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PAVEMENT BEHAVIOUR UNDER THE SUPER SINGLE TYRE

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Keywords

super single tyre; multi-depth deflections; pavement behaviour

Synopsis

Pavement behaviour under the super single tyre (SST) was investigated and compared with that under a conventional dual tyre (CDT). Contact areas and contact pressures over a range of loading conditions were measured and compared. Two approaches were used in the analyses. In the first, measurements were made of deflections with depth in the pavement structure under Heavy Vehicle Simulator loading. From this data, the material properties and structural life of the pavement were precisely determined under SST and CDT loading conditions. In the second, a complementary theoretical approach was used to determine the relative life of a wide variety of pavement structures. It is concluded that the super single tyre is generally more damaging than the conventional dual tyre under the same load, and that the maximum legal wheel load of the super single tyre should be kept at the present level of 3 850 kg.

Sinopsis

Die werkverrigting van plaveisels onder die super-enkelband (SEB) is ondersoek en vergelyk met dié onder 'n konvensionele dubbelband (KDB). Kontakoppervlaktes en kontakdrukke is onder verskeie lastoestande gemeet en vergelyk. In die ontledings is twee benaderings gevolg. In die eerste benadering is diepte-defleksiemetings van die plaveiselstrukture onder Swaarvoertuignabootserbelasting geneem. Uit hierdie data kon akkurate bepaling van die materiaaleienskappe en die strukturele leeftyd van plaveisels onder die super-enkelband en konvensionele dubbelband gedoen word. In die tweede, meer teoretiese benadering, is aanvullende ontledings gedoen om die relatiewe leeftyd van 'n groot verskeidenheid plaveiselstrukture te bepaal. Daar is tot die gevolgtrekking gekom dat die super-enkelband in die algemeen meer skade aanrig as die konvensionele dubbelband onder dieselfde las, en dat die maksimum wettige wiellas van die super-enkelband by die huidige vlak van 3 850 kg gehou moet word.

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1 INTRODUCTION

On the basis of investigations carried out in the 1960s, the super single tyre (SST) has, up to the present, been considered the equivalent of an ordinary single tyre in South Africa. The maximum allowable wheel load is therefore 3 850 kg as laid down in Regulation 102(a) of the Road Ordinance. At the request of the Road Authorities the relative damage caused by the super single tyre as compared with that caused by the conventional dual tyre (CDT) was investigated using available information and improved techniques. The aim of the investigation was to determine whether the SST can replace the CDT which has a maximum legal load of 4 100 kg without increasing damage to road pavements. The cross sections and measured prints of the tyres are compared in Figures 1a and 1b.

Little local literature on this subject is available. Reference can be made to two similar investigations carried out overseas. The first was done by Zube and Forsyth(1) in 1963. Transient pavement deflection and surface tensile strain were selected as the two criteria for evaluating the destructive effect. A direct comparison of strain and deflection data indicated that the destructive effect of the SST with a single axle loading of 12 000 lb (5 443 kg), equalled or exceeded that of the dual-wheel configuration at an axle loading of 18 000 lb (8 135 kg). In the second investigation, Terrel and Rimsritong(1976)(2) based their conclusions on a theoretical study using the linear elastic layered programme Chev 5L.(3). On the basis of their investigation, the following conclusions were drawn :

(a) Super single tyres were generally more destructive than dual tyres with an equivalent contact area.
(b) Super single tyres required a thicker asphalt pavement than dual tyres.

These investigations were somewhat limited in their approach as the first was purely practical and the second purely theoretical.

In the work reported here, a combination of both theory and practice was used - measurements were taken with the Heavy Vehicle Simulator(HVS) system (4) and calculations were done with the mechanistic pavement models (5,6). Elastic deflections were determined for different loading conditions at varying depths within the pavement using multi depth deflectometers(7). The field data were checked against the computer models for a range of materials from typical pavements in South Africa.

2 DETAILS OF TYRES INVESTIGATED

2.1 General

Leyland Special Products made two SST tyres available for testing.

(a) 18R 19,5 Doublex PR20 (XY1), recommended to replace 1000-20 or 1100-20 conventional dual tyres.

(b) 18R 22,5 Doublex PR20 (XY1), recommended to replace inter alia 1300-20 dual tyres.

The investigation concentrated on the 18R 19,5 Doublex PR20 (XY1) tyre, because it is recommended that this tyre should replace the conventional 1000-20 or 1100-20 dual tyres which are being used on most heavy vehicles on South African roads.

2.2 Manufacturers' specifications

Table 1 compares the specifications of the 18R 19,5 Double PR20 (XY1) tyre with the 1000-20 and 1100-20 dual tyres.

The specifications show that the SST requires an internal tyre pressure of approximately 600 kPa as compared to a pressure of approximately 560 kPa for the CDT to carry the maximum legal wheel load of 40 kN (4 100 kg).

3 PROGRAMME OF INVESTIGATION

The programme followed is shown schematically in Figure 2. The individual steps are discussed in more detail below.

3.1 Contact areas and pressures

The contact areas and contact pressures of the two tyre types were compared at different wheel loads and internal tyre pressures. Black shoe polish was applied to the tyre and a print taken on paper in a hydraulic press. Two contact areas were measured, namely the apparent contact area (the total area enclosed by a line drawn around the print) and the actual contact area (the sum of

TABLE 1

Recommended internal tyre pressures at different loadings for the SST & CDT

TYRE	TYRE SIZE	TREAD PATTERN	INTERNAL TYRE PRESSURES (kPa) AND LOAD (kg) FOR HIGHWAY USE										
			450	500	575	600	625	650	675	700	775	800	Internal tyre pressure (kPa)
SST	18R195 Doublex PR20	XY1				8200	8500	8800	9100	9400	10300		LOAD KG
CDT	D20 PR16 1000-20		6850	7450	8490		9090	9390	9690	9990	10900		
CDT	1100-20 E20 PRIG			7790	8780		9420	9740	10030	10390	11600		

those areas of the tyre in actual contact with the road). Similar prints were taken under the Heavy Vehicle Simulator test wheel(4) for comparison with the above measurement. Using the contact areas and contact pressures obtained two approaches were followed. These are described in sections 3.2 and 3.3.

3.2 Practical approach

The structural lives of typical pavement structures were compared under the two tyre types. Material properties obtained from practical measurements with the HVS were used.

Deflections at crawl speed under the HVS wheel were measured at different depths within the pavements using multi-depth deflectometers. The SST and the CDT were evaluated under a range of loads. Three different pavements were investigated : P157/2 near Jan Smuts, an experimental pavement near Mariannhill in Natal and P67/1 near Bapsfontein.

The first two structures both consist of a high quality unbound base supported by a cemented subbase. P67/1 is a light pavement where weaker soil layers are encountered closer to the pavement surface.

A linear elastic program (5), together with the measured depth deflections, were used in an iteration technique to determine effective moduli. The moduli demonstrated clearly both the stress-stiffening behaviour of granular materials and the stress-softening behaviour of subgrade materials under different loadings and tyre configurations. The differences in material properties found that may have been due to the different tyre configurations, were thus allowed for.

The linear elastic program ELSYM5 (5) was used to calculate the stresses and strains induced by the two tyre types. The transfer functions and procedures used to calculate the structural lives are described by Maree and Freeme (6).

3.3 Theoretical approach

The mechanistic design method (6) developed to evaluate the standard designs from the catalogue of designs in Draft TRH4(1980) (8) was used to compare the effect of the SST and the CDT on these structures. Material properties were used which were identical to those used for the evaluation of the structures in TRH4(1980). No allowance was made for differences in material properties that may have resulted from the differences in tyre configurations. The evaluation of pavements with granular base and subbase layers may therefore be less reliable owing to the stress-stiffening and stress-softening behaviour of the materials. The evaluation for pavements with premix and cemented bases are more reliable as these materials have less stress-dependent properties. The practical approach, described in paragraph 3.2, mainly considered granular base pavements. The two approaches are therefore complementary. Loadings ranging from 35 to 40 kN per wheel were considered in the theoretical approach.

4 RESULTS

4.1 Contact areas and pressures

Figure 3 shows the sensitivity of the actual contact area of the two tyre types to differences in wheel load and internal tyre pressure. The actual contact areas of the two tyre types proved to be relatively insensitive to changes in internal tyre pressure over a practical range of pressures.

Figures 4 and 5 compare the apparent contact area and apparent contact pressure of the two tyre types at different wheel loads and internal tyre pressures. These results show that there is no significant difference in the apparent contact pressures (normally used in mechanistic analyses) of the two tyre types. The apparent contact pressure of the SST is approximately 5 per cent higher than that of the CDT at a 40 kN wheel load (maximum legal load) and internal tyre pressures of 600 kPa and 560 kPa required by the SST and CDT respectively (refer to Table 1). At a low wheel load (20 kN) the apparent contact pressure of the SST is approximately 3 per cent higher than that of the CDT, and at a high wheel load (80 kN) the contact pressure of the SST is approximately 3 per cent lower than that of the CDT.

From these two figures it also follows that for mechanistic analysis the print from the CDT, at a 40 kN dual wheel load, can be represented by two circular contact areas with a radius of 110 mm with centres spaced 350 mm apart. The SST can be represented by a circular contact area with a 158 mm radius when loaded to 40 kN.

Figure 6 shows that the actual contact area of the SST is generally of the order of 30 per cent higher than that of the CDT. According to Van Vuuren (9) this value is not of practical significance. The actual contact pressure is a function of the tread pattern of the tyres.

4.2 Mechanistic evaluation

A number of factors are common for the mechanistic evaluation done in sections 4.3 and 4.4. These are the contact areas under a 40 kN wheel load used in these analyses are shown in Figure 7. The symbols used for material types are explained in Table 2. Although these analyses were done over a range of loadings, the comparisons shown concentrate on the maximum legal wheel load of 40 kN.

4.3 Practical results

Three pavement structures were considered.

(a) P157/1 near Jan Smuts

As shown in Figure 8(a) this structure consists of a high quality granular base (G1A) supported by a cemented subbase. Figure 9 compares the measured resilient deflection profiles of the two tyre types at different depths within the structure, and Table 3 shows the effective elastic moduli obtained from these deflection profiles. These effective elastic moduli were used to compare the lives of the structure under a 40 kN wheel load in terms of E80s . The lives of the structure under the two tyre types is also shown in Table 3. This high quality granular base clearly showed stress-stiffening behaviour as higher effective elastic moduli (E') were obtained under the different tyre configurations of the SST. All the results of the tests on this pavement indicated that there was no significant difference between the damage caused by the two tyre types. The weaker soil materials below the subbase normally show stress-softening behaviour, but were well protected for both tyre types.

TABLE 2. - Definition of material symbols

SYMBOL	CODE	MATERIAL	ABBREVIATED SPECIFICATIONS
	G1	Graded crushed stone	Dense-graded unweathered crushed stone, Max size 37,5 mm. G1A: 86–88% of apparent density G1B: 98% mod AASHTO
	G2	Graded crushed stone	Dense-graded stone and soil binder; Max size 37,5 mm; minimum 98% mod. AASHTO
	G3	Dumprock	Ungraded waste rock; Max size ≯ 2/3 layer thickness
	G4	Natural gravel	CBR ≮ 80; PI ≯ 6
	G5	Natural gravel	CBR ≮ 45; PI ≯ 10 to 15 depending on grading; Max. size 63 mm
	G6	Natural gravel	CBR ≮ 25; Max size ≯ 2/3 layer thickness
	G7	Gravel-soil	CBR ≮ 15; Max size ≯ 2/3 layer thickness
	G8	Gravel-soil	CBR ≮ 10 at in situ density
	G9	Gravel-soil	CBR ≮ 7 at in situ density
	G10	Gravel-soil	CBR ≮ 3 at in situ density
	BC	Bitumen hot-mix	Continuously graded; Max. size 26,5 mm
	BS	Bitumen hot-mix	Semi-gap-graded; Max. size 37,5 mm
	TC	Tar hot-mix	As for BC (continuously graded)
	TS	Tar hot-mix	As for BS (semi-gap-graded)
	PCC	Portland cement concrete	Mod. rupture ≮ 3,8 MPa; Max. size ≯ 75 mm
	C1	Cemented crushed stone or gravel	UCS 6 to 12 MPa at 100% mod. AASHTO; Spec at least G2 before treatment; Dense-graded
	C2	Cemented crushed stone or gravel	UCS 3 to 6 MPa at 100% mod. AASHTO; Spec generally G2 or G4 before treatment; Dense-graded
	C3	Cemented natural gravel	UCS 1,5 to 3,0 MPa at 100% mod. AASHTO; Max size 63 mm
	C4	Cemented natural gravel	UCS 0,75 to 1,5 MPa at 100% mod. AASHTO; Max size 63 mm
	C5	Treated natural gravel	Modified mainly for Atterberg limits
	AG	Asphalt surfacing	Ref. TRH8 gap-graded
	AC	Asphalt surfacing	Ref. TRH8 cont. graded
	AS	Asphalt surfacing	Ref. TRH8 semi-gap-graded
	AO	Asphalt surfacing	Ref. TRH8 open-graded
—	ST1	Surface treatment	Ref. TRH3 single seal
—	ST2	Surface treatment	Ref. TRH3 multiple seal
—	SS	Sand seal	Ref. TRH3
—	SC	Cape seal	Ref. TRH3
—	SL1	Slurry	Fine grading
—	SL2	Slurry	Coarse grading
—	SR	Surface renewal	Rejuvenator
—	SE	Surface renewal	Diluted emulsion
	WM	Waterbound macadam	Max. size 75 mm; PI of fines ≯ 6
	PM	Penetration macadam	Coarse stone + keystone + bitumen or tar
	CB	Concrete paving blocks	Wet crushing strength ≮ 30 MPa; interlocking shapes

TABLE 3

Comparison of effective elastic moduli (E') and the structural life of P157/2 (near Jan Smuts) under a 40 kN wheel load of the SST with that of the CDT

	CDT		SST	
	E' (MPa)	Structural life (E80s)	E' (MPa)	Structural life (E80s)
35 AS	3 000	$>30 \times 10^6$	3 000	$>30 \times 10^6$
140 G1A	120	F = 2,32	180	F = 2,57*
255 C4	2 000	-	2 000	-
120 G7	37	14×10^6	35	$13,8 \times 10^6$
In situ material	75	$>14 \times 10^6$	75	$>14 \times 10^6$
Structural life of pavement as a whole		14×10^6		$13,8 \times 10^6$

*F = safety factor used to evaluate shear stresses in granular materials(6).

