

# C3 Bremen

## Circular Construction & Technology Center

STRABAG Environmental Technology is realising a state-of-the-art technology and circular construction centre for urban mining and construction waste processing on the 13-hectare site of a former refinery tank farm in the port of Bremen. The site, which was heavily contaminated with crude oil, will have to undergo extensive remediation before it can be put to new use. Designed as a sustainable facility, C3 will be supplied with electricity from a photovoltaic system. The roof of the administration building will be greened. Green spaces and embankment areas also serving as a habitat for local insects.



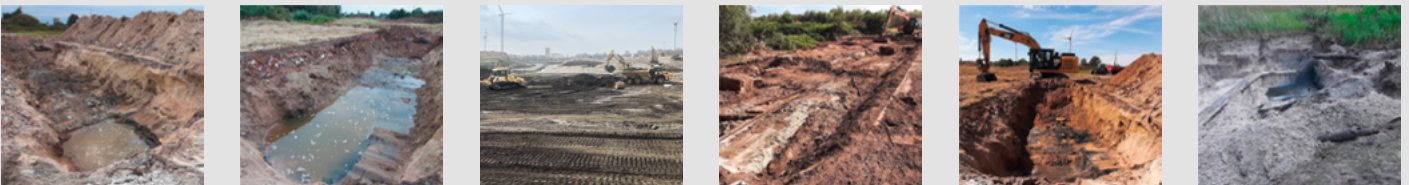
## Legacy: former refinery tank farm

The property, which the City of Bremen sold to STRABAG Environmental Technology and officially handed over on 8 June 2022, is located on the north side of the port. After the Second World War, and until 1976, the facility was used as a large tank farm for fuels and other products from the local Esso refinery. The tanks and above-ground facilities were demolished in 1990. The City of Bremen took over the site, including all legacy issues, almost ten years ago. Massively contaminated with crude oil from the former tank farm, the grounds are unfit for use in their current state. In order to find a suitable, forward-looking use for the location, extensive remediation and redevelopment measures are necessary.

## Sustainable remediation: Securing contaminated sites and reusing available resources

The plan is to create a uniform ground level with a useful area of approx. 86,500 m<sup>2</sup>, roughly equivalent to 12 football pitches. To conserve resources while creating the largest amount of useful space possible, the redevelopment concept is based on a complete relocation and encapsulation of the existing soil stockpiles at the site. At the same time, the location is surveyed for and cleared of explosive ordnance. The individual stockpiles are sorted and classified according to their mechanical properties and processed if necessary. Any uncontaminated soil is reinstalled in layers. Relocating and safely containing the soils on site cuts down on the need for transport that would otherwise be necessary and so eliminates the carbon emissions associated with the use of heavy goods vehicles. The only waste that is removed and discarded is waste that cannot remain on the site because it is harmful to groundwater and to the environment.

### Exploratory surface excavation



Certain building materials will be recycled and re-used already during the redevelopment works. These include:

- building materials that are extracted and recycled in-house during project execution
- recycled building materials supplied from Bremen and the surrounding area for the surfacing works
- recycled asphalt and recycled base courses that are installed over the entire usable space
- bricks and topsoil used for the green areas

The redevelopment work is being carried out in various sections. The first section will be completed by the end of 2024 with commissioning of the plant engineering systems planned for the end of 2026. Areas not yet paved at this time will be paved temporarily.



## Pioneering usage concept: technology and research location with co-working space

STRABAG Environmental Technology intends to use the site together with other STRABAG units from the fields of environmental technology and recycling. The aim is to develop and operate the former oil port in Bremen as a technology and research location for construction waste 2.0. The goal: to process construction waste not only to yield a low-quality alternative to reclaimed landfill construction materials or as a road base material, but to produce high-quality aggregates that can serve, for example, as a fully adequate substitute for gravel/primary raw materials in the production of asphalt or concrete. State-of-the-art facilities with automatic fine sorting also ensure that the construction waste is separated into its individual components in order to return even smaller material, all the way down to sands, to the cycle.



## CIRCULAR CONSTRUCTION & TECHNOLOGY CENTER BREMEN

C3 Bremen will bring together a wide range of expertise in the field of construction waste recycling to create a cutting-edge work and research platform. At the same time, the location will be continuously expanded. Approximately 130 people will be employed at C3 in the medium term. In addition to these STRABAG workplaces, there are also plans to establish a start-up campus with co-working spaces in the laboratory, workshop, production and technical areas. Collaboration with selected universities, colleges, testing laboratories, institutes and engineering offices in flexible working environments is an integral part of the usage concept. These institutions should have a close connection to urban mining and the bio-economy.

## Climate-neutral construction and renewable energies

A pioneering aspect of the usage concept is that C3 will be completely energy self-sufficient and climate neutral. Power is to be generated by photovoltaics, with electricity storage units help absorb any peak loads. A heat pump supplies the heating energy. Electric bicycle and EV charging stations will be available for the staff. Stationary construction machines will also be powered by electricity from renewable sources.

A rainwater collection system will allow the construction waste processing and the sanitary facilities to be operated with rainwater. Green roofs with retention chambers for water storage serve as biohabitats. Landscaping is also planned along the embankments as further ecologically valuable space.

STRABAG focuses on climate-friendly methods already during the construction phase. In choosing the building materials, the company uses mainly wood and recycled concrete. Certification by the German Sustainable Building Council (DGNB) is being sought as well.



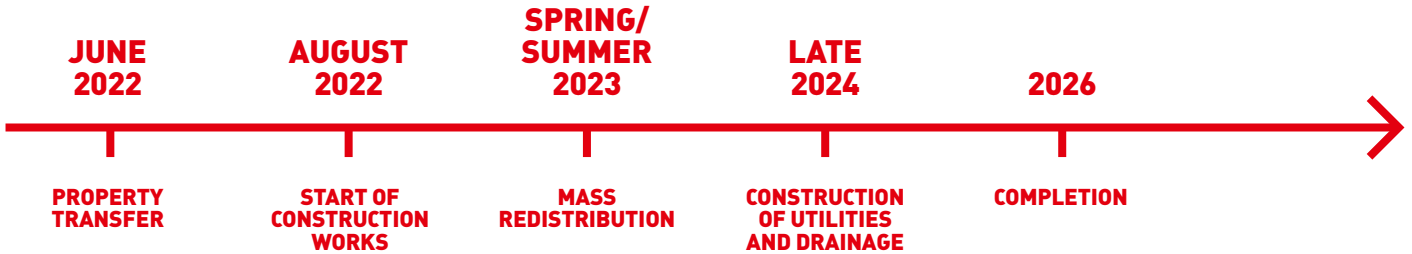
### CO<sub>2</sub>-savings potential \*

Process	Reduction in CO <sub>2</sub> emissions per year (in tonnes)
Material flow	1,069.00
Photovoltaics	4,819.50
<b>Σ</b>	<b>5,888.50</b>

\* In relation to the subprocesses on our premises: The carbon footprint is based on a plant capacity of 100,000 t/year for construction waste, the amount of mineral waste in Bremen and the mass of imported mineral construction materials according to the Federal Statistical Office (2019).

# Project milestones – timing:

## Remediation and Redevelopment 2022–2026



## Plant Engineering and Building Construction 2025–2027

