Substations in special buildings and underground
Worldwide experience – selected projects
Siemens – global references of subterranean substations and substations in special buildings

~ 40 years experience

~ 15 countries served

~ 25 projects completed

~ 250 bays in operation

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1. Soil + Ground Water
2. Fire Fighting
3. HVAC
4. Emissions
5. Access
6. Design Concept
Soil and Ground Water

Ground water table
Soil pressure

Crucial for design and cost
Cost impact of ground water to

- Single-story cellar building
- Single-story underground substation
- Two-story underground substation
Fire Protection Concept and Fire Fighting

Passive Fire Fighting
- No flammable material
- 2 separated ventilation systems for transformers and building

Active Fire Fighting
- Fire extinguish system

HSE Regulations
- Emergency exit
- No toxic materials (PVC)
**Heating Ventilation Air-Condition (HVAC)**

### Ventilation
- Transformer separated from other devices
- More space needed

### Humidity
- Avoid humidity by minimizing air exchange
Emissions

Noise

- Inconvenient sound of HVAC-units and transformers

Electromagnetic

- Too small vertical clearance to public places or EDP
Access

Heavy Equipment

- If possible transformers on ground floor

Aesthetic

- Architectural design of visible parts
Design Concept

3 Possible Layouts

- Underground S/S
- Semi underground S/S
- On-top building

Underground - hide as much as possible

On-top building - design necessary

Semi-underground - 2 levels
Do you have individual questions or want to schedule an appointment for a personal consultation?

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