

EXERCISE: FEASIBILITY ANALYSIS FOR ON-SITE CONCRETE RECYCLING

1 Objective

Evaluate the technical and financial feasibility of implementing an on-site concrete recycling process during demolition works, with the goal of producing recycled concrete (RC) for subsequent construction phases.

2 Context

The exercise is based on a real estate development project in Geneva, on the future Green Village site. The project aims to densify the neighborhood with sustainable buildings.

Students will focus on the demolition of the Salève wing and assess whether recycling the concrete on-site is a viable solution.

3 Task Description

1. Quantify demolition volumes

- Use the provided data table below to calculate the quantities of concrete available from the demolition of the Salève wing. You can also take the drawings attached and directly measure by yourself to verify provided quantities

2. Input data into the provided Excel spreadsheet

- Enter the floor height, the surface of the slabs, and the linear meters of walls in the Excel sheet (yellow cells only).
- Select with a cross (X) the walls of 20 cm thickness and the slabs of 20 cm thickness.

3. Analyze feasibility based on the following constraints:

- Future projects demand: 6 000 m³ of RC-C25 concrete is accepted by the civil engineer and needs to be inserted as a constraint.
- Integration commitment: The contractor commits to using 50% of this volume (minimum required by Minergie-Eco label).
- Site limitations: Maximum available storage area is 320 m².
- Financial condition: The Owner does not want additional costs and expects potential savings since materials are supplied.

4 Data for Quantity Calculation (Salève Wing)

Level	Walls 20 cm (ml)	Walls 25 cm (m)	Solid Slabs 20 cm (m ²)
Ground foor (H = 3.10 m)	153		
Upper floor (H = 2.60 m)	72		705
2nd floor (H = 2.60 m)	72		705
3rd floor (H = 2.60 m)	72		705
4th floor (H = 2.60 m)	82		705
Roof			705

5 Deliverables

Prepare a concise feasibility report including:

- **Technical feasibility:**
 - Is the available crushed concrete quantity sufficient for the new project?
 - Can the recycling process be implemented on-site given space constraints?
- **Economic interest for the Owner:**
 - Does recycling lead to cost neutrality or savings for project owner?
 - What is the minimum volume of concrete from demolition required for the operation to be economically viable, with neither loss nor gain?