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**SIXTH FRAMEWORK PROGRAMME
Sustainable Surface Transport**

Sustainable Pavements for European New Member States



ANNEX C: FALLING WEIGHT DEFLECTOMETER TESTS RESULTS

Deliverable D.12: Recommendations for traffic equivalency factors

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The FWD (Falling Weight Deflectometer) tests were done with the loads from 30 kN to 80 kN in steps of 10 kN. At each testing point, there were 5 drops of the same weight, of which the deflection under the last one was used for the analyses.

Due to organisational reasons it was not possible to perform measurements on the test sections before the HVS measurements. Since the pavements constructed are sufficiently wide and long, the problem has been overcome by performing two series of measurements: one on the parts of the structure that were not loaded during the accelerated loading test. The second one was measured on the pavement areas loaded by HVS. The first series were designated "non-loaded", the latter as "loaded" ones.

On the loaded parts, measurements were done in the test points loaded earlier. On structure 1 it was done in 7 test points, on structure 2 in 3 points, on structure 3 in 6 points, no testing on structure four, on structure 5 in 5 points and on structure 6 in 7 points. When performing the measurements on the non-loaded part of the structures, two measuring points per structure were chosen.

From figures can be seen results for all 9 geophones, labelled from D1 (central one, under the weight) to D9.

1 AVERAGE DEFLECTIONS

In this Chapter, there is a comparison between deflections of loaded (thicker lines) and non-loaded part (thinner lines) of structures shown.

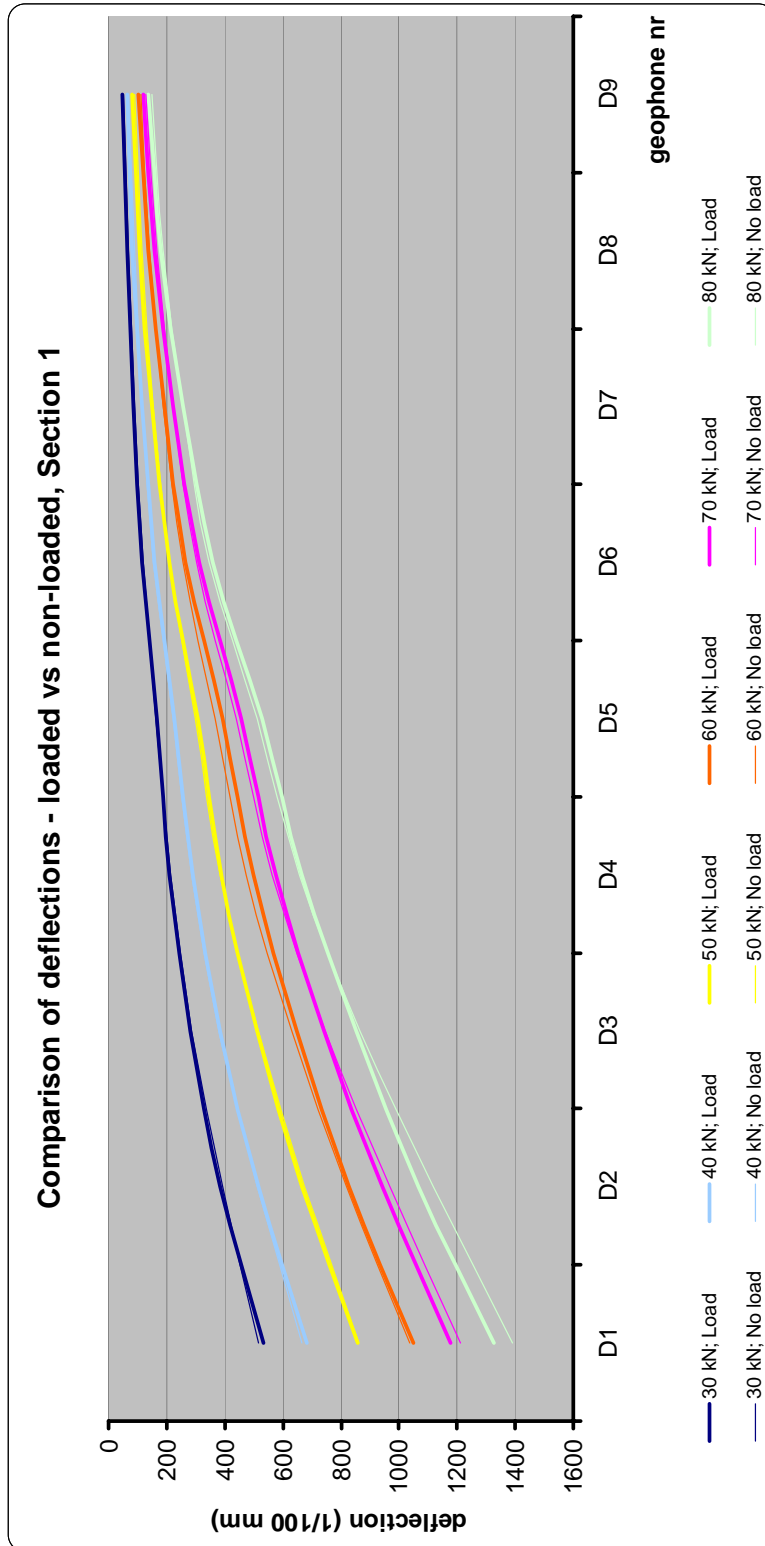


Figure 1-1 Comparison of average FWD-deflections (structure 1)

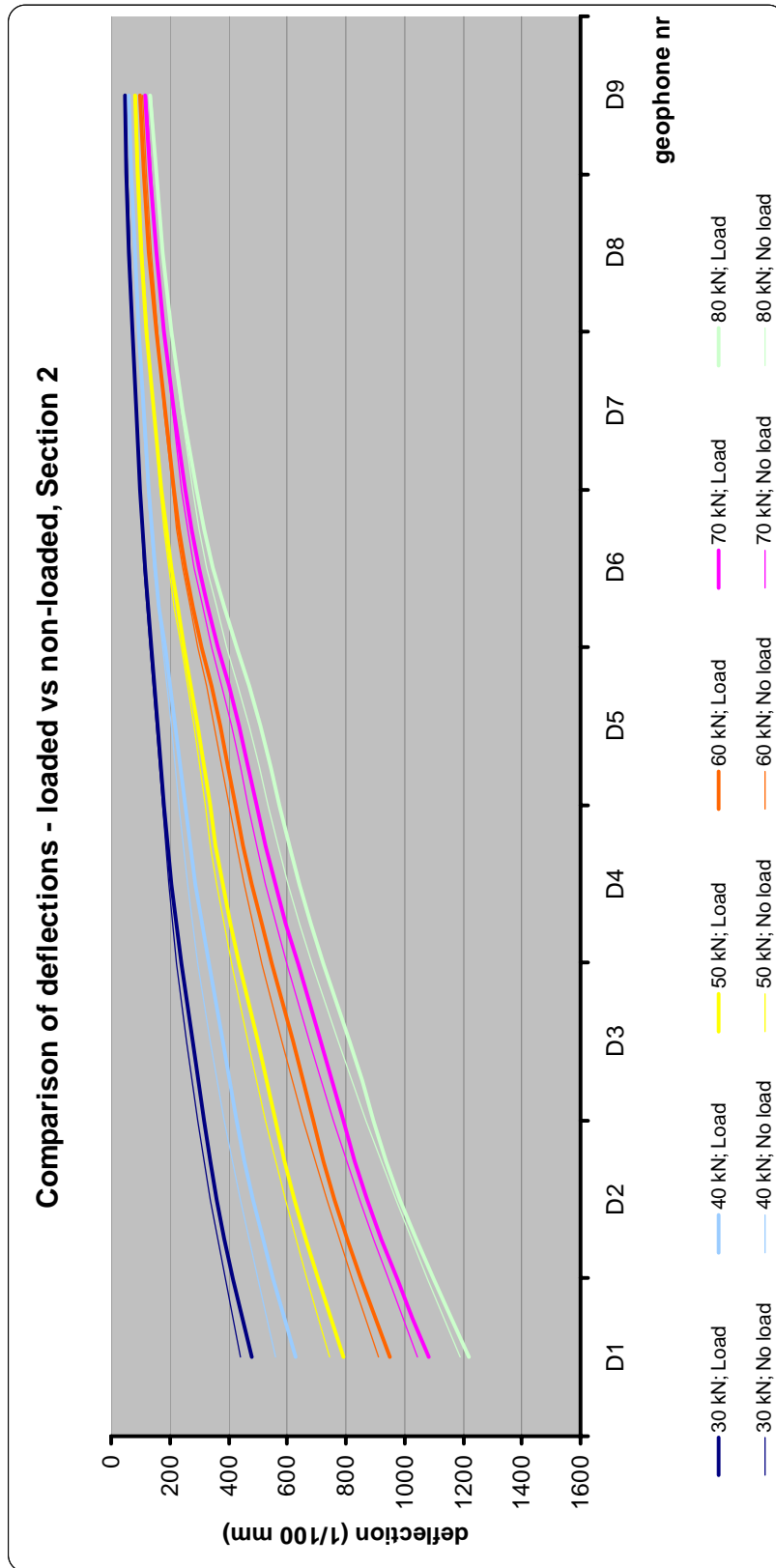


Figure 1-2 Comparison of average FWD-deflections (structure 2)

