BIM_Objects_Attributes_Matrix). Note: the attributes from the "AD4_Bridging_Structures" shown are just an example, in the event the Infrastructure Manager needs specific attributes for that example, the list will be updated and called without any reference to the word "Example".

Example 1:

ASSET CLASSIFICATION

Discipline	Discipline	Class	Asset Class description	Function	Asset Function description	Type	Asset Type description	ISO 12006 mapping	Category	RBR-Functional classification	Object description
CV	Civil & Structures	BR	Bridges	ABGE	Access Bridge			Entity	Non Linear	CV-BR-ABGE-00	Access Bridge
CV	Civil & Structures	BR	Bridges	ABSP	Access Bridge Span			Element	Non Linear	CV-BR-ABSP-00	Access Bridge Span
CV	Civil & Structures	BR	Bridges	ABSU	Access Bridge Support			Element	Non Linear	CV-BR-ABSU-00	Access Bridge Suppt
CV	Civil & Structures	BR	Bridges	BSLB	Bridge Transition Slab			Element	Non Linear	CV-BR-BSLB-00	Bridge Transitn Slab
CV	Civil & Structures	BR	Bridges	FBGE	Footbridge	CO	Corridor	Entity	Non Linear	CV-BR-FBGE-CO	Footbridge-Corridor
CV	Civil & Structures	BR	Bridges	FBGE	Footbridge	SS	Station/Stop	Entity	Non Linear	CV-BR-FBGE-SS	Footbridge-Stat/Stop
CV	Civil & Structures	BR	Bridges	FBSP	Footbridge Span			Element	Non Linear	CV-BR-FBSP-00	Footbridge Span
CV	Civil & Structures	BR	Bridges	FBSU	Footbridge Support			Element	Non Linear	CV-BR-FBSU-00	Footbridge Support
CV	Civil & Structures	BR	Bridges	OBCS	Overbridge Culvert Span			Element	Non Linear	CV-BR-OBCS-00	OBdge Culvert Span
CV	Civil & Structures	BR	Bridges	OBGE	Overbridge			Entity	Non Linear	CV-BR-OBGE-00	Overbridge
CV	Civil & Structures	BR	Bridges	OBSP	Overbridge Span			Element	Non Linear	CV-BR-OBSP-00	Overbridge Span
CV	Civil & Structures	BR	Bridges	OBSU	Overbridge Support			Element	Non Linear	CV-BR-OBSU-00	Overbridge Support
CV	Civil & Structures	BR	Bridges	SBGE	Service Bridge			Entity	Non Linear	CV-BR-SBGE-00	Service Bridge
CV	Civil & Structures	BR	Bridges	SBSP	Service Bridge Span			Element	Non Linear	CV-BR-SBSP-00	Service Bridge Span
CV	Civil & Structures	BR	Bridges	SBSU	Service Bridge Support			Element	Non Linear	CV-BR-SBSU-00	Service Bridge Suppt
CV	Civil & Structures	BR	Bridges	SUBW	Subway	CO	Corridor	Entity	Non Linear	CV-BR-SUBW-CO	Subway-Corridor
CV	Civil & Structures	BR	Bridges	SUBW	Subway	SS	Station/Stop	Entity	Non Linear	CV-BR-SUBW-SS	Subway-Stat/Stop
CV	Civil & Structures	BR	Bridges	UBCS	Underbridge Culvert Span			Element	Non Linear	CV-BR-UBCS-00	UBdge Culvert Span
CV	Civil & Structures	BR	Bridges	UBGE	Underbridge			Entity	Non Linear	CV-BR-UBGE-00	Underbridge
CV	Civil & Structures	BR	Bridges	UBSP	Underbridge Span			Element	Non Linear	CV-BR-UBSP-00	Underbridge Span
CV	Civil & Structures	BR	Bridges	UBSU	Underbridge Support			Element	Non Linear	CV-BR-UBSU-00	Underbridge Support
CV	Civil & Structures	BR	Bridges	WALK	Walkway			Entity	Non Linear	CV-BR-WALK-00	Walkway-Bridge

Type-Specific attributes					
Type	Group	Attribute			
Abutment					
	Dimensions				
		Height_Max			Maximum height of abutment
		Height_Min			Minimun height of abutment
		Width_Max			Maximum width of abutment
		Width_Min			Minimum width of abutment
Apron					
	Dimensions				
		Height_Max			Maximum height of apron
		Height_Min			Minimun height of apron
		Width_Max			Maximum width of apron
		Width_Min			Minimum width of apron
Deck					
	Dimensions				
		Height_Max			Maximum height of deck

Type-specific attributes (see “Attributes requirement & structure & use” chapter within the “Data Management” section of this document):

According to this example, the list of attributes will be the list of Global and Discipline Specific (if exist) attributes and the AD4 ones shown in the “AD4_Bridging Structures” tab, which are [Height_Max], [Height_Min], [Width_Max] for the example shown above.

