Case study
RIJNSTATE Hospital ARNHEM
the Netherlands

Leiden Seminar Building Information Modelling for Healthcare

Rijnstate

Streamer
European research on energy-efficient healthcare districts

Agenda

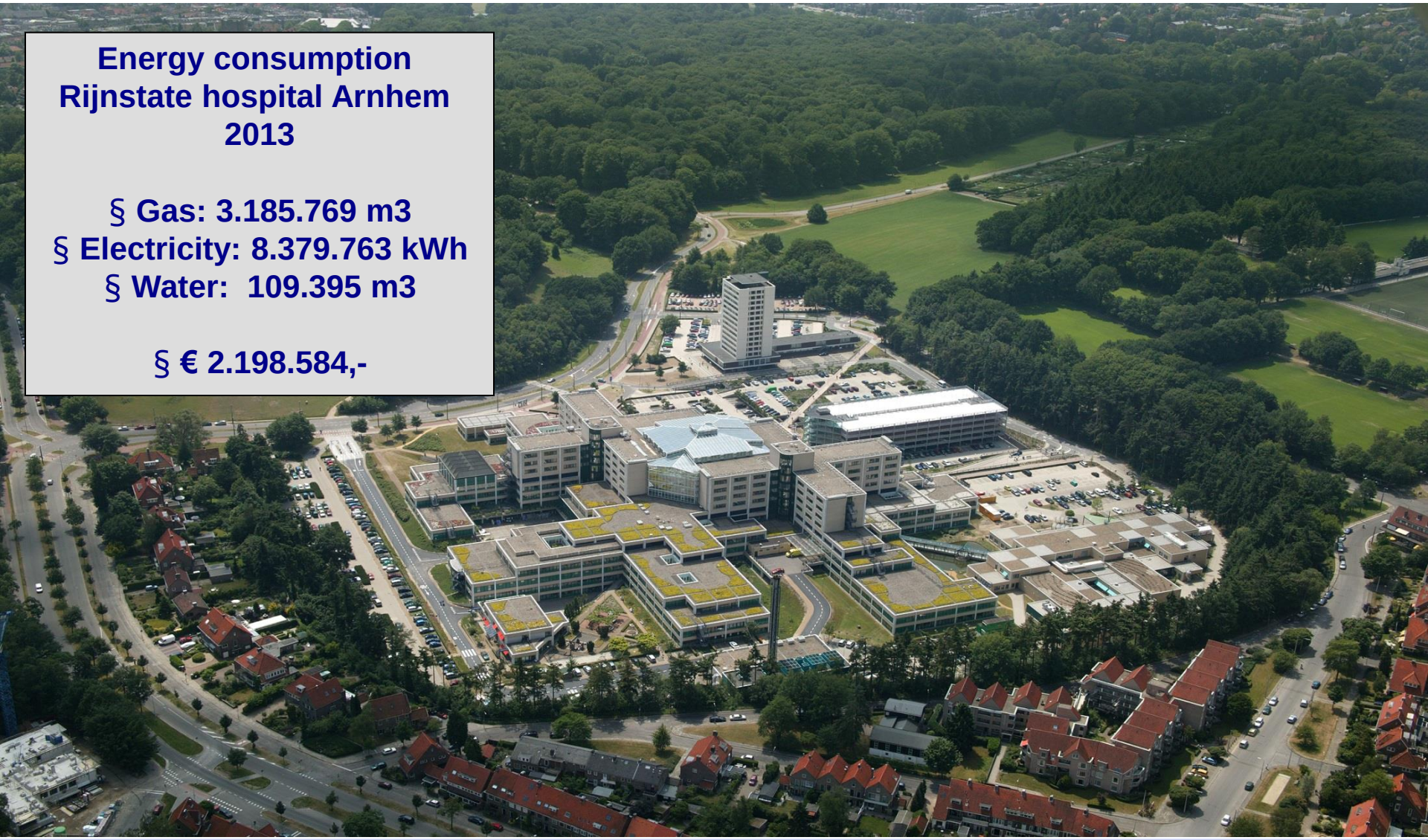
1 Rijnstate hospital locations and energy consumption

Total Energy consumption 2013

§ Gas: 4.660.110 m3
§ Electricity: 15.398.074 kWh
§ Water: 140.124 m3

§ € 4.000.000,-

1 Rijnstate hospital locations and energy consumption



Energy consumption
Rijnstate hospital Arnhem
2013

- **Gas: 3.185.769 m3**
- **Electricity: 8.379.763 kWh**
- **Water: 109.395 m3**

- **€ 2.198.584,-**

2 Why BIM and life case for Streamer

Why BIM for Rijnstate:

- **Optimizing our processes in Healthcare real estate**
- **Reduce failure costs**
- **Helps tot achieve our goals**
- **Better cooperation en transparant processes**
- **Better transition from project to management and use phase**

Participating in the Streamer project helps Rijnstate in our major housing planned for coming period; reduction of energy use en carbon emission by semantic-driven Design (BIM).

3 Description of the Rijnstate case

- **Extension of the existing building with 10.000 m2**

  Phase 1: Extension 4.500 m2, Oncology Center (Factory)

  Phase 2: Extension 4.500 m3, Woman and child center (Factory)

  Phase 3: Extension 1.000 m2, Operating rooms (Hotfloor)

