Trond Bølviken

Veidekke

#LeanLPS

COLLABORATIVE PLANNING IN DESIGN

Trond Bølviken

Director Veidekke Entreprenør AS

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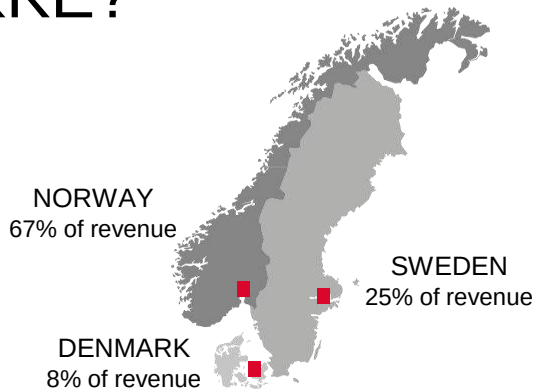
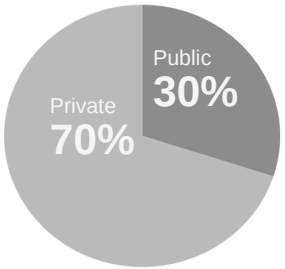
WHO, WHAT AND WHERE IS VEIDEKKE?

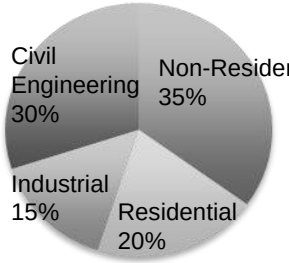
+ Norway's largest and Scandinavia's forth largest contractor and property developer
+ 7,000 employees
+ Annual revenue of GBP 2 billion
+ Noted on the Oslo Stock Exchange
+ 51% of the employees own 18% of the company
+ Has made a profit every year since 1936



CONTRACTS



OPERATIONS



TROND BØLVIKEN

+ Civil Engineer from Norway University of Science and Technology (NTNU), 1979
+ Director of Strategy, HR and HSE
+ Worked 22 years at Veidekke
  - Head of business unit: 7 years
  - Current position: 15 years
  - Member of Norwegian top management: 17 years
+ Lean Construction
  - Attended my first IGLC-conference in 2004
  - Local Chair of IGLC in Oslo 2014
  - Author of several IGLC-papers

THE BACKGROUND

1. In 2008 Veidekke introduced the guide “Collaborative planning in production”
   - It helped make better performance in the projects that used it
2. We believed the same planning principles used in production could also be applied to the design process
3. For 3 years a group within Veidekke’s design management network worked on the guide
   - “Collaborative Planning in Design» was introduced in June 2013

THE GUIDES

Collaborative Planning
in Design

Collaborative Planning
in Production

SOME THEORETICAL FOUNDATIONS

+ Both design and production are value creating processes consisting of transformations and flows
  - *Koskela (2000): An Exploration Towards a Production Theory and its Application to Construction*
+ Both design and production can be managed through the Last Planner System
  - *Ballard (2000): The Last Planner System of Production Control*
+ There can be pooled, sequential and reciprocal interdependences between tasks
  - *Thompson (1967): Organizations in Action*
+ Both design and production are logistical, economical and social processes
  - *Andersen, Bølviken, Dammerud, Skinnarland (2008): Approaching Construction as a Logistical, Economical and Social Process*
+ Dialog is a precondition for design
  - *Bølviken; Gullbrekken, Nyseth (2010): Collaborative Design Management*

