

Starting points for an optimal integration of BIM and Facility Management Information System (FMIS)



Explore. Inspire. Connect.



Goal of the whitepaper

As Facility Managers, we are getting to know more and more about the possibilities of BIM, especially when organizations are doing renovations or new-constructions of their buildings. Because most of them manage their facility processes in a Facility Management Information System (FMIS or CAFM), they'd like to make an optimal use of the information that is coming from BIM. Supported by FMN, the named FMIS-suppliers have taken the initiative to write this document to support the optimal use of BIM.

In this document, we want to support the users of an FMIS and the manager of a building (building manager) with a minimum set of information requirements that are vital for an integration of BIM-data and their FMIS. These minimum requirements should help decision makers and building managers with a more profound explanation of their needs to integrate BIM-data with their FMIS.

We explicitly limit this document to describing the 'how' of connecting BIM to an FMIS. We'd like to focus on the 'what'. What is essential to support facility processes and what information is required from a BIM, next to information that should be managed in an FMIS. We try to explain the information needs, which will focus on using the right information from a BIM, not all information that is available.

Why do we believe FMIS and BIM needs to be integrated?

As FMIS-suppliers, we are convinced of the possibilities of BIM and integrate it with our software. Some benefits are:

- It improves the information management processes for facilities, where we see that information becomes more reliable and can be used on a more strategic level
- It makes the hand-over of a project to the maintenance-phase more efficient. The information is much earlier available.
- It improves the possibilities of visualizing facility data. Not just for the building manager, but also for a servicedesk-employee and maintenance engineers. Management will have better insight into physical properties that relate to the number of reservations, the occupancy of the facility and the number of defects at their assets. For maintenance engineers, it will become much easier to see where defects have been registered and which equipment they will need to fix it.
- The detailed and structured level of the BIM-data will support an FMIS to prepare for future developments, like the integration of AR/VR/AI and IOT.

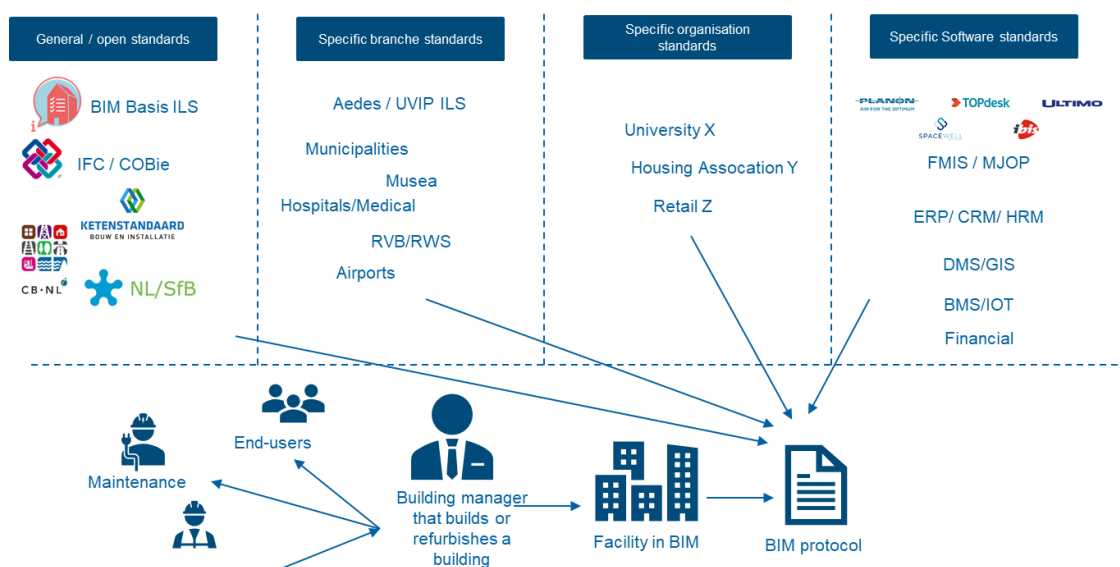
Motivation

As FMIS-suppliers, we often get questions from our clients to import data from a BIM to our FMIS. In the construction phase, it is not clear enough to know which information is needed for an FMIS, which leads to an unfit BIM or a lot of additional

costs to improve the BIM data. We'd like to improve this process, as it should be possible to directly integrate the BIM-data and use it in the whole lifecycle of a facility.

