



Material Handling Forum
Opslagmethoden en opslagtechnieken

Praktijkcase



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November 16, 2011

1. Introduction

2. Feasibility study:
how to determine storage
and handling system?

3. Realization:
specific elements of implementation,
what are lessons learnt?

Introduction Groenewout and Sandvik



- Founded in 1966
- Professional consulting in Logistics and Supply Chain Management
- Supply chain optimization and detailed designs of manufacturing- and distribution centers.



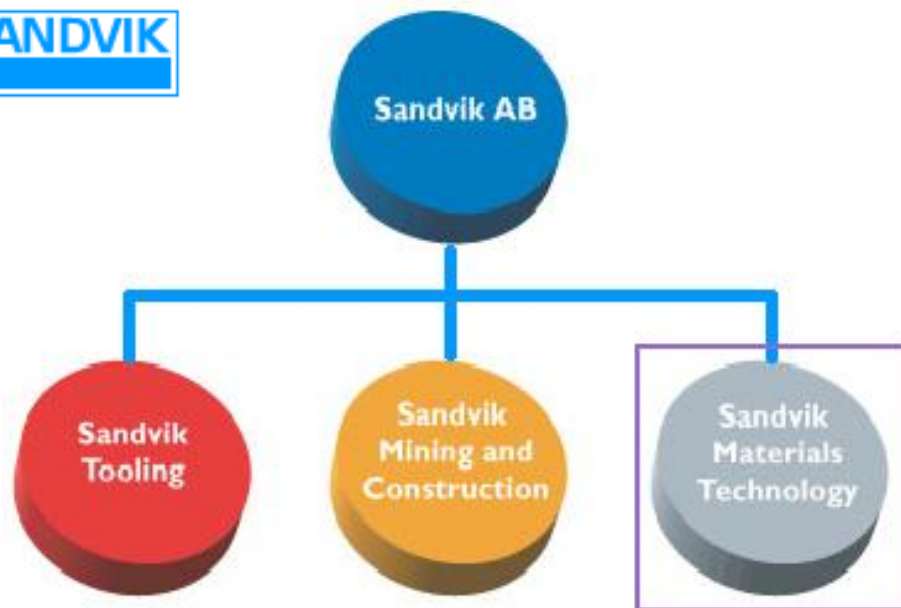
Supply chain management



Warehousing & manufacturing



Assets & facilities



Sandvik Materials Technology
leading manufacturing of stainless steels such as:

- Tubes and pipes



- Fittings and flanges



Introduction – characteristics Sandvik operation

- Products: Fittings and Flanges
- Load types:
 - Large items: palletized on Euro pallets, some items > 35 kg
 - Small items: items < 0,1 kg
- Stock volumes:
 - ± 4.000 SKUs
 - ± 3.500 pallets
 - ± 3 months of stock
- Order flows: relatively low number of orders and orderlines
- Packing activities: majority of FTE in packing

Agenda

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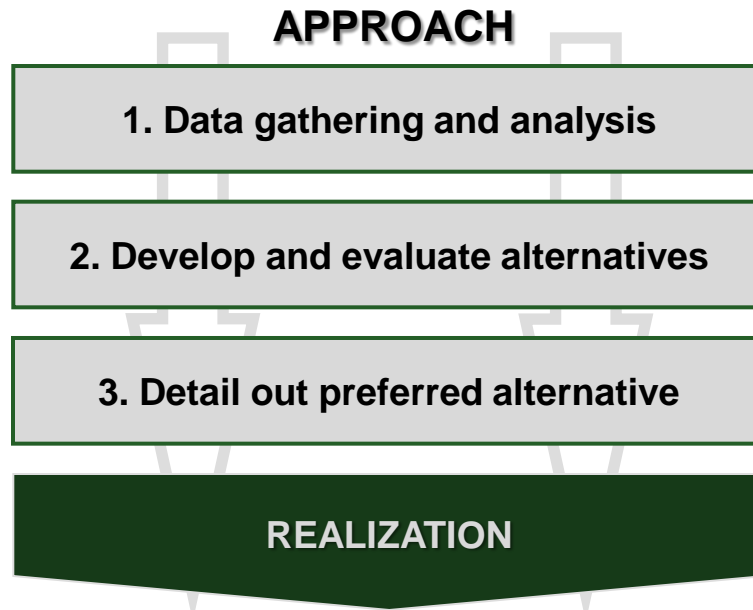
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what are lessons learnt?

