

# Building Information Modelling for Urban Land Administration

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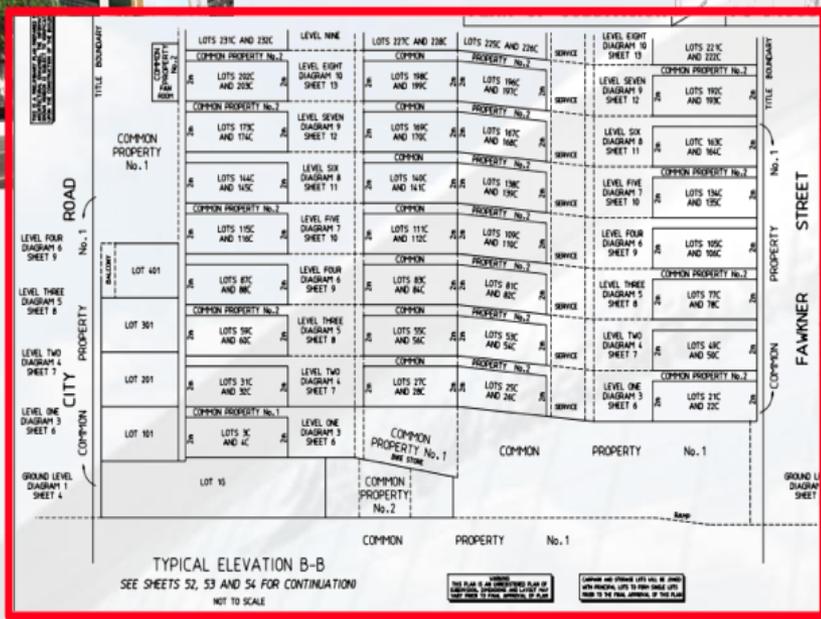


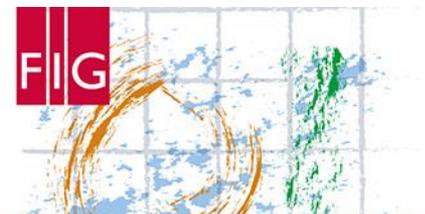


# FIG WORKING WEEK 2017

## BIM FOR SURVEYORS

Helsinki Finland Sunday 28 May 2017





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## BIM FOR SURVEYORS

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Communal interest  
(Among all owners and residents)

Private interest  
(Office Block)

Communal interest  
(Office Owners)

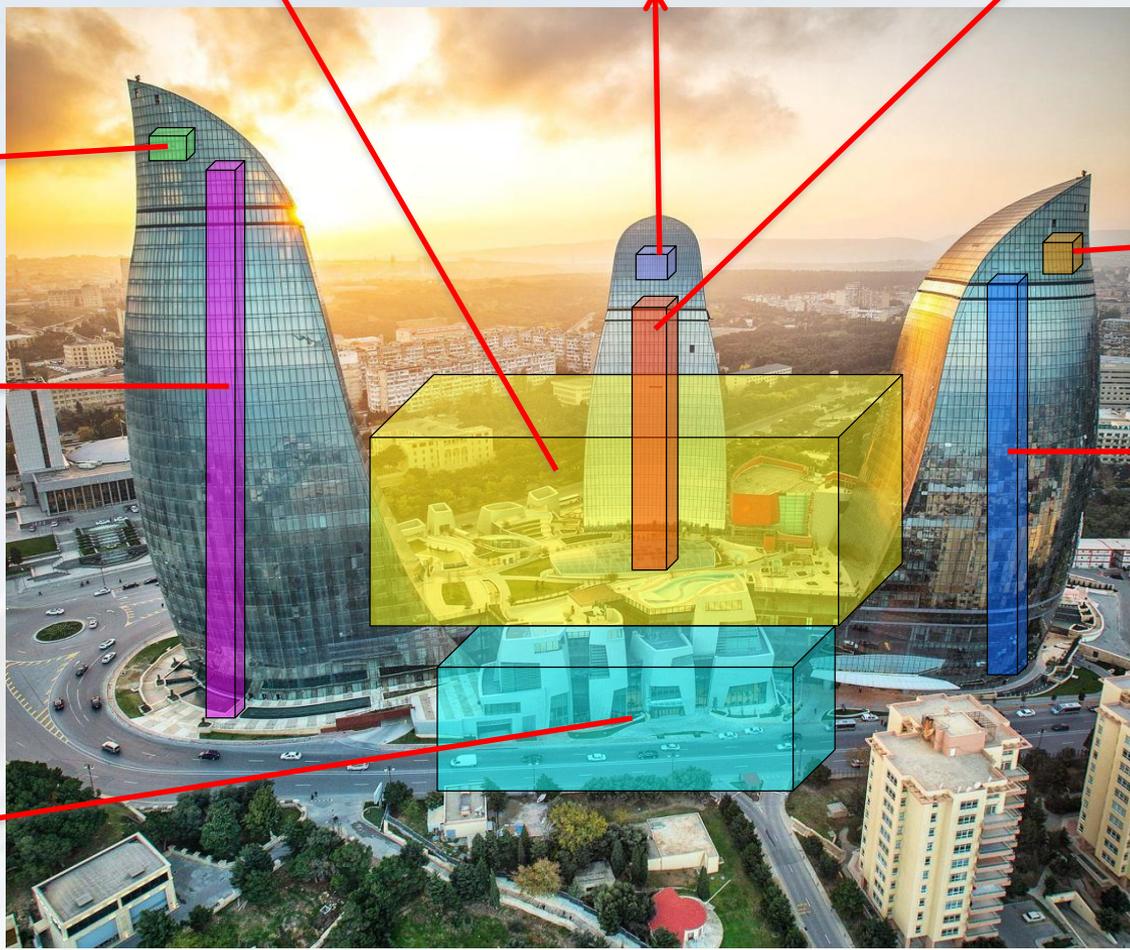
Private Interest  
(Residential Unit)

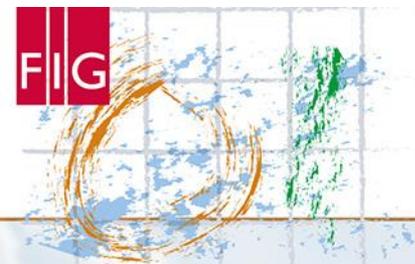
Private Interest  
(Hotel room)

Communal Interest  
(Residential owners)

Communal Interest  
(Hotel Residents)

Public Interest  
(Shopping Mall)



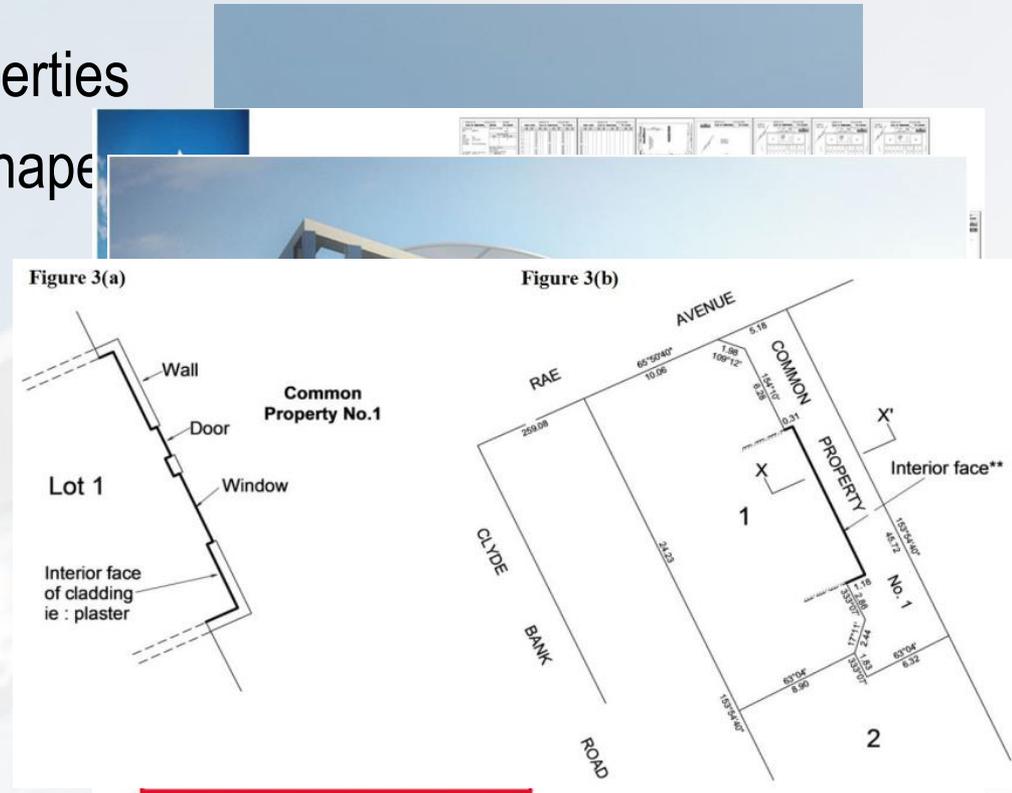


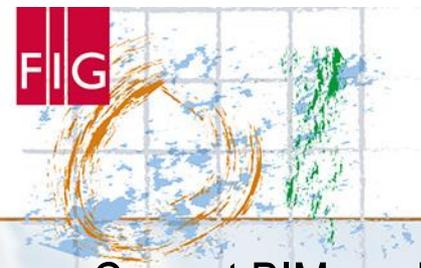
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## BIM FOR SURVEYORS

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- Ineffective representation of properties with irregular and interweaving shapes
- Multiple pages of 2D diagrams
- Ineffective representation of properties encompassing parts of several levels
- Inadequate understanding of physical boundaries for non-technical people





