



**General Contractor's experience in using BIM**  
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**02.10.2014**

# Päevakava

## Maru Ehitus AS tutvustus

- Struktuur
- BIM ajastu algus

BIM projekteerimises

BIM eelarvestuses

BIM ehituses

# Introduction



## An experienced and reliable partner for design and construction

Maru Ehitus boasts a track record of excellence and professionalism that spans more than two decades. Our mission is to meet clients' expectations by providing high-quality services and extensive expertise.

The company's core competencies include general building contracting, project management and design services. We have long-term experience with design and construction of different types of buildings and structures throughout Estonia and Europe.

The main strength of Maru Ehitus is our diversity. We are reliable partners to our clients at all stages of the construction process – from working out the concept to handing the keys of the completed building. As part of our construction services, we provide various forms of cooperation, based on the client's needs and the specific nature of each project.

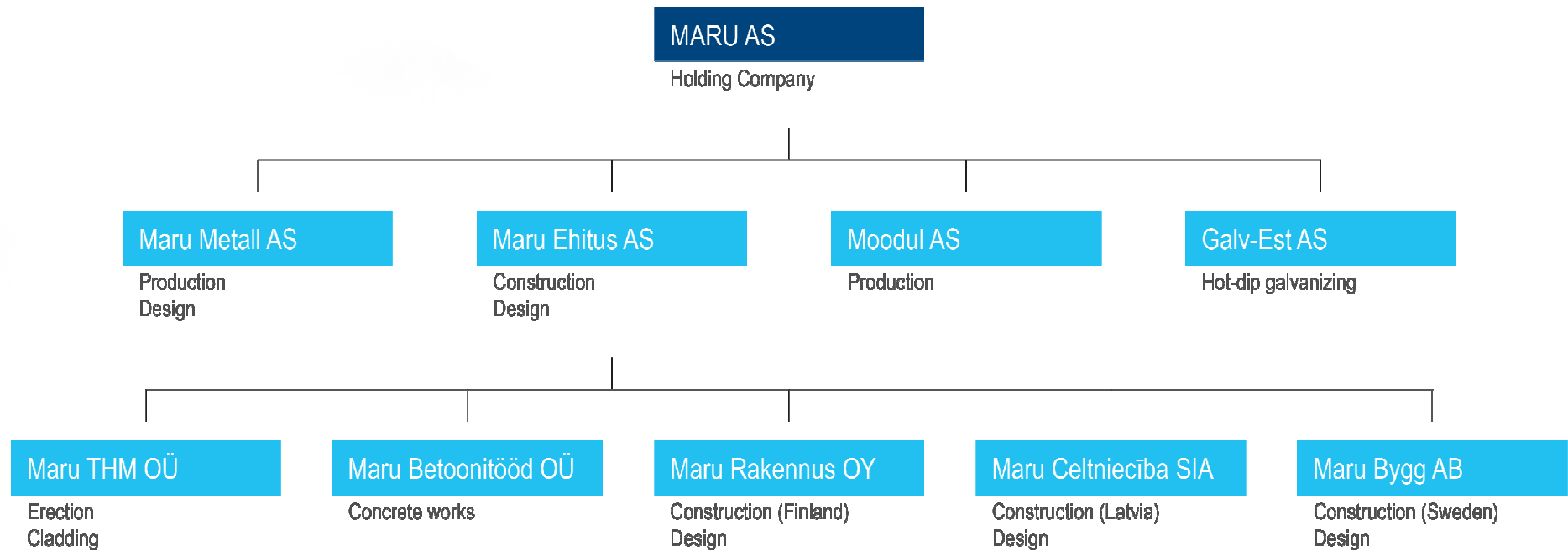
## EMPLOYEES (2014)

160 (incl. 20 designers, 48 project managers and site managers, 80 workers)

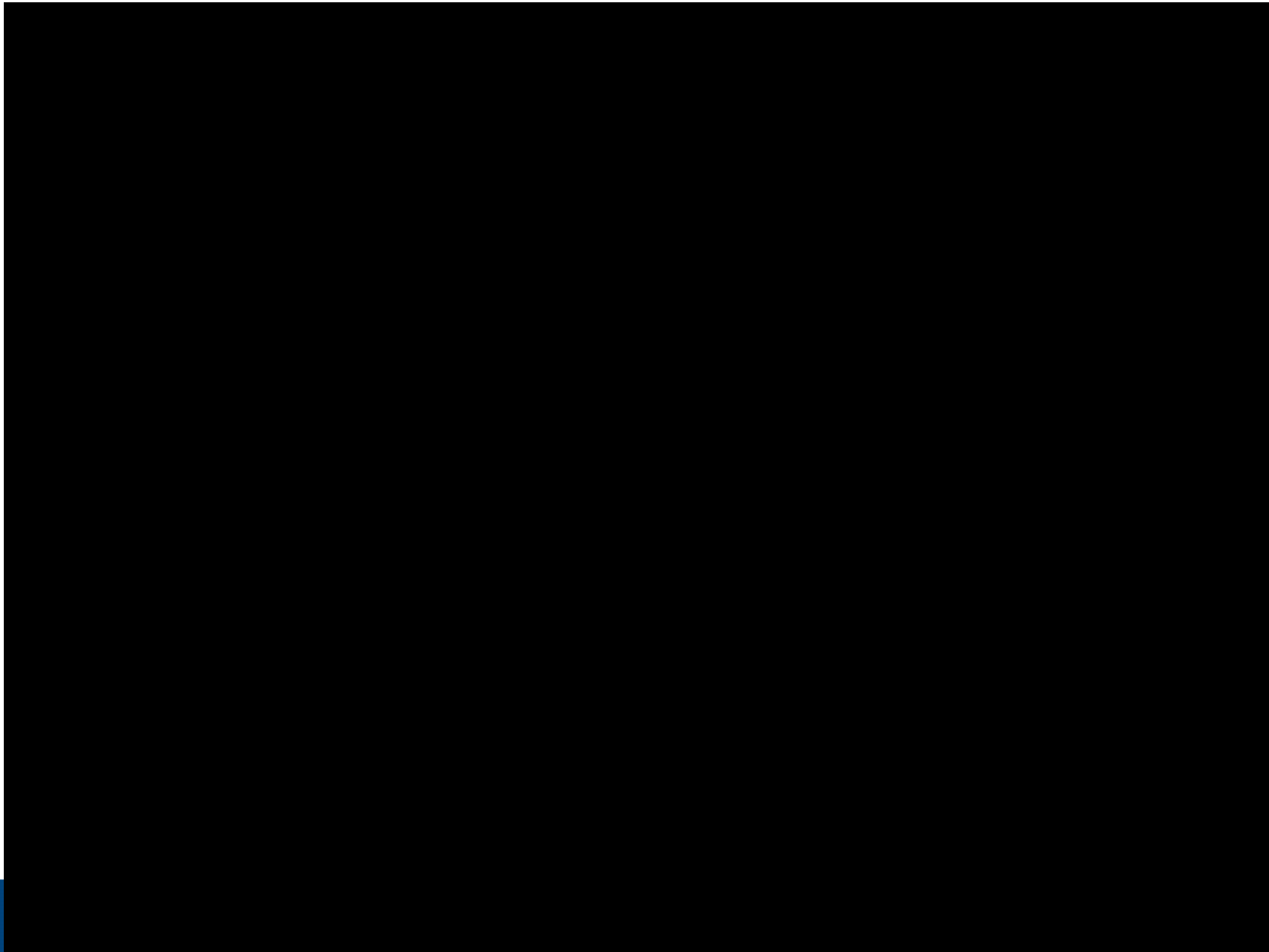
## TURNOVER (2013)