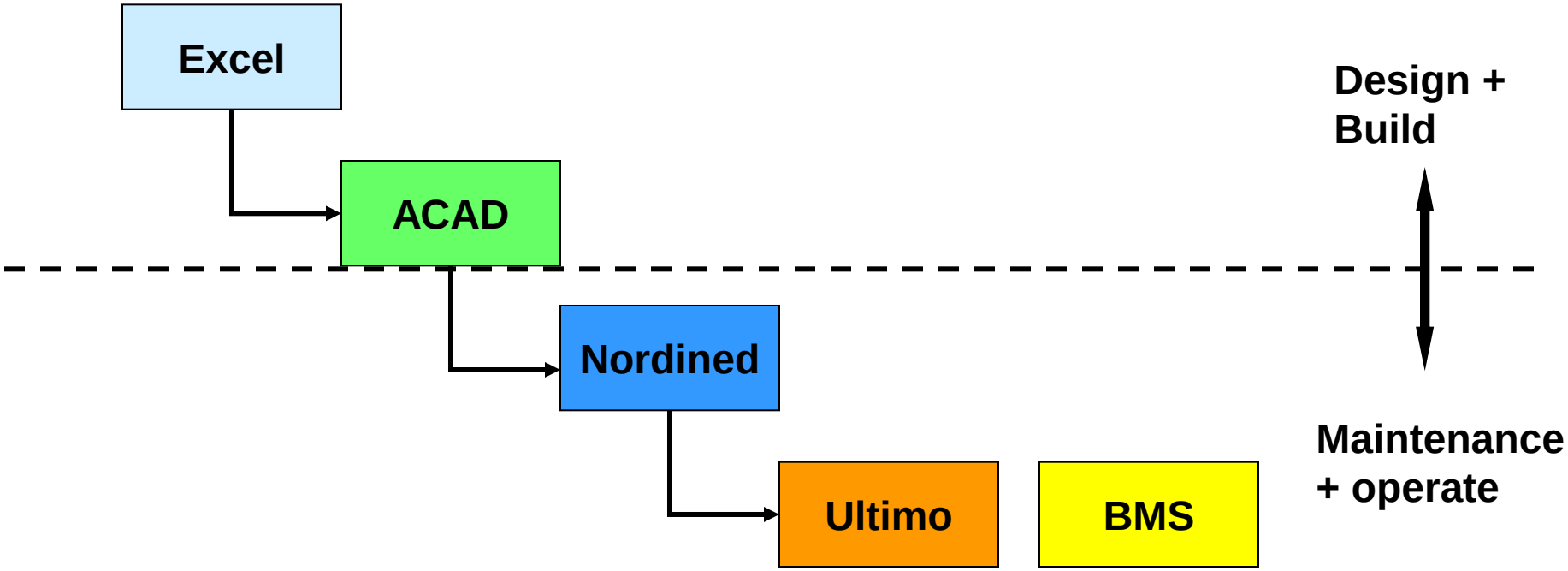
  Goals: Sustainable MEP systems (+ 15 % energy consumption)

§ **Retrofitting MEP systems of the existing building 90.000 m2**

Goals: Sustainable MEP systems (- 15 % energy consumption)

4 Operational workplan task 7.2 in Streamer

4.1 Existing models



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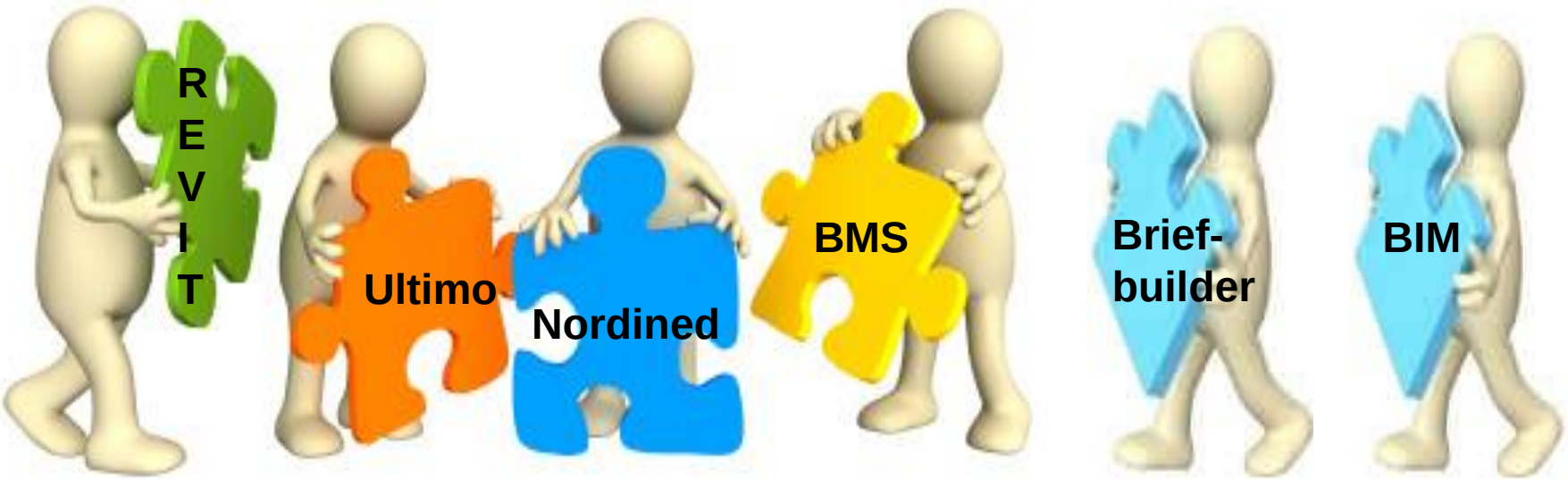
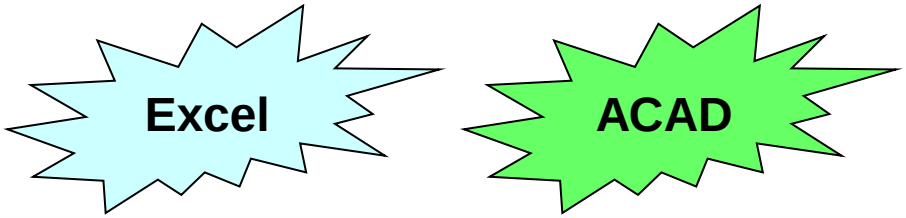
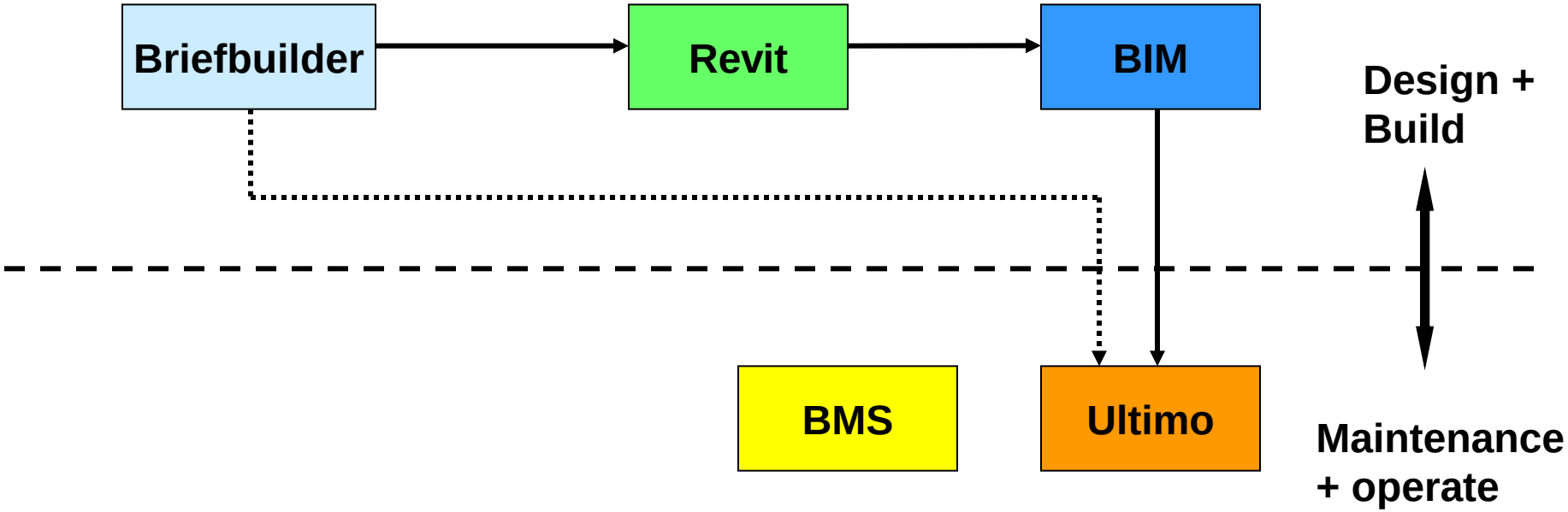
4.2 Ambition > Future (= change of the real estate proces)