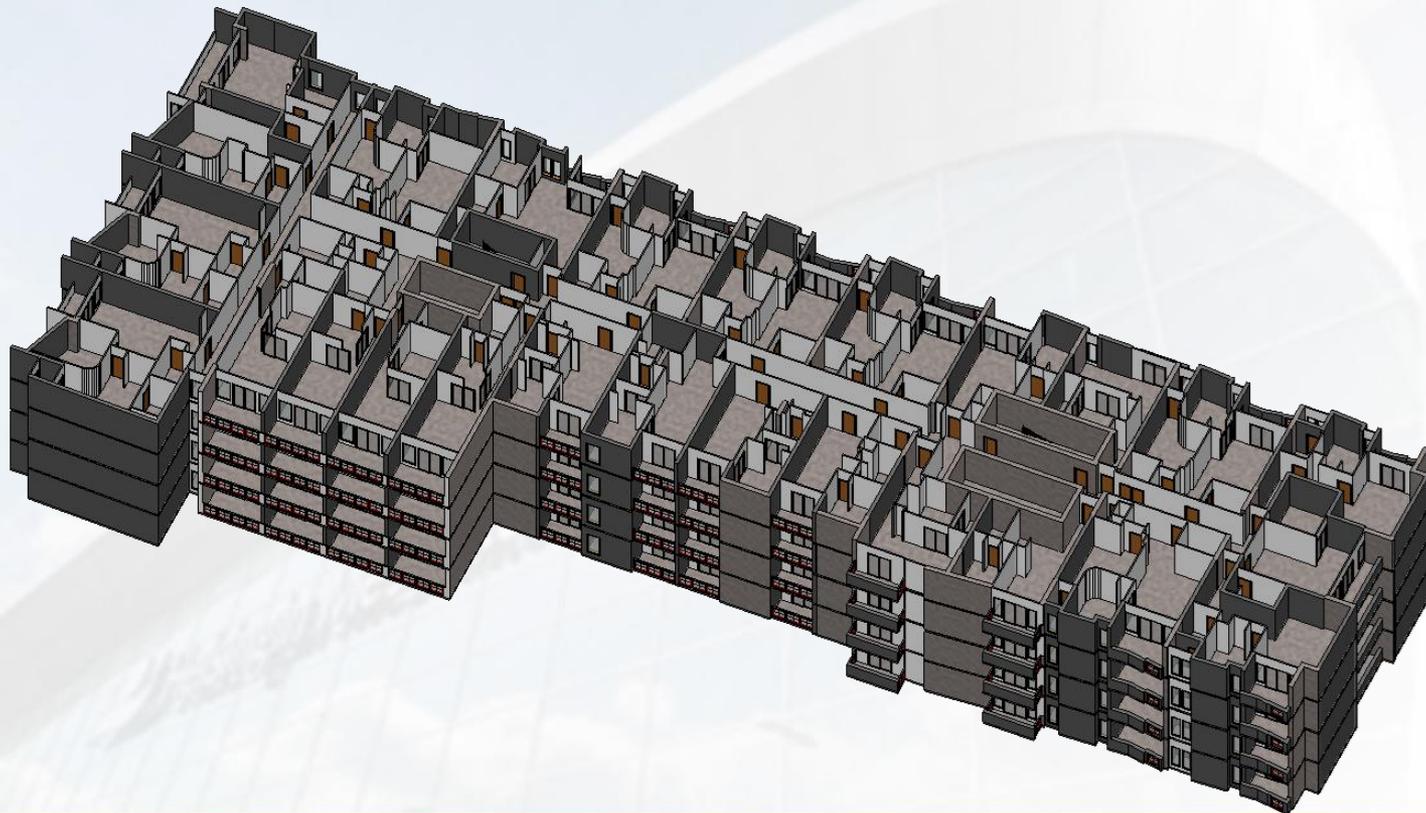
# FIG WORKING WEEK 2017

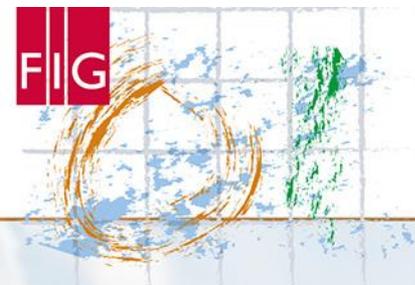
## BIM FOR SURVEYORS

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5

- Current BIM models only include highly detailed information about physical structures.
- However, there is no subdivision (legal) information in these models.

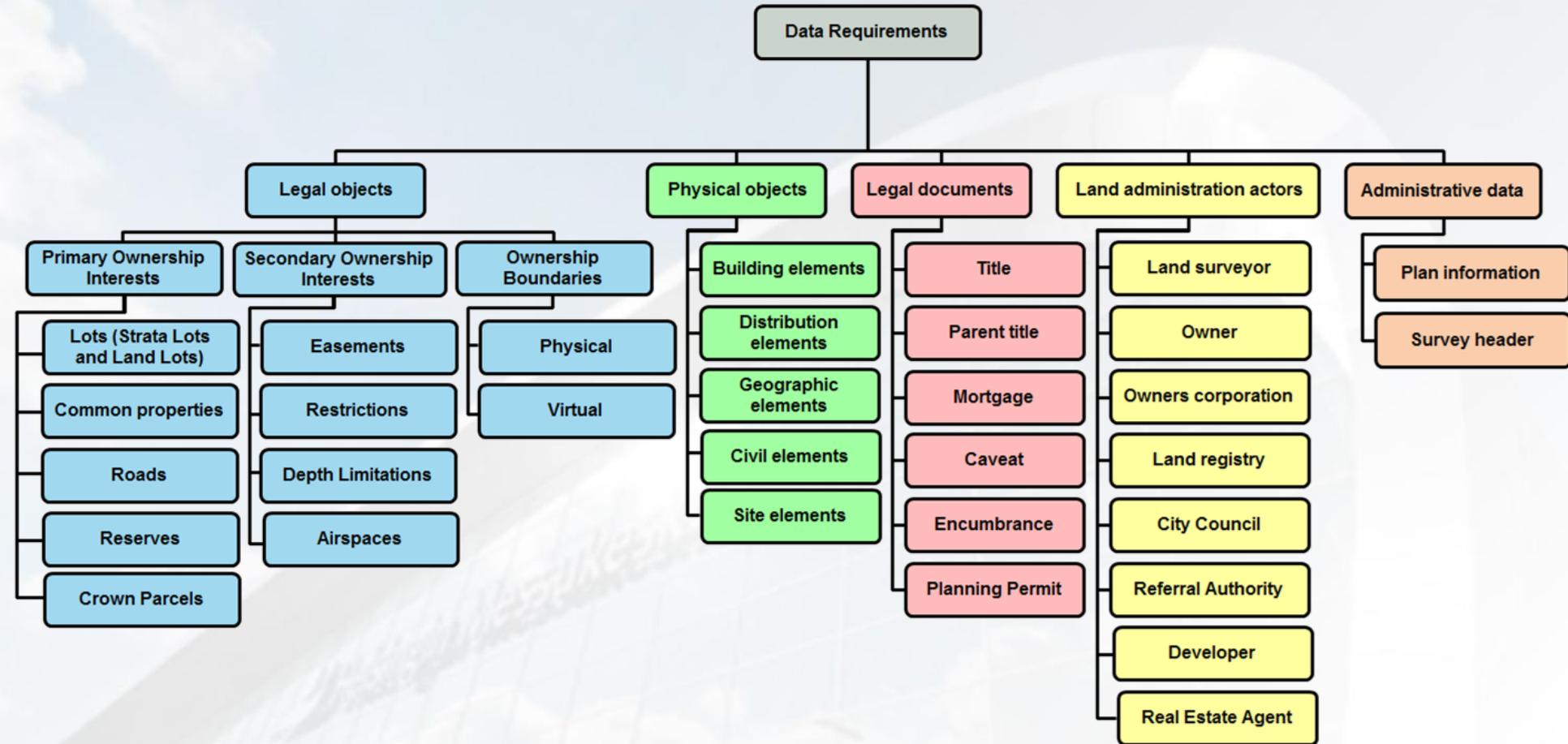


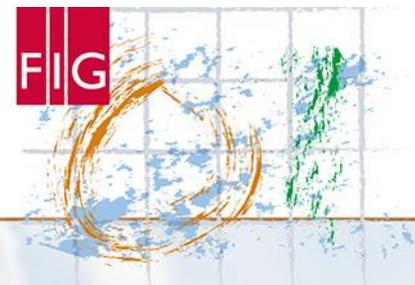


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## BIM FOR SURVEYORS

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## BIM FOR SURVEYORS

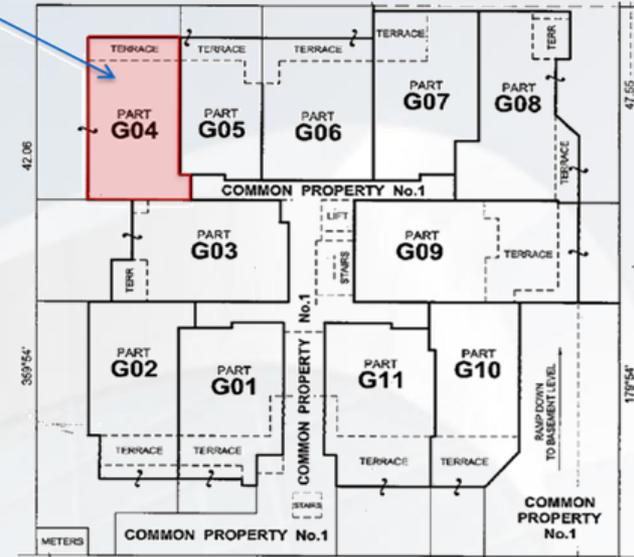
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### Primary ownership interests

- Lots
  - Strata Lots
    - Main part
    - Accessory parts
      - Carpark
      - Storage area
  - Land Lots
    - Undeveloped piece of land

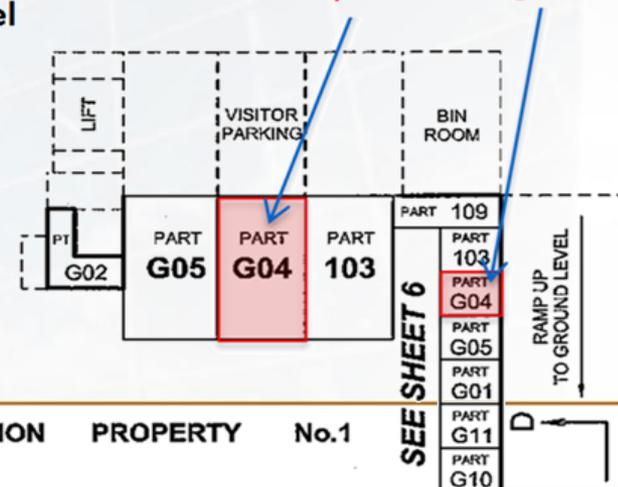
Apartment unit

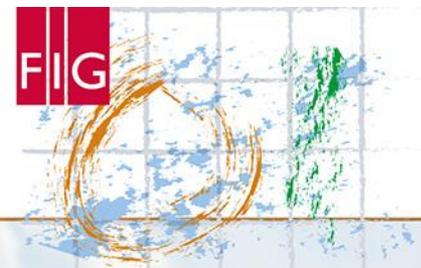
Ground Level



Basement Level

Car park Storage Area





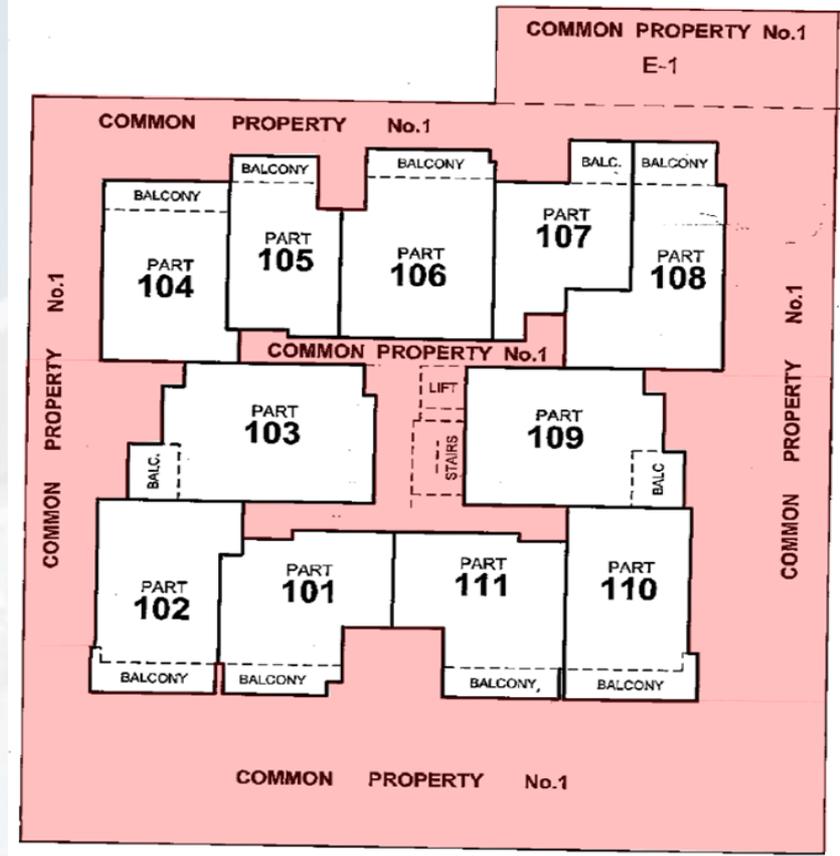
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## BIM FOR SURVEYORS

