Advanced Airport Pavement
Design and Evaluation Method

Asphalt Pavements Evaluation Using FWD

National Institute for Land and
Infrastructure Management
MLIT, JAPAN

Objectives

- Background
  - Bearing Capacity
  - Structural Integrity
  - Deteriorated Portion
- In situ Survey
- Criteria
  - Deflection, Stress, Strain
- Dynamic Analysis
  - Impact Load by FWD, Moving Wheel Load

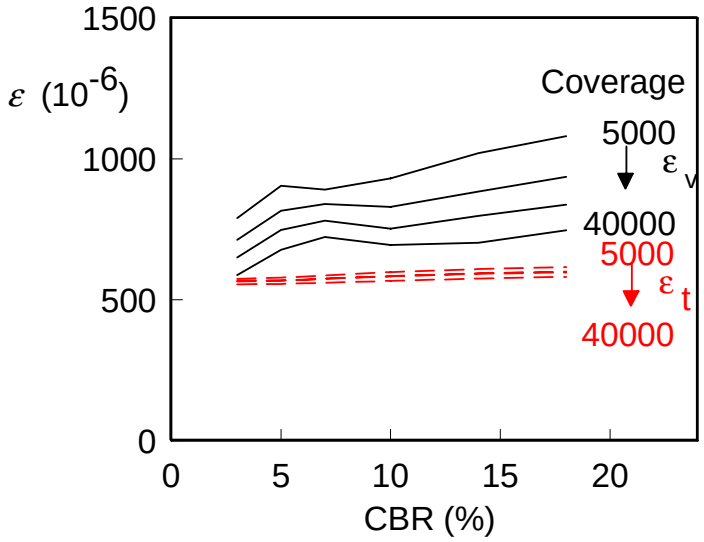
System

- 200kN-FWD with 7 Deflection
- In Accordance with the Current Design Method

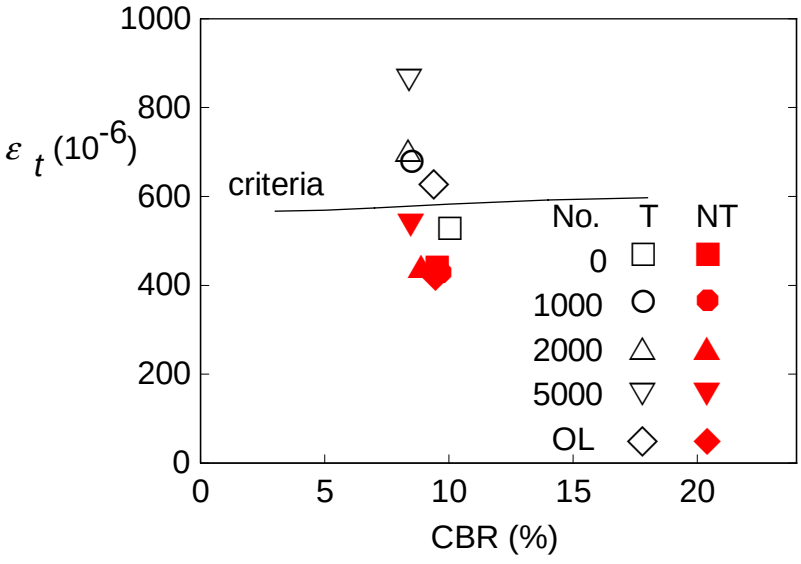
NDT for Asphalt Pavements

- CBR Design Method
- Evaluation Criteria: Strain (AC, SG)
- Temp.: 20℃, Freq.: 2, 10Hz
- Overlay Thickness Calculation
- Rough Evaluation by D_0