Example 2:

Asset Mark:

ABC-ABCDGR-VD01-CV-BR-OBSU-00-12345 (Asset Mark of an Overbridge Support)

RBR-Functional classification for the previous example:

Discipline	Discipline	Class	Asset Class description	Function	Asset Function description	Type	Asset Type description	ISO 12006	Category	RBR-Functional classification	Object description
CV	Civil & Structures	BR	Bridges	OBCS	Overbridge Culvert Span			Element	Non Linear	CV-BR-OBCS-00	OBdge Culvert Span
CV	Civil & Structures	BR	Bridges	OBGE	Overbridge			Entity	Non Linear	CV-BR-OBGE-00	Overbridge
CV	Civil & Structures	BR	Bridges	OBSP	Overbridge Span			Element	Non Linear	CV-BR-OBSP-00	Overbridge Span
CV	Civil & Structures	BR	Bridges	OBSU	Overbridge Support			Element	Non Linear	CV-BR-OBSU-00	Overbridge Support
CV	Civil & Structures	BR	Bridges	SBGE	Service Bridge			Entity	Non Linear	CV-BR-SBGE-00	Service Bridge

2.2.2.1. Functional Classification

In the spreadsheet "RBR-DAT-BIM-BMA-0004_CodificationTables" an example of Functional Classification dictionary (extracted from NSW Government, Asset Standards Authority) has been included so as to be used (or not) as a base for a future development of the dictionary by RB Rail AS, the Implementing bodies and the Infrastructure Managers. This list shall identify the Functional Classifications and Assets that are intended to be managed, so not all the possible assets need to be Functionally Classified, but only the ones that will be necessary. This dictionary includes both Infrastructure and Mobile assets, therefore both the Infrastructure Manager and the Operators will be in the position to use it as a base.

An example of a Functional classification code for a Surface Drainage extracted from "RBR-DAT-BIM-BMA-0004_CodificationTables": CV-DR-DRNG-SU

Discipline	Discipline	Class	Asset Class description	Function	Asset Function description	Type	Asset Type description	ISO 12006	Category	RBR-Functional classification	Object description
CV	Civil & Structures	DR	Drainage & Culverts	CULV	Culvert			Entity	Non Linear	CV-DR-CULV-00	Culvert
CV	Civil & Structures	DR	Drainage & Culverts	DPIT	Drainage Pit			Product	Non Linear	CV-DR-DPIT-00	Drainage Pit
CV	Civil & Structures	DR	Drainage & Culverts	DRNG	Drainage	SB	Subsurface	System	Linear	[illegible]	Drain-Subsurface
CV	Civil & Structures	DR	Drainage & Culverts	DRNG	Drainage	SU	Surface	System	Linear	CV-DR-DRNG-SU	Drain-Surface
CV	Civil & Structures	DR	Drainage & Culverts	FLDG	Flood Gate			Product	Non Linear	[illegible]	Flood Gate
CV	Civil & Structures	DR	Drainage & Culverts	FLUS	Flushing Points			Product	Non Linear	CV-DR-FLUS-00	Flushing Points

The chosen Functional Classifications will also need to define the attributes that will actually be used during the Operation & Maintenance phase; these attributes will be defined in the AD4s (see "Asset Data Dictionary Definition Document (AD4)" chapter in this document).

As a matter to support the identification of what Assets can be preferable to be chosen for the Operation Asset Management, the UIC (International Union of Railways) had a working group called LICB (Lasting Infrastructure Cost Benchmarking) to determine what infrastructure assets are the most commonly used in railway projects, these are summarised in the list below:

- Ground Area
- Track and Track Bed
- Engineering Structures
- Level crossings

- Superstructure
- Access ways for passenger and goods
- Safety, signalling and telecommunications
- Lighting installations for traffic and safety
- Plants for transformation and carrying electric power for train haulage