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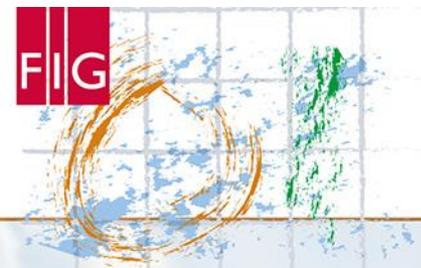
### Primary ownership interests

- Common Properties
  - Common ownership spaces
    - Corridors
    - Lobbies
    - Lifts
    - Stairs
  - Physical structures
    - Walls defining boundaries
    - Floor and ceiling slabs
    - Columns
    - Internal service ducts
    - Conduits
    - Pipe shafts
    - Electricity consumer mains cables



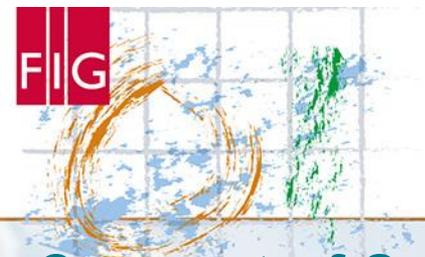
Source: Reeds Consulting, Melbourne





## Physical Objects

- Architectural Elements
  - walls, windows, doors, and columns: vertical boundaries
  - ceilings and floors: horizontal boundaries
  - Part of common property
- Service (Distribution) Elements
  - Ducts, conduits, pipe shafts, and electricity cables: Part of common property
  - drainage, water supply and other services: Part of easements
- Geographic and Civil Elements
  - Roads
  - Rivers: Ambulatory boundaries
- Site Elements
  - Surface of land, on which the building is developed
  - Can represent parcels like Land lots, reserves, crown parcels



## Concept of Spatial Zone in BIM

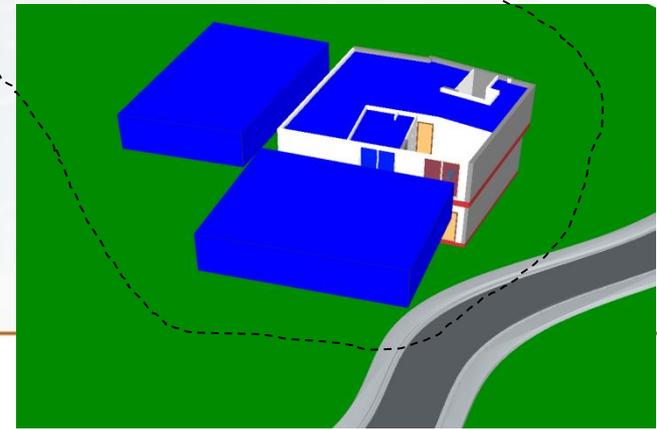
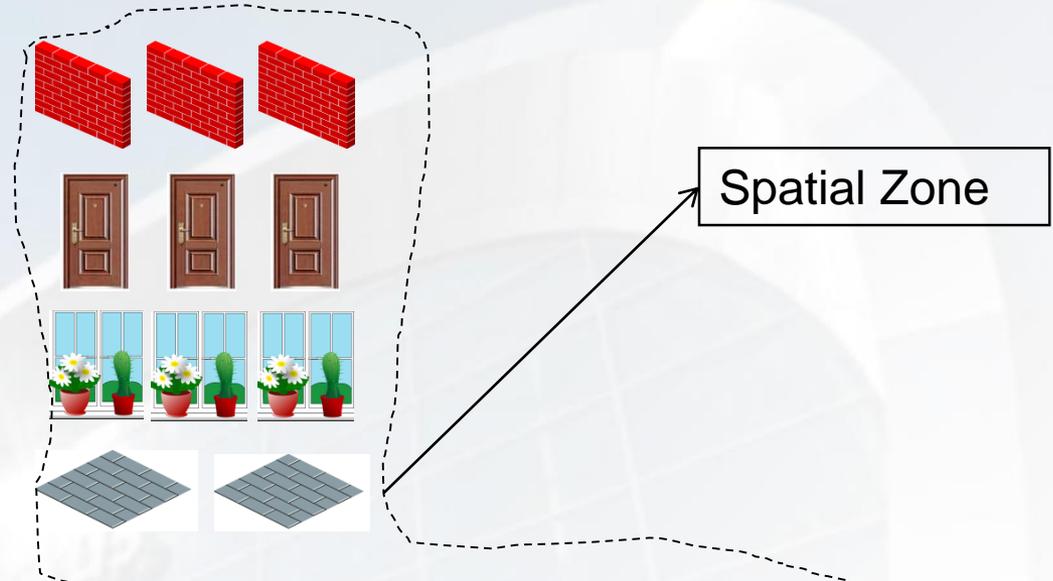
Composition of a Set of :

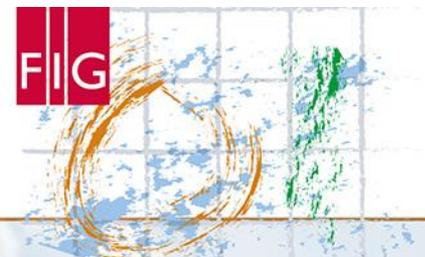
### – Visible Objects

- Walls
- Doors
- Windows
- Ceilings

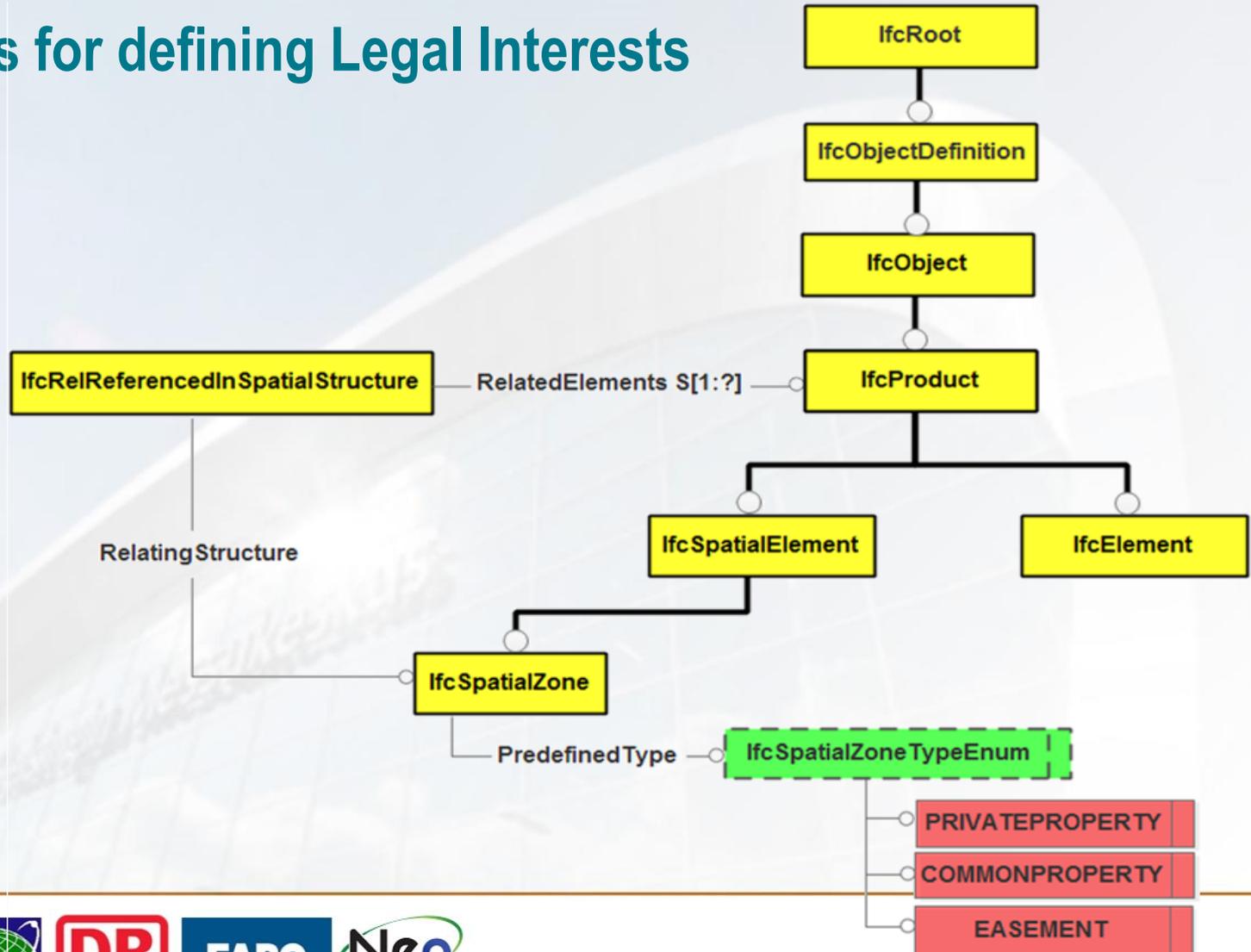
### – Non-visible Objects

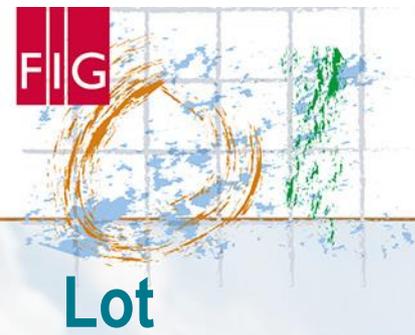
- Spaces inside buildings
- Spaces outside buildings





### Spatial Zones for defining Legal Interests





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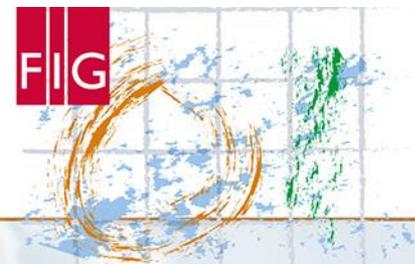
## BIM FOR SURVEYORS

