



Registration of 3D situations in land administration in the Netherlands

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Background

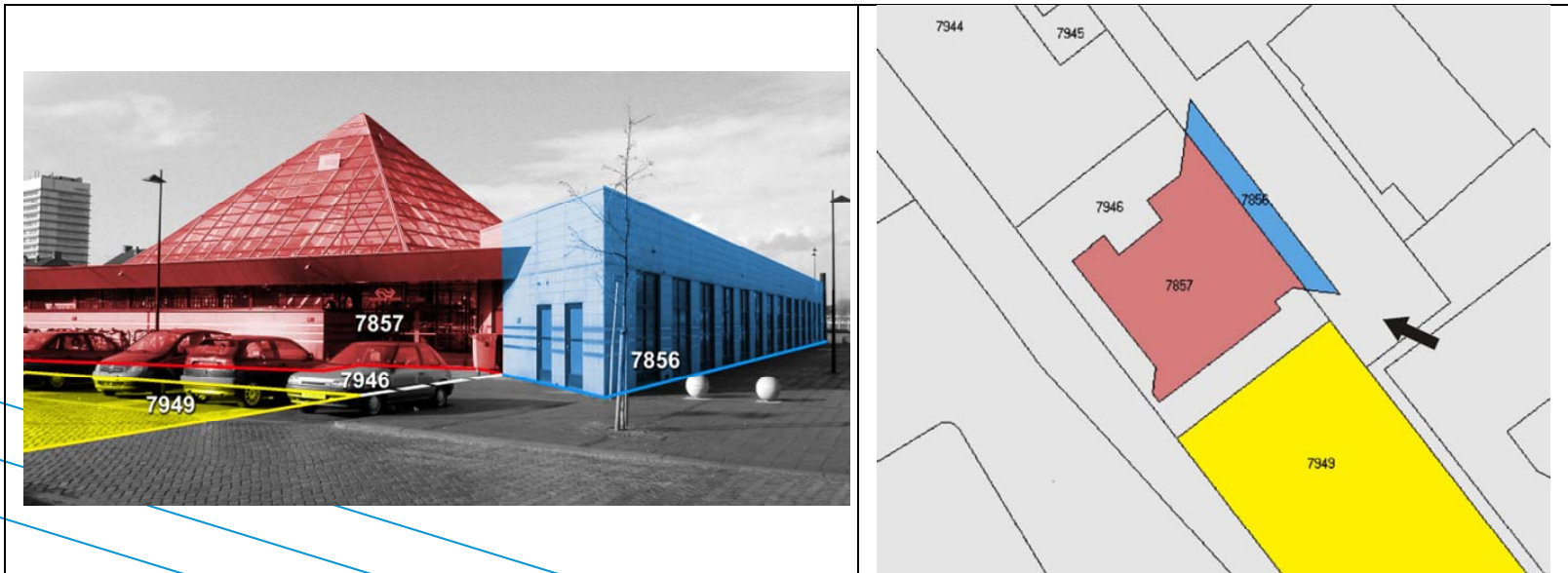
- Several studies have been carried out by the authors
- This paper focuses on actual implementation within legal, institutional, organisational context

Why now?

- Technically it has become possible to accept 3D drawings
- Practice has asked for support

Background

- Main registration entity is 2D parcel
- Although it is possible to establish property rights with 3D boundaries



Overview

- Legal aspects of multilevel property
- Registration of multilevel property
- Case studies
- Proposed 3D registration solution

