

STRADA

STRuctural Analysis

Deflections on Asphalt roads

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Current structural assessment

- CROW publication 92 'Deflection profile no pitfall anymore' (in English: Record 22)
- Guidelines issued in 1995
- Procedure for assessment of Falling Weight Deflection data
- Project level
- Procedure embedded in software code CARE



Update necessary

- FWD testing
- Analysis of test data
- Redesign

- Combination with recently issued software for structural design of new asphalt roads
- Introduction of performance based asphalt specifications

- Updates and development needed

Procedure structural assessment of asphalt roads

Current situation

- Evaluation of data collected in untrafficked longitudinal line (Virgin condition)
- Backcalculation of stiffness modulus of constituent layers
- Computation of critical asphalt strain
- Fatigue characteristics asphalt and traffic carried already
- Results inspection, coring and/or GPR
- Assessment of residual pavement life
- Redesign (when needed)

Procedure structural assessment of asphalt roads

Drawbacks

- Traffic history data usually not available or reliable
- Shifting centre line markings to left or right
- 'Virgin situation' unknown
- Analysis approach very sensitive for some theoretical assumptions
 - Fatigue of asphalt
 - Traffic intensities carried already
 - Age of pavement structure

Procedure structural assessment of asphalt roads

Novel requested situation

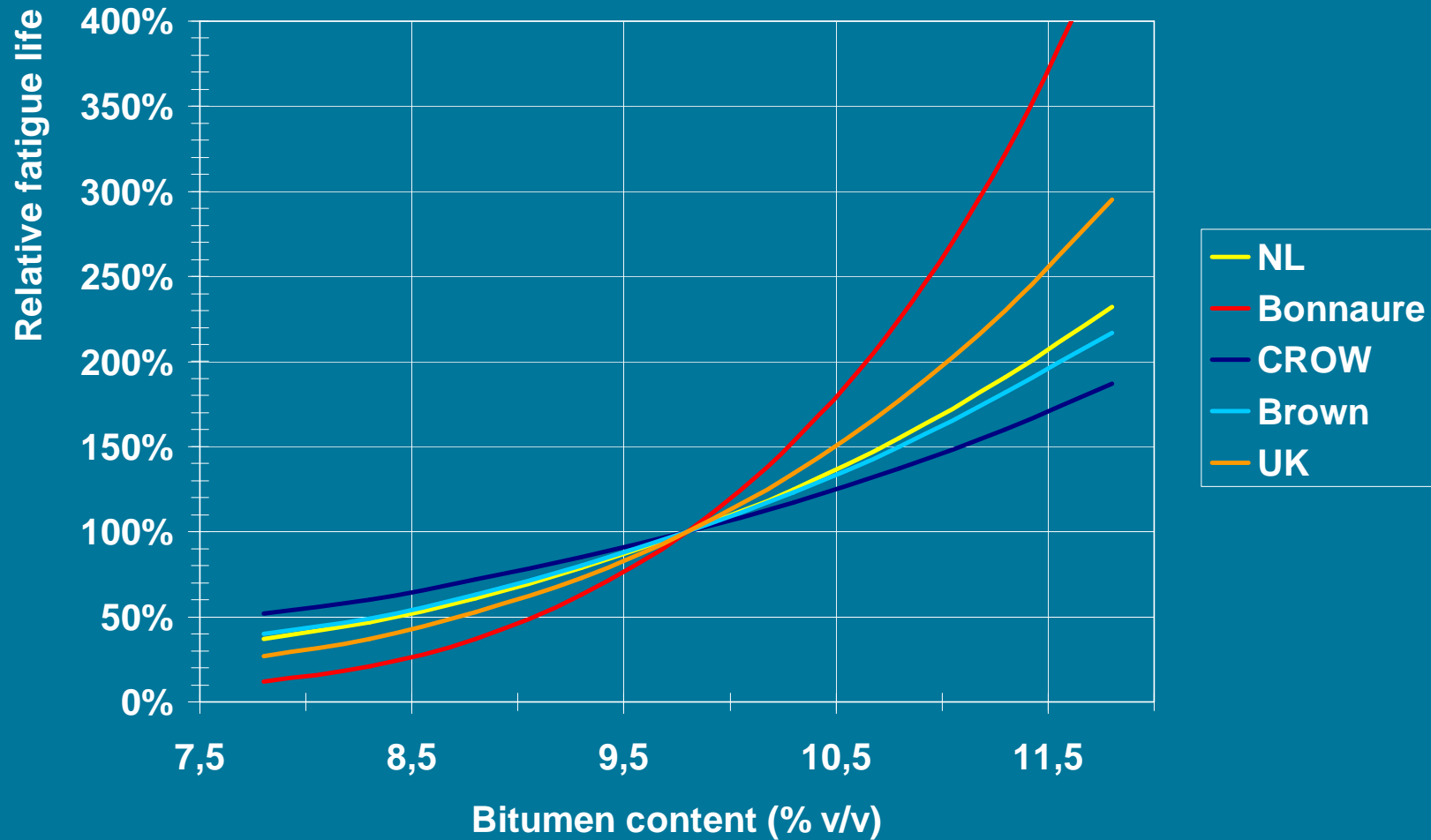
- Update 'classic' assessment approach
 - Input of asphalt data on CE markings
- Development of new analysis approach
 - Analysis of FWD tests conducted in (trafficked) nearside wheelpath
 - Use of no or limited traffic history information
 - Development of approaches for characterisation of fatigued asphalt

