Tender Text

Guide for requesting a Madaster materials passport and / or building file

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Context and Content

This text is made available for building owners / developers by Madaster and serves as a guide how to include a Madaster Material Passport for a building (hereinafter Building Passport) in their tender. This document contains three elements:

Chapter 1 explains the terms used and the general process for generating a Building Passport.

Chapter 2 provides sample texts that can serve as guidelines for general parts of the tender of a Building Passport.

Chapter 3 provides sample texts that can be used to describe and specify the request of a Building passport in a process-oriented, functional and technical manner.

Together, if carried out satisfactorily, this results in a high-quality and accurate Building Passport.

For any additional information, please contact Madaster at info@madaster.ch or by phone on +41 44 500 44 46. We are happy to assist you.

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1 Explanation of terminology and process

1.1 Building Passport; a material passport for a building

A Building Passport is a materials passport for a building and forms a digital representation ('twin') of the specific building, with a focus on the materials and products used. The completeness and accuracy of this Building Passport is determined by the availability and quality of building information (source files).

a. For new buildings, more and more information is recorded in BIM models. This form of recording offers the most advantages with regard to the successful and accurate preparation of a Building Passport in the Madaster Platform.
b. For existing buildings, drawings and possible specifications are the norm. These can be translated (possibly by specialized market parties) into BIM models, or processed in an Excel template[1] in order to prepare a Building passport in the Madaster Platform.
c.

New building

In a new-build situation, a Building Passport is created by the design team, after which the contractor and suppliers further enrich the building information into a so-called "As-Built" BIM model[2] . The Building passport can then be delivered upon delivery of the building to the building owner / developer.

Existing building

Within an existing building (for example in a renovation project) the same aforementioned "As-Built" BIM model is the desired goal. In addition, the building owner / developer can decide that the current situation must first be mapped before starting the project. This means that the elements present in the existing situation are inventoried (quantitative and qualitative) so that before the start of the project it can be determined:

a. to what extent reuse of these elements in the project is desirable / necessary and;
b. to what extent new products and materials must be supplied.

This total inventory of both to be reused and to be supplied products and materials subsequently results in the Building Passport of the new situation and in this case contains information about the products and materials that have been reused and newly supplied.

In projects, the building owner / developer will not always aim for the "As-Built" BIM model. An alternative can then be found in the use of the Madaster Excel template. This alternative solution requires (compared to the as-built variant) a reduced effort and knowledge of materials used in the building.

[1] When Excel is used as a source file, no 3D representation of the building can be generated on the Madaster platform.
[2] An "As-Built" BIM model shows how the building was effectively realized. This as-built model contains an updated and accurate representation of the actual situation. Temporary information is deleted and all elements contain verified information. The desired level of detail for this is determined per project. The as-built plans can be derived from this model.

1.2 Information delivery: Building Information Model (BIM) and Excel

The building information with regard to the materials and products used in the building is preferably linked to a BIM model. In practice, this can be multiple BIM models, where (for example) a distinction is made between the construction, the architectural model, the installation and the interior. The combination of these models ultimately forms the basis for the Building Passport of the relevant building.

Upon delivery of the project, the BIM models must contain the as-built information. This promotes the use and keeping the models up-to-date during operation (maintenance, changes).

A BIM model can be developed in different levels of detail. This is expressed in a standard, being: Levels of Detail (LOD). Madaster requires at least an LOD 300.

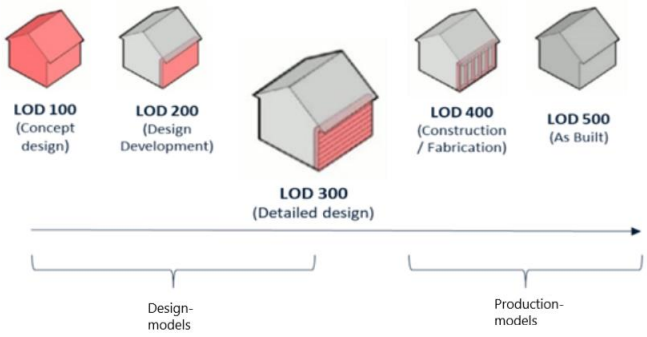

Figure 1 Level of Detail (LOD)

The building owner / developer may consider not using BIM / IFC as the standard for the source information in the tender. Alternatively, there can be asked to record in Excel. In some cases, this form can be less labour intensive and (provided the Madaster Excel template is used) provides largely the same functionalities in the Madaster platform. The difference between IFC and Excel lies in the fact that the building cannot be displayed in a 3D model on the Madaster platform.

