

---

# Soil Things

## How to put Domain Models into STA

---

Hylke van der Schaaf  
Kathi Schleidt



**Fraunhofer**

**IOSB**

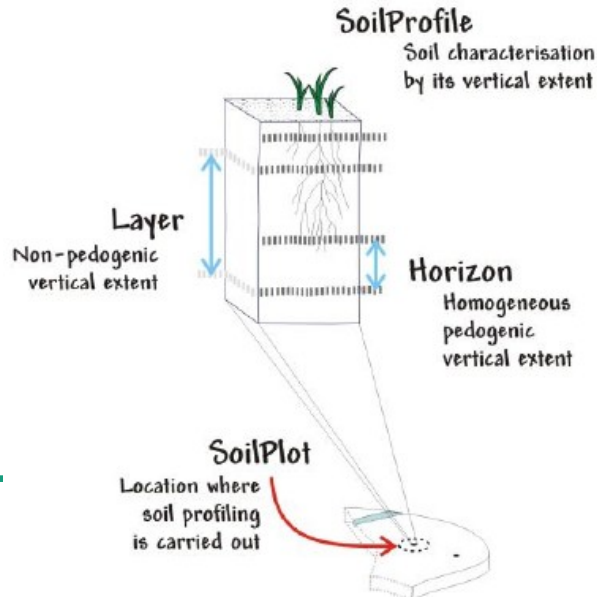
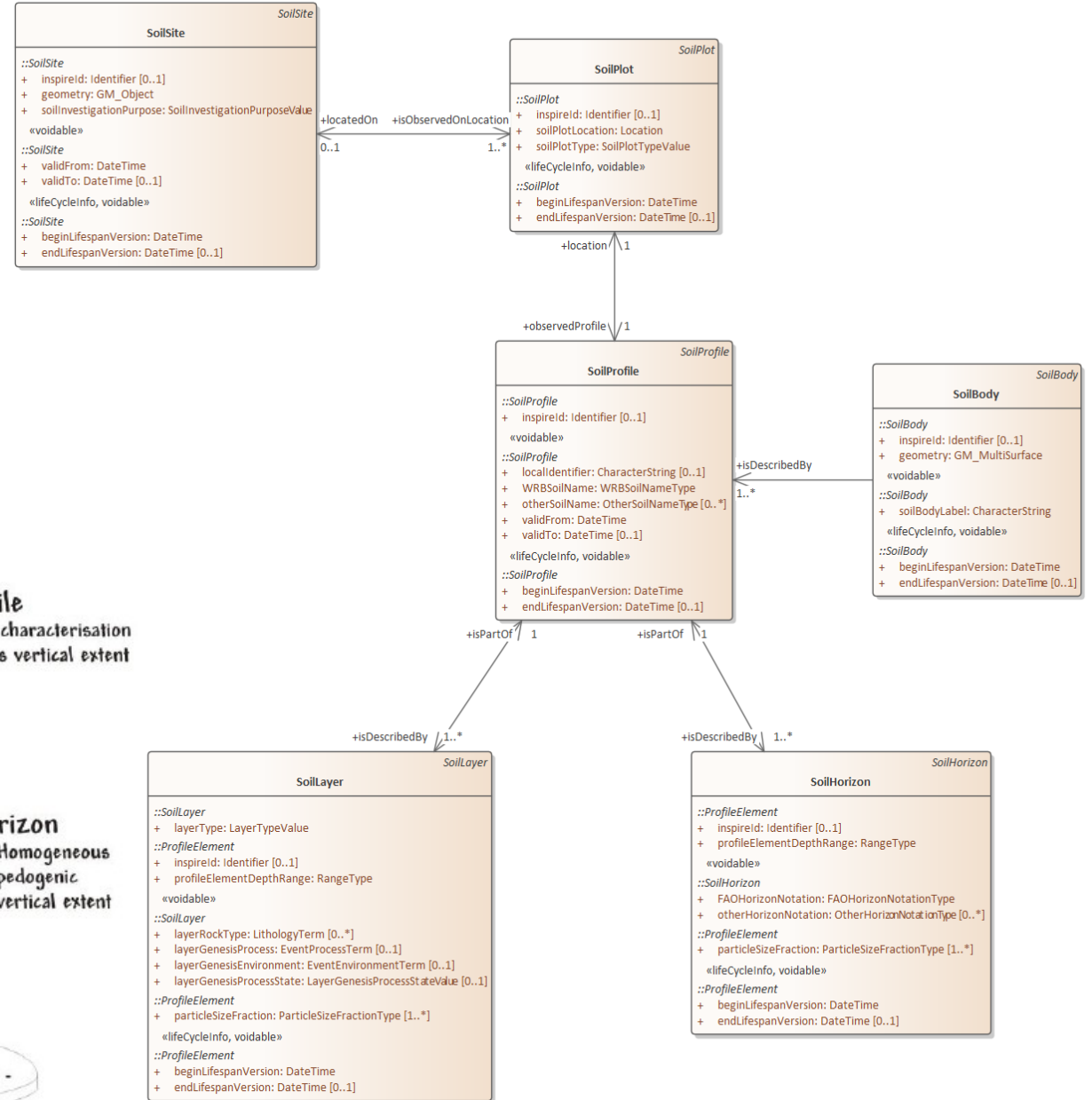
---