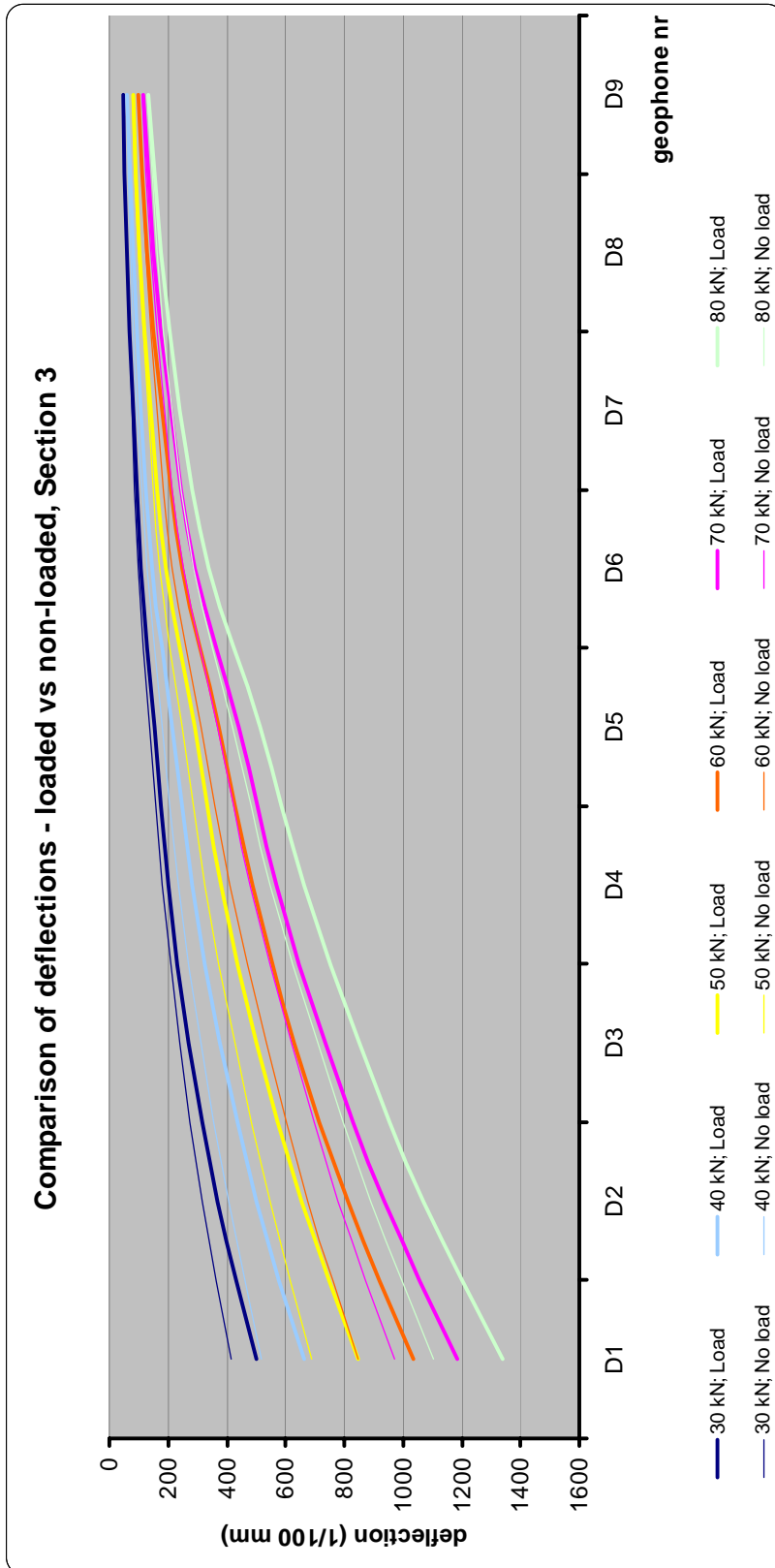


Figure 1-3 Comparison of average FWD-deflections (structure 3)

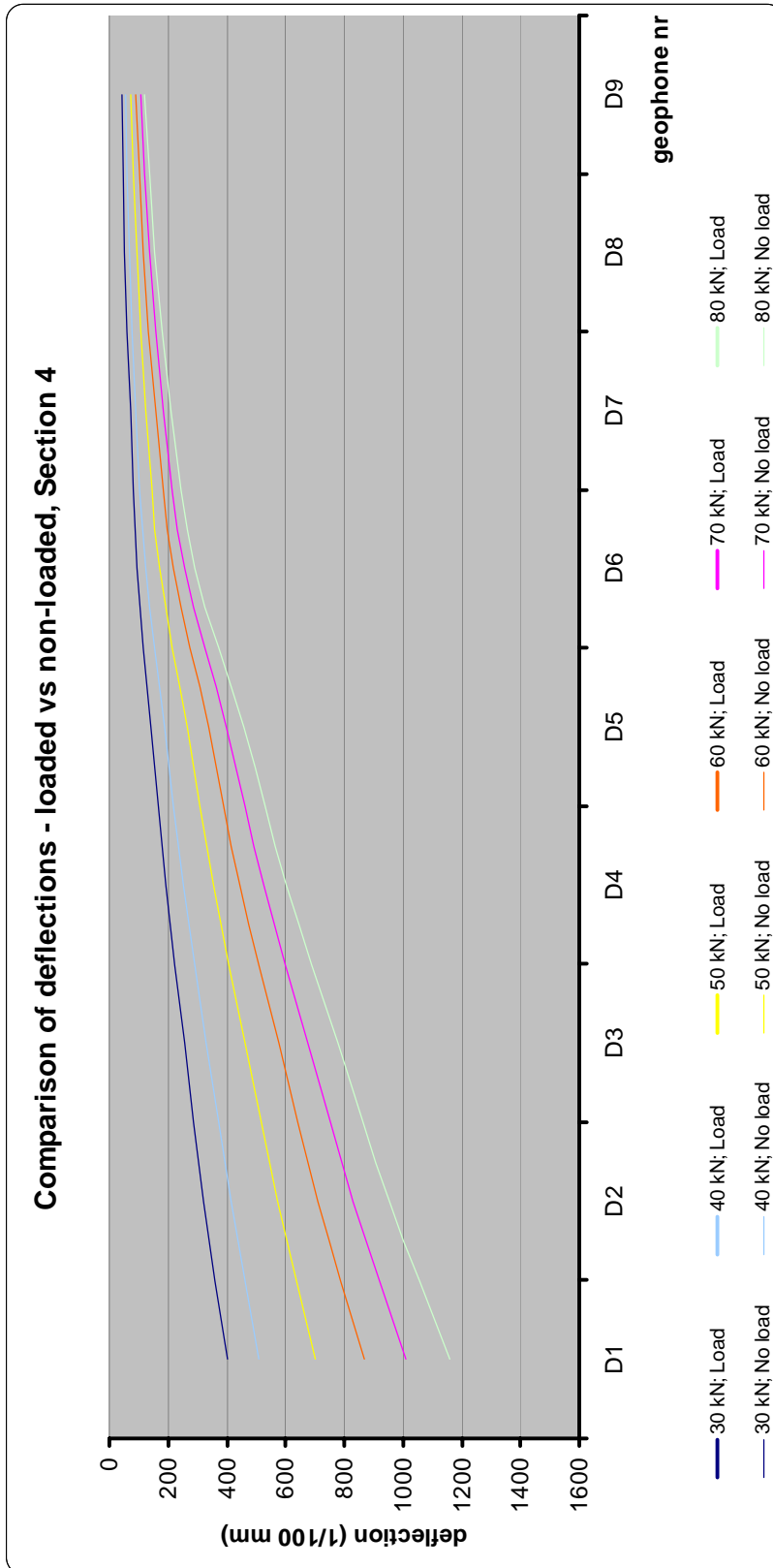


Figure 1-4 Comparison of average FWD-deflections (structure 4)

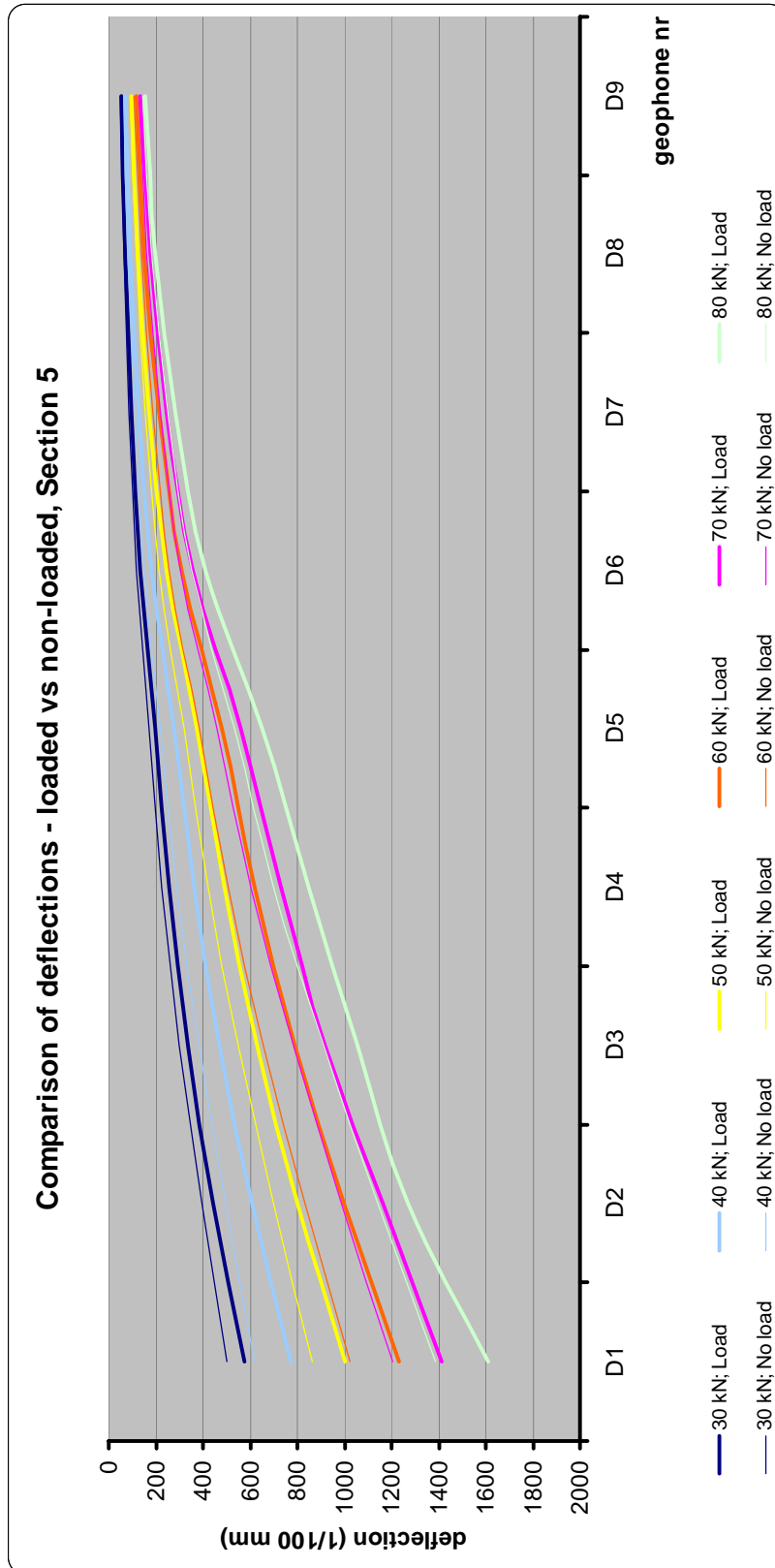


Figure 1-5 Comparison of average FWD-deflections (structure 5)