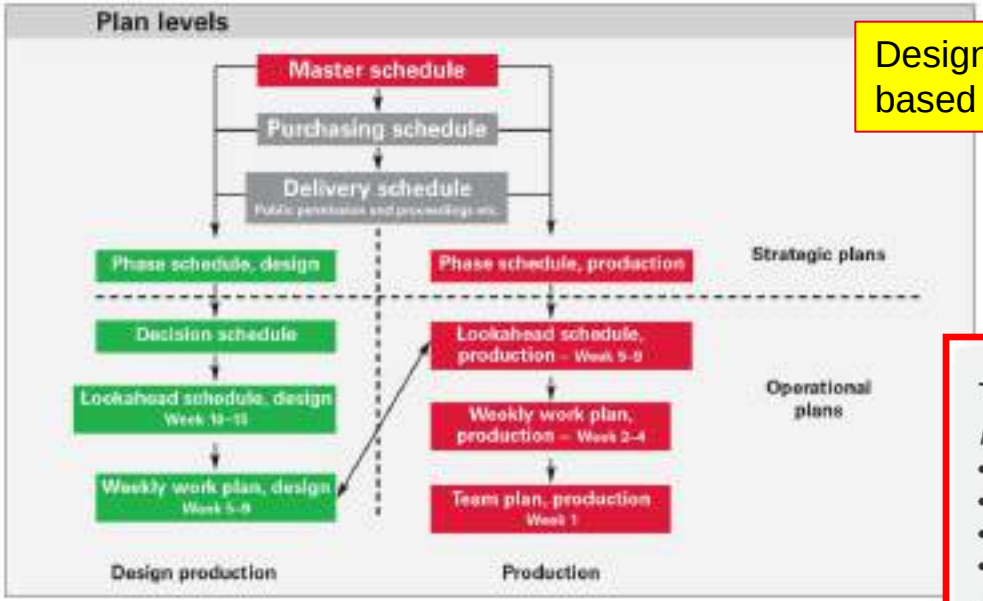
THE MAIN ELEMENTS

+ The start-up process
+ The scheduling system
+ The obstacle analysis
+ Meetings structure

THE START-UP PROCESS

+ In Veidekke we believe in the importance of a good start-up process of a project
+ Therefore we focus on the start-up process as one of the main elements in Collaborative Planning in Design

THE SCHEDULING SYSTEM



Design and production plans are based on the same strategic plans

The scheduling system

Progress plans/schedules

- Overall progress plan (entire project)
- Phase schedule, design
- Lookahead schedule (weeks 10-15)
- Weekly schedule (weeks 5-9)

Other schedules

- Purchasing schedule
- Decision schedule

Operational plans are connected

Weekly work plan for design

Lookahead Schedule for production

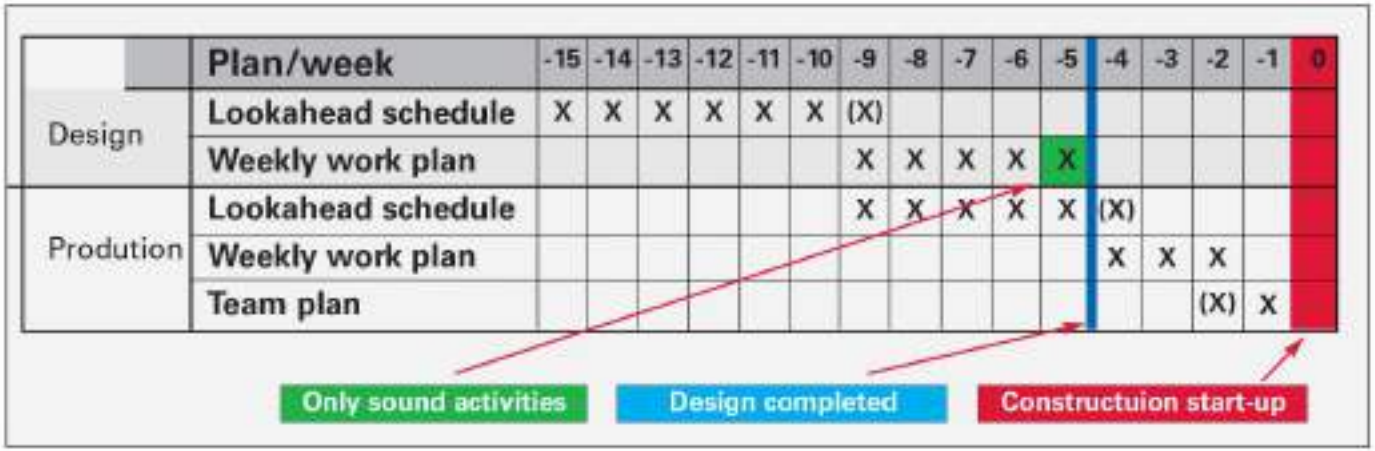
THE SCHEDULING SYSTEM

+ In turn key projects parallel design and production is part of the concept.