Research targets

Better assessment of fatigue characteristics

- Standard F2, F78,
- Based on CE markings
- Based on composition, bitumen content, ...

Effect bitumen on fatigue life



Research targets

Better impression of effect of temperature

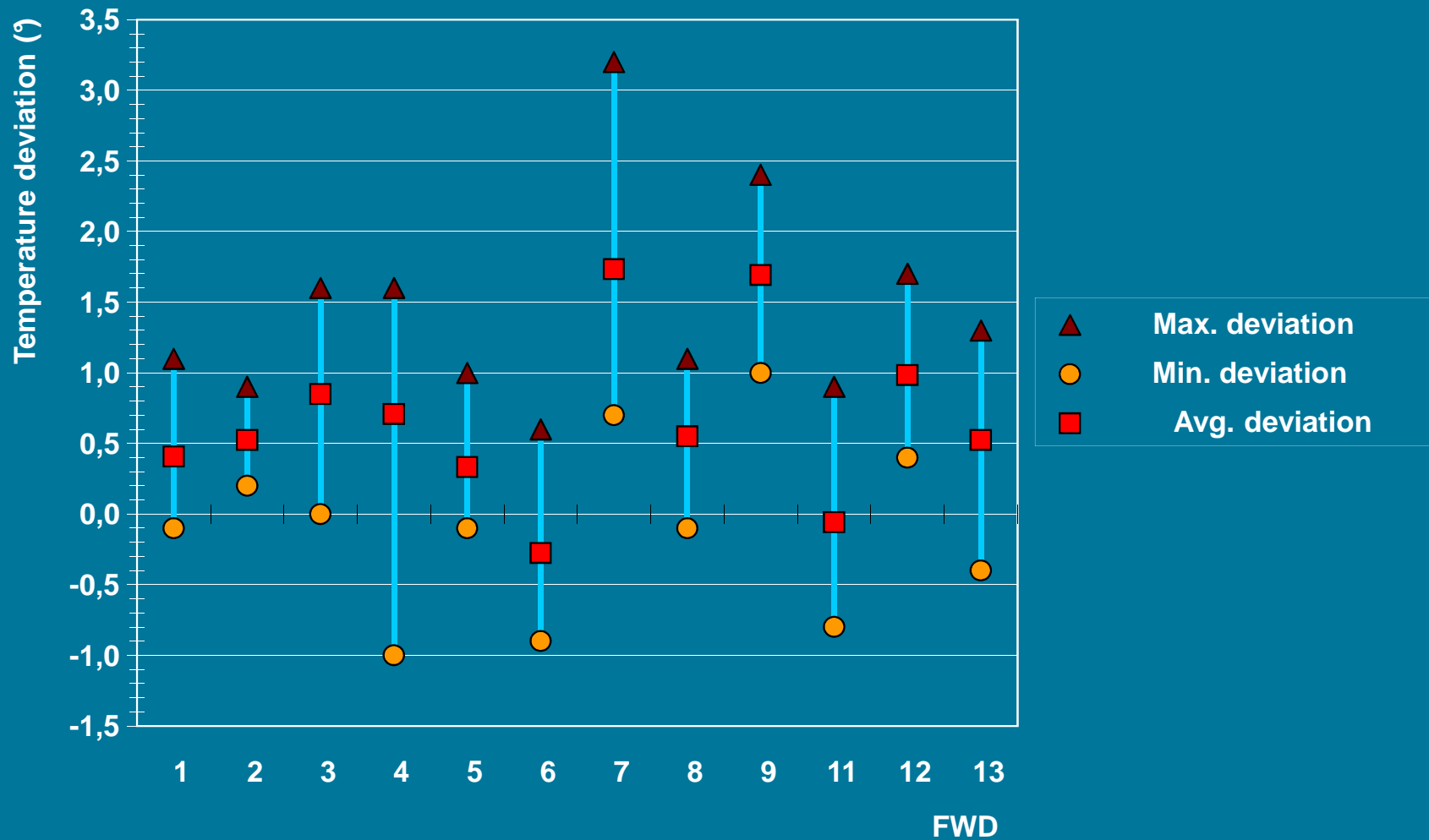
- Maximum accuracy of temperature measurement in routine testing
 - BELLS3 approach
 - Predrilled hole
- Effect use of incorrect temperature in assessment



