



Construction waste: from problem to resource

1. Construction waste - from problem to resource
2. Waste management plan – why and how?
3. Environmental impact assessment
4. **Hazardous material survey**
5. Waste sorting and organization on construction site
6. How does the waste industry handle the various types of waste?



Hazardous material survey

- ✓ Framework
- ✓ Organization
- ✓ Environmental remediation
- ✓ Demolition
- ✓ Documentation/checklist



Framework

- ✓ Laws and regulations.
- ✓ Description texts and offers.
- ✓ Environmental restoration report.
- ✓ Waste management plan.
- ✓ Norwegian standards.
- ✓ Available time.





Organization

- ✓ Available time, while ongoing activities?
- ✓ Available space for sorting/storage.
- ✓ Crew/employees.
- ✓ Construction phase plan.
- ✓ HSE-plan.
- ✓ Checklist.
- ✓ Labeling of components.
- ✓ Type of project.
- ✓ Season/weather.





OHS (Occupational health and safety) plan

- ✓ Everyone must have adapted safety equipment such as: hearing protection, safety shoes, helmet, dust mask, gloves.
- ✓ Protect other workers.
- ✓ Protect the environment.
- ✓ System to capture not-planned objects.
- ✓ Information for neighbors and others affected.





Adapted safety equipment

- ✓ Required safety equipment in addition to safety equipment necessary for the relevant situation, such as:
 - ✓ Solid protective/safety clothing (disposable suit/washable suit).
 - ✓ Gloves of sufficient quality.
- ✓ Mask with necessary filters (motorized).



Foto: Mirja Emilia Ottesen



Protect others and the environment

- ✓ Cover the ground.
- ✓ Tarpaulins on scaffolding to prevent spreading.
- ✓ Exhaust to create negative pressure.
- ✓ Collection of run-off water and dust.
- ✓ Division of the building into zones.



Foto: Mirja Emilia Ottesen



Carry out environmental remediation

- ✓ Carefully review the environmental restoration report and any demolition description.
- ✓ All hazardous waste described in the environmental restoration report must be marked on the site with notes, spray, tape etc.
- ✓ Establish an environmental station (in the building/container).
- ✓ Checklist.
- ✓ Relationships with other contractors.
- ✓ Competence requirements and course requirements are usually required of those in charge of the carrying out the environmental remediation.



Required remediation

- ✓ Paint, sealant, screed, plaster, etc. may contain environmental toxins, and must be remediated before concrete is utilized.
- ✓ Required for PCB7 > 50 mg/kg.



Foto: Mirja Emilia Ottesen



Environmental station – in the building or in a container



Foto: Guro Kristine Milli



Environmental remediation, how?

- ✓ Sandblaster with steel balls.
- ✓ Removal of plaster.
- ✓ Paint removal.
- ✓ Removal of sealants.
- ✓ Removal of floor coverings.
- ✓ PCB-sealant.
- ✓ Asbestos.



Foto: Mirja Emilia Ottesen



Removal of hazardous waste and EE-waste



Foto: Guro Kristine Milli





Remediation of asbestos

The labor inspection authority has to be notified, and only companies with a permit from the Norwegian Labor Inspection Authority can perform the job.



Foto: Terje Borud sortere.no/bedrift



Cooling equipment consists of outdoor and indoor units, connected by pipes



Foto: Mirja Emilia Ottesen



Foto: Lennart Larsson Demotec Nordiska AB



Demolition

- ✓ Openings to bring heavy equipment.
- ✓ Removal of light walls.
- ✓ Internal stripping of the building.
- ✓ Use an eventual elevator to move sorted waste.
- ✓ Remove windows and doors.
- ✓ Demolish the building.