(b) Experimental pavement near Mariannhill.
The structure of this pavement is very similar to that of P157/2 near Jan Smuts (Figure 8(b)). Figure 10 compares the resilient deflections measured under the two tyre types at a 40 kN loading. Field data were not sufficiently complete for a full analysis. The results were very similar to those obtained for P157/2 and indicated that there was no significant difference in the damage caused by the two tyre types.

(c) P67/1 near Bapsfontein. This is a relatively weak structure as shown in Figure 8(c). Weak soil layers are encountered near the surface of the structure. Figure 11 compares the resilient deflection profiles of the two tyre types under a 40 kN loading. The effective elastic moduli obtained and structural lives in terms of E80s are compared in Table 4. For this structure, low effective elastic moduli in the soil layers within the top 350 to 400 mm of the structure were obtained under the SST. The weak soil layers near the surface of the pavement exhibited stress-softening behaviour due to the difference in tyre configuration of the SST. Table 4 shows a marked decrease (approximately 60 per cent) in the life of this light pavement structure under the SST. Interpolation over the range of loading conditions considered indicates that a wheel load of 3 600 kg on the SST will have the same destructive effect as the CDT at a wheel load of 4 100 kg (approximately 40 kN).

4.4 Theoretical results

This evaluation was done with the same values as those used to evaluate the structures in the catalogue of designs, Draft TRH4(1980). The linear elastic program ELSYM5 was used to calculate the stresses and strains within the structures. In an attempt to cover as wide a range of pavement types and structures as possible, pavements of all road categories and traffic classes were evaluated. The structures of the pavements evaluated and also the details of the analyses are given in Appendix A. Table 5 shows the calculated lives under the two tyre types. These results indicate that the calculated lives are significantly lower under the SST for most of the pavement structures considered. This is

TABLE 4

Comparison of effective elastic moduli (E') and structural life of P67/1 (Bapsfontein) under a 40 kN wheel load of the SST with that of CDT

	CDT		SST	
	E' (MPa)	Structural life (E80s)	E' (MPa)	Structural life (E80s)
25 ST	2 500	$1,5 \times 10^5$	2 500	1×10^5
90 C4	120	Early cracking F>1,5*	120	Early cracking F>1,5
100 G7	95	$0,1 \times 10^6$	80	$0,04 \times 10^6$
200 G7	150	3×10^6	140	$2,5 \times 10^6$
Structural life of pavement as a whole		$0,1 \times 10^6$		$0,04 \times 10^6$

*F = safety factor used to evaluate shear stresses in granular materials(6).

TABLE 5

Comparison of structural lives of pavements from TRH4(1980) under SST loading with that of the CDT

ROAD CATEGORY* AND TRAFFIC CLASS	PAVEMENT TYPE		STRUCTURAL LIFE (millions)			
	BASE	SUBBASE	CDT**		SST	
			WHEEL LOAD 4 100 kg	WHEEL LOAD 4 100 kg	WHEEL LOAD 3 850 kg	WHEEL LOAD 3 600 kg
A E4 ($12-50 \times 10^6$ E80)	Bitumen premix	Granular	47,0	40	42	47,0
	Bitumen premix	Cemented	48,5	39,3	40,6	49,0
	Alternative					
	Bitumen premix	Cemented	47,1	35,2	39,3	47,4
	Granular	Cemented	>50	>50	>50	>50
B E3 ($3-12 \times 10^6$ E80)	Bitumen premix	Granular	12,0	8,1	10,0	11,8
	Bitumen premix	Cemented	11,0	8,0	10,0	11,0
	Alternative					
	Bitumen premix	Cemented	16,8	12,0	13,0	14
	Granular	Cemented	>12	>12	>12	>12
	Granular	Granular	12	0,2	0,8	1
	Cemented	Cemented	10,3			
C E2 ($0,8-3 \times 10^6$ E80)	Bitumen premix	Granular	3	1,5	1,8	2,5
	Bitumen premix	Cemented	4	3,0	3,5	4,0
	Granular	Cemented	>10	2,0	2,5	4
	Cemented		Early cracking			
C E1 ($0,2-0,8 \times 10^6$ E80)	Granular	Granular	0,9	0,2	0,3	0,5

*For definition of road category and traffic class refer to Draft TRH4:1980 (8)

**After Maree & Gibson (10)

especially true for pavements with bound bases where fatigue criteria control the life of the pavement. The calculated resilient deflections are, however, very similar under both wheel types.

For premix bases the reduction in life is from 20 per cent for strong pavements to 50 per cent for light pavements. Pavements with cemented bases show a decrease in life of up to 60 per cent under the SST.

The materials within the granular base structures should be treated as stress dependent to produce reliable results. In general the safety factors in the granular base are similar or marginally higher under the SST tyre loading. When a granular subbase is used to support the granular base, the SST has a significantly greater effect on the subbase than the CDT. Higher shear stresses occur in the subbase material. This can result in a decrease in life of more than 60 per cent for light pavement structures.

5 DISCUSSION OF RESULTS

These results, and especially the mechanistic analyses of the TRH4 structures, are in general agreement with results of a similar investigation by Terrel and Rimsritong (2).

Where the use of the SST in place of the CDT is legalized overseas, approximately 90 per cent of all heavy vehicles are still fitted with conventional dual tyres. The investigation shows that the maximum legal load on a SST must be between 3 600 kg to 4 100 kg (depending on the type of structure) to compare with the destructive effect of the CDT loaded to 4 100 kg. Results of an independent investigation reviewing the equivalent single wheel mass concept indicate that the current maximum single wheel load limit is too high. In practice, normal single wheels (usually front axles) are not normally loaded to more than 3 000 kg even though the legal limit is 3 850 kg. It is apparent that the dual type configuration is of substantial benefit owing to the separation of the load areas and the corresponding increase in effective contact width.

The use of the SST has potential advantages, which are listed below :

- the reduction in weight (about 1/3) can be converted into payload;
- the brake drums are better ventilated;
- on uneven ground or in cases of load imbalance (due to differences in internal tyre pressure or tyre wear), the load is better distributed by the SST than in twin fitments;
- the true contact pressure as influenced by the wall stiffness of the tyres may count in favour of the SST.

6 CONCLUSIONS

The main conclusions of this investigation are summarized below :

- there is no significant difference in the apparent contact areas and contact pressures of the conventional dual tyre (CDT) and the super single tyre (SST) under a maximum legal 40 kN wheel load;
- for deep strong pavements, such as pavements with granular bases and cemented subbases, there is no significant difference in the damaging effect of the SST and the CDT;
- the super single tyre will be approximately 20 to 60 per cent more damaging where weak unbound soils occur within the top 350 - 400 mm of light flexible pavements;
- a SST wheel load equivalent to that of a CDT load at 4 100 kg varies from 3 600 kg on a weak pavement to 4 100 kg on a strong pavement;
- the dual tyre configuration benefits substantially from the separation of the load areas and the corresponding increase in effective contact width. This is particularly true when fatigue criteria play a dominant role in the pavement performance, for example in pavements with bound bases.

7 RECOMMENDATIONS AND PRACTICAL IMPLICATIONS

It is recommended that the maximum legal load of 4 100 kg for the conventional dual tyre should not be permitted on the super single tyre, but rather that the existing single wheel load limit of 3 850 kg be applied.

The reduction in weight of the SST compared to the CDT results in a reduction in dead weight of approximately 50 to 60 kg per tyre which can be converted into payload. The effective maximum wheel load recommended on the SST is therefore approximately 3 900 kg.

8 ACKNOWLEDGEMENTS

The National Institute for Transport and Road Research wishes to thank Leyland Special Products (Pty) Ltd., who made the super single tyres available for testing.

The support of the Road Authorities in the investigation is also acknowledged.

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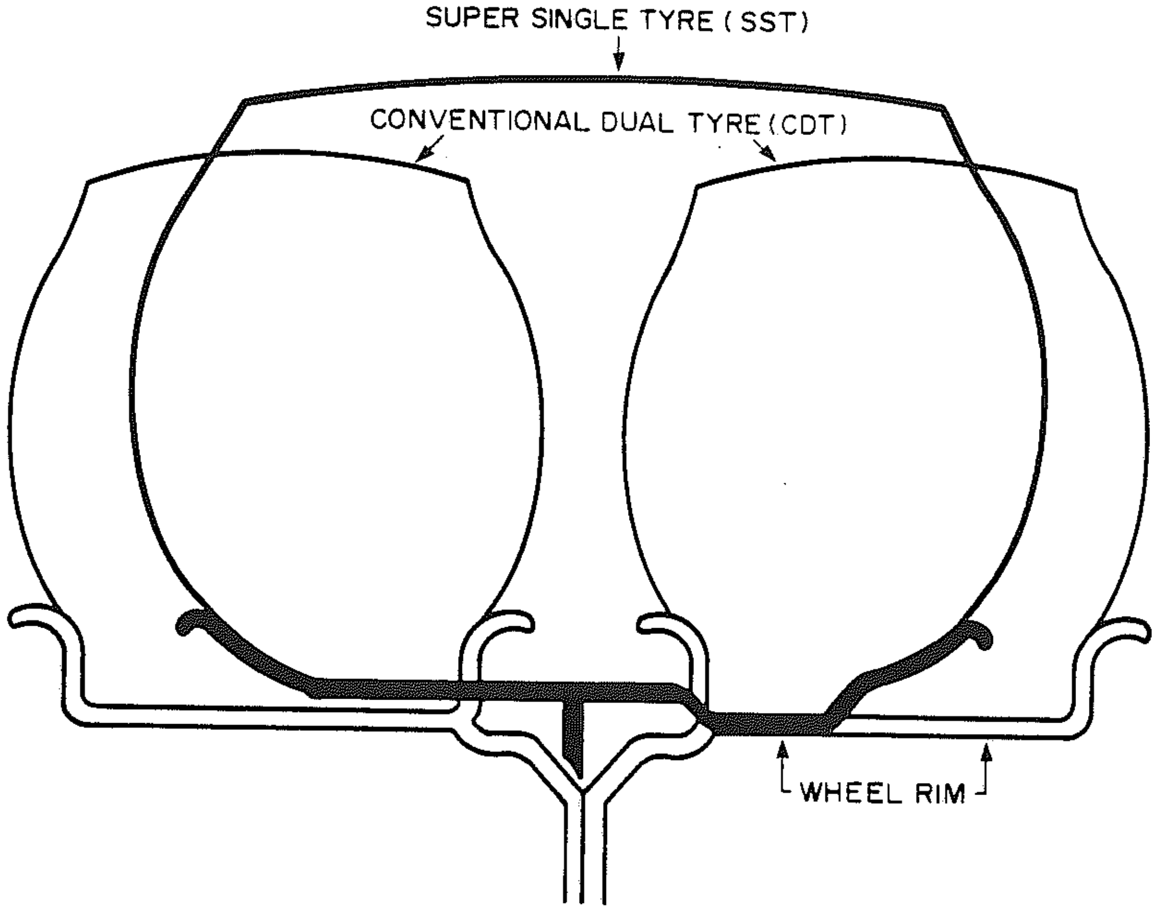


FIGURE 1 (a)

COMPARISON OF CROSS-SECTION

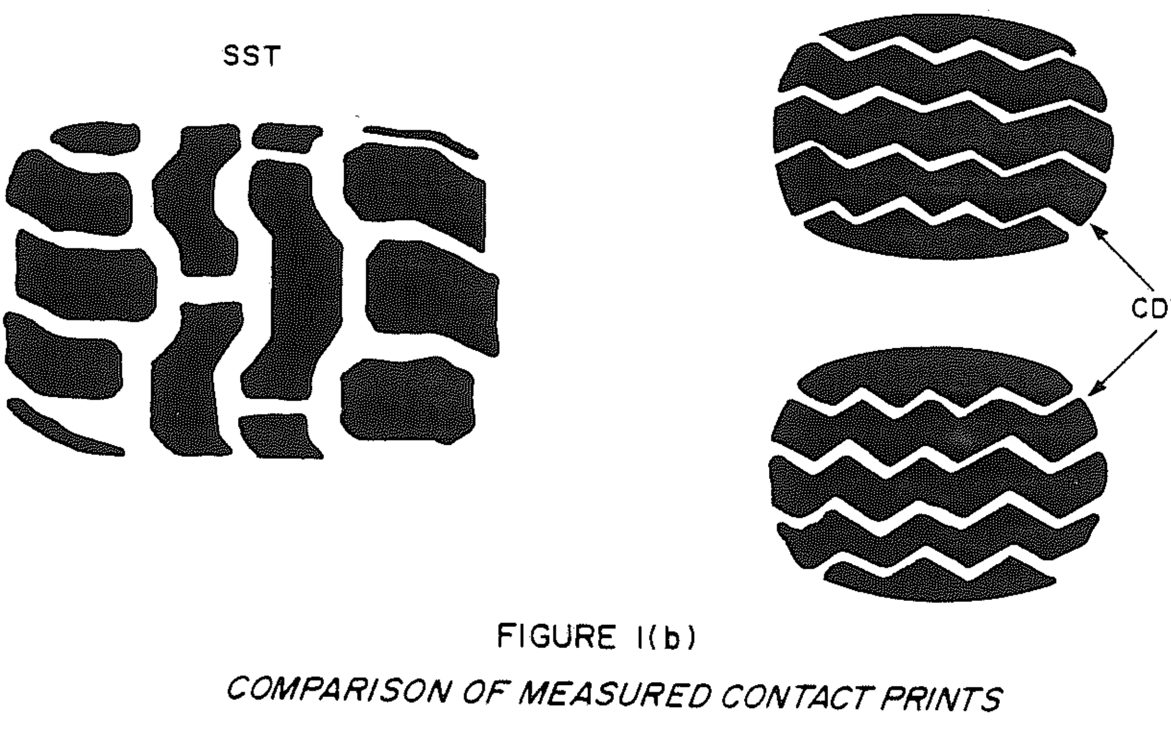


FIGURE 1(b)