32 million euros

# Maru AS kontserni struktuur



## BIM-i algus MARUs



# BIM projekteerimises

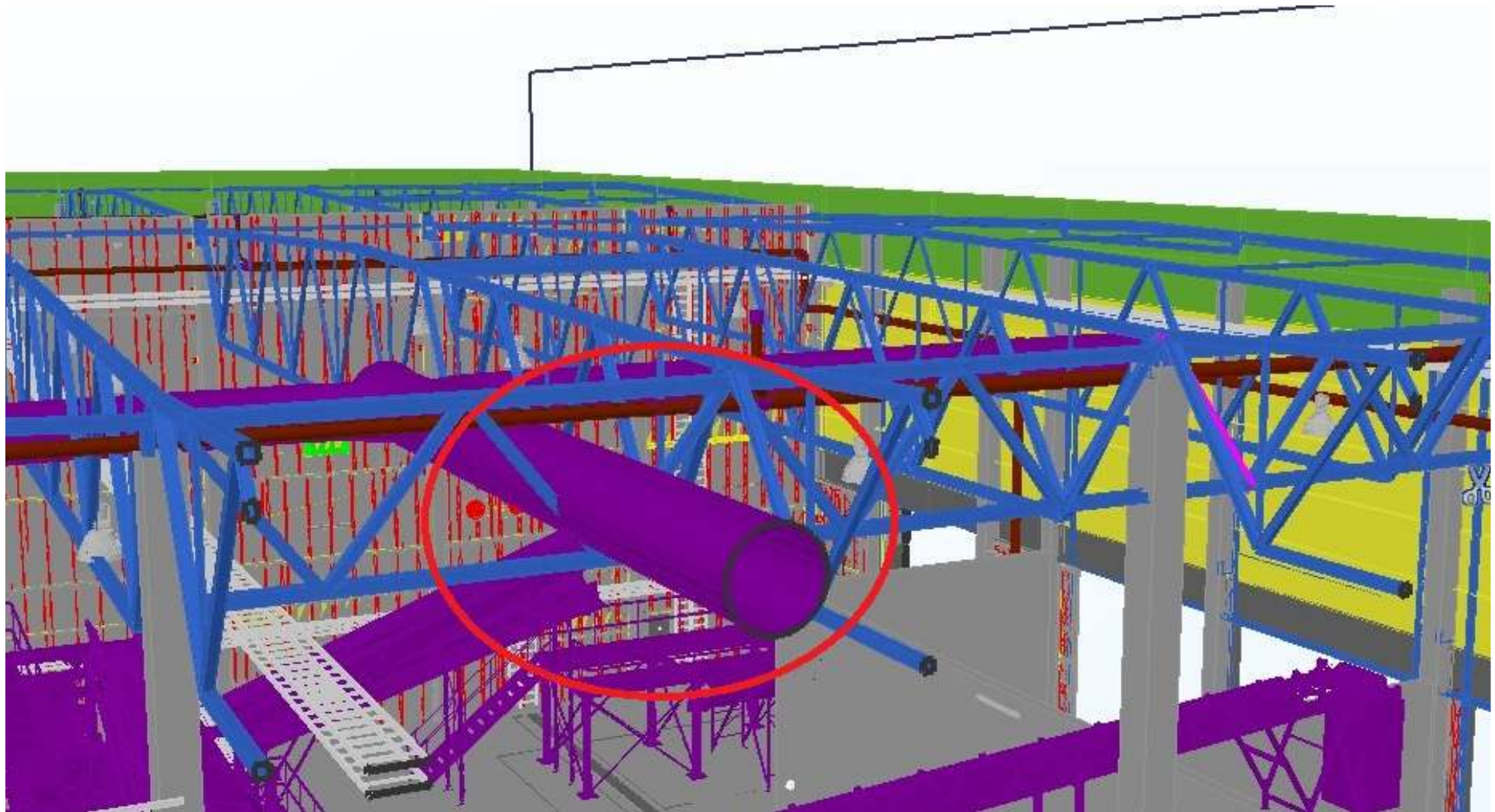


- Konstruktiivne projekteerimine
- Veevarustus ja kanalisatsioon
- Arhitektuurne projekteerimine
- Ristumiste kontroll, koondmudel



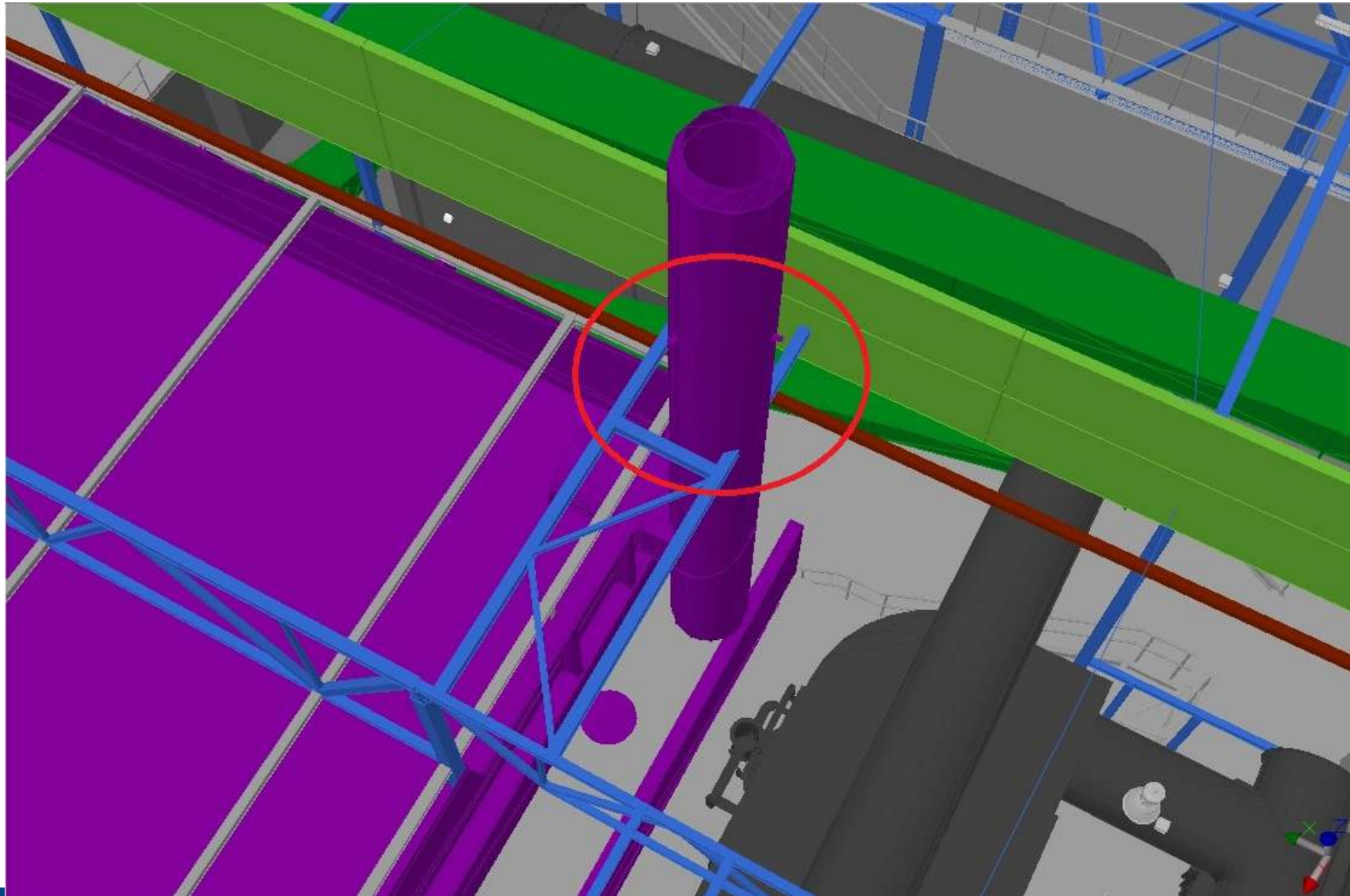
Kunagi pole aega teha midagi korralikult, aga alati on aega ümber teha.