T3

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Lot





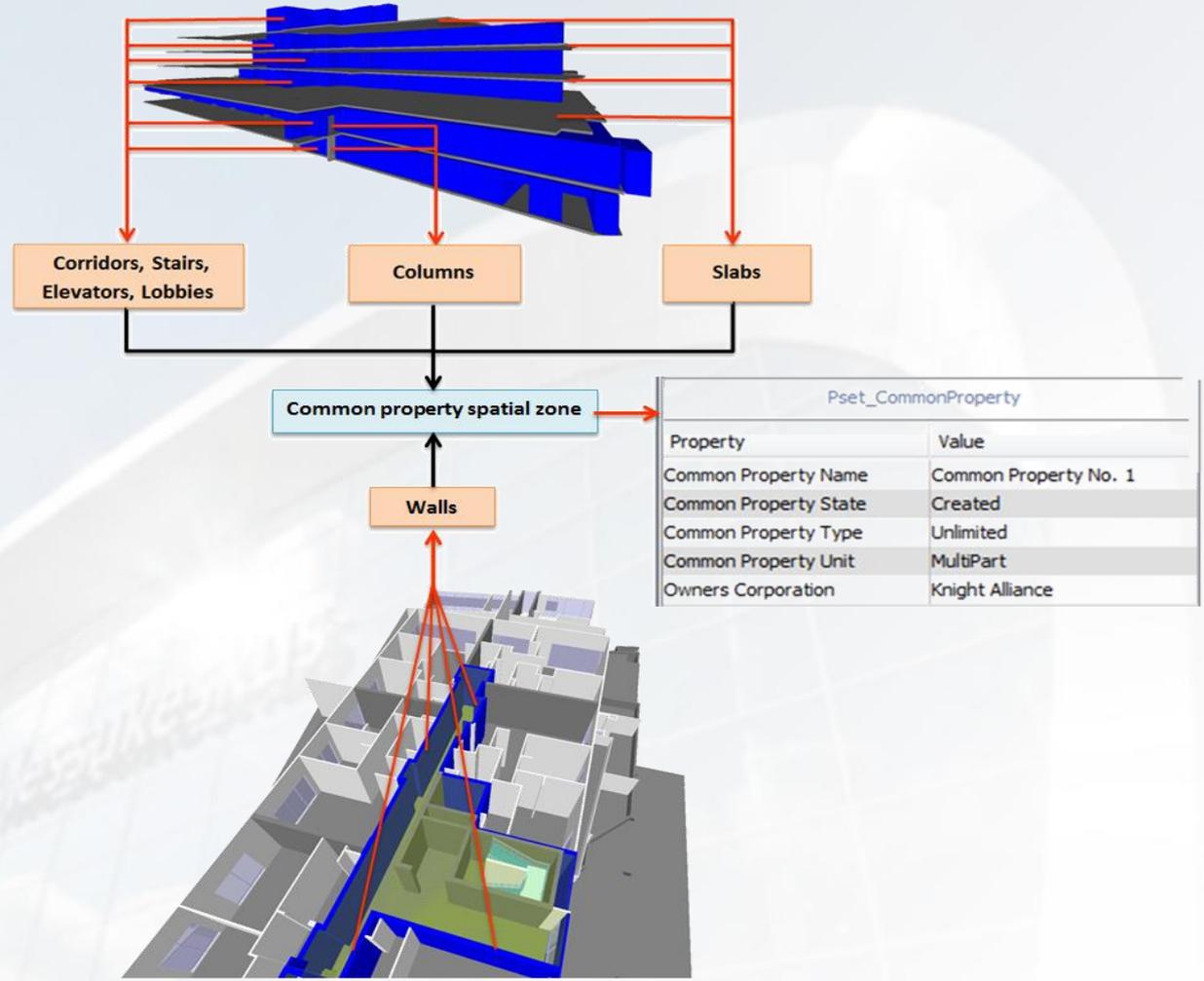
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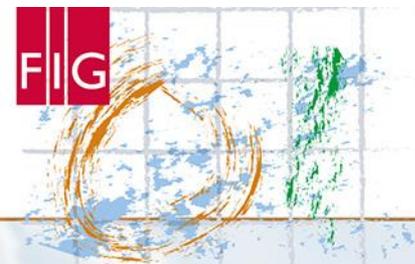
## BIM FOR SURVEYORS

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### Common Property





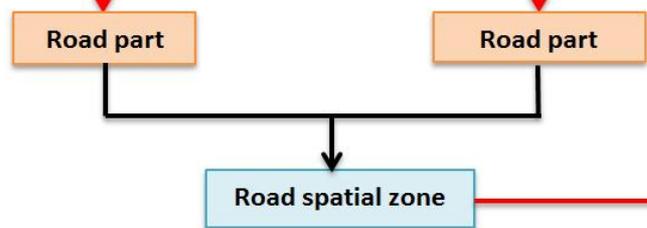
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## BIM FOR SURVEYORS

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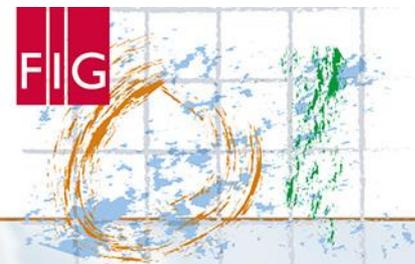
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### Road



| Pset_OwnershipInterestCommon |           |
|------------------------------|-----------|
| Property                     | Value     |
| Ownership Interest Class     | Road      |
| Ownership Interest Holder    | VicRoads  |
| Ownership Interest State     | Existing  |
| Ownership Interest Unit      | MultiPart |

| Pset_Road |            |
|-----------|------------|
| Property  | Value      |
| Road Area | 67.0235 m2 |



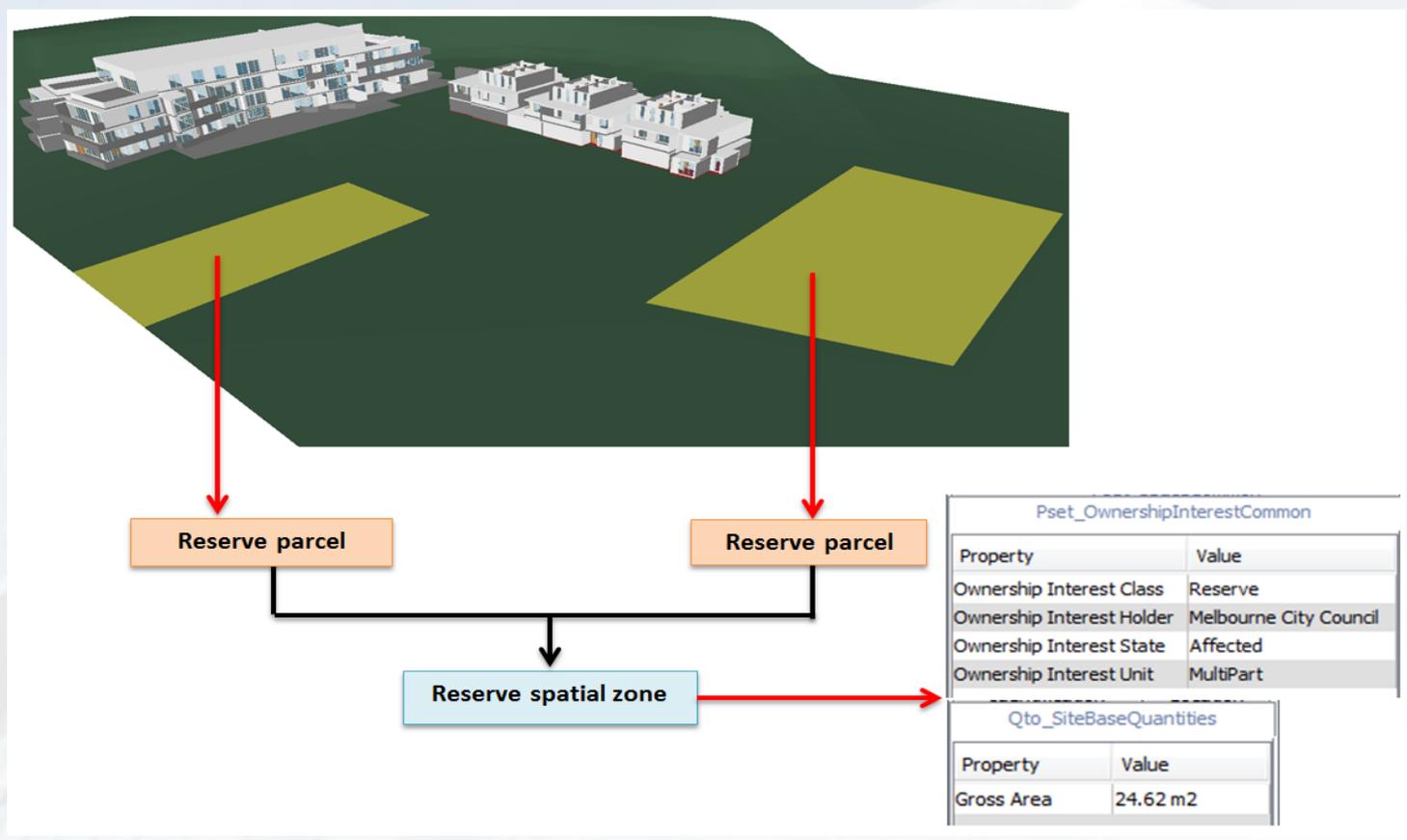
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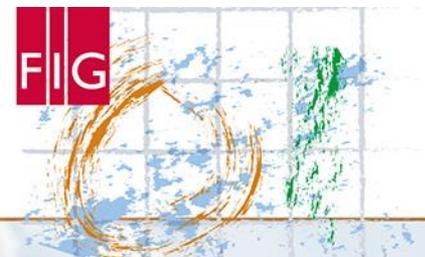
## BIM FOR SURVEYORS

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### Reserve



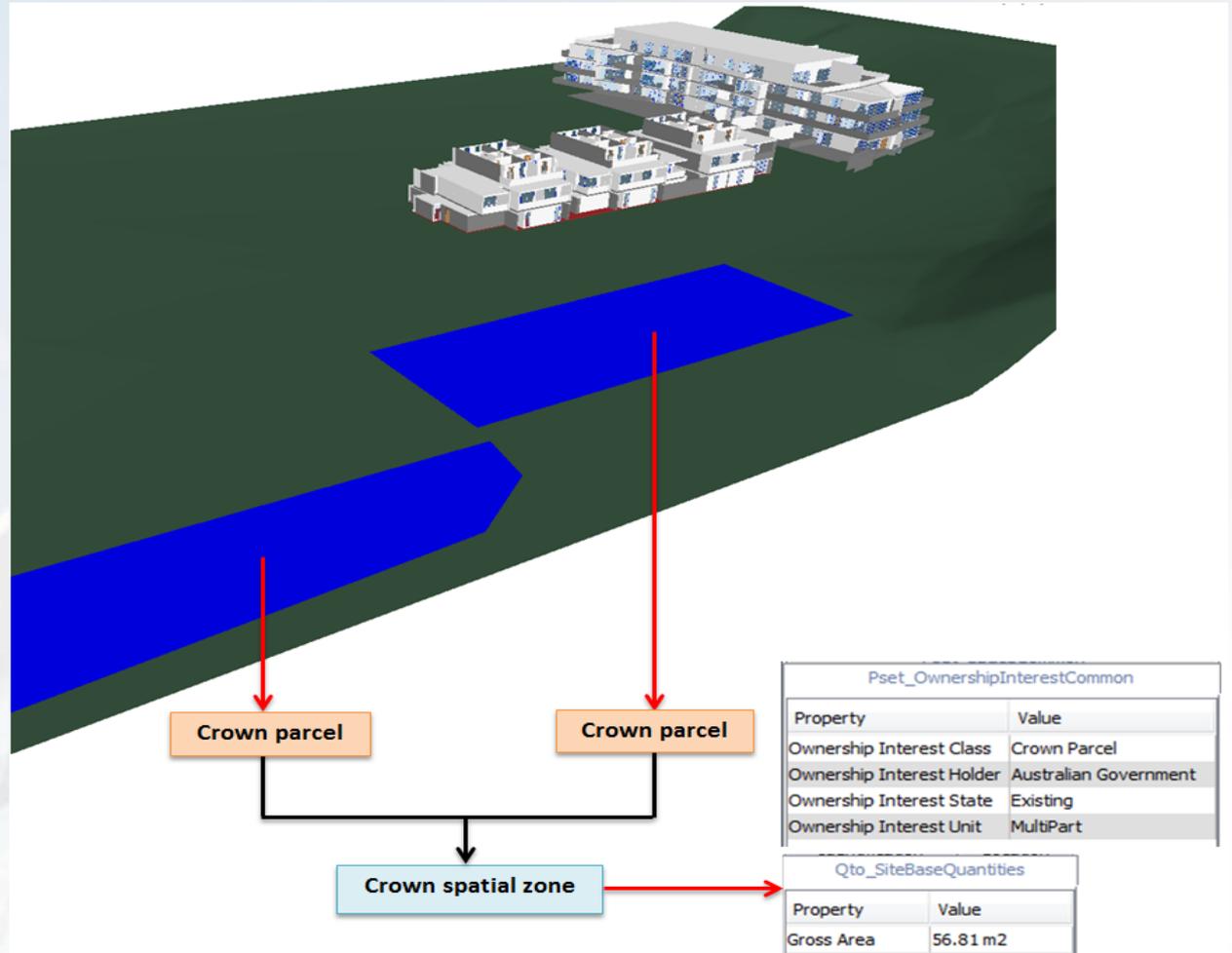


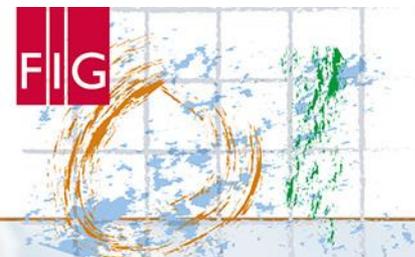
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### Crown Parcel