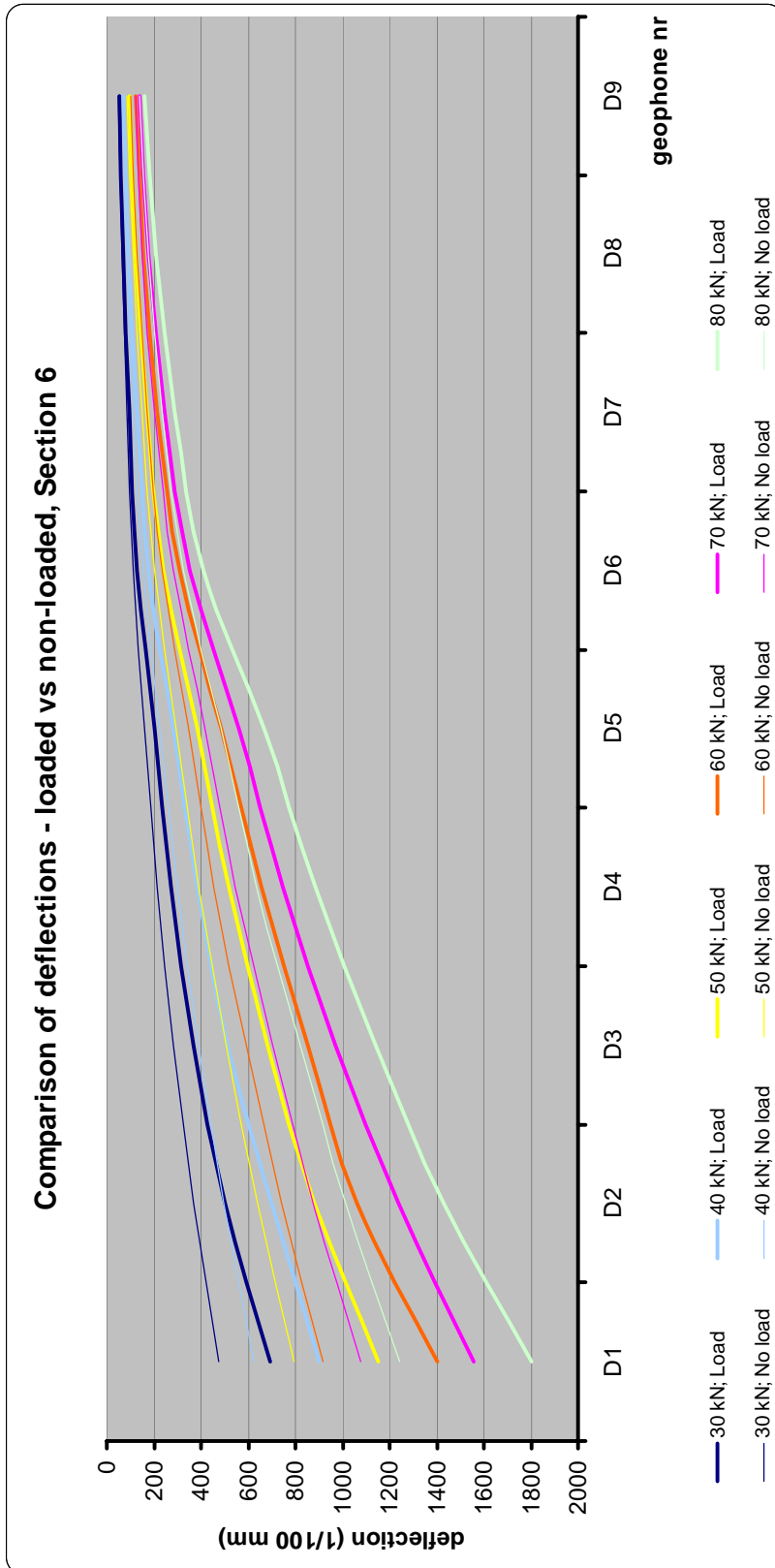


Figure 1-6 Comparison of average FWD-deflections (structure 6)

2 MAXIMAL DEFLECTIONS

Figures in this Chapter show a comparison between maximal deflections of loaded (red lines) and non-loaded part (blue lines). Maximal deflections are shown for each loading (30 kN to 80 kN in steps of 10 kN) and are fitted with best fit lines.

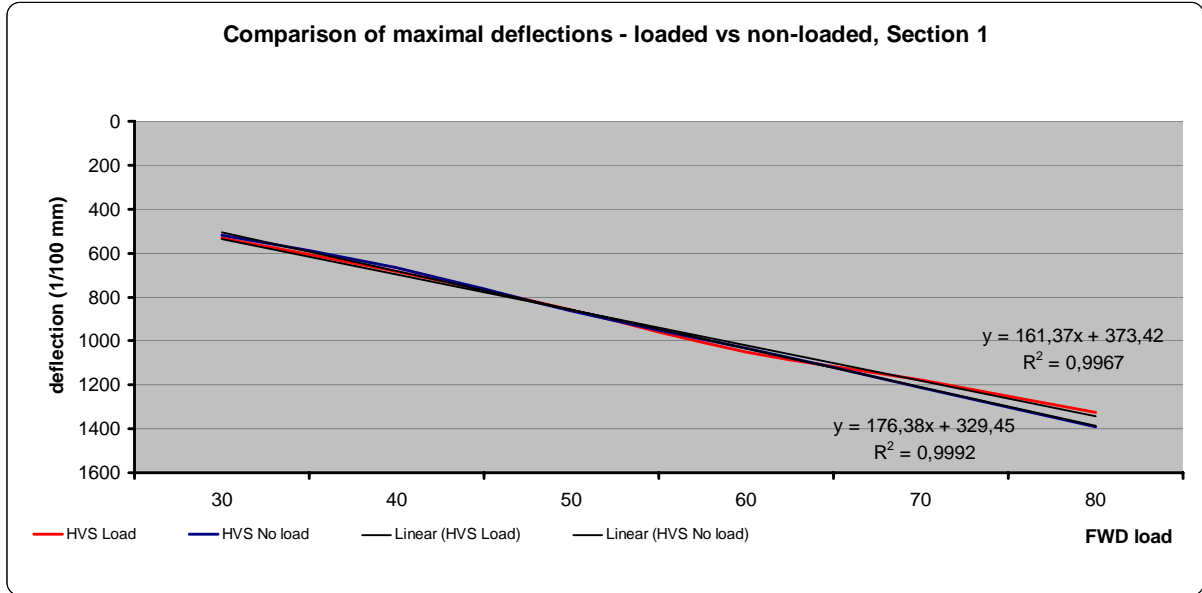


Figure 2-1 Comparison of the averages of maximal FWD-deflections (structure 1)

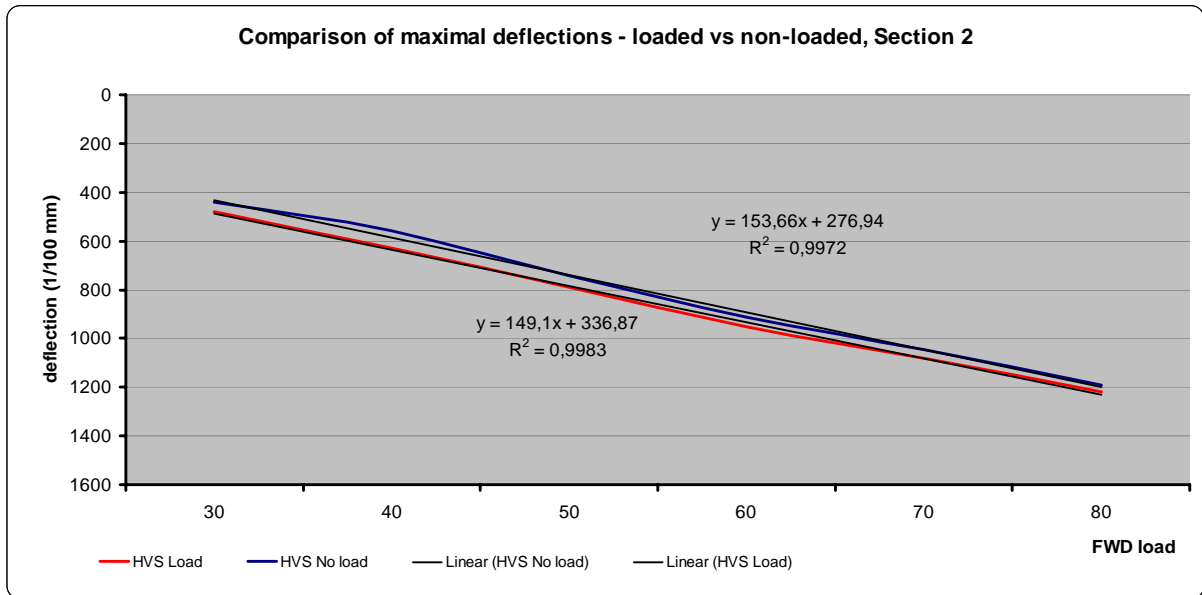


Figure 2-2 Comparison of the averages of maximal FWD-deflections (structure 2)

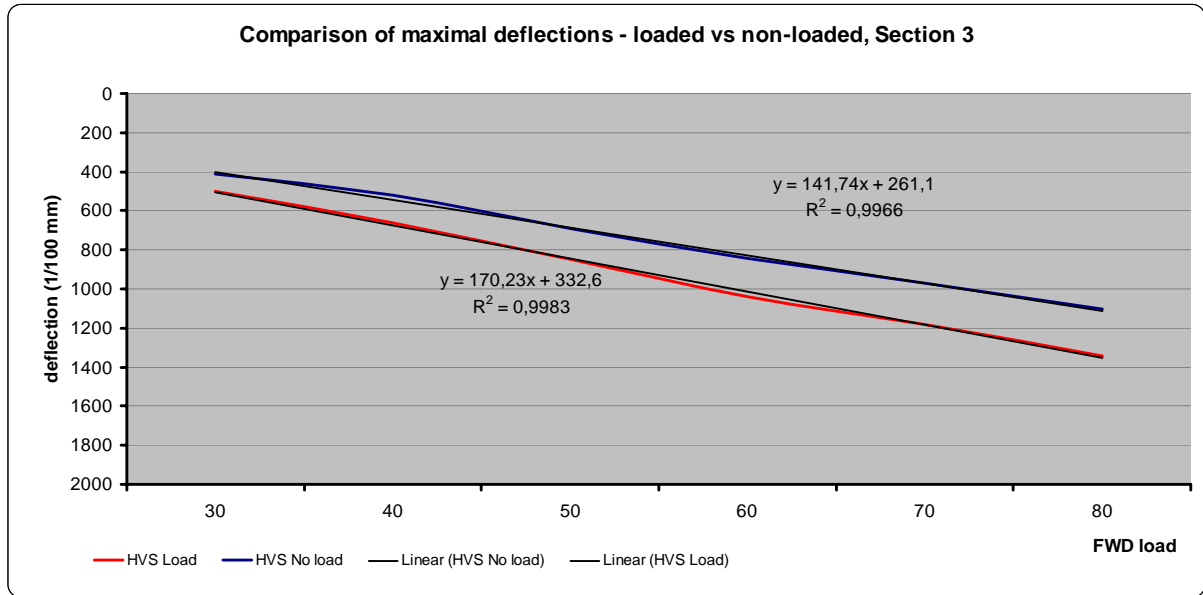


Figure 2-3 Comparison of the averages of maximal FWD-deflections (structure 3)