# The Starting Point

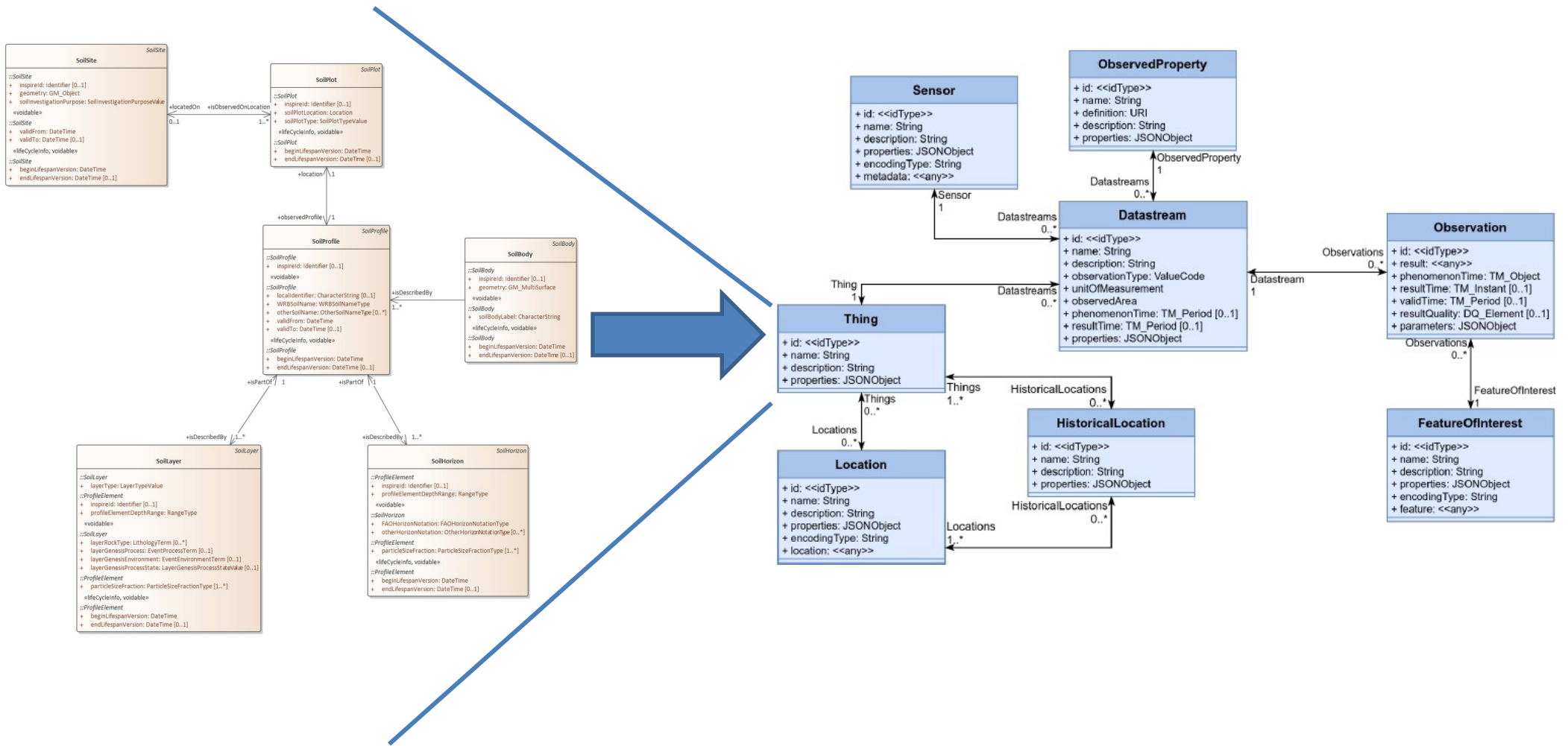
- It's a Domain Model
  - With relations
  - Observations 4 All

