



## 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.



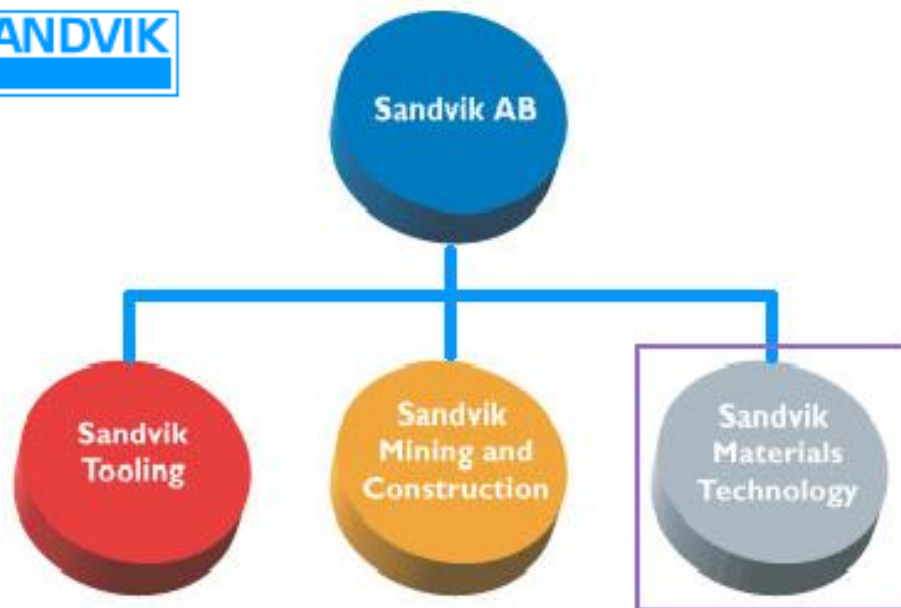
**Supply chain management**



**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:
  - $\pm 4.000$  SKUs
  - $\pm 3.500$  pallets
  - $\pm 3$  months of stock
- Order flows: relatively low number of orders and orderlines
- Packing activities: majority of FTE in packing

# Agenda

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**2. Feasibility study:**  
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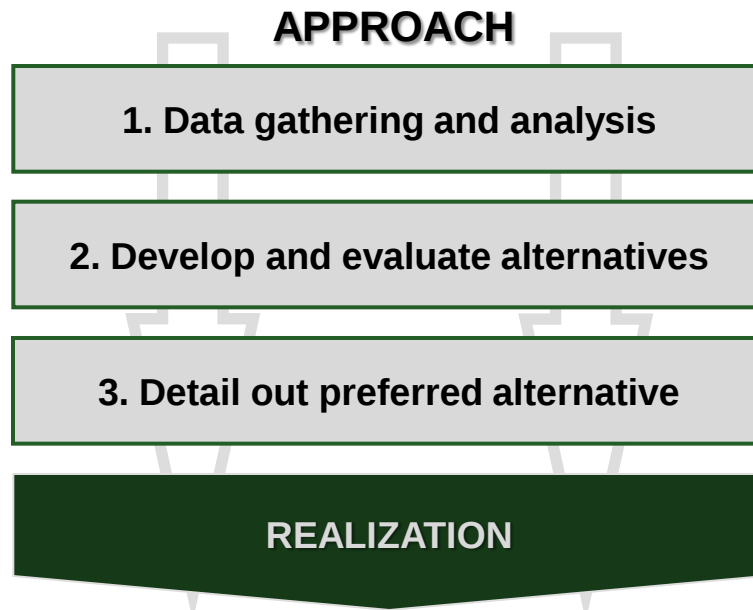
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# Project question and approach