Project question and approach

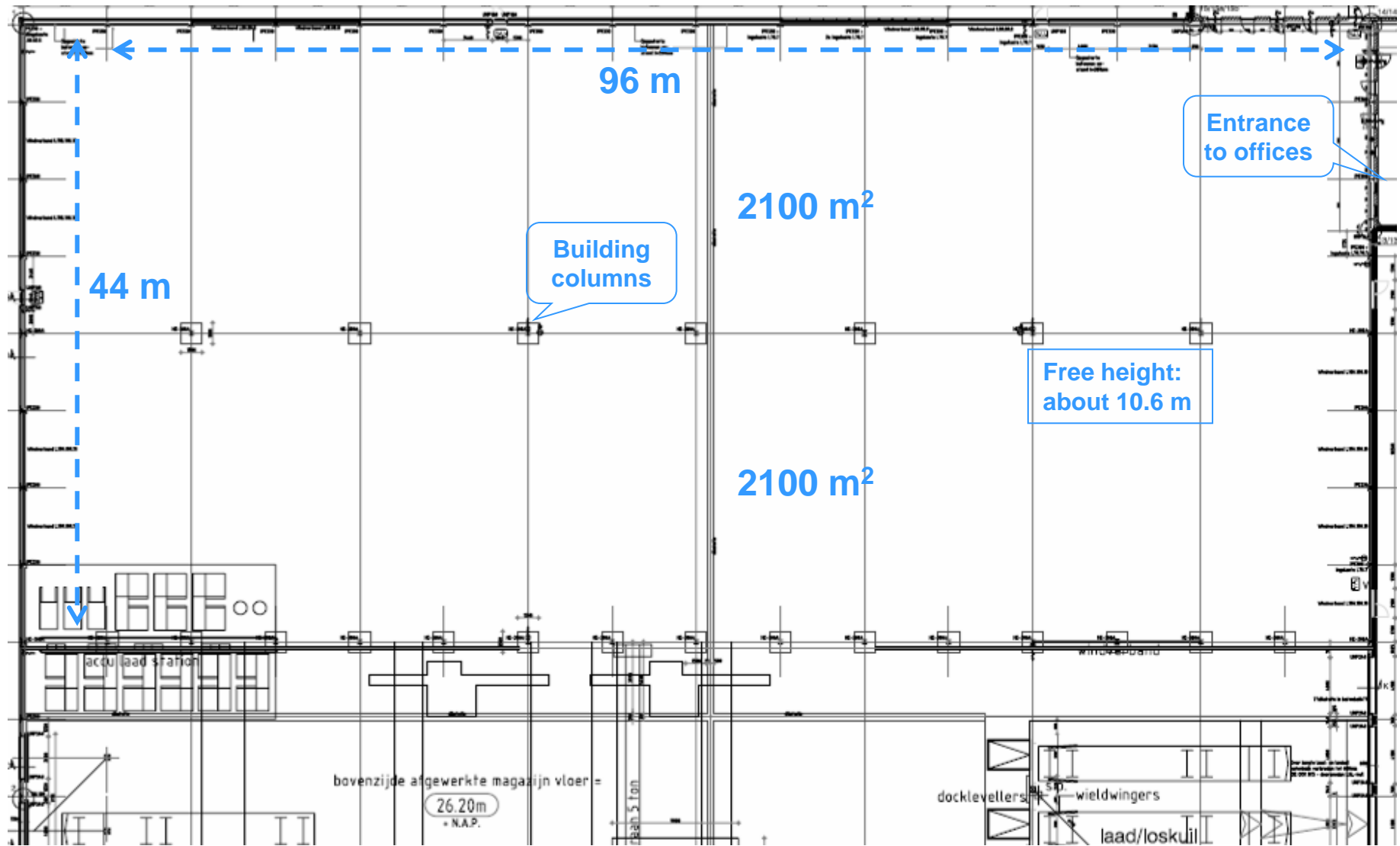
Question:

- In next few years flows and stock will grow
- Existing operation has to be moved to another building