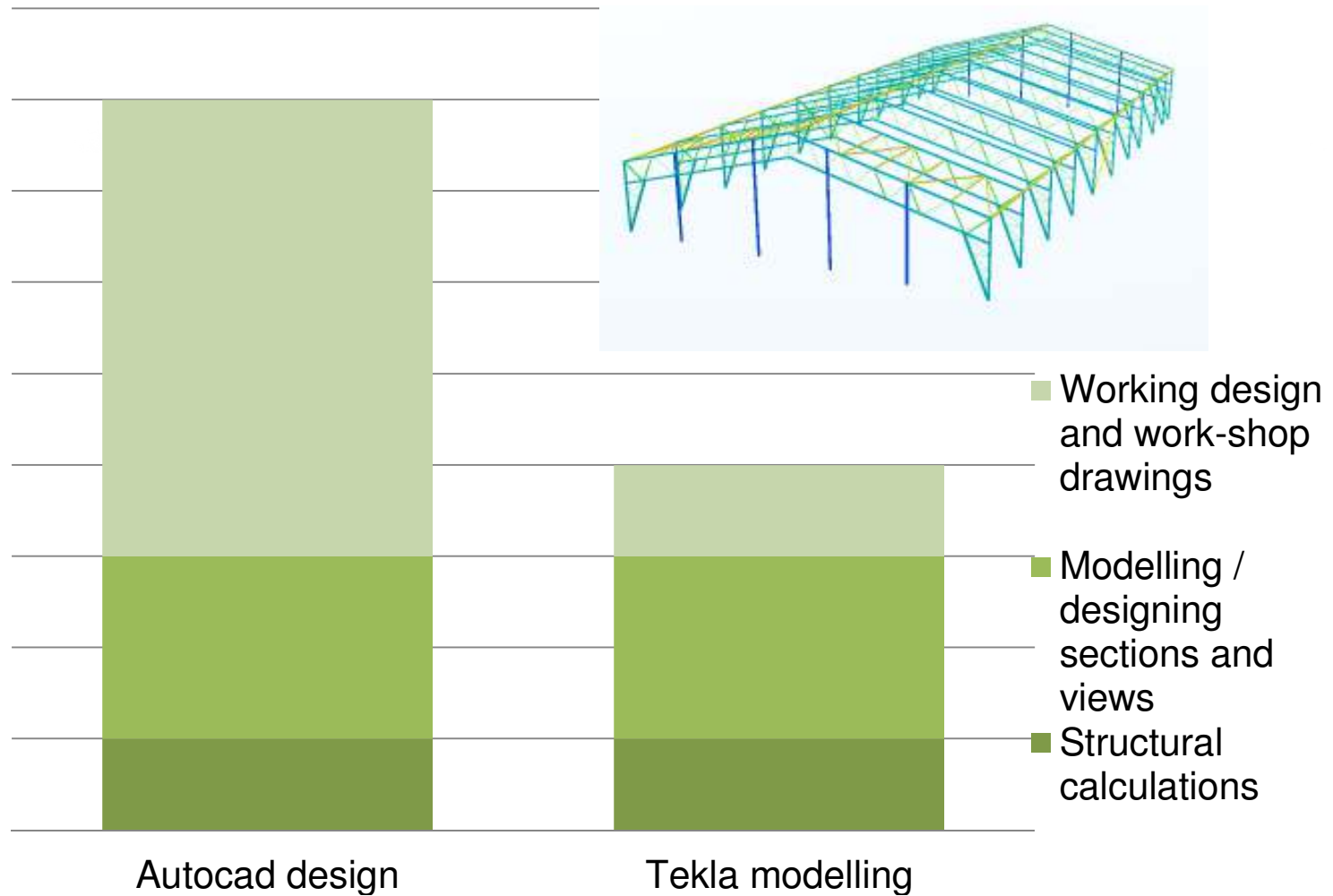




# Ristumiste kontroll – mudeliste täpsus



## Time to design a simple warehouse



## BIM eelarvestuses

### Olulisemad võtmeküsimused:

- Kas on enda projekteeritud või väljastpoolt?
- Kas tellijal on mudel kaasa anda?
- Kas tellijalt saadud mudel on ka tõesti BIM?
- Kust saame kätte mahud?

# BIM eelarvestused

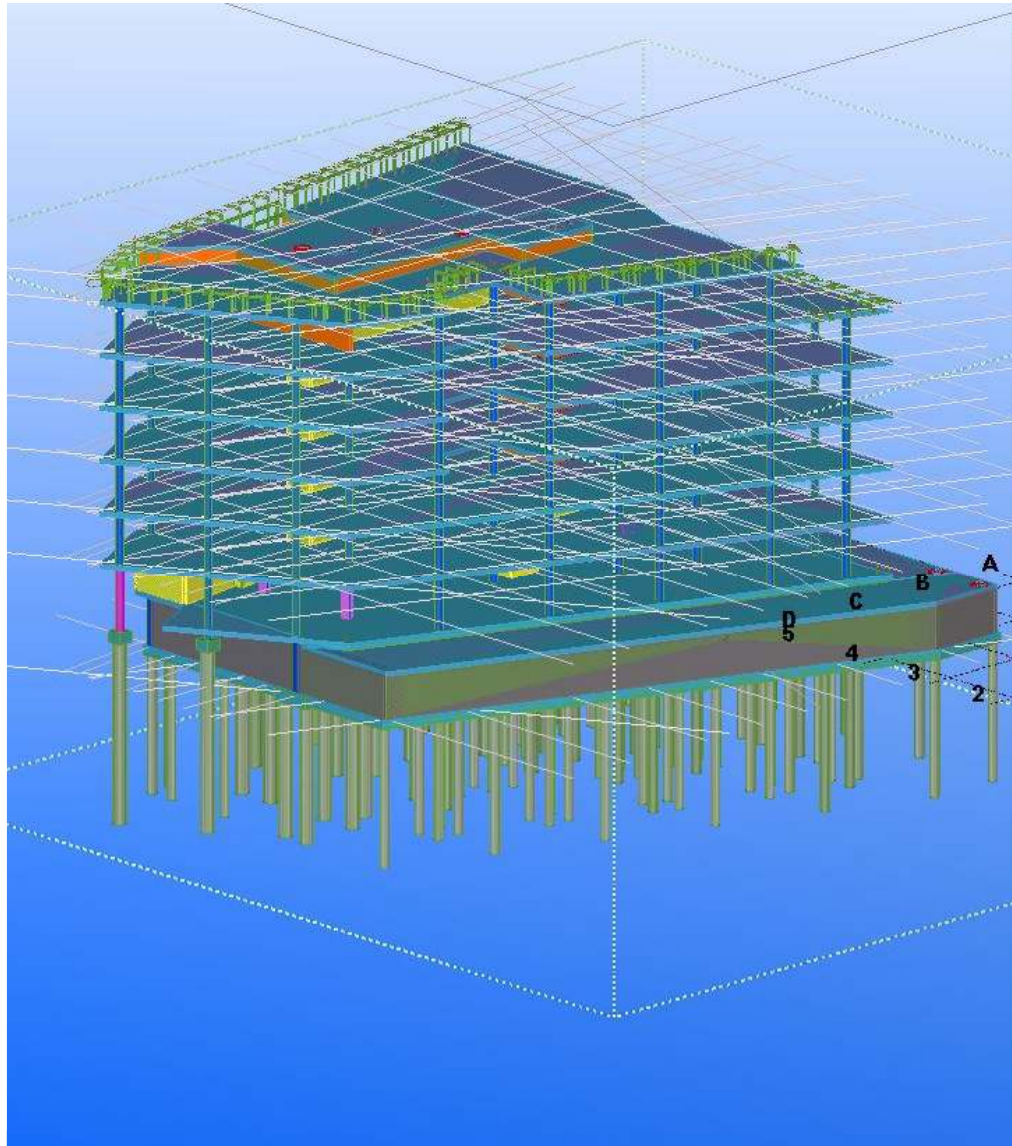


The screenshot displays a BIM software interface. In the background, a 3D model of a structure is shown with various parts highlighted in green and yellow. A grid of axes is visible, with labels A, B, C, D, 1, 2, 3, 4, 5. A percentage symbol (%) is also present near the model.

In the foreground, there are two windows:

- List Window:** Displays a report titled "TEKLA STRUCTURES PARTS LIST FOR CONTRACT NO: 1". The report includes a table with columns: PartPos, Profile, No., Material, Length, Area (m2), and Weight (kg). The table lists 121 members with their respective properties. A total row at the bottom shows: Total for 121 members: 2481.1, 994525.6.
- Report Window:** Shows a list of report templates. The "Part List" template is selected. The window also includes options for saving, loading, and creating reports from all or selected items.

