Designing guided operational strategies for asphalt compaction

First results

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Existing guides

- Basic principles
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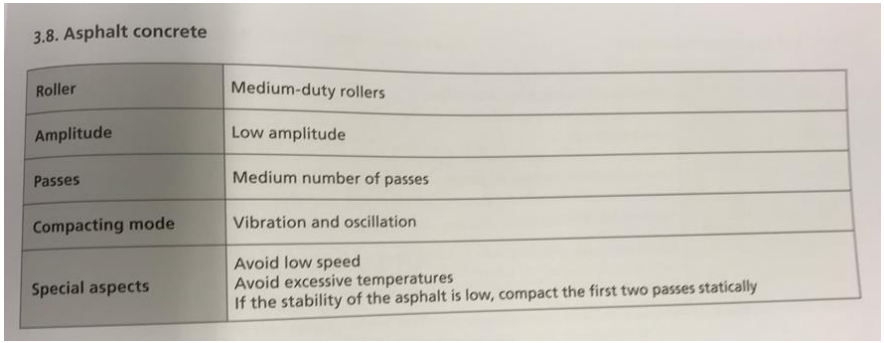
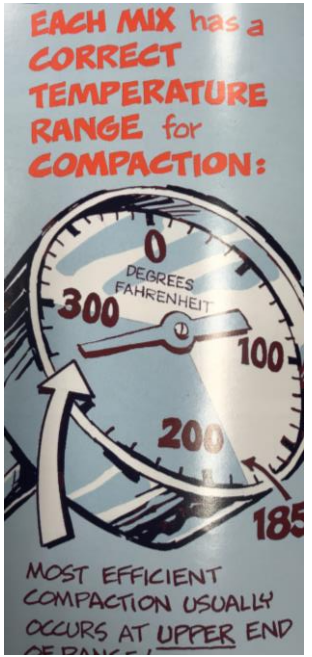


3.8. Asphalt concrete

Roller	Medium-duty rollers
Amplitude	Low amplitude
Passes	Medium number of passes
Compacting mode	Vibration and oscillation
Special aspects	Avoid low speed Avoid excessive temperatures If the stability of the asphalt is low, compact the first two passes statically



Existing guides

Introducing a new method for studying the field compaction

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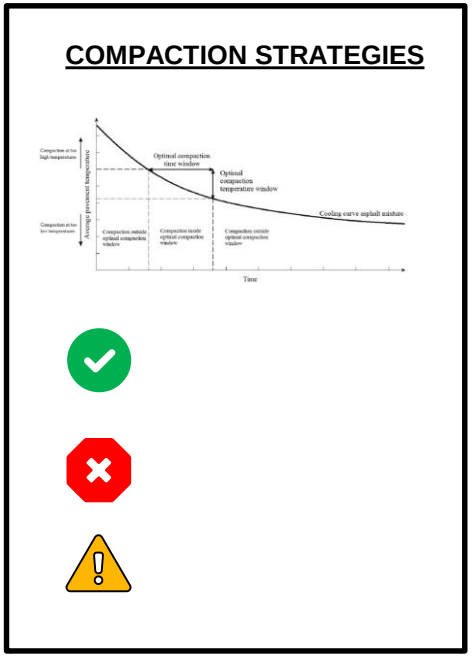
compaction, have more or less high impact on the quality of paved roads. Among all construction phases, compaction may be considered as the most important phase where existing knowledge is still at a very empirical level. The gap between the results of standard laboratory compaction devices for the mixture design and the field compaction stated in the literature (Airey & Collop, 2016; Peterson, Mahboub, Anderson, Masad, & Tashman, 2004) underlines such a claim and indicates the complexity of the compaction that requires more scientifically supported research efforts.

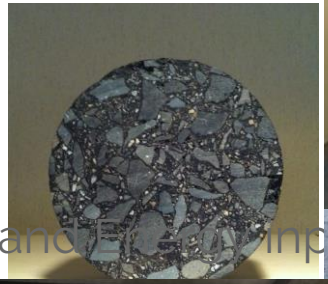
What is needed?

- The science
- Leads us to guided instructions
- Improves consistency
- Improves pavement performance

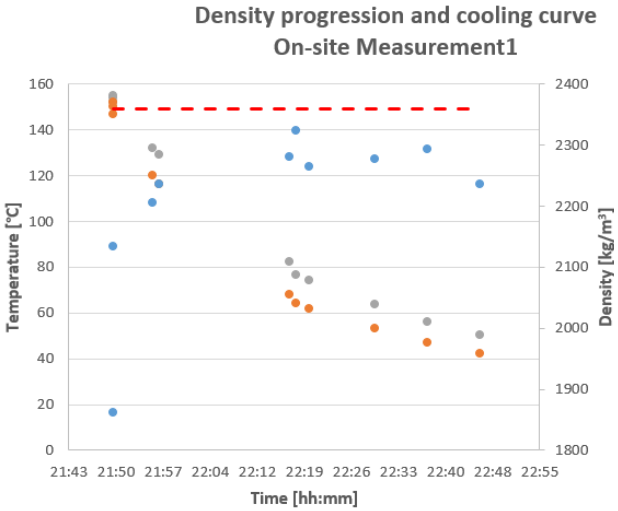


Approach

1. Asphalt mixture
2. On-site practice → laboratory
   a. Monitor on site compaction
   b. Recreate in laboratory (Temp and E
3. Test performance charac
   a. ITSR
   b. Cy-ITT
   c. Triaxial CC
4. Analysis
5. Validation



