



#### Material Handling Forum Opslagmethoden en opslagtechnieken

Praktijkcase



Wouter Speelman – Senior Consultant – Groenewout Edwin Verwaaijen – Warehouse Supervisor – Sandvik

#### Agenda

#### 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**

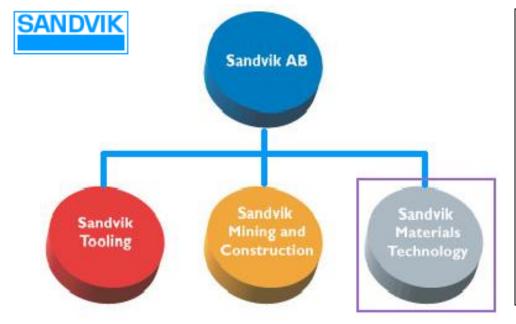


- Founded in 1966
- Professional consulting in Logistics and Supply Chain Management
- Supply chain optimization and detailed designs of manufacturing- and distribution centers.









Sandvik Materials Technology leading manufacturing of stainless steels such as:

· Tubes and pipes



Fittings and flanges



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#### 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</li>
- 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





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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?

#### **APPROACH**

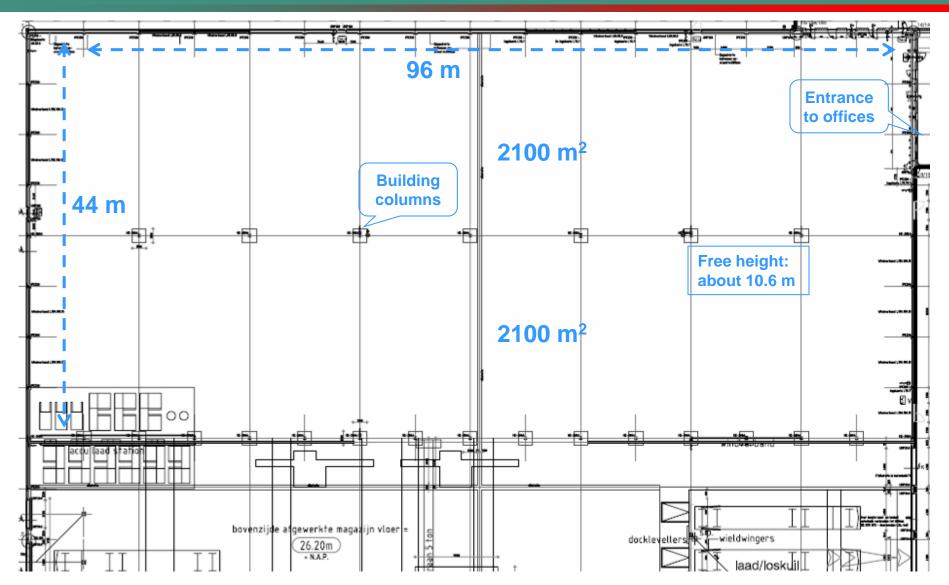
- 1. Data gathering and analysis
- 2. Develop and evaluate alternatives
  - 3. Detail out preferred alternative