# BIM eelarvestuses



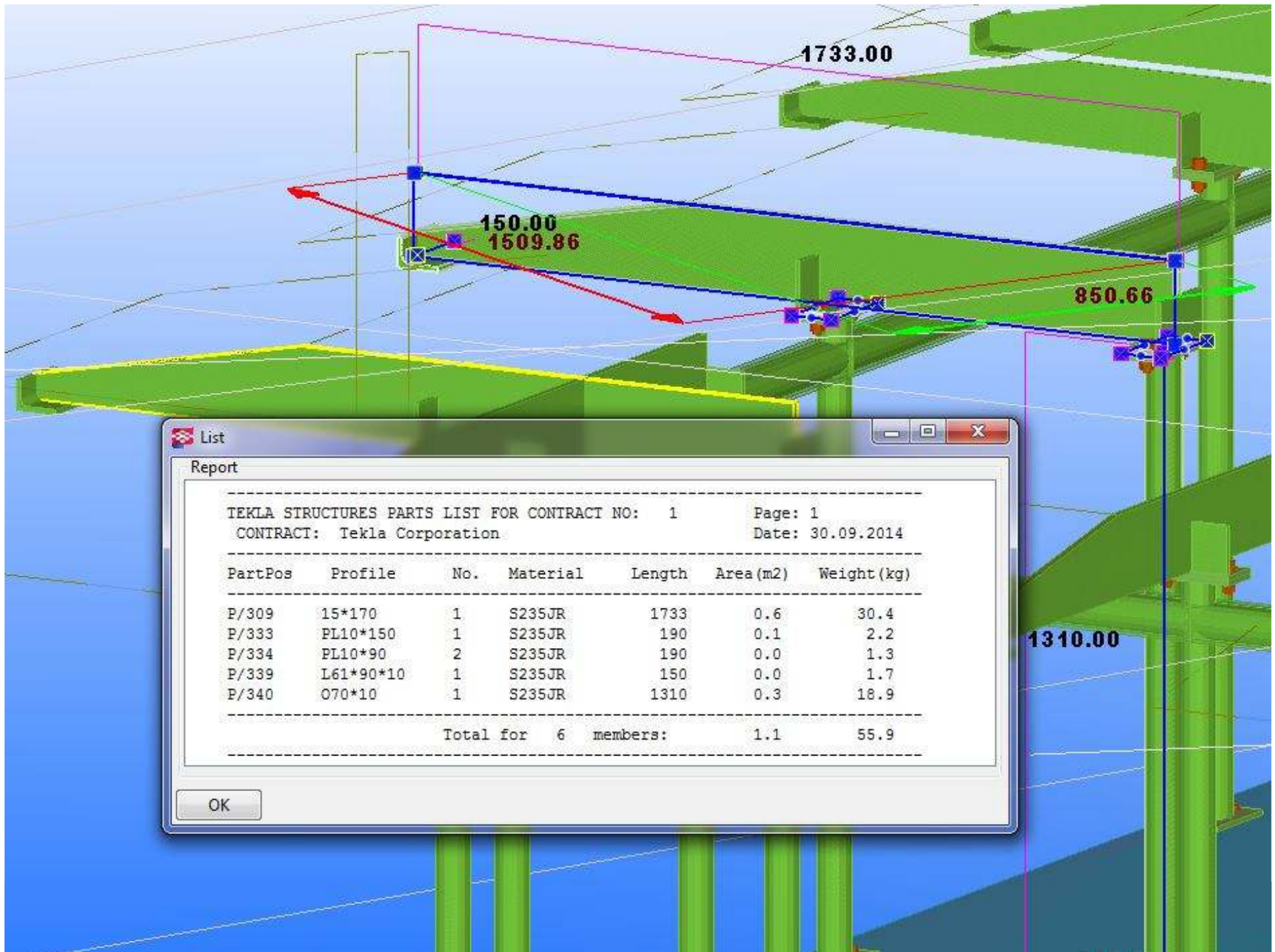
List Report

		Profile Totals:	17978.5	16911.	
1	Id: 48824	PL1300*402	C30/37	4494.7	4294.1
1	Id: 53162	PL1300*402	C30/37	4494.7	4294.1
1	Id: 55618	PL1300*402	C30/37	4494.7	4294.1
1	Id: 57572	PL1300*402	C30/37	4494.7	4294.1
		Profile Totals:	17979.0	17176.	

TEKLA STRUCTURES PRELIMINARY MATERIAL LIST FOR PROJECT:1 Page: 0  
 TITLE: Tekla Corporation Date: 30.09.2014

No.	Prelim Mk.	Unique ID	Profile	Grade	Length(mm)	Weight(kg)
1		Id: 51175	PL1300*415	C30/37	1950.9	1822.5
		Profile Totals:	1950.9	1822.5		
1		Id: 58534	RHS60*40*4	S235JR	1970.5	11.3
1		Id: 58547	RHS60*40*4	S235JR	1961.7	11.2
1		Id: 58644	RHS60*40*4	S235JR	1970.1	11.3
1		Id: 58654	RHS60*40*4	S235JR	1961.4	11.2
1		Id: 58682	RHS60*40*4	S235JR	2151.1	12.3
1		Id: 58717	RHS60*40*4	S235JR	1902.7	10.9
1		Id: 64944	RHS60*40*4	S235JR	635.6	3.6
1		Id: 64960	RHS60*40*4	S235JR	635.6	3.6
1		Id: 64976	RHS60*40*4	S235JR	635.6	3.6
1		Id: 64990	RHS60*40*4	S235JR	635.6	3.6
1		Id: 65004	RHS60*40*4	S235JR	635.6	3.6
1		Id: 65276	RHS60*40*4	S235JR	635.6	3.6
1		Id: 65290	RHS60*40*4	S235JR	651.5	3.7
		Profile Totals:	16382.5	93.6		
1		Id: 65431	RHS76.1X5	S235JR	1545.2	17.2
1		Id: 65443	RHS76.1X5	S235JR	1545.2	17.2
1		Id: 65452	RHS76.1X5	S235JR	765.0	8.5
1		Id: 65461	RHS76.1X5	S235JR	1545.2	17.2
1		Id: 65470	RHS76.1X5	S235JR	1545.2	17.2
1		Id: 65479	RHS76.1X5	S235JR	1545.2	17.2
1		Id: 65488	RHS76.1X5	S235JR	1545.2	17.2
1		Id: 65497	RHS76.1X5	S235JR	1545.2	17.2
1		Id: 65506	RHS76.1X5	S235JR	1545.2	17.2
1		Id: 65515	RHS76.1X5	S235JR	1545.2	17.2
1		Id: 65524	RHS76.1X5	S235JR	1545.2	17.2

OK



List

Report

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TEKLA STRUCTURES PARTS LIST FOR CONTRACT NO: 1      Page: 1  
CONTRACT: Tekla Corporation                              Date: 30.09.2014

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PartPos	Profile	No.	Material	Length	Area (m2)	Weight (kg)
P/309	15*170	1	S235JR	1733	0.6	30.4
P/333	PL10*150	1	S235JR	190	0.1	2.2
P/334	PL10*90	2	S235JR	190	0.0	1.3
P/339	L61*90*10	1	S235JR	150	0.0	1.7
P/340	O70*10	1	S235JR	1310	0.3	18.9
Total for 6 members:					1.1	55.9

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OK

## BIM ehituses

### Olulisemad projektid:

- Postimaja rekonstrueerimine
- Pärnu Maksimarket
- VKG õlitehased Petroter 2 ja 3
- Ragn Sells AS RDF tehas
- Eesti Energia AS õlitehas

# Ragn-Sells AS RDF tehas



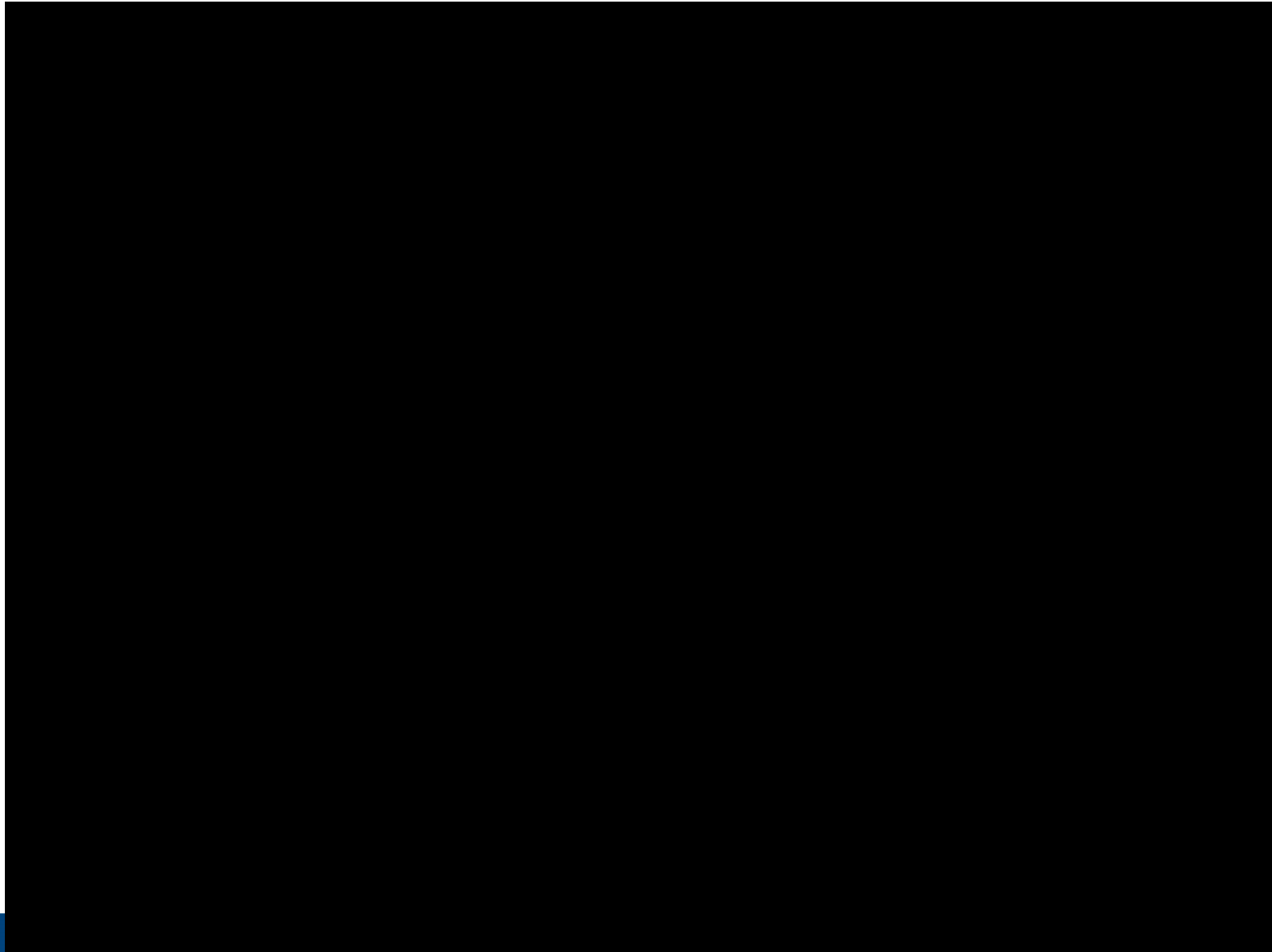
## General Data:

