CitA
BIM GATHERING

stru ction

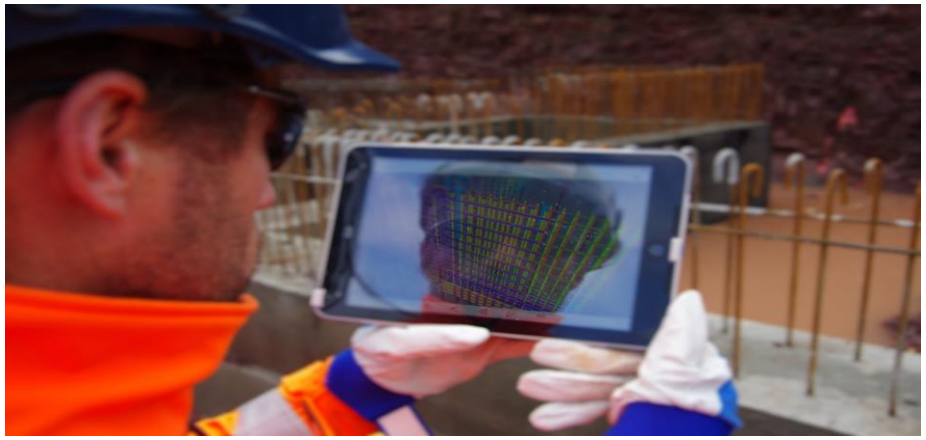
ional Excellence

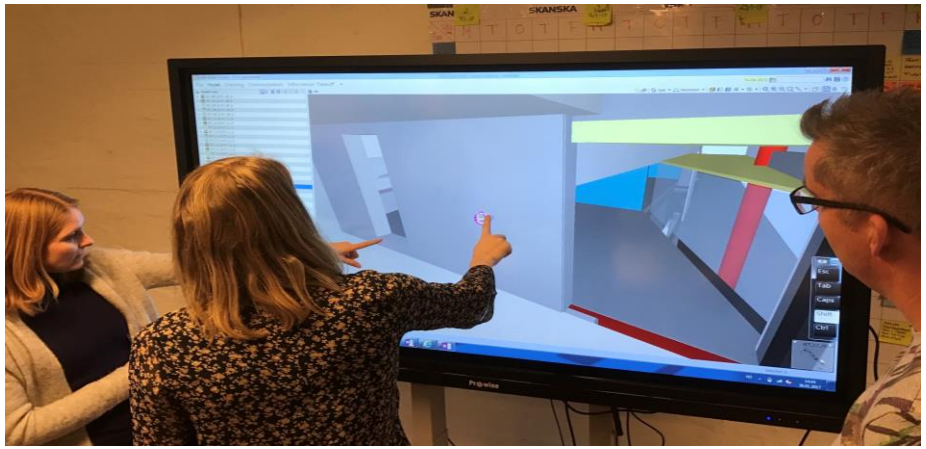
He Habberstad

Senior A isor of BIM & Digital Workflow

SKANSKA

We see a lot of good practices today…





Virtual Design & Construction (VDC)

Framework for designing, planning and executing construction projects using modern methods and tools.

Client Objectives

Project Objectives

LPS

Last Planner System

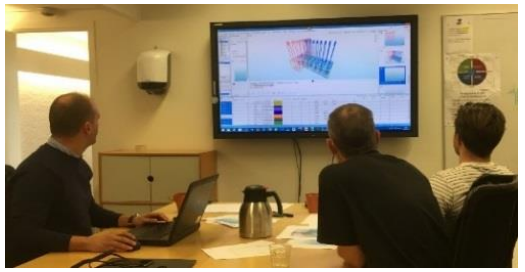
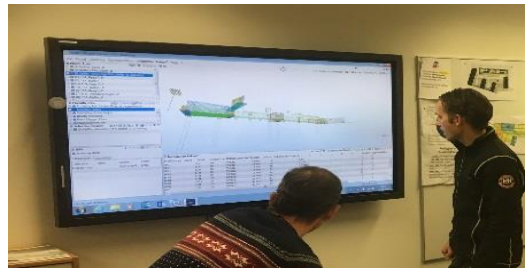
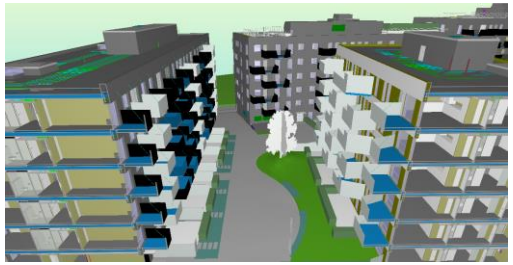
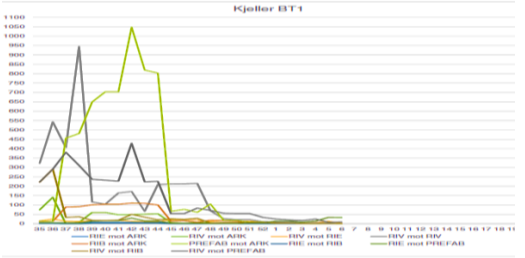
ICE

Integrated Concurrent Engineering

BIM

Building Informaton Modelling

Virtual Design & Construction (VDC)