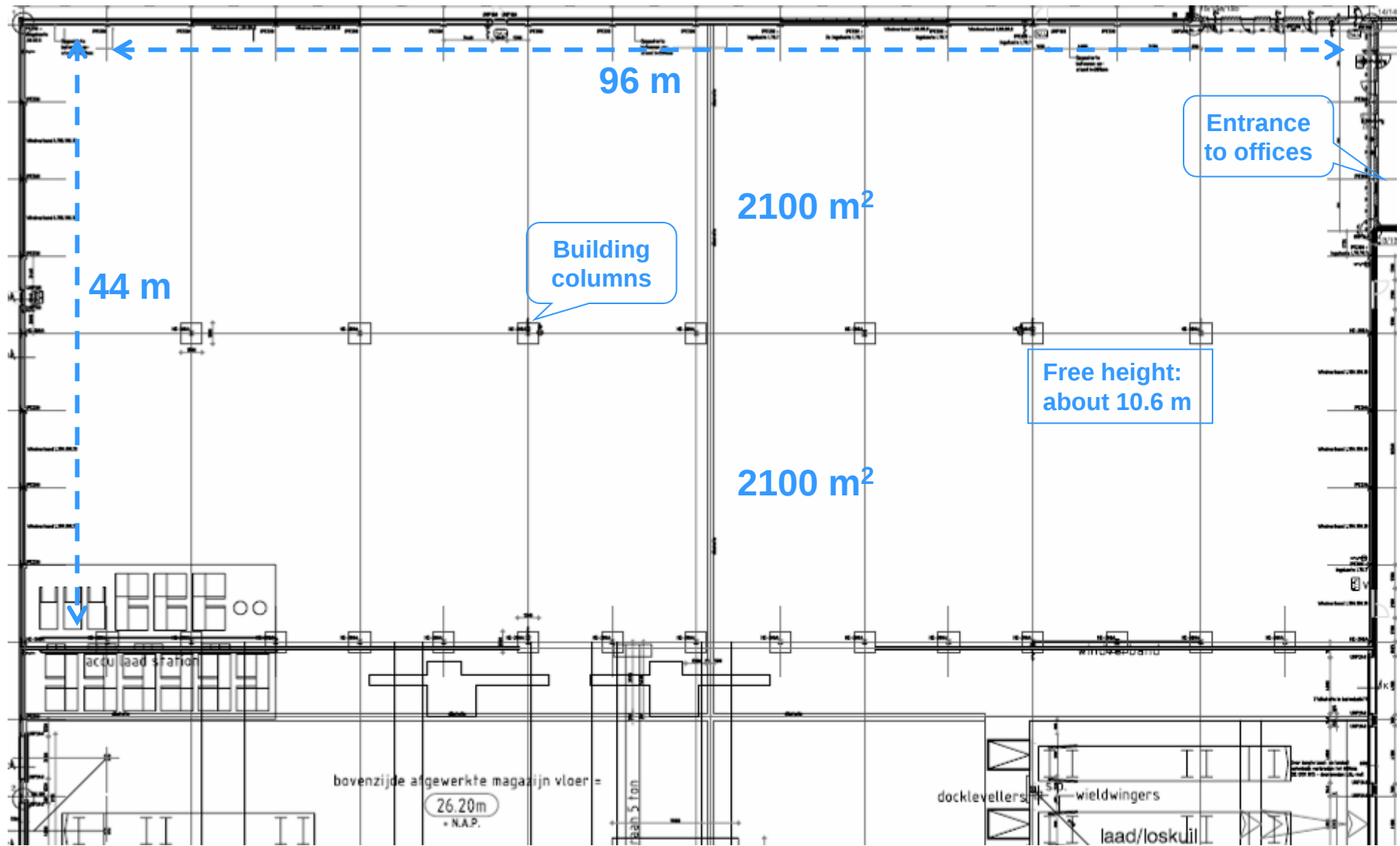
Question:

- 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 m<sup>2</sup>

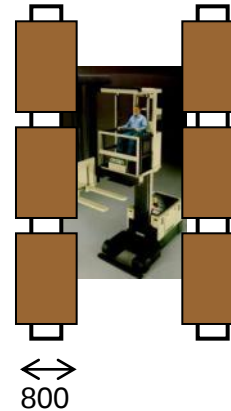


# Possible solutions – large (palletized) items

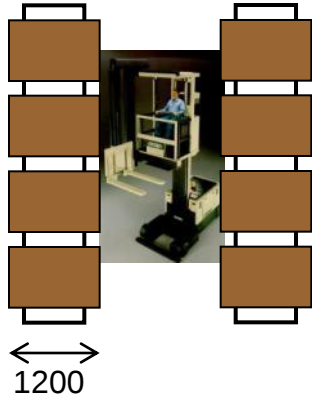
Alt 1: Wide aisle with reachtrucks



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

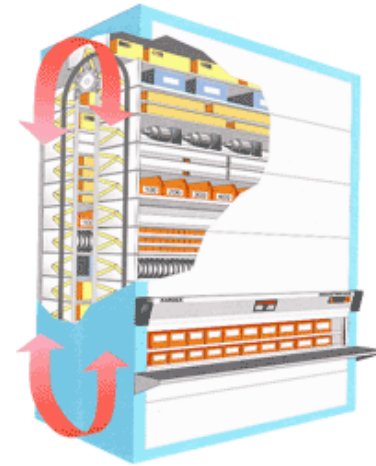


# Possible solutions – small items

Alt 1: Shelving



Alt 2: Paternoster

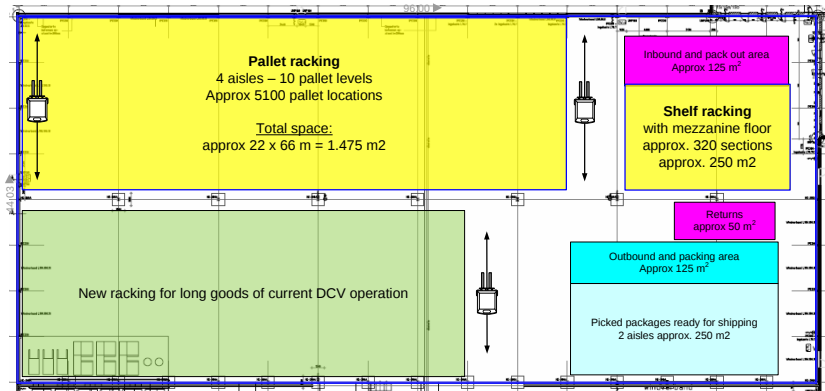