- Area: 9959,5 m<sup>2</sup>
- Height: 15,8 m
- Client: Ragn-Sells AS
- General Contractor: Maru Ehitus AS
- Designer: Maru Ehitus AS

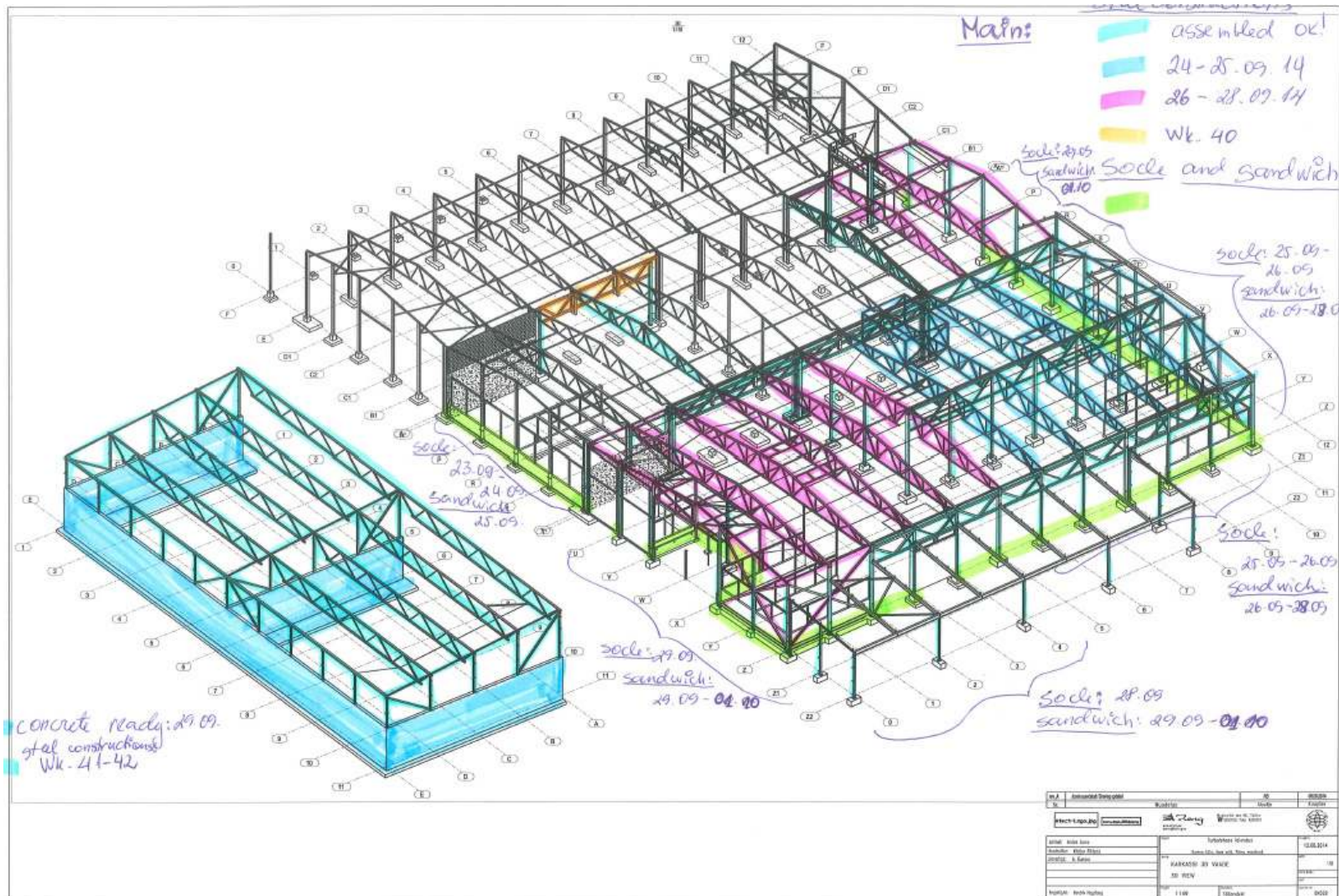




# Ragn Sells – ehitusjuhtimine



# 4D ehitusjuhtimine?

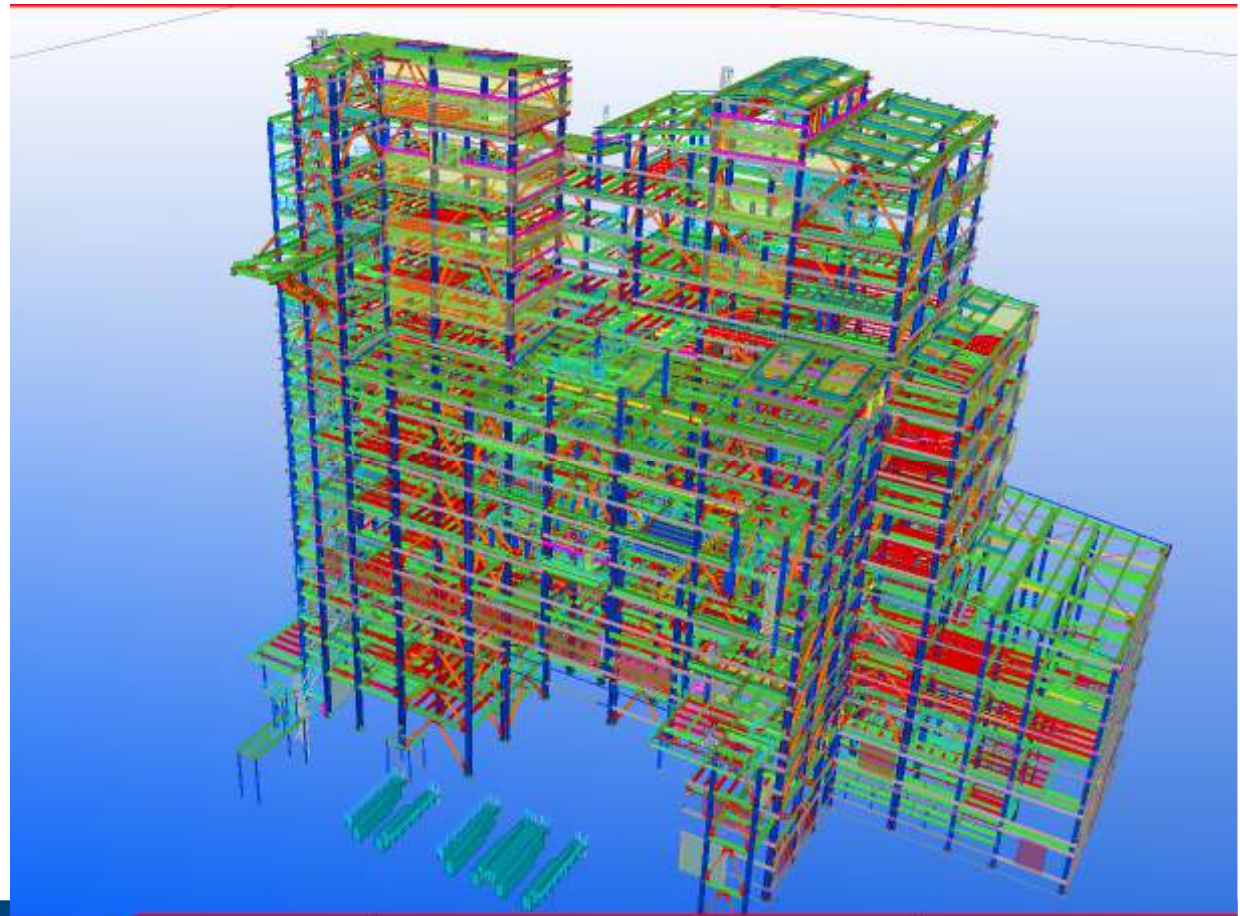


# BIM ehitusplatsil – Eesti Energia Õlitehas.

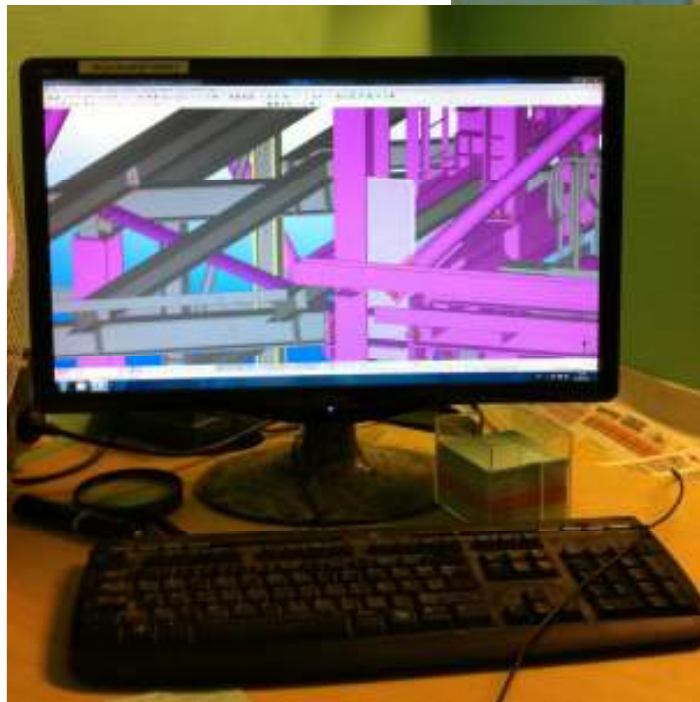


## Oil shale oil factory in Narva

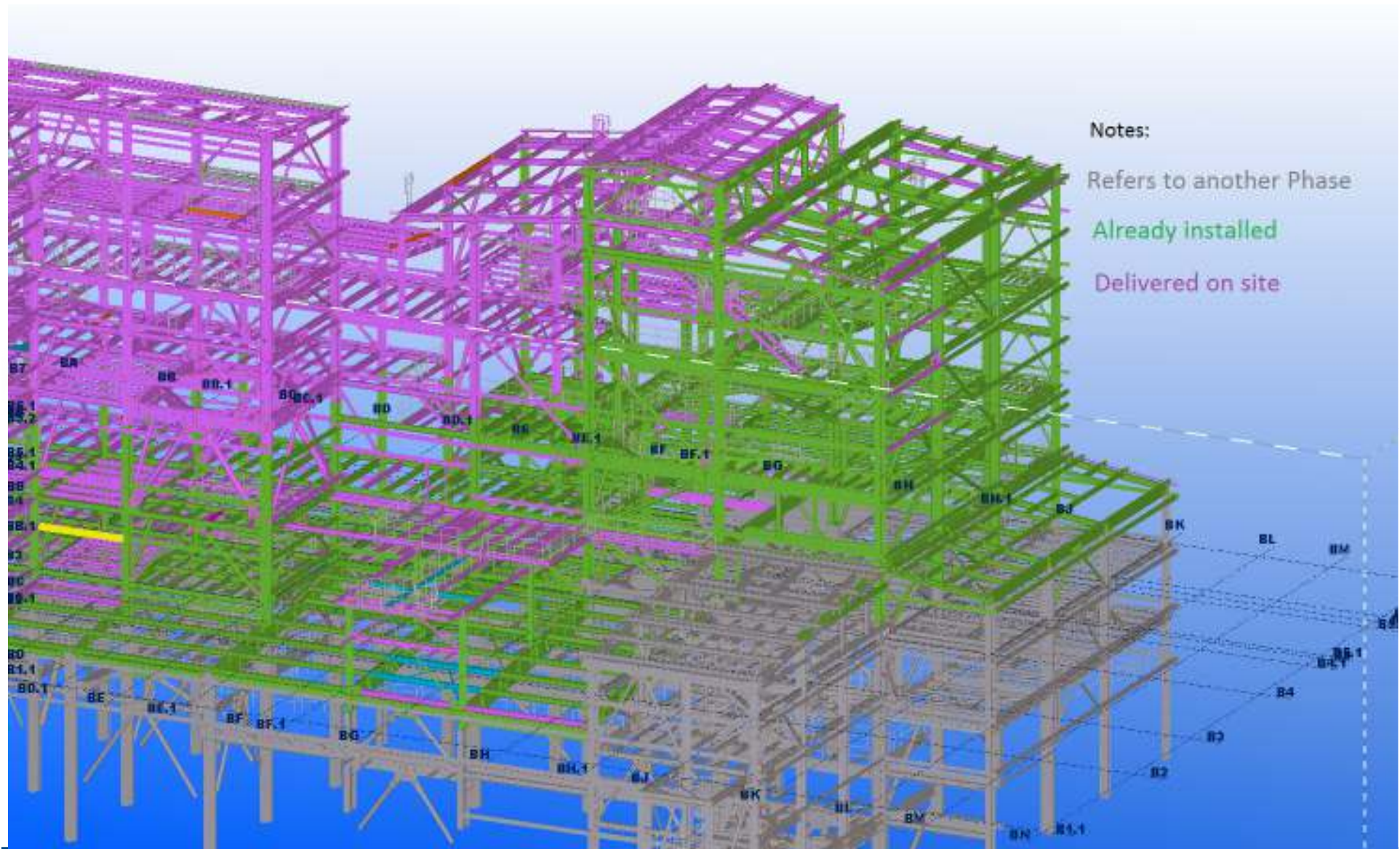