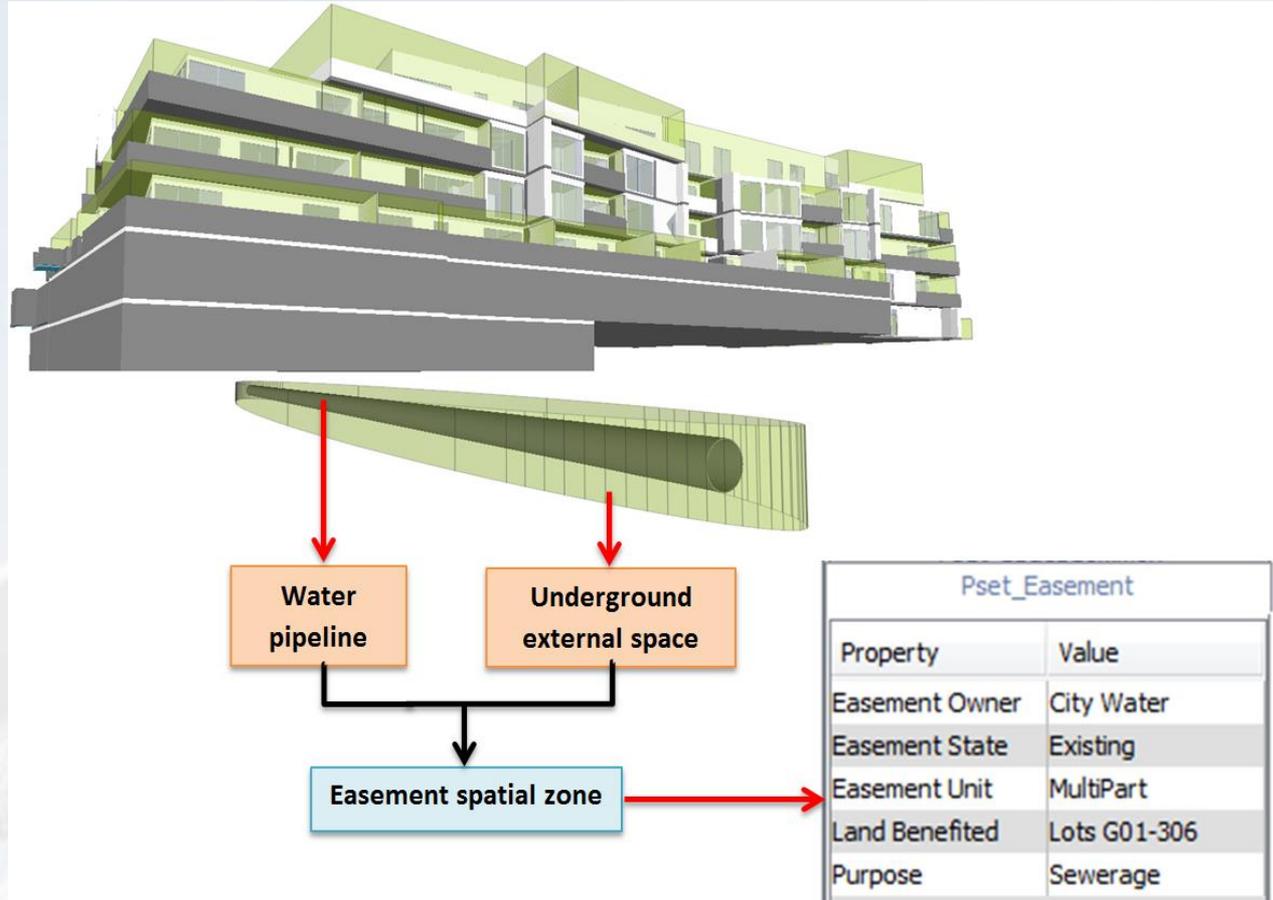
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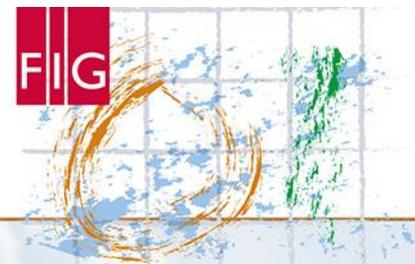
## BIM FOR SURVEYORS

T8

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### Easement





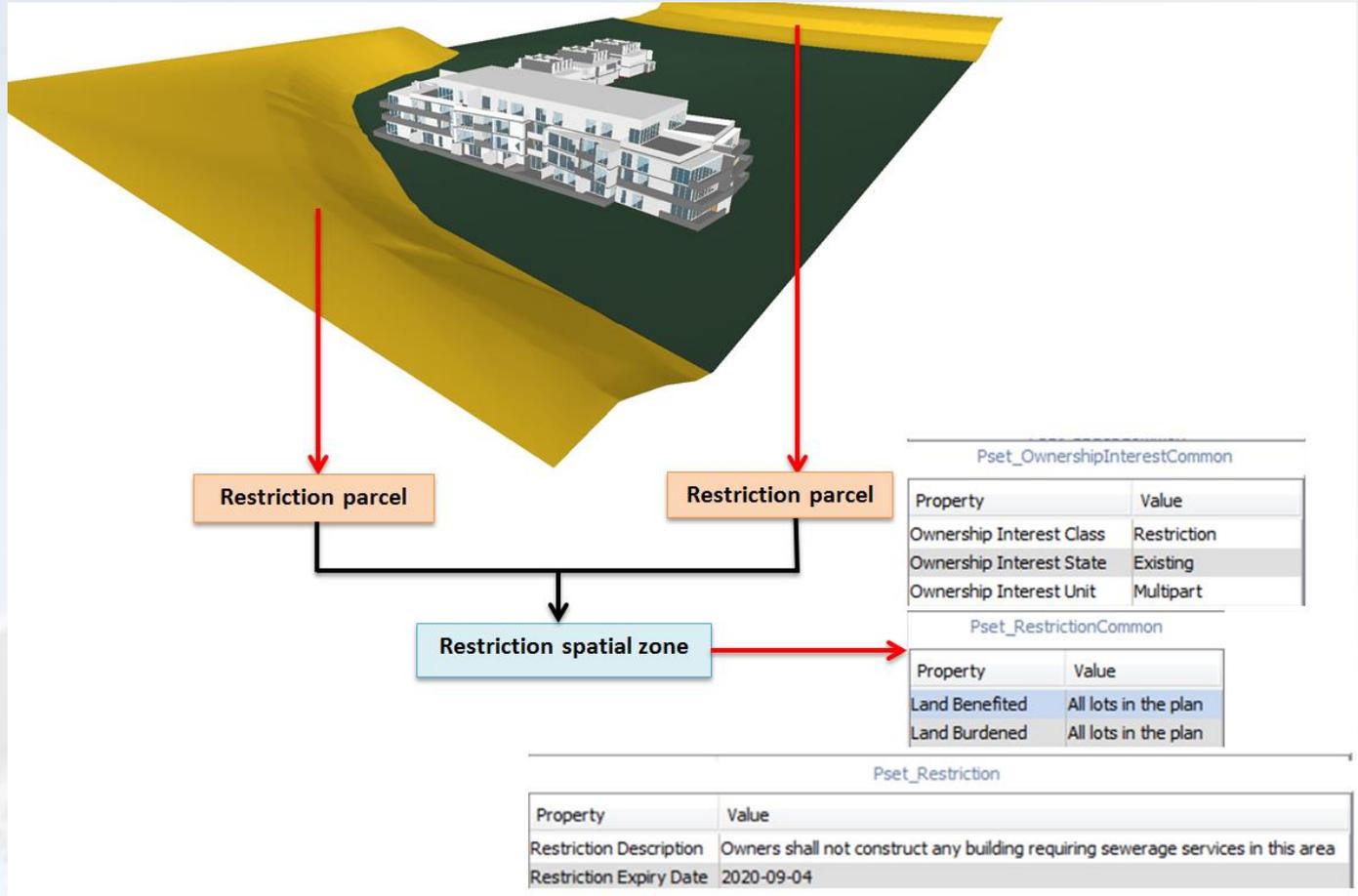
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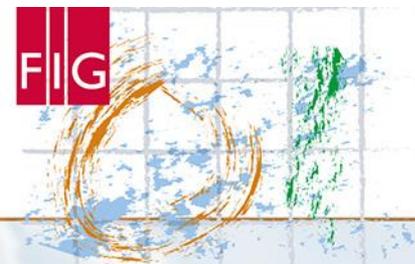
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T9

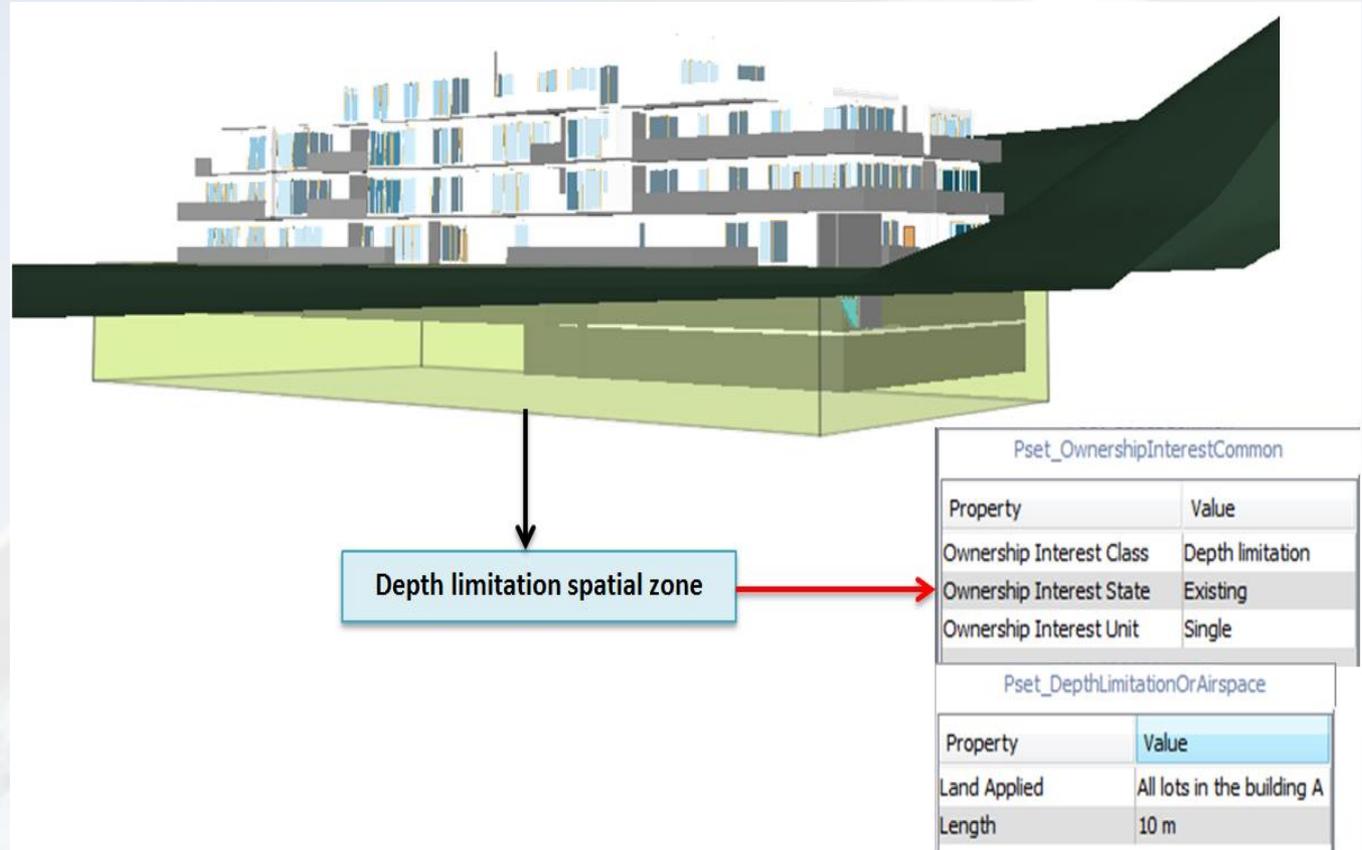
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## Restriction