	Design		Production
LPS			
ICE			
BIM			

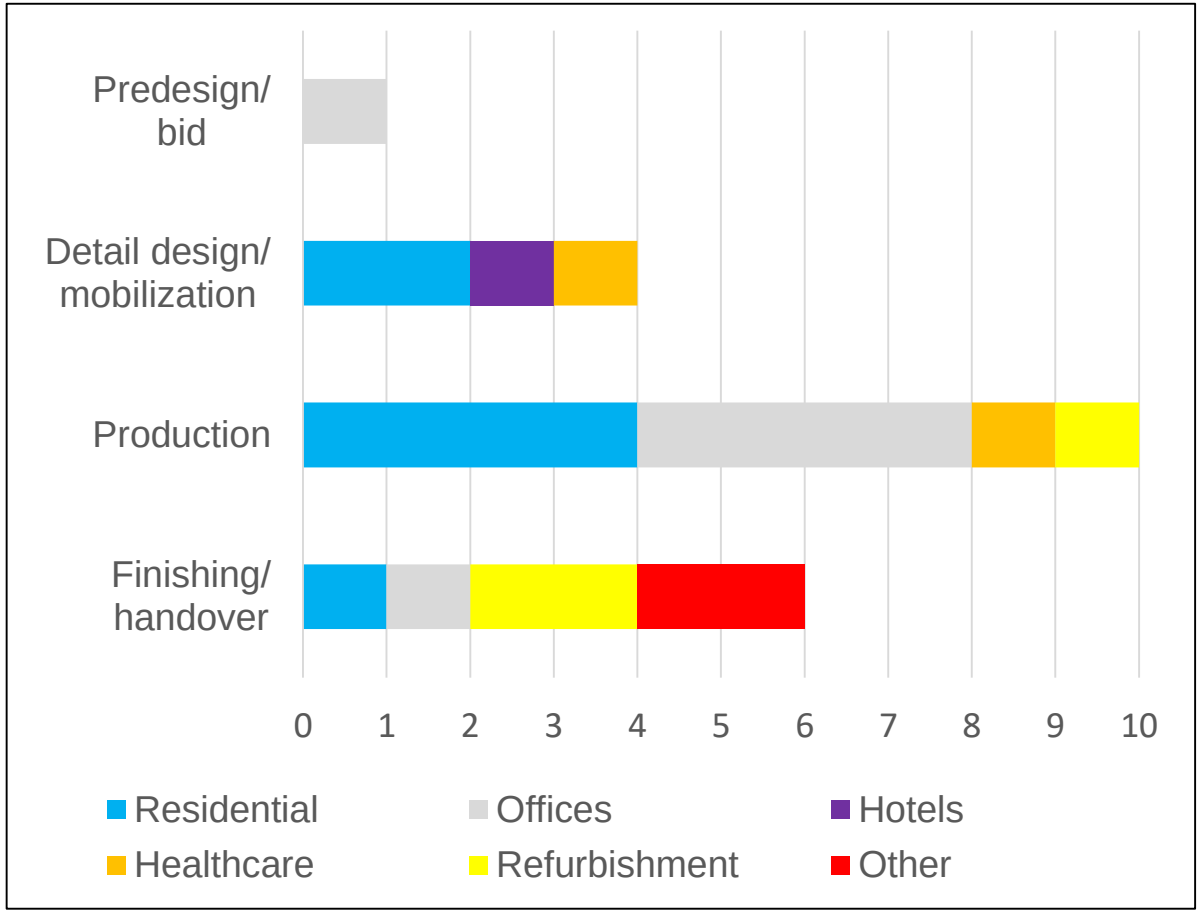
CitA
BIM GATHERING

VDC Implementation & Effects

SKANSKA

Implementation footprint

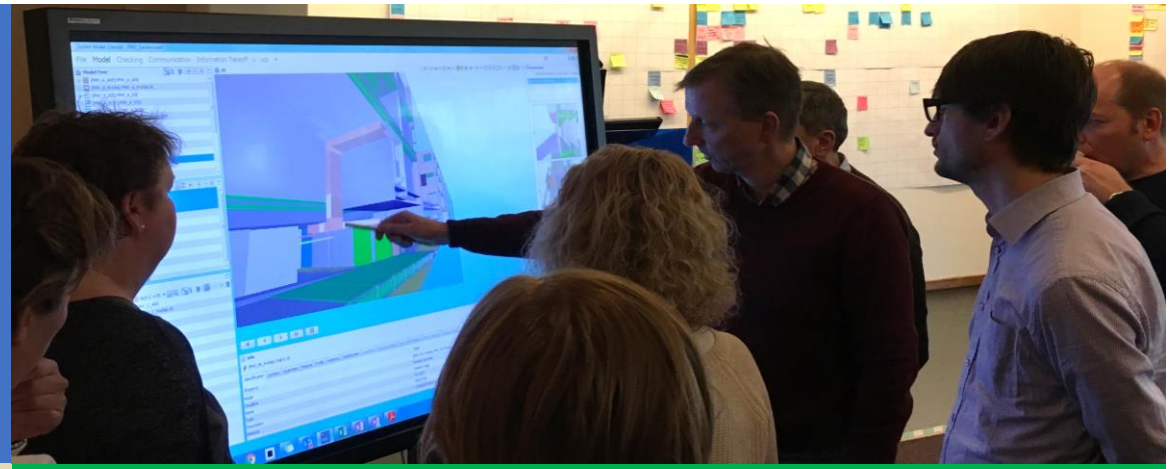
	Fase	VDC basis					Tilleggsleveranser						Piloter
		Involverende Planlegging Produksjon	Involverende Planlegging Prosjektering	ICE Prosjekteringsmøter	BIM samlemodell iht. BIM-manual	BIG ROOM på byggeplass	Prosjektet BIM-koordinerer selv	BIM-statussetting (MMI)	BIM-kiosk	360 Glue (BIM-modell på nettbrett)	Tegningsløs armering	UCO Prosjektbutikk	
BOLIG	Avsluttende												
BOLIG	Avsluttende												
BOLIG	Avsluttende												
BOLIG	Avsluttende												360 Plan
BOLIG	Produksjon												
BOLIG	Produksjon												
BOLIG	Produksjon												
BOLIG	Oppstart												4D Synchro + bascontainer
BOLIG	Forprosjekt												VR Cardboard
BOLIG	Oppstart												
YRKESBYGG	Produksjon												
YRKESBYGG	Oppstart												IPD, samlokalisering, 5D VICO etc.
YRKESBYGG	Oppstart												
YRKESBYGG	Oppstart												
YRKESBYGG	Oppstart												Borerobot? + VR Råmodell + VR Cardboard
YRKESBYGG	Oppstart												5D VICO?
BYGGFORN.	Avsluttende												
BYGGFORN.	Avsluttende												
BYGGFORN.	Produksjon												
BYGGFORN.	Oppstart												VR Visningsleilighet + 5D VICO?
DRAMMEN	Avsluttende												
DRAMMEN	Avsluttende												
DRAMMEN	Avsluttende												
DRAMMEN	Produksjon												
DRAMMEN	Produksjon												

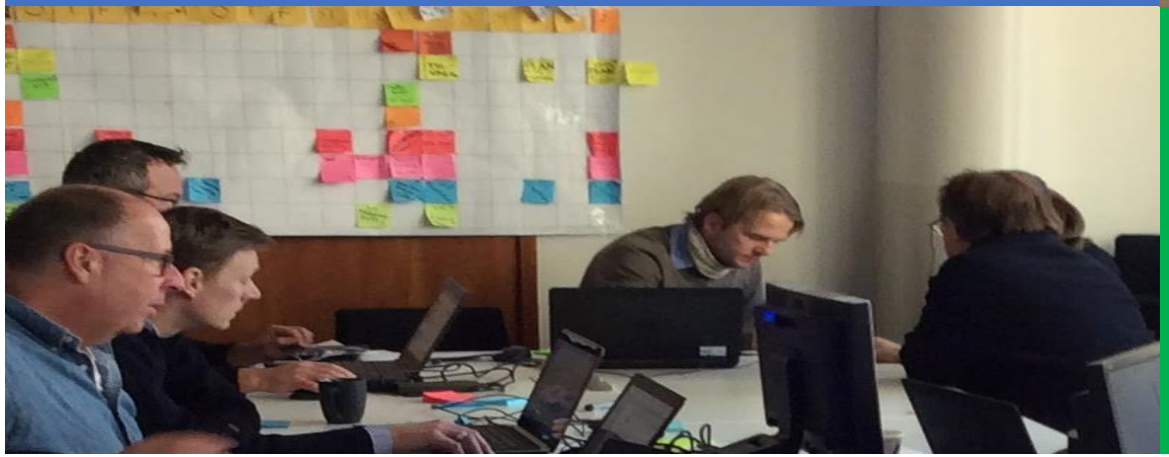


Effects

«We reduced our design phase from 15 to 11 months with VDC practices.»

Lars Bastrup, PGL

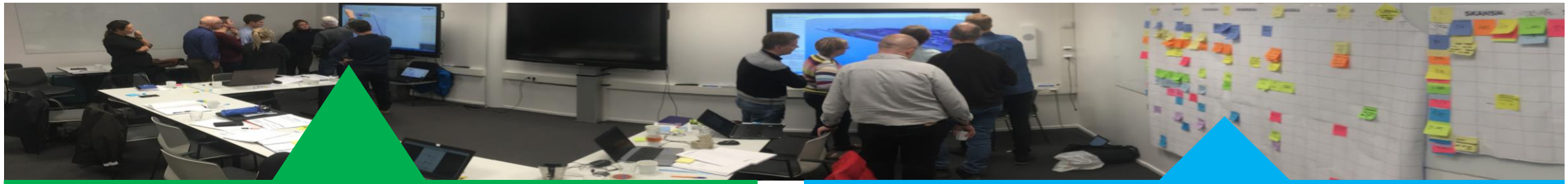




«The problem we just solved in 5 minutes equals about 20 e-mails.»

