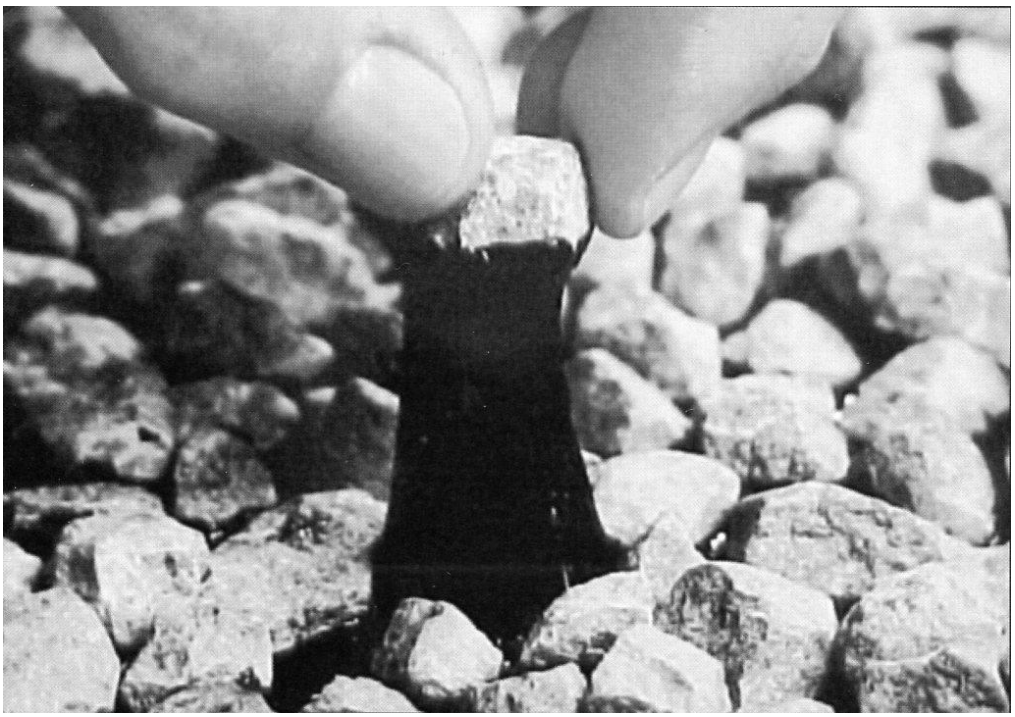
Binder & Hot cutback binder, chipseal life & usage analysis



Analysis Report

for the NZ Transport Agency (National Office)

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Analysis Report

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1 Introduction

The NZ Transport Agency (NZTA) engaged MWH to conduct analysis of the attained life of certain chipseal resurfacing types. This followed some preliminary work as reported at the NZTA / NZIHT 14th annual conference held in Auckland, November 2013, following which refinement of the analysis selection criteria was made at a meeting between the NTZA, MWH and Alan Stevens representing Roading NZ members.

The key selection criteria were as follows:

- Minimum life increased from 60 days to 4½ years in order to exclude any polishing effect
- Exclusion of ramps since the focus was on rural highways
- Use of HCV ranges in lieu of the road traffic R1 to R4 ranges
- Ignoring the size of the second chip for two coat chipseals (specifically 2CHIP and RACK)

The RAMM surface types reported in the national summary were 1CHIP (single coat chipseal), 2CHIP (two coat chipseal) and RACK (racked in two coat chipseal) for first chip grades 2, 3 and 4 for each of the four HCV daily (carriageway) flow ranges and for each of the three levels of horizontal curvature stress (low, mid or medium, high). The analyses were conducted for bituminous and emulsion binder types (Bxxx and Exxx) only, with the additive type adjustment applied to ensure that PMB and EMP (PME) were excluded.

2 Main Reporting

The national summary report was modified with most of the previous reporting removed for clarity. The results are shown in Appendix C

The reporting of the top surface (blue output top of page) was left unchanged from previously. The next block of 24 sets of results had the same output parameters as before but for different surfacings. Basically these were the ones selected for this project (albeit not all combinations) but without the stress element.

The main reporting consists of nine pages. The first three relate to low stress, the middle three mid stress and the last three high stress. The first of each set of three pages relates to 1CHIP, the next set relates to 2CHIP and the final set of three pages relates to RACK.

For each page the top half of each page are the bituminous chipseals and the bottom half are the emulsions, with the four different levels of heavy traffic given for each.