- Client: Eesti Energia AS
- General Contractor: Maru Ehitus AS
- Designer: Outotec / Maru Ehitus AS
- Steel amount: 5100 t.
- Levels/floors: 25
- ~20 000 different steel elements
- ~85 000 elements altogether
- Erection drawings: 9248
- Detail drawings: 19466
- Max height: 70 m







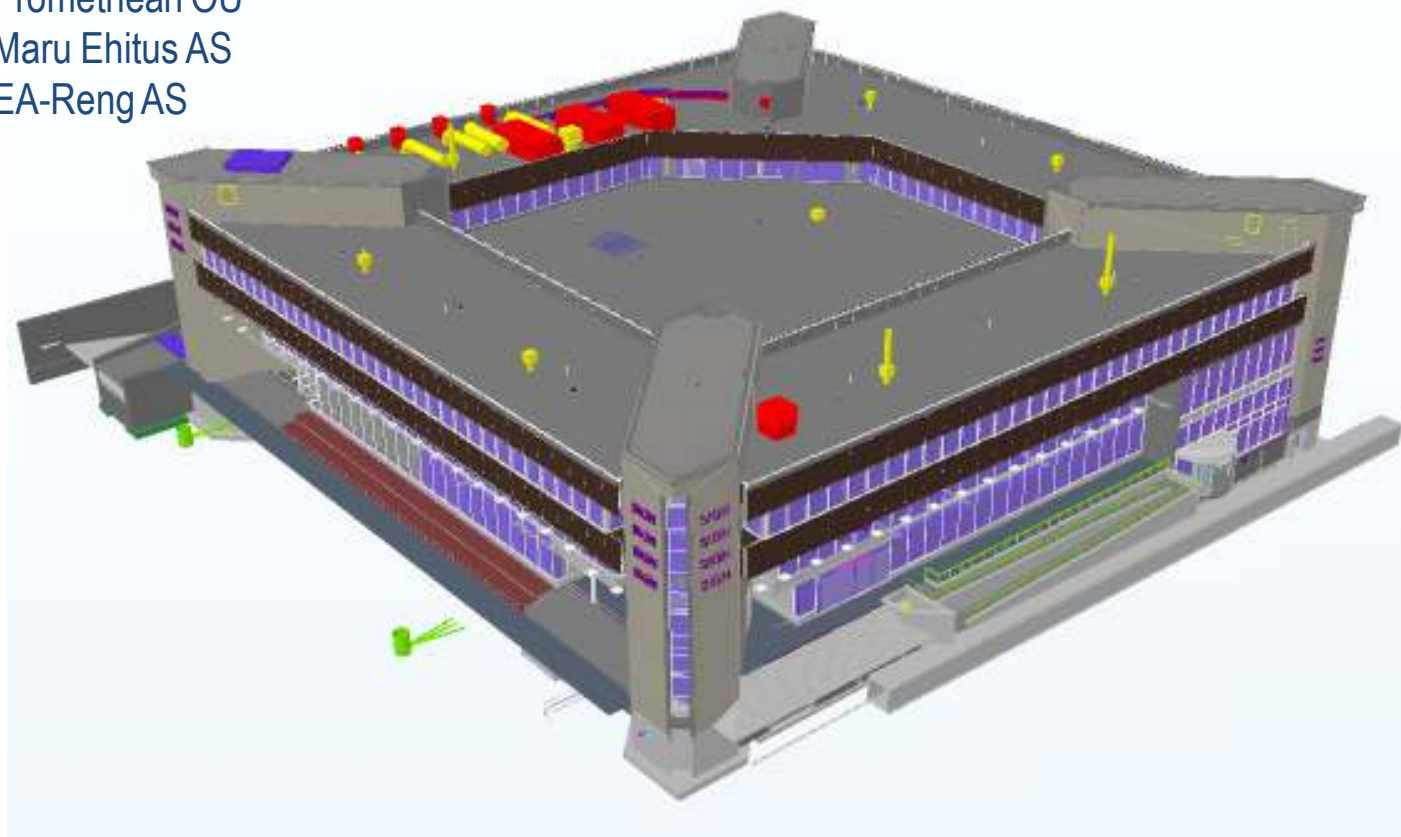
# Eesti Energia õlitehas – tööde planeerimine