COMPARISON OF MEASURED CONTACT PRINTS

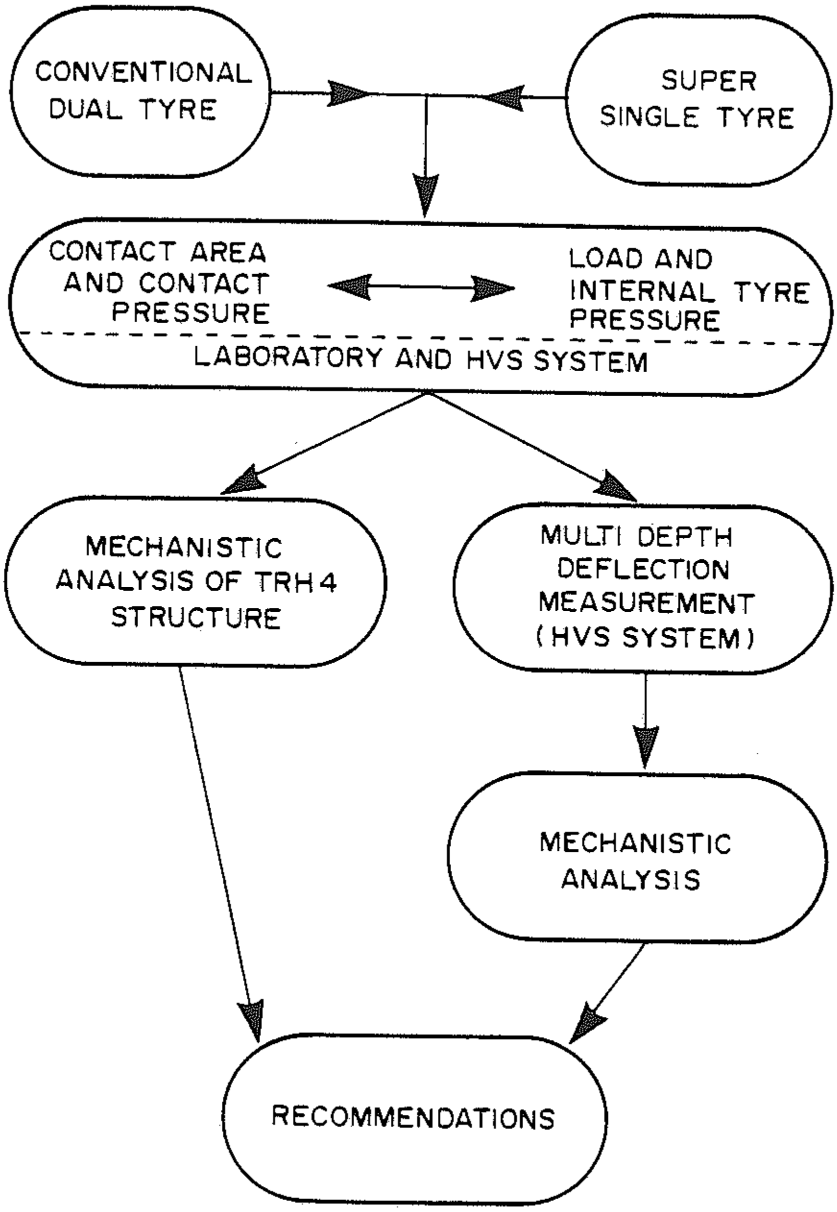


FIGURE 2

SCHEMATIC SUMMARY OF PROGRAMME FOLLOWED

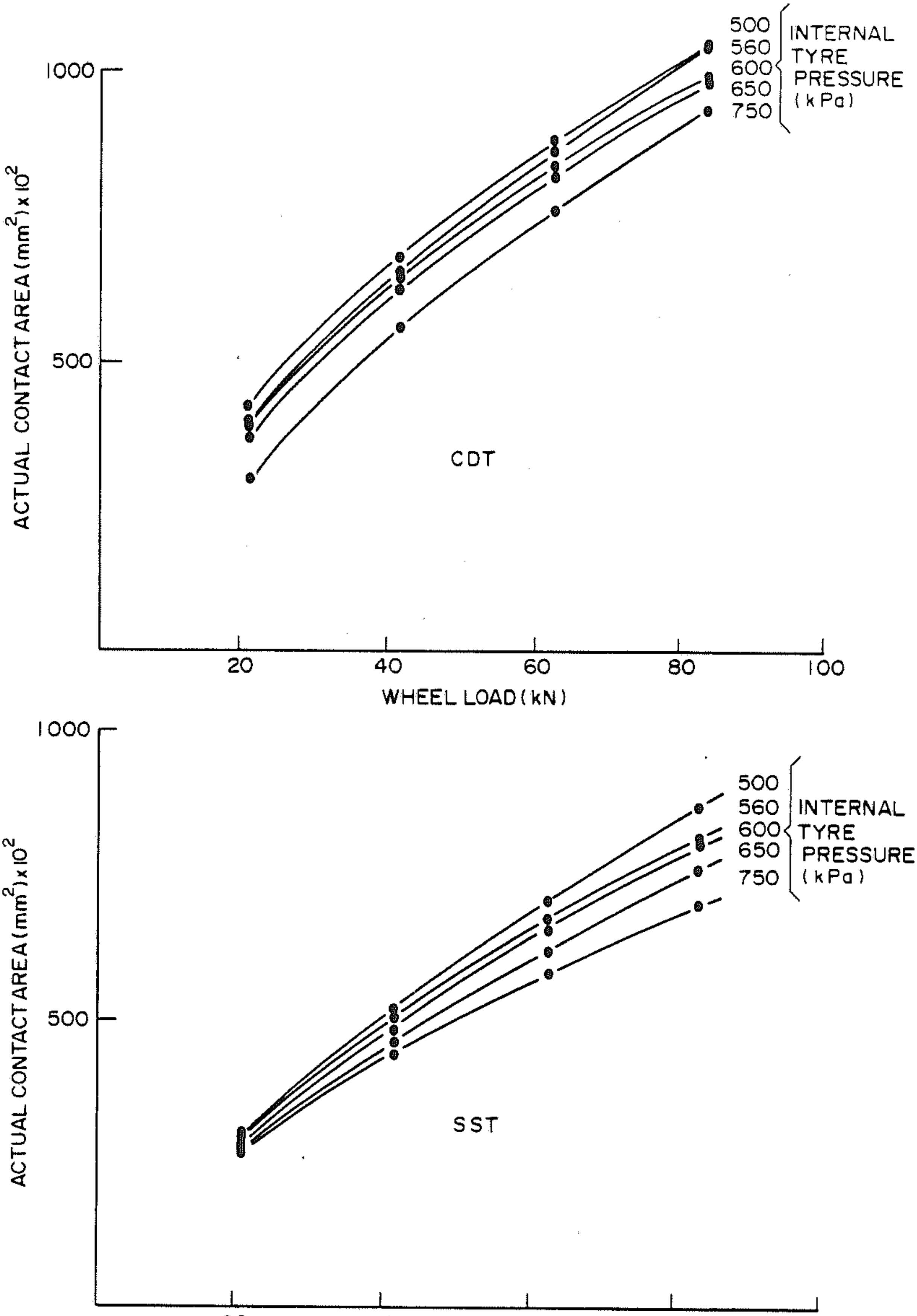


FIGURE 3

ACTUAL CONTACT AREA OF THE SST AND CDT AT DIFFERENT WHEEL LOADS AND INTERNAL TYRE PRESSURES

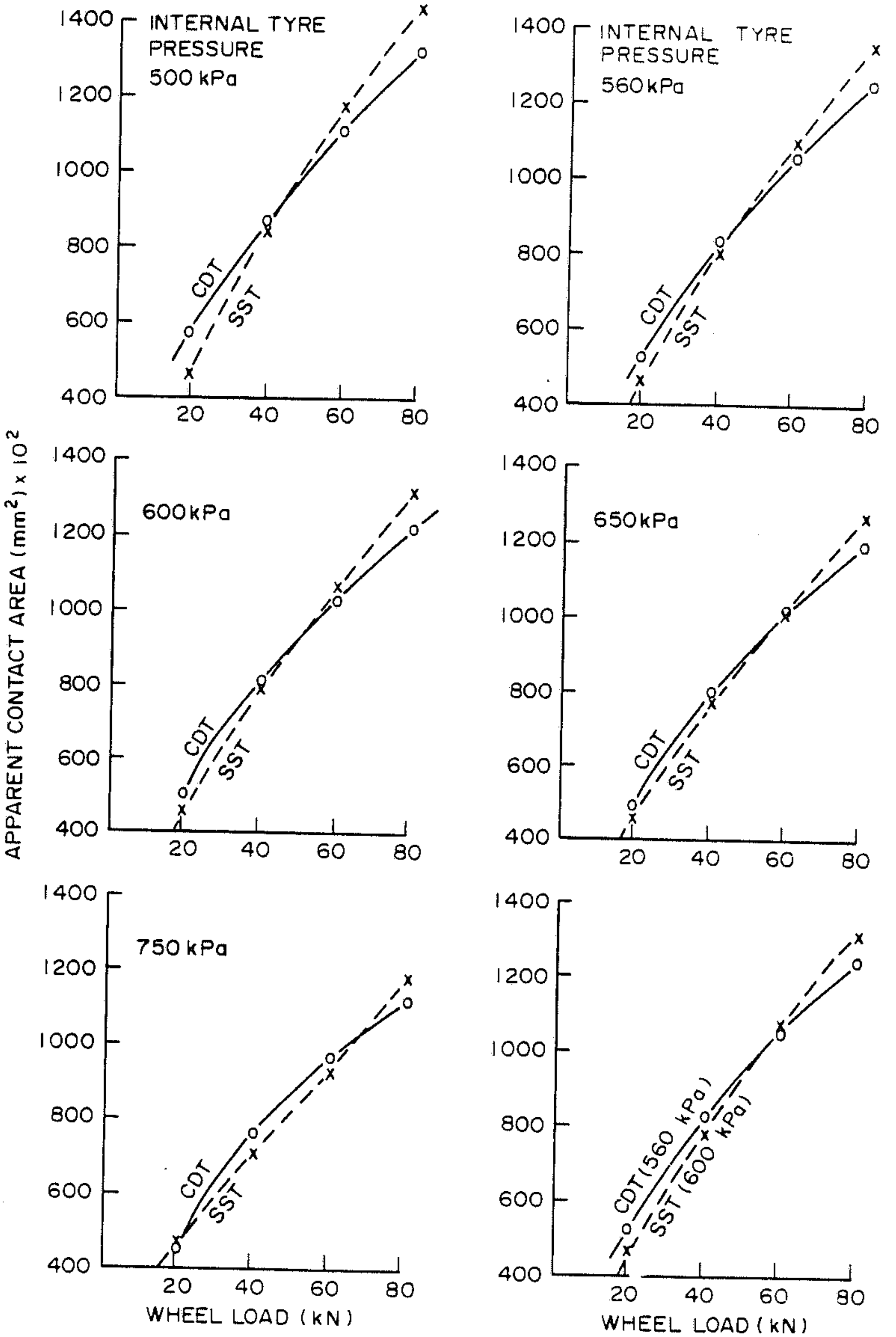


FIGURE 4

COMPARISON OF APPARENT CONTACT AREAS OF SST AND CDT AT DIFFERENT INTERNAL TYRE PRESSURES AND WHEEL LOADS

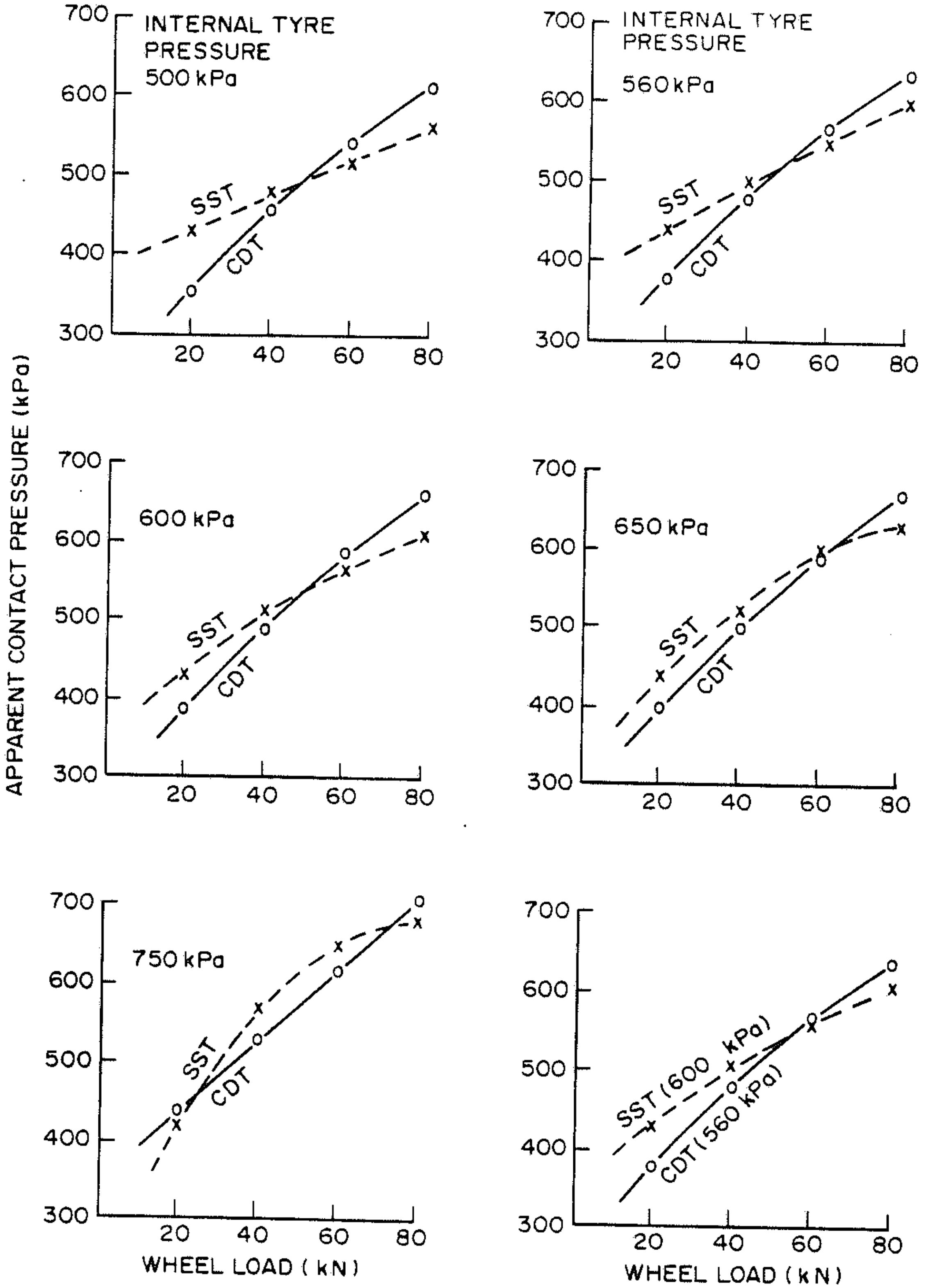


FIGURE 5

COMPARISON OF THE APPARENT CONTACT PRESSURES OF THE SST AND THE CDT AT DIFFERENT WHEEL LOADS AND INTERNAL TYRE PRESSURES

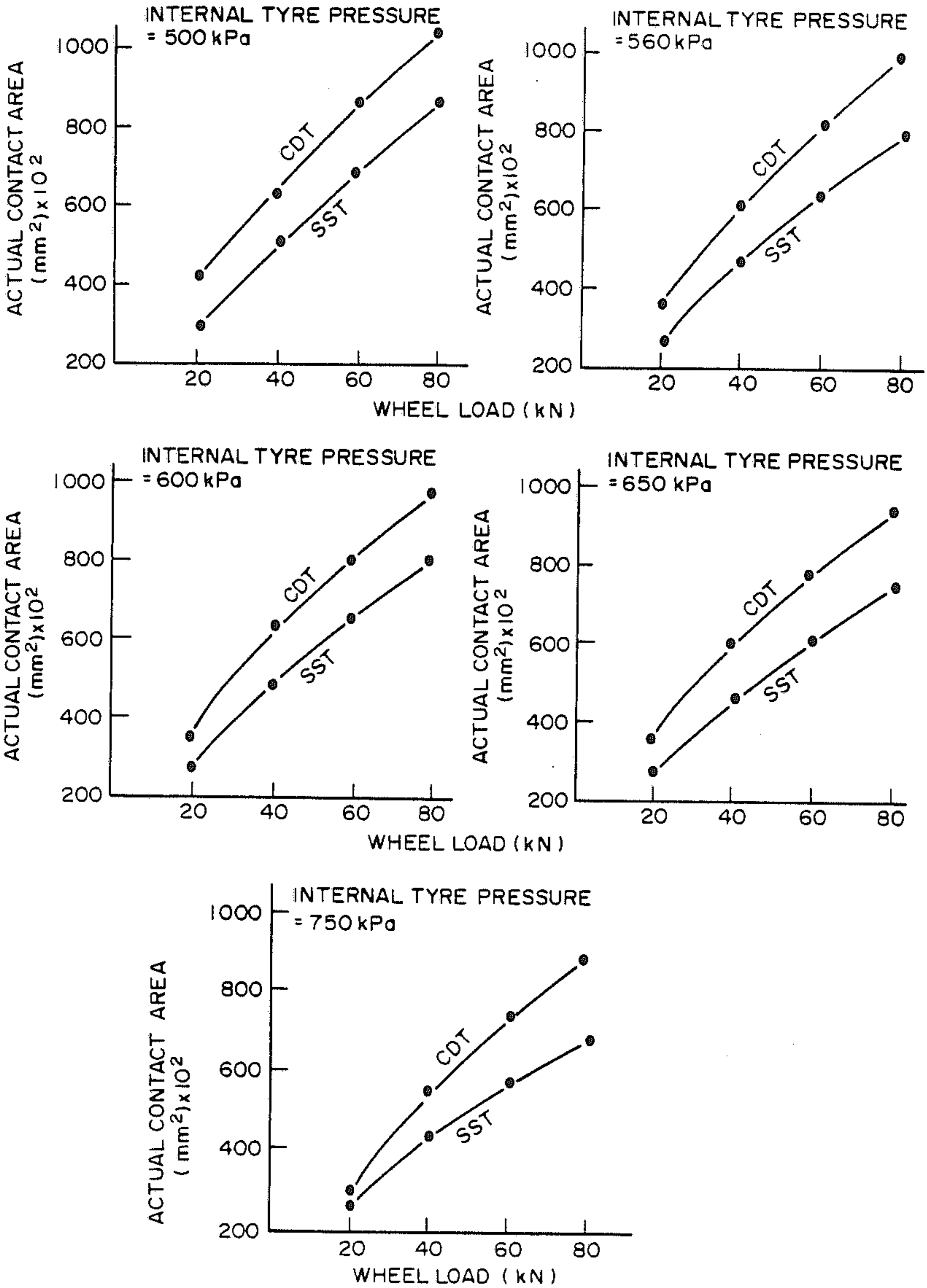


FIGURE 6

COMPARISON OF THE ACTUAL CONTACT AREAS OF THE SST AND THE CDT AT DIFFERENT INTERNAL TYRE PRESSURES AND WHEEL LOADS

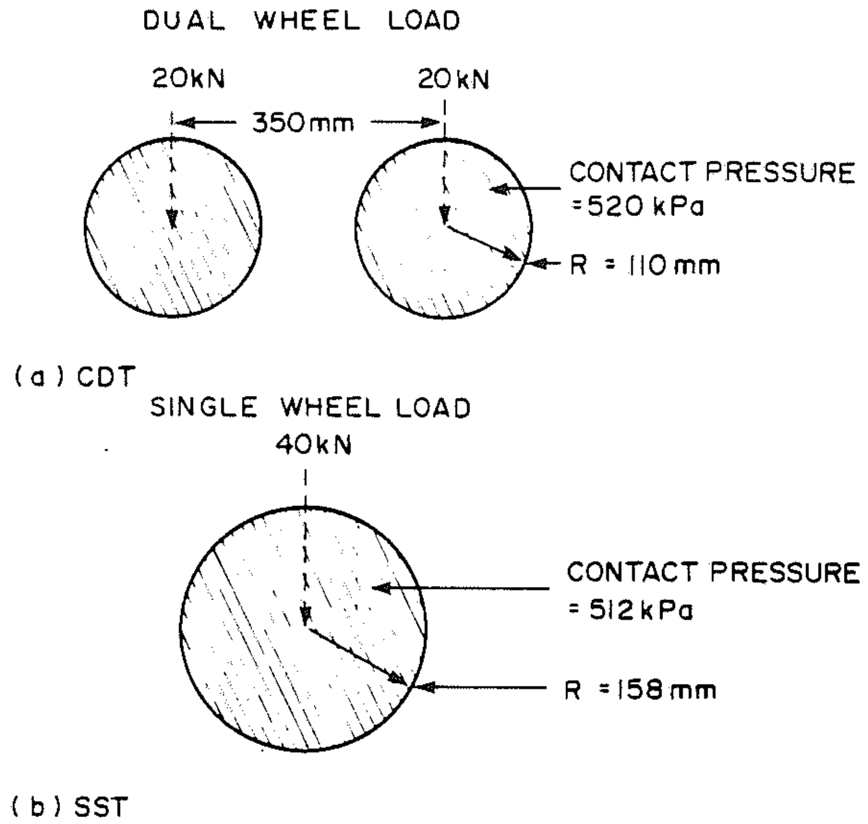


FIGURE 7

REPRESENTATION OF CONTACT AREAS USED IN THE MECHANISTIC ANALYSES (40kN WHEEL LOAD)