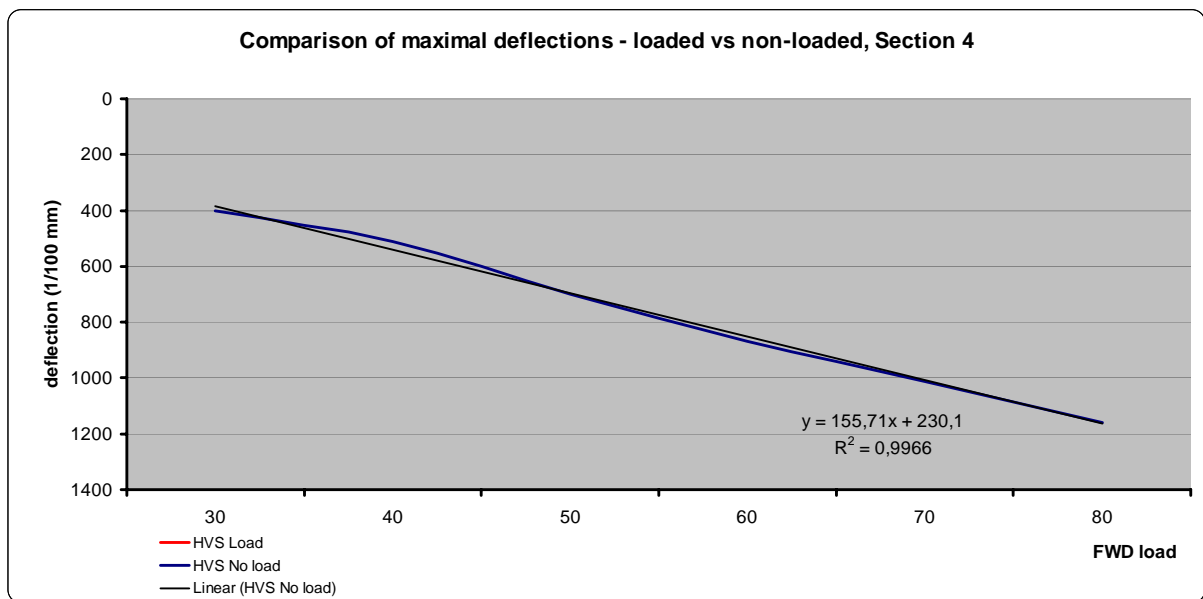


Figure 2-4 Comparison of the averages of maximal FWD-deflections (structure 4)

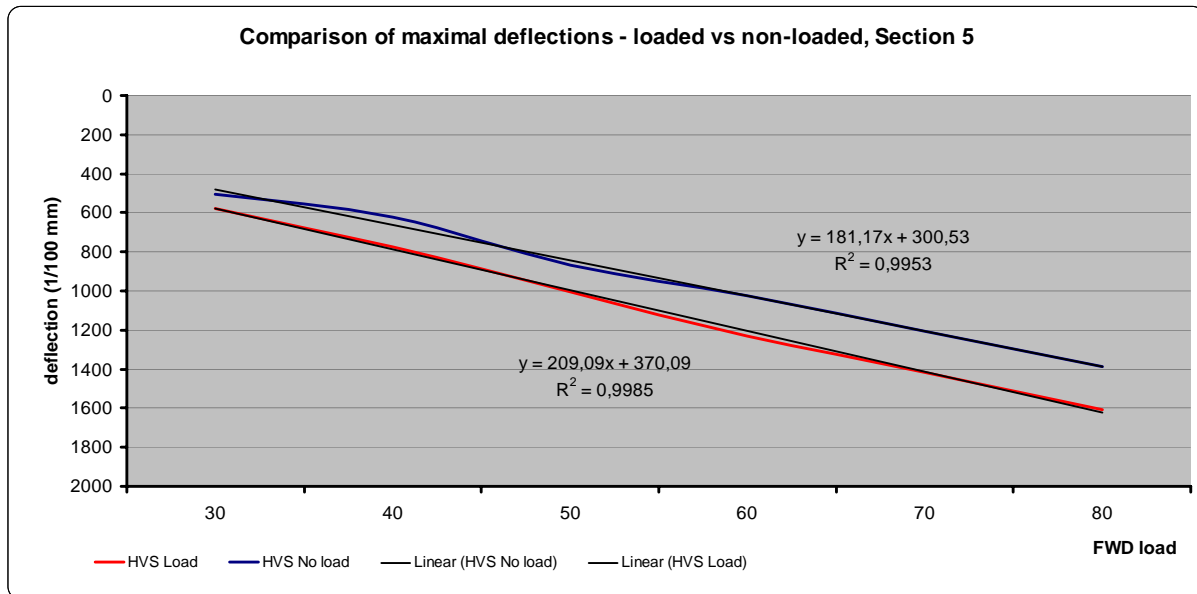


Figure 2-5 Comparison of the averages of maximal FWD-deflections (structure 5)

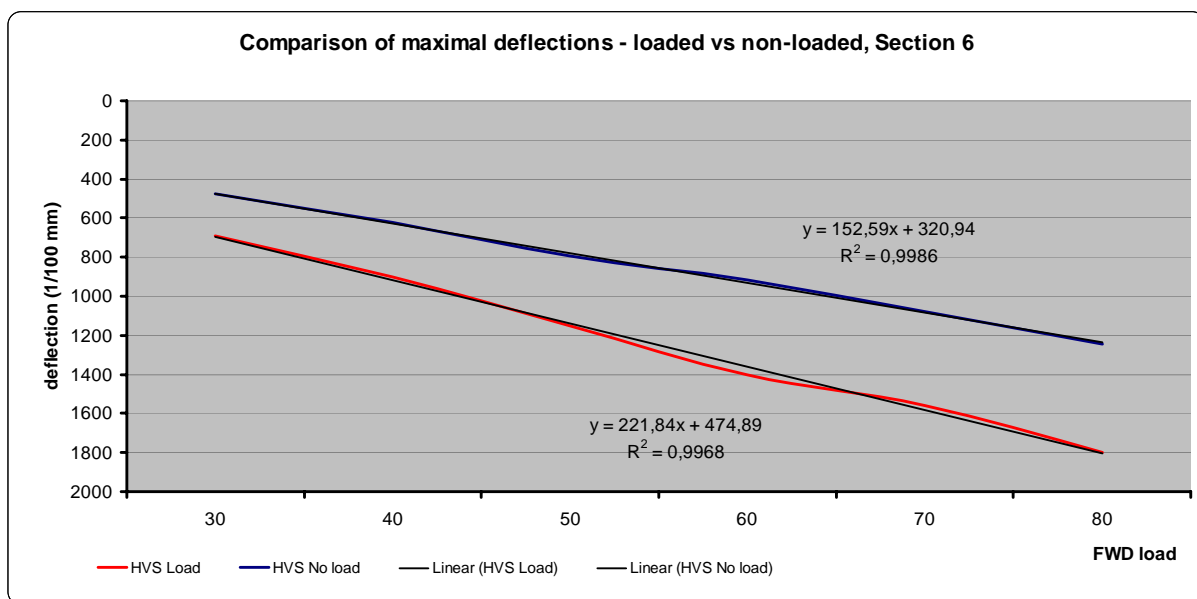


Figure 2-6 Comparison of the averages of maximal FWD-deflections (structure 6)

3 CALCULATED E-MODULI

Based on the measured deflections, E-moduli were calculated using software ELMOD (Evaluation of Layer Moduli and Overlay Design). For the calculation, also thicknesses from **Error! Reference source not found.** (D12 Recommendations for Traffic Equivalency Factors, Final Report) were used. Finally, E-moduli for loaded and non-loaded parts were compared, taking into account the measuring results with all loads (30 kN to 80 kN). This comparison was made using the backcalculation results for the three layers: asphalt, base layer and subbase.

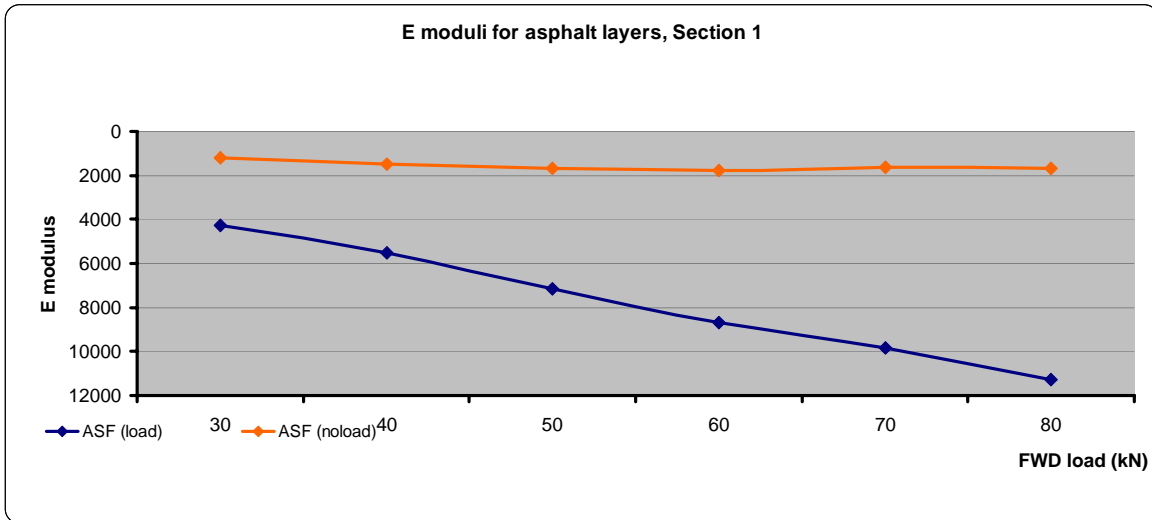


Figure 3-1 Comparison of the E-moduli for asphalt layer (structure 1)