2.2.2.2. Component Tag Identifiers (CTI) relationship

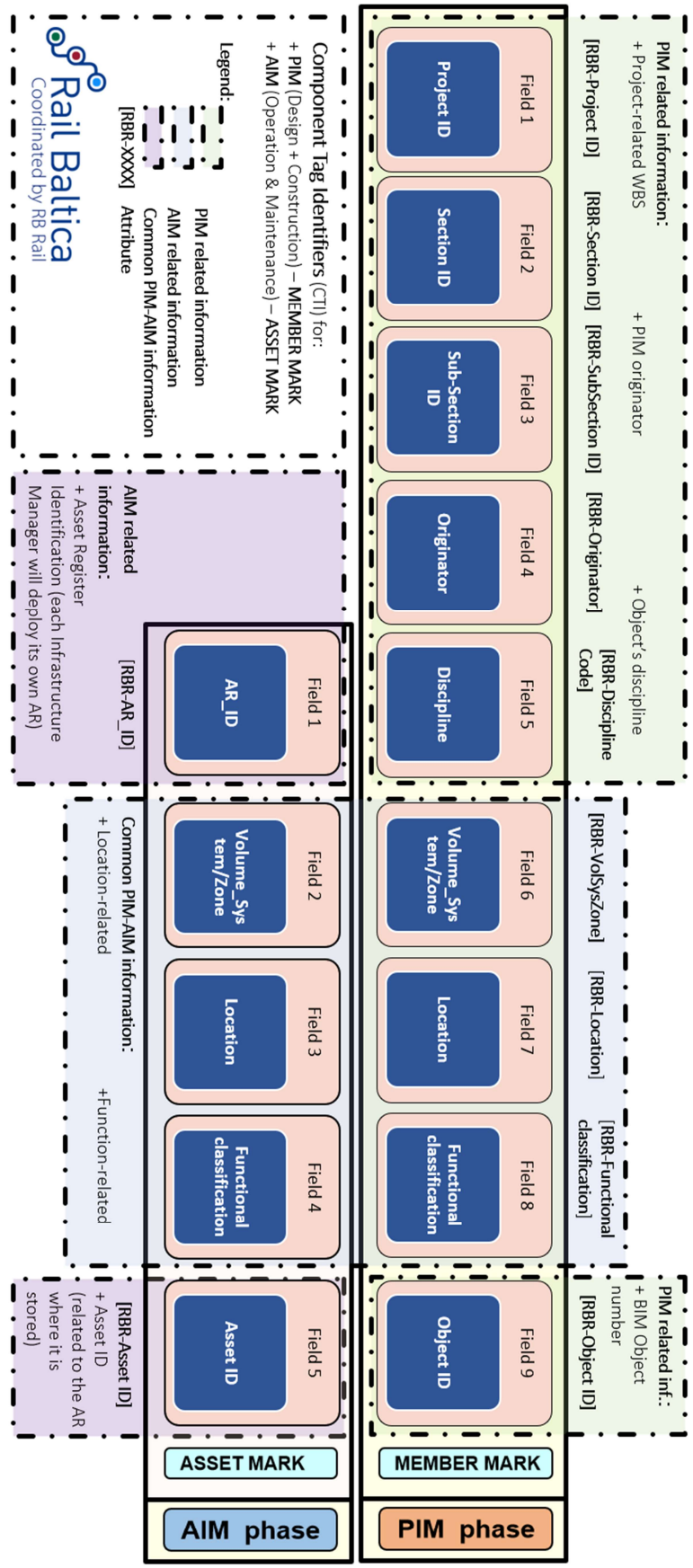
The two identification marks, Member Mark (PIM CTI) and Asset Mark (AIM CTI), are used for the PIM BIM objects and the AIM Assets respectively and relate information from a "File / Object" database (PIM phase) with a "Data" database. As such, the information is mapped during the migration.

The migration takes place by relating the PIM BIM objects to the AIM Assets and this Strategy defines the Common PIM-AIM information as the way to make that possible. Thus, the Common PIM-AIM information is related to the Location attributes (Volume_System & Zone) and the Functional Classification.

Taking the Common Information as a base, both CTIs are defined

- PIM CTI: includes the Common Location/Function PIM-AIM information and the information needed for the collaborative (and responsibility) identification of the models and objects during the Design and Construction stages. This information includes the project WBS [Project, Section, Sub-Section, Originator and Discipline] that identifies each BIM model and the BIM object ID (which is unique per BIM model).
- AIM CTI: includes the Common Location/Function PIM-AIM information and the information needed to locate the Asset information, which will be stored within an independent Asset Register [Asset Register ID] and the Asset ID (which is unique per Asset Register). Any existing system operating during the AIM phase (EAM, ERP, CDE, …) shall refer to the Asset data stored within the Asset Register.Each Infrastructure Manager (if more than one) shall define the way the amount of Asset Registers (if more than one).

The relationship between the CTIs is summarized in the diagram below:


PIM related information:
+ Project-related WBS
+ PIM originator
+ Object's discipline
[RBR-Project ID]
[RBR-Section ID]
[RBR-SubSection ID]
[RBR-Originator]
[RBR-Discipline Code]
Field 1
Field 2
Field 3
Field 4
Field 5
Project ID
Section ID
Sub-Section ID
Originator
Discipline
Component Tag Identifiers (CTI) for:
+ PIM (Design + Construction) – MEMBER MARK
+ AIM (Operation & Maintenance) – ASSET MARK
Legend:
PIM related information
AIM related information
Common PIM-AIM information
[RBR-XXXX] Attribute
Rail Baltica
Coordinated by RB Rail
AIM related information:
+ Asset Register Identification (each Infrastructure Manager will deploy its own AR)
[RBR-AR_ID]
Field 1
AR_ID
[RBR-VolSysZone]
[RBR-Location]
[RBR-Functional classification]
Field 6
Field 7
Field 8
Volume_System/Zone
Location
Functional classification
Common PIM-AIM information:
+ Location-related
+Function-related
Field 2
Field 3
Field 4
Volume_System/Zone
Location
Functional classification
PIM related inf.:
+ BIM Object number
[RBR-Object ID]
Field 9
Object ID
[RBR-Asset ID]
+ Asset ID (related to the AR where it is stored)
Field 5
Asset ID
ASSET MARK
MEMBER MARK
AIM phase
PIM phase

2.3. Attribute requirements, structure & use

Attributes are what makes the 3D models become BIM models, and due to the added value they offer, attributes are mandatory in this BIM Strategy.