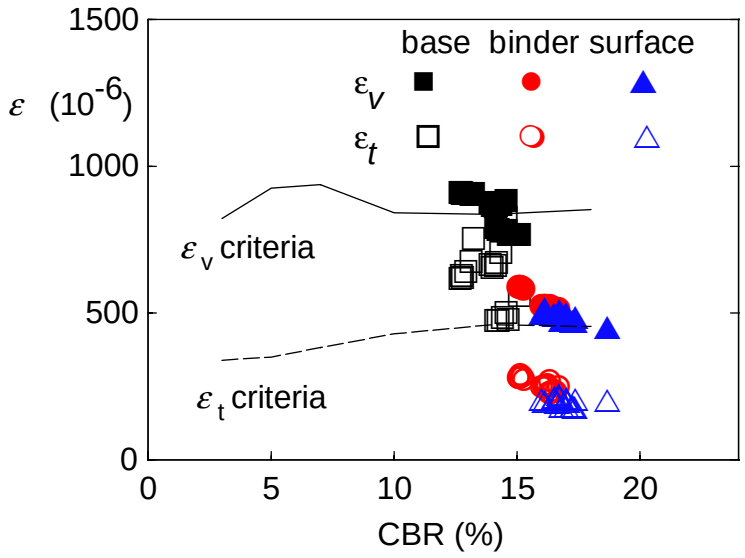
Strain Criteria



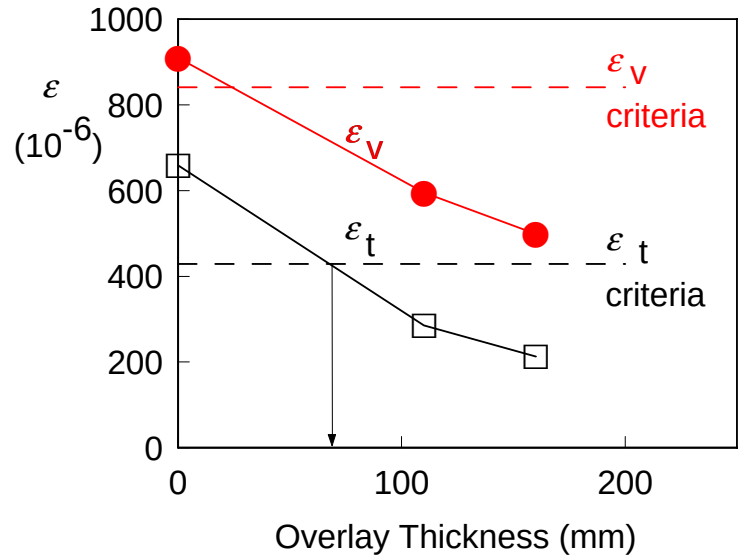
AC Strain in Loading Test



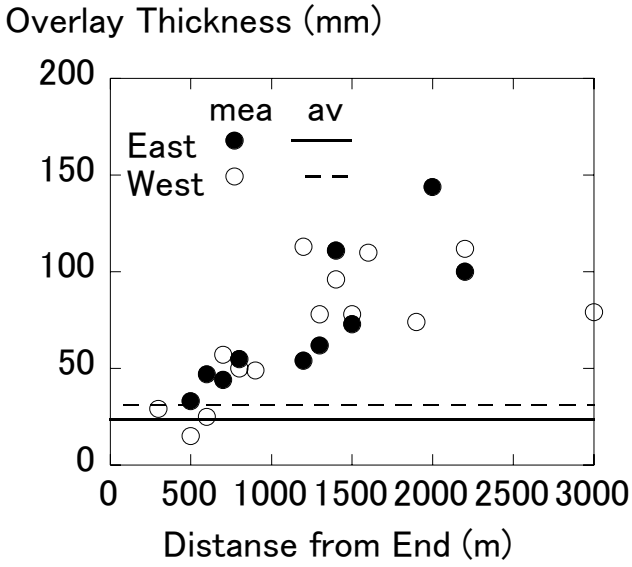
Strain at Construction Stage



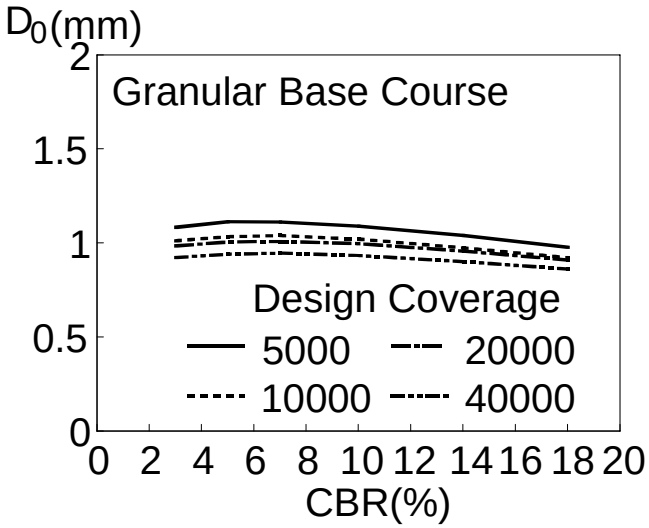
Overlay Thickness



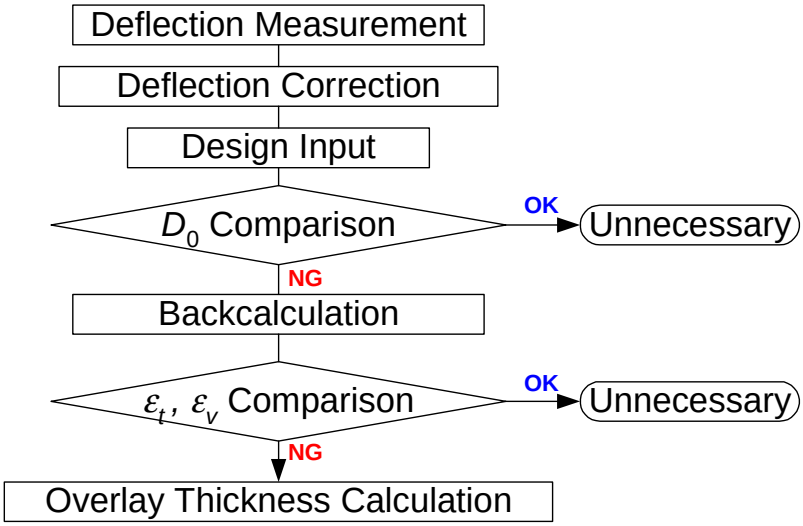
Required Overlay Thickness



