IN SITU RECYCLING USING CEMENT

THE BELGIAN EXPERIENCE

André JASIENSKI
Head of the Department Promotion,
Research and Development
FEBELCEM

Luc Rens
Engineer - Infrastructure
FEBELCEM

SEMINAR ON ROAD PAVEMENT RECYCLING

10 TO 11 OCTOBER 2002

WARSAW (POLAND)

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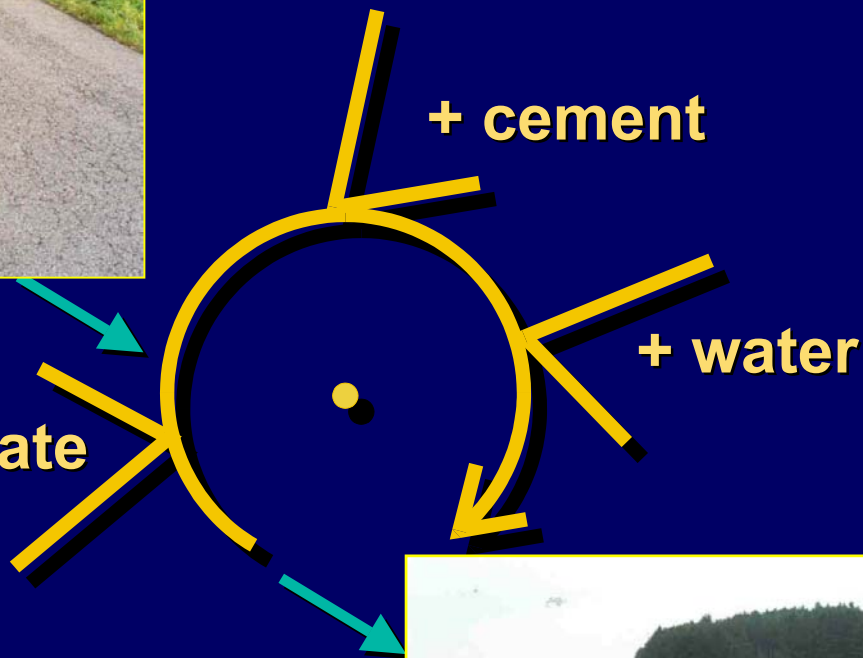
IN SITU RECYCLING



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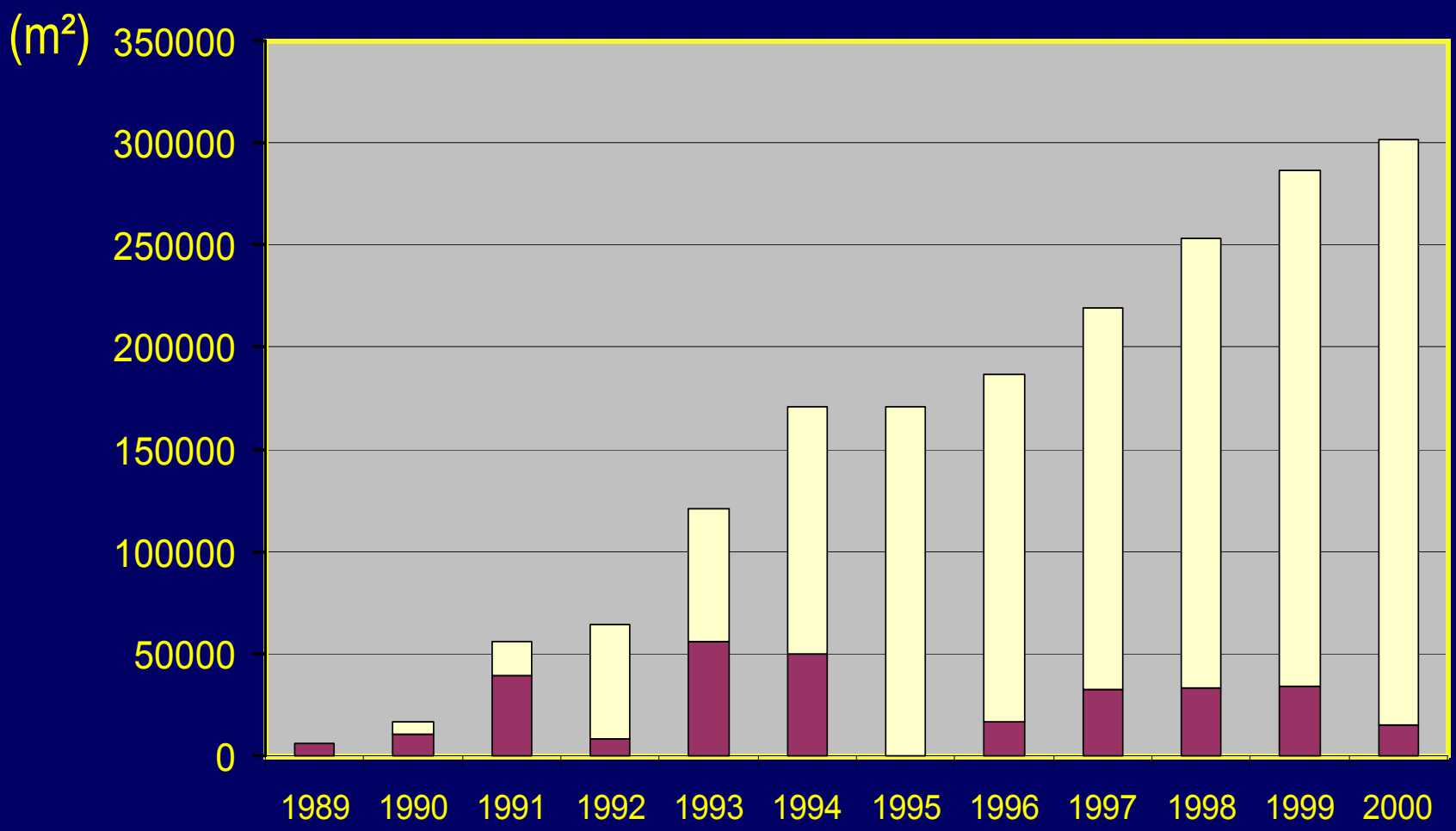
Evolution of Belgian realisations of in situ pavement recycling