## Depth Limitation



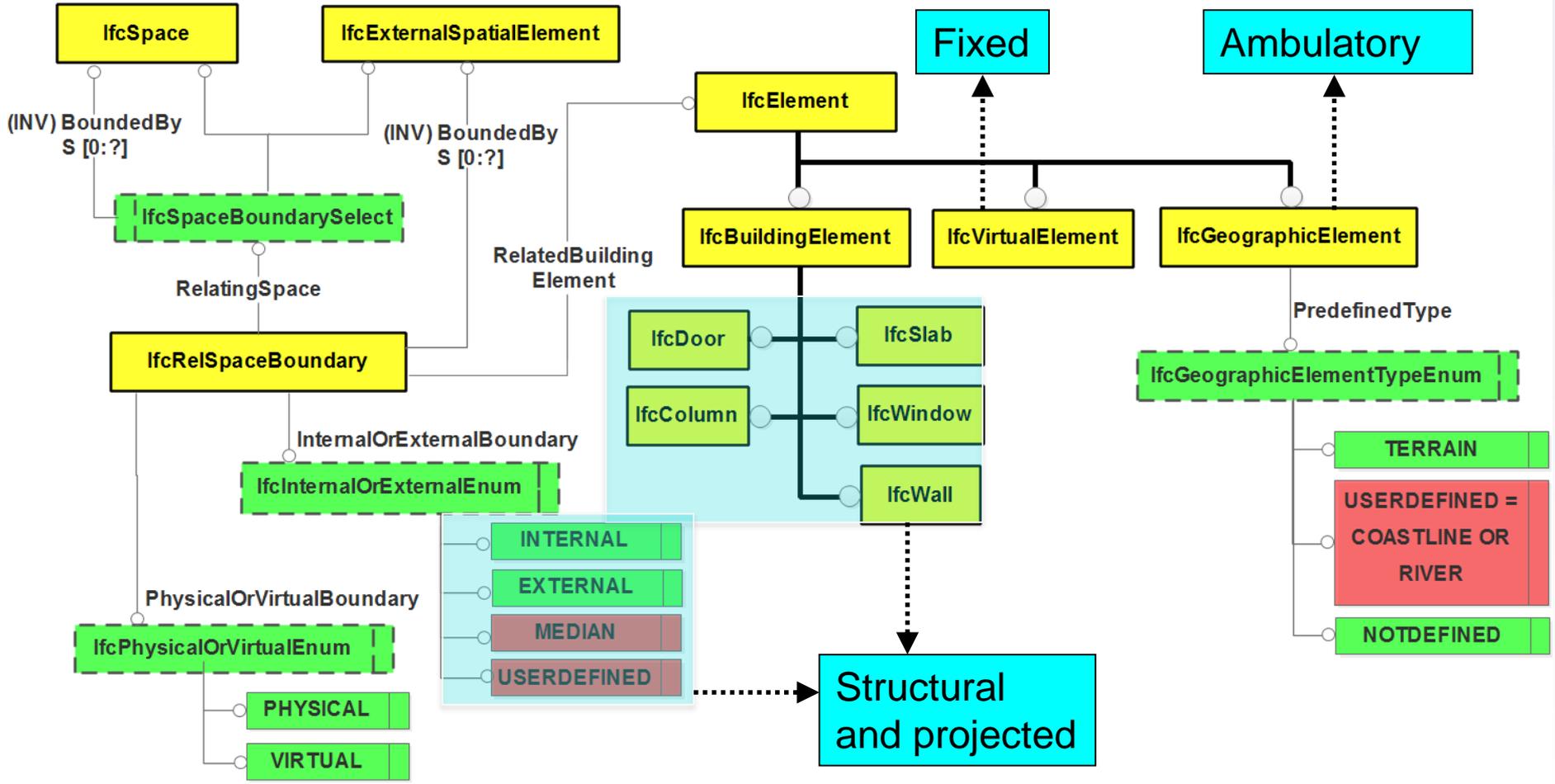


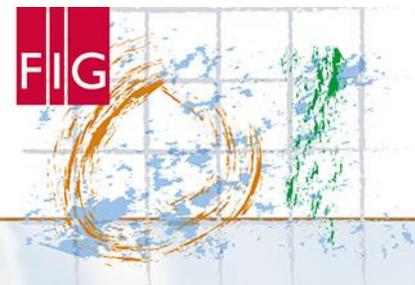
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## BIM FOR SURVEYORS

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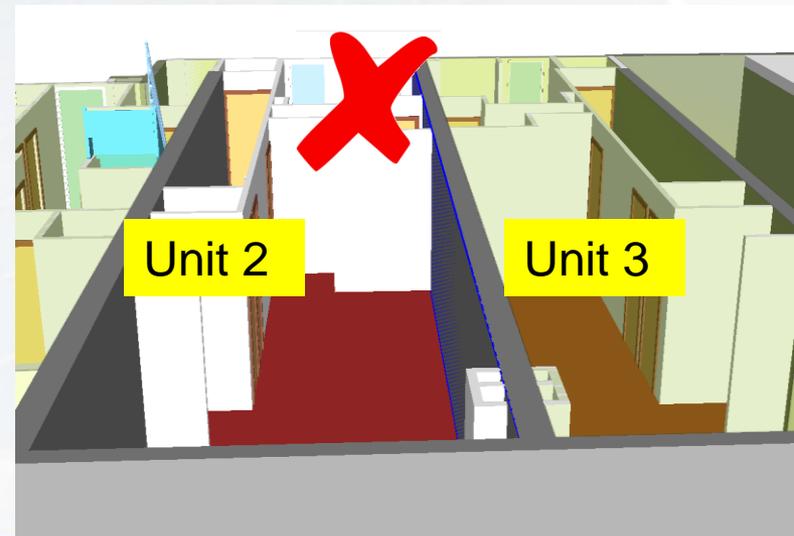
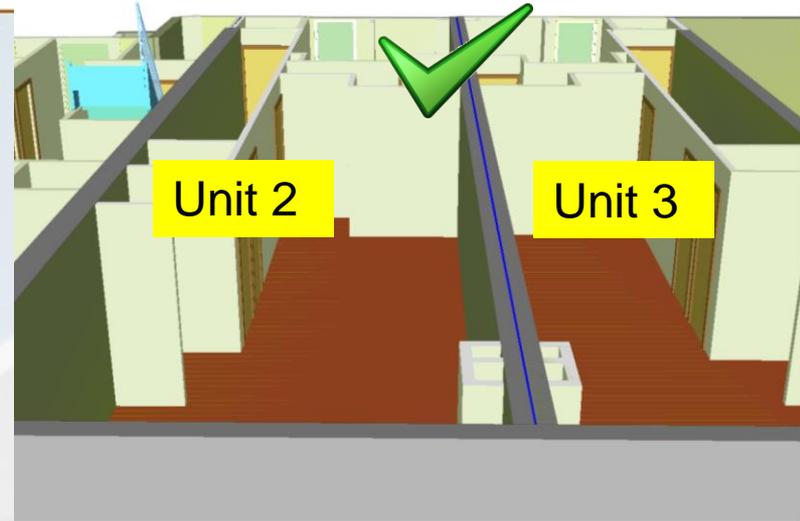
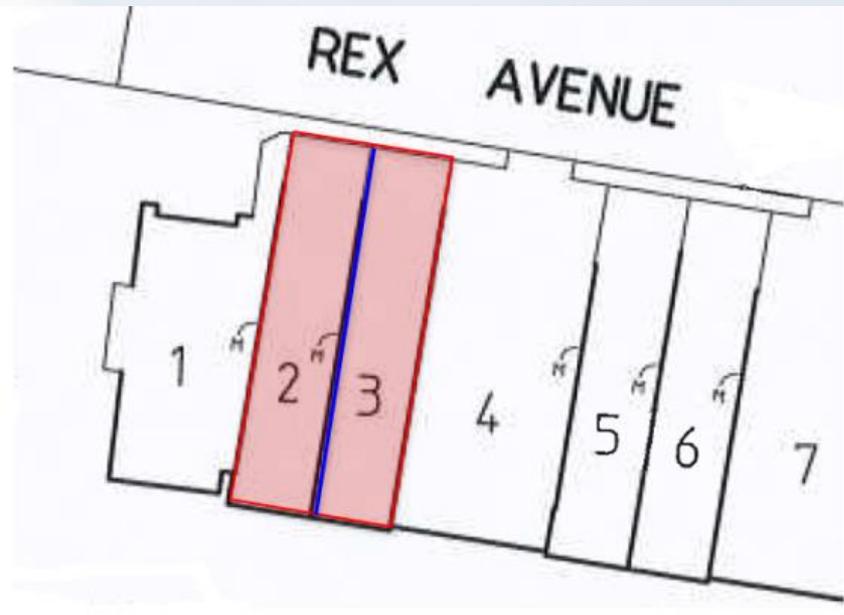