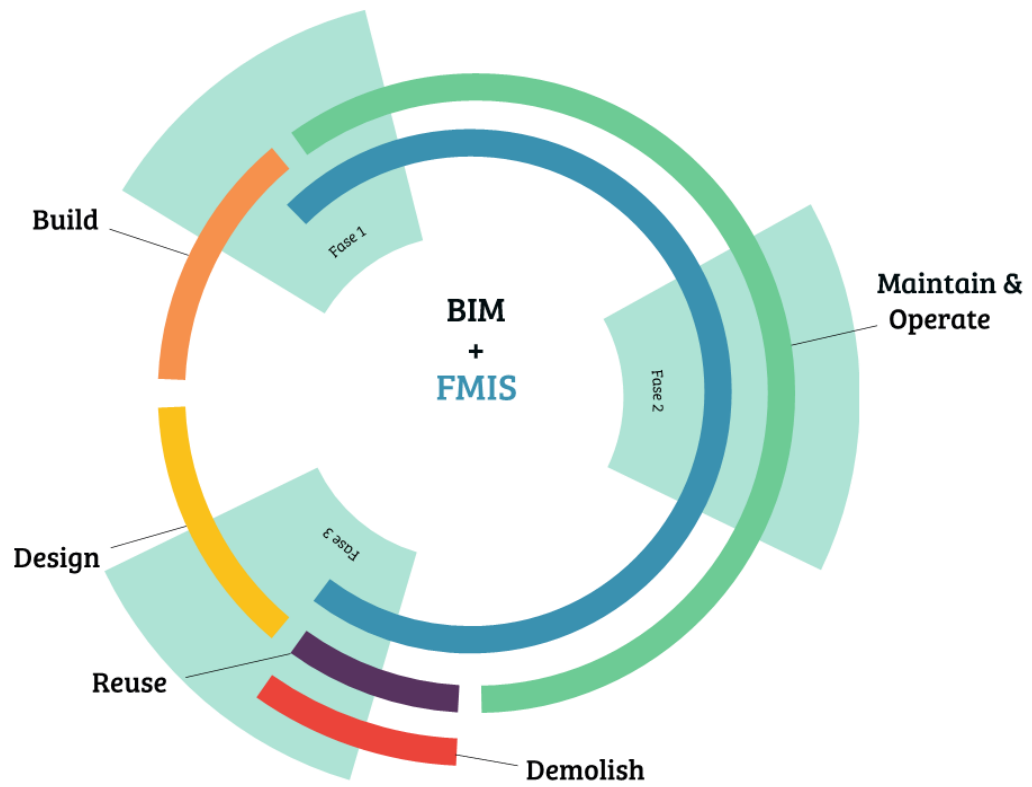
Relation with other initiatives

This whitepaper connects with other initiatives that improve the quality of BIM-data. We notice that our clients will typically draft a BIM-protocol for their new constructions and there are quite some interesting guidelines for this like the BIM Basic IDM or specific lines of businesses (Dutch social housing and universities have a standard which they published) that we support to use and prescribe in future construction projects. As far as we know, we do not contradict to any of these guidelines, but hope to add a useful perspective that goes beyond the construction phase and leads to the use of BIM-data in the total lifecycle.



Scope

This whitepaper points at the first step in integrating BIM-data with an FMIS, which is the handover from a construction project to the maintenance phase (Phase 1). A next step will be to deal with daily maintenance (Phase 2) and a 3rd will be the demolishing or re-use of the facility (Phase 3).



We've come up with 10 common starting points, that we want to explain with practical examples. For these starting points, we've created a minimum set of information needs.

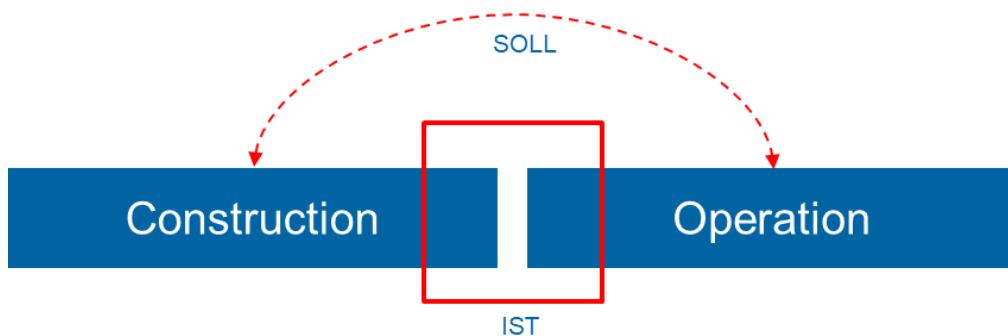
1 FMIS starting points for BIM

1.1 Information in a BIM is always useful for an FMIS

In terms of classification and information needs, during a construction process, models should always be prepared to be exchanged with an FMIS. This will create the opportunity to set-up maintenance plans in an early stage or prepare the space usage for the organization.