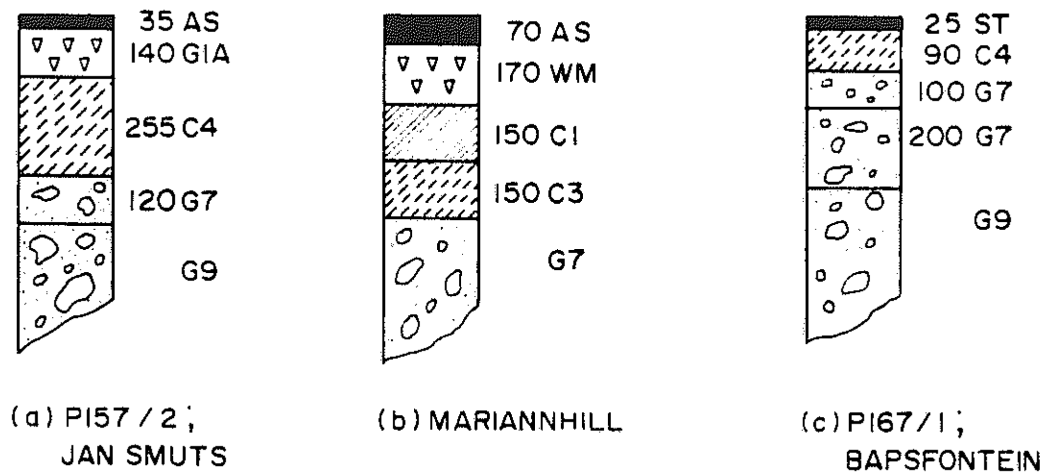


FIGURE 8

STRUCTURES INVESTIGATED WITH THE HEAVY VEHICLE SIMULATOR (HVS) FITTED WITH THE SST AND CDT

940-4-3759/8 KT

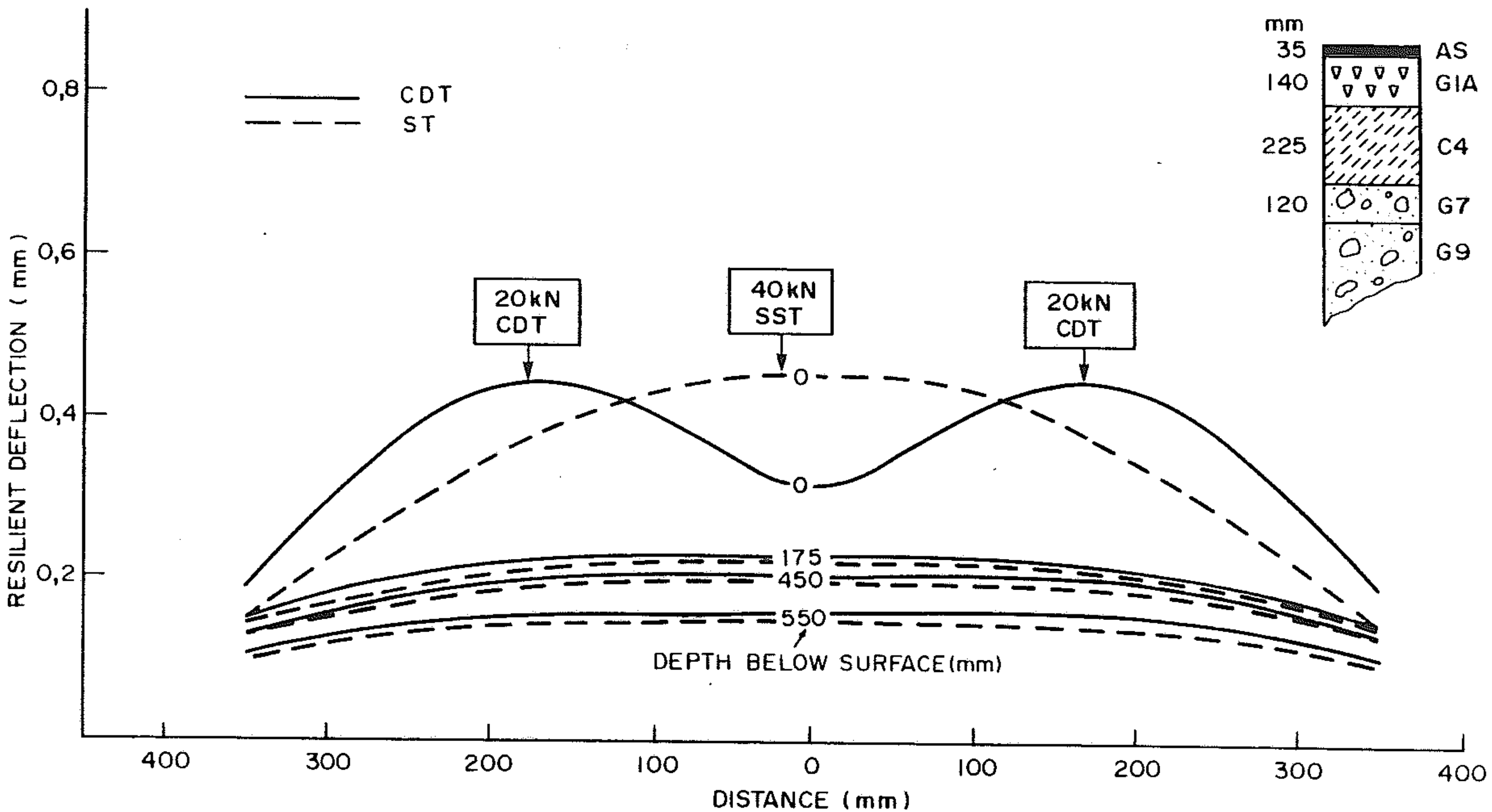


FIGURE 9

MEASURED RESILIENT DEFLECTION PROFILES ON ROAD P157/2 NEAR JAN SMUTS

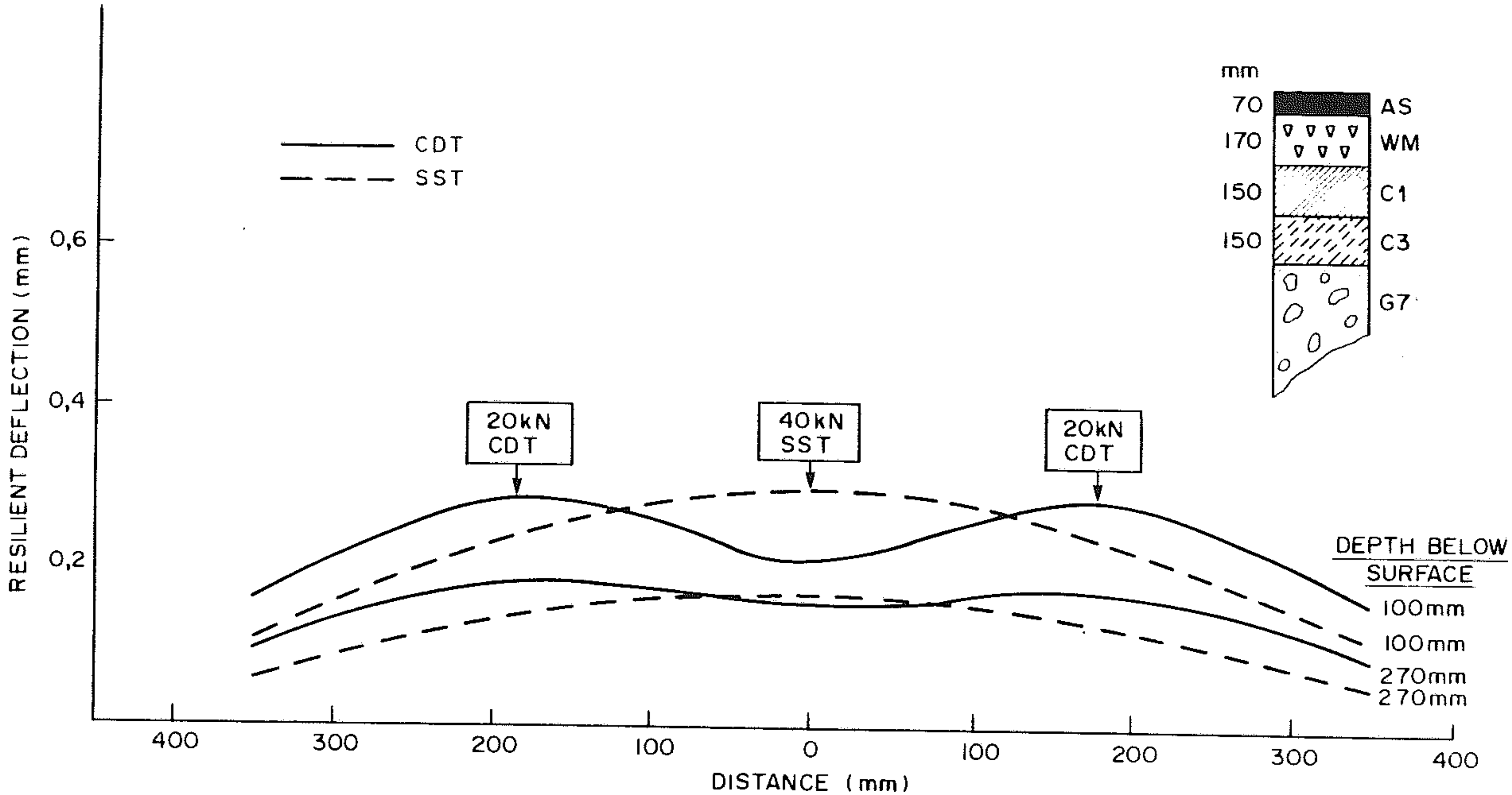


FIGURE 10

MEASURED RESILIENT DEFLECTION PROFILES UNDER THE HVS ON THE EXPERIMENTAL PAVEMENT NEAR MARIANNHILL

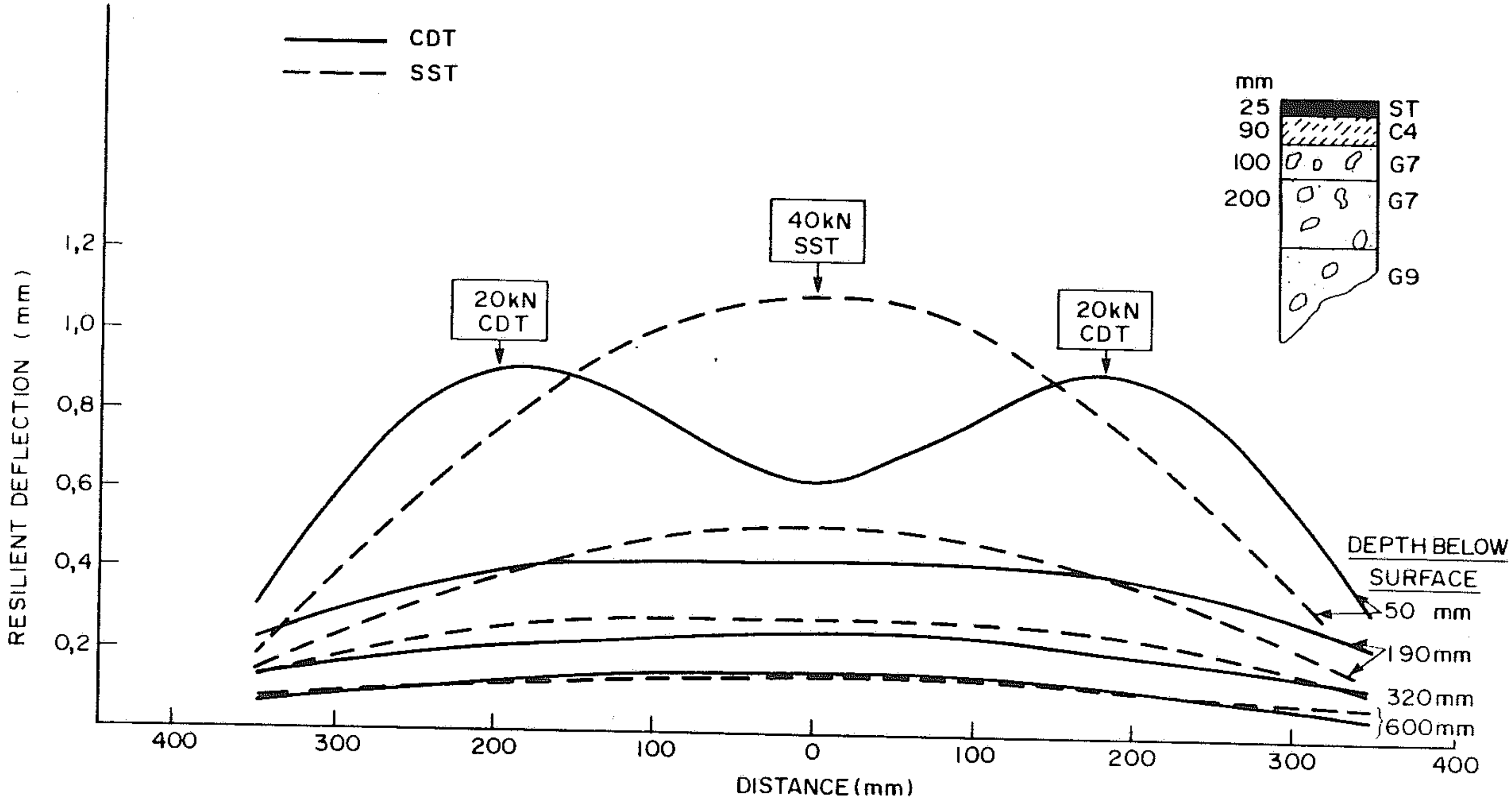


FIGURE 11

MEASURED RESILIENT DEFLECTION PROFILES UNDER THE HVS ON ROAD P67/1 (BAPSFONTEIN)

APPENDIX A

DETAILS OF MECHANISTIC ANALYSES

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE CDT (wheel load 4 100 kg)

PAVEMENT STRUCTURE	ROAD CATEGORY	A
	DESIGN TRAFFIC CLASS	E 4
	PAVEMENT TYPE	BITUMEN PREMIX BASE

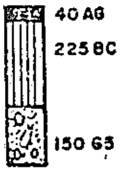
INPUT VALUES						CRITICAL PARAMETERS		
LAYER NUMBER	THICK-NESS (mm)	POISSON RATIO	E – VALUE (MPa)			STRESSES (σ, kPa); STRAINS (ϵ)		
			PHASE 1	PHASE 2	PHASE 3	PHASE 1	PHASE 2	PHASE 3
1	40	0,44	3 000			$\epsilon_t = -16$		
2	225	0,44	5 700			$\epsilon_t = 64$		
3	150	0,35	200			$\sigma_v = 18;\ \sigma_h = -5$		
4	150	0,35	120			$\epsilon_v = 147$		
5	α	0,35	70			$\epsilon_v = 166$		

INTERPRETATION AND EVALUATION

LAYER NUMBER	LAYER LIFE (E80)			STRUCTURE LIFE (E80)	
	PHASE 1	PHASE 2	PHASE 3		
1	>E4			47×10^6	
2	47×10^6			DEFLECTION (mm)	
3	F = 5,7 >E4			INITIAL	FINAL
4	>E4			0,26	0,26
5	>E4				

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE SST (wheel loads 4100 3850 3600 kg)

PAVEMENT STRUCTURE	ROAD CATEGORY	A
	DESIGN TRAFFIC CLASS	E4
	PAVEMENT TYPE	BITUMEN PREMIX BASE



INPUT VALUES / CRITICAL PARAMETERS

LAYER NUMBER	THICKNESS (mm)	POISSON RATIO	E-VALUE (MPa) PHASE 1	E-VALUE (MPa) PHASE 2	E-VALUE (MPa) PHASE 3	STRESSES (σ, kPa); STRAINS (ϵ) PHASE 1	PHASE 2	PHASE 3
1	40	0,44	3000			ε_t = 32 ε_t = 29 ε_t = -27		
2	225	0,44	5 700			ε_t = 64 ε_t = 67 ε_t = 63		
3	150	0,35	200			σ_v = 22,7; σ_h = -7,4 σ_v = 21; σ_h = -6,9 σ_v = 20; σ_h = -5		
4	150	0,35	120			ε_v = 163 ε_v = 153 ε_v = 143		
5	α	0,35	70			ε_v = 175 ε_v = 164 ε_v = 154		

INTERPRETATION AND EVALUATION

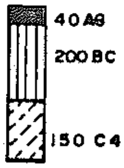
LAYER NUMBER	LAYER LIFE (E80) PHASE 1	PHASE 2	PHASE 3
1	>E4 >E4 >E4		
2	40×10^6 42×10^6 47×10^6		
3	F = 4,0 ; >E4 F = 4,4 ; >E4 F = 4,5 ; >E4		
4	>E4 >E4 >E4		
5	>E4 >E4 >E4		

STRUCTURE LIFE (E80)
40×10^6 42×10^6 47×10^6

DEFLECTION (mm) INITIAL	FINAL

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE CDT (wheel load 4 100 kg)

PAVEMENT STRUCTURE



ROAD CATEGORY	A
DESIGN TRAFFIC CLASS	E4
PAVEMENT TYPE	BITUMEN PREMIX BASE

INPUT VALUES / CRITICAL PARAMETERS