4 Operational workplan task 7.2 in Streamer

4.2 Ambition > Future



4 Operational workplan task 7.2 in Streamer

- **Semantic based programming (Briefbuilder)**
- **3D design (Revit)**
- **Layer-model of TNO**
- **BIM**
- **Check and adjust at an early stage (based on the KPI's)**
- **Possibility of use of resources to achieve goals**

4 Operational workplan task 7.2 in Streamer

Total area (m2) according to the layer-model

Existing Building

Legend:

Hot Floor	8.850	m2
Factory	35.000	m2
Hotel	20.500	m2
Office	18.700	m2
Total	83.050	m2

Extension Building

Legend:

Hot Floor	915	m2
Factory	7.200	m2
Hotel	3.000	m2
Office	920	m2
Total	12.035	m2

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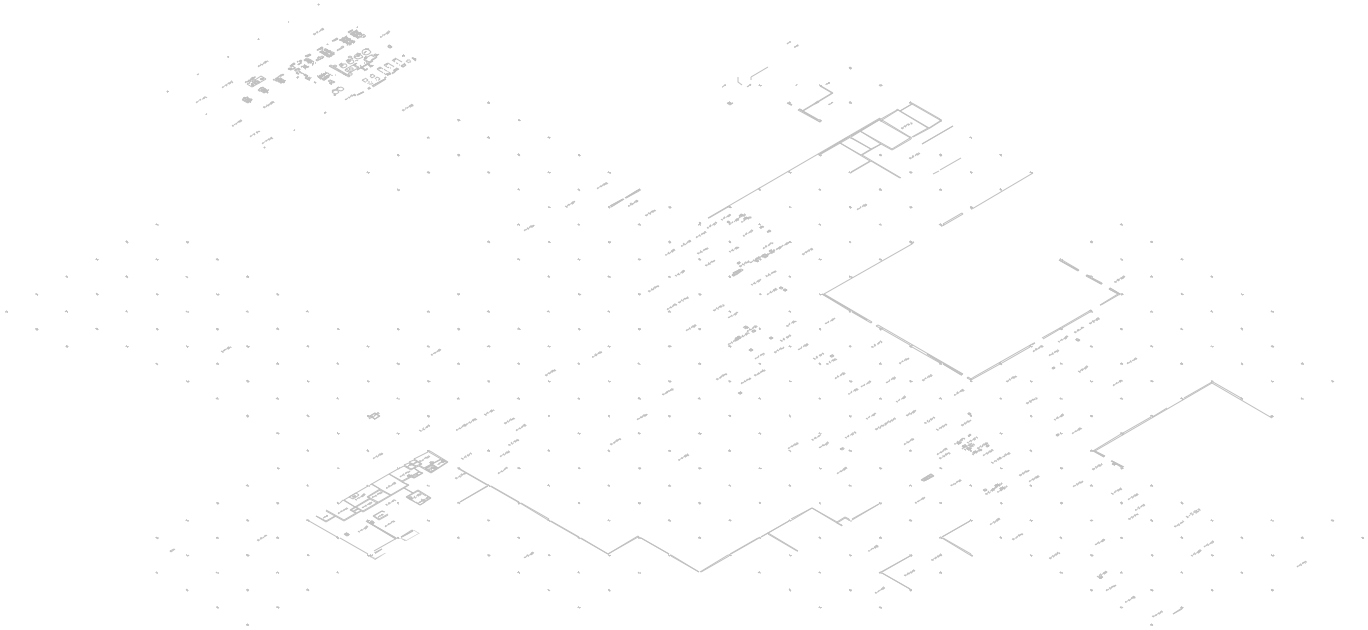
- Existing Building: Basement



