UK GBC

MATERIALS PASSPORT
PRACTICAL GUIDE

This Practical Guide covers key principles of material passports in the built environment.

IN A SNAPSHOT

Materials passports store key information on construction materials and products. They act as identity cards, holding information in a digital format on the characteristics of materials and products to support the recovery and reuse of materials from built assets over their life cycle. By having data in a digital format, on a database or platform, the materials passport supports digitalised data management by holding key information in one place and can be updated over the lifecycle of a material or product to act as single source of data. Ultimately, materials passports help practitioners identify the opportunities for material recovery and reuse, enabling better decision-making and informing strategies to reduce waste and other environmental impacts.

Why is it important?

Currently, 61% of waste comes from demolition, construction and excavation, much of which could be recovered and reused. By storing key information on materials and products over their life-cycle, materials passports can enable due diligence of the material's history and offer options on what to do next, reducing waste and maximising the life of a material or product. The information gathered can support reporting requirements such us the 'Golden Thread' of information. There are a range of reasons to consider using materials passports on projects including:

1 | Providing key product and sustainability information

Material passports hold key material or product information and can contain specific information such as carbon and environmental impact data from Environmental Product Declarations (EPDs). They could also include health and well-being information from material composition, for example, Volatile Organic Compound (VOC) data. This data is often needed for sustainability certifications such as BREEAM, WELL and SKA, as well as for Life Cycle Assessments.

2 | Circularity information

Information on the methods of assembly, disassembly, repair and maintenance, as well as supporting appropriate end-of-life options such as reuse or recycling for the material or product. This helps ensure the material stays at the highest value for as long as possible, reducing the need for virgin materials.

3 | Facilitating long-term material recovery

This includes information related to the manufacture, testing, and warranty. Certifications can help with due diligence processes to insure reused materials by having all the information in one place, providing confidence for reuse.

4 | Feeding into materials reuse hubs and platforms

By providing the product and lifecycle information, materials passports can help to increase the flow of reused materials and provide data across asset portfolios. The information can also feed into reuse hubs or marketplaces where materials can be sold once reclaimed from a built asset. This could be used to provide insight into regional stock information, enabling the supply chain to anticipate future stock flows.

5 | Regulatory drivers

The EU's Ecodesign for Sustainable Products Regulation (ESPR, 2024) includes a requirement for a Digital Product Passport (DPP) to be available for select materials including steel, aluminium, and furniture. Similar to a materials passport, a DPP is a tool aimed to enhance transparency about a product's environmental impact and circularity. Although this is an EU regulation, products sold on the EU markets will need DPP's, impacting the UK market as well.

Key considerations

Different passport levels

There are a variety of passport levels and the relevant stakeholders need to clarify which 'type' of passport is required. As defined by Buildings As Materials Banks (BAMB) 2020, the hierarchy levels are Material, Component, Product, System, and Building. Not all materials are going to have a passport for every level listed, and therefore the information needed for each material and product may differ. Ideally, materials passports can be aggregated upwards to feed into building-level passports.

Data requirements

Although there will be similarities in the basic data needed for different materials and products, each will have specific data that must be included based on where it is located within the building, its expected lifespan, and the technical requirements of that product. For examples of the data that could be collected see the Materials Passport information reference guide.

Future use

It is important to plan for the future use and accessibility of passports. When creating them, it is essential to consider the data to collect, its intended purpose, who will update it and who will need to access it. This requires collaboration with stakeholders across the buiding life cycle to understand how passports will sit within other documentation, e.g. operations and maintenance manuals.

Data management

Due to the digital nature of materials passports, data management and ownership must be a key consideration. To ensure their relevance for future use, these passports should remain dynamic and be continuously updated. Balancing data security with appropriate stakeholder access is essential for safeguarding sensitive information while enabling collaboration. It is also worth investigating how the passport may link in with other digital tools, such as BIM, LCA calculators, digital twins, and digital reuse hubs.

Key stakeholders to engage with

The stakeholders are likely to have different roles and responsibilities in the project planning process and over the materials passports' lifetime:

CONSIDERATIONS FOR REUSED MATERIALS

Existing buildings may need to adopt a different approach for producing materials passports for the materials already in the building. A pre-demolition, redevelopement or strip-out audit can identify materials in the existing building. This can be used to gather basic materials passport information and provide guidance on which materials can be reused. There may also be the need to share materials passports with reuse hubs or platforms.

Developers and asset owners

are likely to have control of the passports over their lifespan. They should develop a brief which includes their project-specific objectives and is incorporated as part of a circular economy strategy. Working with the other stakeholders, they should also decide how the passport information is stored, how the data is collected, and who has the responsibility to manage and update it over its lifespan. They should incorporate materials passports into wider portfolio management so the material stocks can be viewed.

Design or project team

is likely to be responsible for initiating the process of collecting materials passports. They may use existing passports to inform design decisions based on the data available or set out the specification requirement and the data that needs to be collected in alignment with the developer's passport strategy.

Contractors

aid in data collection through their supply chain from subcontractors, materials stockists and manufacturers. Overseeing the installation of materials/products and ensuring the passports are updated at completion with 'as built' information. **Subcontractors** are responsible for gathering documentation and recording information relating to their packages.

Manufacturers or material suppliers

provide information on their products for the materials passport or a DPP if they have one. They should be supported in the data collection for the passports and keeping the data available for materials passports updates.

Facilities Managers

can use the information within the passports to understand how materials and systems need to be cared for during the in-use phase. They should update the passports throughout the in-use stage of the asset with details of maintenance and repair so they remain accurate.

IN SUMMARY

Materials passports provide data to support circularity, reduce carbon emissions, and reduce waste. They can help ensure the true value and lifespan of materials are realised and aid in deconstruction over demolition. In addition, materials passports support enhanced data transparency, improved supply chain management, regulatory compliance, and standardisation by acting as a central lifecycle document for the materials or products within an asset.

FURTHER RESOURCES

Materials passports: Accelerating material reuse in construction

Waterman materials passports framework

UKGBC System enablers for a circular economy