→ **What is the most optimal storage and handling solution?**



Available space – 4.200 m²

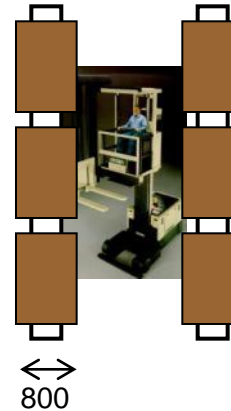


Possible solutions – large (palletized) items

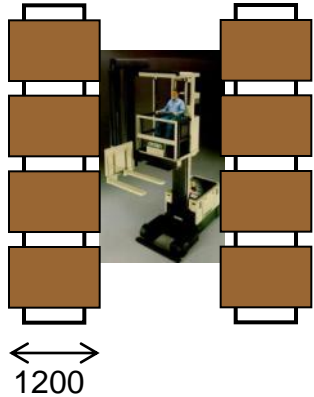
Alt 1: Wide aisle with reachtrucks



Alt 2: Narrow aisles; pallets 800 mm in depth



Alt 3: Narrow aisles; pallets 1200 mm in depth



Alt 4: High Bay with automatic cranes

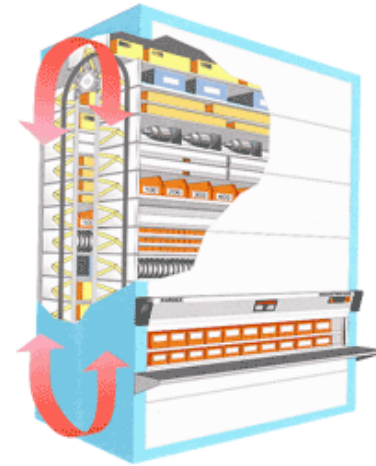


Possible solutions – small items

Alt 1: Shelving



Alt 2: Paternoster

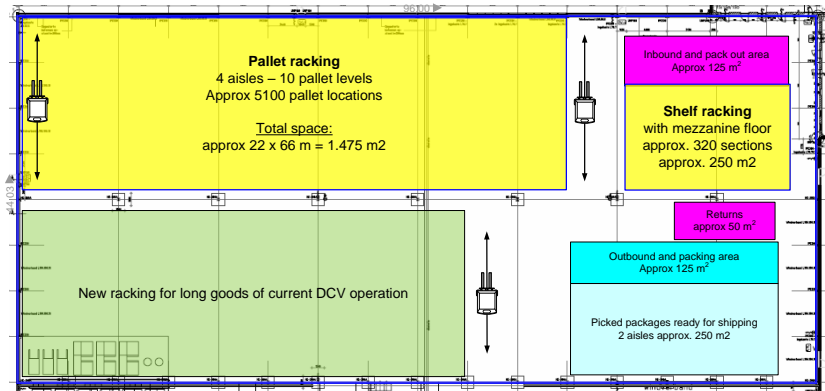


Alt 3: Miniload

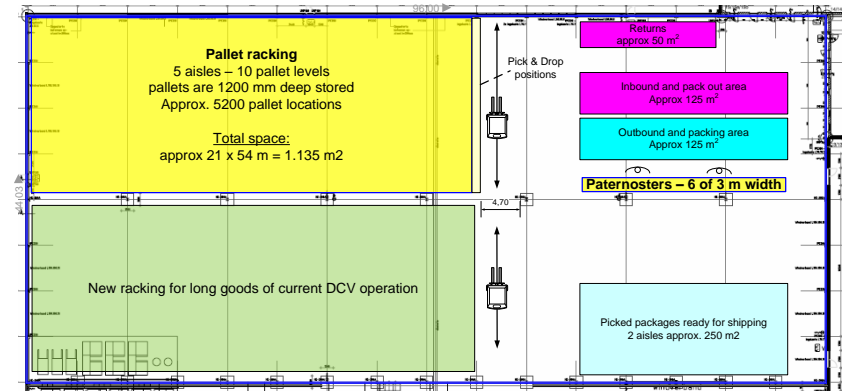


Comparison of alternatives – lay-out plans

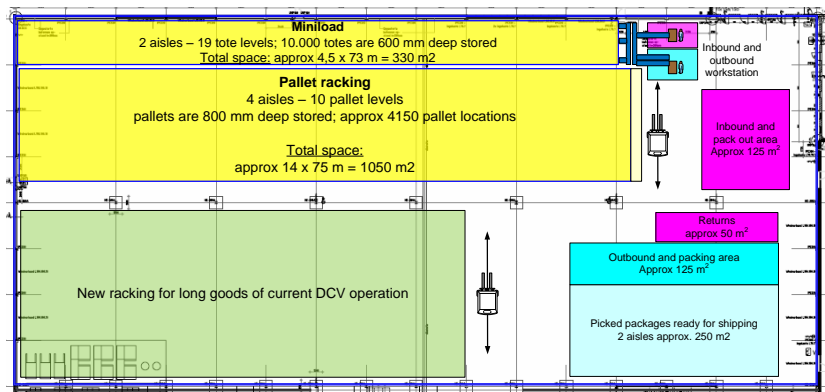
Alt 1: Wide aisles and Shelving



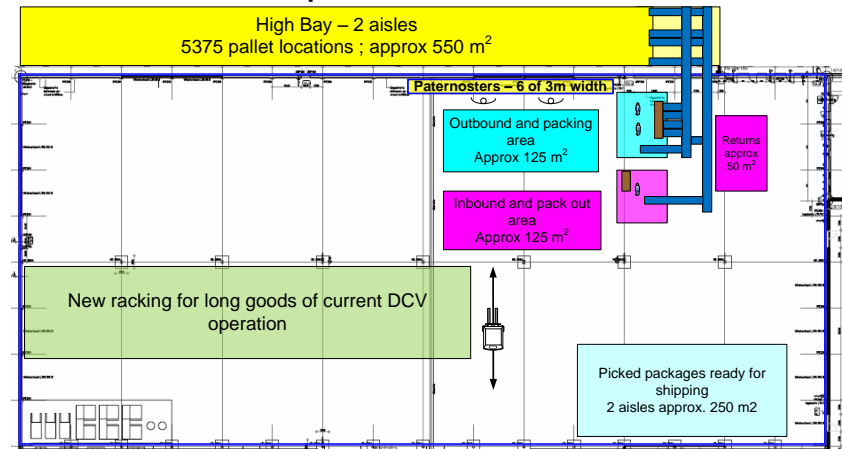
Alt 2: Narrow aisles and Paternoster






Alt 3: Narrow aisles and Miniload