Example:

Use defined spacenumbers or supply a common classification (like NL/SfB, Uniclass, DIN) for all assets. Explain or supply the use of these codings or space numbering as early as possible to the construction partners.

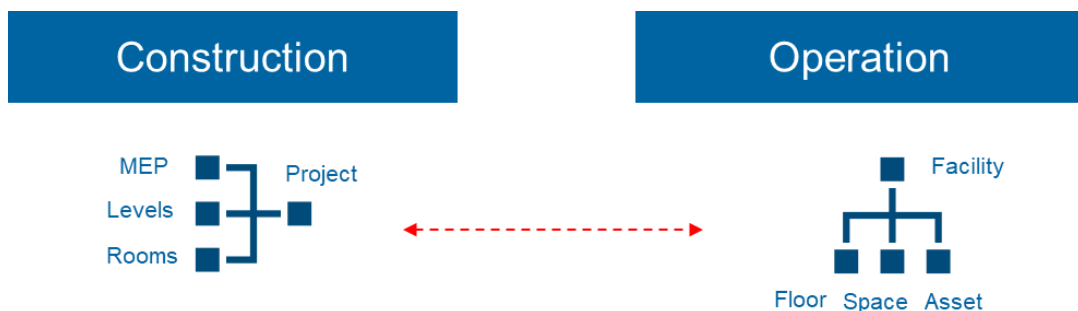


1.2 Explain terminology differences between BIM and FMIS

Make sure to speak the same language. Information that is registered as BIM-data must relate to elements that are managed in an FMIS. Some are just totally different and can't be automatically exchanged. Explain the differences and, if necessary, add annotations in both of the systems to explain them.

Example:

Physical information in an FMIS is structured from a facility perspective in a Site, a Building, Building parts, Floors, Spaces and Assets. In BIM, elements are separated by discipline, for example, Architectural, Structural or MEP.



1.3 Connect elements to spaces

Every BIM element should have a location- or space reference that can be used in an FMIS. This should be registered as a parameter and not just a physical view. Elements that can't be linked to spaces, must have a similar reference to the physical position in the facility.

Example:

An installation-element can be found in the Technical Room on the 1st floor, 01.T01. A façade element, floor or wall-finishing is not linked to one room, but has a floor number or façade-orientation.



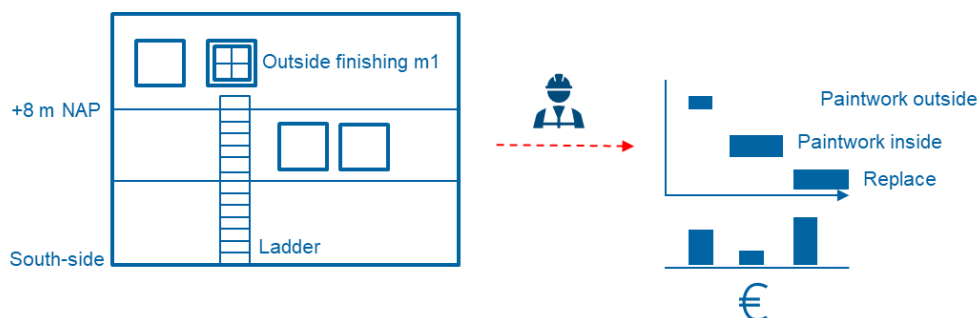
1.4 Align required quantities with FMIS processes

Align expectations to what is physically modelled in a BIM, and which of that is needed for FMIS processes. Some quantities can be extracted without any physically modelled elements, while others might be very hard to extract without a BIM.

By aligning those expectations, disappointments can be prevented to not be able to extract certain quantities. And it will become clear which of the quantities need to be enriched or calculated after the delivery of the models, to have a complete Bill of Material in the FMIS-processes.

Example:

To set-up Long-Term Maintenance Plans, very specific quantities are needed. To extract the wall finishing of a wall, you'll need to specify the exact boundaries of those finishing's. These quantities are not automatically derived from any BIM, but are necessary for budget calculations.