This BIM Strategy defines series of BIM attributes related to the Project Information Model (PIM), but does not propose Operation attributes to be used during the Asset Information Model (AIM) because it is not included within the Rail Baltica project, but the Strategy is set up as a whole so that the AIM owners and Infrastructure Managers could leverage the PIM information during that Phase.

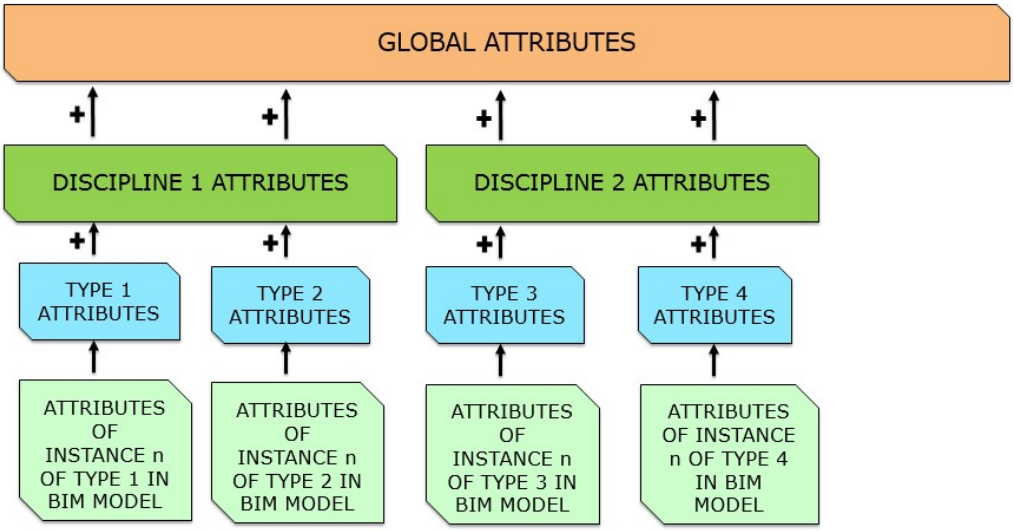
The attributes requirements are included in the spreadsheet "RBR-DAT-BIM-BMA-0005_BIM_Objects_Attributes_Matrix", which is subject to be reviewed during the life cycle of the Rail Baltica project. In the event a newer version modifies the attributes or the dictionaries that existed when a particular project begun, the Supplier and RB Rail / local implementing bodies will agree the version of the file will be used during the project / stage.

Attributes are divided into three levels, as defined in BIM Manual's "Attributes" chapter within the "BIM objects' definition" Section:

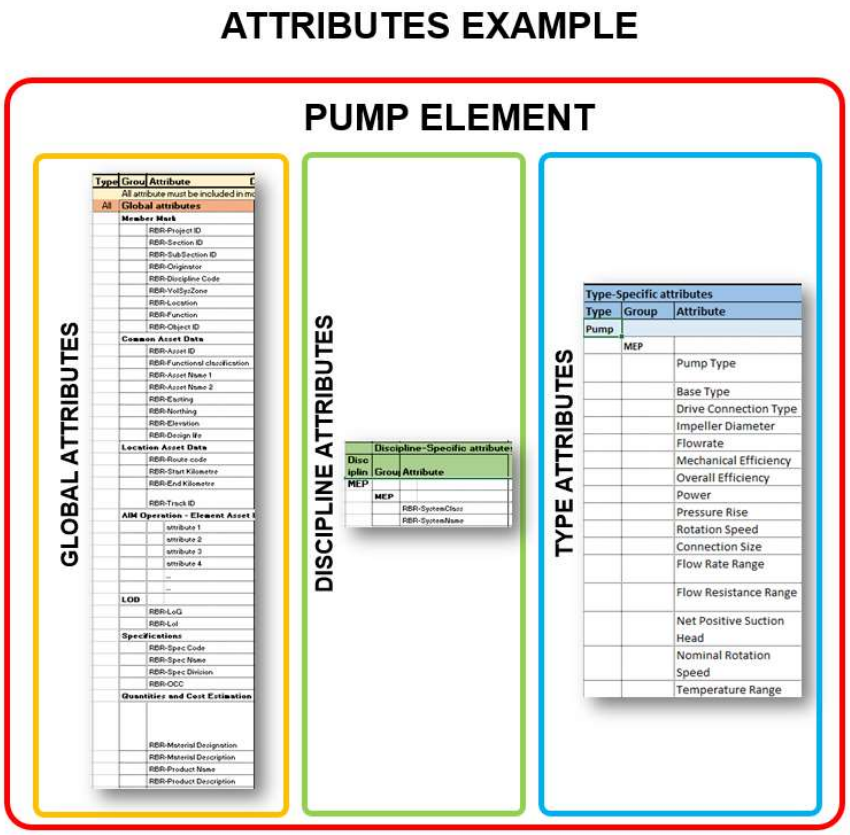
- **Global:** Applied to every single BIM object.
- **Discipline-Specific:** Applied to the objects of one specific discipline. (if defined)
- **Type-Specific**: Applied to specific object types (AD4)