**REALIZATION** 





# Available space – 4.200 m<sup>2</sup>



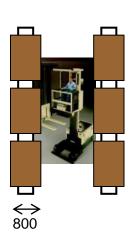


#### Possible solutions – large (palletized) items

Alt 1: Wide aisle with reachtrucks

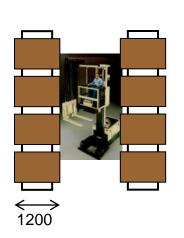


Alt 2: Narrow aisles; pallets 800 mm in depth





Alt 3: Narrow aisles; pallets 1200 mm in depth





Alt 4: High Bay with automatic cranes







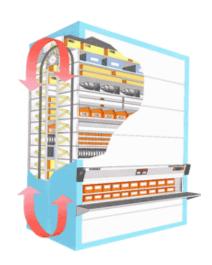


#### Possible solutions – small items

Alt 1: Shelving



Alt 2: Paternoster



Alt 3: Miniload

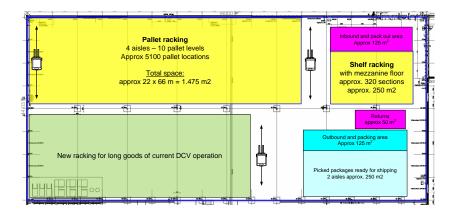




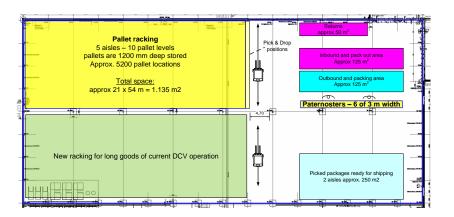


## Comparison of alternatives – lay-out plans

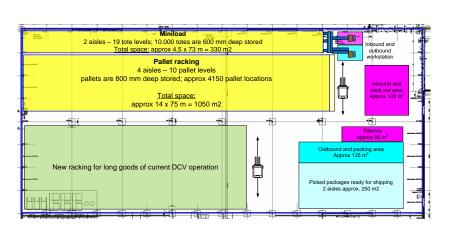
Alt 1: Wide aisles and Shelving



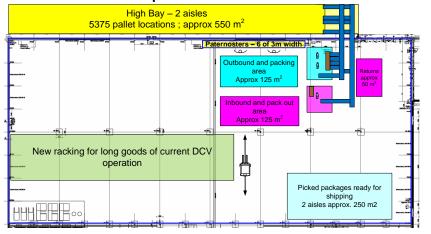
Alt 2: Narrow aisles and Paternoster



Alt 3: Narrow aisles and Miniload



Alt 4: Automatic pallet cranes and Paternoster





### Results detailed comparison of alternatives – small items

		SCORE per criteria*						Weighed Score						
Criteria	Weight	1. 5	Shelving	2	. Patern	3.	Miniload	1. Shelving	2. Patern	3. Miniload				
Estimated investment	20%	4	5	×	1	×	1	1,0	0,2	0,2				
Estimated operational cost	25%	4	5	×	1	×	1	1,3	0,3	0,3				
Use of space	5%	×	1	4	5	×	2	0,1	0,3	0,1				
Extension possibilities	10%	×	2	4	4	×	1	0,2	0,4	0,1				
Reliability processes	10%	4	5	2	3	2	3	0,5	0,3	0,3				
Flexibility lay-out and processes	10%	4	4	×	2	×	1	0,4	0,2	0,1				
Ergonomics	10%	2	3	4	4	4	4	0,2	0,3	0,3				
Impact on existing IT systems	5%	4	5	4	5	×	1	0,3	0,3	0,1				
Required building modifications	5%	2	3	4	4	×	2	0,2	0,2	0,1				
TOTAL	100%							4,0	<b>2</b> ,4	<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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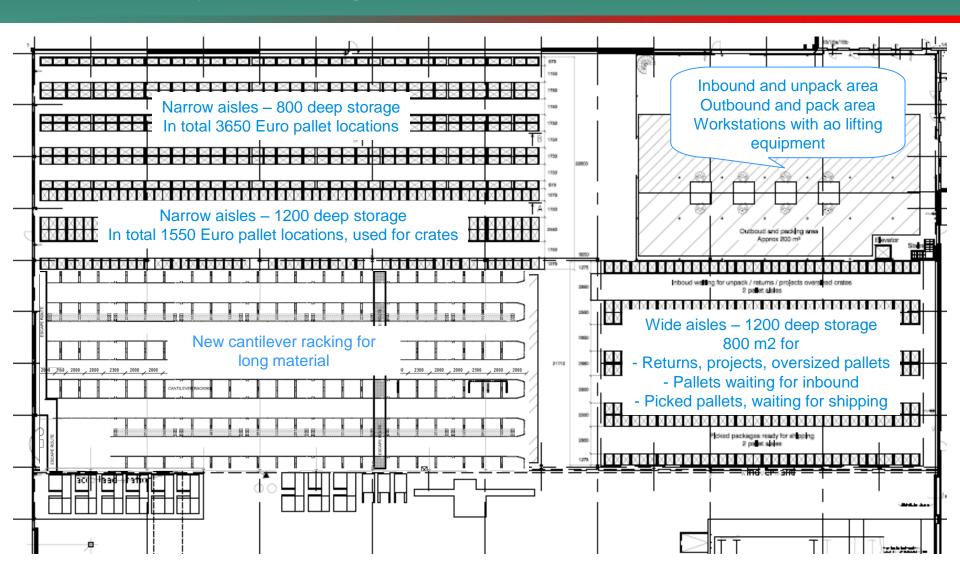
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# Detailed lay-out design (1)