## How to put this in STA?

class Soil STA Things

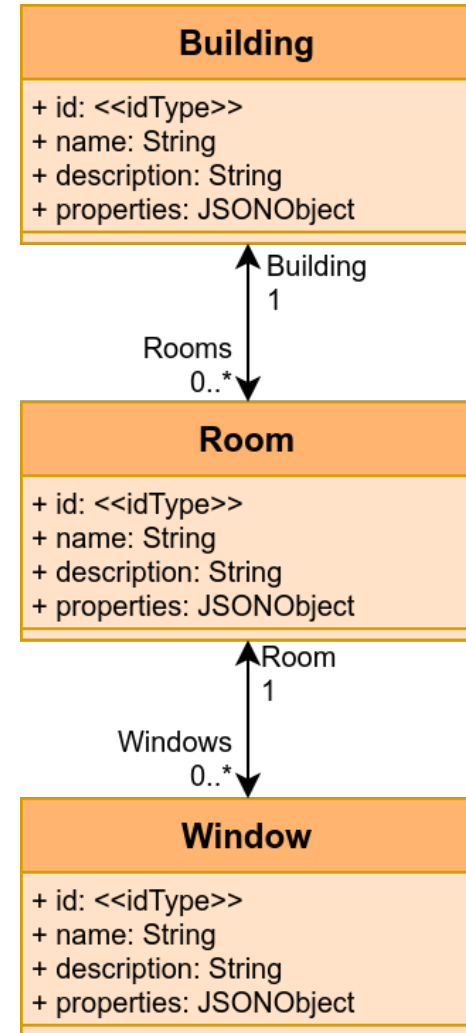


# How to put Soil Features in STA Thing?



# A simpler example

- To reduce diagram complexity



# Option 1 – Pure STA

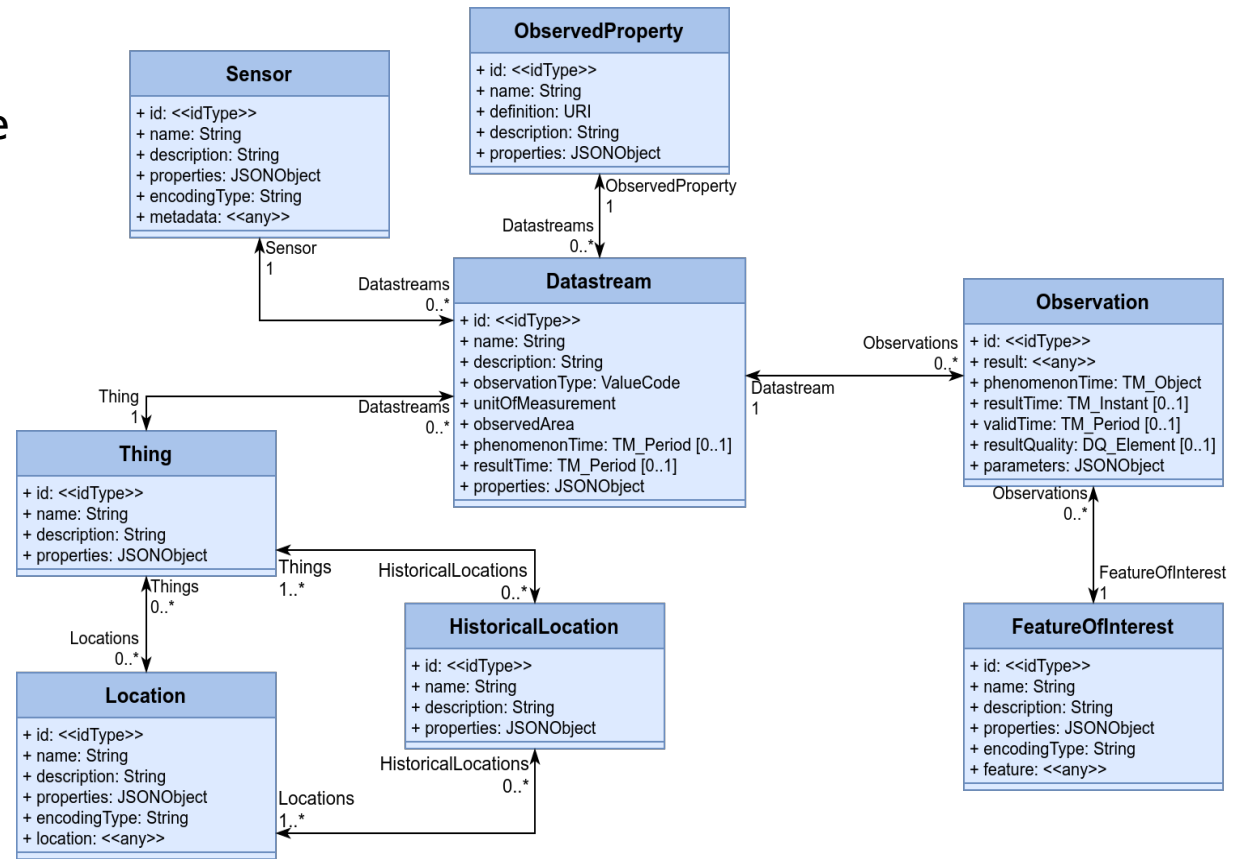
- Model all entities as Thing
  - Give each Thing a properties/type

