

LIPS2015 Barcelona

Lean in Public Sector Construction Conference

Session 4

Lean in Denmark's Public Sector

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#LIPS2015
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Agenda

1. Who are we?
2. Examples of Public Clients applying Lean Principles
3. Examples of Public Clients doing things inspired by Lean
4. Who benefits and who is responsible for using Lean Principles?

1. Who are we?

Consultant Sidse Buch, The Danish Building Trades (BAT)
– a federation of unions in the construction industry

Director Gyrith Saltorp, The Danish Property and Building Agency
– the largest public client of Denmark

Why are we here together?

- We have common goals and interests:
 - A well-functioning construction sector
 - Higher quality
 - Better value for money
 - Mutual trust and good cooperation

 **Better outcome for everybody**

2. Public clients applying Lean Principles

- a. *The Technical University of Denmark – DTU*
- b. *The North Denmark Region*

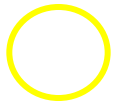
The Technical University of Denmark - DTU



DTU campus - projects



New projects



LIFE Science project



Building 202

LIFE Science & Bioengineering

30.000 m²

How it looks from the outside

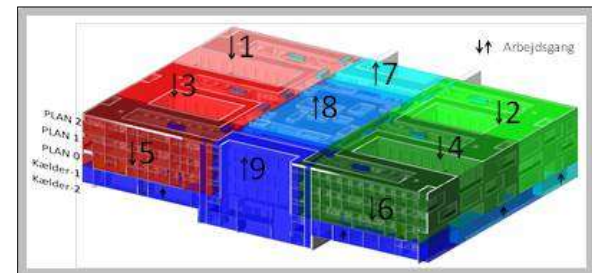


The plant - inside



Building modules

– both standard and unique floors





The vision of the client

"The client wishes to reduce risks and uncertainties during the execution by optimizing the building process for the benefit of the whole project/organisation"

"If not at DTU, where else should anyone be able to improve their construction skills?"

How?



- Award criteria
 - 50 % price
 - 50 % process
- In the tendering process the contractors were asked to describe how they would cooperate on a Lean basis with the other participants
- The client has invested in Lean-education and supervision of the contractors – with the expectation that it pays off in the end

The TRIMIT concept

TRIMIT

People



Planning



Progress



Reflections

Good:

- Very good results on safety
- Strong culture on the project
- Quality on work is very good
- Good person-to-person relations
- Very good planning proces