1.3 Building Layers in Madaster

Materials and products used in a building are categorized in the Madaster Platform and assigned to various building layers. This indicates the location of the materials and products in the building. In addition to architectural and constructional elements, Madaster also has the option of classifying technical installations, interiors and elements in the vicinity of the building (such as pavements, etc.). Depending on the building owner / developer's objectives, it is determined from which building layers a materials passport is expected, which ultimately results in one Building Passport.

Figure 2 Building Layers in Madaster

1.4 Level of Description

To register a new or existing building in Madaster, information (data) is required from this building. The more extensive this data is available (input), the more detailed the report (output) is shown in the Madaster platform and specifically in the Building Passport. It is therefore recommended to determine the purpose and the level of detail of the Building Passport before requesting data.

1.4.1 General

A Building Passport in Madaster can be requested or elaborated on three levels, with the higher level always building on the directly underlying level. There is always the option to "step in" at a specific level and then move on to the next level at a later time. These three levels are explained in the following sections

1.4.2 Level 1 – Material Level

At this level, the Building Passport aims to reflect the materials used in a building and as such provides insight into the quantities of materials used, where these materials are located in the building and what its financial (residual) value is. At this level, no insight is obtained into the products used in the building and their underlying circular properties (degree of reuse, recycling, disassembly, etc.) or environmental properties (degree of CO2, toxicity, etc.). As a result, insufficient insight can be given at this level into the circularity or environmental impact of the building (Madaster Circularity Index).

1.4.3 Level 2 – Product Level

At this level, the purpose of the Building Passport is, in addition to the materials used, also to provide insight into products (incl. their material composition) that are incorporated in the building and the location (building layer) where these products are located in the building. In Madaster a distinction can be made between 4 different types of products (volume, area, length & quantity products). Based on this additional perspective, the Building Passport makes it clearer which products have been used in the building (including numbers) and, in contrast to materials, these can potentially be "reused" at a higher level. Despite the fact that the basis is formed at level 2, insufficient insight is obtained at this level into the degree of circularity and environmental impact of the building, because the circular properties of the materials and products used are still largely lacking.

1.4.4 Level 3 – Including Circularity and/or Environmental impact

At this level, the purpose of the Building Passport is, in addition to displaying the materials and products used, to gain insight into the degree of circularity of a building through the Madaster Circularity Index. This score is made transparent by enriching the materials and products with circular (degree of reuse, recycling, detachability, etc.) and environmental data (degree of CO2, toxicity, etc.). This is the most detailed version of the Building Passport in Madaster.

1.5 Madaster documentation and manuals

Madaster offers various additional documents through its platform that are related to drawing up a Building Passport and working with the Madaster platform. For an overview of this information, please refer to the Documentation, FAQ and API section of the Madaster platform which can be reached (freely accessible) at https://docs.madaster.com/.

2 Tender Text – Specific Criteria

Note: The Building Passport can be delivered at various levels of detail. If desired, a different level can be requested for each shearing layer. In chapter 1.4 the detail levels are described. In the following sections, the functional and technical specifications are described per detail level.

2.1 Generally required criteria

1. The Building Passport is set up using the and fitting into the structure of the Madaster platform.
2. The Building Passport must contain at least [set range between 80 - 100 %] of the elements and components "as-built", fully corresponding to the delivered situation (for both existing[3] and retained elements as well as newly installed elements).
3. The Source File must be delivered by the Contractor as complete as possible[4] upon delivery: product sheets, certifications, ownership/lease agreements, guarantee documents, maintenance instructions, operating instructions, assembly and disassembly instructions and all other relevant documentation is made available to [Building owner / developer]. from the Building File in Madaster.