Alt 4: Automatic pallet cranes and Paternoster



Results detailed comparison of alternatives – small items

Criteria	Weight	SCORE per criteria*				Weighed Score		
		1. Shelving	2. Patern	3. Miniload		1. Shelving	2. Patern	3. Miniload
Estimated investment	20%	✓ 5	✗ 1	✗ 1		1,0	0,2	0,2
Estimated operational cost	25%	✓ 5	✗ 1	✗ 1		1,3	0,3	0,3
Use of space	5%	✗ 1	✓ 5	✗ 2		0,1	0,3	0,1
Extension possibilities	10%	✗ 2	✓ 4	✗ 1		0,2	0,4	0,1
Reliability processes	10%	✓ 5	! 3	! 3		0,5	0,3	0,3
Flexibility lay-out and processes	10%	✓ 4	✗ 2	✗ 1		0,4	0,2	0,1
Ergonomics	10%	! 3	✓ 4	✓ 4		0,2	0,3	0,3
Impact on existing IT systems	5%	✓ 5	✓ 5	✗ 1		0,3	0,3	0,1
Required building modifications	5%	! 3	✓ 4	✗ 2		0,2	0,2	0,1
TOTAL	100%					 4,0	 2,4	 1,5

Shelving is preferred solution for small items



Similar comparison for palletized items resulted in:
Combination of narrow aisles and wide aisles