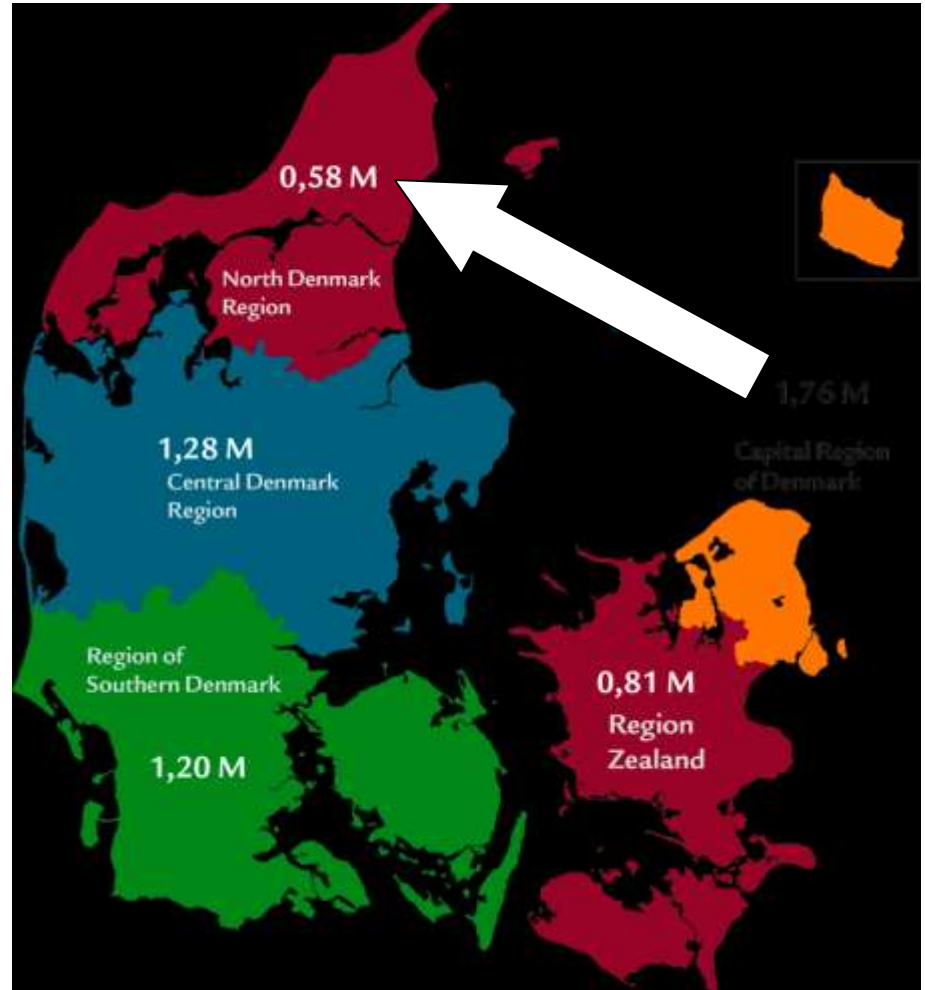


Improvements:

- Be sure that you have the right team (we missed some on the way)
- LPS methods needs to be improved into ON LINE information, the daily work overview is difficult
- Be sure to keep constant supervision on the project (Lean/LPS takes time)

The North Denmark Region

- 600.000 inhabitants
- Responsible for:
 - Health care
 - Regional development
 - Social services
- Yearly budget for construction 100 mio. €





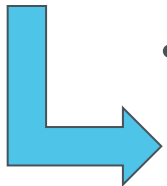
Lean as a competitive parameter

- Award criteria:
 - 40% price
 - 20% Lean
 - 20% Sustainability
 - 20% Health and safety
- LEAN is incorporated already in the design phase



How?

- Contractors are asked to describe what they can offer in regard to Lean Construction in the tenders
- The client has a project manager on each project, following the process closely from start to finish



- A short procedure for decision-making
- A planned, well-organized and smooth building process
- No incidents with random and coincidental solutions



Results

- No errors and flaws
- High quality
- Time schedules are kept
- Budget frames are kept
- Happy contractors, who think it is an exciting way to work
- Contractors have started to include Lean in their company policies and as a strategic tool
- Vocational schools offer training in Lean
- The North Denmark Region feels like a winner and will definitely continue to use the concept.



The best:

- The local construction industry of the North Denmark Region have seized the concept and created a network between clients, contractors, consulting engineers and architects
- The Lean-concept is spreading like ripples in water



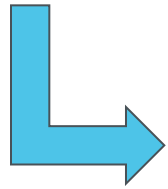
- More information: Niels Sloth ncs@rn.dk

3. Public Clients doing things inspired by Lean

- ☐ *Performance Test*
- ☐ *Health and Safety*
- ☐ *New ways of collaboration*
- ☐ *Digital Construction*

What is a performance test?

- A performance test is a test of the energy consumption in technical installations.
- Performance testing is not a new invention, but a combination and verification of a number of existing requirements and criteria that should already have been followed.



Client forces contractor to optimise his processes in order to comply with the requirements on the building's energy consumption.

We test energy consumption in technical installations

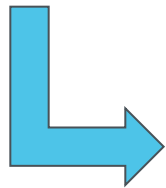


Why conduct performance tests?

- Too many errors and omissions in the technical installations with consequences for energy consumption, indoor climate and technical functionality.
- Estimated loss in the order of DKK 800 million (€ 105 million) in current building production.
- Erroneous records of errors and omissions lead to a number of conflicts after handover of buildings.

Health and safety

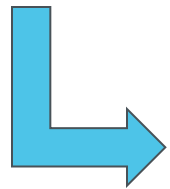
- 1) Health and safety (H&S) as an integrated part of project planning.
- 2) Clearly defined tasks for H&S coordinators during project planning and execution.
- 3) Start-up meetings with instructions about H&S for all on the construction site.
- 4) We always focus on maintaining tidy construction sites.



