



Construction and the Built Environment – Unit 1

1.2 The Built Environment Life Cycle (1 of 2)

1. RAW MATERIAL EXTRACTION

Extraction refers to the processes by which raw materials are harvested from the natural environment for use in the human-built environment.

Oil and gas are non-renewable energy sources found beneath land or the ocean floor. Crude oil is extracted using giant drilling machines or rigs, while natural gas, located in rock formations beneath the earth's surface, is extracted through drilling or a method called fracking.

Forestry extraction involves cutting down trees and transporting them to sawmills, pulp mills, and other wood-processing plants. In sustainable forestry plantations, for every tree cut down, another is grown in its place.

Quarry extraction refers to the removal of rock, sand, gravel, or other minerals from the ground to produce materials for construction. In the UK, the largest quantity of minerals extracted through quarrying is used for construction and is known as aggregates.

Mining extraction involves excavating large amounts of waste rock by tunnelling into the earth's surface. This process recovers important metals such as copper and aluminium, as well as materials like clay, limestone, and granite.

2. MANUFACTURING

Following extraction, raw materials need to be processed into more practical forms before they can be used. The materials most commonly used by the construction industry are:

Timber – Once cut or felled, logs are processed into boards and then seasoned to remove excess water.	Sawn timber – Used as a structural material. PSE (planed square edge) – Used where the timber is visible.
Engineered Wood Products (EWP) is available in sheet form, ranging in thicknesses up to 35 mm. Plywood and oriented strand board (OSB) are among the most commonly used.	Used for all aspects of internal and external components, such as: <ul style="list-style-type: none">• flooring and wall cladding• trussed rafters• structural sections.
Steel has a wide range of applications, including structural framework, cladding, as well as common fixings and fastenings.	Structural steel – Includes column and beam sections. Stainless steel – Used for screws, nails, and rivets. Mild steel – Used for lintels, purlins, and rails. Profiled sheeting – Used for wall and roof cladding.
Copper is extruded into both solid and hollow sections.	Electric cables, water pipes, and gas pipes.
Plastic is extruded into various forms.	Water pipes, windows, doors, and wall cladding.
Crushed rock is extracted through mining, then broken down to the desired size using crushers.	Gravel – Small fragments of rock. Aggregate – Includes sand, gravel, and crushed stone. Hardcore – A mass of solid material.
Clay minerals are crushed, shaped, dried and then fired in ovens to produce bricks.	Bricks
Cement is a mixture of raw materials, such as limestone, which are crushed, blended and heated in a kiln to create cement.	Used as a binding material in construction, it is a key ingredient in mortar and concrete.
Mortar is a mixture of sand, cement, and water.	Used to bind together bricks, blocks, or stones.
Concrete is a mixture of cement, water and aggregate (such as gravel, sand, or rock).	The most common manmade construction material. Combined with steel bars or mesh to make reinforced concrete lintels and floor beams.