



# POTENTIAL BENEFITS OF BIM/OPEN BIM IN HOSPITAL PROJECTS

**Vestfold Hospital Trust / Sykehuset i Vestfold HF (SiV)**



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## **Vestfold Hospital Trust / Sykehuset i Vestfold HF (SiV) Tonsberg location**

## Vestfold Hospital Trust / Sykehuset i Vestfold HF (SiV)



### Hospital key figures:

- Ca 400 beds, 350 in Tonsberg
- Ca. 160 000 outpatient consultants
- Ca 130 000m<sup>2</sup>, ca 100 000m<sup>2</sup> in Tonsberg

# Why BIM/openBIM in hospital projects?

## Background:

- Vestfold Hospital Trust - Facility Development Plan:
  - Started in 1990: 7 building stages. Tear down and build up new buildings.
  - Building on the same location as the old hospital – limited space.
- Seamless connection between new and old buildings – during the renewal period.
  - *Example:* The original low gross floor height created a problem for all the technical installations above the ceiling.
- We have experienced a lot of building collisions.
- 6<sup>th</sup> building stage: We built a mock-up (scale 1:1) of some of the ward rooms and corridor.

# Why BIM/openBIM in hospital projects?

## Our process:

- Our 3D modelling inspiration has been the off-shore and maritime industry:
  - Large and complex Oil platforms in the North Sea – built in modules.
  - Ship building – built in modules.



# Why BIM/openBIM in hospital projects?

## Our process:

- General Technical Program for Building stage 7 (next large project):
  - Established in April 2007
  - Use Open BIM / IFC – as an instrument to reach our goals.
- Our first projects where BIM are implemented:
  - 2-3 smaller projects for the Vestfold Psychiatric Hospital Trust, starting up now.
  - We have based our BIM demands on the BIM manual from Statsbygg (Public Construction and Property Norway)
  - We have secured **all the rights** (including ownership) of the work for these BIM-projects, from the architects/engineering group .

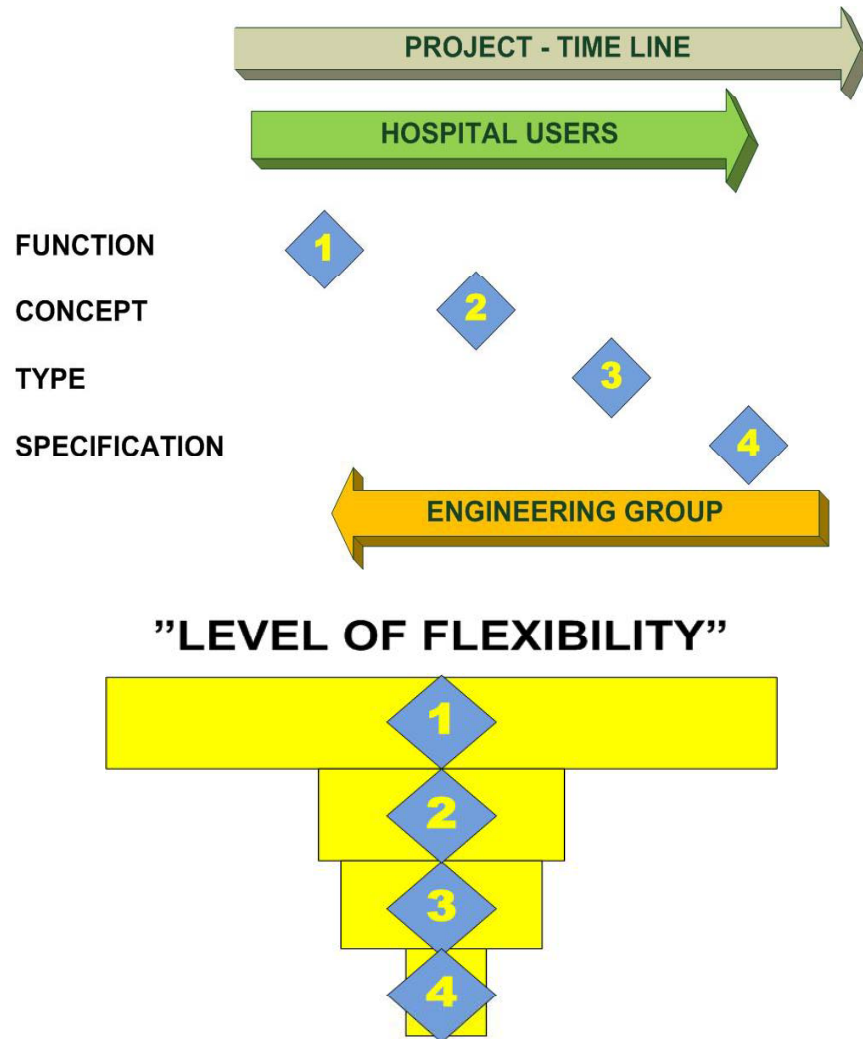


# Potential benefits of BIM/openBIM in hospital projects?

- **Early planning** become easier
- **Connecting planning information** to the model
- **Visualization** – during the planning process.
- **Checking the model** against the program – **Rule checker**

# Potential benefits of BIM/openBIM in hospital projects?

- **Handling the decision process** in the building period (examples):
  - **Conflict of Interest.** Engineering group versus the users: Relating to flexibility.
  - Making **Virtual Spaces - Interface Area.** Change the size according to “Level of flexibility” when the project develops.
- **Visualize the decision process** – with different colours (examples):
  - **Functional lay-out**
  - **Design/Structural elements**



# Potential benefits of BIM/openBIM in hospital projects?

- **Tolerance limits and measuring** – opening up for prefabrication
  - Defined during design phase
  - Rigid controlling regime - during construction
- **Risk management** in the building process:
  - **Cost** (calculations, quantity, etc)
  - **Time**
  - **Interface**

# Potential benefits of BIM/openBIM in hospital projects?

- **To build:**

- **Better** – less problems in the construction period
- **Faster → Industrialization.** Less time spent on the building site. Use prefabrication - where appropriate.
- **Cheaper** – with low LifeCycleCost (LCC)
- **Sustainable buildings**

- **Testing the systems**

- Now: Partial system testing
- *Future: Virtual buildings with seamless interface .  
Complete testing – before construction.*

# Potential benefits of BIM/openBIM in hospital projects?

- **Facility management and maintenance** – it is here we find the real potential for the organization – if the model will be kept updated.
  - Possible scenario: **Data sheets and physical location:** *New research shows that the material “XYZ” increases the cancer risk. Have we used this material in our building - and in case where? A quick search in the BIM-files gives the answer.*