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COMPRESSIVE STRENGTH
(R'c - 90 d - on cores of 100 cm^2)

- Vaux-sur-Sûre: 9,2 N/mm^2
- Lavaux-Ste-Anne: 8,7 N/mm^2
- Francorchamps: 13,5 N/mm^2 (on cores of 200 cm^2)
- Philippeville: 17,9 N/mm^2
- Messancy: 11,2 N/mm^2
- Bierset: 12,1 N/mm^2 (on cubes of 20 cm)
- Waimes: 15,0 N/mm^2 (on cubes of 20 cm)
- Attert: 10,6 N/mm^2
- Marche-en Famenne: 11,7 N/mm^2

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STANDARD SPECIFICATIONS IN BELGIUM

- Walloon Region : “RW 99” + GUIDELINES — detailed
- Flemish Region : “sb250” — briefly
- Brussels Region : “TB2000” — only subgrade stabilisation

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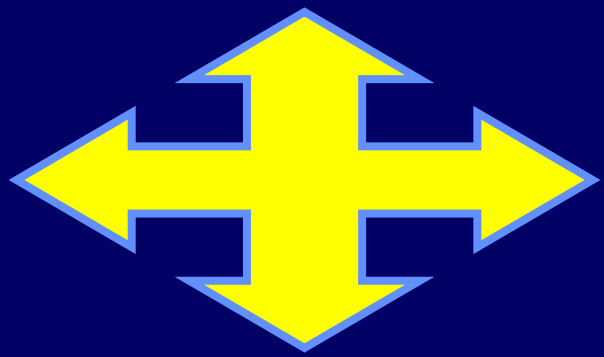
TECHNICAL PRESCRIPTIONS