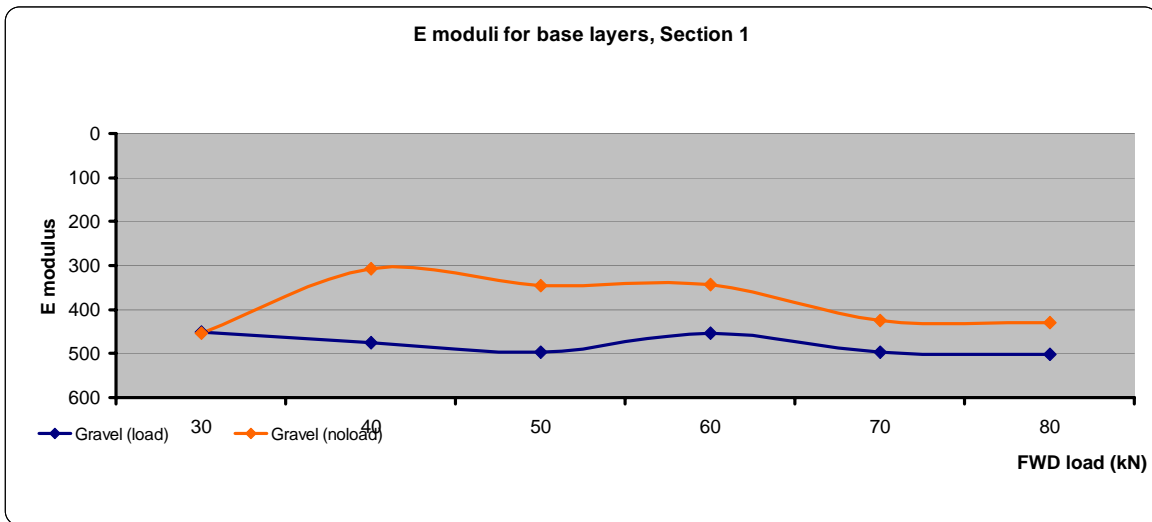


Figure 3-2 Comparison of the E-moduli for base layer (structure 1)

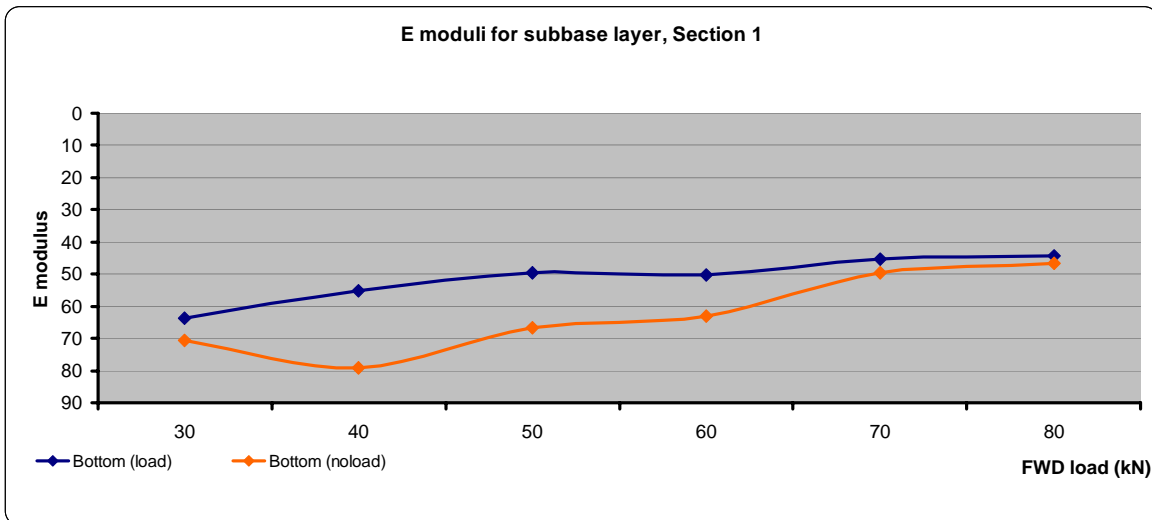


Figure 3-3 Comparison of the E-moduli for subbase (structure 1)

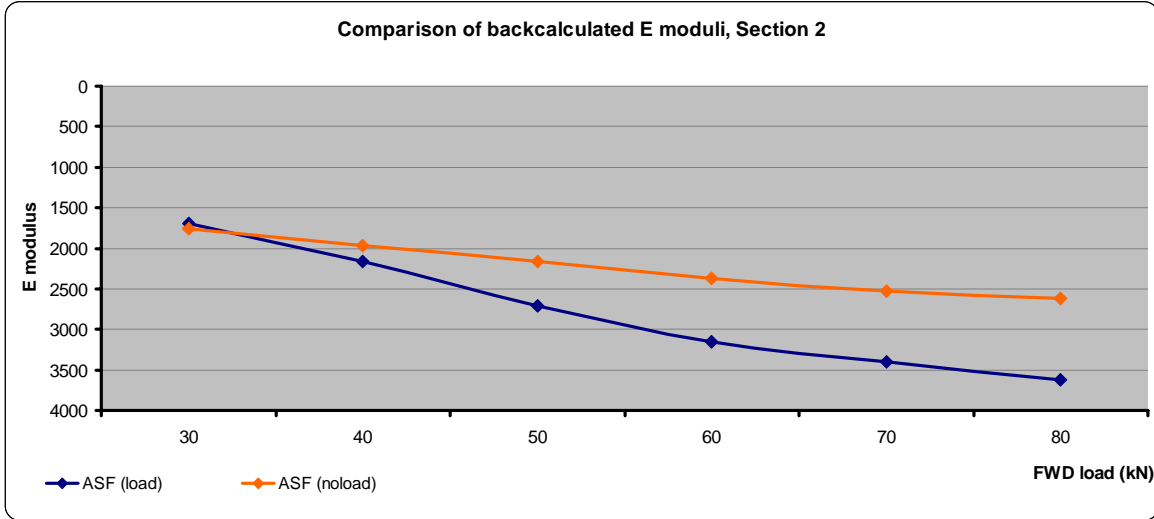


Figure 3-4 Comparison of the E-moduli for asphalt layer (structure 2)

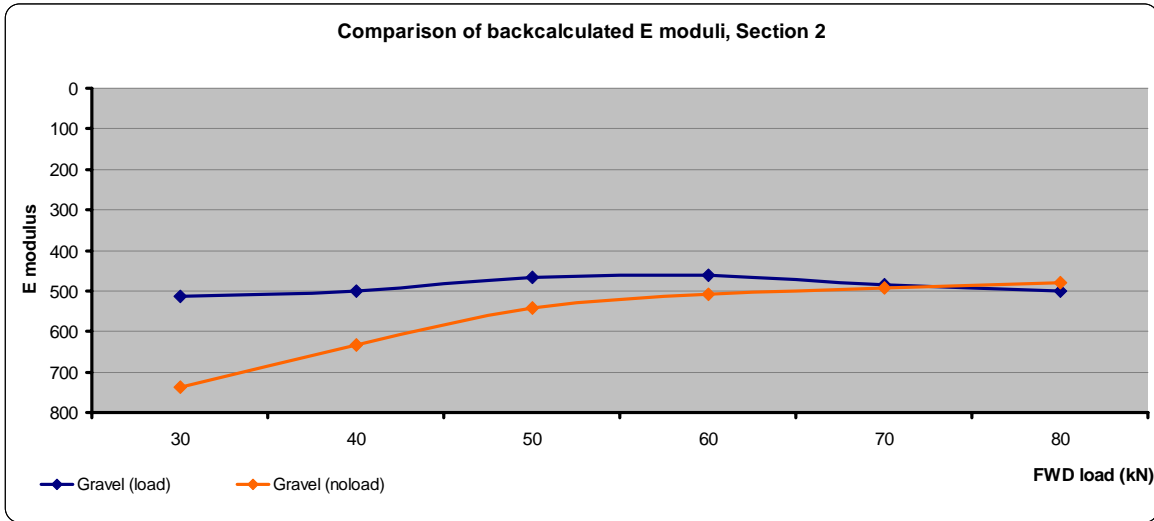


Figure 3-5 Comparison of the E-moduli for base layer (structure 2)

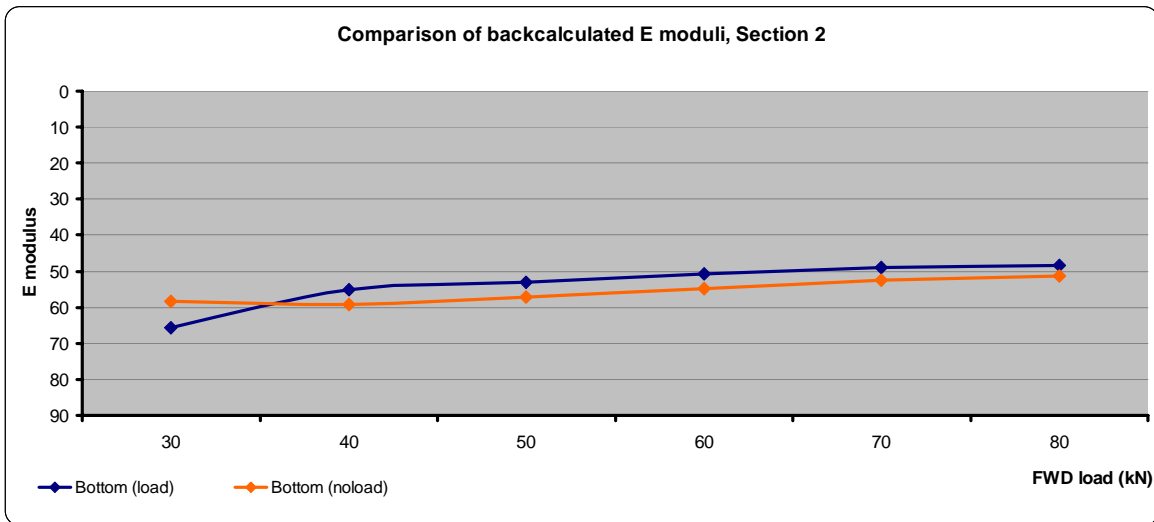


Figure 3-6 Comparison of the E-moduli for subbase (structure 2)