## ■ Advantages

- 100% STA

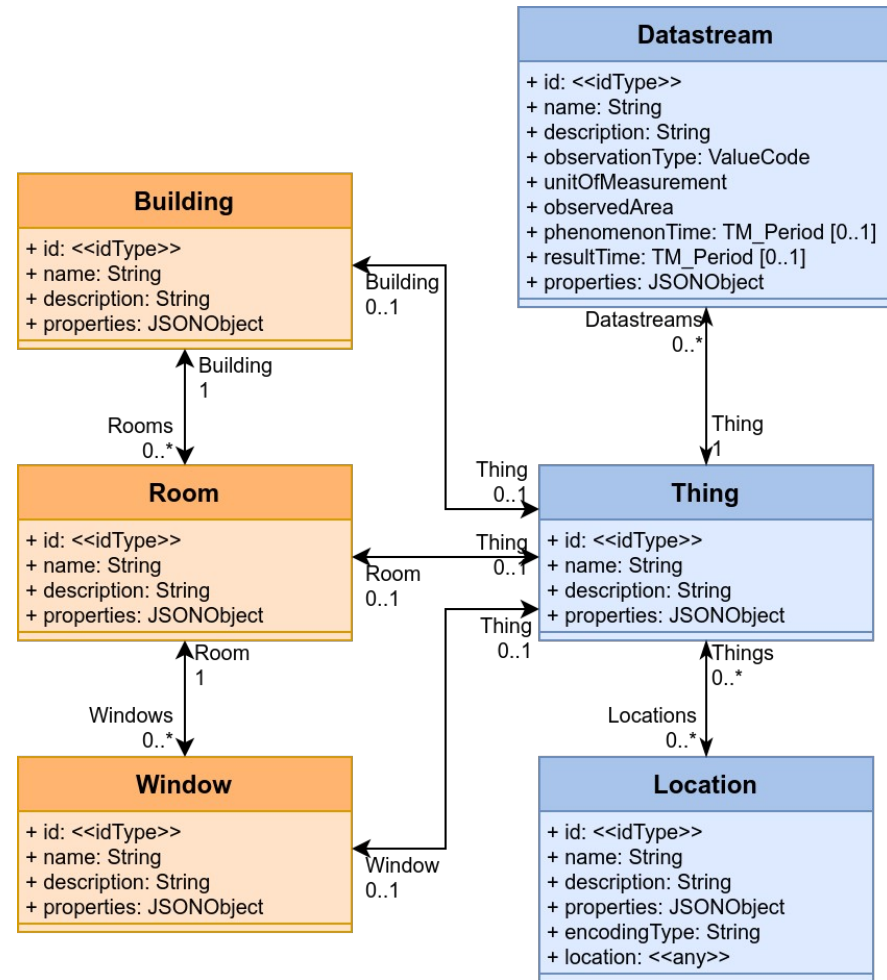
## ■ Disadvantages

- Relations between specialized thing entities are lost



# Option 2 – Shadow Things

- Add Entities attached to Things
  - Give each Thing a properties/type
- Advantages
  - 100% STA
  - Relations are fully exposed
    - Full Query/Expand
- Disadvantages
  - All domain entities duplicated
    - → Double maintenance
  - Things in between
    - Room → Thing → Datastream
    - Room → Thing → Location