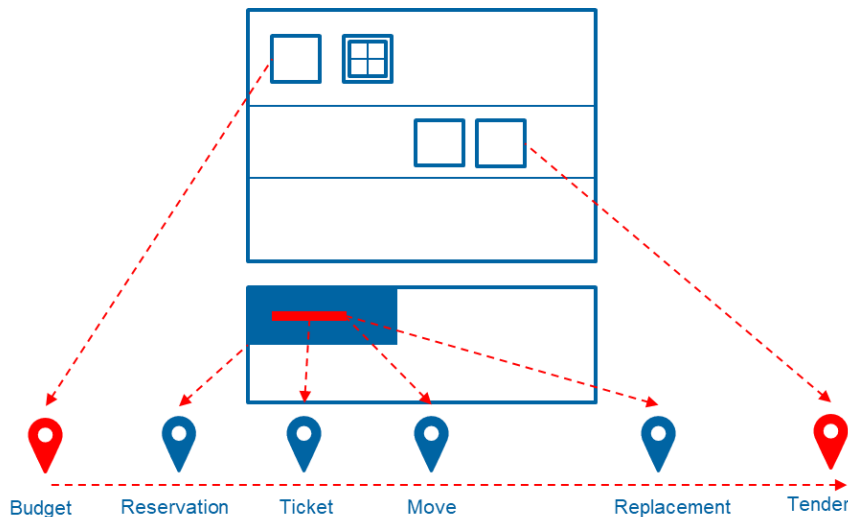


1.5 Limit the exchange of quantities to the minimum which are necessary in an FMIS

Try to use your BIM-data in the most efficient way, so don't extract all data that might be relevant in your FMIS, but is not needed on a daily basis. Use your BIM-data for any one-time queries. Make sure that data is easy to find in a BIM and accessible.

Example:

For a tender on a Window-Cleaning-servicecontract, the total m2 of all windows on all floor levels is a key figure to extract. This information is available in BIM by calculating the total amount of window-glass on that specific floor. You don't need this on a daily basis in your FMIS, so you should extract it from BIM once.

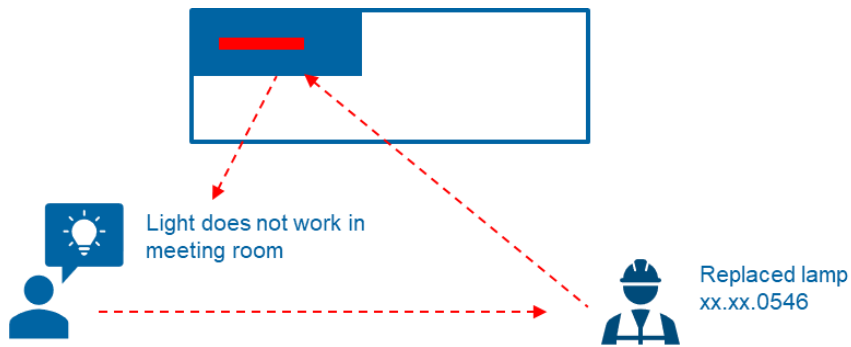


1.6 Limit the Level Of Detail to the quantities and location from your assets

Try not to demand near-reality modelled assets for your FMIS-processes. You might want this as then the end-users can make very specific calls on very detailed assets. Typically, the location of asset is enough. You must be able to recognize the asset and find it at the right location, but don't steer on the detailed level. The added-value of modelling these assets is very low and the effort to realize it, is very high.

Example:

A requestor limits their service request to the issue in the room, not to the asset that has a failure. To register it on the asset-detail, more advanced engineers or systems (like IOT or BMS) can assist.