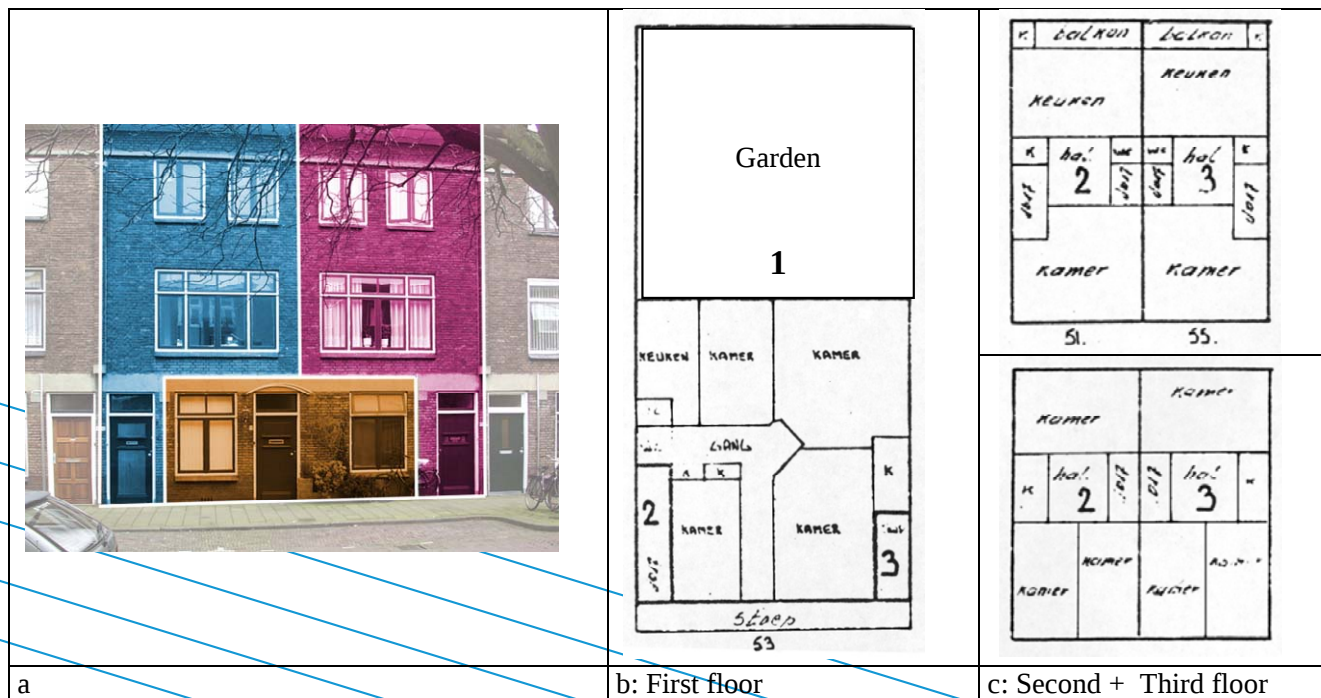
Legal framework multilevel property

Legal aspects
Cadastral registration
Case studies
3D registration solution

- Apartment rights
 - Only appropriate for homogenous units
- Right of superficies
 - Relates to physical construction
- Right of long lease
 - Right may be limited in space
- Easement
 - Also to safeguard line-of-sight and free wind streams
- Cables and pipelines

Boundaries of 3D units in the land administration (1/2)