## BIM ehituses - Postimaja

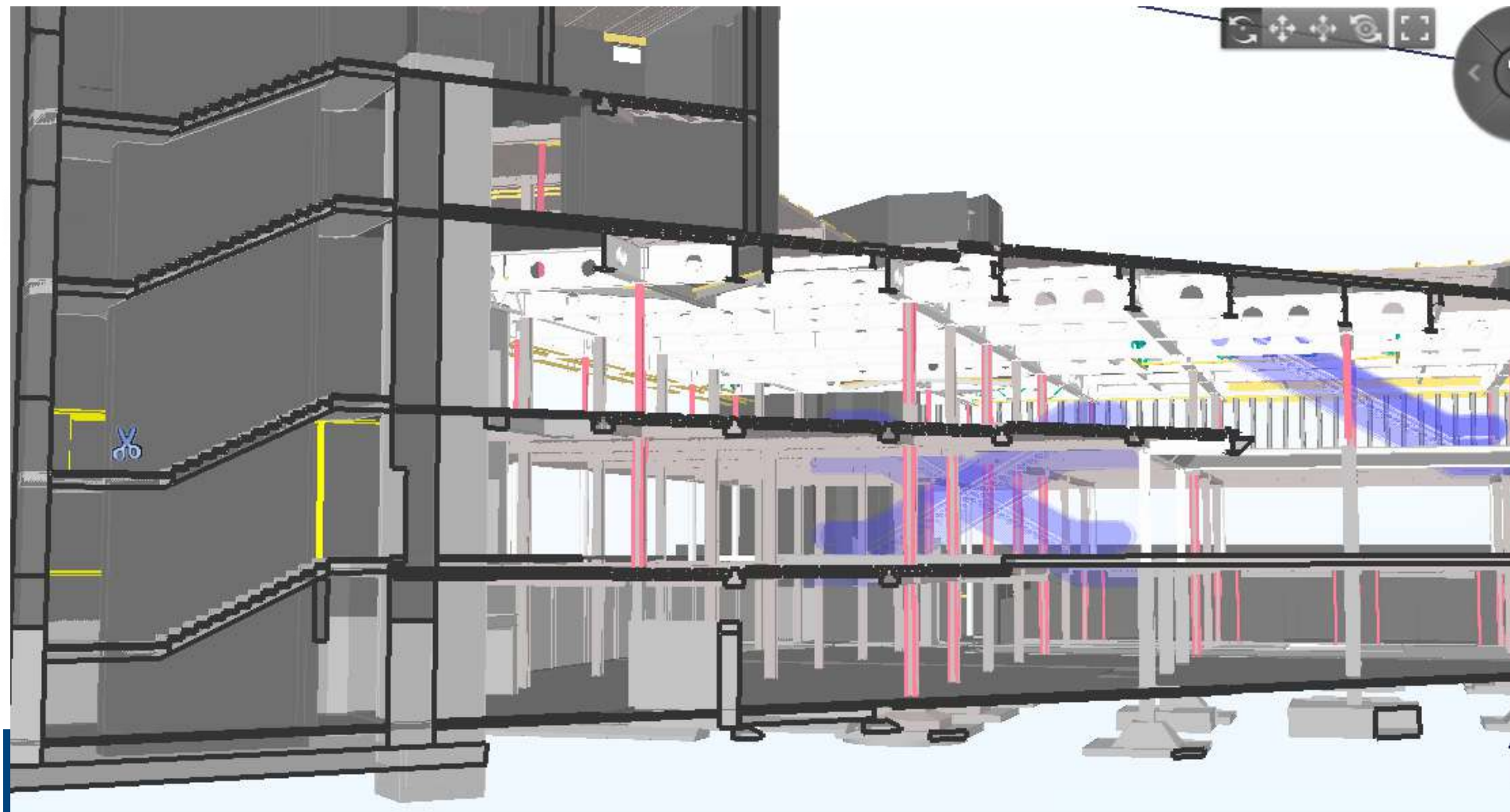
### Postimaja:

- Area: 11 891 m<sup>2</sup>
- Height: 17,1 m
- Client: Promethean OÜ
- General Contractor: Maru Ehitus AS
- Designer: EA-Reng AS



## Postimaja mudel – konstruktiivne osa

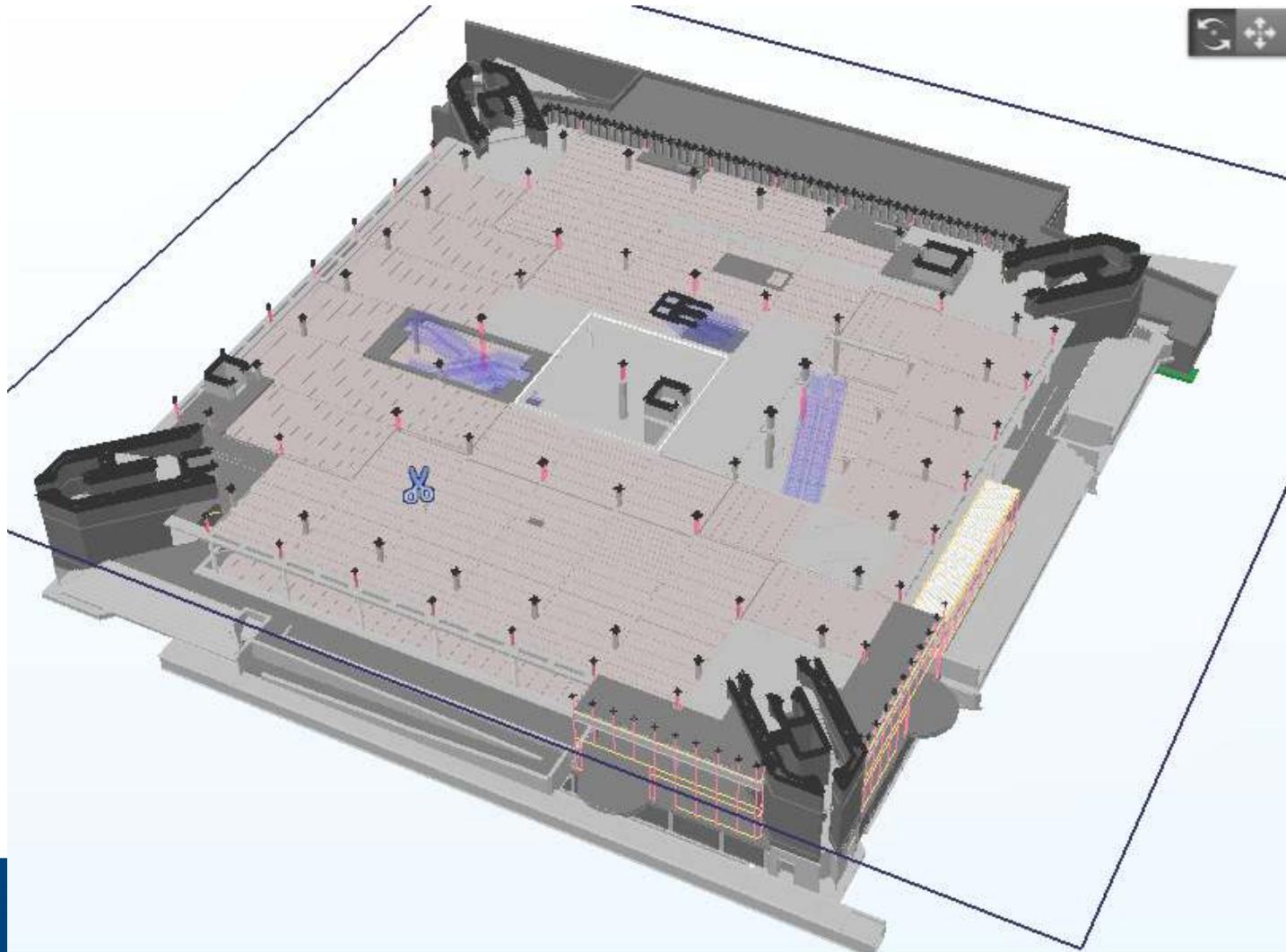
- Olemasoleva osa teostusmudel.
- Suurepärane abimees, sh lammutustöödel.