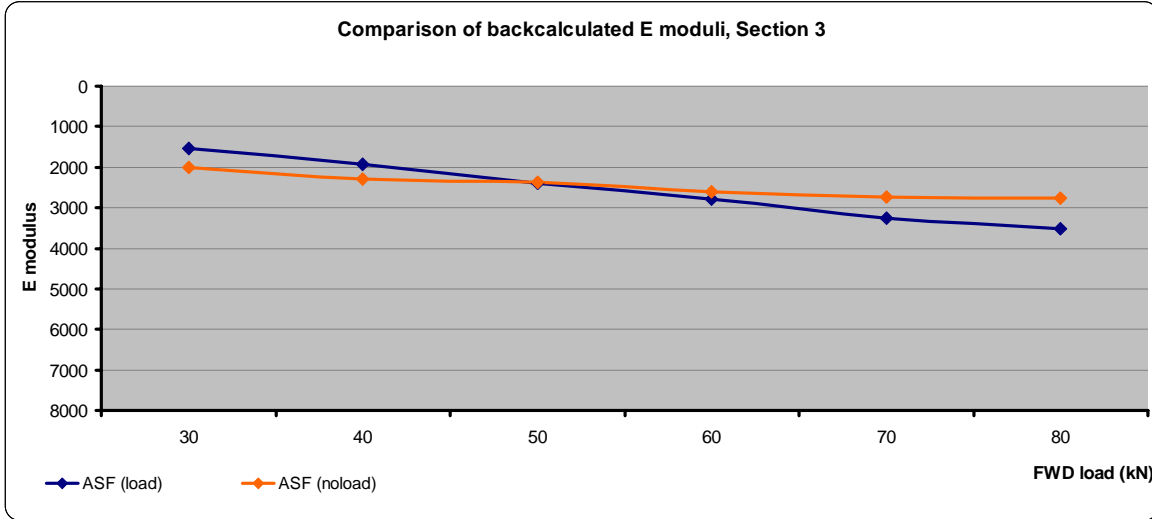


Figure 3-7 Comparison of the E-moduli for asphalt layer (structure 3)

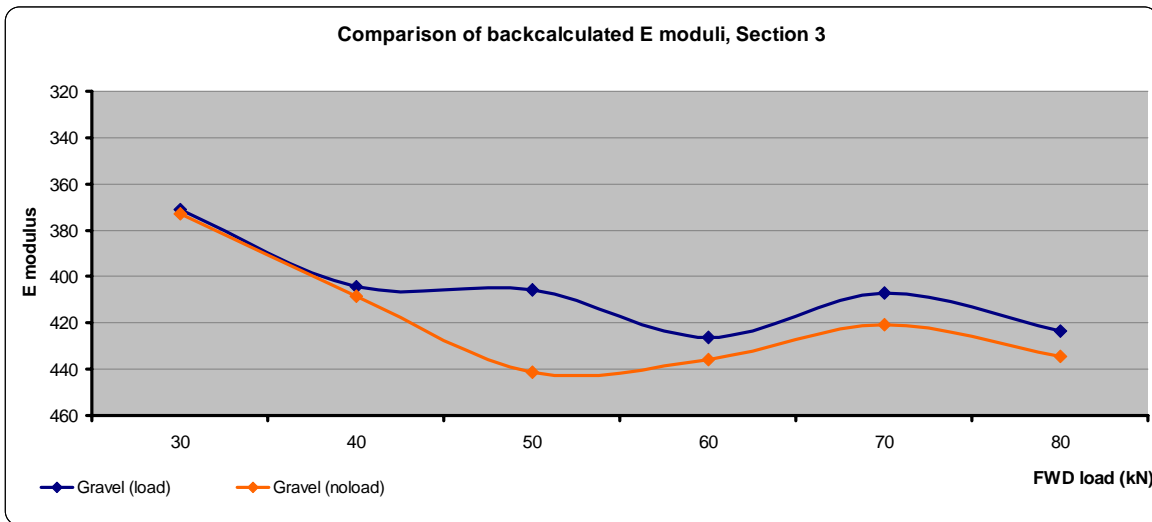


Figure 3-8 Comparison of the E-moduli for base layer (structure 3)

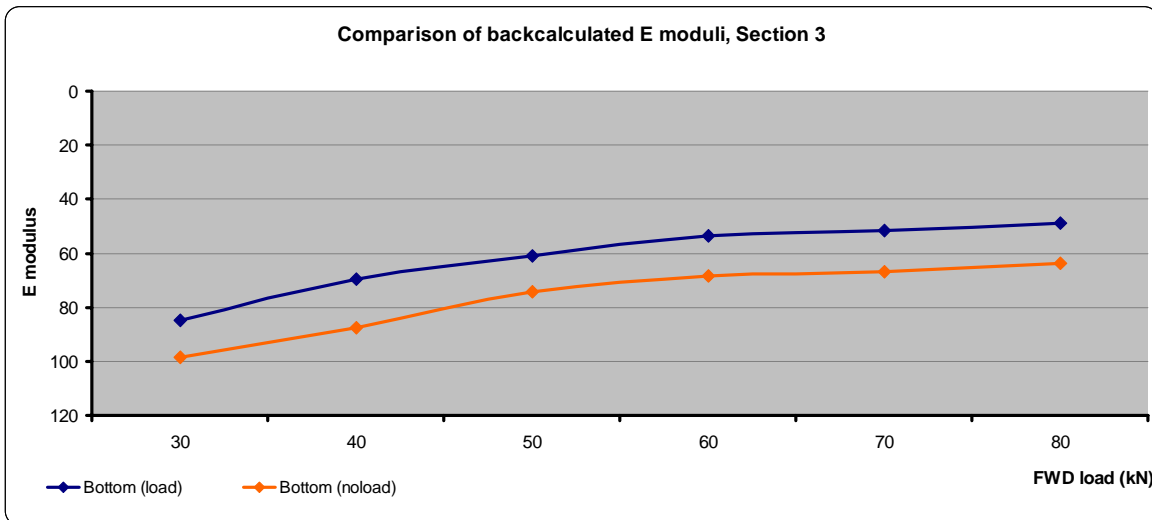


Figure 3-9 Comparison of the E-moduli for subbase (structure 3)

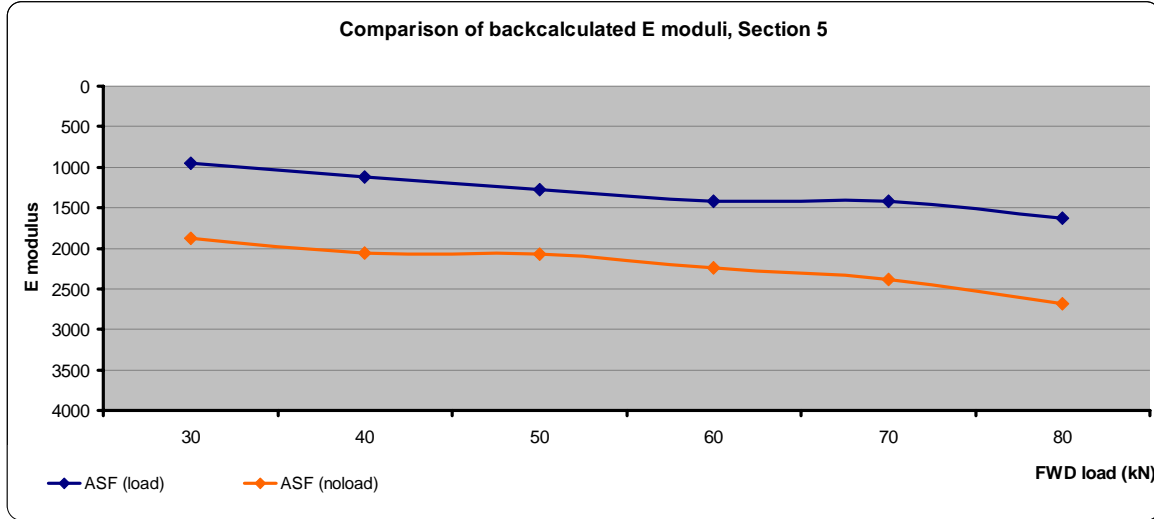


Figure 3-10 Comparison of the E-moduli for asphalt layer (structure 5)

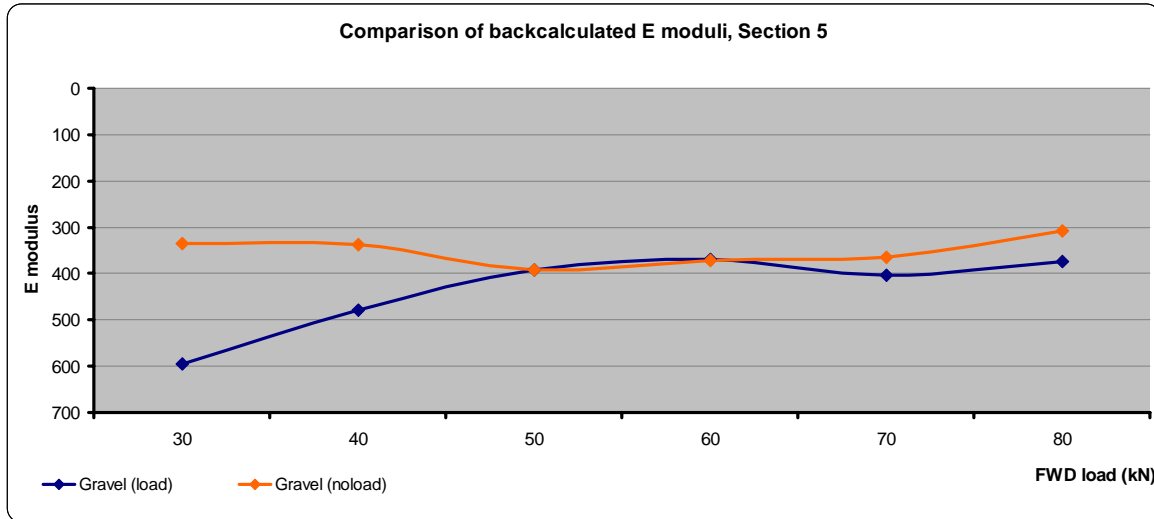


Figure 3-11 Comparison of the E-moduli for base layer (structure 5)