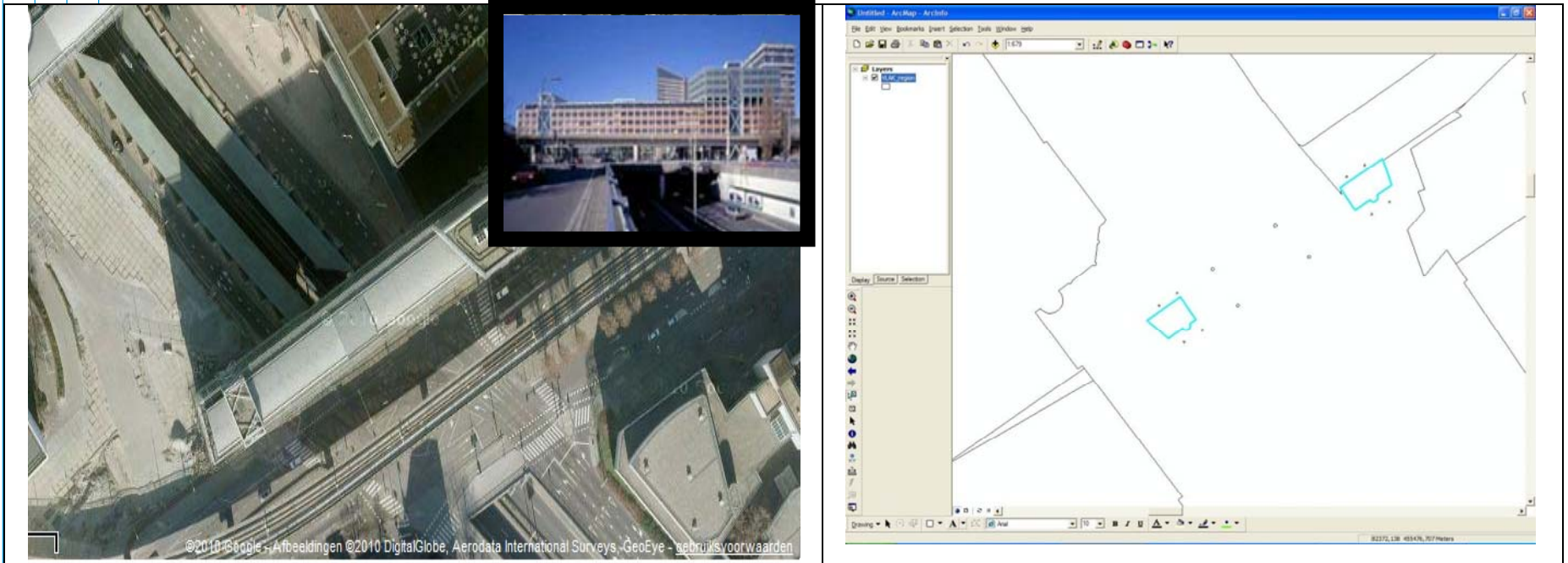
- Requirements for apartment units: separate plan per floor
- Mental exercise to understand real world situation



Boundaries of 3D units in the land administration (2/2)

- For other than apartment rights:
 - Property should be “identifiable”
 - Deeds may contain:
 - Sketches
 - Detailed drawings (3D PDF, cross sections)
 - Description is left to the parties
 - In practise: drawings are not legally binding
 - Registrar will refuse deed when description of boundaries is lacking