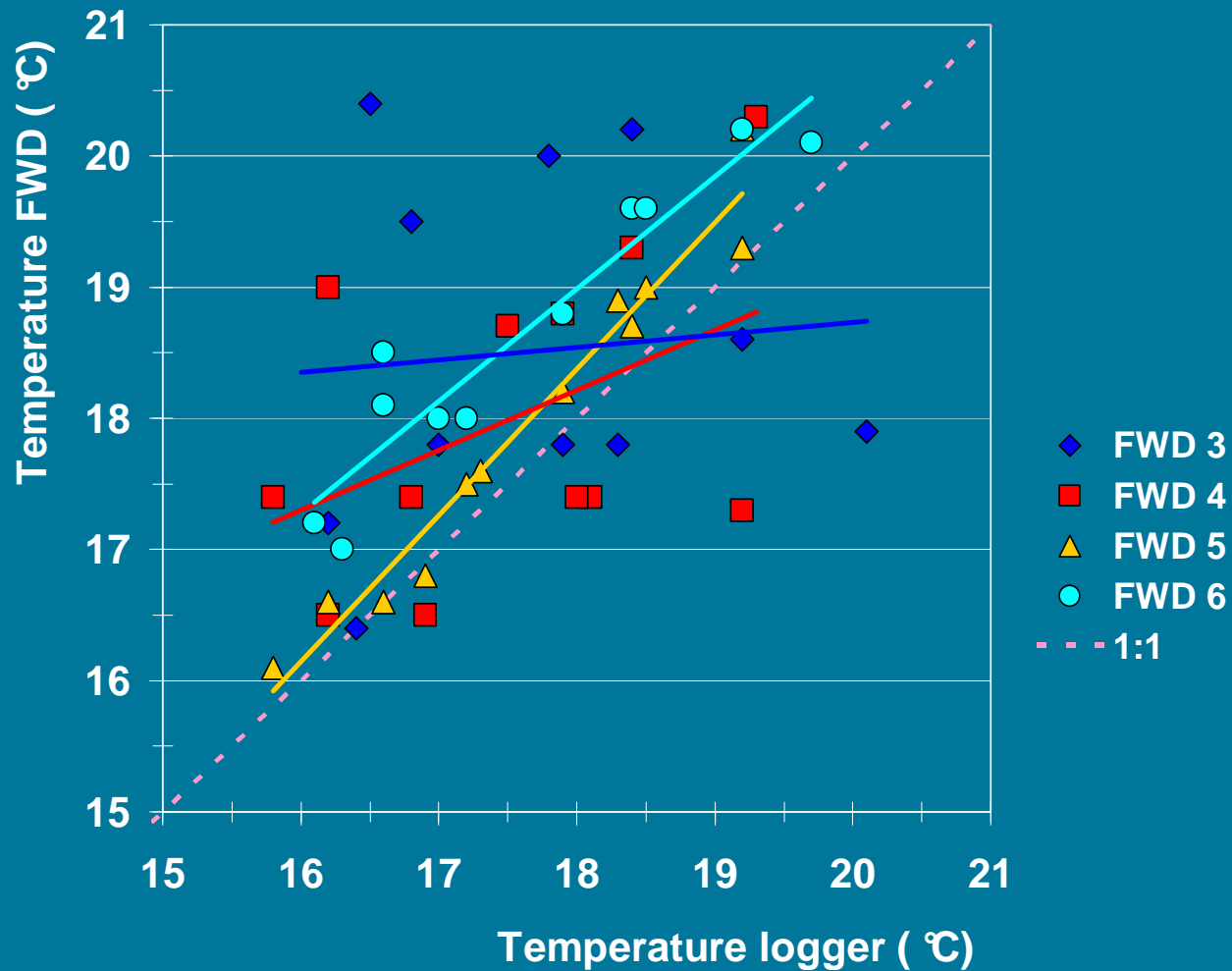
Accuracy of temperature

- Error of +1°C in temperature results in overprediction of pavement life
 - of 5% for asphalt roads with cement bound bases
 - of 10% for all other asphalt roads