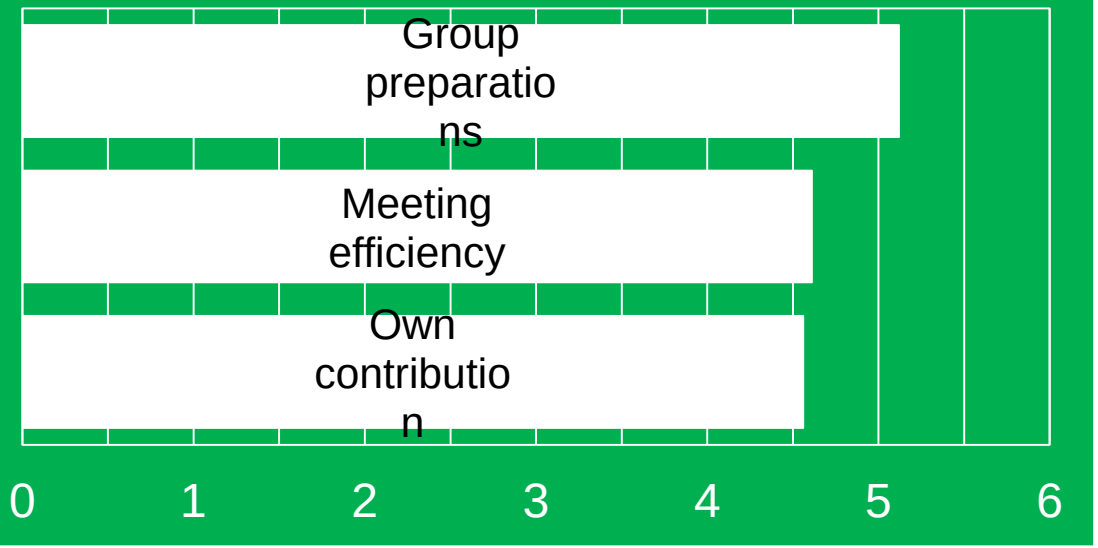
Kristian Setsaas, RIB

Effects



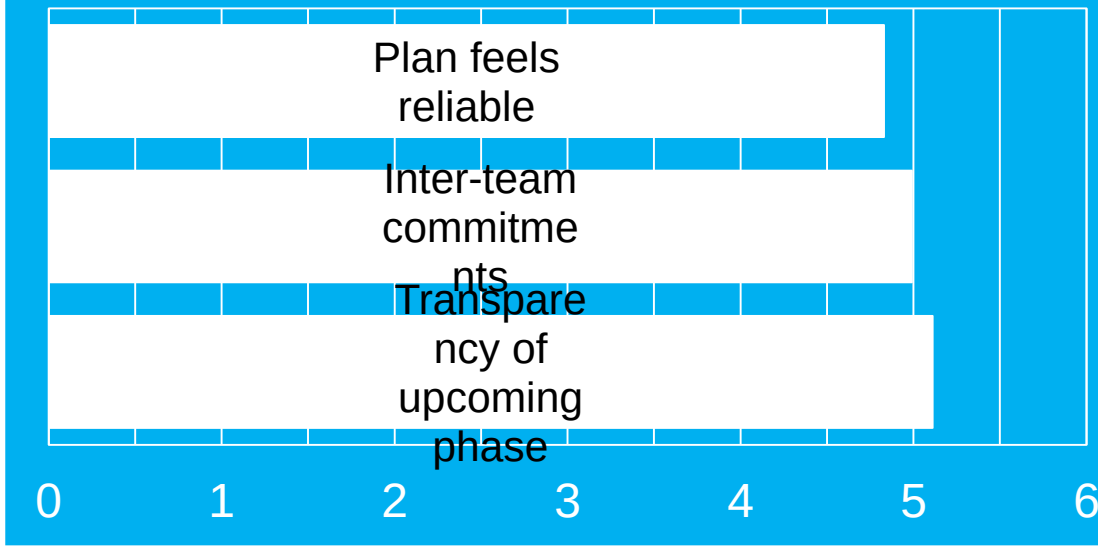
ICE

Average of 29 sessions



Last Planner

Answers from 186 people



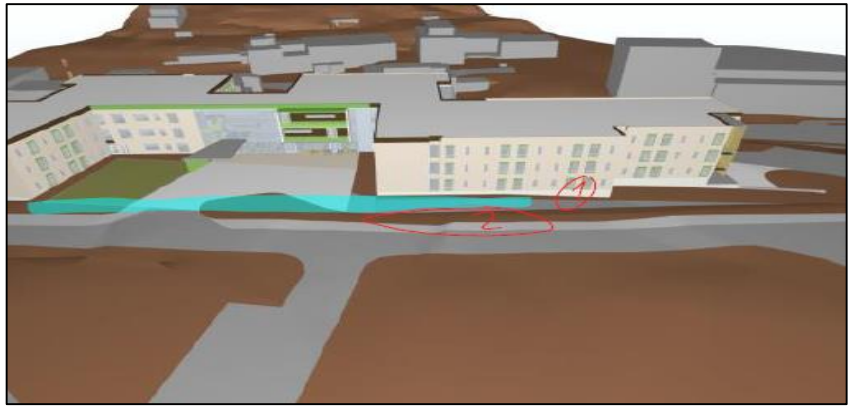
CitA
BIM GATHERING

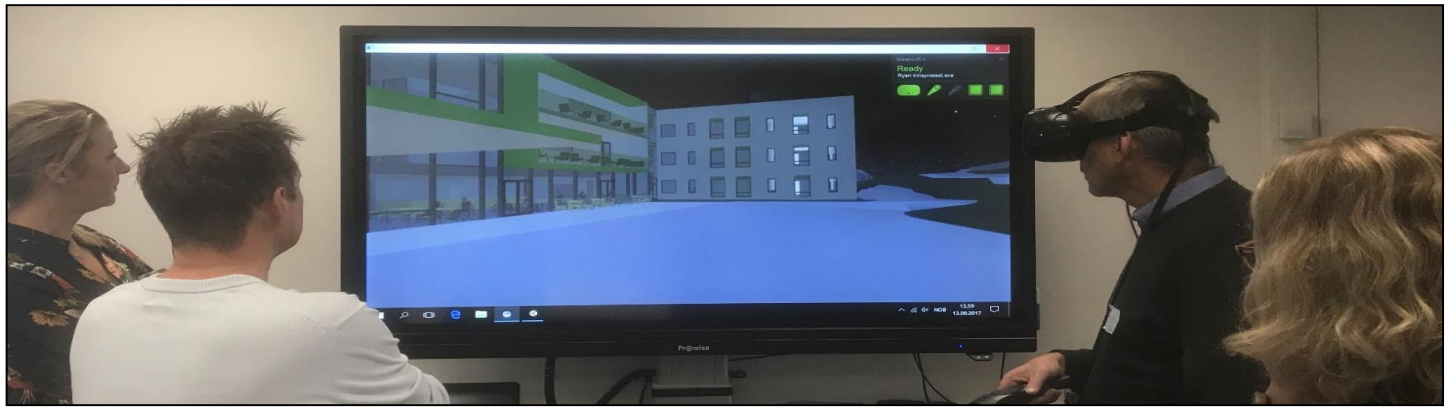
VDC builds on Lean Thinking

SKANSKA

People who see together, understand together

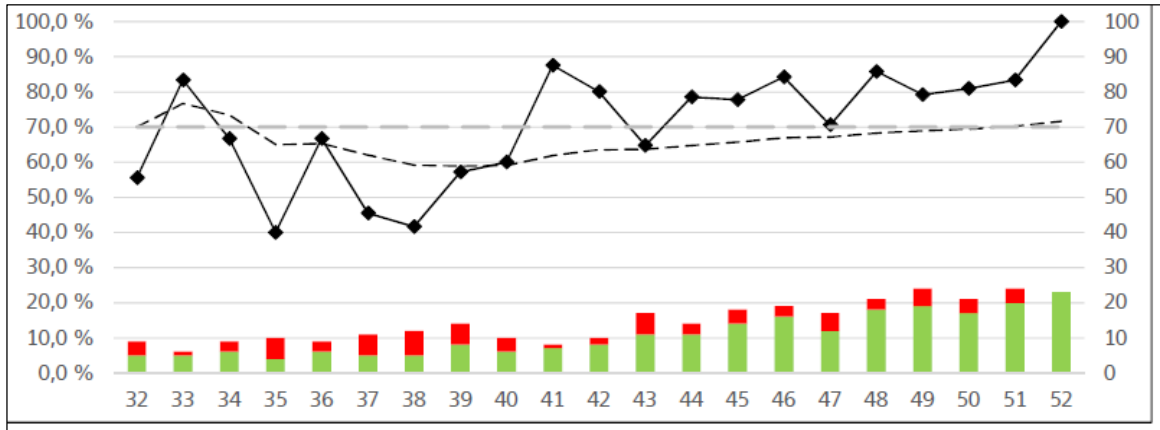
People who see together, understand together