Deflection Criteria

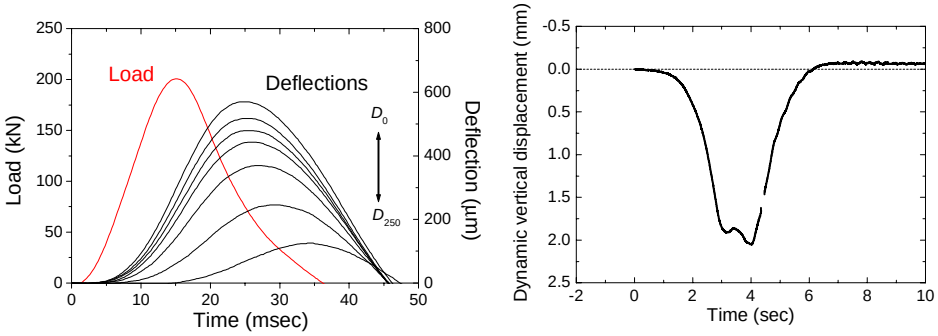


Flowchart for AP Evaluation

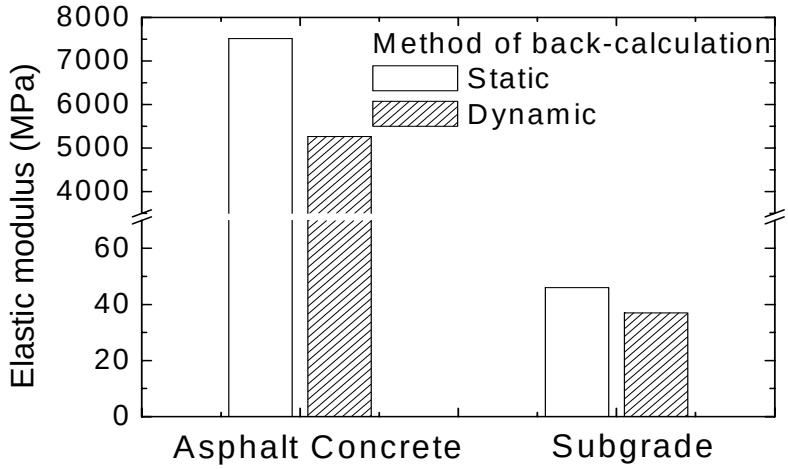


Dynamic & Static Analysis

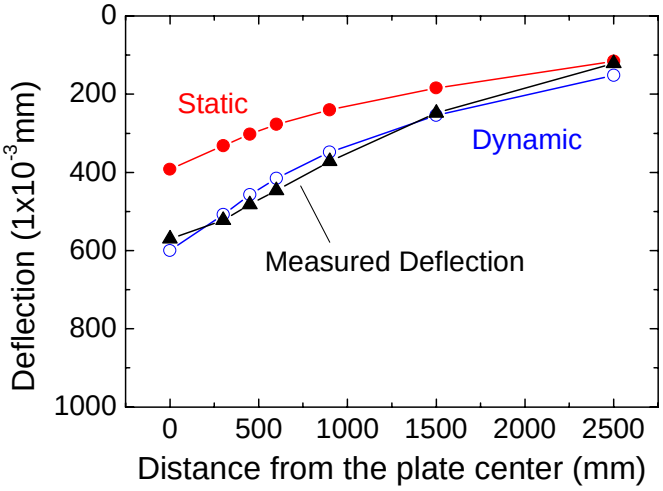
- Dynamic Analysis
  - Impact load generated by FWD
  - Moving wheel load by aircraft



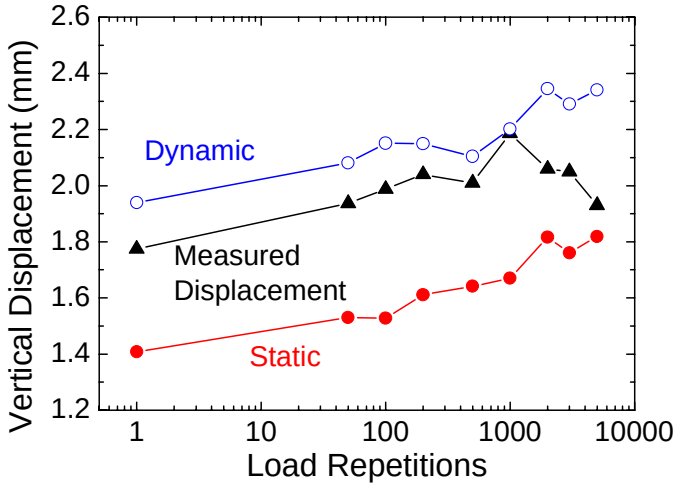