Foto: Steinar Amlo



Internal stripping of the building



Foto: Mirja Emilia Ottesen





Stacking of insulated glass panes





Remote controlled mini robot





Cutting concrete



Foto: Guro Kristine Milli



Central crushing of concrete





Recycling of concrete waste

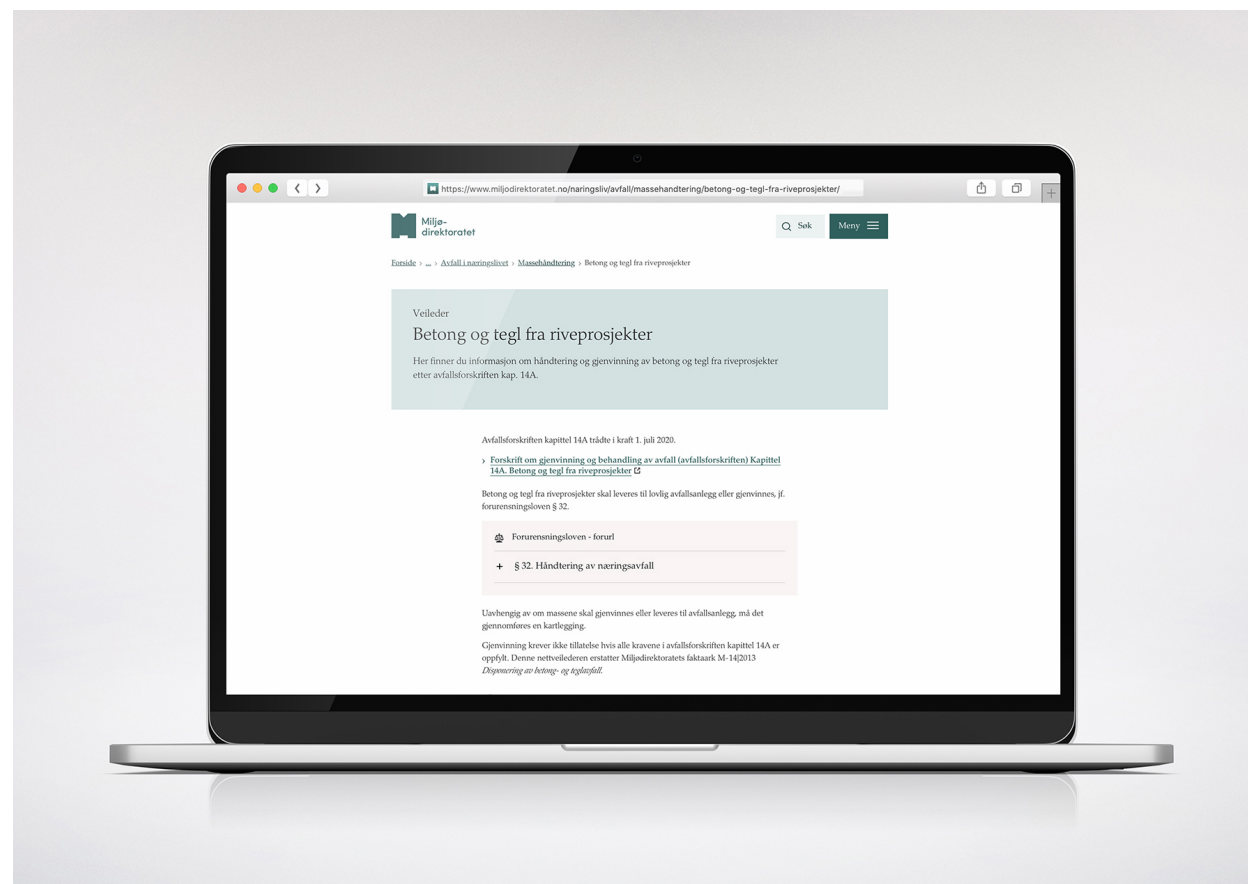
- ✓ Pure concrete can be utilized.
- ✓ Slightly contaminated concrete can be reused under certain conditions.
- ✓ The Norwegian Environment Agency has prepared a fact sheet, M14, which describes the conditions that apply to the reuse of concrete.
- ✓ Mechanical properties of the concrete determine how the concrete can be reused.
- ✓ New regulations on concrete recycling are being prepared.



Waste Regulations chapter 14A

Visit:
Betong og tegl fra
riveprosjekter - Miljødirektoratet
(miljodirektoratet.no)

<https://www.miljodirektoratet.no/naringsliv/avfall/massehandtering/betong-og-tegl-fra-riveprosjekter/>





Checklist for remediation

Construction/demolition site	Address:		Building:					Floor/locality
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Locality	Waste type/ component	Amount and unit	Marked (y/n)	Removed by	Date	Controlled by	Date	Remarks
ground floor, kitchen	Blue tiles containing asbestos	ca. 8 m ²						Handle according to "Regulations concerning the performance of work" Part 2, chapter 4. "Work with asbestos" *
ground floor, kitchen	Windows containing chlorinated paraffins	2 pieces						Declare and deliver as windows containing chlorinated paraffins
ground floor, hallway	Vinyl flooring (1 layer)	ca. 6 m ²						Declare and deliver as hazardous waste containing phthalates
ground floor, living room	Heat pump	1 piece						Gas removed by an approved company. Cellular rubber is sorted as separate fraction. The heat pump is delivered as electrical waste.
ground floor, living room	Cellular rubber, hidden behind casing	ca. 10 meters long						Declare and deliver as hazardous waste containing brominated flame retardants