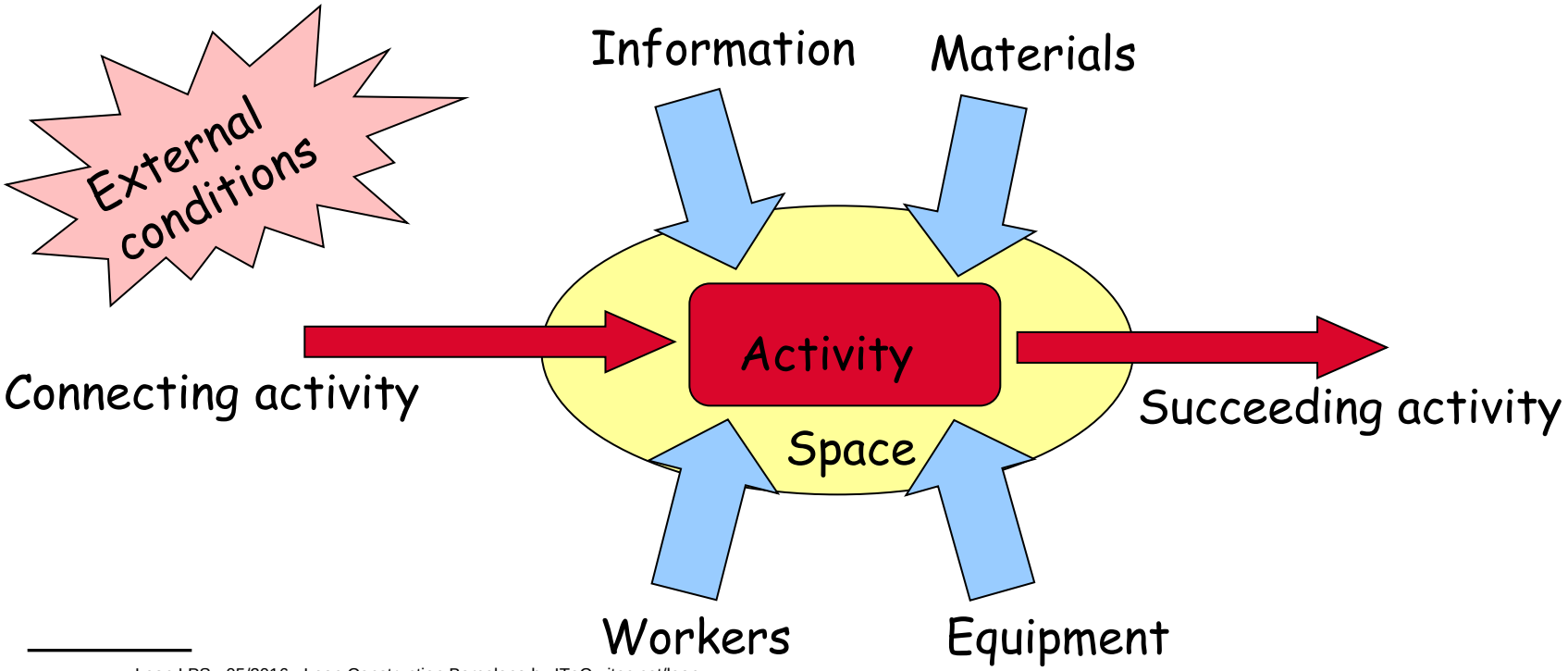
+ This is challenging because of the little time span between design and production

THE SCHEDULING SYSTEM

+ The time span between «Design Complete» and production is aimed to be 4 weeks
+ Collaborative Planning in Design helps control this