BIM attributes	Related to	Populated during	Applied to	Defined by	Defined in "RBR-DAT-BIM-BMA-0005_BIM_Objects_Attributes_Matrix" - tab
Global	PIM objects	PIM	all BIM objects	RB Rail AS	GLOBAL & DISCIPLINE ATTRIBUTES
Discipline-Specific	PIM objects	PIM	objects by discipline	RB Rail AS	GLOBAL & DISCIPLINE ATTRIBUTES
Type-Specific	AIM assets	AIM: "RBR-Asset ID" attribute PIM: the rest (see EIR)	objects by specific types	Infrastructure Manager (see AD4)	AD4_xxxxxx

In the diagram below, the attribute levels are shown. It is important to mention that the attribute levels are lists of attributes that are additive, therefore the complete set of attributes to be included and populated within the object are the summation of the three levels.



In the example below, it is shown how a BIM object (a Pump element for instance) type has a complete set of attributes that includes attributes from the three levels. Please note that the Type attributes only have to be included in the event there is a specific AD4 (see "Asset Data Dictionary Definition Document (AD4)" chapter) for that type of elements.



2.3.1. Asset Data Dictionary Definition Document (AD4)

The Asset Data Dictionary Definition Document (AD4) are specific documents that can be created by the Infrastructure Managers so that the BIM objects have a particular object / asset information that will be used for a specific task or decision-making during the Operation or maintenance phase. These documents are split by asset types or groups and are a brief definition of a list of additional attributes needed for the particular asset defined in the AD4. The document will provide guidance and examples about how to populate the attributes requested.

The AD4 attributes will also be included in the spreadsheet called "RBR-DAT-BIM-BMA_0005_BIM_Objects _Attributes_Matrix" so that the attribute requirements could always be found in the same spreadsheet, for an easier understanding. In the specific tab, called "AD4_xxxx" there may be attributes divided by Types (abutment, apron, bridge deck in the example shown) or by attribute group (example shown: dimension).

Type-Specific attributes					
Type	Group	Attribute			
Abutment					
	Dimensions				
		Height_Max			Maximum height of abutment
		Height_Min			Minimun height of abutment
		Width_Max			Maximum width of abutment
		Width_Min			Minimum width of abutment
Apron					
	Dimensions				
		Height_Max			Maximum height of apron
		Height_Min			Minimun height of apron
		Width_Max			Maximum width of apron
		Width_Min			Minimum width of apron
Deck					
	Dimensions				
		Height_Max			Maximum height of deck

The information required types required to support the Operation & Maintenance decision making are commonly based in the next types of information:

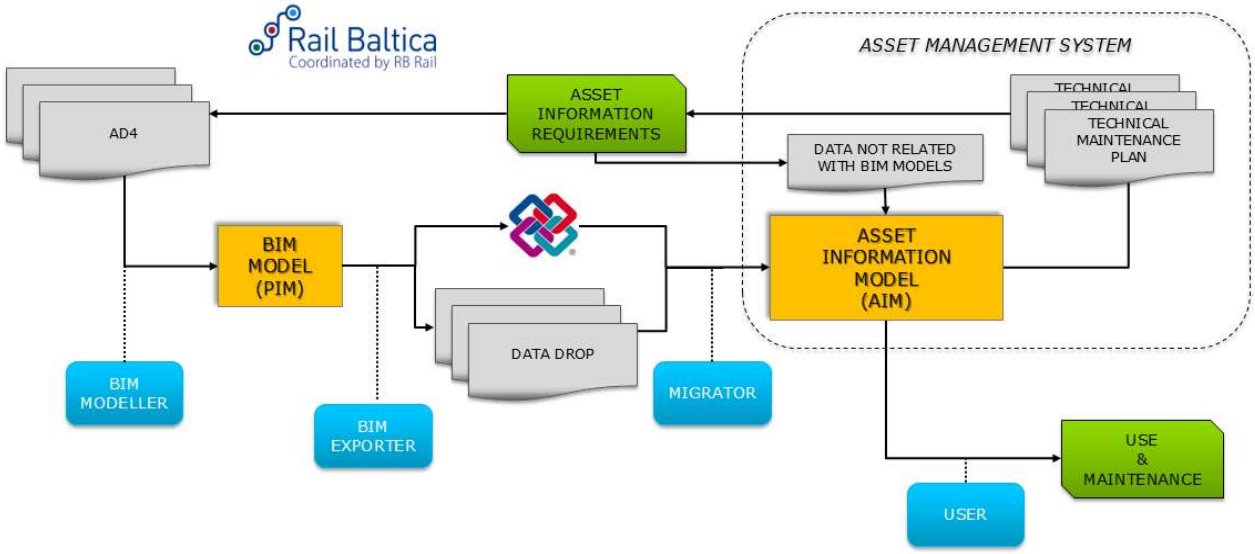
- Information on the physical asset (dimensions, materials, supplier brand, model…)
- Location information
- Asset and system relationship / hierarchy information
- Intervention history information
- Performance and service impact information
- Asset health information (status, quality information gathered from site during maintenance…)

