

Development of carbon pool concrete and implementation in pavements and structures

Organization CP Concrete Consortium

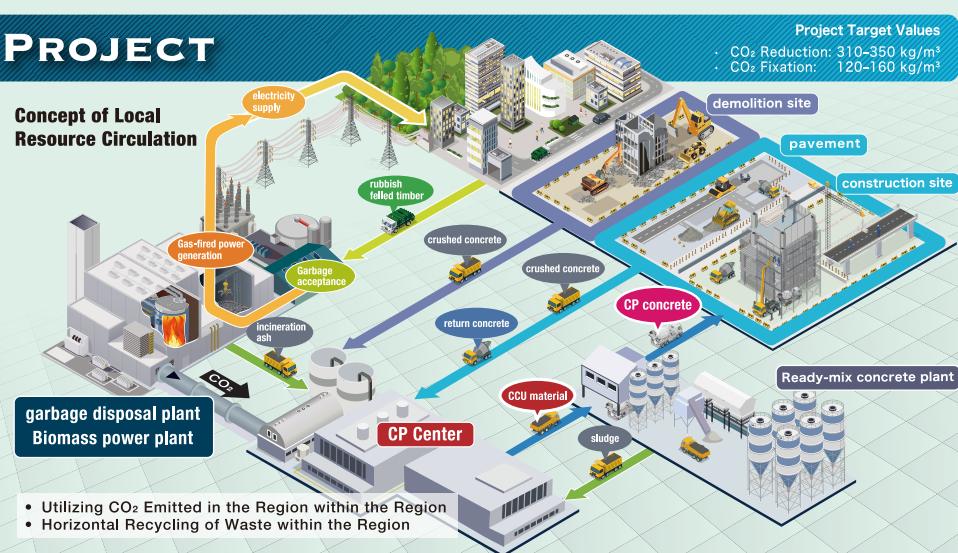
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1. PURPOSE OF THE PROJECT

CP Concrete is being developed to achieves both **resource circulation** and **maximized CO₂ fixation** by:

- Absorbing and fixing CO₂ emitted from **waste incineration plants, biomass power plants**, and cement plants into industrial waste derived from concrete
- Utilizing the fixed material as a component for concrete
- Fixing CO₂ during the **curing process** of concrete

This initiative aims to contribute to a decarbonized society through real-world implementation.



2. MAIN ACHIEVEMENTS

- Full-scale R&D on CP Concrete started in FY2022, and the development of fundamental technologies at the laboratory scale was largely completed by FY2023
- Developed ready-mixed concrete manufacturing technology using **CO₂-fixed aggregates and sludge powder**
- Established **CP Center Ritto** and started construction of **CP Center Kawasaki**
- Increased visibility with an exhibition booth at the Future City Pavilion of Expo 2025 Osaka, Kansai, Japan (until **Oct.13, 2025**)

Pilot Project at LAGO Otsu



CP Concrete was applied to the parking lot and garden paths of **LAGO Otsu** in Otsu City, Shiga Prefecture, operated by the traditional Japanese confectionery company **Taneya**. Japan's first CP porous concrete pavement Fixed 3.0 t of CO₂ — equivalent to the annual CO₂ absorption of 214 cedar trees

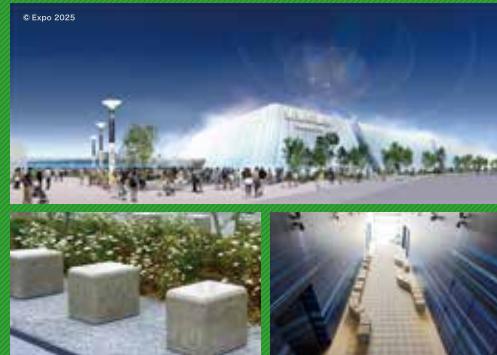
CP Porous Concrete Pavement

Garden paths: 39.8 m³ → CO₂ fixed: 1,672 kg (42.0 kg-CO₂/m³)
Parking lot: 31.5 m³ → CO₂ fixed: 1,323 kg (42.0 kg-CO₂/m³)

Pilot Project at the Future City Pavilion, Expo 2025 Osaka, Kansai, Japan

CP Concrete was applied to some part of pavements, benches, and floor slabs at the Future City Pavilion of Expo 2025 Osaka, Kansai, Japan. Fixed 3.2 t of CO₂ — equivalent to the annual CO₂ absorption of 229 cedar trees

This concrete absorbs and fixes biomass-derived CO₂ emitted from the Itabashi Clean Association and Itabashi Green Energy Biomass Power Plant, and stores it in the floor slabs and benches — presenting a vision for the concrete of the future.



CP porous concrete pavement: 25.5 m³ → 1,084 kg (42.5 kg-CO₂/m³)
CP concrete pavement: 13.8 m³ → 260 kg (18.2 kg-CO₂/m³)
CP concrete pavement (sidewalk): 14.3 m³ → 391 kg (28.3 kg-CO₂/m³)
CP concrete pavement (roadway): 15.5 m³ → 549 kg (35.4 kg-CO₂/m³)
CP concrete floor slabs (biomass-based): 3.4 m³ → 109 kg (31.9 kg-CO₂/m³)
CP concrete benches: 9 m³ → 443 kg (49.2 kg-CO₂/m³)

Applied CP Concrete Quantities and CO₂ Fixation

3. CHALLENGES AND FUTURE INITIATIVES

- Scale up facilities for CO₂-fixed material production
- Establish CO₂ fixation technology during curing in pavements and structures
- Achieve **target values for CO₂ fixation and reduction** across the entire process from material production to curing through additional trials and demonstrations



4. OUTLOOK FOR PRACTICAL IMPLEMENTATION

- Aim for commercialization **after FY2030**
- Promote technology enhancement, standardization, and acquisition of environmental certifications
- Build **public acceptance and social implementation** of CP Concrete