LAYER NUMBER	THICKNESS (mm)	POISSON RATIO	E - VALUE (MPa) PHASE 1	PHASE 2	PHASE 3	STRESSES (σ, kPa); STRAINS (ϵ) PHASE 1	PHASE 2	PHASE 3
1	40	0,44	3000	3000		$\epsilon_t = -6$	$\epsilon_t = -15$	
2	200	0,44	5600	5600		$\epsilon_t = 24$	$\epsilon_t = 63$	
3	150	0,35	3500	.500		$\epsilon_t = 49$	—	
4	150	0,35	120	120		$\epsilon_v = 108$	$\epsilon_v = 173$	
5	a	0,35	70	70		$\epsilon_v = 122$	$\epsilon_v = 186$	

INTERPRETATION AND EVALUATION

LAYER NUMBER	LAYER LIFE (E80) PHASE 1	PHASE 2	PHASE 3
1	>E4	>E4	
2	>E4	48 x 10^6	
3	0,6 x 10^6	F = 5,7 >E4	
4	>E4	>E4	
5	>E4	>E4	

STRUCTURE LIFE (E80): 48,6 x 10^6

DEFLECTION (mm) INITIAL	FINAL
0,21	0,27

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE

SST (wheel loads 4100 / 3650 / 3600 kg)

PAVEMENT STRUCTURE		
	ROAD CATEGORY	A
	DESIGN TRAFFIC CLASS	E4
	PAVEMENT TYPE	BITUMEN PREMIX BASE

INPUT VALUES / CRITICAL PARAMETERS

LAYER NUMBER	THICKNESS (mm)	POISSON RATIO	E - VALUE (MPa) PHASE 1	PHASE 2	PHASE 3	STRESSES (σ, kPa); STRAINS (ε) PHASE 1	PHASE 2	PHASE 3
1	40	0,44	3000	3000		ε_t = -17 ε_t = 15,8 ε_t = 14	ε_t = 35 ε_t = 32 ε_t = 29	
2	200	0,44	5600	5600		ε_t = 27 ε_t = 26 ε_t = 24,7	ε_t = 72 ε_t = 68 ε_t = 64	
3	150	0,35	3500	500		ε_t = 52 ε_t = 49 ε_t = 45	– – –	
4	150	0,35	120	120		ε_v = 126 ε_v = 119 ε_v = 111	ε_v = 198 ε_v = 186 ε_v = 175	
5	α	0,35	70	70		ε_v = 130 ε_v = 122 ε_v = 114	ε_v = 198 ε_v = 186 ε_v = 174	

INTERPRETATION AND EVALUATION

LAYER NUMBER	LAYER LIFE (E80) PHASE 1	PHASE 2	PHASE 3
1	>E4 >E4 >E4	>E4 >E4 >E4	
2	>E4 >E4 >E4	39 x 10^6 40 x 10^6 48 x 10^6	
3	0,3 x 10^6 0,6 x 10^6 1 x 10^6	F = 4,8 ; >E4 F = 5,7 ; >E4 F = 5,2 ; >E4	
4	>E4 >E4 >E4	>E4 >E4 >E4	
5	>E4 >E4 >E4	>E4 >E4 >E4	

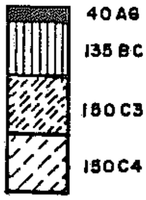
STRUCTURE LIFE (E80)

39,3 x 10^6
40,6 x 10^6
49 x 10^6

DEFLECTION (mm) INITIAL	FINAL

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE CDT (wheel load 4 100 kg)

PAVEMENT STRUCTURE



ROAD CATEGORY	A
DESIGN TRAFFIC CLASS	E 4
PAVEMENT TYPE	ALTERNATIVE BITUMEN PREMIX BASE

INPUT VALUES / CRITICAL PARAMETERS

LAYER NUMBER	THICKNESS (mm)	POISSON RATIO	E - VALUE (MPa) PHASE 1	PHASE 2	PHASE 3	STRESSES (σ, kPa); STRAINS (ϵ) PHASE 1	PHASE 2	PHASE 3
1	40	0,44	3000	3000	3000	$\epsilon_t = -1$	$\epsilon_t = -6$	$\epsilon_t = -16$
2	135	0,44	5250	5250	5 250	$\epsilon_t = 9$	$\epsilon_t = 12$	$\epsilon_t = 69$
3	150	0,35	6000	6000	750	$\epsilon_t = 19$	$\epsilon_t = 44$	—
4	150	0,35	3 500	500	500	$\epsilon_t = 34$	—	—
5	α	0,35	70	70	70	$\epsilon_v = 99$	$\epsilon_v = 146$	$\epsilon_v = 237$

INTERPRETATION AND EVALUATION

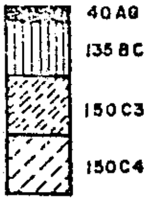
LAYER NUMBER	LAYER LIFE (E80) PHASE 1	PHASE 2	PHASE 3
1	>E4	>E4	>E4
2	>E4	>E4	40×10^6
3	>E4	$0,34 \times 10^6$	—
4	$6,8 \times 10^6$	—	—
5	>E4	>E4	>E4