# Option 3 – Thing-less

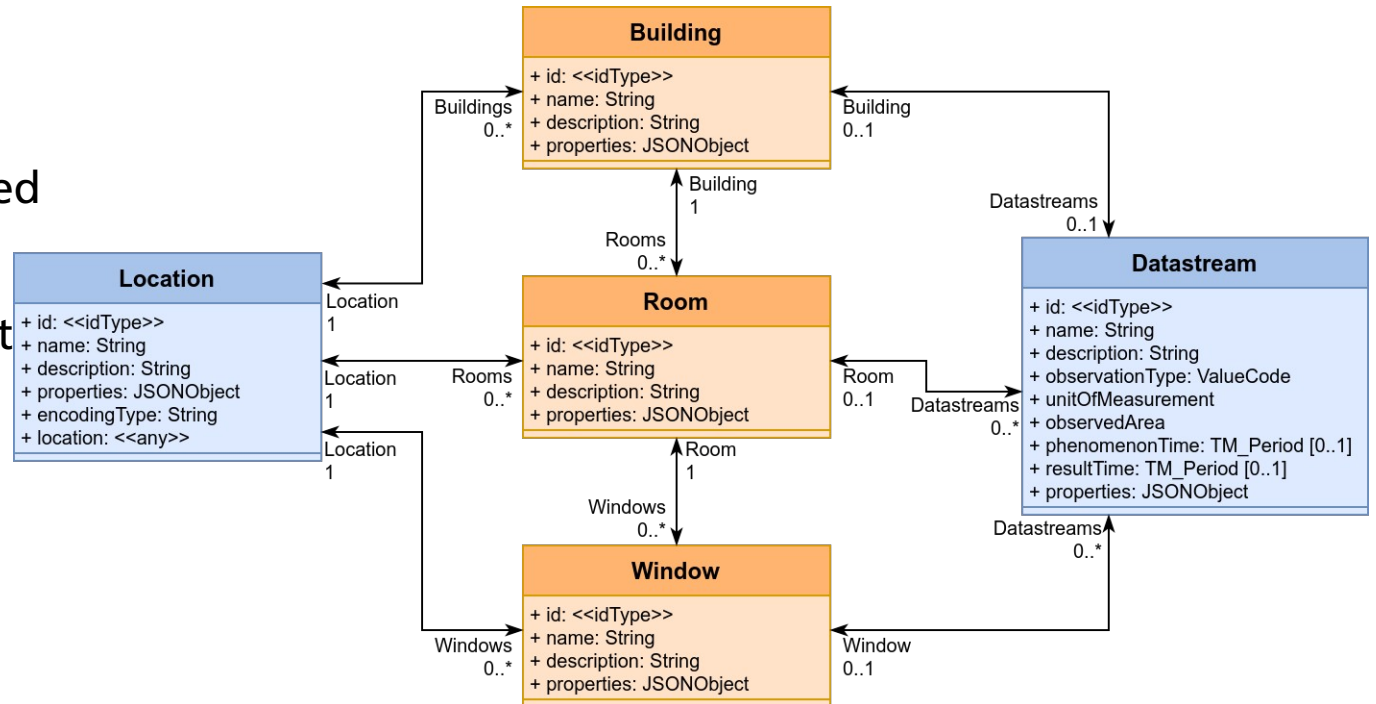
## ■ Replace Things with Domain Entities

