

# Sustainable Construction

## Practical Guide

This Practical Guide explores the key principles of sustainable construction

### IN A SNAPSHOT

**Sustainable construction** is defined as "construction activities whose negative impacts are minimised and positive impacts maximised so as to achieve a balance in terms of environmental, economic and social performance."



### WHY IS IT IMPORTANT?

The construction phase of any building project can come with huge potential environmental and social impacts. Taking a responsible and sustainable approach ensures that any negative impacts are reduced and positive impacts are heightened. Some common detrimental impacts of the construction phase of a building project includes:

#### Fossil fuel consumption

Heavy plants and machinery used on construction sites are often based on high fossil fuel consumption. There can also be high levels of [embodied carbon](#) from the fabrication and shipping of materials, and the impacts of mining for raw materials. For example, the manufacturing of concrete, steel, and aluminum are responsible for [23%](#) of total global emissions.

#### Impact on the natural environment

The construction phase can have negative impacts on the surrounding natural environment, especially when taking place on greenfield sites (sites not previously built on). The industry has [more](#) water pollution incidents than any other industry.

#### Health and wellbeing

Construction of buildings is believed to account for [4%](#) of particulate air pollution and construction projects receive thousands of noise complaints [per year](#).

However, the industry has an opportunity to reduce these negative impacts and maximise positive impacts whilst maintaining business returns and improved organisational reputation. Read on to find out how.



### PRINCIPLES OF SUSTAINABLE CONSTRUCTION

There are many ways in which construction can be made more sustainable, both in terms of the on-site construction practices and the final built product. Some examples include:

#### Energy and carbon reduction

High amounts of energy are used in construction projects. Using [renewable energy](#) on site and building low energy consumption into the final product can reduce this.

#### Low embodied carbon

Selecting materials with low [embodied carbon](#) can significantly reduce the overall carbon of a construction project.

#### Sustainable materials

As [LETI](#) highlight: 'Materials with a low carbon footprint must be prioritised, and wherever possible, are locally reclaimed materials. Low carbon materials are often naturally-sourced and renewable, are reused, or have a high recycled content'.

#### Waste reduction

The UK construction industry produces roughly [100 million tonnes](#) of waste every year. Wherever possible reuse, recycling, and the sustainable selection of materials should be prioritised.

#### Enhancing nature

The noise, pollution and disturbance caused during construction projects, especially on greenfield sites, can affect many species. Restoration and enhancement of nature and habitats should be part of the construction plan.

#### Prioritising health and wellbeing and social value

On-site health, safety and wellbeing is a [legal requirement](#). Impacts on local communities should be positive, with air pollution and noise disruption mitigated as much as possible.

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### HOW CAN IT BE DONE?

Each building project is unique and will require different approaches depending on its context. However, below are some considerations that should be thought through.

STEP 1

#### Early contractor involvement

Contractors should be involved in early discussions with developers and design teams to ensure specialist advice and a full understanding of [sustainable designs](#) can be obtained early. Greater buy-in is enabled and there is also an opportunity to identify cost and other efficiency savings. There should be enough time to enable [the procurement](#) of sustainable materials and plan sustainability into every decision.

STEP 2

#### Sustainability opportunities defined

The sustainability opportunities for the construction phase of the project should be assessed and defined (i.e. waste reduction, water conservation, biodiversity enhancement). All parts of the construction process and the building structure should be considered and a sustainability plan for the delivery should be created.

STEP 3

#### Upskill, embed, inspire

Sustainability should be embedded into roles and processes of those working on delivering the construction, to ensure everyone is onboard and has a shared vision. Upskilling and training should be undertaken where needed to ensure all [sustainable design](#) features (i.e. [renewable energy](#) technology installation) can be installed correctly to avoid a [performance gap](#).

STEP 4

#### Sustainable project delivery

Sustainability should be included in all stages of the project delivery, including [tender submissions](#), contracts, specification, data and reporting, through to handover to in use. Stakeholder engagement and collaboration with the client, supply chain, and sub-contractors is key. During the construction period, there should be continual evaluation to ensure the sustainability plan is being delivered as intended.

STEP 5

#### Soft landings and post-occupancy measuring

A '[soft landing](#)' strategy should be implemented so that the transition from construction to occupation is 'bump-free' and that operational performance is optimised. Measuring and monitoring post-occupancy can help ensure problems are identified, user behaviour is understood, and lessons are learned for future projects.



#### CASE STUDY: THE FORGE, BANKSIDE

On track align with the UKGBC's [Net Zero Carbon Buildings: A Framework Definition](#) for construction and operation. The project is achieving a series of sustainability objectives and outcomes in the construction phase. For example:

- **Design for Manufacture and Assembly (DfMA)** has helped reduce material use, waste generated and [embodied carbon](#). It has also enabled a faster build time and safer working environment as working at height was shortened.
- **Operational carbon reduction** will be achieved through on-site [renewable](#) electricity via PV panels.
- [Sustainable procurement](#) of **local stone, steel and concrete** reduces the embodied carbon associated with travel.
- **Off-site manufacturing** has reduced material waste on site.

Find out more about this project on the UKGBC [Case Study Library](#) or [The Forge](#) website.

#### IN SUMMARY...

The construction stage of a building or infrastructure project can be made more sustainable in a variety of ways. By focusing on valuing key sustainability principles, upskilling, and early involvement, construction practice sustainability can be maximised.

#### READ MORE ABOUT SUSTAINABLE CONSTRUCTION

- Constructing Excellence: [Plain English Guide to Sustainable Construction](#)