The reported metrics are the carriageway kilometres (two decimal points) and the attained age (red values, one decimal point) for each of the three sizes (grades 2, 3 and 4) of the first chip.

3 Main Processing

There were a few issues with processing the networks, relating to change in computer and server issues. One outcome is that it is suggested to use a copy of the Access database on the computer hard drive and not directly from the server, and likewise to 'work' from the hard

drive. It is also recommended to use a new 'CAD spec' desktop or laptop since the analysis spreadsheet grows with increasing outputs pasted into the three worksheets for each region. The main processing issue appears to occur when saving the file rather than when recalculating.

4 Main Results

The summary results given in Appendix C are separately provided in a PDF (with different page breaks) and in a standalone spreadsheet to facilitate graphing of the results.

With many cross-comparisons it is not easy to compare but some overall observations are:

- RACK (racked in two coat chipseal) is historically not a very prevalent surface type.
- Generally speaking as the stress increases the attained life decreases.

Examining the Appendix A results for each regions the following observation are made:

- Little use of emulsions in high stress areas except for Taranaki, Nelson-Tasman and Coastal Otago regions.
- More use of emulsions in medium stress areas, generally only for single coat or two coat chipseals and not for both (except for Nelson-Tasman and Coastal Otago).
- Limited use of emulsions where more than 500 HV per day (North Canterbury, Coastal Otago, Southland and Waikato regions), and in these situations they achieved similar or worse life compared to bituminous binders (except for West Waikato).
- As is already known, hardly any use of chipseals of any kind (only single coat grade 3) in the existing Auckland network region.

Examining the Appendix B results for single coat chipseals the following observations are made:

- Little use of emulsions, comprising generally only 1-2 per cent for all grades and stresses.
- Comparing bituminous and emulsion binders they appeared to achieve similar lives for single coat grades 2 and 4. For single coat grade 3 the emulsion binders had shorter lives, with the exception of South Canterbury where emulsions achieved longer lives for the low stress areas.

Examining the Appendix B results for two coat chipseals the following observations are made:

- Little use of emulsions, comprising less than 1½ per cent for grade 2 (491 km), 6-9 per cent for grade 3 (345 km), and much higher percentage for grade 4 (but only 15 km).
- Comparing bituminous and emulsion binders for two coat seals they appeared to achieve similar lives with the possible exception of central Waikato and South Canterbury regions where emulsions achieved longer lives; however sample sizes are generally low.

Examining the Appendix B results for racked in seals the following observations are made:

- Grade 4 (first chip) has seldom been used (never in high stress areas).
- Only for Coastal Otago can bituminous and emulsion be compared (grade 3), with the emulsion racked in seal performing better (by about 3-4 years).

5 Analysis of binder application rates

5.1 Background

An initial investigation of the effect of varying bitumen application rates was then undertaken for the existing Napier / Hawkes Bay region, but with additional filtering to screen out sections for which flushing was potentially an issue. This involved excluding those sections with macrotexture below certain thresholds, with three different thresholds tried. Namely 100 % less than 0.5 mm ("100 TL"), >50% less than the 0.5 mm ("50 TL") & >50% less than 0.7 mm ("50 IL"). To implement this required modifying the Skid Resistance (SR) procedure for macrotexture such that the 0.5 mm and 0.7 mm thresholds became equivalent to the SCRIM TL and IL respectively. Additional modification was needed to simultaneously introduce the exclusion of those sections for which the resurfacing reason was specified as FL=flushing.

Note that for this region there was no use of emulsions and no use of racked in chipseals with grade 4 first chip. There were some 1CHIP (single coat), 2CHIP (two coat) and RACK (racked in) chipseals for low, mid (medium) and high stress situations. The results are tabulated in Table 1.

5.2 Findings

For the Napier- Hawkes Bay (test case) region, while the life of single coat chipseals decreased with increasing stress, for two coat and racked in chipseals increasing stress did not result in decreased average life. For low stress situations single coat chipseals performed better, suggesting that the use of two coat and racked in chipseals in low stress situations might be sub-optimal from an attained life performance objective. Single coat chipseals also performed better in mid (medium) and high stress situations.

Interestingly grade 4 chipseals achieved longer life than grades 2 and 3 for the low stress situations although this is based on a relatively small sample size.

Strangely single coat grade 3 chipseals for situations with < 500 hvpd achieved a shorter life compared to situations with > 500 hvpd, for both low and mid stress cases. This also appeared to be the case for two coat chipseals with grade 2 first chip for low and mid stress situations.

