Jiang, L., van den Berg, M., Voordijk, H. & Hartmann, A. (2026). Uncertainty and equivocality in reuse-oriented deconstruction. *Buildings and Cities*.

SUPPLEMENTAL DATA

Appendix A: Interview protocol

General project information

- Could you please introduce XXX (the case project)?

Activities of the Reuse Process

In the case of XXX:

Identifying:

(A demolition project normally starts with 'identifying' reusable materials in an old building)

- How did you determine whether the materials in the project can be reused? Who was involved in this decision-making process?
- What kind of information did you take to support your decision-making process?
- What type of materials are reused in the project and why? / What kind of materials cannot be reused, and why not?
- What kind of information do you share with other parties, and what information is returned by them to you?
- What additional documentation/information emerges during this process?

Harvesting:
(This activity concerns how to demolish/deconstruct a building and collect those reusable materials)

- What kind of information did you receive from the previous phase?
- How do you plan the demolition or deconstruction?
- Did you encounter any unexpected situations on-site? How did you update the relevant information during the execution phase?
- How did you communicate with other parties (e.g., contractors)?
- Are there specific digital tools or systems that assist you in this planning and execution process?

Distributing:
(This activity concerns sharing reusable materials with other projects and transporting those materials to identified partners/buyers)

- What kind of information did you receive from the previous phase?
- How do you manage the storage and distribution of materials to the new project, to support the future rebuild?
- How did you collaborate with other stakeholders? What kind of information do you typically share with them?

Overall challenges and opportunities:

- Did you observe situations where stakeholders interpreted the same situation or information differently? How did you reach alignment when interpretations diverged?
- Can you describe situations in deconstruction projects where things were unclear or confusing? How did you and others try to resolve them?
- Have responsibilities for reuse-related tasks ever been unclear? How are responsibilities typically clarified or negotiated?
- Have you faced tasks/situations where there were no examples, references, or guidelines to follow? How did your team figure out what to do?
- Can you recall a case where unclear interpretation or disagreement slowed progress or resulted in lost reuse opportunities?
- What opportunities could potentially reduce such issues in future projects?

Appendix B: Code and themes examples

Table S1: *Code and themes development centred on project uncertainty and equivocality*

Representative quotes	Code	Theme
The building is too high to disassemble; there are a lot of risks. Normally, it is demolished. But we chose to deconstruct, but it is very high. It is very complex. – I9	Task capacity	Workflow Uncertainty
It's worth knowing where the elements are at the new location...that is also something that [demolishers] did not do, and the new contractor has problems with that. – I10	Task interdependence	
However, after a week of storage, the codes were not visible anymore due to the weather, so the data could not be added to the model. – I9	Weather conditions	Environmental Uncertainty
The doors and the window frames are difficult to reuse, because the building strategies in the Netherlands change each year. – I6	Building regulations	
For this project, we had the opportunity to sell materials somewhere since we knew the clients, but that wasn't always the case. It's very difficult to take this part of the building to another client, and many companies remain hesitant to use reused products. – I6	Market demand	
You need to check whether what was in the drawings actually corresponded to what they had built, because that's also not a guarantee that the drawings that you find are correct. – I10	As-is conditions	Building Uncertainty
Most of the materials we knew at the beginning were how to reuse them. But some parts, when you demolish a building, you find out some parts were different from the paper. – I10	Element reusability	
We made a list of what would be reused…there was a carpet on the 1st floor… We thought it was a screw or something loose, but it was again connected with a kind of glued wooden floor. So that we could not reuse it. – I2		
The mistake is, partly our mistake, but what they also say, yeah, [the contractor] had to also be there with the demolition, or the disassembling of the facade, because those constructive facade elements were the biggest problem. They also had to invest hours during the disassembly of the building, but they did not invest enough. – I2	Task Responsibilities	Workflow Equivocality
Applying for the permit took quite some time. [Reusing elements] was also new for the municipality. They do not know how to do it. – I8	Standards	Environmental Equivocality
[The client] asked to reuse as much concrete as possible so that all the materials in the building could be reused in the building industry. [One demolition company] said they would reuse all the concrete by making new concrete. [The interviewed demolition company] said that they would reuse concrete (in a one-to-one manner). [The interviewed company] explained to the clients that there are several ways to reuse concrete, because the term reuse is very tricky. – I8	Terminology	
The communication was difficult. That's where thoughts and ideas are different; for instance, some people think, "We can use click bricks, as it's a brick that is not put together with cement." Well, there are some lines of thinking where you say, "Maybe it isn't as circular as you would expect, because a click brick is very labour-intensive to harvest." – I2	Reusability potential	Building Equivocality
What [the demolishers] said to the client was, we could disassemble the gypsum plates and reuse them in the new building...(however,) old gypsum plates were thrown away because [the contractors] who built the interior walls said that they wanted to use new gypsum plates. – I2		
[The clients] said to reuse as much as possible, at least 80%. [The demolishers] asked, "80% of what, is it 80% of CO2 or 80% of the volume or the mass?" – I8	Circularity goals	

Table S2: *Development of codes and themes centred on coordination mechanisms*

Representative quotes	Related uncertainty or equivocality	Code	Theme
We always try to sell things to our clients who have been with us for years. (If not possible), The last thing we want to do is put it on [a marketplace]... So we tried to sell the things to our clients who are familiar with us. – I2	Environmental uncertainty	Previous partnership	Prolongation of buyer collaboration
When we dismantle a building, we immediately notify potential buyers about available materials, such as steel staircases, which are always in demand. If a buyer is interested, we arrange the sale; if not, we look for alternatives. – I6		Company network	
We know that from other projects, the metal stud profiles can be reused when you disassemble them the right way. – I2	Building uncertainty	Demolishers' experience	Tacit knowledge
[The demolishers] interviewed workers who were involved in the construction to understand the process so that we could reverse it. – I12		Interview with former workers	Lateral relations
[The demolishers] put the damaged elements in a list, so then they know what [new elements] to order. So there is an overview to show what is damaged and what materials cannot be reused. – I13	Workflow uncertainty	Excel sheets	Information systems
Workers did it wrong (multiple times), so the old hoisting facilities had to be tested; otherwise, the elements would fall off. – I9		Testing hoisting facilities on site	Learning-by-doing
[Reusing] is finally decided by the client. – I2	Building Equivocality	Final decision-making by clients	Hierarchy
[The clients] started to talk with several demolishers...then some suggestions came. – I12		Contact demolishers for suggestions	Lateral relations
[Two contractors] who were present for the dismantling were also involved in the rebuilding. – I4	Workflow equivocality	Contractors' direct involvement	Joint problem-solving
Applying for the permit took quite some time. [Reusing elements] was also new for the municipality. They do not know how to do it. But they are willing to hear from us and report (our requirements) to higher levels. We are moving in the right direction, but it is a slow process. – I8	Environmental equivocality	Regulation negotiation	Lateral relations