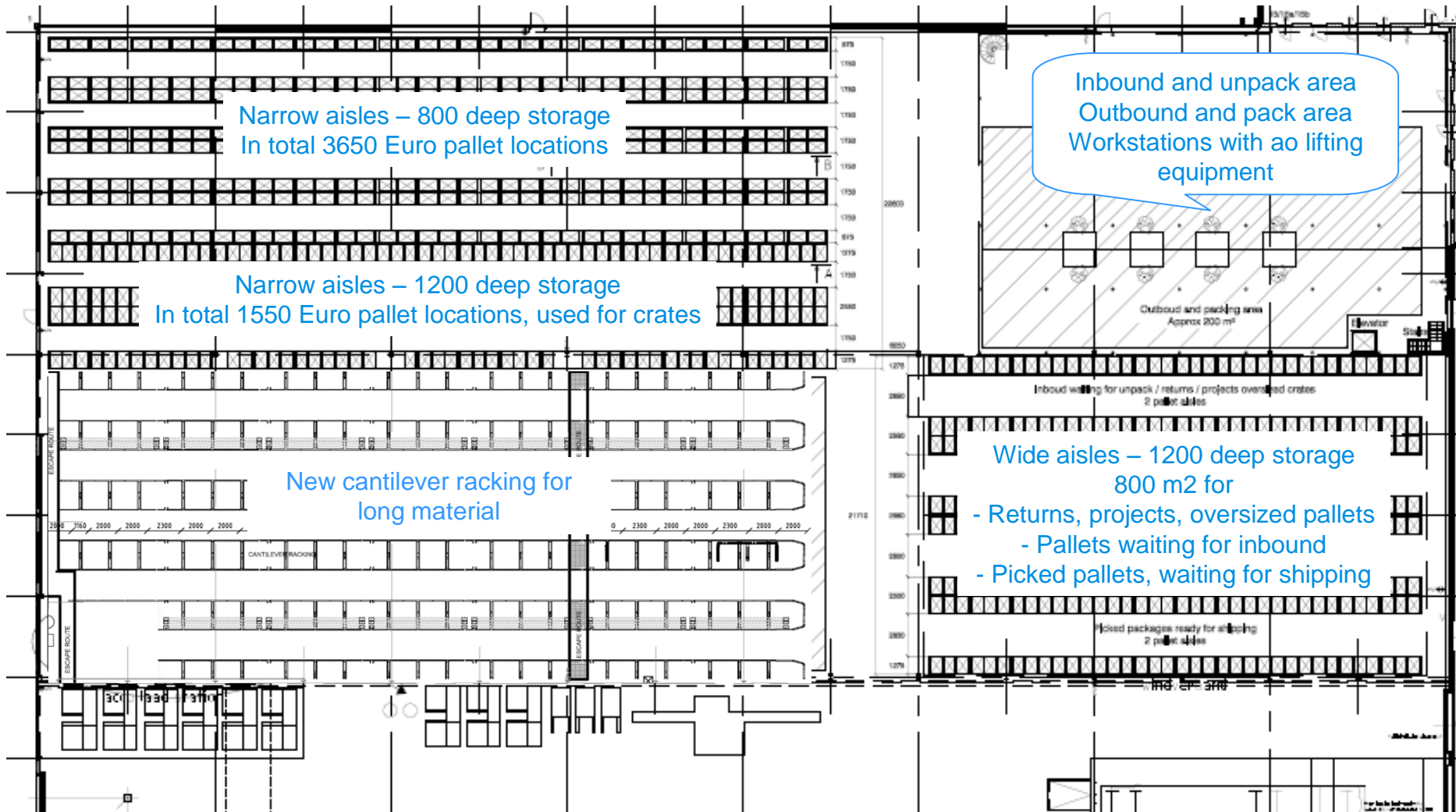
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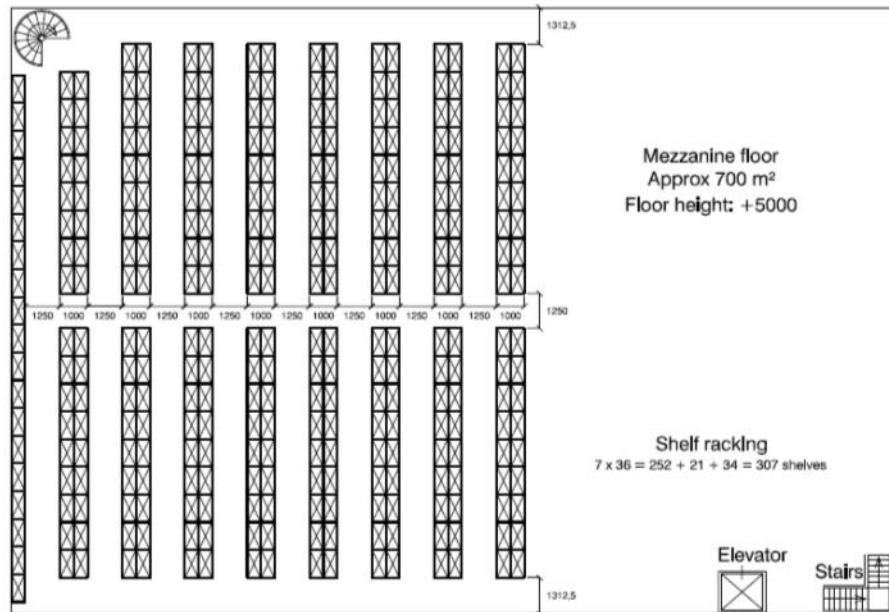
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Detailed lay-out design (1)