- Geospatial information
- Financial information

Note: it is recommended to have the shorter list of information as possible, because the reliability could be affected if the amount of data is too large, because it may not be easy / cheap to maintain updated the database. The attributes/data/information should be reduced as much as possible to the strictly needed information.

2.3.2. Asset Data Workflow and use

The following Workflow is proposed:



When the Infrastructure Manager develops the Configuration Management Plan (see point 10.2.1 of the BIM Manual) key assets will be identified and individual plans for each key asset will generated, these plans can be both Technical Maintenance Plan (TMP) and/or Optimisation ones (*), identifying the data needed to achieve their objectives/goals. With these data identified (Asset Information Requirements), the Infrastructure Manager can generate the AD4 that will determine the data to be added in the BIM models.

Once the data is filled in the BIM objects (hosted within BIM models), by means of Data Drops all the information can be extracted and migrated to the Asset Information Model, where the Infrastructure Manager will carry out the Asset Management.

Note: The graphical information cannot be migrated by means of the Data Drops, therefore, if the Asset Register supports graphical data, the BIM model exportations to IFC format will be incorporated to the AIM.

(*) In general, only the TMPs are mentioned in this Manual, but it does not mean that the Optimisation Plans cannot be implemented.

2.3.3. AIM roles

The following Roles are considered within the workflow:

ROLE	DESCRIPTION	ROLE PROVIDER
BIM MODELLER	Will be the responsible person/people to add all the necessary data within the models, based on the AD4.	Design team/Construction design team
BIM EXPORTER	Will be the responsible person/people to export all the data contained in the models by means of the data drops.	Design team/Construction design team
MIGRATOR	Will be the responsible person/people that will import the data contained in the data drops in the Asset Information Model.	Infrastructure Manager
USER	Will be the person/people that will use the Asset Management System in order to maintain and use the infrastructure.	Infrastructure Manager

2.4. Attribute grouping

This grouping should be interpreted as a basis for the development of the project and may be expanded according to the needs of RB Rail AS and/or the local implementing bodies.

Attribute grouping has no direct relationship with the attribute levels, but with where the attributes are stored within the BIM object in the BIM models. Therefore, a Global, Discipline-Specific and a Type-Specific (AD4) may be stored in the same groups as other attribute levels. (Example, the Architectural specific attribute **[RBR-GrossArea]** and the Type-Specific (AD4_Int.Door) attribute **[Glazing type]** are both to be stored within the group "Architectural").

Type	Group	Attribute	Data Type	Units	Description	Commentary
	All attribute must be included in models					
All	Global attributes					
	Member Mark					
		RBR-Project ID	Text		See Member Mark section	See codification tables
		RBR-Section ID	Text		See Member Mark section	See codification tables
		RBR-SubSection ID	Text		See Member Mark section	See codification tables
		RBR-Originator	Text		See Member Mark section	See codification tables
		RBR-Discipline Code	Text		See Member Mark section	See codification tables
		RBR-VolSysZone	Text		See Member Mark section	See codification tables
		RBR-Location	Text		See Member Mark section	See codification tables
		RBR-Functional classification	Text		See Member Mark section	Classification code according with the functional hierachy
		RBR-Object ID	Integer		See Member Mark section	See codification tables
	Common Asset Data					
		RBR-Asset ID	Text		Unique Asset ID	
		RBR-AR_ID	Text		Asset register identificator	
		RBR-Asset Name 1	Text		Descriptive name (e.g. "Pump 01")	Operator defined, (Supplier defined if not by operator). Attributes used to relate components/sub-components hierarchically within assets.
		RBR-Asset Name 2	Text		Descriptive name (e.g. "Pump 01")	
		RBR-Easting	Number			According to the WCS in use, refer to BIM models' Geo-reference in the BI
		RBR-Northing	Number			According to the WCS in use, refer to BIM models' Geo-reference in the BI
		RBR-Elevation	Number			According to the WCS in use, refer to BIM models' Geo-reference in the BI
		RBR-Design life	Integer		Design Whole life, in years	Design Whole life, in years
	Location Asset Data					
		RBR-Route code	Text		Specific code for Route	Specific code for Route
		RBR-Start Kilometre	Number		Start Kilometre of a linear asset	Start Kilometre of a linear asset, if not linear, N/A
		RBR-End Kilometre	Number		End Kilometre of a linear asset	Start Kilometre of a linear asset, if not linear, N/A
		RBR-Track ID	Text		For Instances where the bridge does not span all	For Instances where the bridge does not span all
		RBR-Room Name	Text		Room Name	The room name where the Item is located (MEP&Arch elements), if it is a
	AIM Operation - Element Asset Data					
		attribute 1				

