



Construction and demolition waste (C&D Waste) – From problem to resource

1. C&D Waste – from problem to resource
2. Waste Management Plan – Why and How?
3. Survey of hazardous materials and components
4. **Environmental remediation**
5. Organisation and sorting on site
6. Downstream solutions



Environmental remediation

Vi skal se på:

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



Framework conditions

- ✓ Legislation
- ✓ Description texts and offers
- ✓ Report from environmental surveying
- ✓ Waste management plan
- ✓ Norwegian standards
- ✓ Available time





Organization

- ✓ Available time,
- ✓ Parallel ongoing activities?
- ✓ Available space for sorting/storage
- ✓ Staffing
- ✓ Rig plan
- ✓ HSE plan
- ✓ Checklists Labeling of components
- ✓ Type of project
- ✓ Season/weather





HSE-plan

- ✓ Protective equipment is essential, such as:
 - ✓ hearing protection,
 - ✓ safety shoes,
 - ✓ helmet,
 - ✓ dust mask,
 - ✓ gloves.
- ✓ Protect other workers.
- ✓ Protect the environment.
- ✓ System for capturing uncharted things.
- ✓ Information to neighbors and others stake holders.





Adapted protective equipment

- ✓ Required protective equipment in addition to situational protective equipment such as;
 - ✓ Full-coverage protective clothing (disposable coveralls/washable coveralls)
 - ✓ Gloves of sufficient quality
 - ✓ Mask with necessary filters (motorized?)
 - ✓ Extraction arrangements on milling equipment



Photo:: Mirja Emilia Ottesen



Protect others and the environment

- ✓ Covering the ground
- ✓ Tarpaulins on scaffolding to prevent spreading
- ✓ Suction to create negative pressure
- ✓ Collection of runoff water, chemicals and dust
- ✓ Division of the building into zones



Photo: Mirja Emilia Ottesen



Environmental remediation

- ✓ Carefully review the report from the environmental survey and any demolition description.
- ✓ All hazardous waste described in the report from the environmental survey must be marked on the site with sticky notes, spray, tape etc.
- ✓ Establish an collection points (in the building/container)
- ✓ Checklist
- ✓ Relationship with other contractors
- ✓ Competence requirements and mandatory courses are required for the environmental surveyor



Remediation obligation

Paint, sealants, screeds, plaster etc. may contain environmental hazards, cleaning is necessary for recovery.

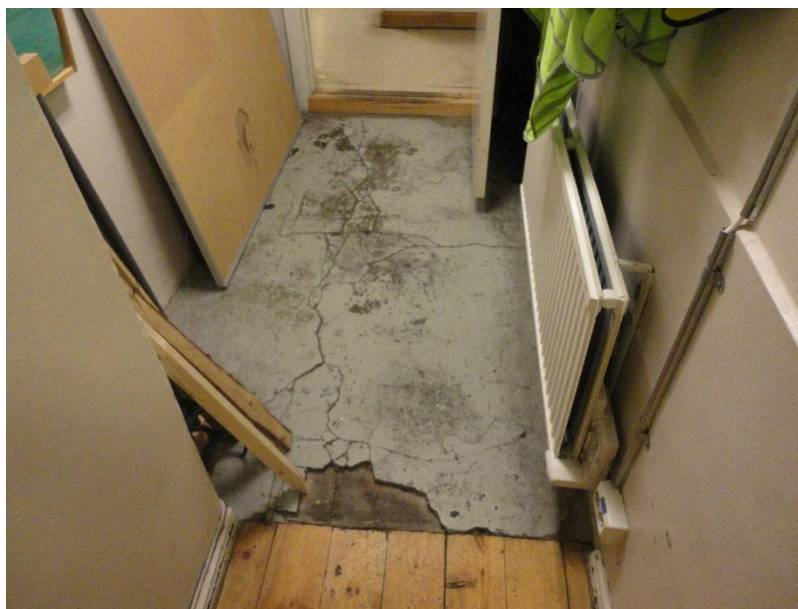


Photo:: Mirja Emilia Ottesen



Collection points – inhouse or container



Photo: Guro Kristine Milli



How to conduct environmental surveying?

- ✓ Sandblasting with steel balls
- ✓ Removal of plaster layers
- ✓ Paint removal
- ✓ Removal of sealants Removal of floor coverings
- ✓ PCB joints
- ✓ Asbestos





Removal of hazardous waste and WEEE



Photo: Guro Kristine Milli





Asbestsanering

The Norwegian Labour Inspection Authority must be notified, and only companies with permission from the Norwegian Labor Inspection Authority can carry out the remediation.





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



Photo:: Mirja Emilia Ottesen



Photo:: Lennart Larsson Demotec Nordiska AB



Demolition

- ✓ Openings to bring in heavy equipment?
- ✓ Removal of lightweight walls
- ✓ Internal stripping of the building
- ✓ Use possibly elevator to transport sorted fractions to the ground
- ✓ Remove windows and doors
- ✓ Demolish/cut down the building



Photo: Steinar Amlo



Internal stripping of the building



Photo:: Mirja Emilia Ottesen



Stacking of sealed glazing units



Photo:: Guro Kristine Milli



Remote controlled mini robot





Cutting concrete



Photo:: Guro Kristine Milli

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Central crushing of concrete





Recovery of concrete

- ✓ Clean concrete may be recovered.
- ✓ Light contaminated concrete may be recovered under certain conditions.
- ✓ “The waste regulations, chapter 14a, concrete and bricks from demolition projects,” describe the conditions that apply to the recovery of concrete
- ✓ The mechanical properties of the concrete determine the use of the recovered concrete.



Photo: Guro Kristine Milli



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