Density progression – on-site



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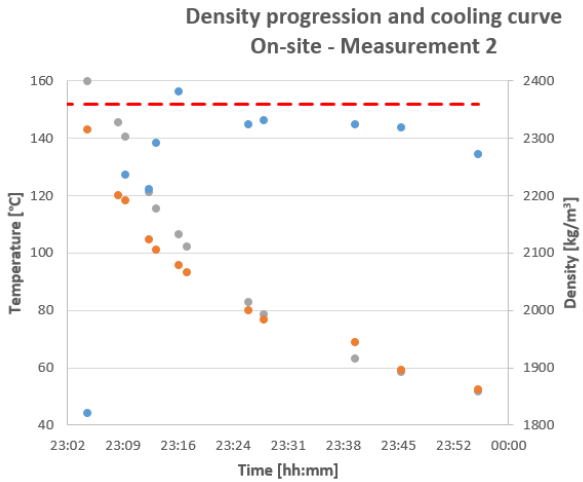

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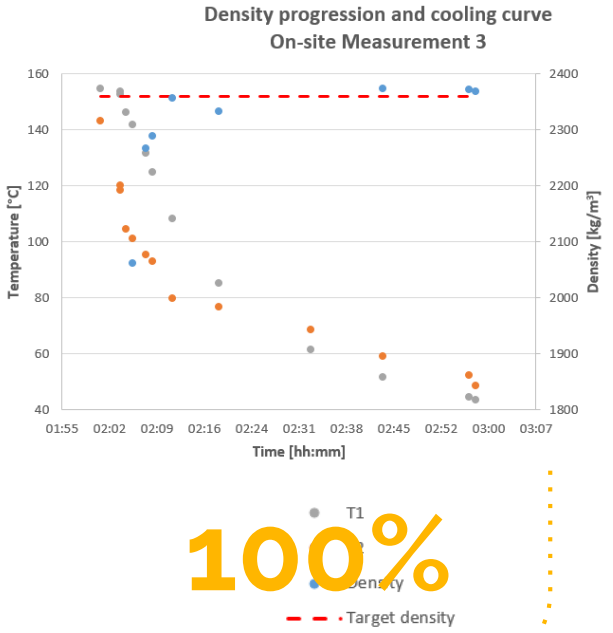

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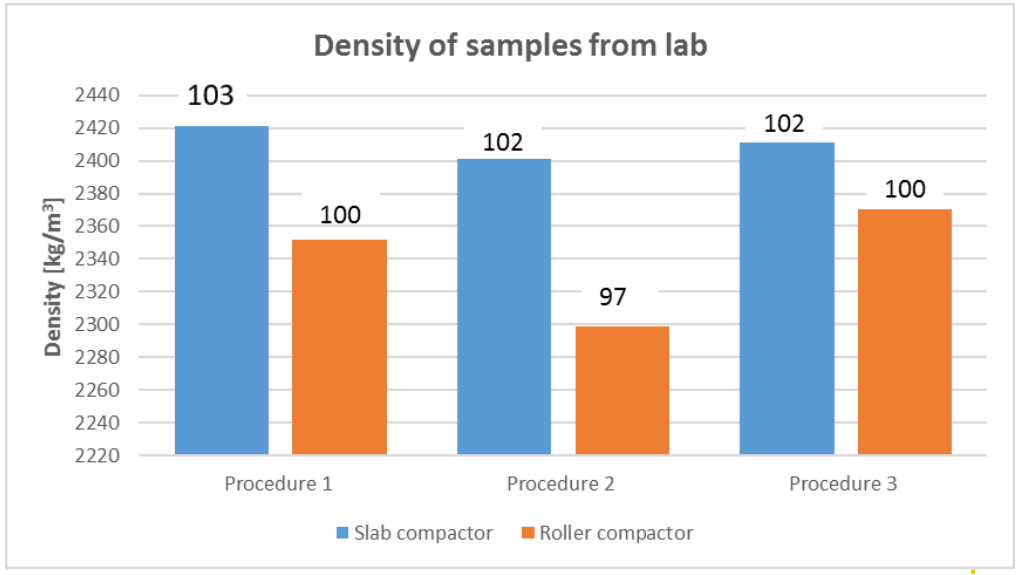
Density from labs

- Target density was achieved



Further

1. Choose asphalt mixture
2. On-site practice → laboratory
   a. Monitor on site compaction
   b. Recreate in laboratory (Temp and Energy input)
3. Test performance characteristics
   a. ITSR
   b. Cy-ITT
   c. Triaxial CC
4. Analysis
5. Validation

Thanks!

Any questions?

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