2.2 Level 1 – Material Level required criteria

1. The source files of the building to be registered in Madaster must be created by the Contractor (and/or its partners) for each shearing layer, on the basis of BIM, in the IFC file format at least at LOD 300 and delivered in accordance with the BIM Basis ILS standard. If the tender demands Microsoft Excel, the Madaster Excel template must be used.
2. [Building owner / developer] expects that at least [set range between 80 - 100 %] of the elements in the source files (IFC and/or Excel template) to be delivered contain the following data:
    a. EBKP Classification, min. 4-digits
    b. Geometric data:
        i. Quantity of the element (unit of quantity e.g. m, m2, m3);
        ii. Quantity of the element in m3 and kg;
        iii. BIM model: export of so-called "Base quantities" in the IFC.
    c. IFC file or the Excel template contains a material description for at least [determine range between 80 - 100%] of the elements, which is correctly linked to:
        i. Materials and products in a Madaster database or;
        ii. the [Building owner / developer]'s own account or contractor's database in Madaster[5] , or
        iii. product databases linked to Madaster.

[3] Existing elements: in consultation with the building owner / developer it should be determined whether investigation on reuse potential is desirable or necessary.
[4] As complete as possible: the Contractor informs if the relevant documents are not available.
[5] As complete as possible: the contractor demonstrates if the relevant documents are not available from the supplier.

2.3 Level 2 – Product Level required criteria (adding upon Level 1)

1. Overview of at least [determine range between 80 - 100%] of the products used in the building, with at least the following specifications of each product:

a. Product name;
b. Product code (EAN or GTIN, etc.) (if available);
c. Product type (volume, area, length or amount/piece);
d. Product dimensions (depending on selected product type). Can be specified by: length/width/height/depth/thickness/diameter/etc.;
e. Product composition (materials used in the product expressed in weight (kg/per functional unit: m^3 , m^2 or m);
f. If product composition is not known/specified: Weight (in kg/per product functional unit: m3, m2or m);
g. Search criteria.

2. These products are entered and made available in the account database of the [Building owner / developer] or contractor. Or;

3. The IFC file or the Excel template from Madaster contains a material or product description for a minimum of [determine range between 80 - 100%] of the elements modelled, which are correctly linked to:

a. Materials and products in a Madaster database or;
b. the [Building owner / developer]'s own account or contractor's database in Madaster**Error! Bookmark not defined.** , or
c. Product databases linked to Madaster.

2.4 Level 3 – Circularity and/or Environmental impact (adding upon Level 2)

1. Overview of at least [determine range between 80 - 100%] of the materials and products used in the building, including at least the following specifications of each material and product:
    1.1. Material properties:
        i. Specific weight (in kg/m3);
        ii. Feedstock input composition in %;
            a. Primary material, of which:
                A. From "Renewable sources";
                B. From "Renewables sustainably produced";
                C. From "Rapid renewables";
                D. From "Rapid renewables sustainably produced";
                E. From "Non-renewable sources.
            b. Secondary material, of which:
                A. Reused;
                B. Recycled.
        iii. Lifespan/Service life (in years);
        iv. % of material (also in products) in their final life cycle stage available:
                A. For "Recycling";
                B. For "Landfill";
                C. For "Incineration".

1.2. Product properties:

i. Defining the material composition, which includes 1.1. material properties;
ii. Degree (%) of recoverability of product;
iii. Functional lifetime / lifespan (in years);
iv. Degree of detachability, as developed by DGBC, RVO NL, etc. and described in the report described in the report "Circular Buildings - a measurement methodology for 2.0" commissioned by the Ministry of the Interior and the Transition the Transition Agenda Circular Building Economy.
    A. Connection type;
    B. Connection accessibility;
    C. Intersections;
    D. Product edges.
v. Environmental cost indicator per unit (in €)
vi. Environmental impact (expressed per LCA phase of the product (A1-A3 to D):
    A. in kg CO2 equivalent
    B. To be completed with other EPD data as described in (NEN-) EN 15804

2. These products are entered and made available in the account database of the [Building owner / developer] or contractor. Or;

3. The IFC file or the Excel template from Madaster contains a material or product description for a minimum of [determine range between 80 - 100%] of the elements modelled, which are correctly linked to:

a. Materials and products in a Madaster database or;
a. the [Building owner / developer]'s own account or contractor's database in Madaster[6] , or
b. product databases linked to Madaster.