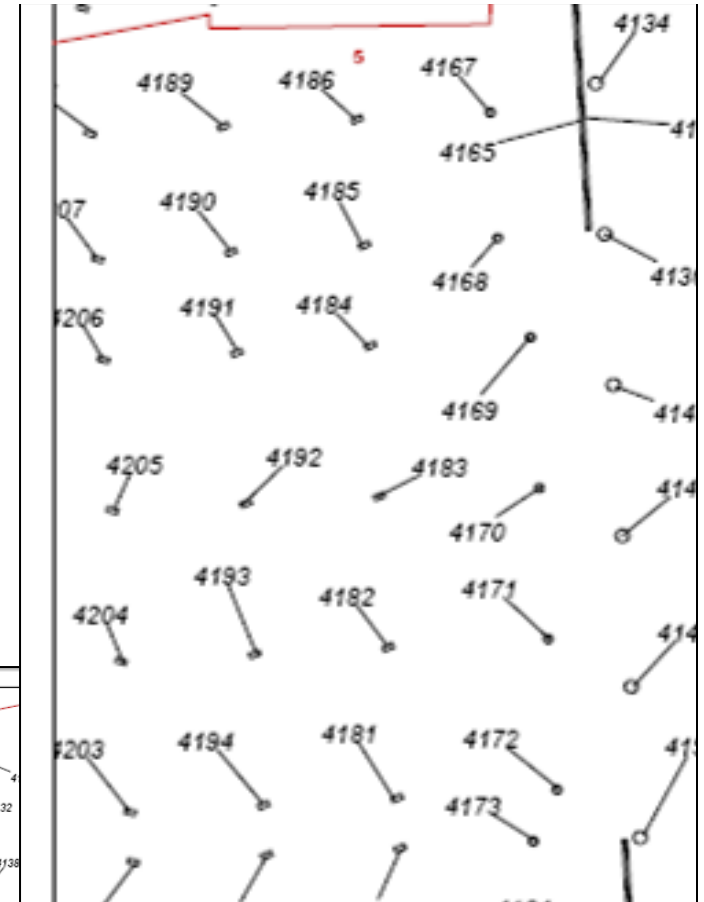
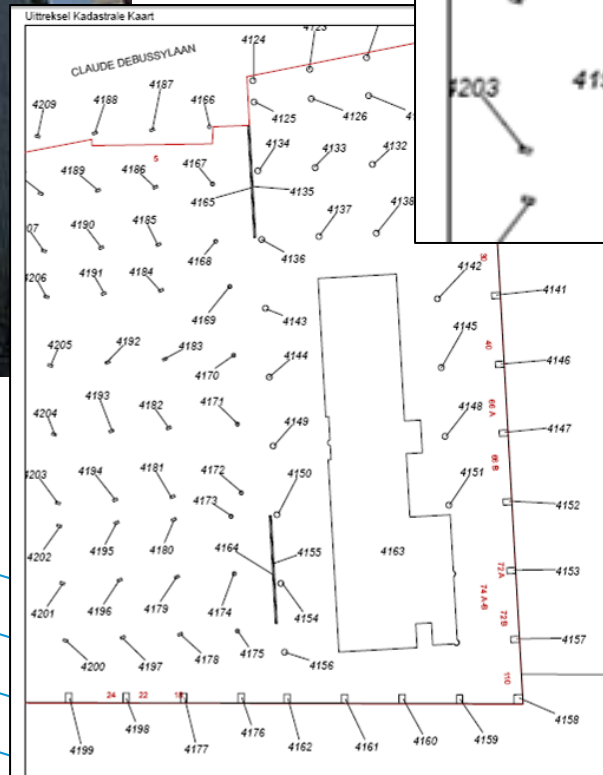
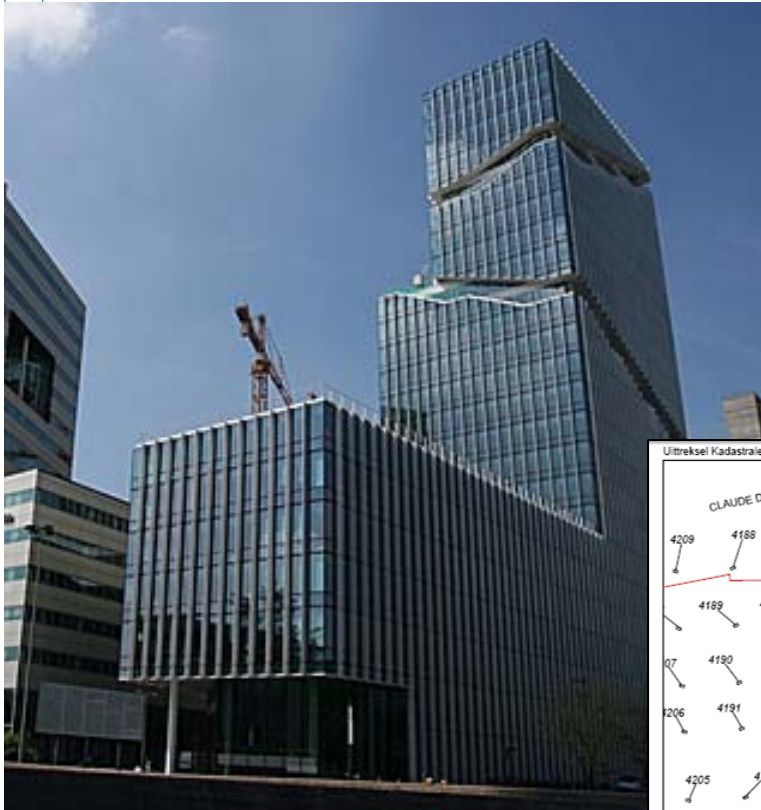
Case study 1 (1/2)