Clients' focus on H&S rubs off on the contractor and enhances the Lean mindset.

New ways of collaboration – Sølvgade School

Conditions: Limited construction space in central Copenhagen



**Limited space,
tighter planning and
communication at the
construction site**





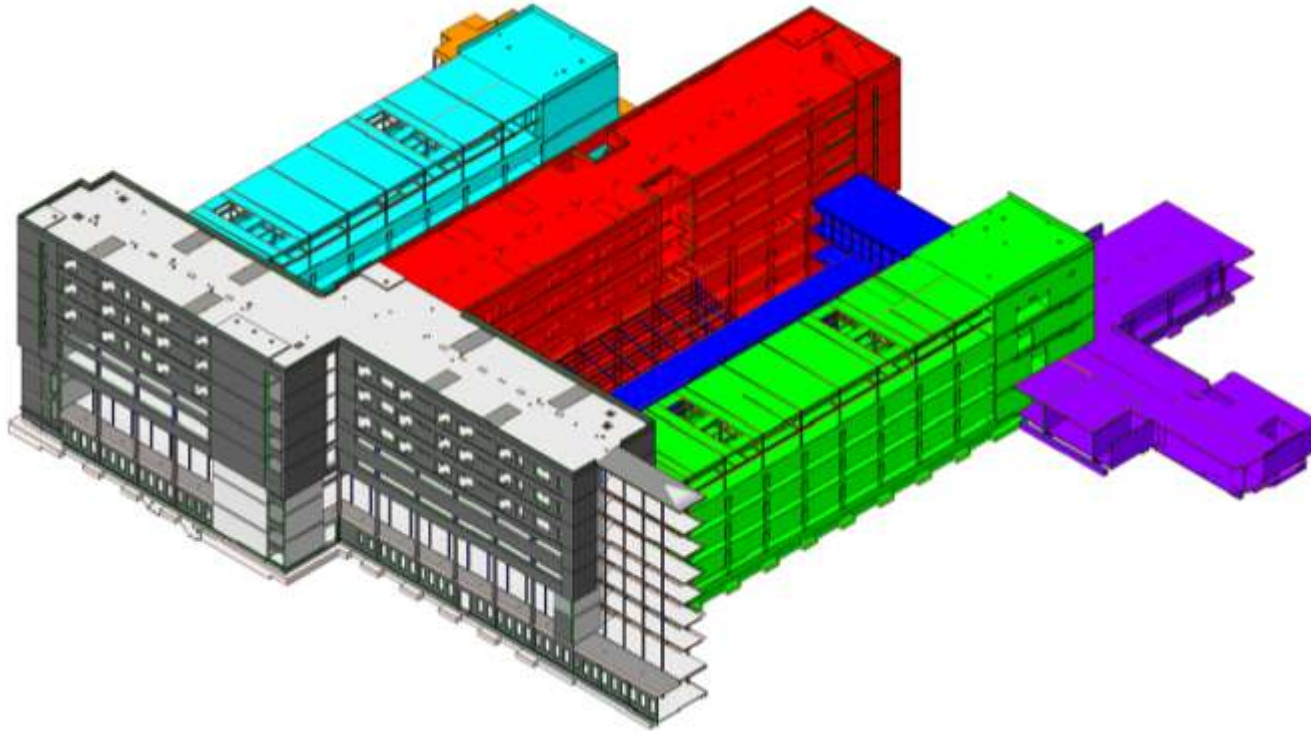
Sølvgade School in Copenhagen



Skejby University Hospital



Digital Construction at Skejby



- 1) BIM used for production and planning
- 2) Location based planning to ensure a better flow on site
- 3) Collision control to avoid conflict → better working environment

Ipads for the craftsmen

- Quick communication with less mistakes
- Shorter path from changes in the project material to new drawings
- Increased possibility to involve the solutions and ideas from craftsmen
- Age is no obstacle!



4. Discussion

Who benefits and who is responsible for using Lean Principles?

Win-Win-Win situation