Alt 3: Miniload

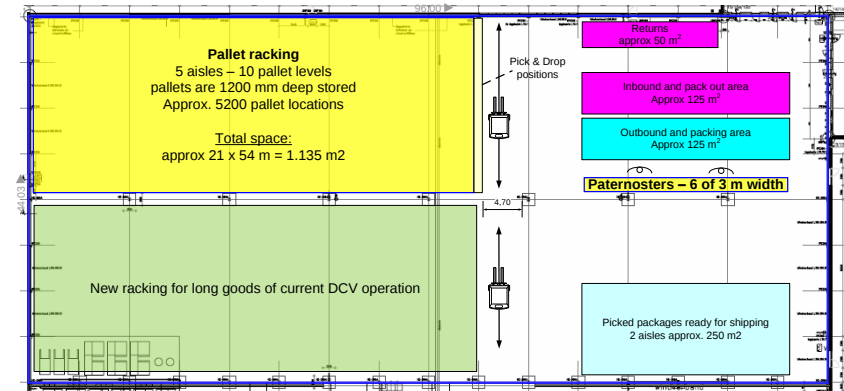


# Comparison of alternatives – lay-out plans

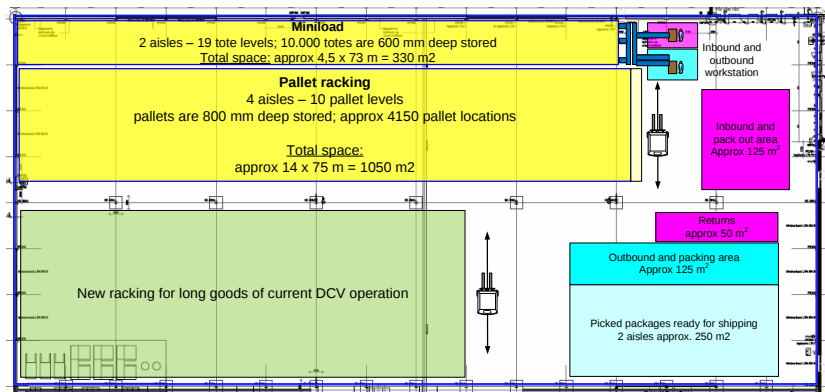
## Alt 1: Wide aisles and Shelving



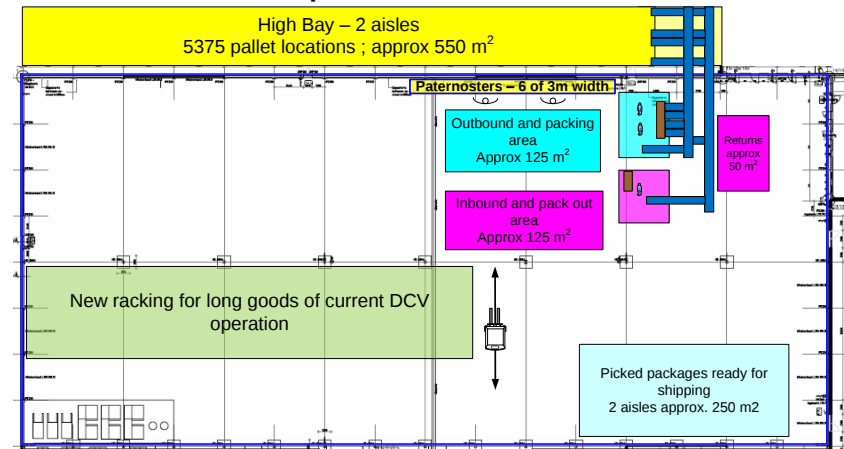
## Alt 2: Narrow aisles and Paternoster



## 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                                                                                            |
| <b>TOTAL</b>                      | <b>100%</b> |                     |   |           |   |             |   |  <b>4,0</b> |  <b>2,4</b> |  <b>1,5</b> |

Shelving is preferred solution for small items



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

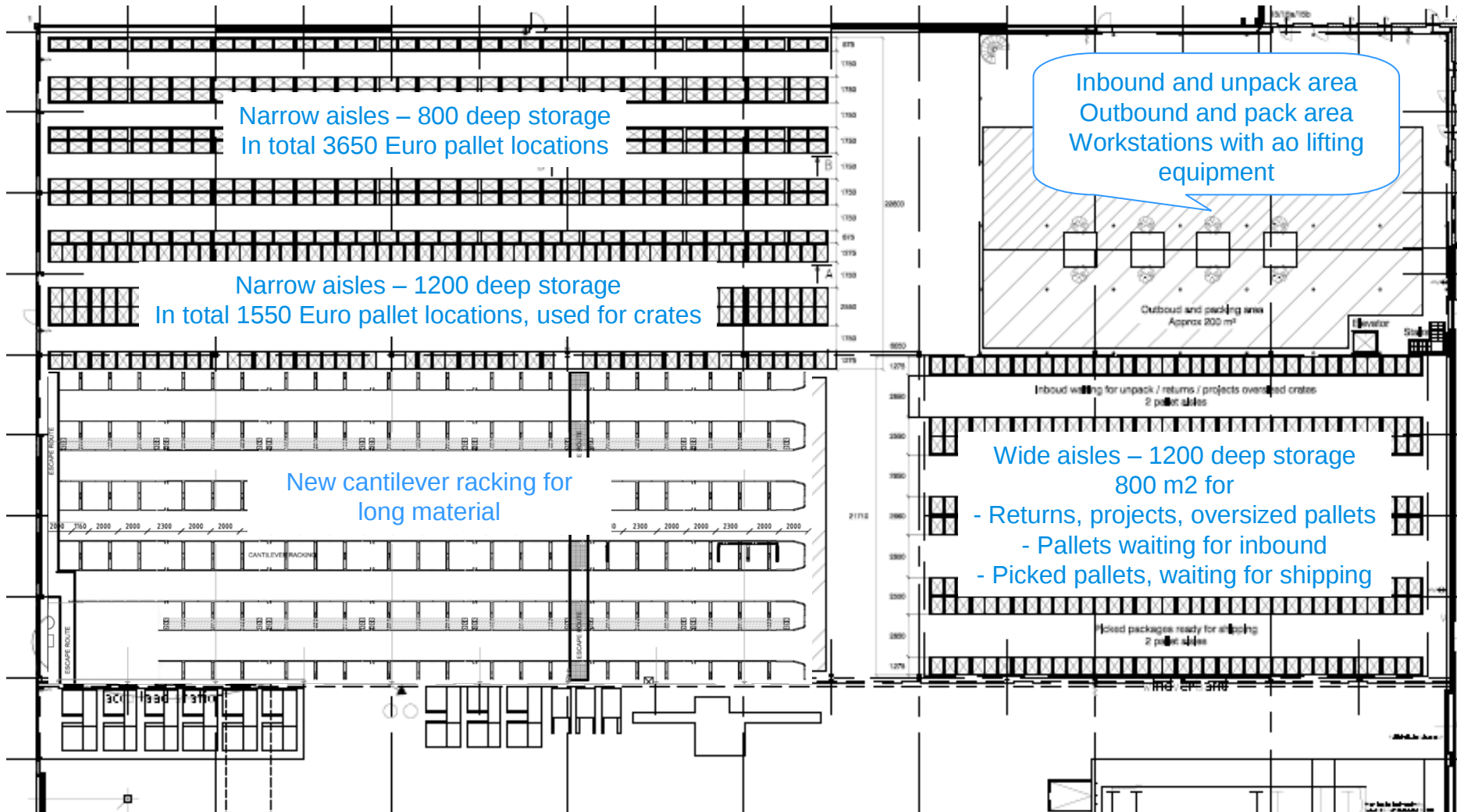
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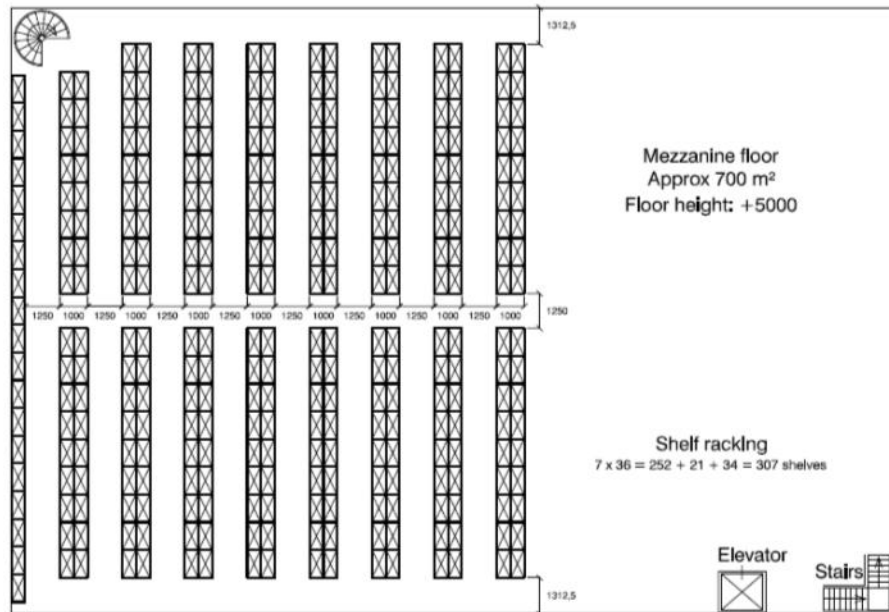
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# Detailed lay-out design (1)