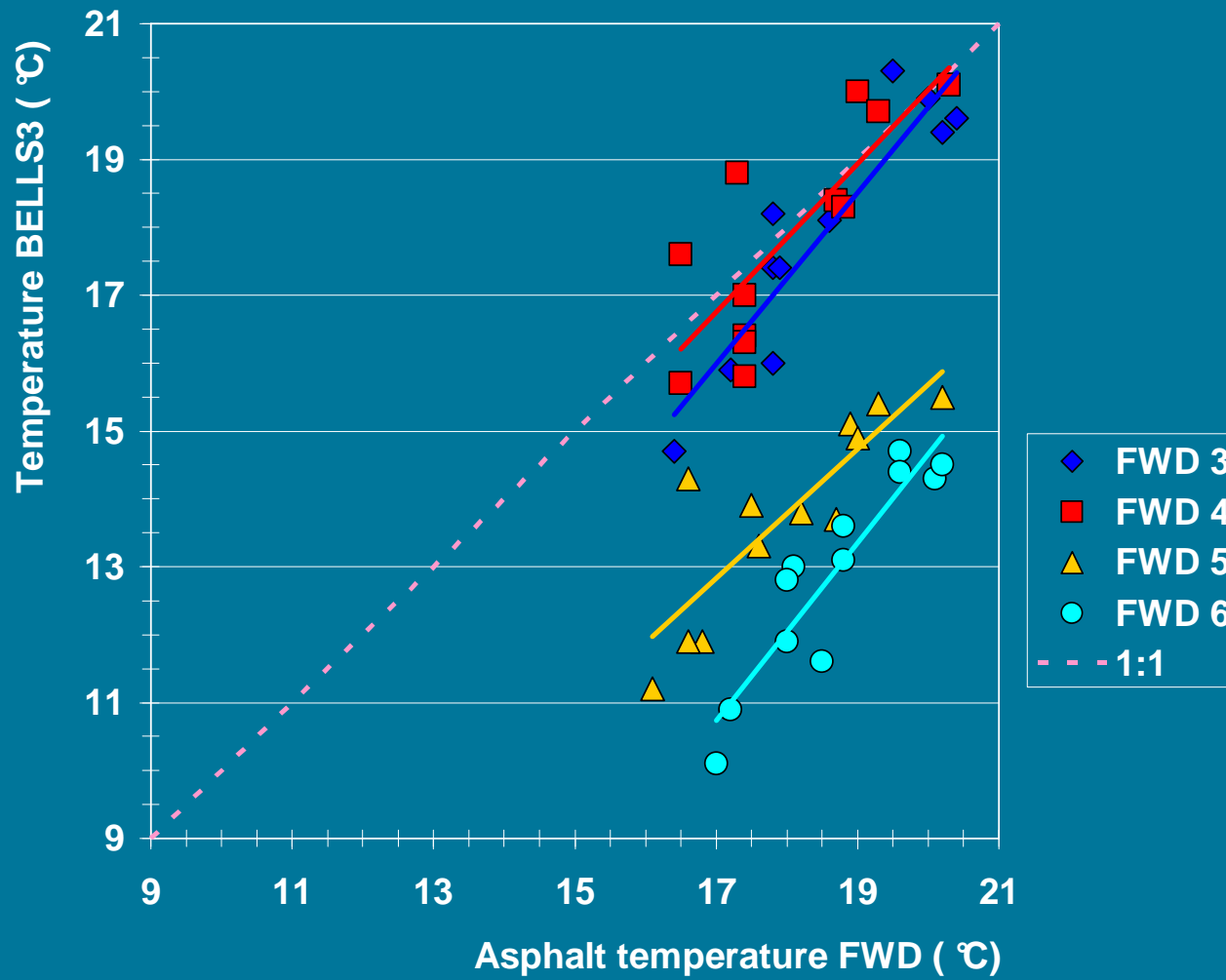
Accuracy of temperature



Accuracy of temperature



Accuracy of temperature



Research targets

Better backcalculation of layer stiffness moduli

- Currently only one stiffness modulus for whole set of asphalt layers
- Request for more realistic stiffness moduli at conditions with increasing stiffness with depth

Stiffness moduli

- In CARE only one asphalt stiffness modulus
- Adjustment factor for structural contribution of porous asphalt

- In OIA maximum up to 6 asphalt layers
- Preset stiffness ratios for all asphalt layers
 - Laboratory testing
 - Estimates by experts
- Redistribute backcalculated aggregate asphalt stiffness over asphalt layers via stiffness ratios

Research targets

Better matching with actual performance

- More focus on interaction between visual condition, material properties and results of FWD data analysis
- More accurate registration of cracking

Products

- Falling Weight Deflectometer calibration guide (rapport D11-07)