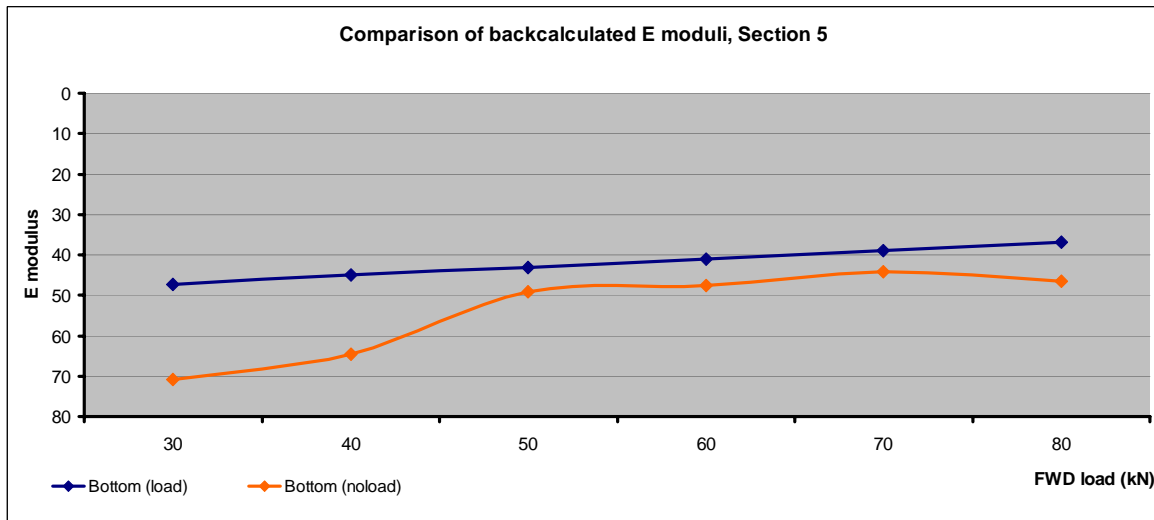


Figure 3-12 Comparison of the E-moduli for subbase (structure 5)

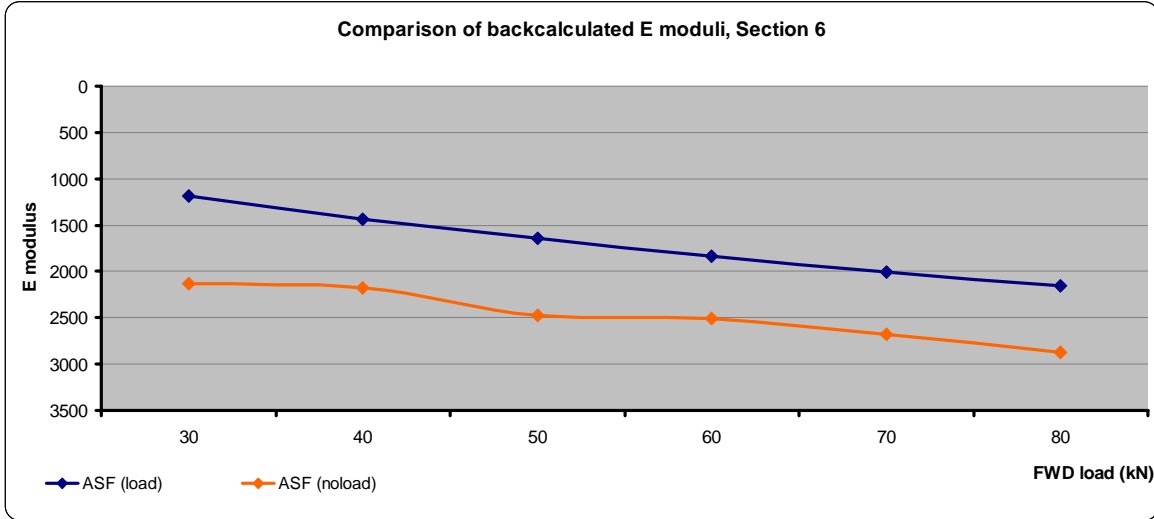


Figure 3-13 Comparison of the E-moduli for asphalt layer (structure 6)

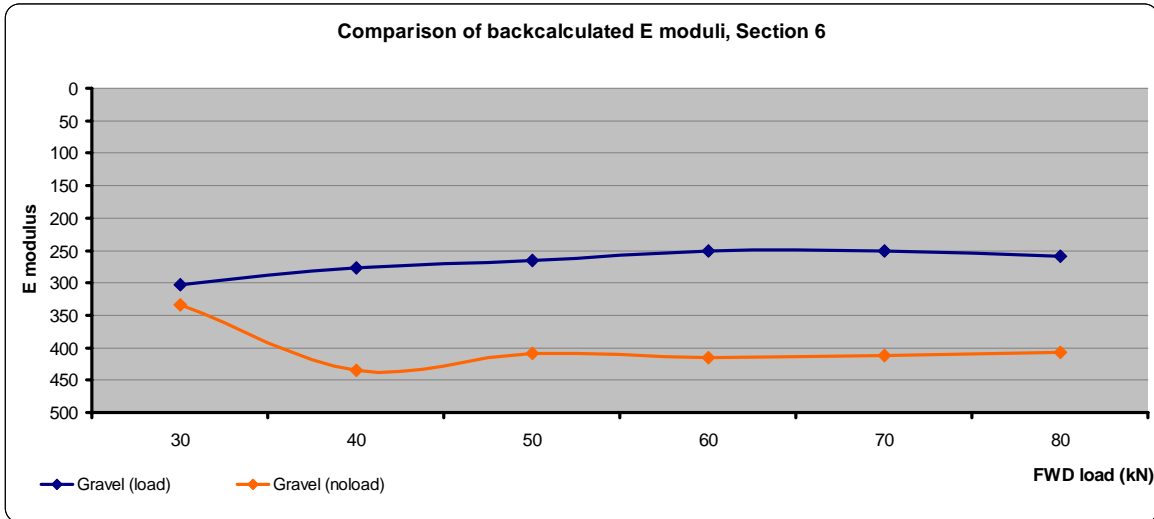


Figure 3-14 Comparison of the E-moduli for base layer (structure 6)

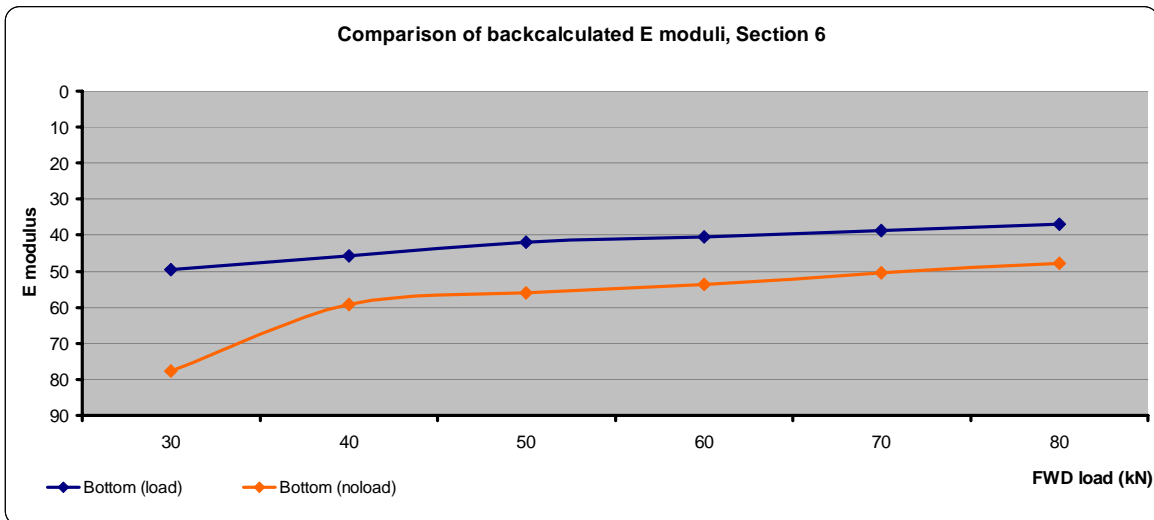


Figure 3-15 Comparison of the E-moduli for subbase (structure 6)

4 COMPARISON OF E-MODULI

Figures in this Chapter present the combination of the results coming from the comparison of back-calculation results for each layer and part of the structures (sections).

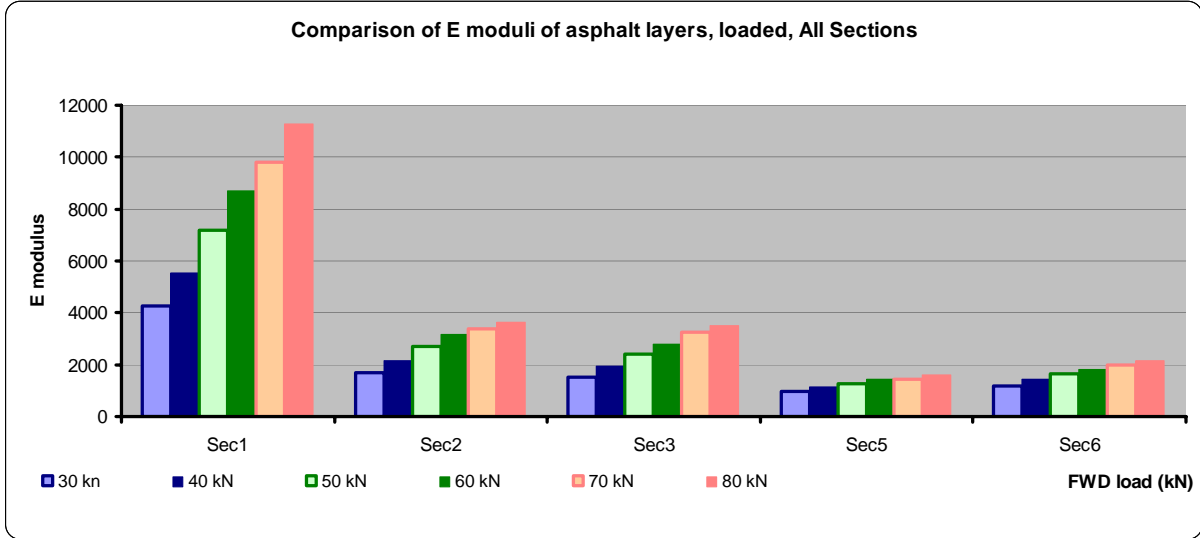


Figure 4-1 Comparison of the E-moduli of asphalt layers between the structures (loaded parts)