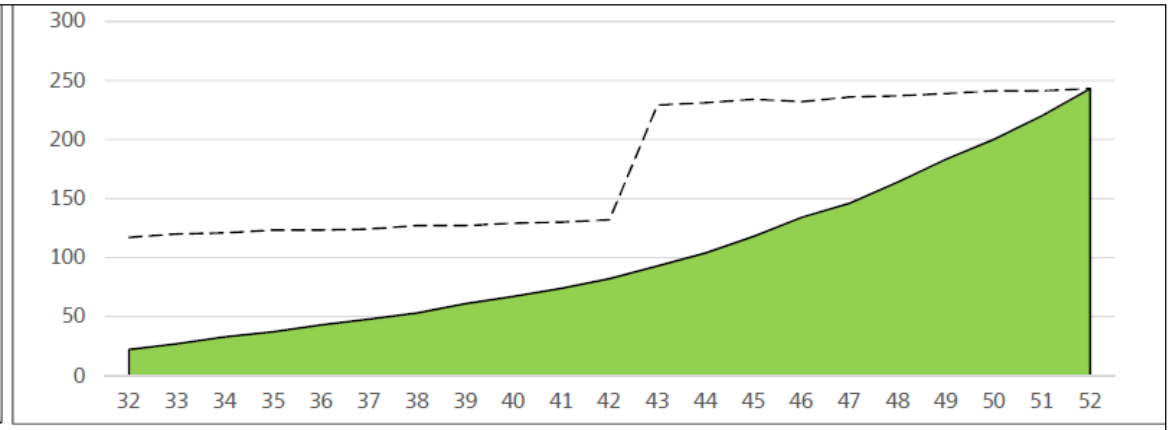


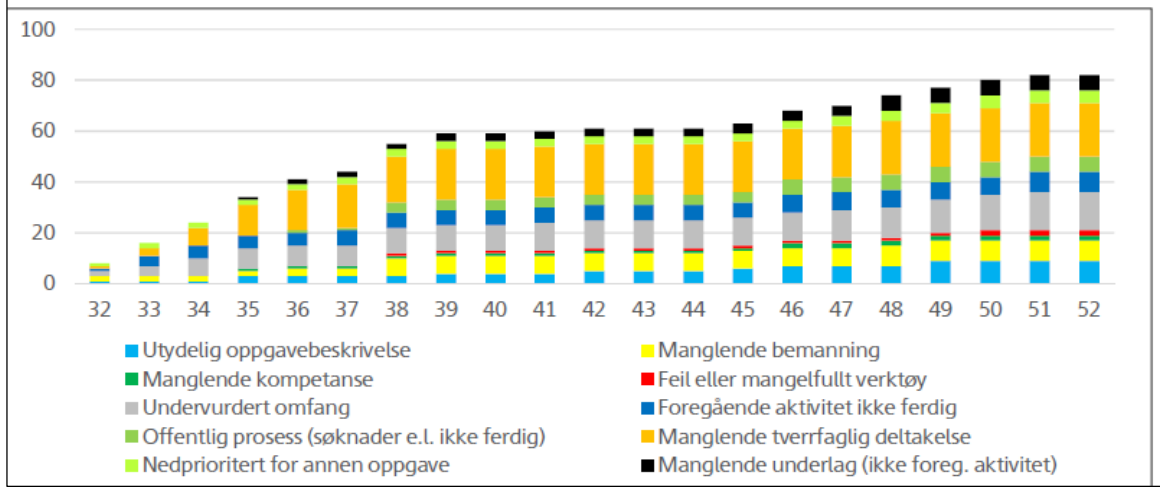


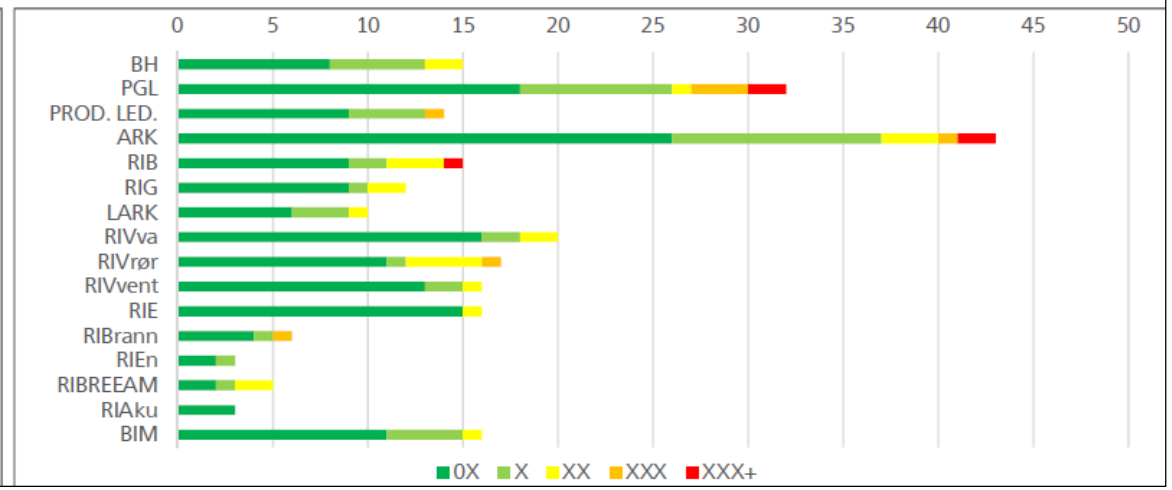
Establish flow from customer pull

Measure what you want to manage



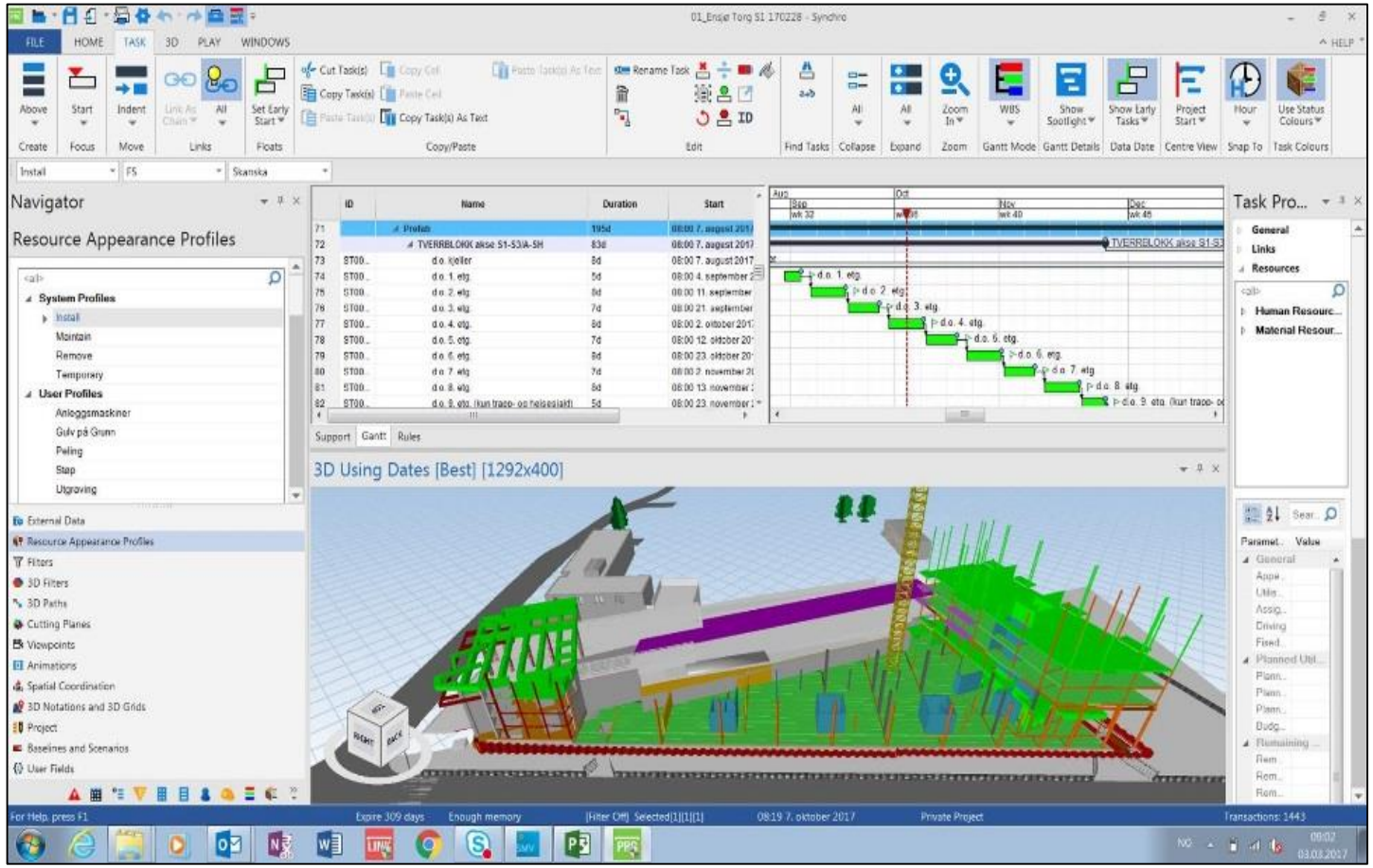


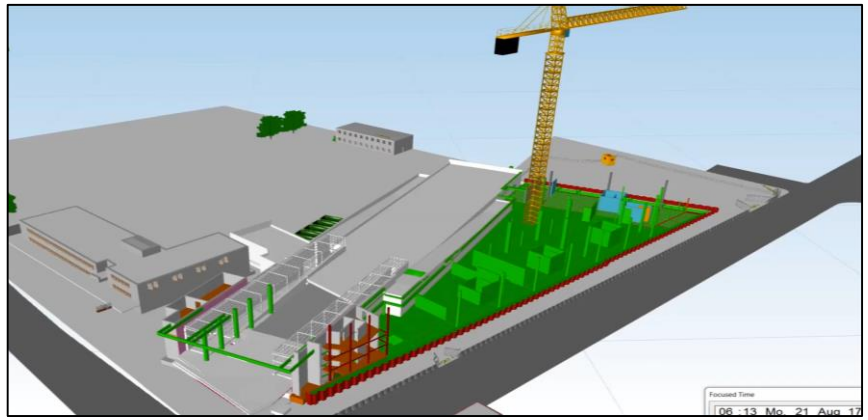


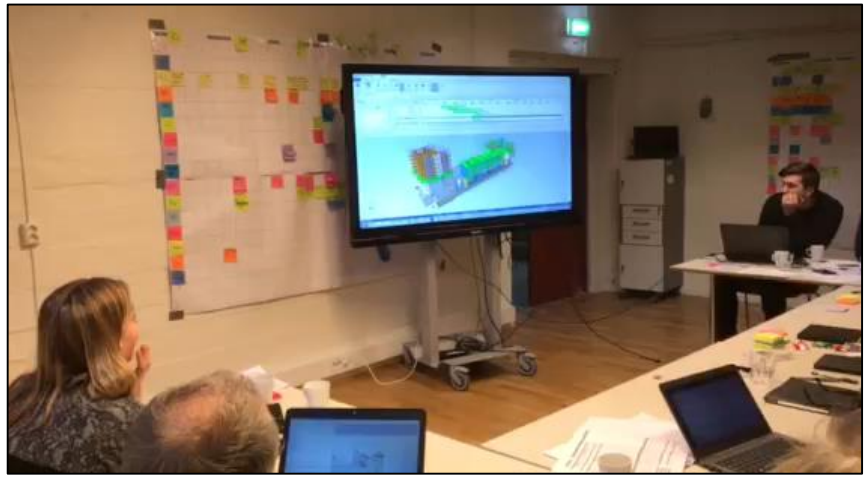


We co-locate to solve, not to meet

Let the computer do what it's good at…





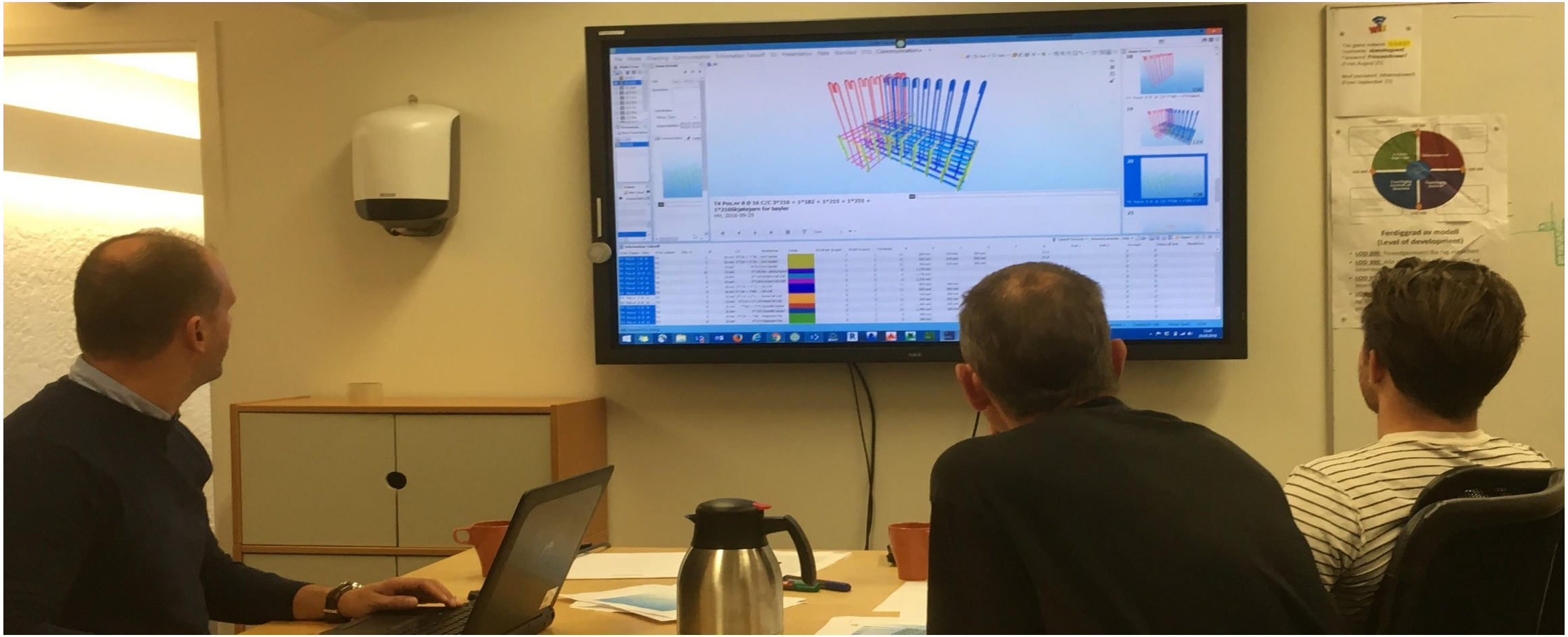