For the low stress situation without excluding the flushing reason, there was no difference in the results except for the least stringent case of >50% less than 0.7 mm for the 1CHIP grade surface category with < 500 hvpd (heavy vehicles per day).

For the low stress situation including the flushing reason resulted in a decrease in the carriageway km of at least 0.4 km for several of the surfacing categories for heavy traffic flows between 200 and 800 hvpd, namely single coat grade 2, single coat grade 3, two coat grade 2 first chip, and two coat grade 3 first chip chipseals. For the corresponding mid stress situation for heavy traffic flows between 200 and 800 hvpd, the exclusion of flushing affected two coat grade 2 first chip, and two coat grade 3 first chip chipseals. Generally as might be expected, for both the low and mid stress situations, the average attained life was slightly higher when flushing was excluded but there were two exceptions.

There were only three cases with more than 4 km for at least two different binder application rates. The attained life was the same for two cases and differed by two years for the other case.

Table 1: Investigation of binder application rate for Napier-Hawkes Bay region

FL reason		included	included	included	included	included	included	excluded	included	included	included	included	included	included	excluded	excluded	excluded	excluded	excluded	excluded	included	excluded	excluded
Stress		Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Mid	Mid	Mid	Mid	Mid	Mid	Mid	Mid	Mid	High	High	High
Bitumens		B180	B130	B80	B60	sum	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	Bit	B180	B130	B80	B60	Bit	Bit	Bit
Texture		50 TL	50 TL	50 TL	50 TL	50 TL	n/a	50 TL	50 TL	100 IL	50 IL	n/a	50 IL	50 TL	50 IL	50 TL	50 TL	50 TL	50 TL	50 TL	n/a	50 IL	50 TL
Region		HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB	HB
Surf Cat	HVPD																						
1C2 km	> 800	0.01	0.02	0.03	0.00	0.06		0.06	0.06	0.06	0.06		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00
1C3 km		0.00	4.59	2.46	0.00	7.05		6.81	7.05	7.05	7.05		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00
1C4 km		0.00	2.63	0.00	0.00	2.63		2.63	2.63	2.63	2.63		0.35	0.35	0.35	0.35	0.00	0.35	0.00	0.00		0.00	0.00
1C2 age		24.1	11.0	11.8	0.0	22.14	22.14	13.6	13.6	13.6	13.6	1.10	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.00	0.0	0.0
1C3 age		0.0	9.1	14.5	0.0	12.83	12.83	10.8	11.0	11.0	11.0	1.81	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.01	0.0	0.0
1C4 age		0.0	12.7	0.0	0.0	3.12	3.12	12.7	12.7	12.7	12.7	0.71	12.7	12.7	12.7	12.7	0.0	12.7	0.0	0.0	0.00	0.0	0.0
1C2 km	500-800	0.00	8.79	13.28	0.00	22.08		20.24	22.08	22.08	21.85		1.10	1.10	1.10	1.10	0.00	0.18	0.92	0.00		0.00	0.00
1C3 km		0.00	0.88	4.91	0.00	5.78		5.40	5.78	5.78	5.78		1.81	1.81	1.58	1.58	0.00	0.20	1.38	0.00		0.01	0.01
1C4 km		0.00	0.49	0.00	0.00	0.49		0.49	0.49	0.49	0.49		0.36	0.36	0.36	0.36	0.00	0.36	0.00	0.00		0.00	0.00