STRUCTURE LIFE (E80): $47,1 \times 10^6$

DEFLECTION (mm) INITIAL	FINAL
0,18	0,28

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE SST (wheelloads 4100 / 3850 / 3600 kg)

PAVEMENT STRUCTURE	ROAD CATEGORY	A
	DESIGN TRAFFIC CLASS	E4
	PAVEMENT TYPE	ALTERNATIVE BITUMEN PREMIX BASE



INPUT VALUES / CRITICAL PARAMETERS

LAYER NUMBER	THICKNESS (mm)	POISSON RATIO	E – VALUE (MPa) PHASE 1	PHASE 2	PHASE 3	STRESSES (σ, kPa); STRAINS (ϵ) PHASE 1	PHASE 2	PHASE 3
1	40	0,44	3000	3000	3000	ϵ_t = -8 ϵ_t = -7 ϵ_t = -5,6	ϵ_t = -18 ϵ_t = -16 ϵ_t = -14	ϵ_t = -41 ϵ_t = 11,6 ϵ_t = 8
2	135	0,44	5250	5250	5250	ϵ_t = 11,5 ϵ_t = 11,3 ϵ_t = 11,1	ϵ_t = 13 ϵ_t = 13,5 ϵ_t = 13	ϵ_t = 32 ϵ_t = 78 ϵ_t = 74
3	150	0,35	6000	6000	750	ϵ_t = 21 ϵ_t = 19,7 ϵ_t = 18,6	ϵ_t = 47 ϵ_t = 44,7 ϵ_t = 42	– – –
4	150	0,35	3500	500	500	ϵ_t = 36 ϵ_t = 33,6 ϵ_t = 31,4	– – –	– – –
5	a	0,35	70	70	70	ϵ_v = 109 ϵ_v = 103 ϵ_v = 97	ϵ_v = 160 ϵ_v = 151 ϵ_v = 141	ϵ_v = 263 ϵ_v = 248 ϵ_v = 232

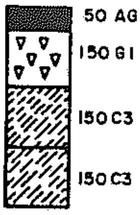
INTERPRETATION AND EVALUATION

LAYER NUMBER	LAYER LIFE (E80) PHASE 1	PHASE 2	PHASE 3
1	>E4 >E4 >E4	>E4 >E4 >E4	>E4 >E4 >E4
2	>E4 >E4 >E4	>E4 >E4 >E4	30×10^6 32×10^6 37×10^6
3	>E4 >E4 >E4	$0,2 \times 10^6$ $0,3 \times 10^6$ $0,4 \times 10^6$	– – –
4	5×10^6 7×10^6 9×10^6	– – –	– – –
5	>E4 >E4 >E4	>E4 >E4 >E4	>E4 >E4 >E4

STRUCTURE LIFE (E80)
$35,2 \times 10^6$ $39,3 \times 10^6$ $47,4 \times 10^6$

DEFLECTION (mm) INITIAL	FINAL

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE CDT (wheel load 4 100 kg)

PAVEMENT STRUCTURE		
	ROAD CATEGORY	A
	DESIGN TRAFFIC CLASS	E4
	PAVEMENT TYPE	GRANULAR BASE

INPUT VALUES

LAYER NUMBER	THICKNESS (mm)	POISSON RATIO	E - VALUE (MPa) PHASE 1	PHASE 2	PHASE 3
1	50	0,44	3000	3000	
2	150	0,35	450	200	
3	300	0,35	6000	500	
4	150	0,35	120	120	
5	a	0,35	70	70	

CRITICAL PARAMETERS

LAYER NUMBER	STRESSES (σ, kPa); STRAINS (ϵ) PHASE 1	PHASE 2	PHASE 3
1	$\epsilon_t = 162$	$\epsilon_t = 308$	
2	$\sigma_v = 280$; $\sigma_h = 89$	$\sigma_v = 221$; $\sigma_h = 42$	
3	$\epsilon_t = 33{,}4$	—	
4	$\epsilon_v = 84$	$\epsilon_v = 275$	
5	$\epsilon_v = 100$	$\epsilon_v = 276$	

INTERPRETATION AND EVALUATION

LAYER NUMBER	LAYER LIFE (E80) PHASE 1	PHASE 2	PHASE 3
1	100×10^6	25×10^6	
2	$F_{dry} = 4{,}1$; $F_{wet} = 2{,}2$ >E4	$F_{dry} = 4{,}2$; $F_{wet} = 2{,}2$ >E4	
3	$2{,}8 \times 10^6$	—	
4	>E4	>E4	
5	>E4	>E4	

STRUCTURE LIFE (E80)

$> 50 \times 10^6$

REQUIRES A RESURFACING BEFORE 28×10^6

DEFLECTION (mm) INITIAL	FINAL
0,22	0,42

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE

SST (wheelloads 4100 / 3850 / 3600 kg)

PAVEMENT STRUCTURE	ROAD CATEGORY	A
	DESIGN TRAFFIC CLASS	E4
	PAVEMENT TYPE	GRANULAR BASE

INPUT VALUES / CRITICAL PARAMETERS

LAYER NUMBER	THICKNESS (mm)	POISSON RATIO	E - VALUE (MPa) PHASE 1	PHASE 2	PHASE 3	STRESSES (σ, kPa); STRAINS (ε) PHASE 1	PHASE 2	PHASE 3
1	50	0,44	3000	3000		εt = 100 εt = 143 εt = 143	εt = 286 εt = 282 εt = 279	
2	150	0,35	450	200		σv = 446; σh = 172 σv = 429; σh = 59 σv = 412; σh = 153	σv = 331; σh = 69 σv = 317; σh = 64 σv = 303; σh = 60	
3	300	0,35	6000	500		εt = 39,8 εt = 37,5 εt = 35,2	– – –	
4	150	0,35	120	120		εv = 96 εv = 90 εv = 85	εv = 329 εv = 310 εv = 291	
5	α	0,35	70	70		εv = 107 εv = 100 εv = 95	εv = 306 εv = 288 εv = 270	

INTERPRETATION AND EVALUATION

LAYER NUMBER	LAYER LIFE (E80) PHASE 1	PHASE 2	PHASE 3
1	>E4 >E4 >E4	30 x 10⁶ 35 x 10⁶ 40 x 10⁶	
2	F=6,84 ; >E4 F=6,69 ; >E4 F=6,6 ; >E4	F=3,7 ; >E4 F=3,73 ; >E4 F=3,74 ; >E4	
3	1 x 10⁶ 1,5 x 10⁶ 2 x 10⁶	– – –	
4	>E4 >E4 >E4	>E4 >E4 >E4	
5	>E4 >E4 >E4	>E4 >E4 >E4	

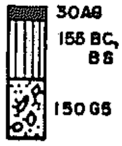
STRUCTURE LIFE (E80)

$> 50 \times 10^6$

REQUIRES A RESURFACING BEFORE 28×10^6

DEFLECTION (mm) INITIAL	FINAL

DETAILS OF MECHANISTIC ANALYSES OF INDICA[illegible] PAVEMENT STRUCTURE CDT (wheel load 4 10[illegible])

PAVEMENT STRUCTURE			
	ROAD CATEGORY	B	
	DESIGN TRAFFIC CLASS	E3	
	PAVEMENT TYPE	BITUMEN PREMIX BASE	

INPUT VALUES / CRITICAL PARAMETERS

LAYER NUMBER	THICKNESS (mm)	POISSON RATIO	E - VALUE (MPa) PHASE 1	PHASE 2	PHASE 3	STRESSES (σ, kPa); STRAINS (ϵ) PHASE 1	PHASE 2	PHASE 3
1	30	0,44	3000			$\epsilon_t = -35$		
2	155	0,44	5300			$\epsilon_t = 107$		
3	150	0,35	200			$\sigma_v = 34$; $\sigma_h = -7$		
4	150	0,35	120			$\epsilon_v = 252$		
5	a	0,35	70			$\epsilon_v = 280$		

INTERPRETATION AND EVALUATION

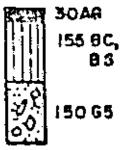
LAYER NUMBER	LAYER LIFE (E80) PHASE 1	PHASE 2	PHASE 3
1	> E3		
2	12 x 10^6		
3	F = 3,0 >E3		
4	>E3		
5	>E3		

STRUCTURE LIFE (E80)
12 x 10^6

DEFLECTION (mm) INITIAL	FINAL
0, 35	0,35

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE

SST (wheel loads 4100 / 3850 / 3600 kg)

PAVEMENT STRUCTURE		
	ROAD CATEGORY	B
	DESIGN TRAFFIC CLASS	E3
	PAVEMENT TYPE	BITUMEN PREMIX BASE

INPUT VALUES / CRITICAL PARAMETERS

LAYER NUMBER	THICKNESS (mm)	POISSON RATIO	E - VALUE (MPa) PHASE 1	PHASE 2	PHASE 3	STRESSES (σ, kPa); STRAINS (ϵ) PHASE 1	PHASE 2	PHASE 3
1	30	0,44	3000			ε_t = 61 ε_t = 55 ε_t = 49		
2	155	0,44	5300			ε_t = 124 ε_t = 117 ε_t = 111		
3	150	0,35	200			σ_v = 44; σ_h = -10.8 σ_v = 41.7; σ_h = -10.2 σ_v = 39; σ_h = -9.6		
4	150	0,35	120			ε_v = 297 ε_v = 280 ε_v = 263		
5	α	0,35	70			ε_v = 306 ε_v = 287 ε_v = 269		

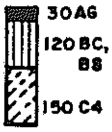
INTERPRETATION AND EVALUATION

LAYER NUMBER	LAYER LIFE (E80) PHASE 1	PHASE 2	PHASE 3
1	>E3 >E3 >E3		
2	8×10⁶ 10×10⁶ 12×10⁶		
3	F=2.0 >E3 F=2.16 >E3 F=2.35 >E3		
4	>E3 >E3 >E3		
5	>E3 >E3 >E3		

STRUCTURE LIFE (E80)
8×10^6 10×10^6 12×10^6

DEFLECTION (mm) INITIAL	FINAL

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE CDT (wheel load 4 100 kg)

PAVEMENT STRUCTURE	ROAD CATEGORY	B
	DESIGN TRAFFIC CLASS	E 3
	PAVEMENT TYPE	BITUMEN PREMIX BASE

INPUT VALUES / CRITICAL PARAMETERS

LAYER NUMBER	THICKNESS (mm)	POISSON RATIO	E – VALUE (MPa) PHASE 1	E – VALUE (MPa) PHASE 2	E – VALUE (MPa) PHASE 3	STRESSES (σ, kPa); STRAINS (ϵ) PHASE 1	STRESSES (σ, kPa); STRAINS (ϵ) PHASE 2	STRESSES (σ, kPa); STRAINS (ϵ) PHASE 3
1	30	0,44	3000	3000		ϵ_t = –20	ϵ = –37	
2	120	0,44	5000	5000		ϵ_t = 28	ϵ_t = 109	
3	150	0,35	3500	500		ϵ_t = 79	—	
4	150	0,35	120	120		ϵ_v = 172	ϵ_v = 320	
5	α	0,35	70	70		ϵ_v = 195	ϵ_v = 331	

INTERPRETATION AND EVALUATION

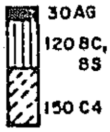
LAYER NUMBER	LAYER LIFE (E80) PHASE 1	LAYER LIFE (E80) PHASE 2	LAYER LIFE (E80) PHASE 3
1	>E3	>E3	
2	>E3	$11,8 \times 10^6$	
3	$< 0,01 \times 10^6$	—	
4	>E3	>E3	
5	>E3	>E3	

STRUCTURE LIFE (E80)	
$11,8 \times 10^6$	

DEFLECTION (mm) INITIAL	DEFLECTION (mm) FINAL
0,27	0,37

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE

SST (wheel loads 4100 / 3850 / 3600 kg)

PAVEMENT STRUCTURE	ROAD CATEGORY	B
	DESIGN TRAFFIC CLASS	E 3
	PAVEMENT TYPE	BITUMEN PREMIX BASE

INPUT VALUES / CRITICAL PARAMETERS

LAYER NUMBER	THICK-NESS (mm)	POISSON RATIO	E – VALUE (MPa) PHASE 1	PHASE 2	PHASE 3	STRESSES (σ, kPa); STRAINS (ϵ) PHASE 1	PHASE 2	PHASE 3
1	30	0,44	3000	3000		ε_t = 11 ε_t = 7,9 ε_t = 4,5	ε_t = 72 ε_t = 66 ε_t = 60	
2	120	0,44	5000	5000		ε_t = 30 ε_t = 29,5 ε_t = 28,6	ε_t = 127 ε_t = 121 ε_t = 116	
3	150	0,35	3500	500		ε_t = 86 ε_t = 81 ε_t = 77	— — —	
4	150	0,35	120	120		ε_v = 216 ε_v = 204 ε_v = 192	ε_v = 401 ε_v = 378 ε_v = 356	
5	α	0,35	70	70		ε_v = 213 ε_v = 200 ε_v = 187	ε_v = 370 ε_v = 348 ε_v = 326	

INTERPRETATION AND EVALUATION

LAYER NUMBER	LAYER LIFE (E80) PHASE 1	PHASE 2	PHASE 3
1	>E3 >E3 >E3	>E3 >E3 >E3	
2	>E3 >E3 >E3	8×10^6 10×10^6 11×10^6	
3	$<0,01 \times 10^6$ $<0,01 \times 10^6$ $<0,01 \times 10^6$	— — —	
4	>E3 >E3 >E3	>E3 >E3 >E3	
5	>E3 >E3 >E3	>E3 >E3 >E3	

STRUCTURE LIFE (E80)

8×10^6
10×10^6
11×10^6

DEFLECTION (mm) INITIAL	FINAL

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE CDT (wheel load 4 100 kg)

PAVEMENT STRUCTURE		
	ROAD CATEGORY	B
	DESIGN TRAFFIC CLASS	E3
	PAVEMENT TYPE	ALTERNATIVE BITUMEN PREMIX BASE

INPUT VALUES / CRITICAL PARAMETERS

LAYER NUMBER	THICKNESS (mm)	POISSON RATIO	E – VALUE (MPa) PHASE 1	PHASE 2	PHASE 3	STRESSES (σ, kPa); STRAINS (ε) PHASE 1	PHASE 2	PHASE 3
1	30	0,44	3000	3000	3000	ϵ_t = −12	ϵ_t = −22	ϵ_t = −39
2	80	0,44	4650	4650	4650	ϵ_t = 5	ϵ_t = 7	ϵ_t = 104
3	125	0,35	6000	6000	750	ϵ_t = 28	ϵ_t = 70	—
4	125	0,35	3500	500	500	ϵ_t = 57	—	—
5	α	0,35	70	70	70	ϵ_v = 163	ϵ_v = 254	ϵ_v = 407