CitA
BIM GATHERING

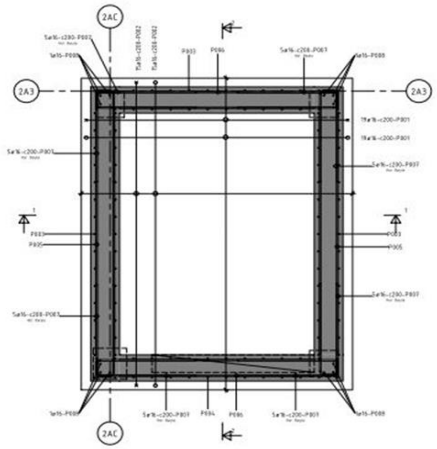
Digital Workflows

SKANSKA

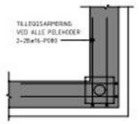
Working with our crews to digitalize their workflows



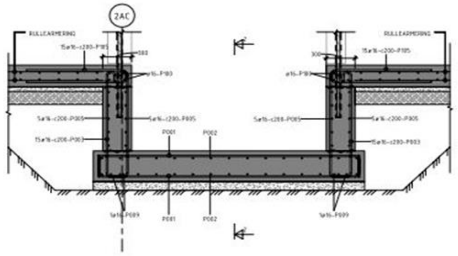
Traditional vs BIM-based rebar



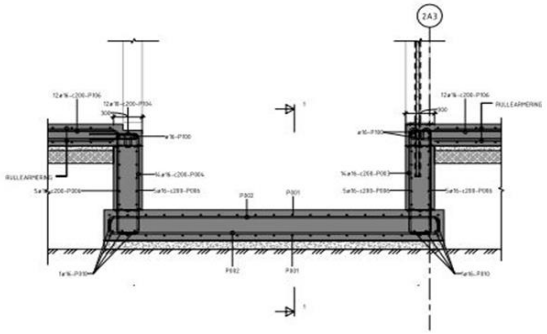
Heisgrube A - Armering



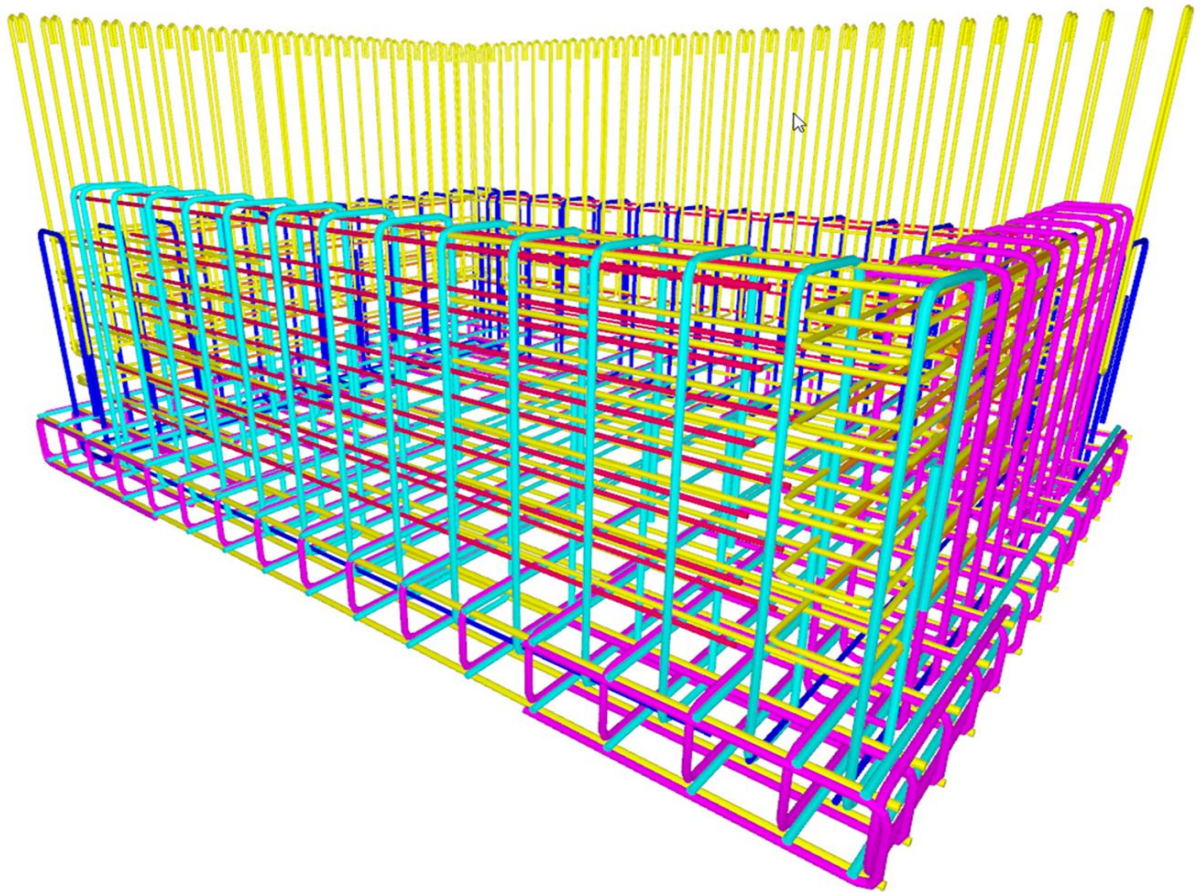
Heisgrube A - Prinsippsnitt tilleggsarmering pelehoder