Case study 1 (2/2)

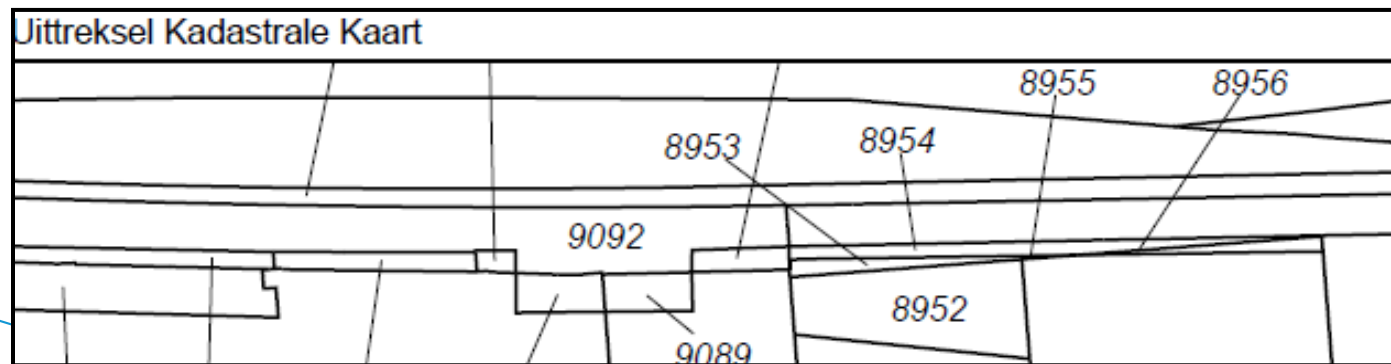


Case study 2



Case study 3

- 2D parcels have been established for various 3D objects:
 - dam walls; parking ramps; technical equipment