INTERPRETATION AND EVALUATION

LAYER NUMBER	LAYER LIFE (E80) PHASE 1	PHASE 2	PHASE 3
1	>E3	>E3	>E3
2	>E3	>E3	16,5 x 10^6
3	11,4 x 10^6	<0,01 x 10^6	—
4	0,3 x 10^6	—	—
5	>E3	>E3	>E3

STRUCTURE LIFE (E80)
16,8 x 10^6

DEFLECTION (mm) INITIAL	FINAL
0,23	0,37

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE

SST (wheel loads 4100 / 3850 / 3600 kg)

PAVEMENT STRUCTURE	ROAD CATEGORY	B
	DESIGN TRAFFIC CLASS	E3
	PAVEMENT TYPE	ALTERNATIVE BITUMEN PREMIX BASE

INPUT VALUES / CRITICAL PARAMETERS

LAYER NUMBER	THICKNESS (mm)	POISSON RATIO	E - VALUE (MPa) PHASE 1	PHASE 2	PHASE 3	STRESSES (σ, kPa); STRAINS (ε) PHASE 1	PHASE 2	PHASE 3
1	30	0,44	3000	3000	3000	ε_t = -11 ε_t = -13 ε_t = -16	ε_t = 19 ε_t = 15 ε_t = 11	ε_t = 69 ε_t = 64 ε_t = 58
2	80	0,44	4650	4650	4650	ε_t = 2,5 ε_t = 3 ε_t = 3.7	ε_t = 2.8 ε_t = 3,4 ε_t = 3.9	ε_t = 115 ε_t = 112 ε_t = 108
3	125	0,35	6000	6000	750	ε_t = 31,6 ε_t = 30 ε_t = 28	ε_t = 79 ε_t = 75 ε_t = 71	– – –
4	125	0,35	3500	500	500	ε_t = 61 ε_t = 58 ε_t = 54	– – –	– – –
5	α	0,35	70	70	70	ε_v = 188 ε_v = 177 ε_v = 166	ε_v = 293 ε_v = 276 ε_v = 258	ε_v = 490 ε_v = 462 ε_v = 433

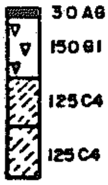
INTERPRETATION AND EVALUATION

LAYER NUMBER	LAYER LIFE (E80) PHASE 1	PHASE 2	PHASE 3
1	>E3 >E3 >E3	>E3 >E3 >E3	>E3 >E3 >E3
2	>E3 >E3 >E3	>E3 >E3 >E3	$11,8 \times 10^6$ 12.7×10^6 13.5×10^6
3	8×10^6 10×10^6 $11,4 \times 10^6$	$<0,01 \times 10^6$ $<0,01 \times 10^6$ $<0,01 \times 10^6$	– – –
4	$0,2 \times 10^6$ $0,3 \times 10^6$ $0,5 \times 10^6$	– – –	– – –
5	>E3 >E3 >E3	>E3 >E3 >E3	>E3 >E3 >E3

STRUCTURE LIFE (E80)
12×10^6 13×10^6 14×10^6

DEFLECTION (mm) INITIAL	FINAL

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE CDT (wheel load 4 100 kg)

PAVEMENT STRUCTURE	ROAD CATEGORY	B
	DESIGN TRAFFIC CLASS	E 3
	PAVEMENT TYPE	GRANULAR BASE

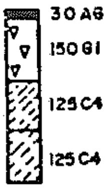
INPUT VALUES						CRITICAL PARAMETERS		
LAYER NUMBER	THICK-NESS (mm)	POISSON RATIO	E - VALUE (MPa)			STRESSES (σ, kPa); STRAINS (ϵ)		
			PHASE 1	PHASE 2	PHASE 3	PHASE 1	PHASE 2	PHASE 3
1	30	0,44	3000	3000		$\epsilon_t = 110$	$\epsilon_t = 286$	
2	150	0,35	450	200		$\sigma_v = 349; \sigma_h = 72$	$\sigma_v = 293; \sigma_h = 42$	
3	250	0,35	3500	300		$\epsilon_t = 62$	—	
4	150	0,35	120	120		$\epsilon_v = 146$	$\epsilon_v = 396$	
5	α	0,35	70	70		$\epsilon_v = 167$	$\epsilon_v = 387$	

INTERPRETATION AND EVALUATION

LAYER NUMBER	LAYER LIFE (E80)		
	PHASE 1	PHASE 2	PHASE 3
1	> E3	30 x 10^6	
2	$F_{dry} = 3,7$; $F_{wet} = 2,0$ > E3	$F_{dry} = 3,0$; $F_{wet} = 1,6$ > E3	
3	0,13 x 10^6	—	
4	> E3	> 20 x 10^6	
5	> E3	> E3	

STRUCTURE LIFE (E80)	
> 12 x 10^6	
DEFLECTION (mm)	
INITIAL	FINAL
0,27	0,49

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE SST (wheelloads 4100 / 3850 / 3600 kg)

PAVEMENT STRUCTURE		
	ROAD CATEGORY	B
	DESIGN TRAFFIC CLASS	E 3
	PAVEMENT TYPE	GRANULAR BASE

INPUT VALUES						CRITICAL PARAMETERS		
LAYER NUMBER	THICK-NESS (mm)	POISSON RATIO	E - VALUE (MPa) PHASE 1	PHASE 2	PHASE 3	STRESSES (σ, kPa); STRAINS (ϵ) PHASE 1	PHASE 2	PHASE 3
1	30	0,44	3000	3000		$\varepsilon_t = 51$ $\varepsilon_t = 54$ $\varepsilon_t = 58$	$\varepsilon_t = 186$ $\varepsilon_t = 188$ $\varepsilon_t = 192$	
2	150	0,35	450	200		$\sigma_v = 454; \sigma_h = 124$ $\sigma_v = 439; \sigma_h = 117$ $\sigma_v = 424; \sigma_h = 110$	$\sigma_v = 394; \sigma_h = 75$ $\sigma_v = 380; \sigma_h = 70$ $\sigma_v = 366; \sigma_h = 65$	
3	250	0,35	3500	300		$\varepsilon_t = 166$ $\varepsilon_t = 62$ $\varepsilon_t = 58$	– – –	
4	150	0,35	120	120		$\varepsilon_v = 171$ $\varepsilon_v = 161$ $\varepsilon_v = 151$	$\varepsilon_v = 499$ $\varepsilon_v = 471$ $\varepsilon_v = 443$	
5	α	0,35	70	70		$\varepsilon_v = 180$ $\varepsilon_v = 169$ $\varepsilon_v = 158$	$\varepsilon_v = 438$ $\varepsilon_v = 413$ $\varepsilon_v = 387$	

INTERPRETATION AND EVALUATION

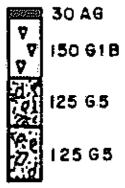
LAYER NUMBER	LAYER LIFE (E80) PHASE 1	PHASE 2	PHASE 3
1	>E3 >E3 >E3	$>50 \times 10^6$ $>50 \times 10^6$ $>50 \times 10^6$	
2	F = 4,42 ; >E3 F = 4,35 ; >E3 F = 4,26 ; >E3	F = 3,25 ; >E3 F = 3,2 ; >E3 F = 3,16 ; >E3	
3	$0,13 \times 10^6$ $0,13 \times 10^6$ $0,14 \times 10^6$	– – –	
4	>E3 >E3 >E3	$>20 \times 10^6$ $>20 \times 10^6$ $>20 \times 10^6$	
5	>E3 >E3 >E3	>E3 >E3 >E3	

STRUCTURE LIFE (E80)
12×10^6 12×10^6 12×10^6

DEFLECTION (mm)	
INITIAL	FINAL

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE CDT (wheel load 4 100 kg)

PAVEMENT STRUCTURE



ROAD CATEGORY	B
DESIGN TRAFFIC CLASS	E3
PAVEMENT TYPE	GRANULAR BASE

INPUT VALUES / CRITICAL PARAMETERS

LAYER NUMBER	THICKNESS (mm)	POISSON RATIO	E – VALUE (MPa) PHASE 1	PHASE 2	PHASE 3	STRESSES (σ, kPa); STRAINS (ϵ) PHASE 1	PHASE 2	PHASE 3
1	30	0,44	3000			$\epsilon_t = 293$		
2	150	0,35	200			$\sigma_v = 281$; $\sigma_h = 30$		
3	250	0,35	200			$\sigma_v = 76$; $\sigma_h = -10$		
4	150	0,35	120			$\epsilon_v = 424$		
5	a	0,35	70			$\epsilon_v = 416$		

INTERPRETATION AND EVALUATION

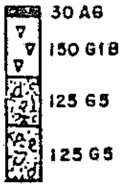
LAYER NUMBER	LAYER LIFE (E80) PHASE 1	PHASE 2	PHASE 3
1	28×10^6		
2	$F_{dry} = 2,1$; $F_{wet} = 1,1$ >E2; 4×10^6		
3	$F = 1,3$ 12×10^6		
4	>E3		
5	>E3		

STRUCTURE LIFE (E80)
12×10^6 (NOT FOR WET REGIONS)

DEFLECTION (mm) INITIAL	FINAL
0,54	0,54

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE

SST (wheel loads 4100 / 3850 / 3600 kg)

PAVEMENT STRUCTURE		
	ROAD CATEGORY	B
	DESIGN TRAFFIC CLASS	E3
	PAVEMENT TYPE	GRANULAR BASE

INPUT VALUES / CRITICAL PARAMETERS

LAYER NUMBER	THICKNESS (mm)	POISSON RATIO	E - VALUE (MPa) PHASE 1	E - VALUE (MPa) PHASE 2	E - VALUE (MPa) PHASE 3	STRESSES (σ, kPa); STRAINS (ϵ) PHASE 1	PHASE 2	PHASE 3
1	30	0,44	3000			ε_t = 195 ε_t = 198 ε_t = 201		
2	150	0,35	200			σ_v = 375; σ_h = 55 σ_v = 361; σ_h = 52 σ_v = 348; σ_h = 48		
3	250	0,35	200			σ_v = 116; σ_h = −17 σ_v = 110; σ_h = −16 σ_v = 104; σ_h = −16		
4	150	0,35	120			ε_v = 546 ε_v = 515 ε_v = 485		
5	α	0,35	70			ε_v = 480 ε_v = 452 ε_v = 424		

INTERPRETATION AND EVALUATION

LAYER NUMBER	LAYER LIFE (E80) PHASE 1	PHASE 2	PHASE 3
1	>E3 >E3 >E3		
2	F = 2,7; >12 x 10^6 F = 2.7; >E3 F = 2.68; >E3		
3	F = 0.68; 0.2 x 10^6 F = 0.73; 0.8 x 10^6 F = 0.77; 1 x 10^6		
4	12 x 10^6 >E3 >E3		
5	>E3 >E3 >E3		

STRUCTURE LIFE (E80)

4100 kg	3850 kg	3600 kg
0.2 x 10^6	0.8 x 10^6	1 x 10^6

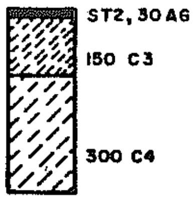
(NOT FOR WET REGIONS)

DEFLECTION (mm)

INITIAL	FINAL

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE CDT (wheel load 4 100 kg)

PAVEMENT STRUCTURE		
ROAD CATEGORY	B	
DESIGN TRAFFIC CLASS	E 3	
PAVEMENT TYPE	CEMENTED BASE	



INPUT VALUES / CRITICAL PARAMETERS

LAYER NUMBER	THICKNESS (mm)	POISSON RATIO	E - VALUE (MPa) PHASE 1	PHASE 2	PHASE 3	STRESSES (σ, kPa); STRAINS (ε) PHASE 1	PHASE 2	PHASE 3
1	160	0,35	6000	6000	750	ϵ_t = 18	ϵ_t = 80	—
2	300	0,35	3500	500	500	ϵ_t = 37	—	—
3	150	0,35	120	120	120	ϵ_v = 82	ϵ_v = 187	ϵ_v =
4	α	0,35	70	70	70	ϵ_v = 94	ϵ_v = 197	ϵ_v =
5								

INTERPRETATION AND EVALUATION

LAYER NUMBER	LAYER LIFE (E80) PHASE 1	PHASE 2	PHASE 3
1	>E3	<0,01 x 10^6	—
2	10,3 x 10^6	—	—
3	>E3	>E3	>E3
4	>E3	>E3	>E3
5			

STRUCTURE LIFE (E80)
10,3 x 10^6

DEFLECTION (mm) INITIAL	FINAL
0,19	0,29

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE CDT (wheel load 4 100 kg)

PAVEMENT STRUCTURE	ROAD CATEGORY	C
	DESIGN TRAFFIC CLASS	E2
	PAVEMENT TYPE.	BITUMEN PREMIX BASE

INPUT VALUES / CRITICAL PARAMETERS

LAYER NUMBER	THICKNESS (mm)	POISSON RATIO	E - VALUE (MPa) PHASE 1	E - VALUE (MPa) PHASE 2	E - VALUE (MPa) PHASE 3	STRESSES (σ, kPa); STRAINS (ϵ) PHASE 1	PHASE 2	PHASE 3
1	120	0,44	4600			ϵ_t = 179		
2	150	0,35	200			σ_v = 82; σ_h = -9		
3	150	0,35	120			ϵ_v = 418		
4	α	0,35	70			ϵ_v = 445		
5								

INTERPRETATION AND EVALUATION

LAYER NUMBER	LAYER LIFE (E80) PHASE 1	PHASE 2	PHASE 3
1	3 x 10^6		
2	F = 1,7 >E2		
3	>E2		
4	>E2		
5			

STRUCTURE LIFE (E80)	
3,0 x 10^6	

DEFLECTION (mm) INITIAL	FINAL
0,46	0,46

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE

SST (wheelloads 4100 3850 3600 kg)

PAVEMENT STRUCTURE		
	ROAD CATEGORY	C
	DESIGN TRAFFIC CLASS	E2
	PAVEMENT TYPE	BITUMEN PREMIX BASE

INPUT VALUES / CRITICAL PARAMETERS

LAYER NUMBER	THICKNESS (mm)	POISSON RATIO	E - VALUE (MPa) PHASE 1	PHASE 2	PHASE 3	STRESSES (σ, kPa); STRAINS (ϵ) PHASE 1	PHASE 2	PHASE 3
1	120	0,44	4600			ε_t = 208 ε_t = 199 ε_t = 190		
2	150	0,35	200			σ_v = 62; σ_h = -9 σ_v = 81; σ_h = -13 σ_v = 76,8; σ_h = -12,7		
3	150	0,35	120			ε_v = 537 ε_v = 507 ε_v = 477		
4	a	0,35	70			ε_v = 508 ε_v = 478 ε_v = 449		
5								