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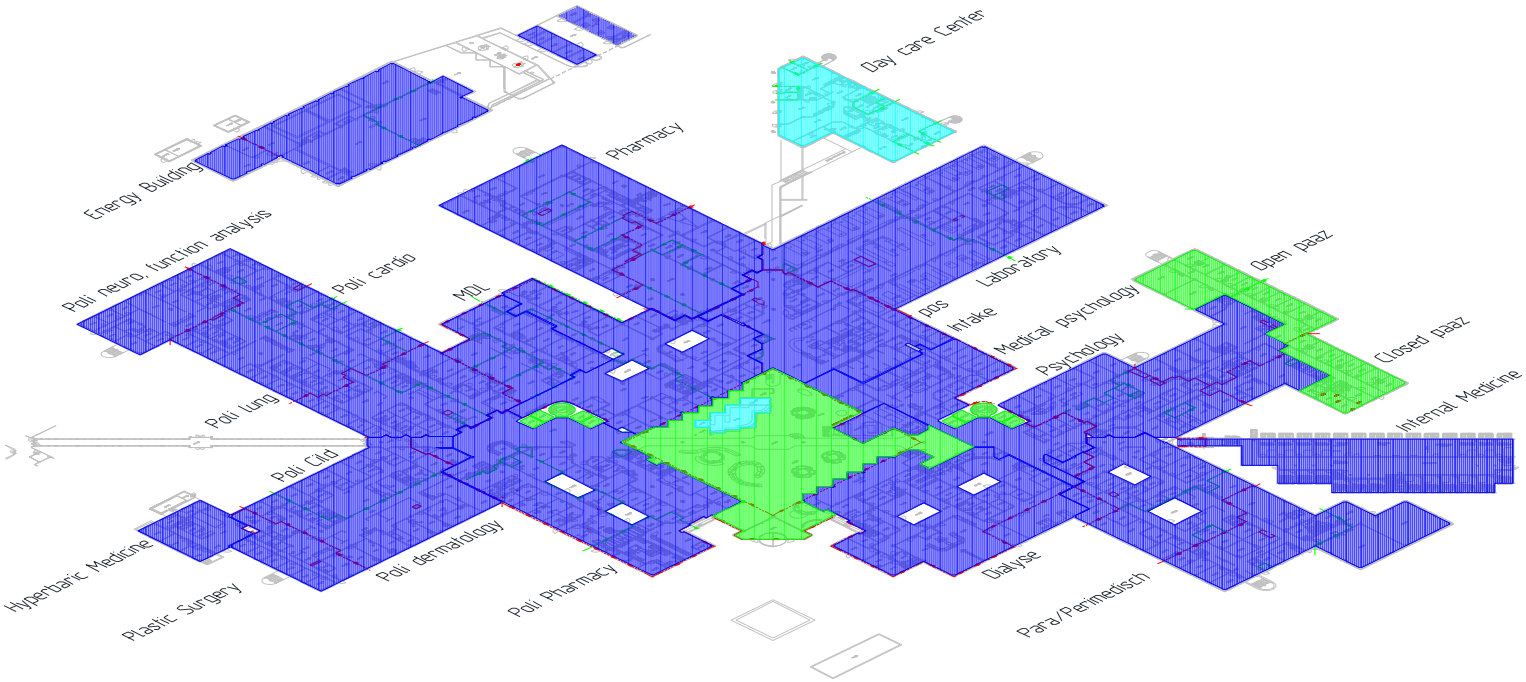
- Existing Building: Groundfloor



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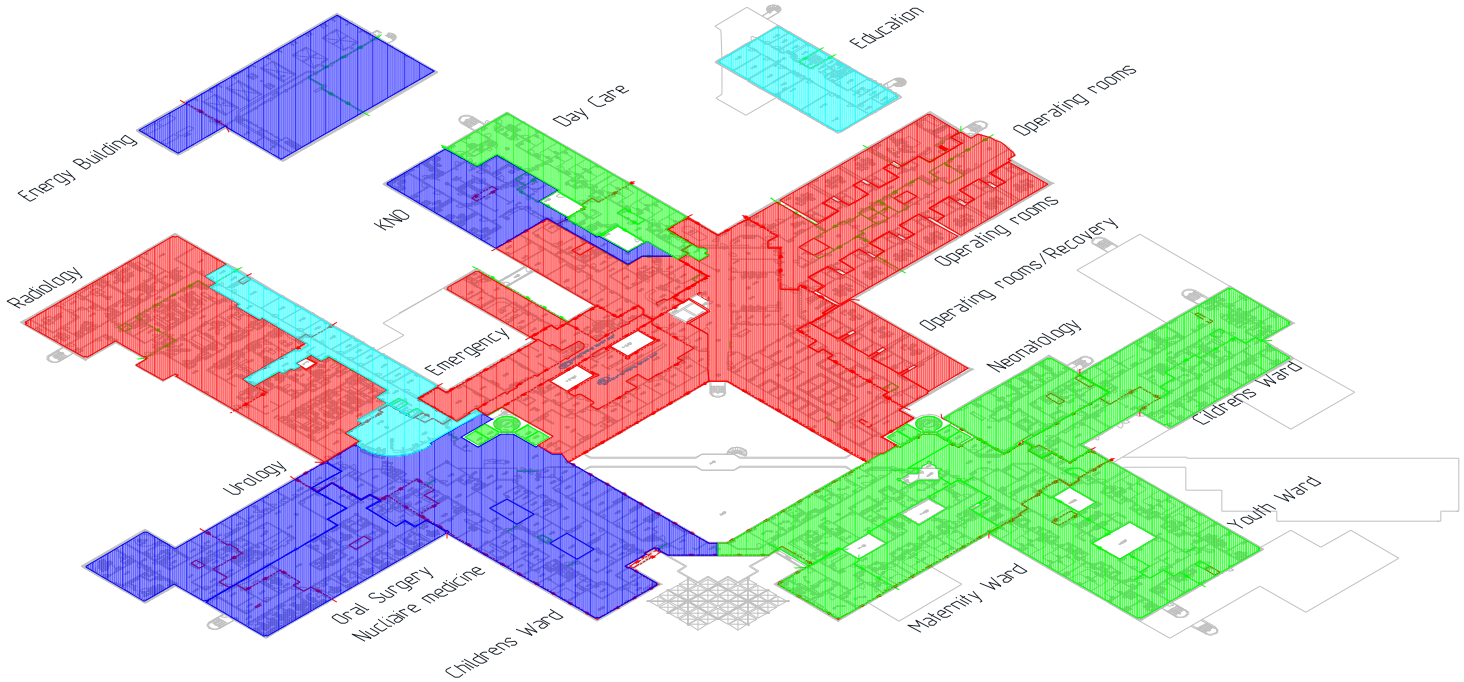
- Existing Building: 1st Floor