① Heisgrube A - Snitt 1 - Armering



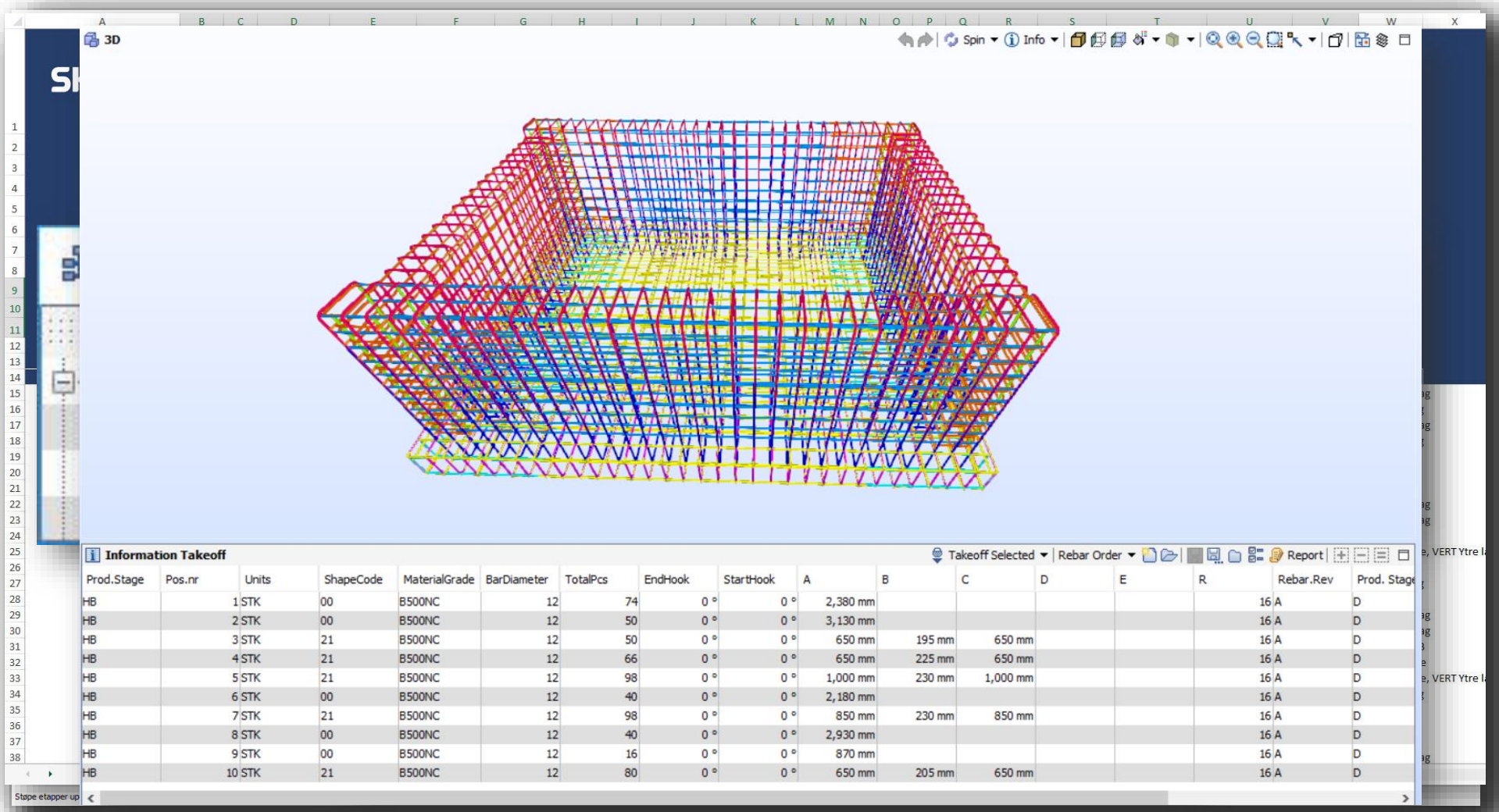
② Heisgrube A - Snitt 2 - Armering



CitA
BIM GATHERING

Digital Rebar Procurement

SKANSKA

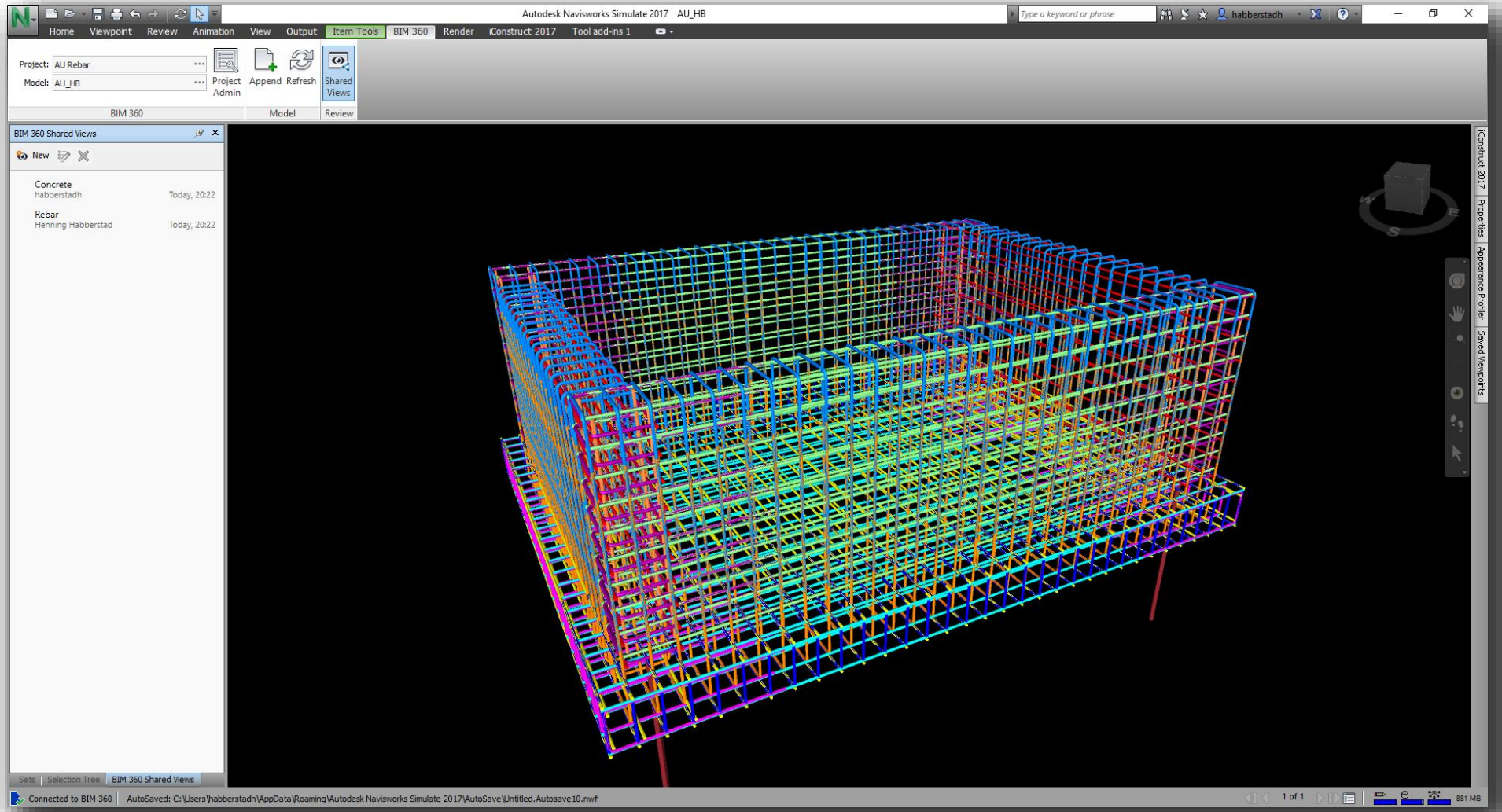


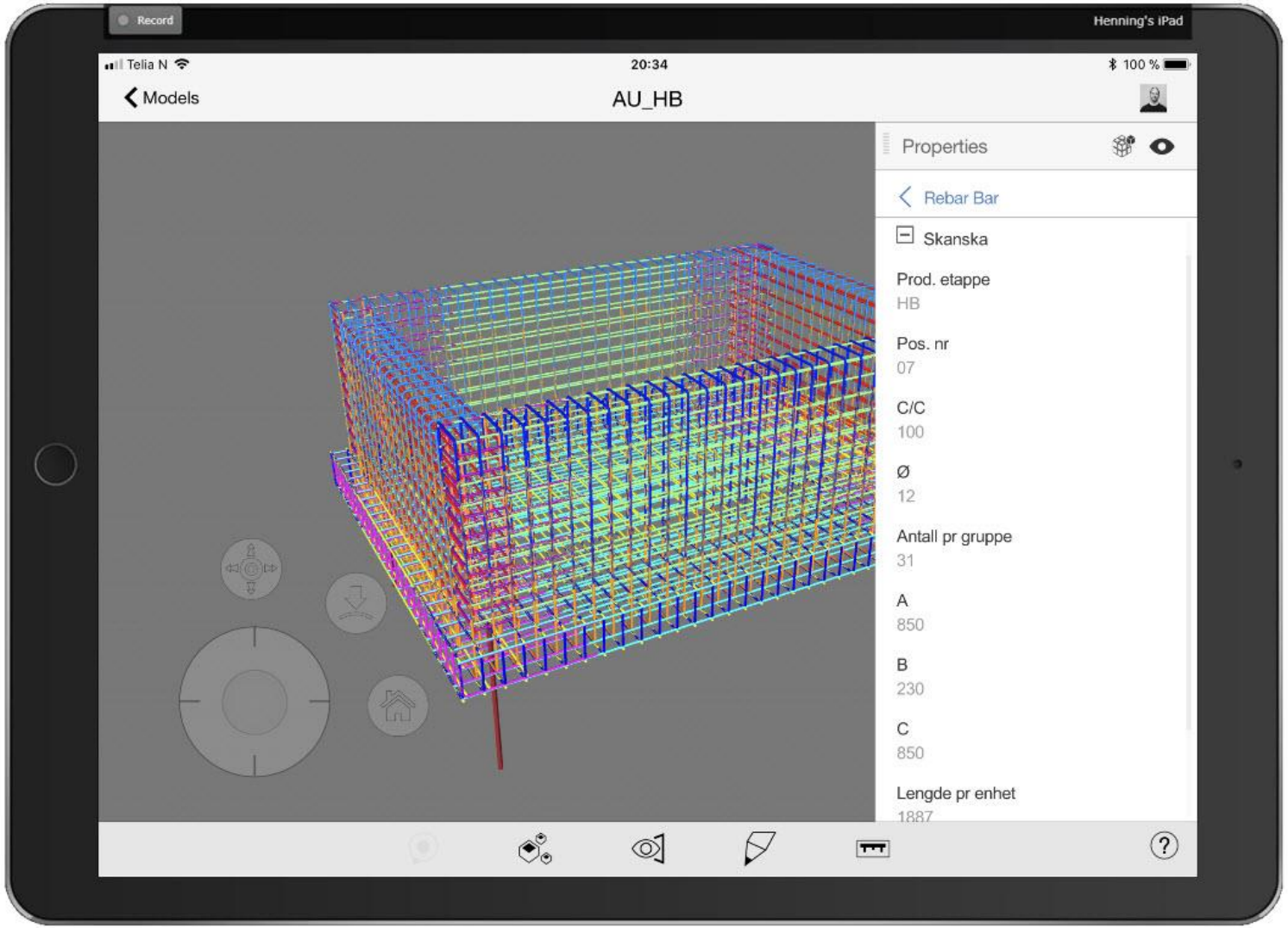
Prod.Stage	Pos.nr	Units	ShapeCode	MaterialGrade	BarDiameter	TotalPcs	EndHook	StartHook	A	B	C	D	E	R	Rebar.Rev	Prod. Stage
HB	1	STK	00	B500NC	12	74	0 °	0 °	2,380 mm					16	A	D
HB	2	STK	00	B500NC	12	50	0 °	0 °	3,130 mm					16	A	D
HB	3	STK	21	B500NC	12	50	0 °	0 °	650 mm	195 mm	650 mm			16	A	D
HB	4	STK	21	B500NC	12	66	0 °	0 °	650 mm	225 mm	650 mm			16	A	D
HB	5	STK	21	B500NC	12	98	0 °	0 °	1,000 mm	230 mm	1,000 mm			16	A	D
HB	6	STK	00	B500NC	12	40	0 °	0 °	2,180 mm					16	A	D
HB	7	STK	21	B500NC	12	98	0 °	0 °	850 mm	230 mm	850 mm			16	A	D
HB	8	STK	00	B500NC	12	40	0 °	0 °	2,930 mm					16	A	D
HB	9	STK	00	B500NC	12	16	0 °	0 °	870 mm					16	A	D
HB	10	STK	21	B500NC	12	80	0 °	0 °	650 mm	205 mm	650 mm			16	A	D

CitA
BIM GATHERING

Digital Rebar On-site Coordination

SKANSKA


Autodesk Navisworks Simulate 2017 AU_HB
Home Viewpoint Review Animation View Output Item Tools BIM 360 Render iConstruct 2017 Tool add-ins 1