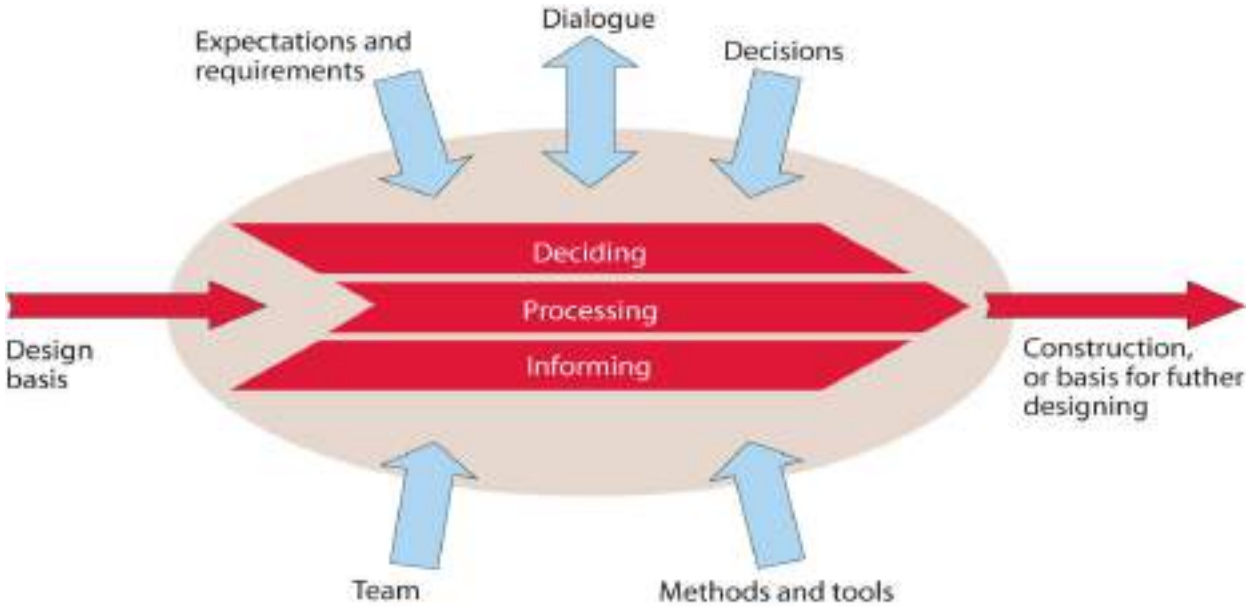


7 PRECONDITIONS FOR A SOUND PRODUCTION ACTIVITY



Koskela: Management of Production in Construction: A Theoretical View (IGLC 1999)
Bertelsen: Louise – en beretning om Trimmet Byggeri (2003)

6 PRECONDITIONS FOR A SOUND DESIGN ACTIVITY

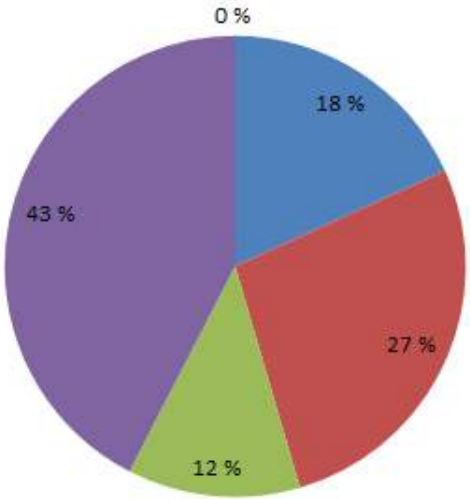


Bølviken, Gulbrekken, Nyseth - Collaborative Design Management (IGLC 2010)
Veidekke: Involverende planlegging i prosjektering - Veileder

REASONS FOR DELAYS IN ACTION PLAN

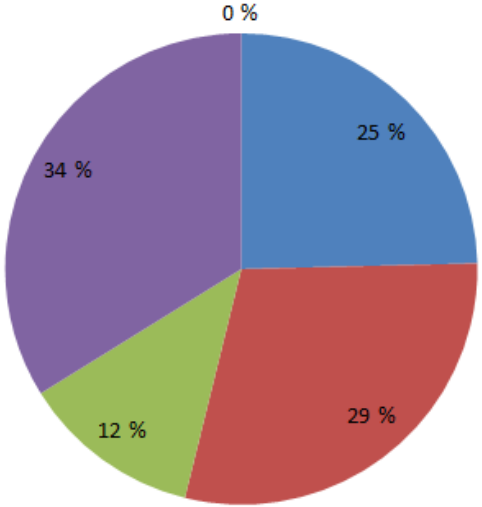
Week 48/13

(total number of delays 17)



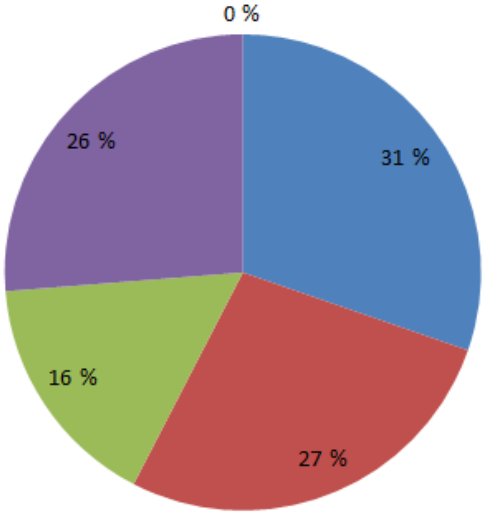
Week 51/13

(total number of delays 33)



Week 6/14

(total number of delays 50)