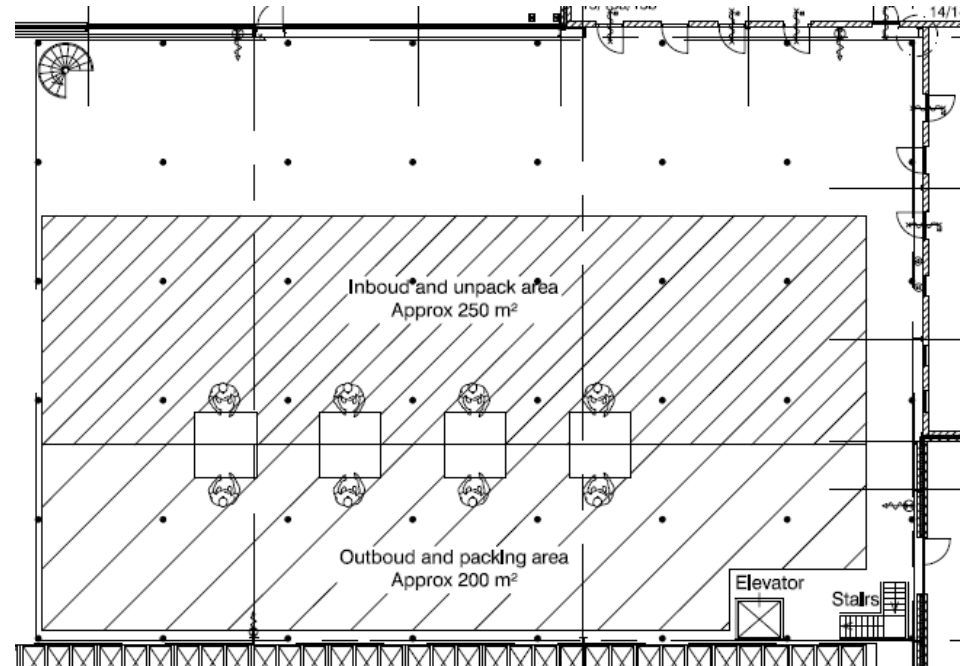


# Detailed lay-out design (2)

## Shelving area on mezzanine:



Mezzanine at 5 m in height



Ground floor below mezzanine

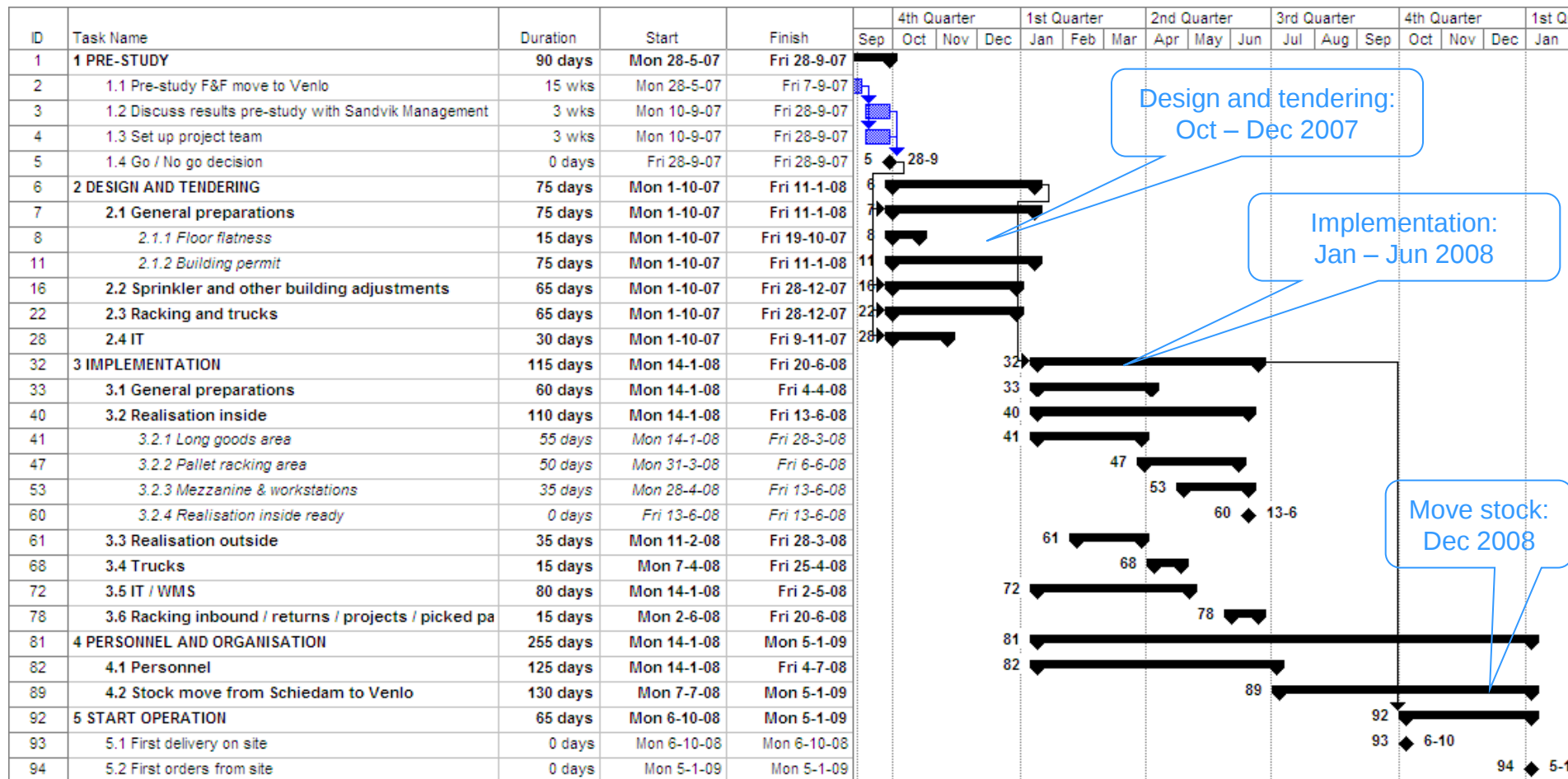


# Pictures of realization (1)

Start – 4200 m2 (almost) empty building



# Implementation schedule

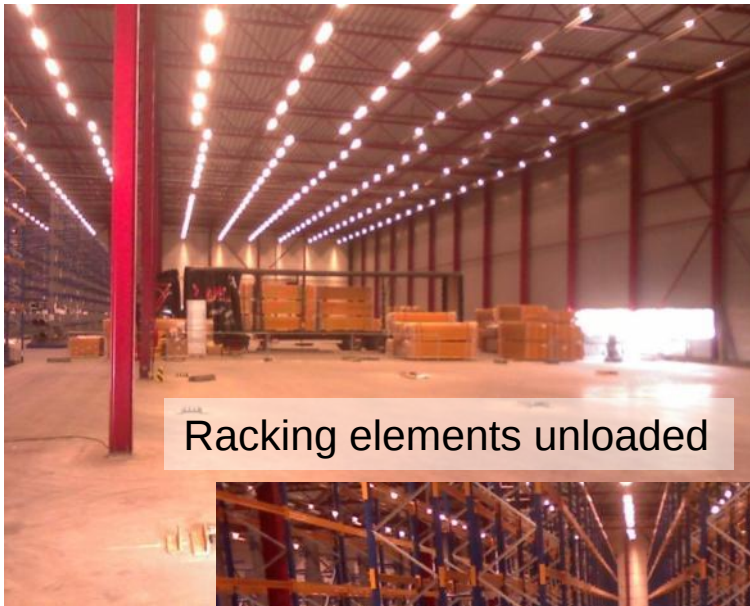