Project: AU Rebar
Model: AU_HB
Project Admin
Append
Refresh
Shared Views
BIM 360
Model
Review
BIM 360 Shared Views
New
Concrete
habberstadh
Today, 20:22
Rebar
Henning Habberstad
Today, 20:22
Sets
Selection Tree
BIM 360 Shared Views
Connected to BIM 360
AutoSaved: C:\Users\habberstadh\AppData\Roaming\Autodesk Navisworks Simulate 2017\AutoSave\Untitled.Autosave10.nwf
1 of 1
881 MB


Record
Henning's iPad
Telia N
20:34
100 %
Models
AU_HB
Properties
Rebar Bar
Skanska
Prod. etappe
HB
Pos. nr
07
C/C
100
Ø
12
Antall pr gruppe
31
A
850
B
230
C
850
Lengde pr enhet
1887

CitA
BIM GATHERING

Digital Rebar Feedback

SKANSKA

Implementation

Implementation

Project Experiences & Feedback

- Supply Chain:
  - All feel involved in development
  - Improved information flow for all
- Structural engineers:
  - No paper or pdf rebar drawings or bend lists
  - 30-60% engineering hours decrease
- Suppliers:
  - Precise rebar orders
  - Less waste and surplus rebar
- Construction workers:
  - Improved overall understanding of rebar assemblies
  - Better on-site logistics and planning