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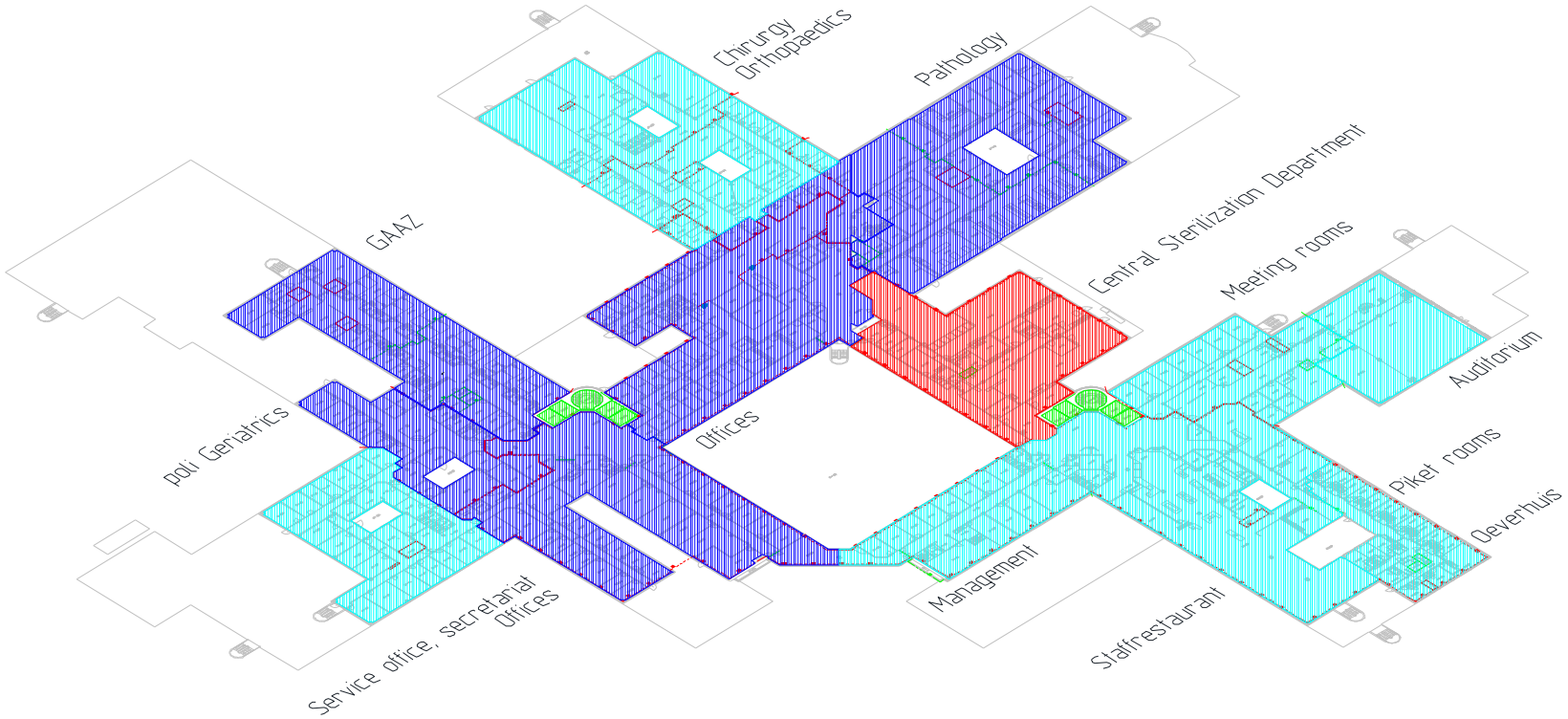
- Existing Building: 2nd Floor



