Material Passport definition

Extract from study on material passports

Apeldoorn, the Netherlands
Definition of a material passport

In essence the information needed for a material passport is what lies where, what’s the expected life span and what can be done with it at end of life e.g. reuse, remanufacturing or recycling.

In CityLoops we have used these top five of requirements to define our material passport:

1. it needs to include a bill of materials (BOM) with quantities, material composition, and location (GIS) of the materials on site;
2. inspection and maintenance history of the materials on site needs to be recorded in the passport;
3. it includes technical lifetime expectancy of materials on site, so information on production date, manufacturer’s or contractor’s lifetime expectancy adjusted with information from the field;
4. renovation or ‘end-of-life’ options of the materials are addressed;
5. the setup of the material passport complies with a uniform system and clear definitions.

The five requirements is based on a CityLoops study of material passports done by Ing. E.A. Erik Goselink, Saxion research group Industrial Design, Saxion University in 2021. The link to the full report is here.

Below is an example on how the material passport can be structured.
**Table 1: Example on how to structure a material passport**

<table>
<thead>
<tr>
<th>TILE</th>
<th>TILE (V2)</th>
<th>BRICK</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dimensions</strong>: 300 x 300 x 65 mm</td>
<td><strong>Dimensions</strong>: 300 x 300 x 65 mm</td>
<td><strong>Dimensions</strong>: 105 x 210 x 80 mm</td>
</tr>
<tr>
<td><strong>Material</strong>: concrete (solid)</td>
<td><strong>Material</strong>: concrete (solid)</td>
<td><strong>Material</strong>: concrete (top layer)</td>
</tr>
<tr>
<td><strong>Colour</strong>: grey</td>
<td><strong>Colour</strong>: grey + P (white)</td>
<td><strong>Colour</strong>: pink</td>
</tr>
<tr>
<td><strong>Area</strong>: 3690 m²</td>
<td><strong>Area</strong>:</td>
<td><strong>Area</strong>: 850 m²</td>
</tr>
<tr>
<td><strong>Location</strong>: 52.18877892446144, 5.994409573507057</td>
<td><strong>Location</strong>: 52.18877892446144, 5.994409573507057</td>
<td><strong>Location</strong>: 52.18877892446144, 5.994409573507057</td>
</tr>
<tr>
<td><strong>% damaged</strong>:</td>
<td><strong>% damaged</strong>:</td>
<td><strong>% damaged</strong>:</td>
</tr>
<tr>
<td><strong>Weight</strong>: (ton)</td>
<td><strong>Weight</strong>: (ton)</td>
<td><strong>Weight</strong>: (ton)</td>
</tr>
<tr>
<td><strong>Amount (aprox):</strong> 41.000</td>
<td><strong>Amount (aprox):</strong> 10</td>
<td><strong>Amount (aprox):</strong></td>
</tr>
<tr>
<td><strong>Theoretical life span</strong>: 30 years</td>
<td><strong>Theoretical life span</strong>: 40 years</td>
<td><strong>Theoretical life span</strong>: 25 years</td>
</tr>
<tr>
<td><strong>Years in use</strong>: 43</td>
<td><strong>Years in use</strong>: 20</td>
<td><strong>Years in use</strong>: 43</td>
</tr>
<tr>
<td><strong>Expected life span</strong>: -13!</td>
<td><strong>Expected lifespan</strong>: 20</td>
<td><strong>Expected lifespan</strong>: -18!</td>
</tr>
<tr>
<td><strong>Contractor</strong>:</td>
<td><strong>Contractor</strong>:</td>
<td><strong>Contractor</strong>:</td>
</tr>
<tr>
<td><strong>Material supplier</strong>: unknown</td>
<td><strong>Material supplier</strong>: unknown</td>
<td><strong>Materials supplier</strong>: unknown</td>
</tr>
<tr>
<td><strong>Pressure test data (link)</strong></td>
<td><strong>Pressure test data (link)</strong></td>
<td><strong>Pressure test data (link)</strong></td>
</tr>
</tbody>
</table>
CityLoops is an EU-funded project focusing on construction and demolition waste (CDW), including soil, and organic waste (OW), where seven European cities are piloting solutions to be more circular.

Hoje-Taastrup and Roskilde (Denmark), Mikkeli (Finland), Apeldoorn (the Netherlands), Bodo (Norway), Porto (Portugal) and Seville (Spain) are the seven cities implementing a series of demonstration actions on CDW and soil, and OW, and developing and testing over 30 new tools and processes.

Alongside these, a sector-wide circularity assessment and an urban circularity assessment are to be carried out in each of the cities. The former, to optimise the demonstration activities, whereas the latter to enable cities to effectively integrate circularity into planning and decision making. Another two key aspects of CityLoops are stakeholder engagement and circular procurement.

CityLoops started in October 2019 and will run until September 2023.