1C2 age		0.0	10.7	10.5	0.0			10.7	10.6	10.6	10.4		9.2	9.2	9.2	9.2	0.0	9.9	9.1	0.0		0.0	0.0
1C3 age		0.0	12.3	10.5	0.0			10.4	10.8	10.8	10.8		10.8	10.8	10.1	10.1	0.0	11.9	9.8	0.0		9.8	9.8
1C4 age		0.0	12.5	0.0	0.0			12.5	12.5	12.5	12.5		9.0	9.0	9.0	9.0	0.0	9.0	0.0	0.0		0.0	0.0
1C2 km	200-500	0.14	4.55	8.73	0.00	13.42		11.96	13.42	13.42	13.42		3.56	3.56	3.37	3.37	0.00	1.10	2.27	0.00		0.04	0.04
1C3 km		0.03	1.72	3.46	0.00	5.21		3.67	5.21	5.21	5.21		2.05	2.05	1.90	1.90	0.00	0.76	1.14	0.00		0.19	0.19
1C4 km		0.00	0.06	0.32	0.00	0.38		0.38	0.38	0.38	0.38		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.04	0.04
1C2 age		8.1	9.8	9.8	0.0	23.32	23.32	9.9	9.8	9.8	9.8	8.51	9.5	9.5	9.6	9.6	0.0	8.7	10.0	0.0	0.29	9.1	9.1
1C3 age		15.3	5.5	8.3	0.0	15.24	15.24	6.8	7.5	7.5	7.5	4.30	6.9	6.9	6.7	6.7	0.0	5.8	7.4	0.0	1.28	9.4	9.4
1C4 age		0.0	7.8	6.5	0.0	1.14	1.14	6.7	6.7	6.7	6.7	0.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.04	9.9	9.9
1C2 km	< 200	4.33	1.59	3.98	0.00	9.90		9.74	9.90	9.90	9.90		4.95	4.95	4.78	4.78	2.36	1.36	1.06	0.00		0.25	0.25
1C3 km		5.06	4.06	0.91	0.00	10.03		9.73	10.03	10.03	10.03		2.25	2.25	2.05	2.05	0.79	0.87	0.39	0.00		1.09	1.09
1C4 km		0.76	0.00	0.00	0.00	0.76		0.76	0.76	0.76	0.76		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00
1C2 age		13.6	8.7	9.6	0.0			11.2	11.2	11.2	11.2		9.6	9.6	9.7	9.7	10.4	9.2	8.7	0.0		9.9	9.9
1C3 age		10.4	8.3	9.9	0.0			9.5	9.5	9.5	9.5		9.1	9.1	9.1	9.1	9.4	8.4	9.9	0.0		7.4	7.4
1C4 age		16.7	0.0	0.0	0.0			16.7	16.7	16.7	16.7		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
2C2 km	> 800	0.00	0.03	0.07	0.00	0.10		0.05	0.10	0.10	0.10		0.13	0.13	0.13	0.13	0.00	0.08	0.05	0.00		0.00	0.00
2C3 km		0.04	0.00	0.00	0.00	0.04		0.04	0.04	0.04	0.04		0.02	0.02	0.02	0.02	0.00	0.00	0.02	0.00		0.00	0.00
2C4 km		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00
2C2 age		0.0	7.8	5.1	0.0	5.38	5.38	6.7	5.9	5.9	5.9	3.77	6.5	6.5	6.5	6.5	0.0	7.5	5.1	0.0	0.00	0.0	0.0
2C3 age		5.9	0.0	0.0	0.0	3.78	3.78	5.9	5.9	5.9	5.9	1.54	11.6	11.6	11.6	11.6	0.0	0.0	11.6	0.0	0.01	0.0	0.0
2C4 age		0.0	0.0	0.0	0.0	0.00		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
2C2 km	500-800	0.52	2.44	2.32	0.00	5.28		4.20	5.28	5.28	5.28		3.64	3.64	2.98	2.98	1.06	1.48	0.44	0.00		0.00	0.00
2C3 km		0.91	1.85	0.97	0.00	3.74		2.88	3.74	3.74	3.74		1.52	1.52	0.85	0.85	0.00	0.03	0.82	0.00		0.01	0.01
2C4 km		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00
2C2 age		7.0	12.1	7.5	0.0			10.4	9.6	9.6	9.6		8.6	8.6	9.0	9.0	6.3	11.9	5.9	0.0		0.0	0.0
2C3 age		9.3	9.1	6.9	0.0			9.1	8.6	8.6	8.6		5.9	5.9	6.4	6.4	0.0	8.7	6.4	0.0		6.0	6.0
2C4 age		0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
2C2 km	200-500	3.67	0.09	7.44	0.00	11.21		6.03	11.21	11.21	11.21		5.45	5.45	4.69	4.69	1.90	0.29	2.50	0.00		1.81	1.81
2C3 km		0.02	0.00	0.99	0.00	1.01		0.74	1.01	1.01	1.01		1.17	1.17	0.54	0.54	0.02	0.00	0.52	0.00		0.25	0.25