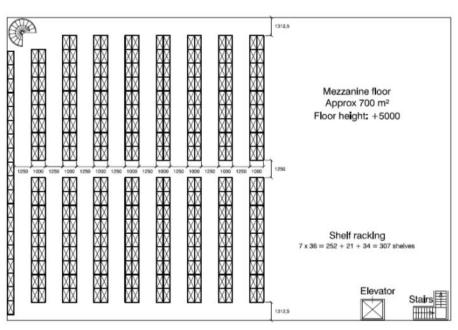






#### **Detailed lay-out design (2)**

#### Shelving area on mezzanine:



Inboud and unpack area
Approx 250 m²

Outboud and packing area
Approx 200 m²

Ellevator
Stalins

Mezzanine at 5 m in height





Ground floor below mezzanine









## Pictures of realization (1)

Start – 4200 m2 (almost) empty building







# Implementation schedule

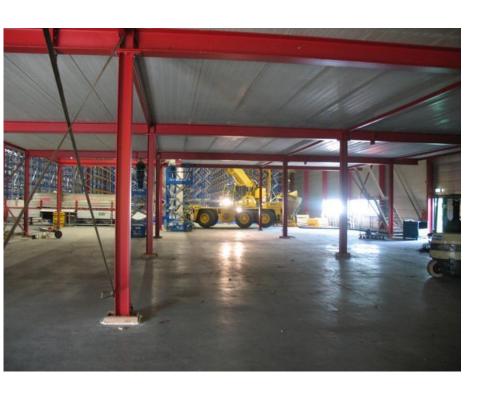
						4th Quarter	1st Q	uarter		2nd Quart	er	3rd Quarter	4th Quarter	.	1st Qı
ID	Task Name	Duration	Start	Finish	Sep		_	Feb	Mar	Apr May					
1	1 PRE-STUDY	90 days	Mon 28-5-07	Fri 28-9-07		7									
2	1.1 Pre-study F&F move to Venio	15 wks	Mon 28-5-07	Fri 7-9-07	t.				( r	Docian	and	tendering:			
3	1.2 Discuss results pre-study with Sandvik Management	3 wks	Mon 10-9-07	Fri 28-9-07					'						
4	1.3 Set up project team	3 wks	Mon 10-9-07	Fri 28-9-07						Oct	- D	ec 2007			
5	1.4 Go / No go decision	0 days	Fri 28-9-07	Fri 28-9-07	5 🔻	28-9			$\supset$						
6	2 DESIGN AND TENDERING	75 days	Mon 1-10-07	Fri 11-1-08	6 (	<del>-</del>	▼1								_
7	2.1 General preparations	75 days	Mon 1-10-07	Fri 11-1-08	7▶1	<del> </del>						Implem	entatio	٥.	
8	2.1.1 Floor flatness	15 days	Mon 1-10-07	Fri 19-10-07	8 1							•			
11	2.1.2 Building permit	75 days	Mon 1-10-07	Fri 11-1-08	11 (	<del>,</del>	7					Jan – J	Jun 200	ŏ	J
16	2.2 Sprinkler and other building adjustments	65 days	Mon 1-10-07	Fri 28-12-07	16										
22	2.3 Racking and trucks	65 days	Mon 1-10-07	Fri 28-12-07	22	<del></del>									
28	2.4 IT	30 days	Mon 1-10-07	Fri 9-11-07	28	<del></del>									