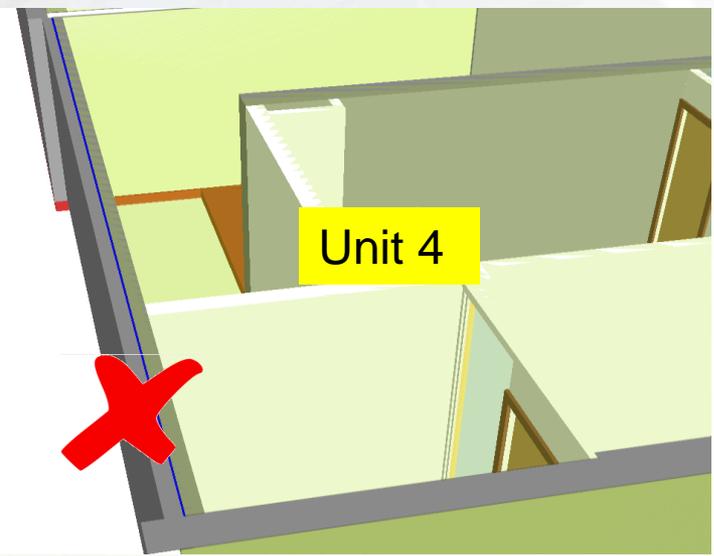
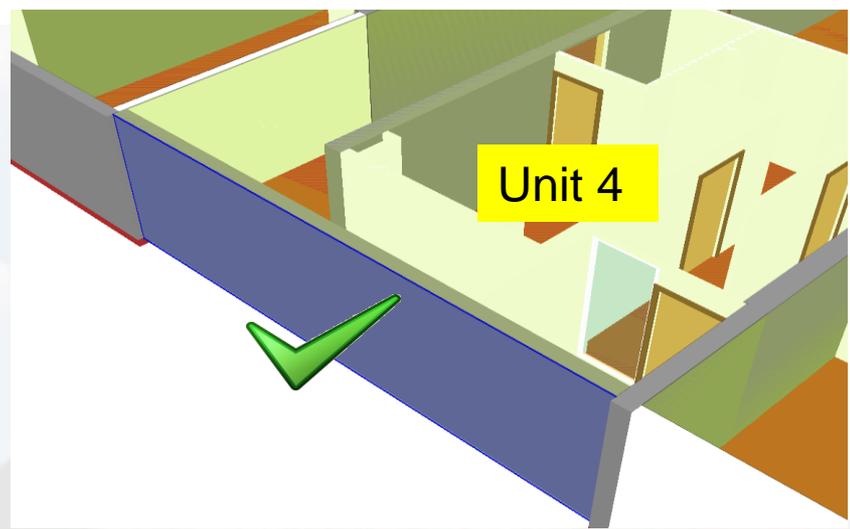
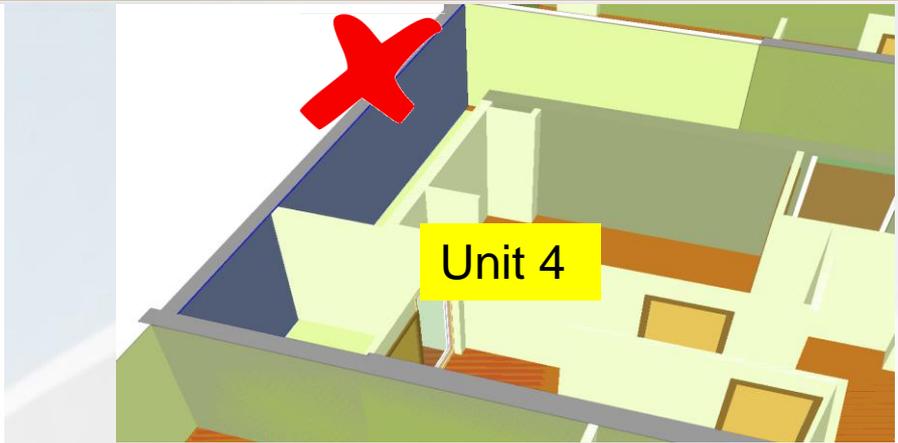
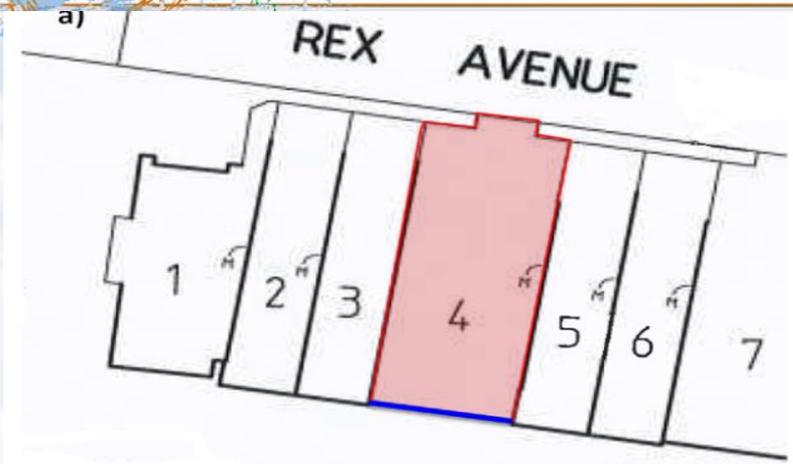
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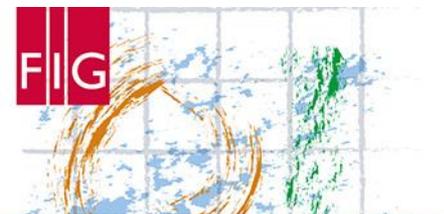
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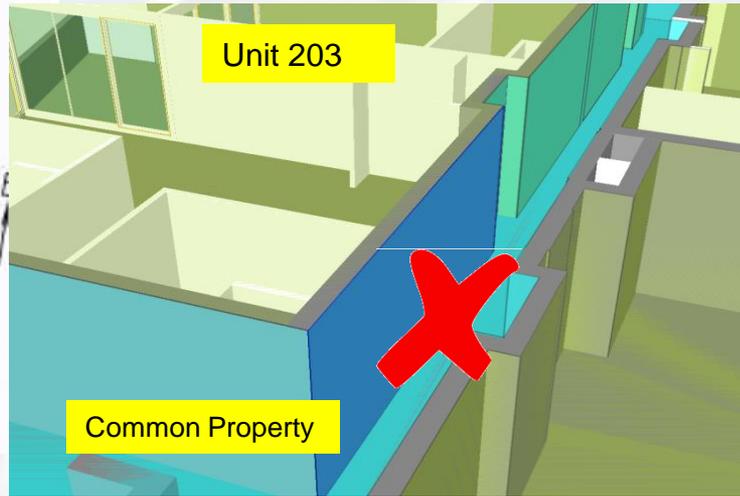
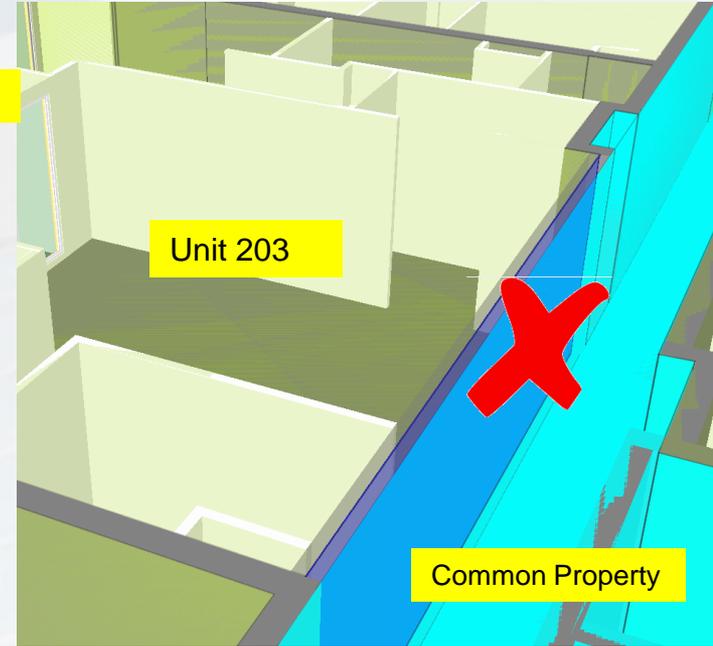
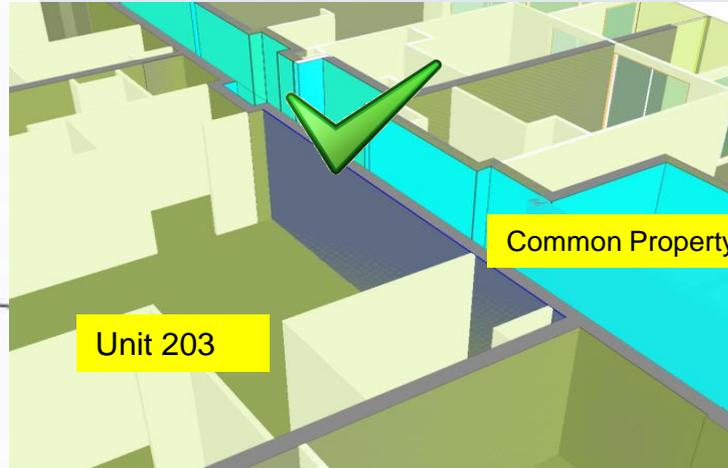
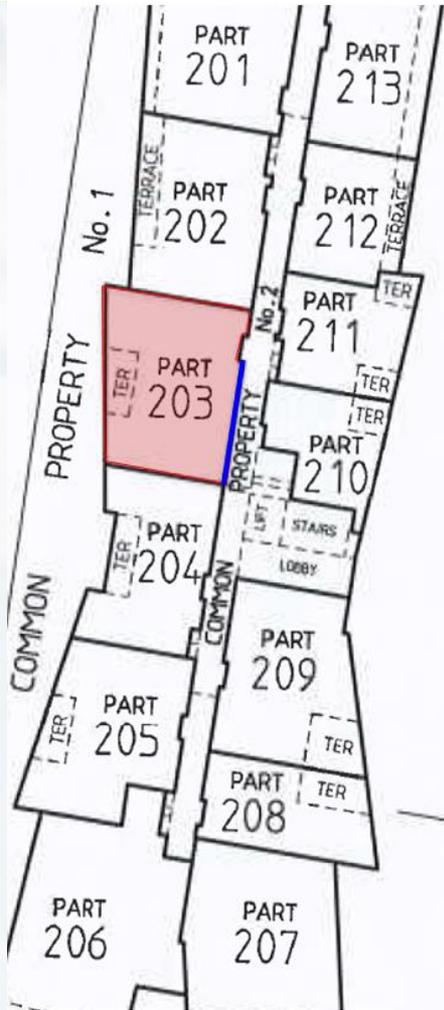