2.5 Schematic overview per output

For a schematic overview of the individual data requirements necessary to generate a specific output (financial residual value, circularity, detachability or CO2 (embodied Carbon)) on the Madaster platform, please refer to the document "Schematic overview Madaster data requirements per output".

3 Additional General Tender Text Samples

The tender text is divided into a number of segments. For the successful preparation and delivery of a Building Passport by means of the Madaster Platform by the contractor, at least the segments indicated under Chapter 2 must be included in the tender. The segments under Chapters 3.1 and 3.2 provide additional guidance that the building owner / developer can draw from when drawing up the tender.

Chapter 1 provides an explanation of terms used and process descriptions that may be used to clarify certain components.

3.1 Introduction Text

As part of this call for tender, [Building owner / developer] requests the Contractor to provide a Building Passport in the form of a Madaster registration. This Building Passport must contain at least [determine range between 80 - 100%] of the materials and products of [the building]. With the Building Passport [Building owner / developer] wants to guarantee the reuse of the materials and products, make the residual value transparent and prevent waste in a broad sense.

3.2 Description of the Goal

The Building Passport serves to facilitate the reuse of materials and products in order to minimize the impact on the environment, the stock of materials and the loss of the value created. [Building owner / developer] uses the Building Passport so that:

- Information about the materials and products used in [the building] are available to relevant parties and individuals;
- In such a way that this information can be kept up to date during maintenance, alterations and replacements after completion;
- By the building owner and / or manager and / or the parties who carry out work in [the building] on behalf of (one of) these parties;
- Or be otherwise responsible for keeping the information about [the building] up to date

3.3 Process

3.3.1 Availability

1. The Contractor draws up a digital Building Passport of the building, which is kept and made clear during the design phase, the work preparation and implementation phase and is delivered on the Madaster Platform to [Building owner / developer] in the account of [Building owner / developer] upon completion of the project.
2. The Building Passport is set up in accordance with the options in section 3.2. and provides, upon delivery, insight into at least [determine range between 80 - 100%] of the materials (and products) used in the building.
3. A written and oral explanation and instruction to the building owner and manager about the Building Passport and its use within the Madaster platform is part of the Contractor's obligations. The Contractor must also be available for any additional explanation and / or answering questions during the first year after delivery of the building.

3.3.2 Selection of detail level and desired source file

Explanation: The building owner / developer selects the desired level of detail and source file per building envelope in which the contractor must deliver the Building Passport.

The Building Passport is delivered in the following level of detail per building layer:

		To be delivered level of detail		
Select	**Building layer**	**Level 1**	**Level 2**	**Level 3**
		Material level	Product level	Including circularity
☐	Location (Site)	☐	☐	☐
☐	Construction (Structure)	☐	☐	☐
☐	Outside/shell (Skin)	☐	☐	☐
☐	Technical installations (Services)	☐	☐	☐
☐	Finish (Space plan)	☐	☐	☐
☐	Interior (Stuff)	☐	☐	☐

The following types of source files are supplied for the building passport: (The building owner / developer may also leave the decision on this to the Contractor).

		Madaster source file	
Select	**Building layer**	**BIM-/IFC-File**	**Excel template**
☐	Location (Site)	☐	☐
☐	Construction (Structure)	☐	☐
☐	Outside/shell (Skin)	☐	☐
☐	Technical installations (Services)	☐	☐
☐	Finish (Space plan)	☐	☐
☐	Interior (Stuff)	☐	☐

3.4 Split models: Building numbers

The Building Passport is delivered by the Contractor per building number (object). If the Contractor models several buildings/residences, a Building Passport per building number can be created automatically in Madaster using the “building number” modelled in the IFC file (using the “Split buildings” function on the platform).