Next FWD Correlation Trial
2 October 2013
Register now

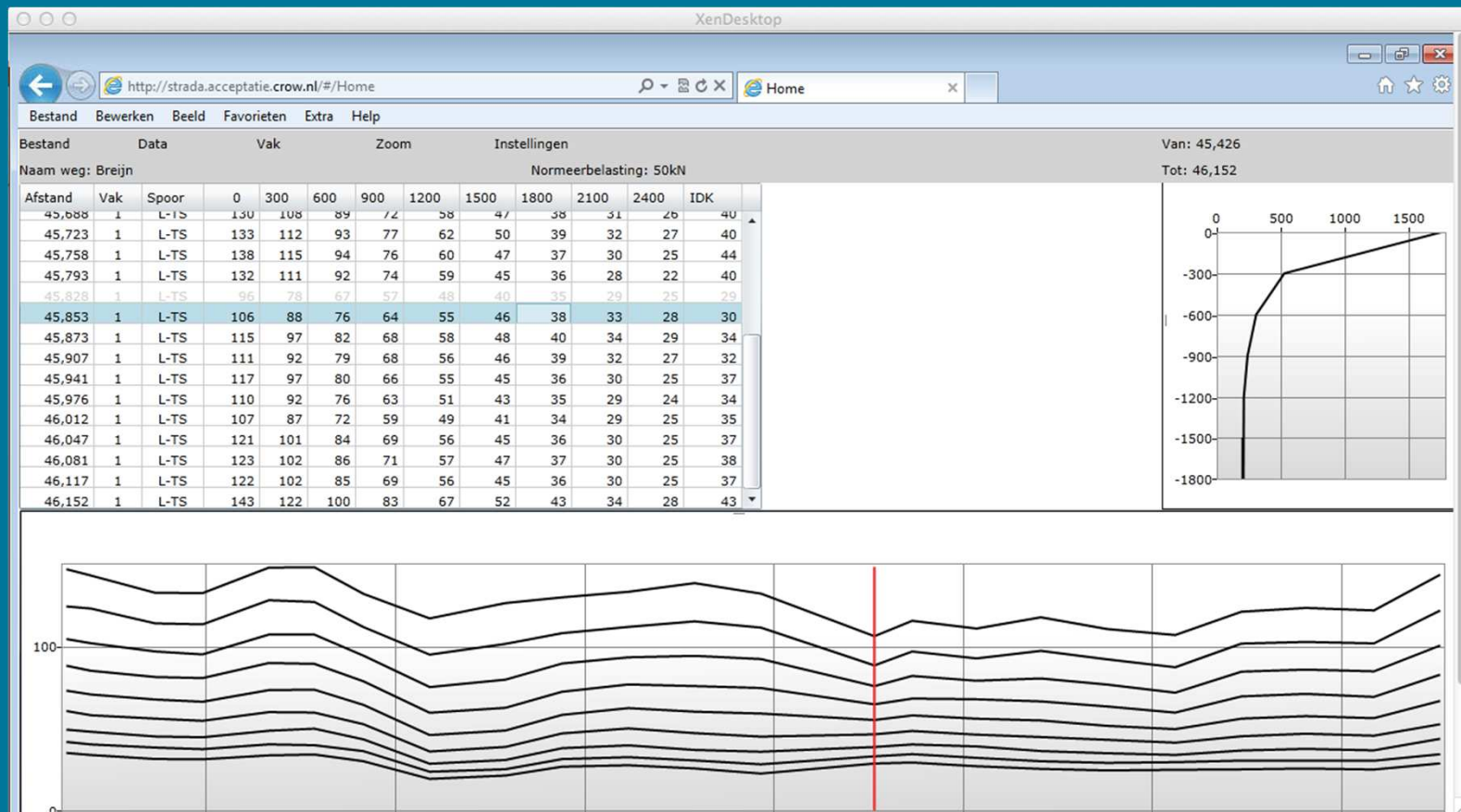


Products