INTERPRETATION AND EVALUATION

LAYER NUMBER	LAYER LIFE (E80) PHASE 1	PHASE 2	PHASE 3
1	1,5 x 10^6 1,8 x 10^6 2,5 x 10^6		
2	F = 1,39; >E2 F = 1,51; >E2 F = 1,62; >E2		
3	>E2 >E2 >E2		
4	>E2 >E2 >E2		
5			

STRUCTURE LIFE (E80)
1,5 x 10^6 1,8 x 10^6 2,5 x 10^6

DEFLECTION (mm) INITIAL	FINAL

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE CDT (wheel load 4 100 kg)

PAVEMENT STRUCTURE		
	ROAD CATEGORY	C
	DESIGN TRAFFIC CLASS	E 2
	PAVEMENT TYPE	BITUMEN PREMIX BASE

INPUT VALUES						CRITICAL PARAMETERS		
LAYER NUMBER	THICKNESS (mm)	POISSON RATIO	E - VALUE (MPa) PHASE 1	PHASE 2	PHASE 3	STRESSES (σ, kPa); STRAINS (ϵ) PHASE 1	PHASE 2	PHASE 3
1	80	0,44	4250	4250		ϵ_t = 14	ϵ_t = 168	
2	150	0,35	3500	500		ϵ_t = 116	—	
3	150	0,35	120	120		ϵ_v = 260	ϵ_v = 535	
4	α	0,35	70	70		ϵ_v = 291	ϵ_v = 523	
5								

INTERPRETATION AND EVALUATION

LAYER NUMBER	LAYER LIFE (E80) PHASE 1	PHASE 2	PHASE 3	STRUCTURE LIFE (E80)	
1	>E2	$4,0 \times 10^6$		$4,0 \times 10^6$	
2	<$0,01 \times 10^6$	—		DEFLECTION (mm)	
3	>E2	>E2		INITIAL	FINAL
4	>E2	>E2		0,34	0,48
5					

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE

SST (wheelloads 4100 / 3850 / 3600 kg)

PAVEMENT STRUCTURE		
	ROAD CATEGORY	C
	DESIGN TRAFFIC CLASS	E2
	PAVEMENT TYPE	BITUMEN PREMIX BASE

INPUT VALUES / CRITICAL PARAMETERS

LAYER NUMBER	THICKNESS (mm)	POISSON RATIO	E-VALUE (MPa) PHASE 1	E-VALUE (MPa) PHASE 2	E-VALUE (MPa) PHASE 3	STRESSES (σ, kPa); STRAINS (ϵ) PHASE 1	PHASE 2	PHASE 3
1	80	0,44	4250	4250		ε_t = 6 ε_t = 5,3 ε_t = 6,4	ε_t = 181 ε_t = 175 ε_t = 169	
2	150	0,35	3500	500		ε_t = 132 ε_t = 125 ε_t = 118	— —	
3	150	0,35	120	120		ε_v = 143 ε_v = 327 ε_v = 309	ε_v = 767 ε_v = 727 ε_v = 687	
4	α	0,35	70	70		ε_v = 332 ε_v = 312 ε_v = 292	ε_v = 628 ε_v = 593 ε_v = 557	
5								

INTERPRETATION AND EVALUATION

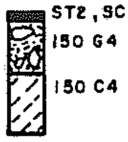
LAYER NUMBER	LAYER LIFE (E80) PHASE 1	PHASE 2	PHASE 3
1	> E2 > E2 > E2	3×10^6 $3,5 \times 10^6$ 4×10^6	
2	$< 0,01 \times 10^6$ $< 0,01 \times 10^6$ $< 0,01 \times 10^6$	— —	
3	> E2 > E2 > E2	> E2 > E2 > E2	
4	> E2 > E2 > E2	> E2 > E2 > E2	
5			

STRUCTURE LIFE (E80)
3×10^6 $3,5 \times 10^6$ 4×10^6

DEFLECTION (mm) INITIAL	FINAL

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE CDT (wheel load 4 100 kg)

PAVEMENT STRUCTURE



ROAD CATEGORY	C
DESIGN TRAFFIC CLASS	E 2
PAVEMENT TYPE	GRANULAR BASE

INPUT VALUES

LAYER NUMBER	THICK-NESS (mm)	POISSON RATIO	E – VALUE (MPa) PHASE 1	PHASE 2	PHASE 3
1	160	0,35	350	225	
2	150	0,35	3500	300	
3	150	0,35	120	120	
4	a	0,35	70	70	
5					

CRITICAL PARAMETERS

LAYER NUMBER	STRESSES (σ, kPa); STRAINS (ε) PHASE 1	PHASE 2	PHASE 3
1	$\sigma_v = 446; \sigma_h = 131$	$\sigma_v = 420; \sigma_h = 115$	
2	$\epsilon_t = 122$	—	
3	$\epsilon_v = 305$	$\epsilon_v = 644$	
4	$\epsilon_v = 364$	$\epsilon_v = 632$	
5			

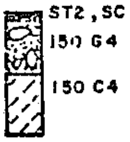
INTERPRETATION AND EVALUATION

LAYER NUMBER	LAYER LIFE (E80) PHASE 1	PHASE 2	PHASE 3
1	$F_{dry} = 3,0; F_{wet} = 1,8$ >E2	$F_{dry} = 2,8; F_{wet} = 1,7$ >E2	
2	<0,01 x 10^6	—	
3	> E 2	>10 x 10^6	
4	>E2	>E2	
5			

STRUCTURE LIFE (E80)
>10 x 10^6

DEFLECTION (mm) INITIAL	FINAL
0,39	0,57

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE SST (wheelloads 4100 / 3850 / 3600 kg)

PAVEMENT STRUCTURE	ROAD CATEGORY	C
	DESIGN TRAFFIC CLASS	E2
	PAVEMENT TYPE	GRANULAR BASE

INPUT VALUES / CRITICAL PARAMETERS

LAYER NUMBER	THICKNESS (mm)	POISSON RATIO	E-VALUE (MPa) PHASE 1	E-VALUE (MPa) PHASE 2	E-VALUE (MPa) PHASE 3	STRESSES (σ, kPa); STRAINS (ε) PHASE 1	PHASE 2	PHASE 3
1	160	0,35	350	225		σ_v = 497; σ_h = 200 σ_v = 484; σ_h = 190 σ_v = 471; σ_h = 180	σ_v = 466; σ_h = 178 σ_v = 453; σ_h = 169 σ_v = 441; σ_h = 160	
2	150	0,35	3500	300		ε_t = 138 ε_t = 131 ε_t = 123	– – –	
3	150	0,35	120	120		ε_v = 404 ε_v = 382 ε_v = 359	ε_v = 962 ε_v = 912 ε_v = 863	
4	α	0,35	70	70		ε_v = 416 ε_v = 392 ε_v = 367	ε_v = 783 ε_v = 738 ε_v = 694	
5								

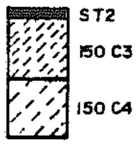
INTERPRETATION AND EVALUATION

LAYER NUMBER	LAYER LIFE (E80) PHASE 1	PHASE 2	PHASE 3
1	F = 4.45; >E2 >E2 >E2	F = 4.17; >E2 >E2 >E2	
2	<0,01 x 10^6 <0,01 x 10^6 <0,01 x 10^6	– – –	
3	>E2 >E2 >E2	2 x 10^6 2,5 x 10^6 4 x 10^6	
4	>E2 >E2 >E2	>E2 >E2 >E2	
5			

STRUCTURE LIFE (E80)	
2 x 10^6 2,5 x 10^6 4 x 10^6	

DEFLECTION (mm) INITIAL	FINAL

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE CDT (wheel load 4 100 kg)

PAVEMENT STRUCTURE		
	ROAD CATEGORY	C
	DESIGN TRAFFIC CLASS	E 2
	PAVEMENT TYPE	CEMENTED BASE

INPUT VALUES						CRITICAL PARAMETERS		
LAYER NUMBER	THICK-NESS (mm)	POISSON RATIO	E - VALUE (MPa)			STRESSES (σ, kPa); STRAINS (ϵ)		
			PHASE 1	PHASE 2	PHASE 3	PHASE 1	PHASE 2	PHASE 3
1	160	0,35	6000	6000	750	ϵ_t = 28	ϵ_t = 94	—
2	150	0,35	3500	500	500	ϵ_t = 70	—	—
3	150	0,35	120	120	120	ϵ_v = 153	ϵ_v = 271	ϵ_v = 466
4	α	0,35	70	70	70	ϵ_v = 172	ϵ_v = 284	ϵ_v = 469
5								

INTERPRETATION AND EVALUATION

LAYER NUMBER	LAYER LIFE (E80)		
	PHASE 1	PHASE 2	PHASE 3
1	>E2	<0,01 x 10^6	—
2	0,06 x 10^6	—	—
3	>E2	>E2	>10^6
4	>E2	>E2	>10^6
5			

STRUCTURE LIFE (E80)	
EARLY CRACKING, SUBGRADE WELL PROTECTED	
DEFLECTION (mm)	
INITIAL	FINAL
0,25	0,46

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE SST (wheelloads 4100 / 3850 / 3600 kg)

PAVEMENT STRUCTURE	ROAD CATEGORY	C
	DESIGN TRAFFIC CLASS	E 2
	PAVEMENT TYPE	CEMENTED BASE

INPUT VALUES / CRITICAL PARAMETERS

LAYER NUMBER	THICKNESS (mm)	POISSON RATIO	E – VALUE (MPa) PHASE 1	PHASE 2	PHASE 3	STRESSES (σ, kPa); STRAINS (ϵ) PHASE 1	PHASE 2	PHASE 3
1	160	0,35	6000	6000	750	ε_t = 31,3 ε_t = 30,1 ε_t = 28,9	ε_t = 110 ε_t = 105 ε_t = 99,9	— — —
2	150	0,35	3500	500	500	ε_t = 76,4 ε_t = 72,0 ε_t = 67,8	— — —	— — —
3	150	0,35	120	120	120	ε_v = 189 ε_v = 178 ε_v = 167	ε_v = 332 ε_v = 313 ε_v = 294	ε_v = 663 ε_v = 628 ε_v = 593
4	∞	0,35	70	70	70	ε_v = 187 ε_v = 176 ε_v = 164	ε_v = 314 ε_v = 295 ε_v = 276	ε_v = 556 ε_v = 524 ε_v = 492
5								

INTERPRETATION AND EVALUATION

LAYER NUMBER	LAYER LIFE (E80) PHASE 1	PHASE 2	PHASE 3
1	> E2 > E2 > E2	< 0,01 x 10^6 < 0,01 x 10^6 < 0,01 x 10^6	— — —
2	0,02 x 10^6 0,04 x 10^6 0,06 x 10^6	— — —	— — —
3	> E2 > E2 > E2	> E2 > E2 > E2	> E2 > E2 > E2
4	> E2 > E2 > E2	> E2 > E2 > E2	> E2 > E2 > E2
5			

STRUCTURE LIFE (E80)

EARLY CRACKING, SUBGRADE WELL PROTECTED

DEFLECTION (mm) INITIAL	FINAL

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE CDT (wheel load 4 100 kg)

PAVEMENT STRUCTURE		
	ROAD CATEGORY	C
	DESIGN TRAFFIC CLASS	E 1
	PAVEMENT TYPE	GRANULAR BASE

INPUT VALUES						CRITICAL PARAMETERS		
LAYER NUMBER	THICK-NESS (mm)	POISSON RATIO	E - VALUE (MPa)			STRESSES (σ, kPa); STRAINS (ϵ)		
			PHASE 1	PHASE 2	PHASE 3	PHASE 1	PHASE 2	PHASE 3
1	135	0,35	225			σ_v = 440; σ_h = 142		
2	125	0,35	200			σ_v = 159; σ_h = -7		
3	150	0,35	120			ϵ_v = 867		
4	α	0,35	70			ϵ_v = 781		
5								

INTERPRETATION AND EVALUATION

LAYER NUMBER	LAYER LIFE (E80)			STRUCTURE LIFE (E80)	
	PHASE 1	PHASE 2	PHASE 3		
1	F_{dry} = 3,4; F_{wet} = 2,0 >E1			0,9 x 10^6	
2	F = 0,74 0,9 x 10^6				
3	3 x 10^6			DEFLECTION (mm)	
				INITIAL	FINAL
4	>E1			0, 65	0, 65
5					

DETAILS OF MECHANISTIC ANALYSES OF INDICATED PAVEMENT STRUCTURE

SST (wheelloads 4100 / 3850 / 3600 kg)

PAVEMENT STRUCTURE		
	ROAD CATEGORY	C
	DESIGN TRAFFIC CLASS	E 1
	PAVEMENT TYPE	GRANULAR BASE

INPUT VALUES						CRITICAL PARAMETERS		
LAYER NUMBER	THICKNESS (mm)	POISSON RATIO	E - VALUE (MPa)			STRESSES (σ, kPa); STRAINS (ϵ)		
			PHASE 1	PHASE 2	PHASE 3	PHASE 1	PHASE 2	PHASE 3
1	135	0,35	225			σ_v=469; σ_h=206 σ_v=457; σ_h=196 σ_v=446 σ_h=187		
2	125	0,35	200			σ_v=228; σ_h=-14 σ_v=218; σ_h=-14 σ_v=208 σ_h=-14		
3	150	0,35	120			ε_v=1311 ε_v=1247 ε_v=1184		
4	α	0,35	70			ε_v=1020 ε_v=963 ε_v=906		
5								

INTERPRETATION AND EVALUATION

LAYER NUMBER	LAYER LIFE (E80)			STRUCTURE LIFE (E80)
	PHASE 1	PHASE 2	PHASE 3	
1	F=2,93 ; >E1 F=4,98 >E1 F=4,78 >E1			$0,2 \times 10^6$ $0,3 \times 10^6$ $0,5 \times 10^6$
2	F=0,4; $0,4 \times 10^6$ F=0,43; $0,8 \times 10^6$ F=0,45 $0,9 \times 10^6$			
3	$0,2 \times 10^6$ $0,3 \times 10^6$ $0,5 \times 10^6$			DEFLECTION (mm)
4	2×10^6 2×10^6 2×10^6			INITIAL / FINAL
5				