Feasibility Study



Execution

CASE STUDY

Marche-En -Famenne

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FEASABILITY STUDY

- Study of the history of the road & visual examination
- Cores or transverse trenches

  thickness of bituminous layer max. 1/3
- Sieve analysis

  ✠max. 10 % aggregates > 80 mm

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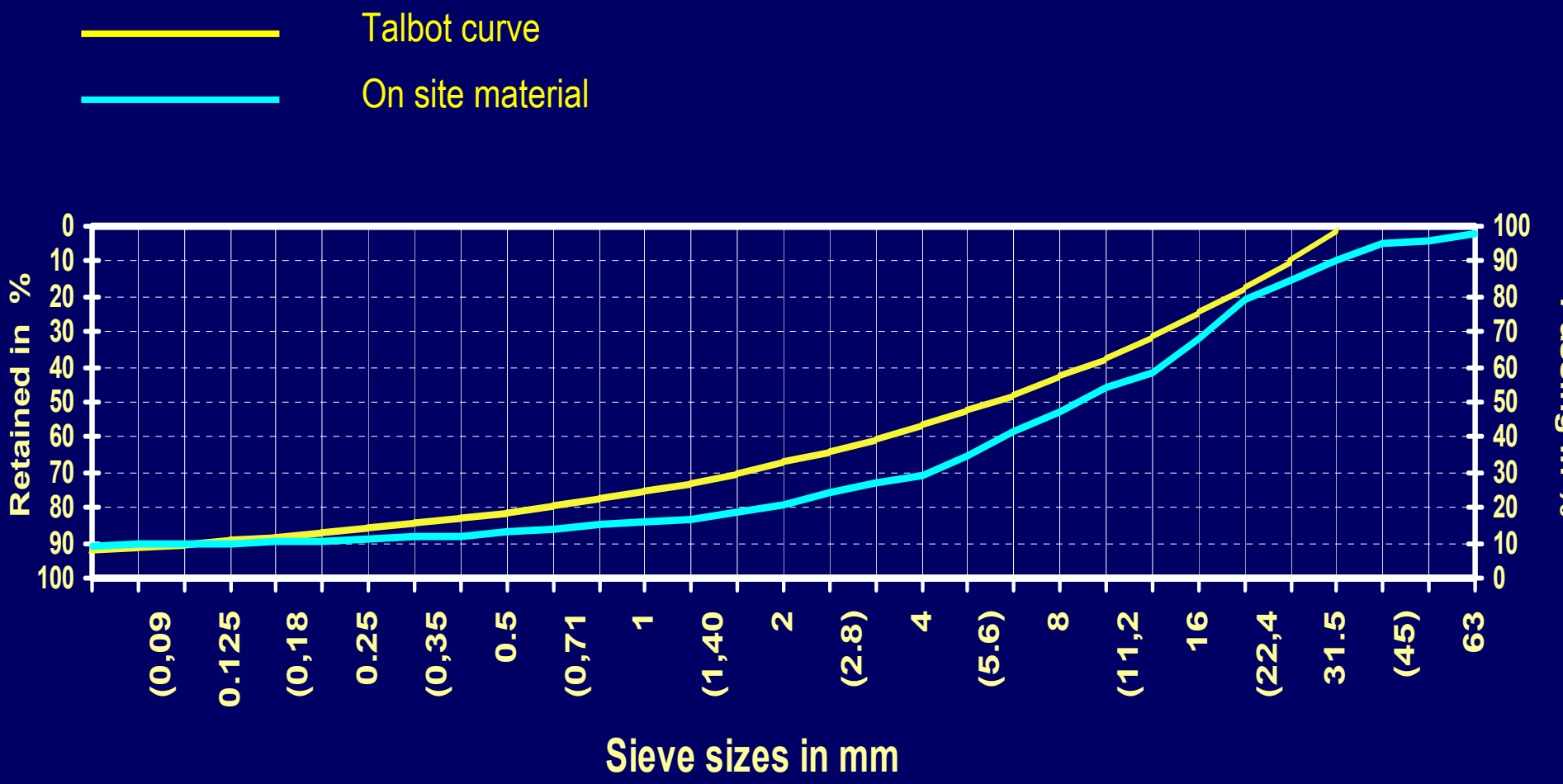
ON SITE MATERIAL COMPARED TO THE TALBOT CURVE



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QUICK STABILISATION TEST

Water content (%)	6	7	7,5	8	9
Compressive strength after 7 days (N/mm^2)	13,0	21,0	20,8	15,5	17,5

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MATERIALS

- 6 % CEM III/A 42,5

- ADDED AGGREGATE :
  0/32 CRUSHED LIMESTONE

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WATER CONTENT AND BULK DENSITY

	Average	Standard deviation
Water content (%)	7,19	1,21
Density (kg/m³)	2370	33

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COMPRESSIVE STRENGTH (N/mm²) ON CUBES 20x20x20 cm³