The attributes within the project can be used for different functions, in order to better organize the existing attributes in the project, (and the future ones) the following groups have been created: (If any else group is needed, it will be agreed with RB Rail AS)

Attributes are defined as Mandatory or Optional. Optional attributes can be made Mandatory in the EIRs. "RBR-DAT-BIM-BMA-0005_BIM_Objects_Attributes_Matrix" file. Attributes may be "Optional" even if related to a BIM Use case that is mandatory, like the ones included in the *Timeliner* and *Clash Detection* groups, this is because those attributes were created as a possible help for filtering when carrying out the Timeliner (4D planning) or the Clash Detection (Geometry verification) tasks.

2.4.1. Member Mark

See Member Mark main point for further explanations.

2.4.2. Common Asset Data

Within this group we will find common attributes applicable for all BIM Objects and / or Assets.

2.4.3. Location Asset Data

Within this group we will find all attributes related to the linear location of the asset.

2.4.4. OM Operation – Element Asset Data

Attributes specific attributes shall be defined by the Infrastructure Manager by means of the AD4.

2.4.5. LOD

Within this group we will find all attributes related to the Level of Definition.

[RBR-LoI] and **[RBR-LoG]**, these attributes indicate the level of accuracy of the element. (See BIM manual, Level of Definition for further details)

2.4.6. Specifications

Within this group we will find attributes related to the specifications of the project, naming, coding and all the necessary to integrate construction specifications within the models or link the specifications with the model elements.

[RBR-Spec_Code] will contain the specification code.

[RBR-Spec_Name] will contain the specification name.

[RBR-Spec_Division] will contain the division of the specification (Specifications can be divided into divisions for better grouping).

[RBR-OCC] will contain Object category codes values extracted from "RBR-DAT-BIM-BMA-0004_CodificationTables.xlsx"

Some attributes are given in order to achieve this linking of information and models.

2.4.7. Quantities and Cost Estimation

Within this group we will find attributes related with the Quantities and Cost Estimation.

Some attributes are given in order to gathering information related to Material, Product classification, product name, Measurement units. If any other information is needed for quantities extraction or cost estimation they can be added in this group.

For further explanations about **[RBR-PR_Code]** and **[RBR-Type_Number]** refer to "Object Type Dictionary" in the "BIM Manual".

2.4.8. Time Liner

Within this group we will find attributes related with the project planning and scheduling.

In conjunction with the time schedule, attributes can be used to easily map elements with the time schedule or can be necessary to link elements with a third-party application…

2.4.9. Clash Detection

Within this group we will find attributes related with the Clash Detection procedures.

Attributes can be used to customize the selection of elements, or to ignore some elements that should not be considered or to suit any specific need during the clash detection…

2.4.10. Sustainability

Within this group we will find attributes related with Sustainability and Environmental Protection.

Having manufacturer's data available in BIM ensures complete control of the compliance with regulations. By having easy access to different types of environmental impact properties such as ozone depletion, acidification of soil and water, depletion of natural resources, energy consumption, etc., project teams can make a fast decision on the basis of true data that becomes embedded in the model and ensures as-designed matches as-built, all this data can be stored in attributes within this group.

2.4.11. Life and Safety

Within this group we will find attributes related with the protection of people and assets.

Attributes with information related to life and safety would allow project managers and safety engineers to test the impact of different spatial workflows and scaffolding types on safety, and to make preconstruction decisions that minimize hazards and maximize protection, etc.

2.4.12. GIS

Within this group we will find attributes related with the Geographic Information System.

2.4.13. Operation/Facility Management

Within this group we will find attributes related with the Operation and Facilities Management.

The Infrastructure Manager may need some specific information in order to efficiently operate or maintain the facility, this information can be stored in attributes within the model.

2.4.14. Dimension/Constrains

Within this group we will find attributes used to control dimensions and stablish graphic constrains.

This attribute can be used to control dimensions of elements or to storage some auxiliary dimension not directly related with the model, restrict an element position…

2.4.15. Analytical

Within this group we will find attributes related with the analytical information of the elements.

This analytical information can be used to perform some analysis within the model or trough third party applications. Some typical analysis are Structural analysis, lighting analysis, Energy analysis, air flow analysis….

2.4.16. MEP

Within this group we will find attributes related with the MEP discipline.