# Pictures of realization (2)

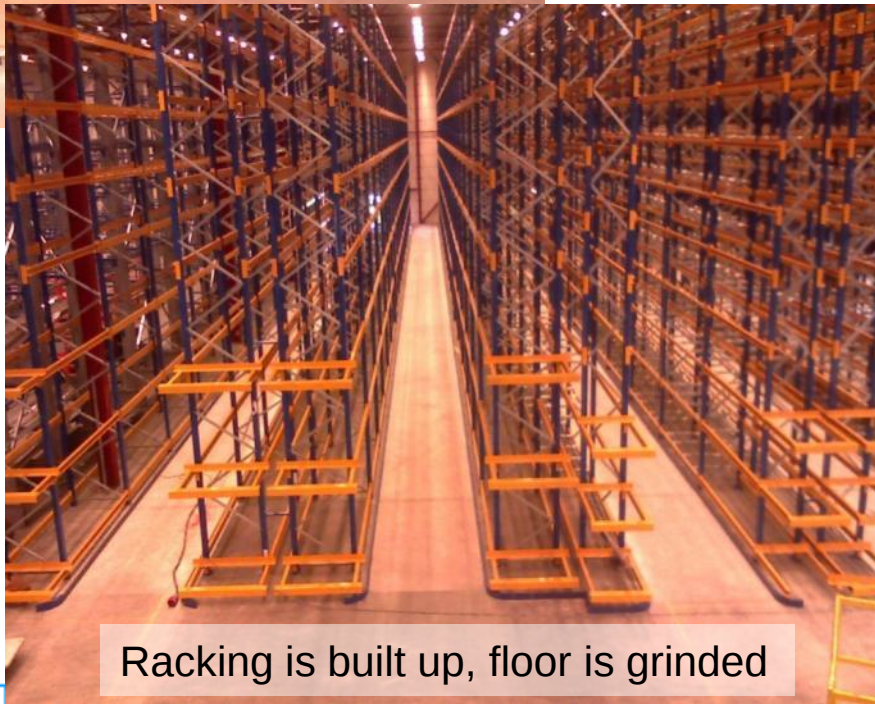
## Construction of mezzanine



# 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

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C O M P E T I T I V E   A D V A N T A G E !

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