	Average	Standard deviation
After 7 days	12,56	6,3
After 28 days	20,1	9,5
After 91 days	24,9	11,8

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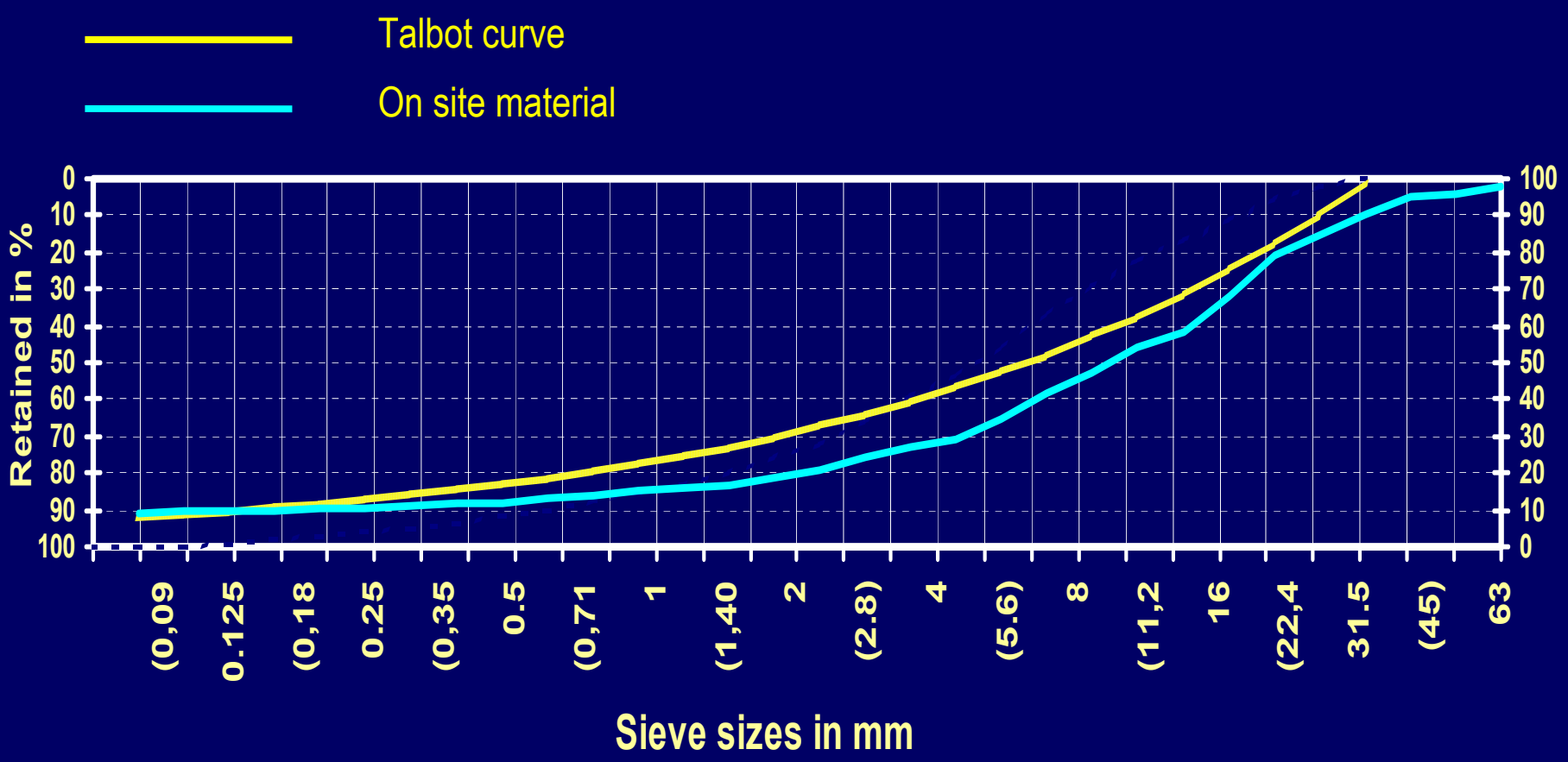
THE ON SITE MATERIAL AND THE TALBOT CURVE