## ■ Advantages

- Relations are fully exposed
- Full Query/Expand
- Perfect for Domain Client

## ■ Disadvantages

- Not STA  
→ Things are missing



# Option 4 – Thing Views

## ■ Model all Domain Entities

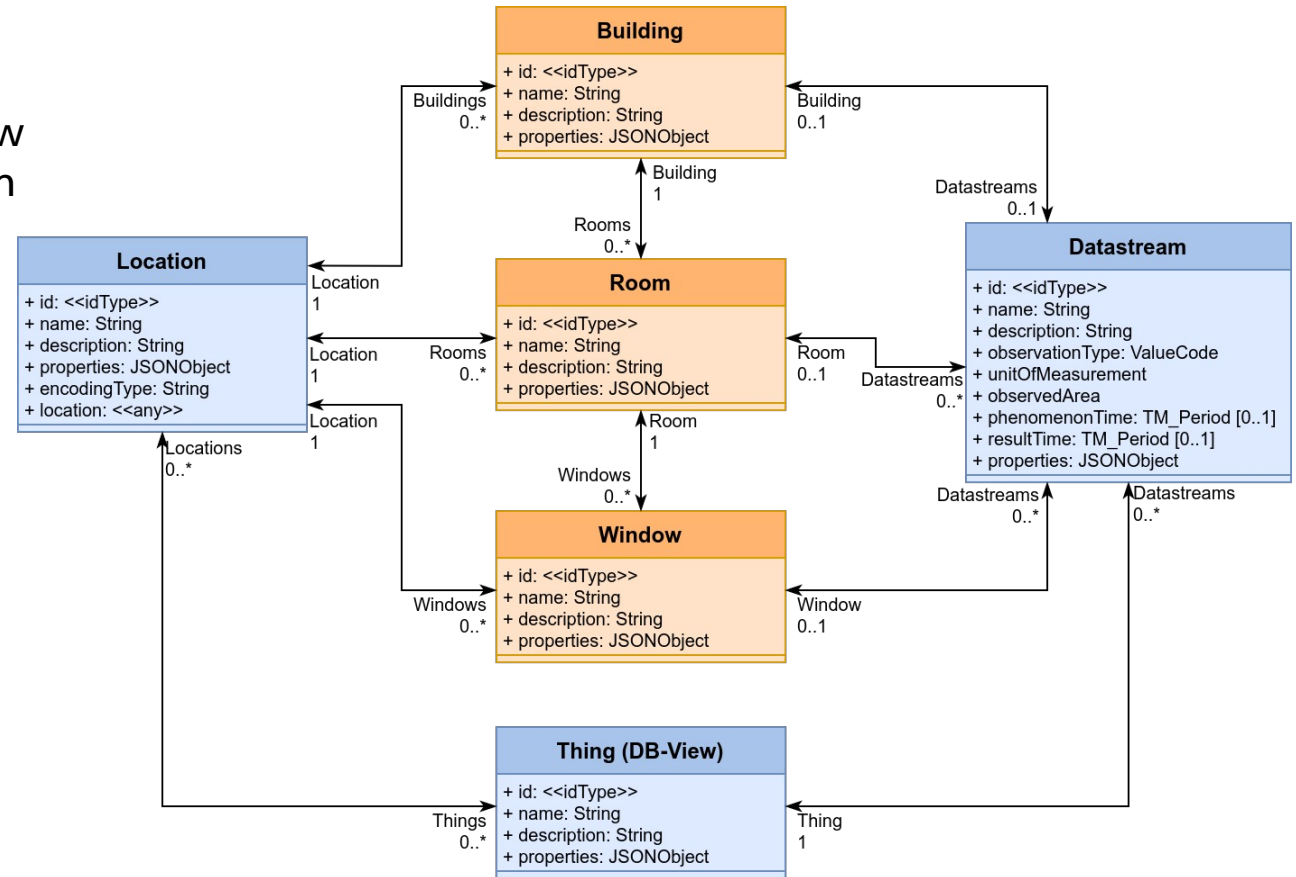
- Replace Things with a DB-View merging all entity information

## ■ Advantages

- 100% STA
- Relations are fully exposed
  - Full Query/Expand
- Perfect for Domain Clients