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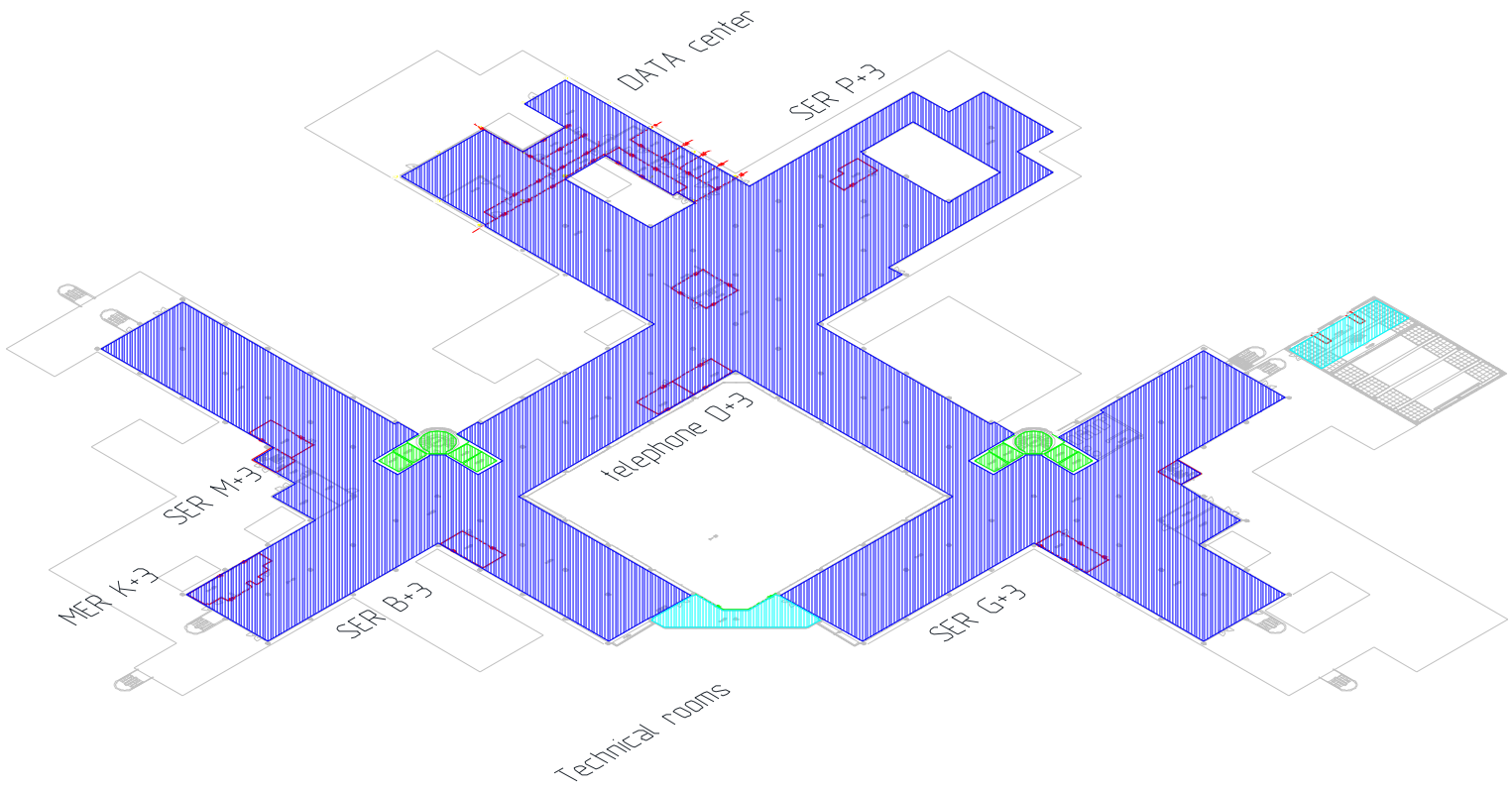
- Existing Building: 3rd Floor



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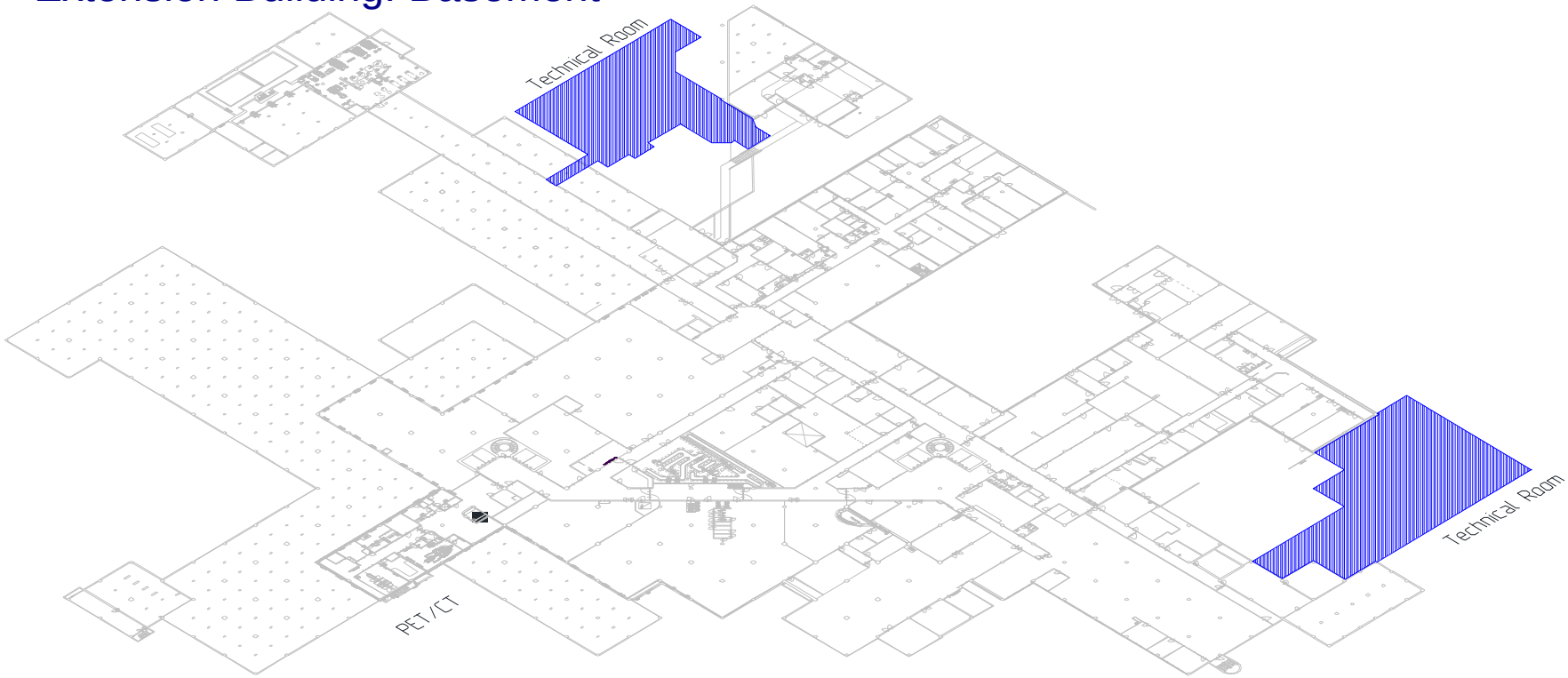
- Extension Building: Basement