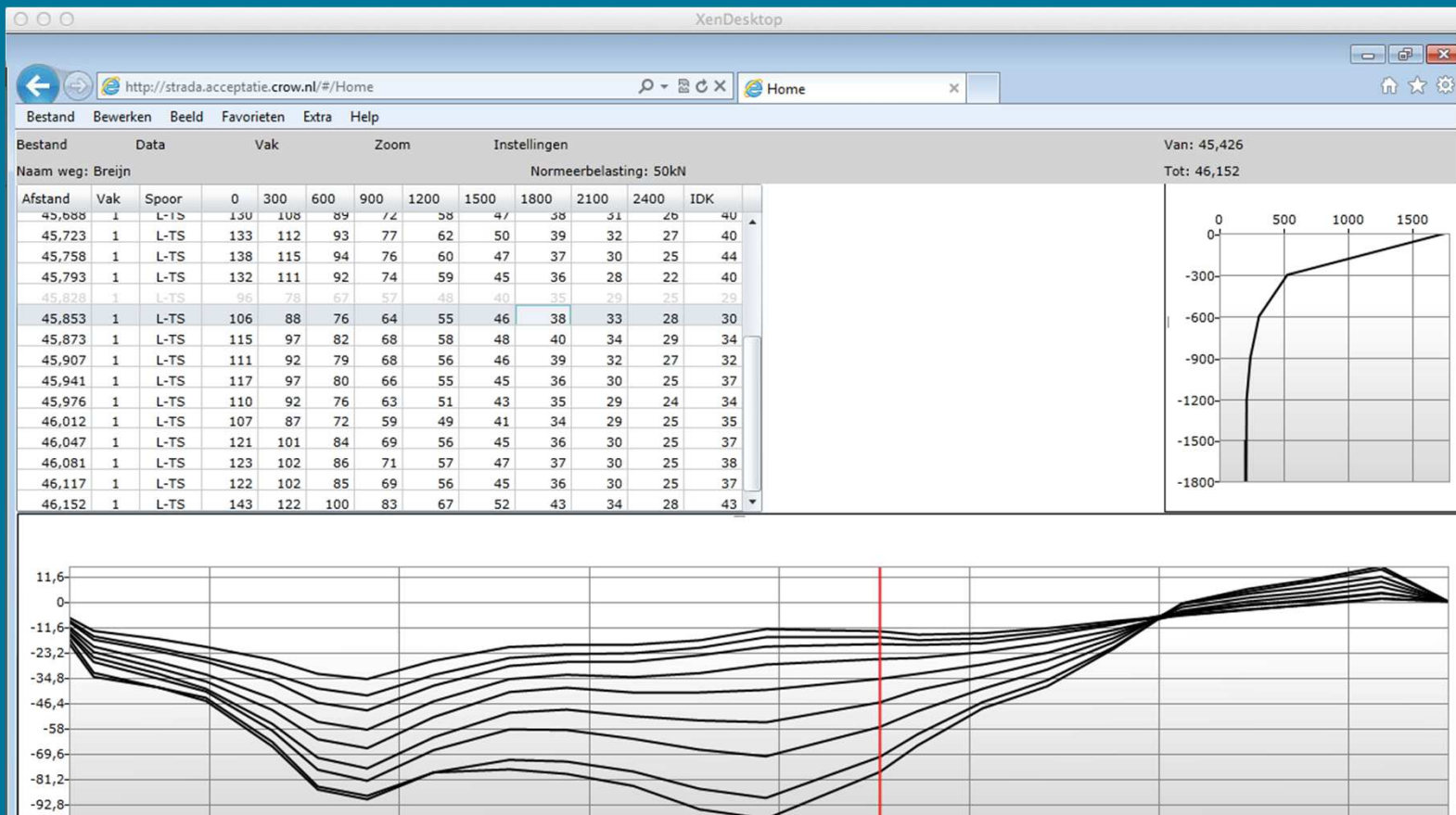
- Software
 - Redesign module
 - In combination with design module OIA