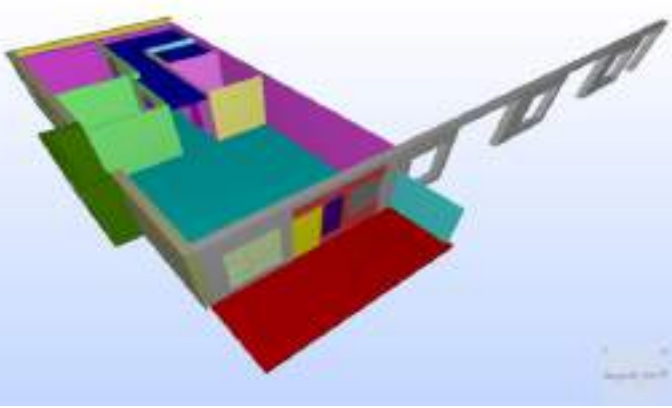


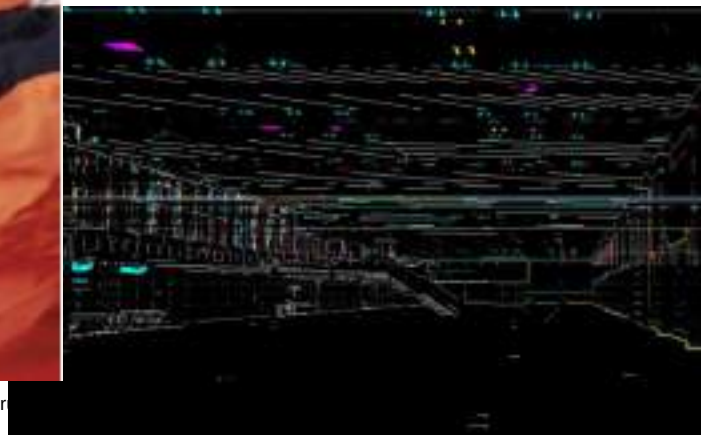
Not realistic planning
Lack of information
Lack of personel/ priority
Lack of decisions
Wrong method/ tools

MEETING STRUCTURE

Meeting	Contents	Recommended date/frequency	Basis and outcome	Recommended participants	Meeting owned by
Start-up assembly for the design process Post-it note meeting	A process (using the post-it note technique) of generating decisions and design activities is initiated at this gathering. The gathering also marks the starting point for the work on the phase schedule for design.	As soon as all of the designers have signed their contracts	**Basis** Overall progress plan **Result** Phase schedule for design (draft)	Management trio from Veidekke (PM, PRM, DL) All of the designers Owner, possibly subcontractors and suppliers	Design manager
Progress meeting for the design process Design meeting	At the meeting, status updates since the previous meeting are given. Next, activities for the next two weeks are presented and detailed in preparation for production handover. At the same time, the rolling schedules are updated by moving two new weeks from the phase schedule into the lookahead schedule, and allowing two new weeks to glide from the lookahead schedule to the weekly schedule. On some projects, ICE (see below) will be part of the meeting.	Every week or every other week depending on project scope and needs	**Basis** Phase schedule for design **Outcome** Review and updating of lookahead schedule and weekly design schedule, plus preparation of documents for production handover		
ICE-møte Integrated Concurrent Engineering	The ICE meeting builds on the idea that clarification and correct decisions are achieved faster if all relevant stakeholders in the decision are involved and allowed to share in the decision making. This is done by organising the designing at the design meeting as individual or group efforts, in addition to the reviewing and updating of status and schedules.	Every week or every other week depending on project scope and needs	**Basis** Lookahead schedule and weekly schedule **Outcome** Missing documentation needed for further designing is uncovered		
Special meeting **Thematic meeting**	Any member of the design team can call this type of meeting. At the meeting, areas or topics requiring closer examination or in-depth attention one way or another are addressed. Thematic meetings can also be dedicated to scrutiny of the project or to going through drawings with the operations unit.	As needed	**Basis** Phase schedule and lookahead plan for design **Outcome** Detailed designing for – or other processing of – selected project areas or topics	Everyone involved in the area or topic addressed by the meeting	Everyone
Evaluation meeting	The meeting is held to adjust for – and learn from – any defects or shortcomings (so far) in the design process.	Halfway through the design process and at the end of the process	**Basis** The design process **Outcome** What can and should be improved	Management trio from Veidekke (PM, PRM, DM). All of the designers Owner; possibly subcontractors and suppliers	Design manager
Meetings: **Consultant engineer/ Architect** **Consultant engineer/ Operating unit**	Meetings attended by the architect and the production unit. A series of such meetings is also held between the consultant engineer from construction and the production unit. Efficient meetings with few participants, focused on choosing solutions, and on reviewing draft drawings and progress/priorities.	Once a week	**Basis** Lookahead schedule and weekly schedule **Outcome** Review of drawings, solutions singled out	PRM, Foremen, Carpers/bosses Architect. The consultant engineer from construction	Design manager

BIM





IN SHORT

+ The Last Planner System can be used both in design an in production
+ The scheduling of design and production should be connected
+ There are six preconditions for a sound design activity
+ Dialog is one of the pre-conditions
+ All preconditions have to be established proactively