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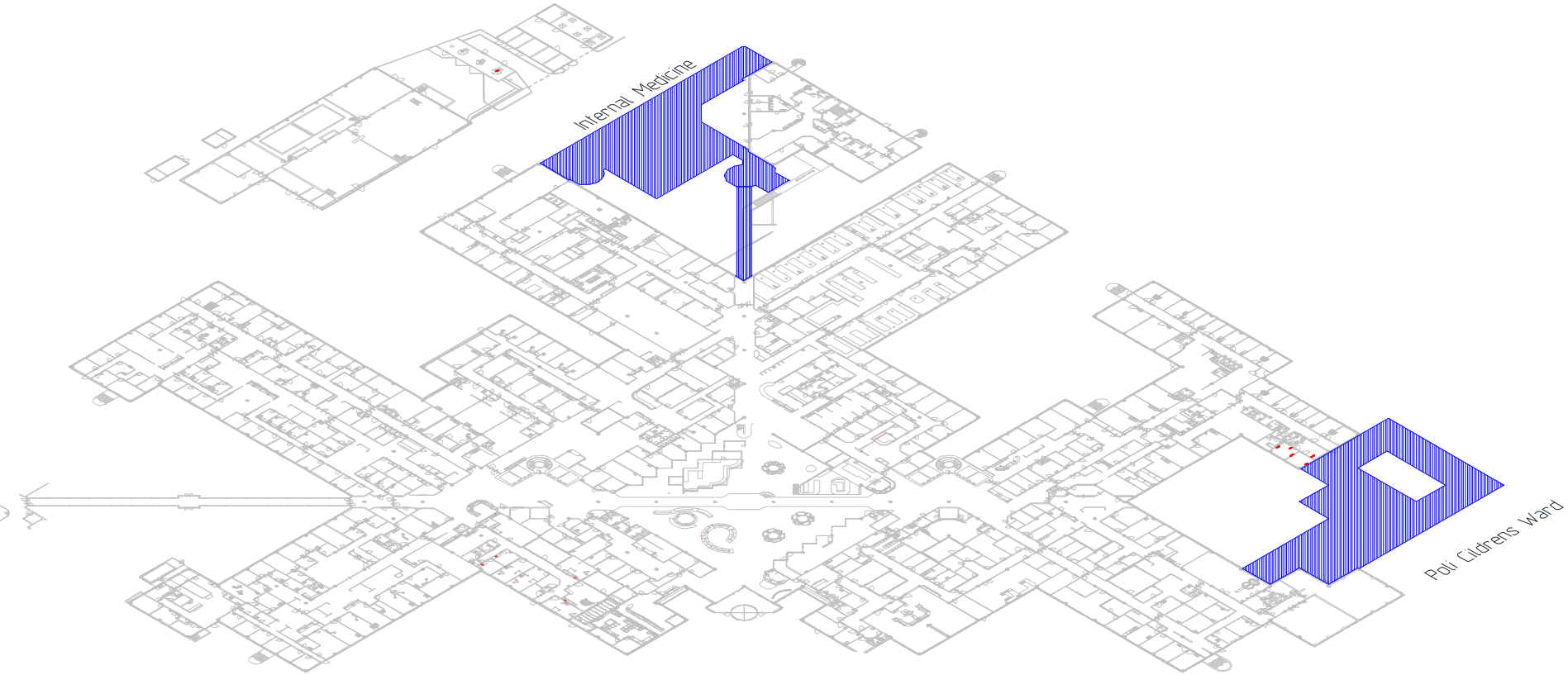
- Extension Building: Groundfloor