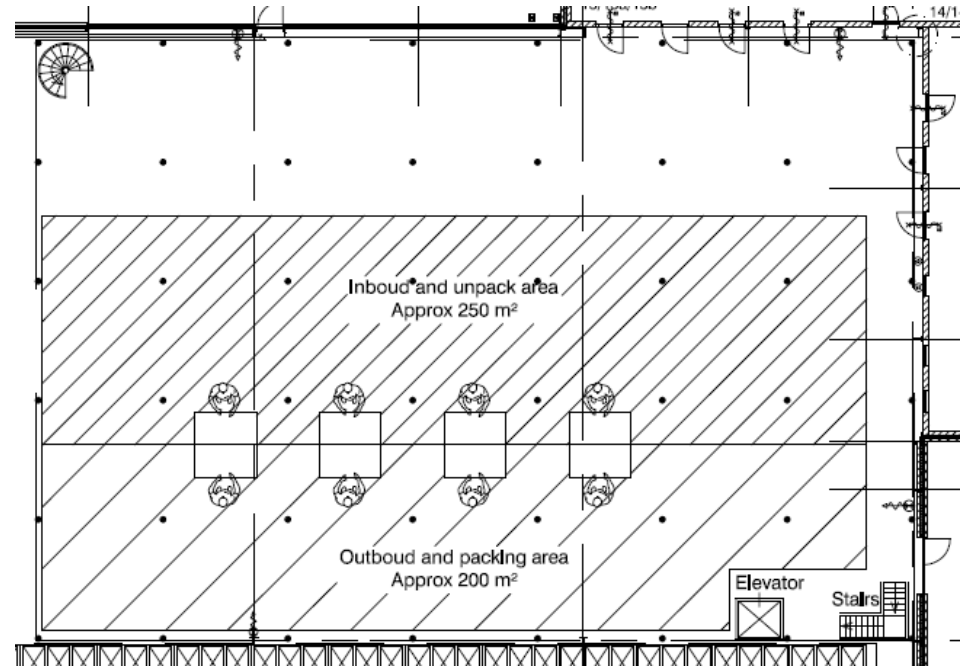


Detailed lay-out design (2)

Shelving area on mezzanine:



Mezzanine at 5 m in height



Ground floor below mezzanine



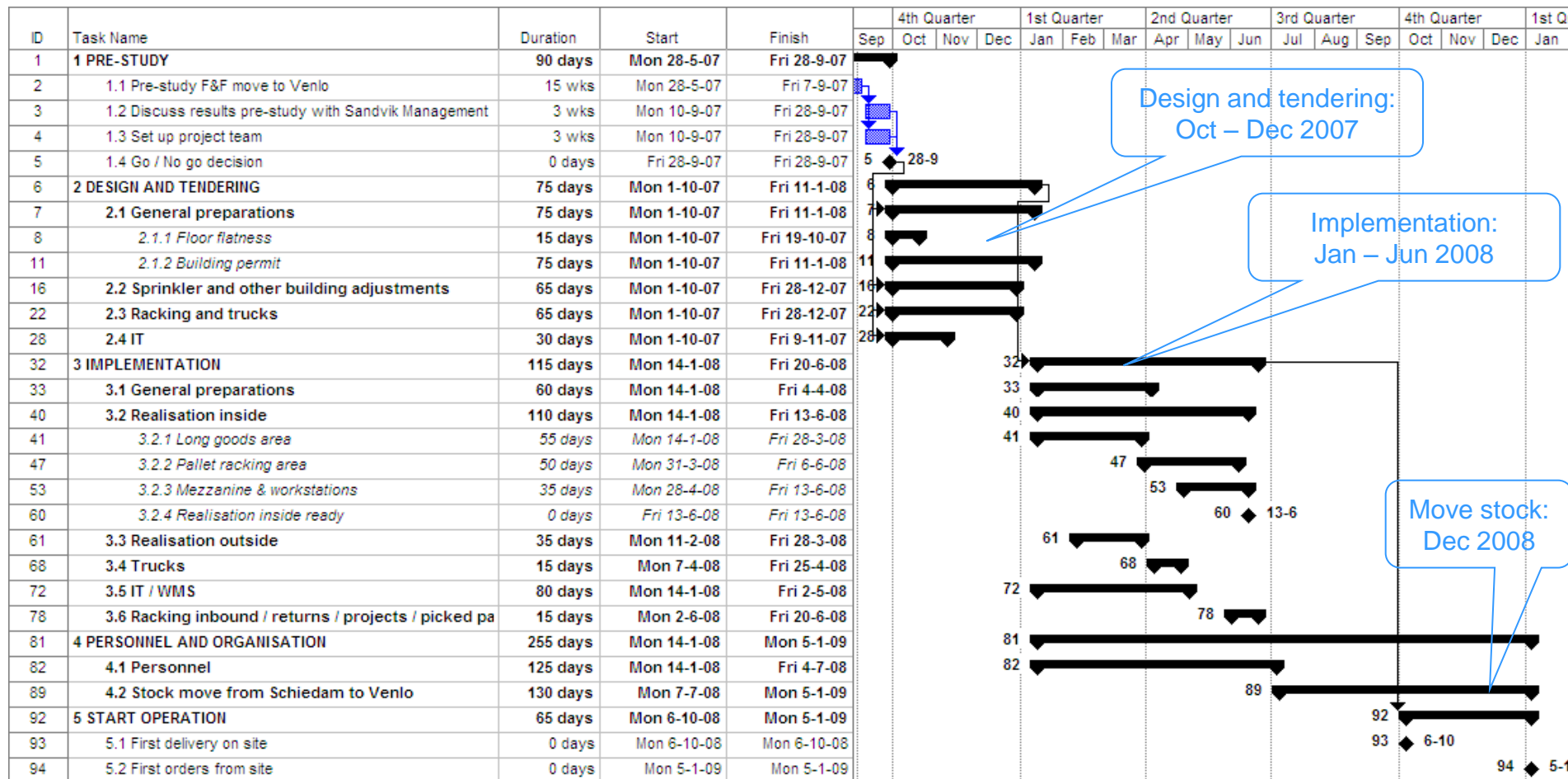
Pictures of realization (1)

Start – 4200 m2 (almost) empty building



Long material is moved to new cantilever racking

Implementation schedule

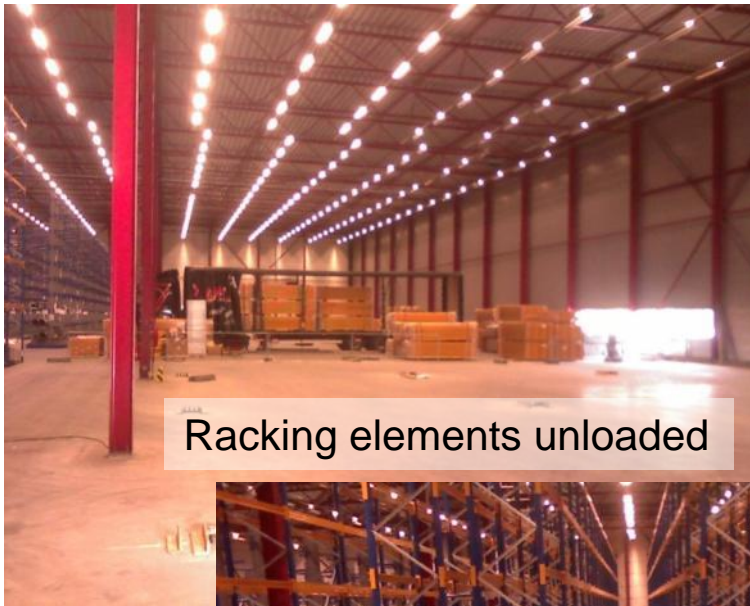


Pictures of realization (2)