Disciplines may need attributes to achieve some discipline specific task, like tagging, grouping, filtering…

2.4.17. Structural

Within this group we will find attributes related with the Structural discipline.

Disciplines may need attributes to achieve some discipline specific task, like tagging, grouping, filtering…

2.4.18. Architectural

Within this group we will find attributes related with the Architectural discipline.

Disciplines may need attributes to achieve some discipline specific task, like tagging, grouping, filtering…

2.4.19. Civil

Within this group we will find attributes related with the Civil discipline

Disciplines may need attributes to achieve some discipline specific task, like tagging, grouping, filtering…

2.4.20. Utilities

Within this group we will find attributes related with the Utilities discipline.

Disciplines may need attributes to achieve some discipline specific task, like tagging, grouping, filtering…

2.4.21. Construction

Within this group we will find attributes related with the Construction Phase.

Attributes can be used to track the storage of materials, control of purchases, track construction progress…

Any attribute needed to accomplish a specific task within the construction phase, should be included in this group.

2.4.22. Other

Within this group we will find attributes not related with any specific discipline.

[RBR-Local_Code] Will contain the discipline according to local legislation

[RBR-Project_Stage] Will contain the abbreviation of the project stage

[RBR-Revision] Will contain the revision number

3. Data Drops

Data drops are the way to extract the information contained in the BIM models, this information is populated in spreadsheets to be exchanged.

The spreadsheets are related one with each other by means of some key parameter.

The spreadsheets contain the basic information, but if necessary, RB Rail AS can ask for more information to be collected from the models by adding extra attributes in the spreadsheets.

Not all the parameters included in the "RBR-DAT-BIM-BMA-0005_BIM_Objects_Attributes_Matrix" are exported in the Data Drops, only the ones considered necessary for the AIM.

Note: RB Rail AS will provide the forms that will be populated by the Supplier, no new columns can be created by the Suppliers, only the ones corresponding to the new data requested in the AD4. In the event the Supplier considers that it is necessary to modify the Data Drop template, it will be discussed and agreed with RB Rail AS BIM Management team.

There are seven main and two auxiliary sheets, which are described in this section:

3.1. Information

This spreadsheet contains general information about the project and the model in order to identify the origin of the data.

3.2. Type

This spreadsheet contains information about the existing types within the model, (see BIM Model's objects'/elements' classification for further explanations about types).

The name of the type, its classification according to UniClass 2015 (**[RBR-Pr_Code]**) and Type number (**[RBR-Type number]**), Product name and description, Specification code…are included in this spreadsheet.

More information about **[RBR-Pr_Code]** and **[RBR-Type_number]** can be found in the point "Object Type Dictionary" of the "BIM Manual", these two parameters are the key parameters that relate the Data Drop's "Component" tab and the "Documents" tab one. (See RBR-DAT-BIM-BMA-0035_DataDropTemplate)

Additional parameters can be included in this sheet by Rail Baltica AS if required.

3.3. Component

This table contains information about the elements within the model (instances, see BIM Model's objects'/elements' classification for further explanations about instances).

Member Mark information is included as unique identifier of the element, information related with the assets, Room, Location, Operation and Facilities Management, MEP system if proceed, QTO, and any other required parameter.

[RBR-VolSysZone] and **[RBR-Location]** are the key parameters that relate the "Component" tab with the "Rooms" one. In the cases a component (or object) is placed in a room, the "Room name" parameter will also relate "Component" with "Rooms".

[RBR-Pr_Code] and **[RBR-Type_number]** are the key parameters that relate "Component" with the "Type" and the "Documents" tabs.

Additional parameters can be included in this sheet by Rail Baltica AS if required.

3.4. Rooms

This sheet contains information about the existing rooms (or Spaces) created in the BIM model and the information related to the location of the Room / Space.

[RBR-Location] and **[RBR-VolSysZone]** are the key parameters that relate the "Rooms" tab with the "Component" and "Locations" tabs.

Additional parameters can be included in this sheet by Rail Baltica AS if required.

3.5. Locations

This sheet contains information about the physical subdivision of the model, **[RBR-Location]** and **[RBR-VolSysZone]** are the key parameters that relate the "Locations" tab with the "Rooms" one.

Additional parameters can be included in this sheet by Rail Baltica AS if required.

3.6. Documents

This sheet contains information of the documents related to specific types, **[RBR-Pr_Code]** and **[RBR-Type_number]** are the key parameters that relate the "Documents" tab with the "Type" and the "Component" tabs.

"Document" sheet is not a mandatory tab. This sheets intend is to allow the link of the Components/Objects and Types with external data like data sheets, manuals, etc.

3.7. Parameter Units

This sheet contains the measurement units of the parameters listed in the other sheets.

3.8. Pick List

This is an auxiliary sheet to storage values used in the Document sheet. Not to be modified by the Supplier.

3.9. Relationship

This is an auxiliary sheet that contains a schema with the relationships between different sheets of the Data Drops. Not to be modified by the Supplier.