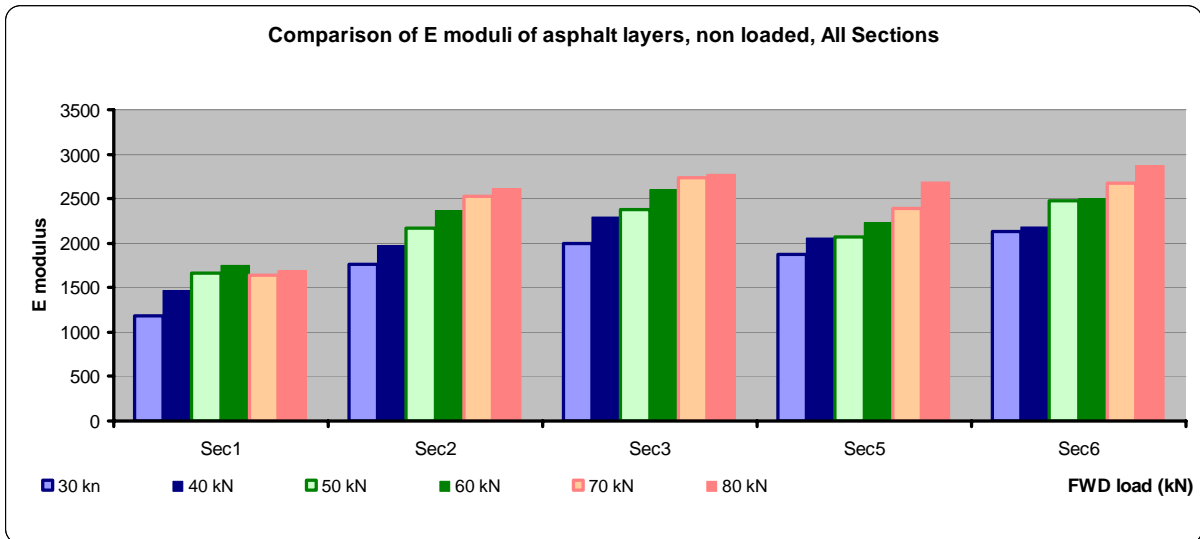


Figure 4-2 Comparison of the E-moduli of asphalt layers between the structures (non-loaded part)

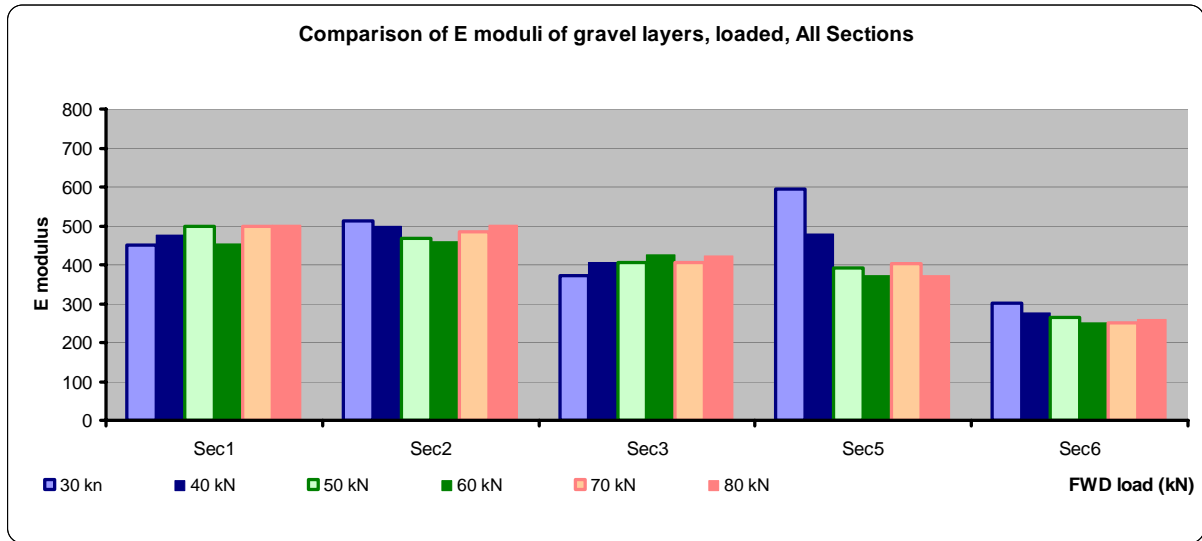


Figure 4-3 Comparison of the E-moduli of gravel base layers between the structures (loaded parts)

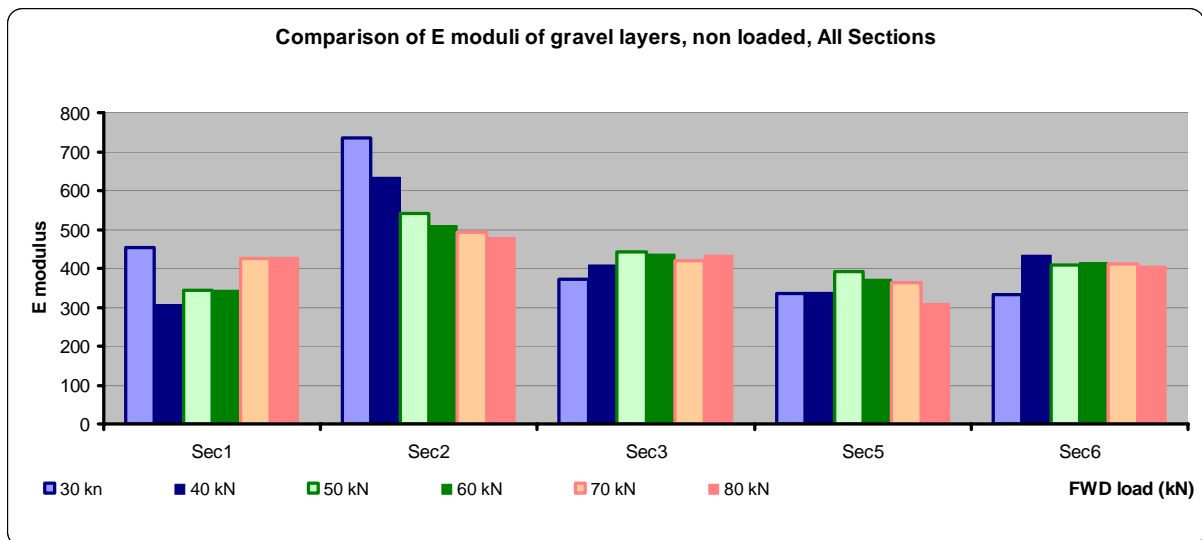


Figure 4-4 Comparison of the E-moduli of gravel base layers between the structures (non-loaded parts)

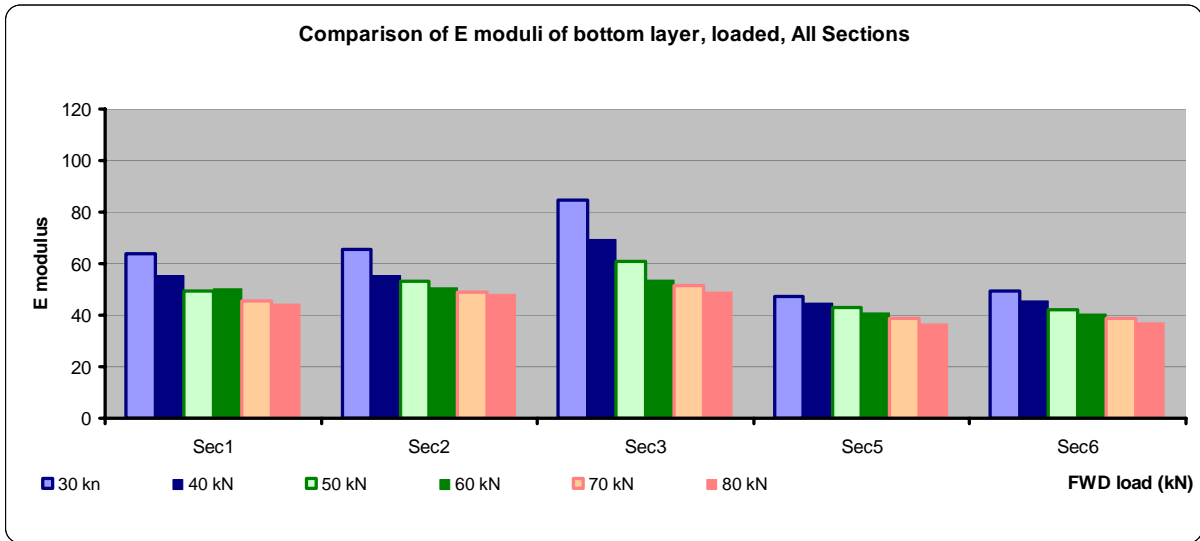


Figure 4-5 Comparison of the E-moduli of subbase between the structures (loaded parts)

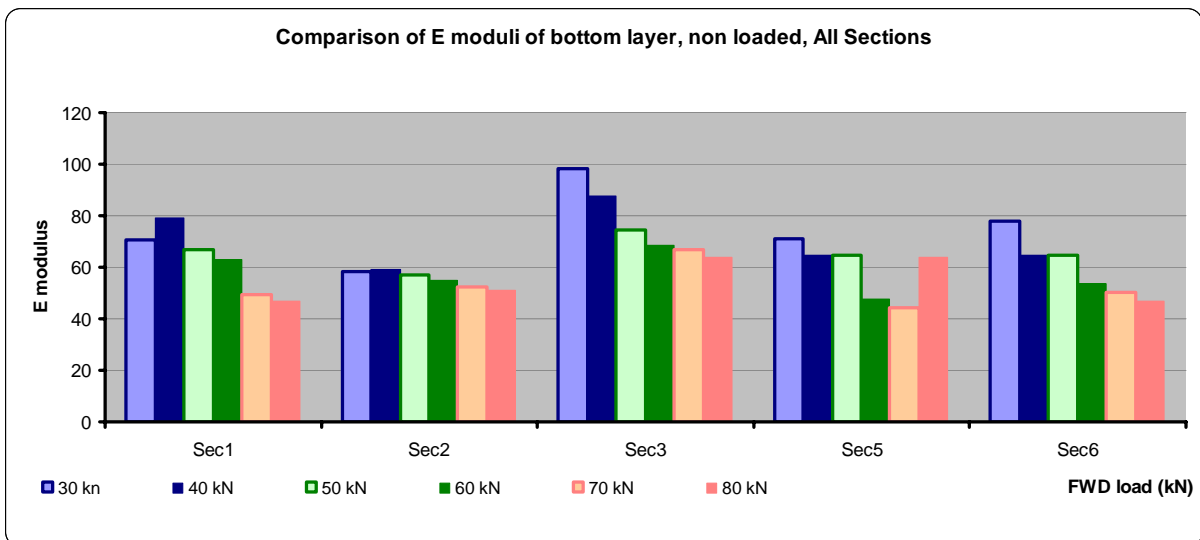


Figure 4-6 Comparison of the E-moduli of subbase between the structures (non-loaded parts)