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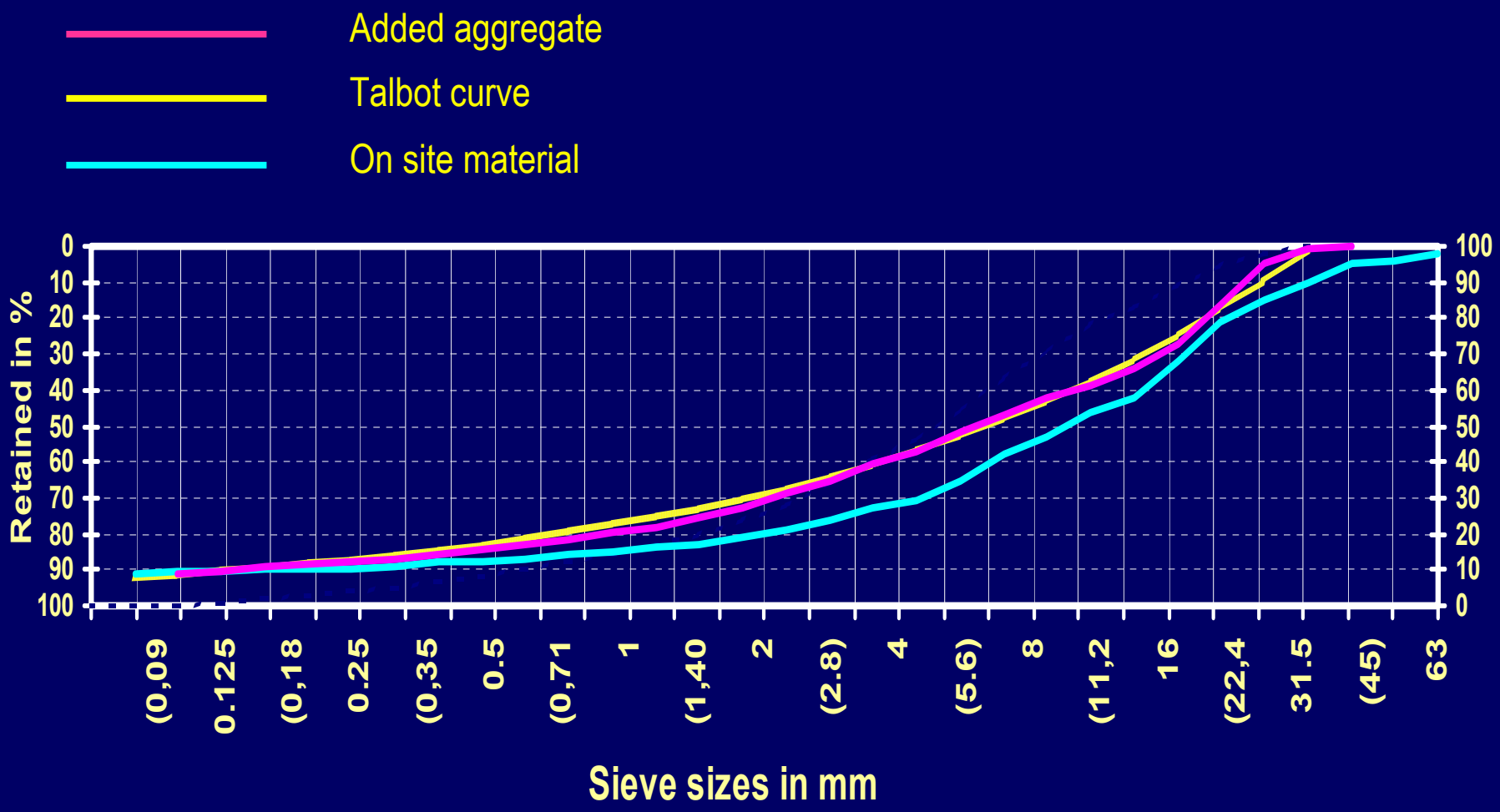
THE ON SITE MATERIAL, ADDED AGGREGATE AND THE TALBOT CURVE