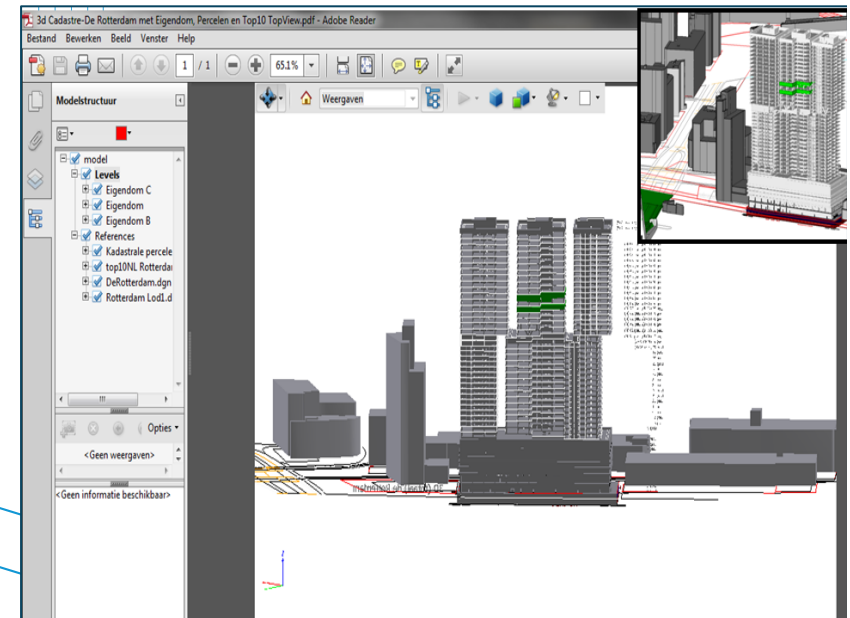
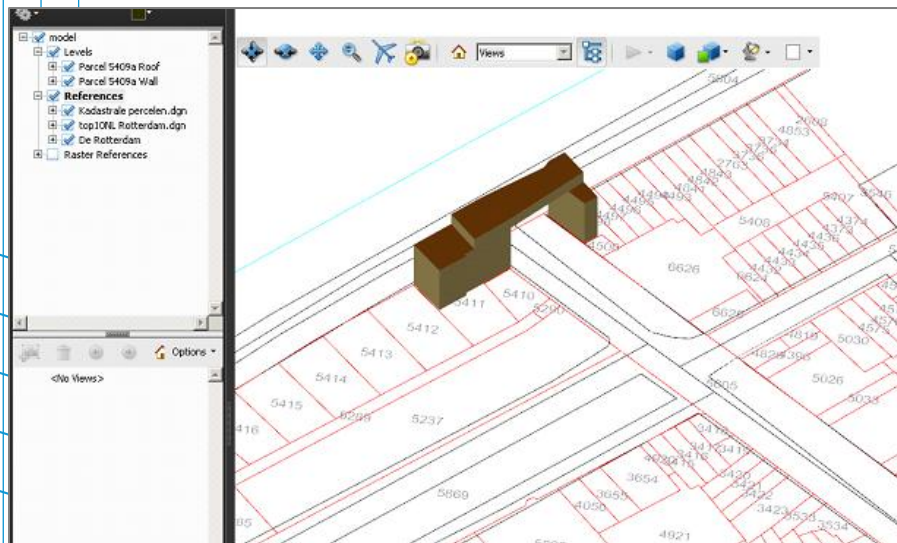


Findings from the case studies

- Registration and publication of rights on multi-level property is possible
- But:
 - Registration is not clear
 - Hard to understand if more than one object is involved
 - Objects are divided over several parcels:
 - Hard to maintain

Proposed solution

- No dramatic change
- Principle: refuse “fragmented parcel creation”
- Require a registration of 3D representation that reflects the space to which right applies
- Cross sections or 3D PDF (is already possible!)



Courtesy of Kees van Prooijen, Bentley

Proposed solution in cadastral registration

- Notification of 3D registration in cadastral map
- Link to 3D drawing
- Original 2D parcels can be kept
- Projection 3D representation in separate layer?
- No 3D cadastral map

Is this de facto a 3D parcel?

- Formal definition:
spatial unit against which (one or more) unique and homogeneous rights (e.g. ownership right or land use right), responsibilities or restrictions are associated to the whole entity
- 3D aspect can be conceptual when no 3D geometry is used
- But in our case: no 3D parcel in cadastral map

Proposed solution

- Fits within current technical, legal and cadastral framework
- But: is new to notaries
- Also new: encouraging uniformity in consultation with notaries
- Guidelines being set up

Guidelines

- Which 3D situations appropriate for 3D registration?
- How? 3D PDF

Issues for 3D PDF

- How to specify Z?
- Required precision
- Add footprint?
- Allowed geometries; (open allowed)
- How to check closure?
- Should Kadaster check quality?
- Mention volume?
- Unique ID?
- What objects are needed for reference?
- Encourage parties to accept the boundaries as legal boundaries

How to create 3D representation **3D registration solution**

- 3D survey
- Via design files: standardised workflow possible via IFC (BIM)?

Work in progress

- Studying 'BIM/IFC to 3D PDF' workflow with architects
- Decide on criteria for 3D registration (with notary)
 - What situations?
 - Conditions for the 3D drawings
- Result: 3D registration that extends the frameworks
 - No dramatic changes; but major improvement



Questions?