32	3 IMPLEMENTATION	115 days	Mon 14-1-08	Fri 20-6-08		32	-				_		i		
33	3.1 General preparations	60 days	Mon 14-1-08	Fri 4-4-08		33	_			•					
40	3.2 Realisation inside	110 days	Mon 14-1-08	Fri 13-6-08		40	-								
41	3.2.1 Long goods area	55 days	Mon 14-1-08	Fri 28-3-08		41	_		_						
47	3.2.2 Pallet racking area	50 days	Mon 31-3-08	Fri 6-6-08					47		•				
53	3.2.3 Mezzanine & workstations	35 days	Mon 28-4-08	Fri 13-6-08						53	_				
60	3.2.4 Realisation inside ready	0 days	Fri 13-6-08	Fri 13-6-08						ε	60 💠 1	13-6	Move		
61	3.3 Realisation outside	35 days	Mon 11-2-08	Fri 28-3-08			61	•	_				Dec	200₹	3
68	3.4 Trucks	15 days	Mon 7-4-08	Fri 25-4-08					68	•			-	<b>-</b>	
72	3.5 IT / WMS	80 days	Mon 14-1-08	Fri 2-5-08		72	_			_					/
78	3.6 Racking inbound / returns / projects / picked pa	15 days	Mon 2-6-08	Fri 20-6-08						78	•				
81	4 PERSONNEL AND ORGANISATION	255 days	Mon 14-1-08	Mon 5-1-09		81	•							1/1	•
82	4.1 Personnel	125 days	Mon 14-1-08	Fri 4-7-08		82	_					<b>*</b>		/	
89	4.2 Stock move from Schiedam to Venlo	130 days	Mon 7-7-08	Mon 5-1-09							89	<b>-</b>		<i>-</i>	•
92	5 START OPERATION	65 days	Mon 6-10-08	Mon 5-1-09								92	—		•
93	5.1 First delivery on site	0 days	Mon 6-10-08	Mon 6-10-08								93	♦ 6-10		
94	5.2 First orders from site	0 days	Mon 5-1-09	Mon 5-1-09										94	5-1





# Pictures of realization (2)

#### Construction of mezzanine

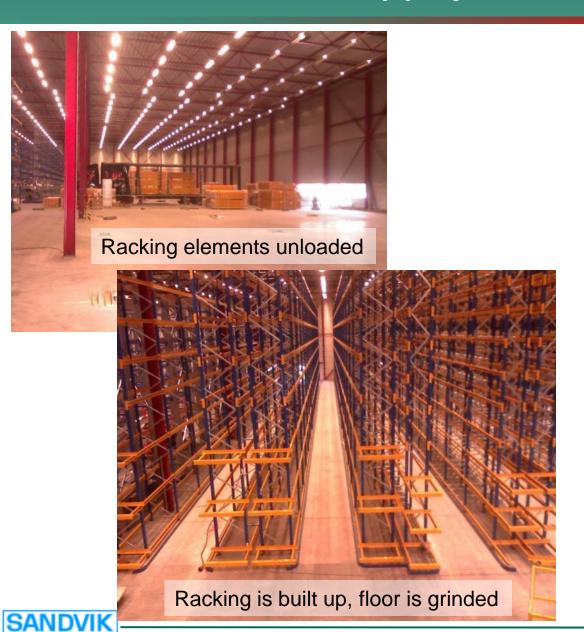








#### Pictures of realization (3) – pallet racking narrow aisles









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