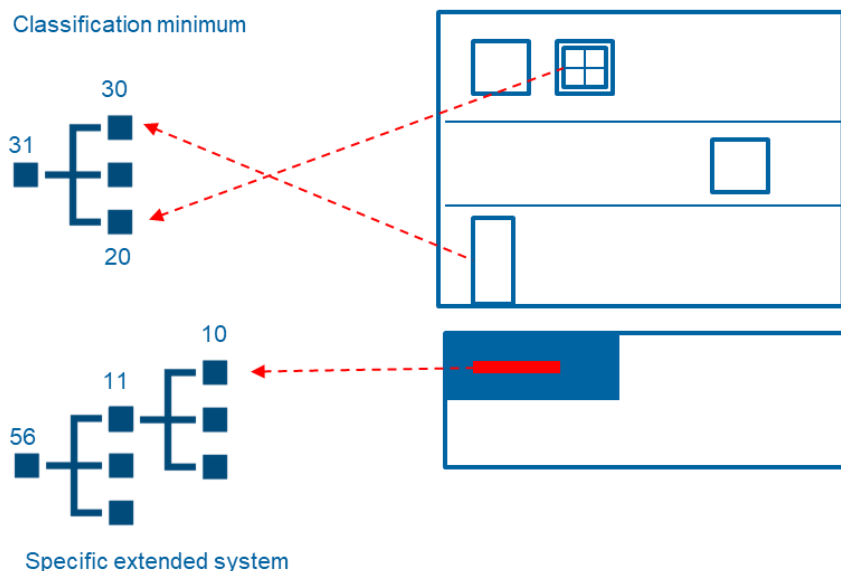


1.7 Classify elements

Demand the application of a classification system that is common in the country or region where the facility is managed. In the Netherlands, this is the NL-SfB. It should be classified to a deep-level, at least 4 positions. As some organizations or FMIS-suppliers apply a more detailed classification system, for example to add the materialization, this can be applied by supplying the system or list to the contracting parties.

Example:

A heating panel is classified as 56.11.10, which explains already that the element is part of the heating distribution system (56), it is part of the radiator-system (11) and it's not a vector-panel (20), but a radiator (10).



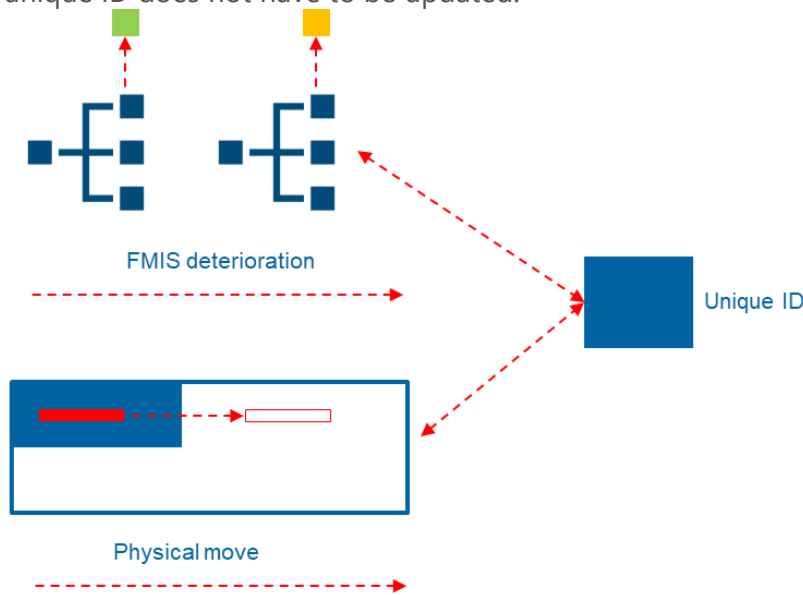
1.8 Register unique reference ID's between BIM and FMIS

After the exchange between BIM-data and the FMIS, elements should contain unique ID's in both systems, to be able to notice updates and changes. The ID's will

be different in both systems, so it is advised to store these references in parameters or fields.

Example:

After a change in the BIM-data, the new ID can create an actual new asset in the FMIS, or it can update this value to the existing element in an FMIS. For some changes in the FMIS, the update does not have an effect to the BIM-data, so the unique ID does not have to be updated.

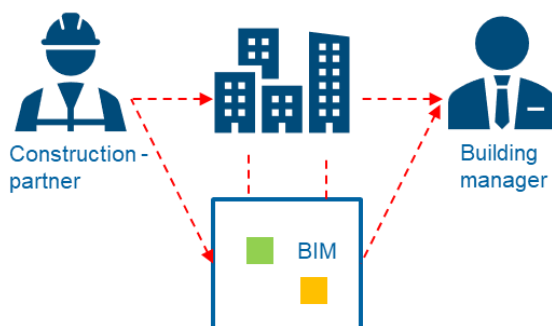


1.9 Define the ownership of BIM-data

BIM-data is created by various construction partners, who need to transfer the ownership of this data after the hand-over. Make sure the format and the content of the data is well-written and defined by all stakeholders.

Example:

To be able to make changes in BIM-data during the maintenance-phase, access to native-BIM-models (either via contracts with external partners or for the building managers' design-team) is necessary. If the data is just delivered in read-only formats, it won't be possible to update it.