Processing of raw data

Main menu



Processing of raw data Delineation into sections

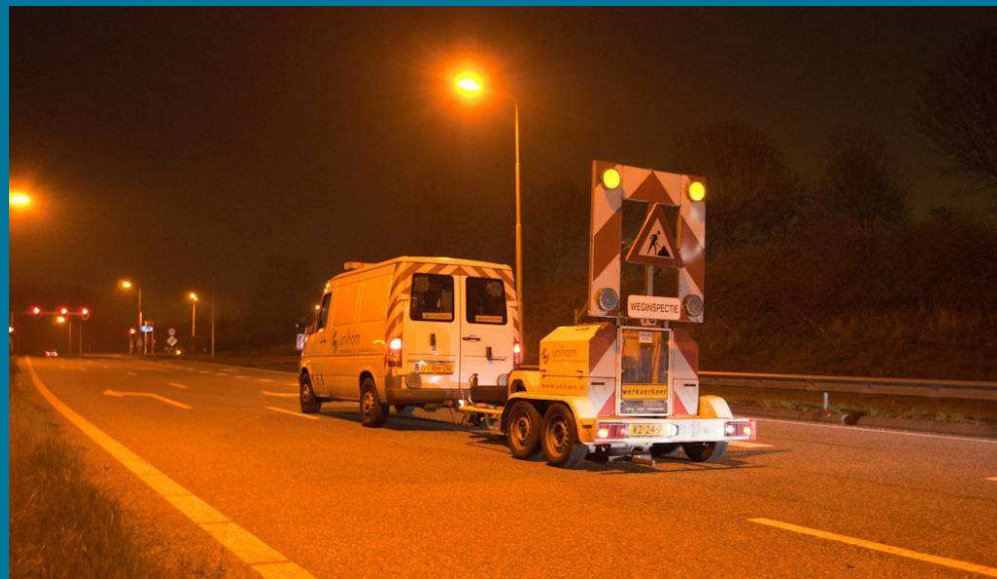


Products

- Publication for roadway authorities
 - Purpose of FWD testing
 - Guideline for drafting proposals for FWD testing

Products

- Background report
 - Part A: Manual for performing FWD tests
 - Part B: Manual for analysis of FWD data, structural condition of asphalt road and redesign
 - Part C: Informative annexes to the various procedures



Questions, remarks, suggestions?