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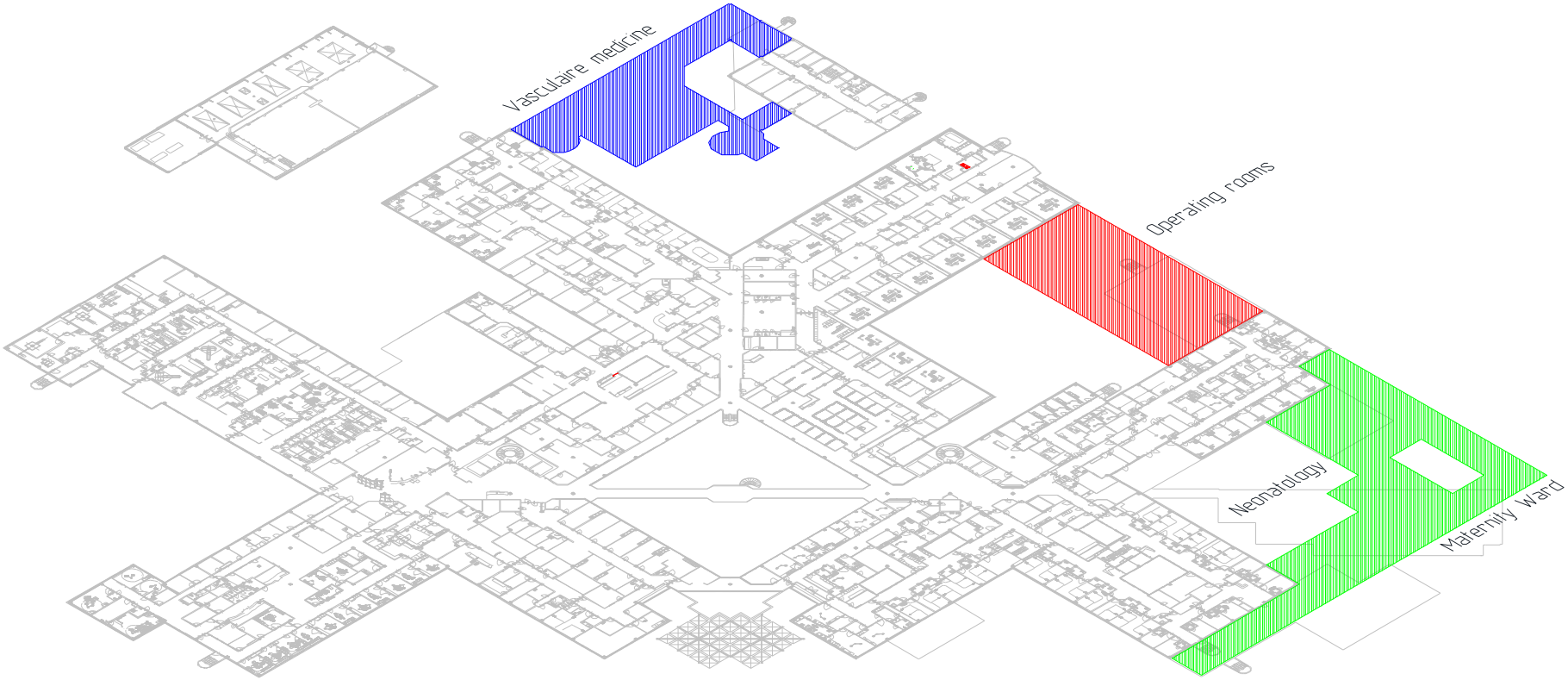
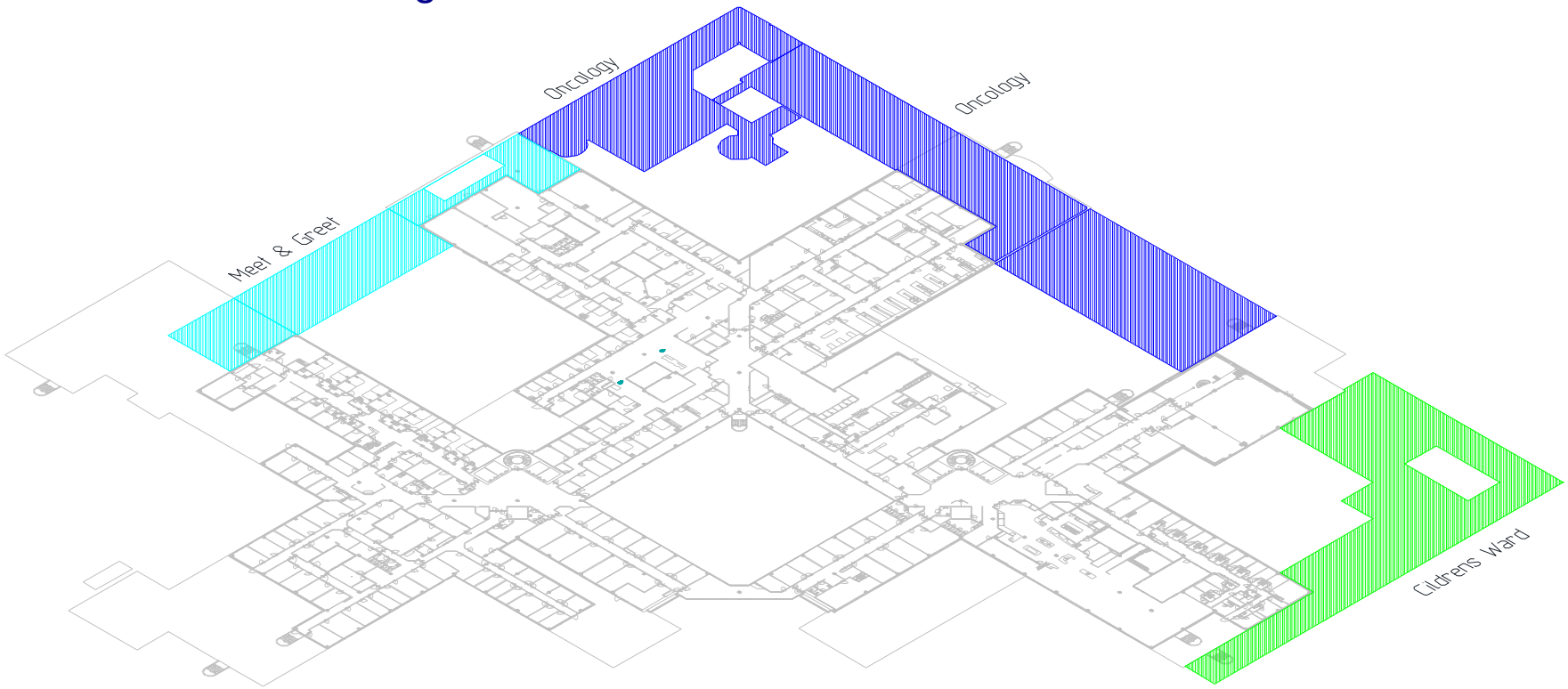
- Extension Building: 1st floor



4 Operational workplan task 7.2 in Streamer

- Extension Building: 2nd floor



Questions?