

INTRODUCTION TO MIX DESIGN

Presented by

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H.A.W.

2.1.1

EXISTING MIX DESIGN METHODS

MARSHALL

MVEEM

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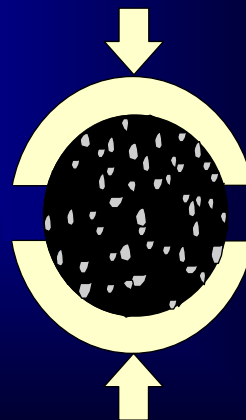
2.1.2

HISTORY OF MARSHALL

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2.1.3

MARSHALL MIX DESIGN



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2.1.4

Automatic Marshall Hammer



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2.1.5

Marshall Stability and Flow



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2.1.6

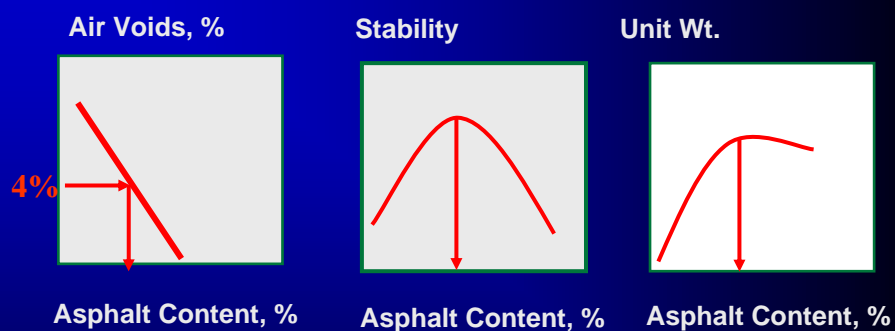
Marshall Mix Design

- Three types of hammers used
- 50 or 75 blow compactive effort
- Lab density equal to field density after traffic
- Volumetric properties
- Marshall stability and flow

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2.1.7

Marshall Design Use of Data Asphalt Institute Procedure



Target optimum asphalt content = average

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2.1.8

Marshall Mix Design – Advantages

- Cheap
- Simple
- Portable

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2.1.9

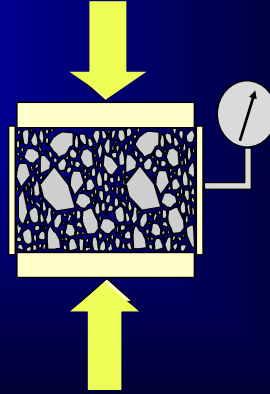
Marshall Mix Design - Disadvantages

- Empirical
- Does not predict performance
- Load perpendicular to compaction axis
- Does not orient aggregate particles like traffic

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2.1.10

HVEEM MIX DESIGN



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2.1.11

Hveem Kneading Compactor



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2.1.12

Hveem Stabilometer



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2.1.13

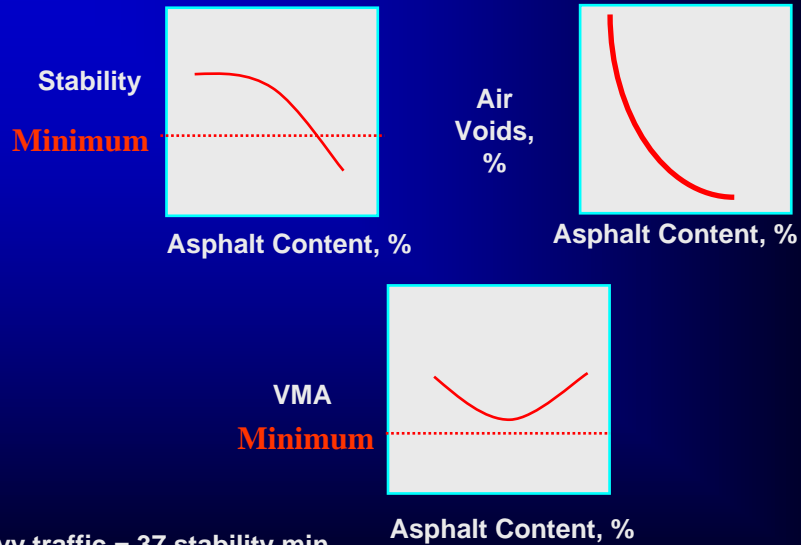
Hveem Mix Design:

- Compact with kneading compactor
- Lab density equal to field density after traffic
- Volumetric properties
- Hveem stability

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2.1.14

Hveem Mix Design Method



Heavy traffic = 37 stability min.
Medium = 35 min.
Light = 30 min.

2.1.15

Hveem Mix Design – Advantages

- Orients aggregate more like traffic

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2.1.16

Hveem Mix Design – Disadvantages

- Costly , more complicated, and less portable than Marshall
- Empirical
- Does not predict performance

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2.1.17

Marshall and Hveem have worked satisfactorily to date but with heavier load and higher tire pressure these methods need to be improved.

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2.1.18

What do we need in a new method ?

- Orients particles more like traffic
- Test sample like traffic
- Predicts performance