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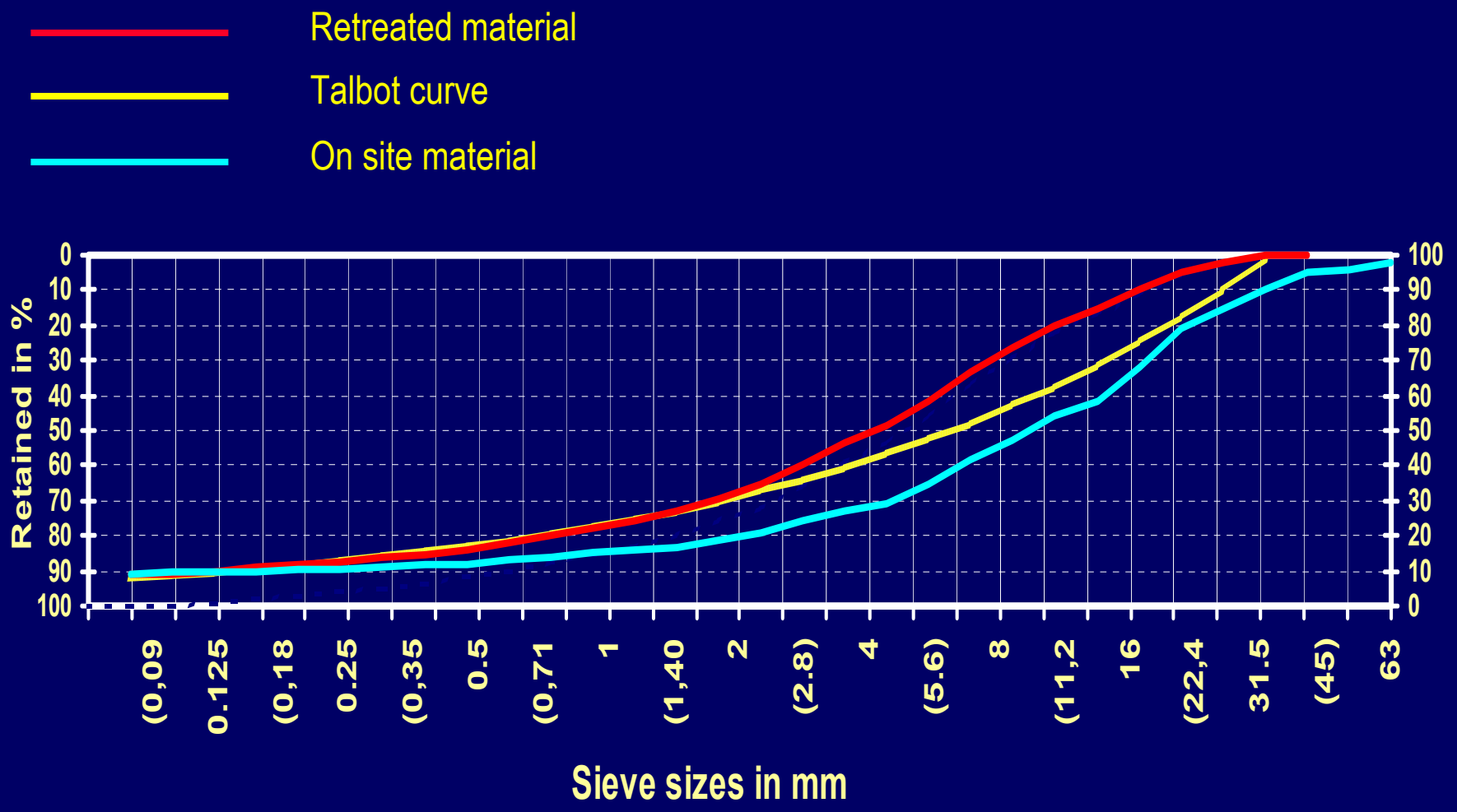
RETREATED MATERIAL COMPARED TO THE ON SITE MATERIAL AND TO THE TALBOT CURVE



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COMPRESSIVE STRENGTH (N/mm²) AFTER FIVE MONTHS ON CORES 100 cm²

	Average	Standard deviation
Upper parts	15,0	9,2
Middle parts	11,8	7,2
Lower parts	7,1	3,4
Mean of all samples	11,7	7,8

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REFLECTIVE CRACKING

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REFLECTIVE CRACKING

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CONCLUSIONS

RECYCLING IN SITU = MASTER RECYCLING TECHNIQUE

- **STANDARD SPECIFICATIONS EXIST**
- **FUTURE ?**
  - feasibility studies
  - innovating techniques - specific material
  - financial incentive ?
- **PROMOTION**
  - economical and ecological advantages

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