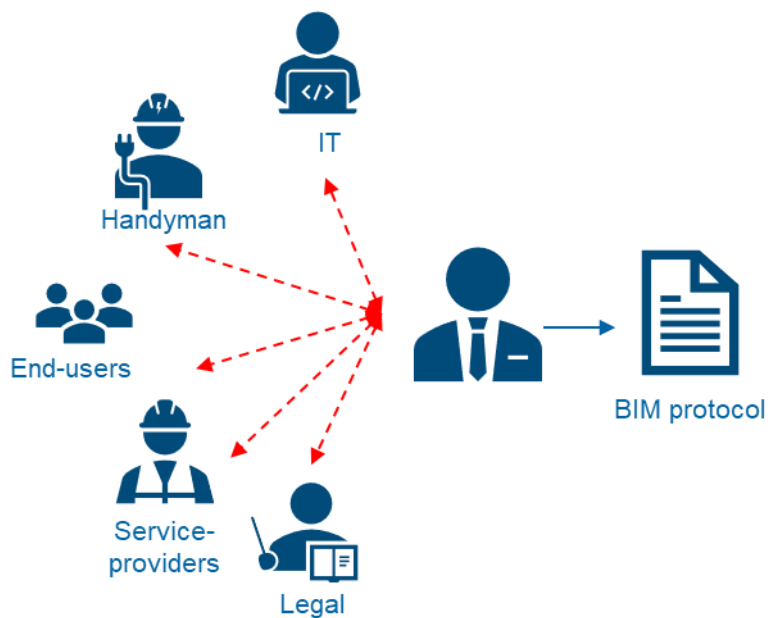


1.10 Involve the right stakeholders to define information needs

Involve the right stakeholders from the FM, IT or Real Estate department in defining your minimum data requirements. Link information needs to the processes that are managed in your FMIS. By mapping the information needs and processes, the best decisions can be made on how and in which systems certain information must be managed.

Example:

After a consultation of the IT-department, a new added value to map the patch-connections from BIM becomes clear. The BIM-data will now have a much bigger impact in the organization.



2 Information needs by FMIS-processes

This list will represent the minimal information that should come from BIM-data, to integrate it in FMIS-processes. Not all building managers will need all FMIS-processes, so based on their needs, he can choose which are relevant to their organization. It is a minimum-list, so a building manager can add own items to the list. If we say 'optional', we have noticed that this information doesn't come 'out of the box' from BIM-data. We added this item, because it's still very important for an FMIS, so it might be added to the BIM-data as required.

The FMIS-processes:

1. Reservations: reserve spaces and equipment
2. Lease management: lease spaces or parts of the facility to internal or external lessees or departments.
3. Space management: manage space properties
4. Cleaning: regular cleaning processes in or around facilities
5. Service requests: request failures or services to assets or spaces by end-users of the facility.
6. LTMP: make budgetted maintenance plans based on assets and estimated costs
7. Regular maintenance: planned (permitted) & reactive maintenance that needs to be executed in and around facilities.

Data uit de BIM-modellen	Processen						
Data	Reserveren	Verhuren	Ruimtebeheer	Schoonmaak	Melden/storing	MJOB	Regulier onderhoud
Gebouw	X	X	X	X	X	X	X
Gebouwdeel	X	X	X	X	X	X	X
Etage	X	X	X	X	X	X	X
Ruimtes							
Technisch ruimtenummer	X	X	X	X			X
Gebruiksfunctie	X	X	X	X			
Ruimtesoort	X	X	X	X			
Brandklasse			X				
Ruimtebenaming (optioneel)	X	X	X				X
Kamernummer (optioneel)	X	X		X	X		
Elementen (bouwdeel)							
NLSFB (minimaal 4 cijfers)						X	
Bouwdeelomschrijving						X	
Fabrikant en type						X	
Hoeveelheid st, m1 en m2						X	
Installaties							
NLSFB (minimaal 4 cijfers)						X	X
Bouwdeelomschrijving						X	X
Fabrikant en type						X	X
Ruimte (technisch ruimtenummer)						X	X
Hoeveelheid st, m1 en m2						X	X
Afmetingen							
Netto vloeroppervlakte	X		X	X			
Verhuurbaar vloeroppervlakte	X	X	X				
Inventaris							
Meubilair (optioneel)	X	X	X	X	X		X
Apparatuur (optioneel)	X	X	X	X	X		X

Explanation to sheet:

- A technical spacenumber is used as the physical spacenumbering. A roomnumber or roomname is typically added by facility managers as additional explanation to the end-users of the facility.
- When creating LTMP, the definition of assets can be different from defining it for the purpose of regular maintenance to fix assets.