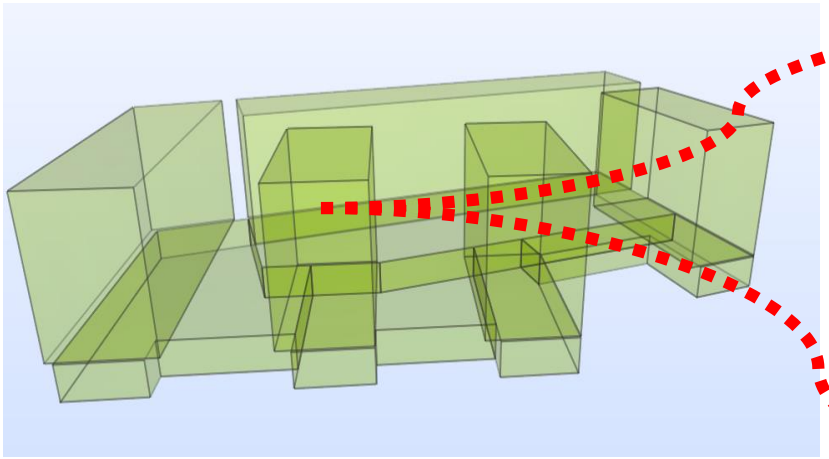
It’s not about tools

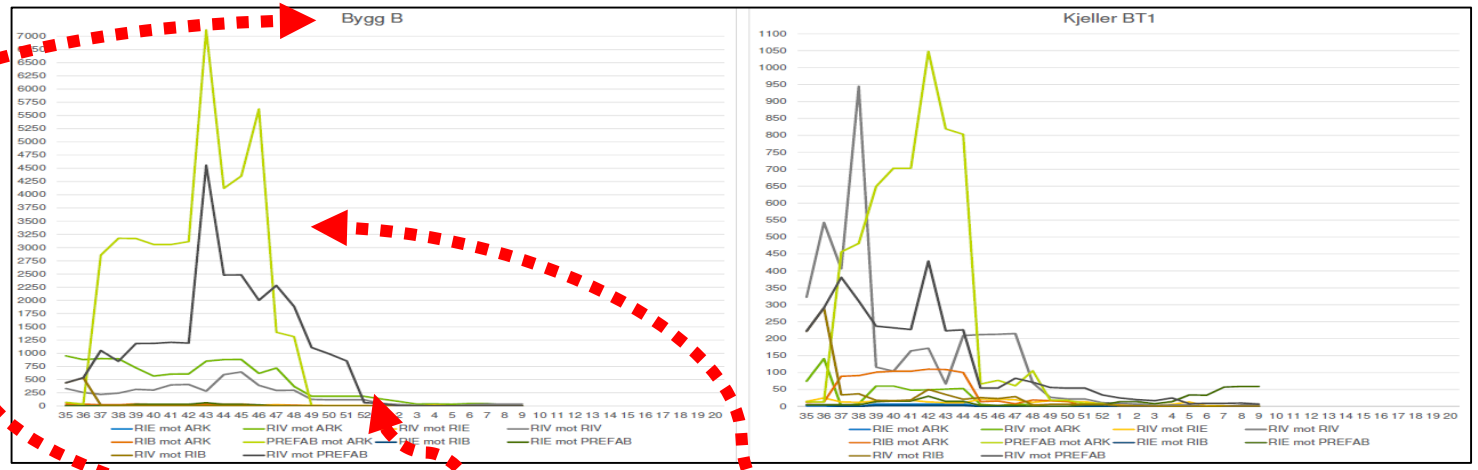
CitA
BIM GATHERING

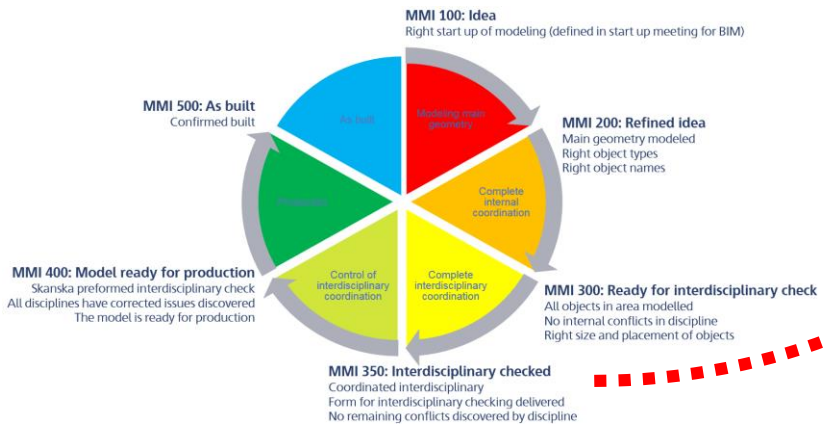
Tools, process & organization

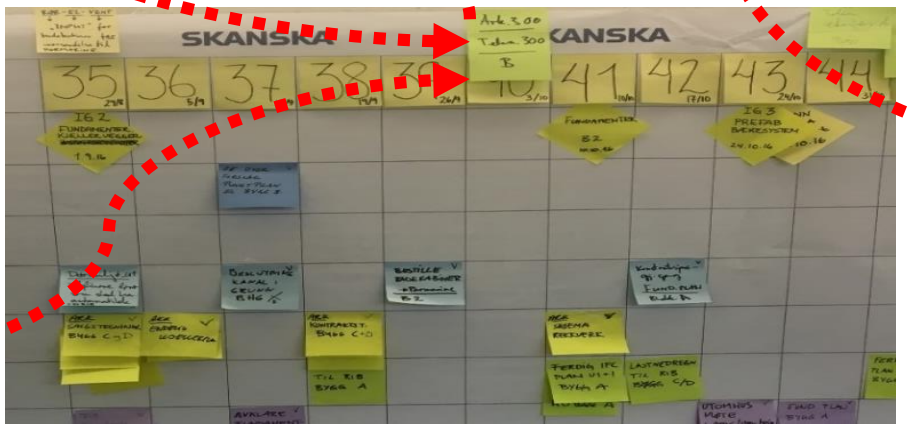
SKANSKA

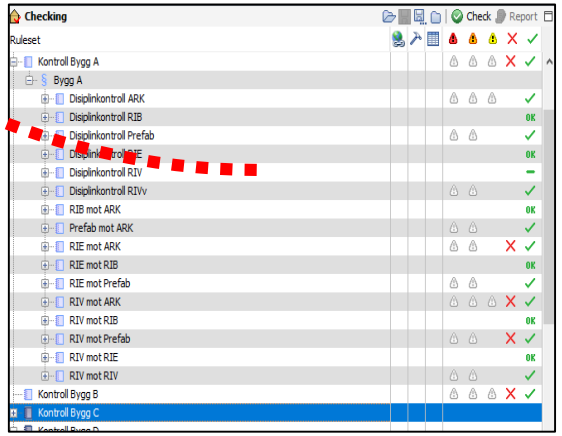
Model Maturity Index (MMI)



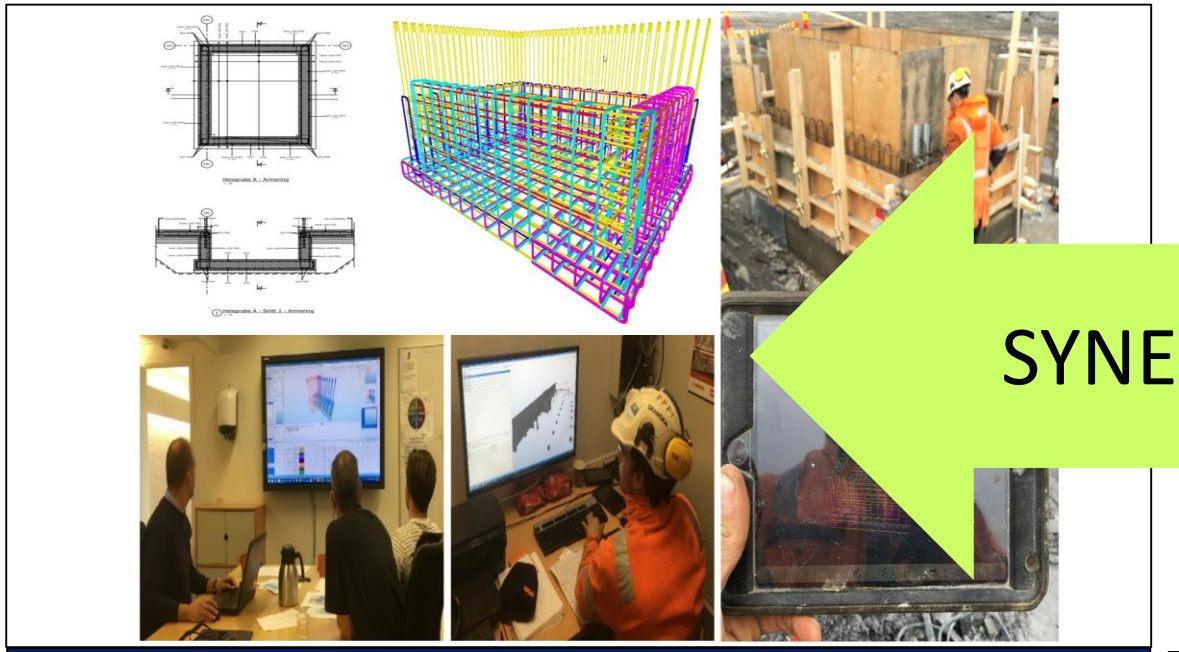






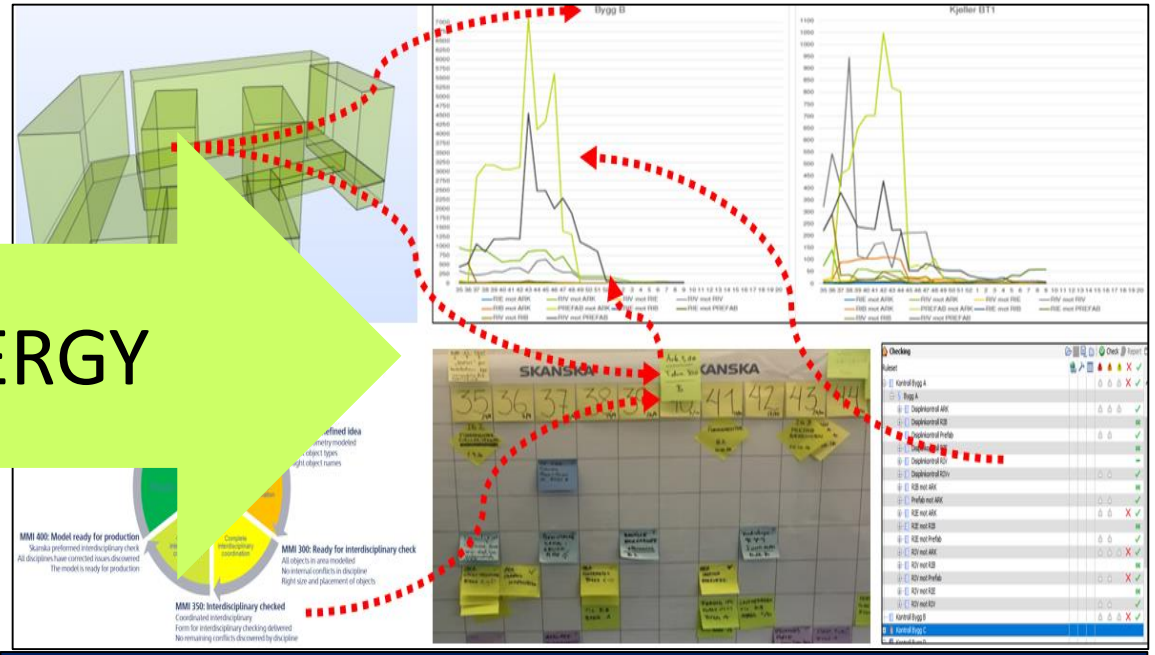


BIM & Lean synergies



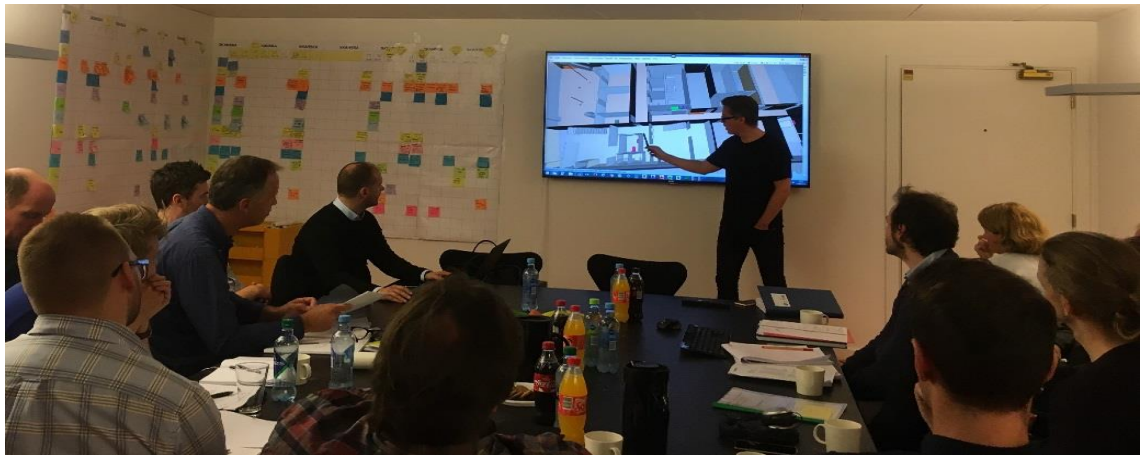
BIM-related tech advancements

SYNERGY



Lean-based process approach

Methods, process & organization



Where do we want to find the solutions?

CitA
BIM GATHERING

Thank you!

SKANSKA