## ■ Disadvantages

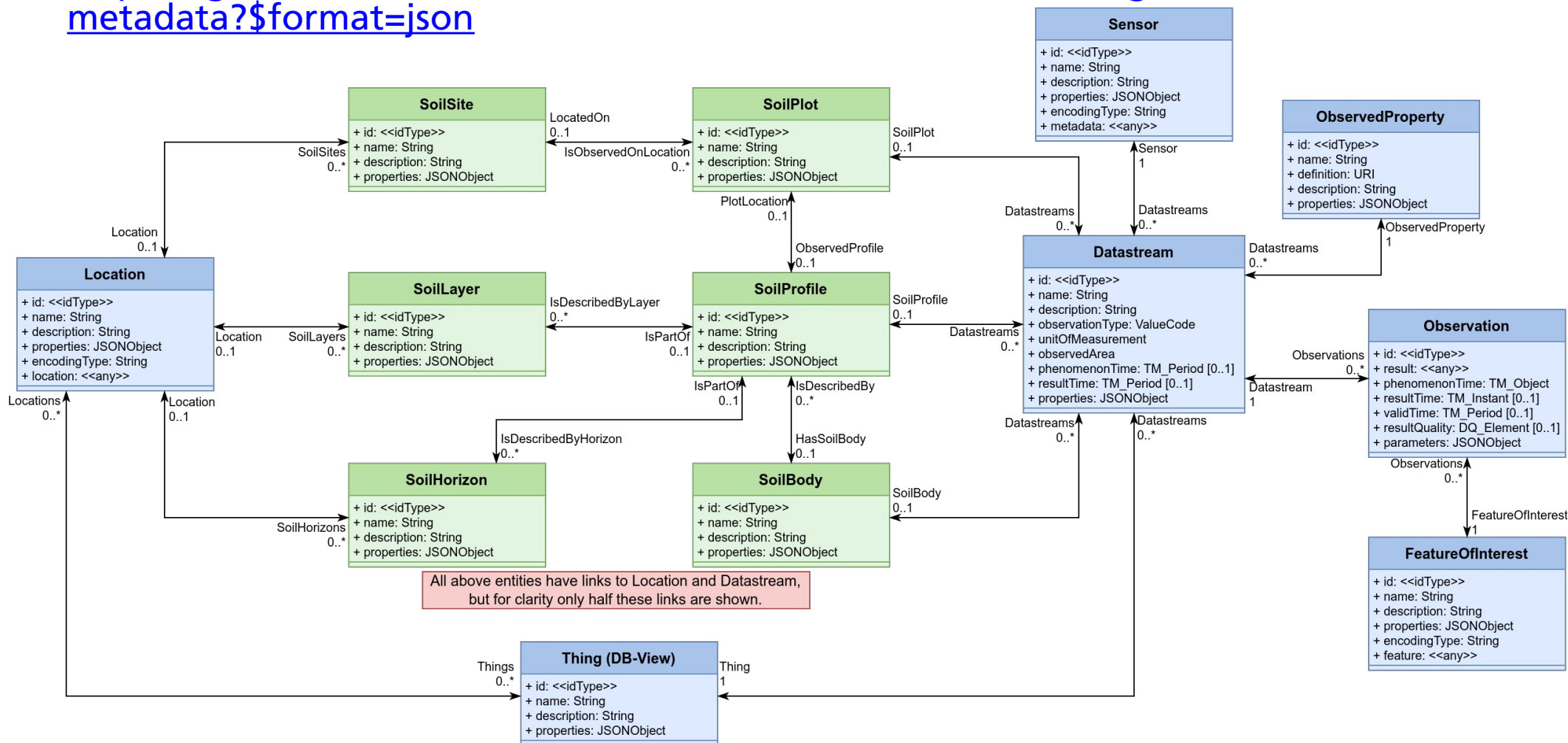
- ...?





# Back to Soil Things

- <https://ogc-demo.k8s.ilt-dmz.iosb.fraunhofer.de/FROST-SoilThings/v1.1/>
- [https://ogc-demo.k8s.ilt-dmz.iosb.fraunhofer.de/FROST-SoilThings/ODATA\\_4.01/\\$metadata?\\$format=json](https://ogc-demo.k8s.ilt-dmz.iosb.fraunhofer.de/FROST-SoilThings/ODATA_4.01/$metadata?$format=json)