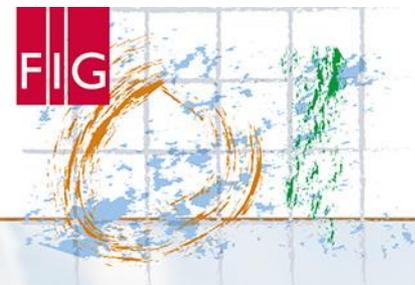




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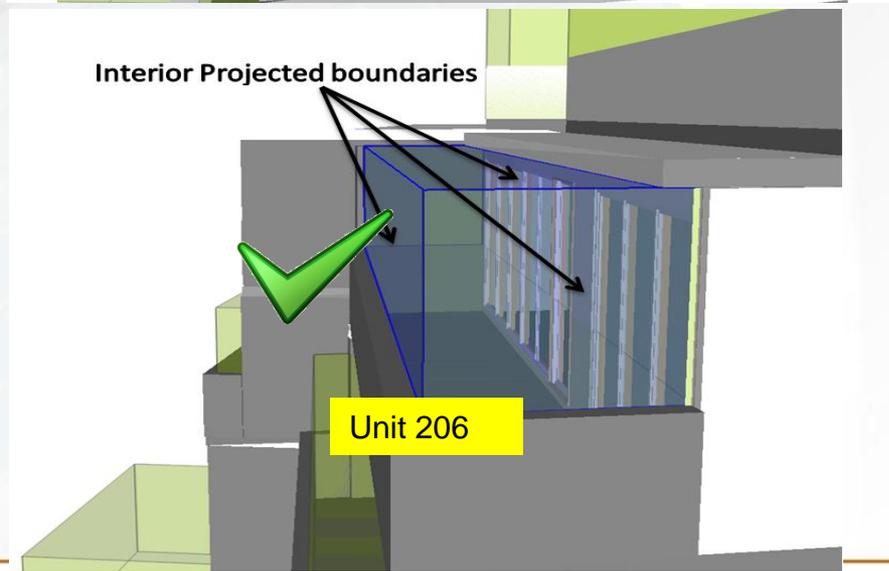
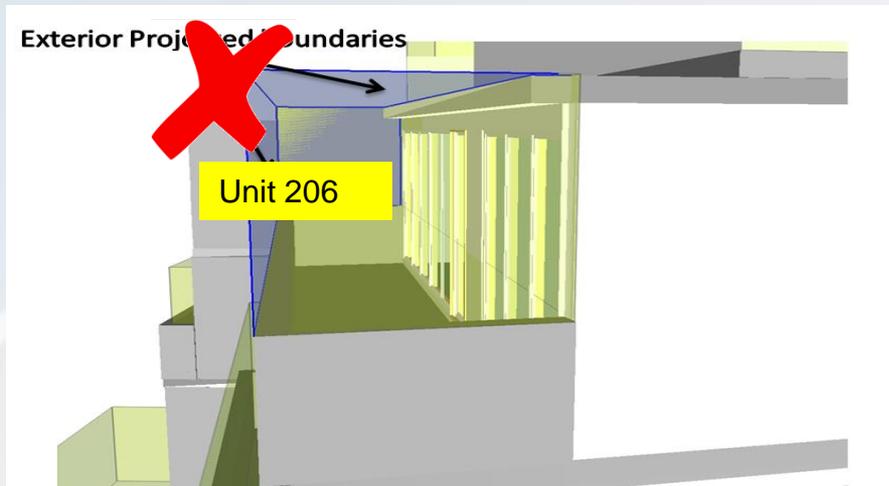
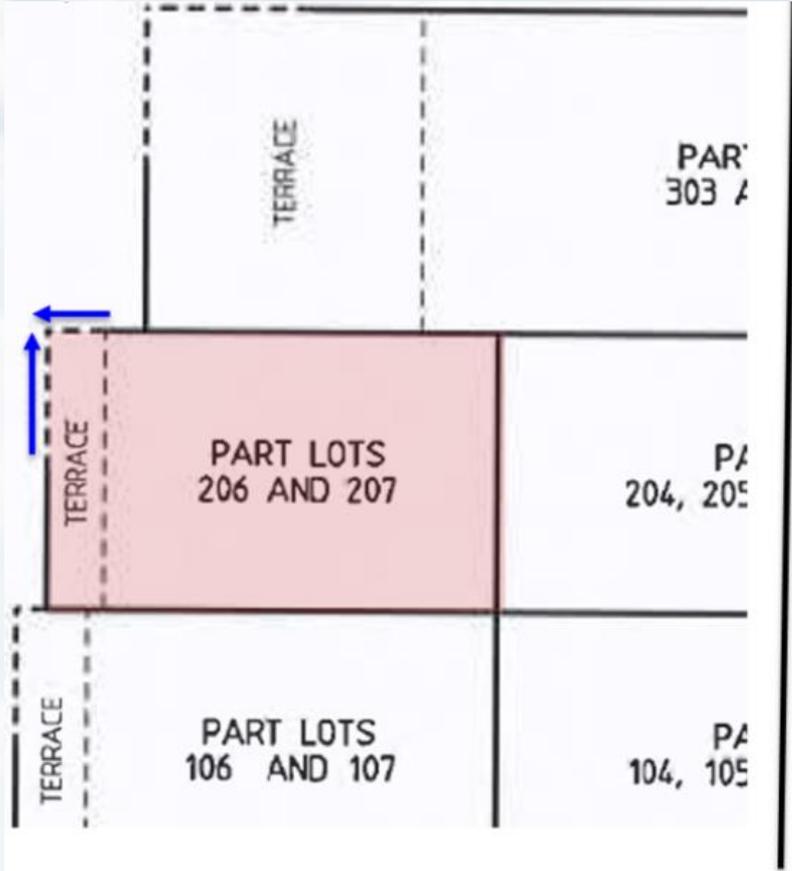


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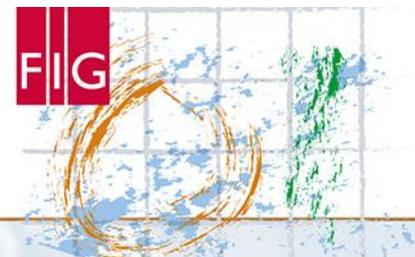
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Location of boundary: Where?



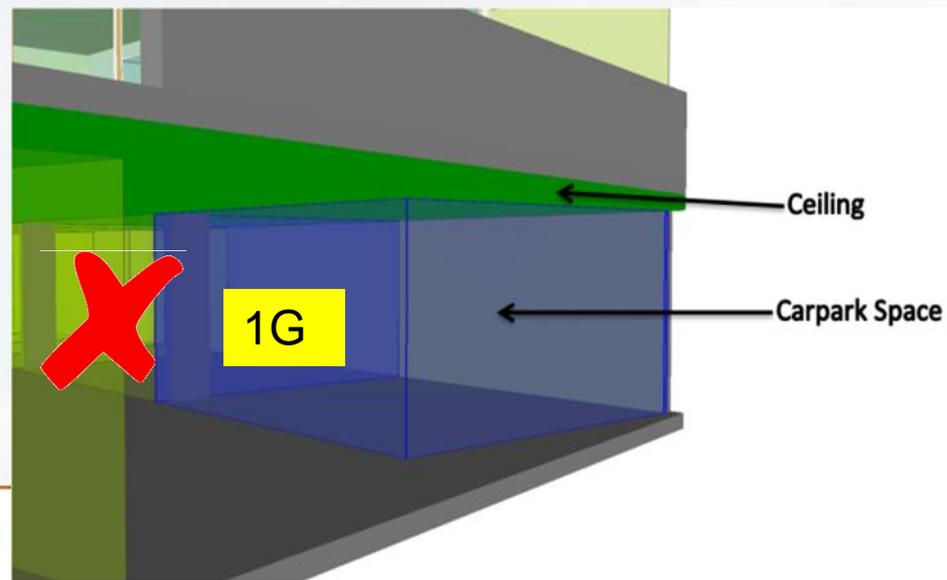
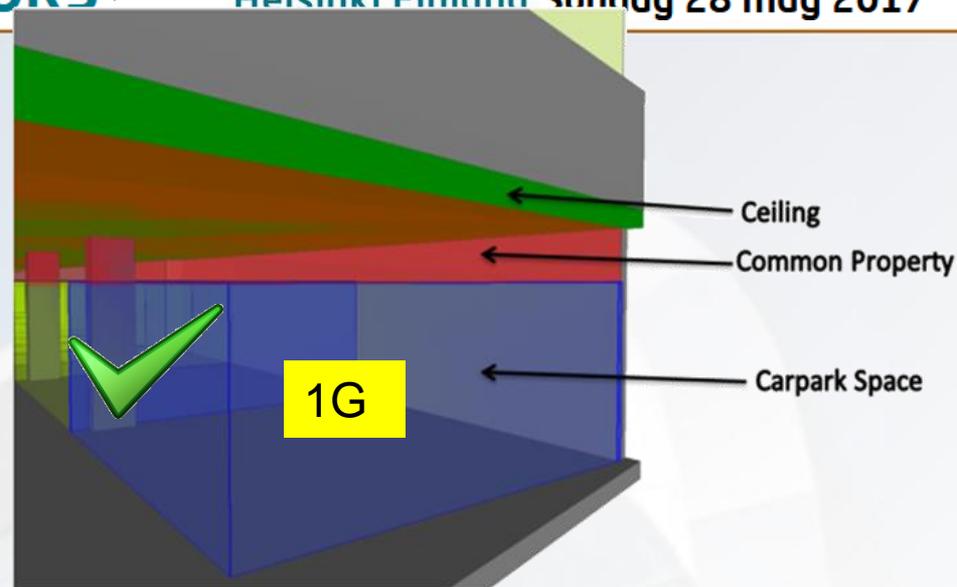
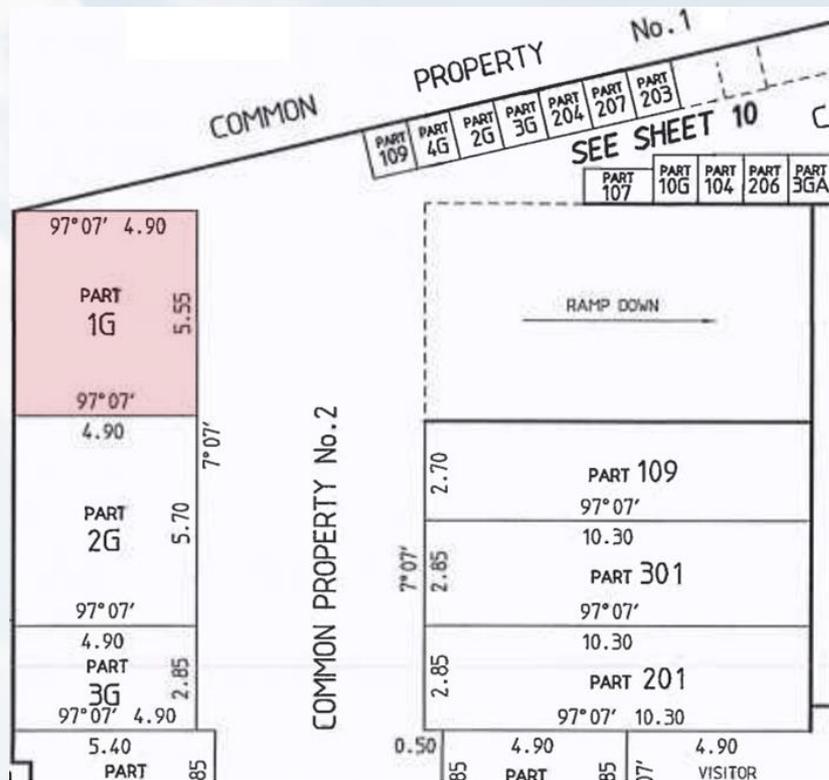
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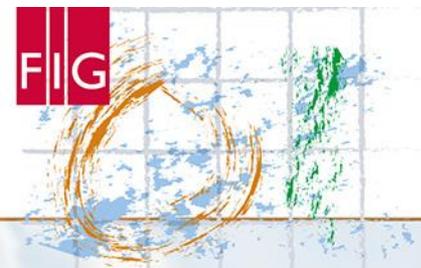
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### Location of boundary: Where?





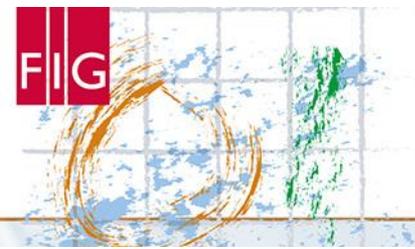
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## BIM FOR SURVEYORS

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- Over the last decade, significant developments in graphics of computers in terms of rendering 3D models.
- 3D models of buildings and other urban infrastructures have proliferated in different formats and levels of details





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## BIM FOR SURVEYORS

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3D  
AUSTRALIA  
2017 3D GeolInfo Conference



12th 3D GeolInfo Conference  
26 - 27 October

1st International IAG Workshop on BIM and  
GIS Integration  
25 October

3D Cadastres symposium and training  
24 October