Elastic Modulus by Backcalculation



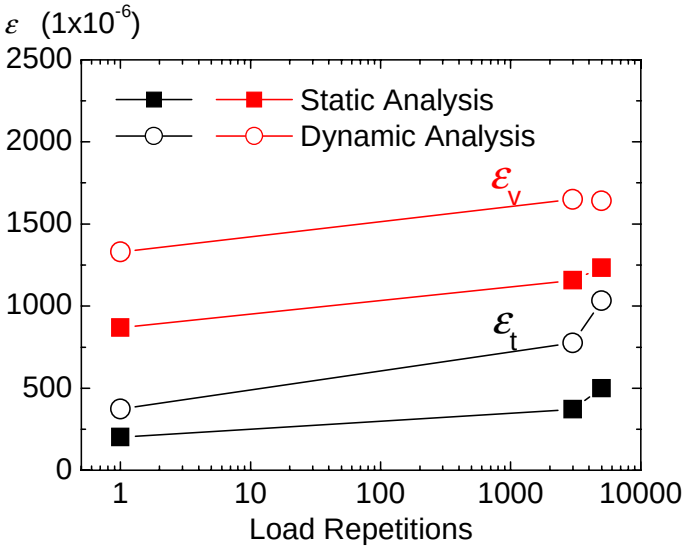
FWD Deflection



Vertical Displacement in Loading Test



Strain in Loading Test



Conclusion

- Asphalt Pavements Evaluation using FWD
  - Detailed Evaluation: Strain (AC, SG)
  - Overlay Thickness
  - Rough Evaluation: D_0
  - Difference between Static & Dynamic Analysis (E, ε)