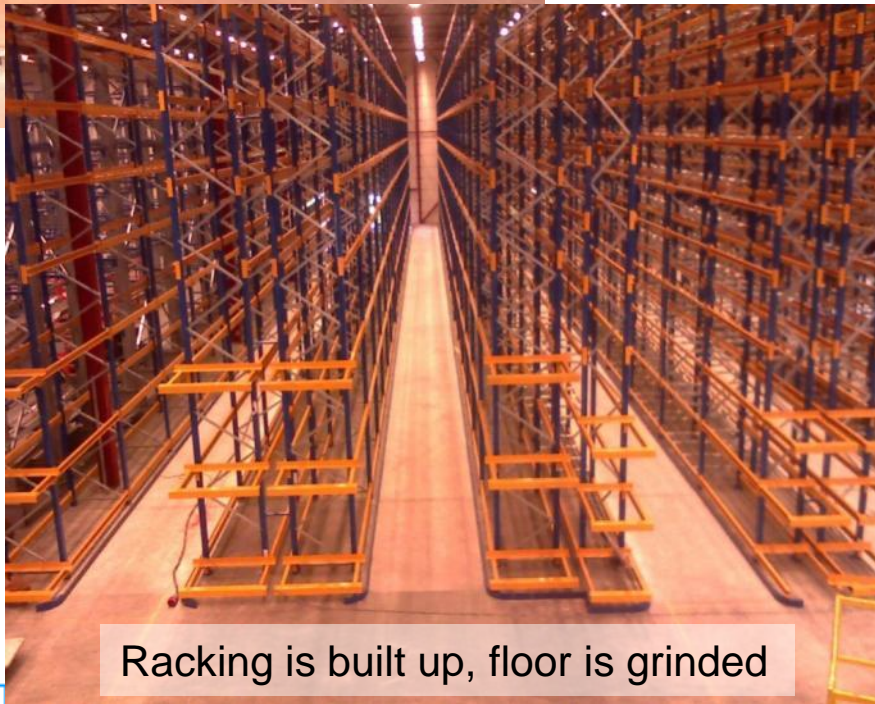
Construction of mezzanine



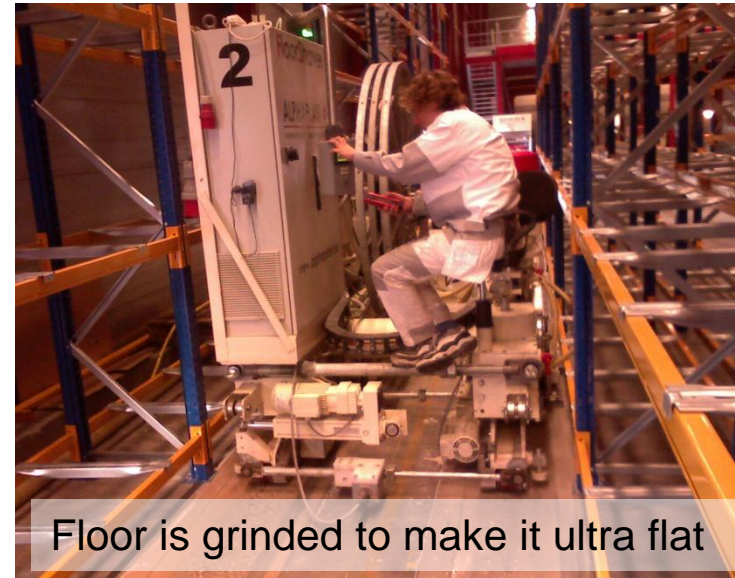
Pictures of realization (3) – pallet racking narrow aisles



Racking elements unloaded



Racking is built up, floor is grinded



Floor is grinded to make it ultra flat



Pallets moved to new racking

• GROENEWOUT •

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