## Postimaja mudel – konstruktiivne osa

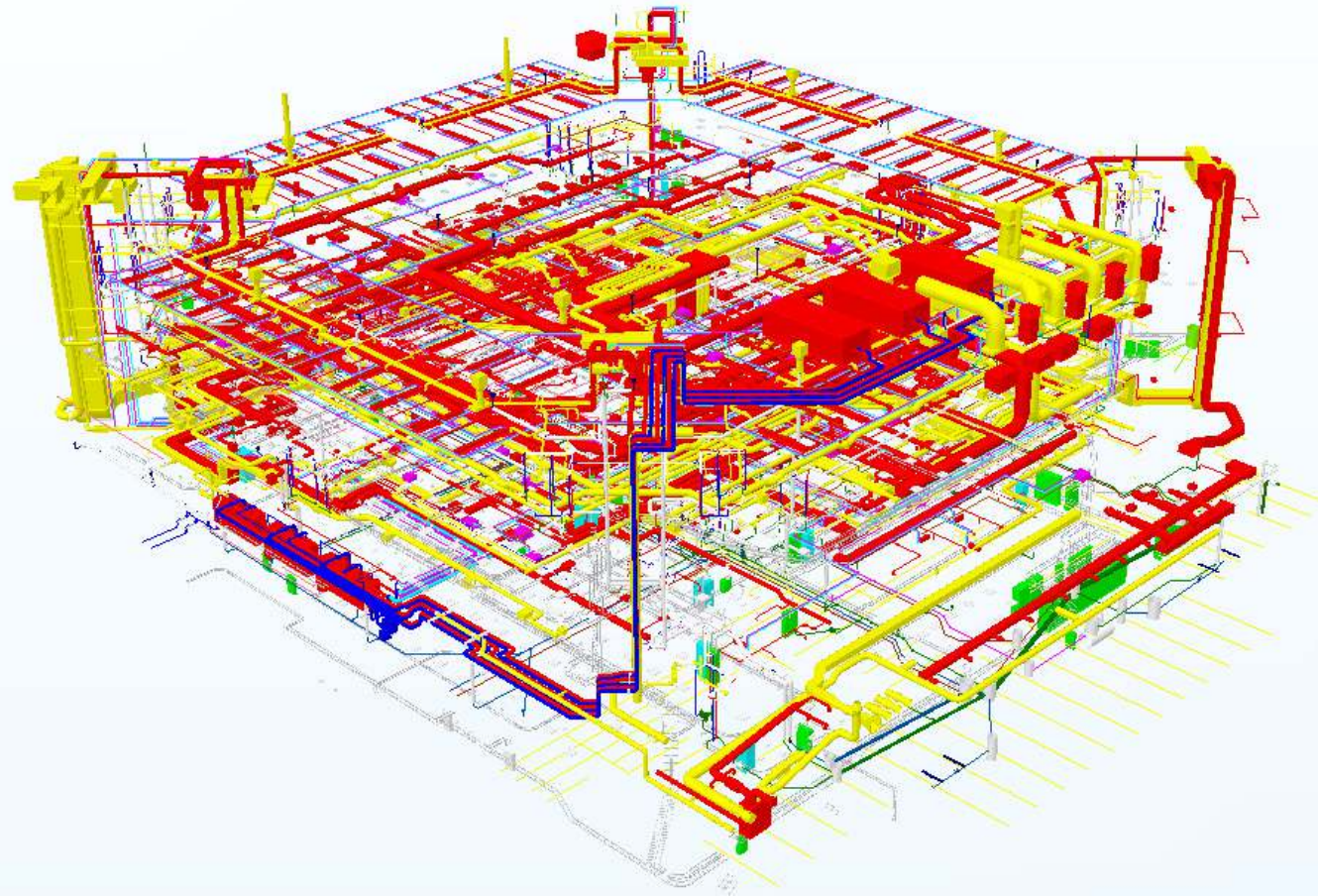
- Olemasolev hoone aastast 1980 = keeruline ja mitmekesine konstruktsioon.



# Postimaja – konstruktiivne osa



# Postimaja – eriosad



## Postimaja – eriosad

- Olemasolev hoone = madal korruste kõrgus = madalad ripplaed ja minimaalne ruum eriosadele.
- Ripplagede plaanid koos eriosadega.



# Postimaja – eriosad



# Postimaja – eriosad





## Postimaja BIM



### Kogemused BIMi kasutamisest Postimaja näitel:

- Mudel peab olema täpne, sh olemasolevat hoonet kajastav mudel.
- Muudatuste puhul tuleb kõiki mudeli osi uuendada.
- Paljud alltöövõtjad oskavad juba mudelit küsida.
- Ilma BIM-mudelita ei oleks hoone valminud tähtaegselt.





Thank You!  
[www.maru.ee](http://www.maru.ee)



## References

## PRODUCTION AND WAREHOUSE/OFFICE BUILDINGS

- Enrichment Plant in VKG Ojamaa mine
- Nestle Purina warehouse in Kaluga Oblast, Russia
- Baltic Workboats production facility extension
- Avies airplane hangar and office building
- Intersad warehouse and office building
- Costas Invest warehouse and office building

## PUBLIC AND SPORTS BUILDINGS

- K-Rauta store in St. Petersburg
- Steel structures of the Saku Arena
- Roof structure for the multifunctional Arena Riga
- Audentes Sports Complex
- Lilleküla Football Stadium grandstands
- Steel structures for football arenas in Reydarfird, Iceland
- Steel structures for the Tallinn Airport Annex

## INDUSTRIAL BUILDINGS

- Enefit-280 Oil Plant steel structures, walls and claddings
- Enefit-280 Fuel Handling System Civil Works
- VKG Ojamaa mine FHS (Fuel Handling System)
- Wienerberger Aseri brick factory
- Galv-Est galvanization plant
- Eesti Kraanavabrik production plant
- Awila technological buildings

## OFFICE BUILDINGS

- Baltic Disc office building
- MARU office building

## APARTMENT HOUSES AND DWELLINGS

- Apartment buildings in Tallinn at Kunderi põik 4-8
- Apartment Buildings in Pärnu on Paju street 5

### PRODUCTION AND WAREHOUSE/OFFICE BUILDINGS

- Ragn-Sells RDF (refuse derived fuel plant)
- Baltic Workboats production facility extension
- Enrichment plant in VKG Ojamaa mine
- Valga Gomab Mööbel refinement hall
- Technomar industrial building
- ASVA warehouse and office building
- Printall production plant
- Konesko warehouse and office building
- Estat Paber copybook factory
- Assistor warehouse and office building
- Baltic Disc commercial and industrial building
- Fors MW warehouse and industrial
- Smarten Logistics logistics centre building
- Tallinna Elektrotehnikatehas (ESTEL)
- Intersad warehouse

### PUBLIC AND SPORTS BUILDINGS

- K-Rauta store in St. Petersburg
- Espak store in Paide
- Ehitus Service store
- Lasnamäe Athletics Hall
- Roof structure for the multifunctional Arena Riga
- FEB Tartu sales office
- Palamuse Rural Municipality Building
- Bank of Estonia gallery
- Lilleküla Football Stadium grandstands

### APARTMENT HOUSES AND DWELLINGS

- Sõpruse pst 244 apartment building renovation
- Tammsaare tee 71 apartment building renovation
- Apartment/commercial building in Tallinn on Aia street
- Apartment buildings in Pärnu at Paju St. 5

## Construction



### INDUSTRIAL BUILDINGS

- Enefit -280 Oil Plant steel structures , walls and claddings
- VKG Ojamaa mine FHS (fuel handling system)
- Helme CHP (combined heating and power plant)
- Launkalne CHP (combined heating and power plant)
- Kyröskoski CHP (combined heating and power plant)
- Vão CHP( combined heating and power plant)
- Galv-Est galvanization plant
- Stora Enso Timber joist factory
- Wienerberger Aseri brick factory
- Lihula Bio-boiler house

### INFRASTRUCTURE

- Assistor storage area for cars
- Oil shale compound storage and bridge for Eesti Energia Kaevandused

### OFFICE BUILDINGS

- MARU office building
- Frelok office building