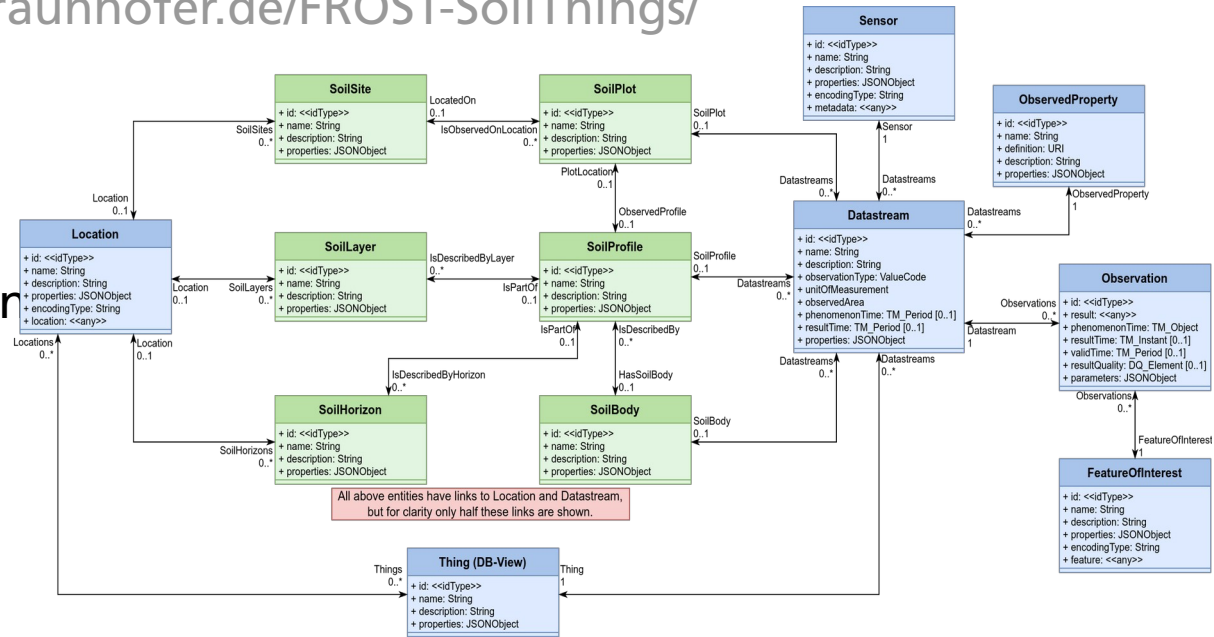
# Example Queries

- [https://ogc-demo.k8s.ilt-dmz.iosb.fraunhofer.de/FROST-SoilThings/v1.1/SoilPlots?\\$filter=ObservedProfile/IsDescribedByHorizon/Datastreams/ObservedProperty/name eq 'grensduidelijkheid'](https://ogc-demo.k8s.ilt-dmz.iosb.fraunhofer.de/FROST-SoilThings/v1.1/SoilPlots?$filter=ObservedProfile/IsDescribedByHorizon/Datastreams/ObservedProperty/name eq 'grensduidelijkheid')
- <https://ogc-demo.k8s.ilt-dmz.iosb.fraunhofer.de/FROST-SoilThings/v1.1/SoilPlots?>

```

$select=id,name&
$expand=ObservedProfile(
  $select=id,name;
  $expand=IsDescribedByHorizon(
    $select=id,name
  )
)

```



# Standard STA Client can read Soil Things

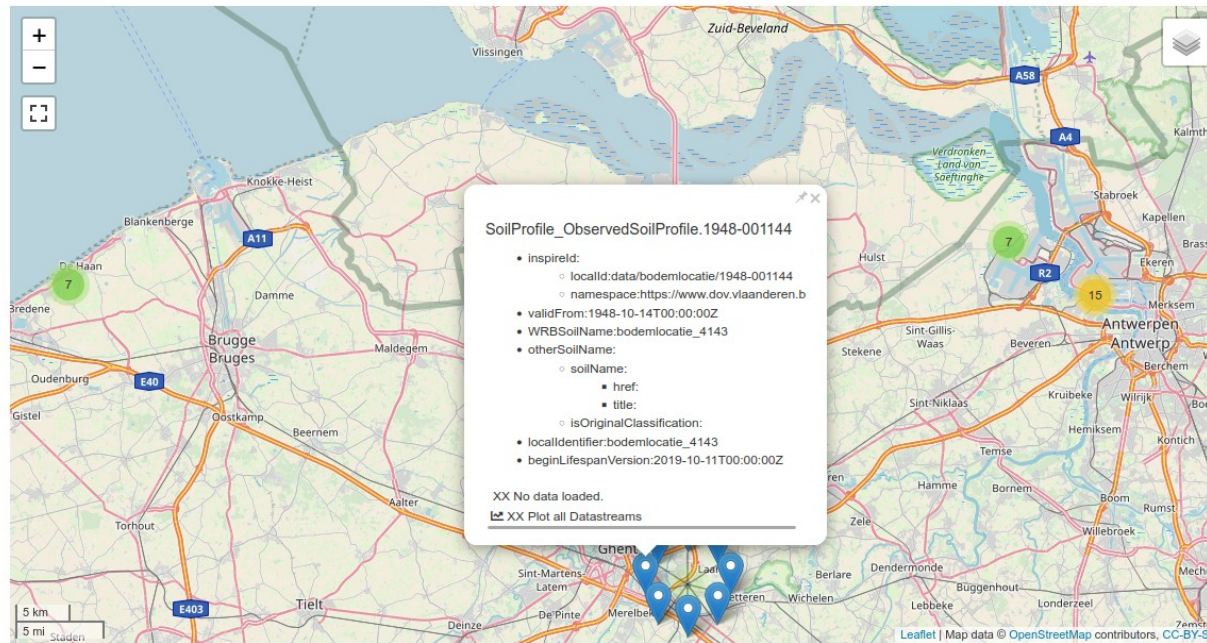
■ <https://api4inspire.k8s.ilt-dmz.iosb.fraunhofer.de/servlet/is/203/>



Use Cases ▾ Other Data ▾ Datenschutzerklärung Impressum Anmelden

Genesis > Other Data > SoilThings

## SoilThings



# How about *Your* Domain Models?

- Tooling

- Domain Database → Domain+STA Database
- Database → FROST

- SoilThings Example:

<https://github.com/hylkevds/FROST-Server.SoilThings>

- Observable Properties example:

<https://github.com/hylkevds/FROST-Server.ObservableProperty>