2C4 km		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00
2C2 age		7.7	6.7	5.9	0.0	13.23	13.23	6.7	6.5	6.5	6.5	6.84	6.6	6.6	6.4	6.4	6.0	7.7	6.6	0.0	3.08	6.4	6.4
2C3 age		5.2	0.0	6.7	0.0	1.52	1.52	7.0	6.6	6.6	6.6	1.74	6.3	6.3	7.3	7.3	5.2	0.0	7.4	0.0	0.96	6.0	6.0
2C4 age		0.0	0.0	0.0	0.0	0.00		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
2C2 km	< 200	0.23	0.29	1.35	0.16	2.03		1.69	2.03	2.03	2.03		1.39	1.39	1.17	1.17	0.02	0.00	0.96	0.19		0.86	0.86
2C3 km		0.00	0.37	0.14	0.00	0.51		0.51	0.51	0.51	0.51		0.57	0.57	0.57	0.57	0.00	0.46	0.11	0.00		0.00	0.00
2C4 km		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00
2C2 age		7.2	9.7	7.1	9.4			7.6	7.6	7.6	7.6		7.3	7.3	7.2	7.2	7.8	0.0	7.2	7.1		9.2	9.2
2C3 age		0.0	8.7	5.8	0.0			7.9	7.9	7.9	7.9		7.4	7.4	7.4	7.4	0.0	7.7	6.3	0.0		0.0	0.0
2C4 age		0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
RACK2 k	> 800	0.00	0.00	0.62	0.00	0.62		0.55	0.62	0.62	0.62		0.67	0.67	0.67	0.67	0.00	0.00	0.67	0.00		0.00	0.00
RACK3 km		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00
RACK4 km		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00
RACK2 age		0.0	0.0	5.7	0.0	0.69	0.69	5.3	5.7	5.7	5.7	0.74	5.3	5.3	5.3	5.3	0.0	0.0	5.3	0.0	0.00	0.0	0.0
RACK3 age		0.0	0.0	0.0	0.0	0.38	0.38	0.0	0.0	0.0	0.0	0.35	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.03	0.0	0.0
RACK4 age		0.0	0.0	0.0	0.0	0.00		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
RACK2 k	500-800	0.00	0.00	0.00	0.07	0.07		0.07	0.07	0.07	0.07		0.07	0.07	0.07	0.07	0.00	0.00	0.00	0.07		0.00	0.00
RACK3 km		0.00	0.20	0.18	0.00	0.38		0.20	0.38	0.38	0.38		0.35	0.35	0.35	0.35	0.00	0.24	0.11	0.00		0.03	0.03
RACK4 km		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00
RACK2 age		0.0	0.0	0.0	10.0			10.0	10.0	10.0	10.0		10.0	10.0	10.0	10.0	0.0	0.0	0.0	10.0		0.0	0.0
RACK3 age		0.0	6.8	8.0	0.0			6.8	7.3	7.3	7.3		7.1	7.1	7.1	7.1	0.0	6.8	8.0	0.0		8.0	8.0
RACK4 age		0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
RACK2 k	200-500	0.02	0.00	1.27	1.28	2.57		2.45	2.57	2.57	2.57		3.58	3.58	3.33	3.33	0.21	0.01	1.71	1.40		0.71	0.71
RACK3 km		0.00	0.00	0.95	0.00	0.95		0.95	0.95	0.95	0.95		0.79	0.79	0.79	0.79	0.00	0.00	0.79	0.00		0.22	0.22
RACK4 km		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00
RACK2 age		5.9	0.0	6.7	6.6	3.14	3.14	6.7	6.7	6.7	6.7	3.79	6.8	6.8	6.8	6.8	5.9	6.1	6.8	6.9	0.71	6.4	6.4
RACK3 age		0.0	0.0	6.3	0.0	0.96	0.96	6.3	6.3	6.3	6.3	0.91	6.5	6.5	6.5	6.5	0.0	0.0	6.5	0.0	0.22	6.7	6.7
RACK4 age		0.0	0.0	0.0	0.0	0.00		0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0
RACK2 k	< 200	0.00	0.00	0.57	0.00	0.57		0.57	0.57	0.57	0.57		0.21	0.21	0.21	0.21	0.00	0.00	0.21	0.00		0.00	0.00
RACK3 km		0.01	0.00	0.00	0.00	0.01		0.01	0.01	0.01	0.01		0.01	0.01	0.01	0.01	0.00	0.00	0.01	0.00		0.00	0.00
RACK4 km		0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00
RACK2 age		0.0	0.0	6.0	0.0			6.0	6.0	6.0	6.0		6.7	6.7	6.7	6.7	0.0	0.0	6.7	0.0		0.0	0.0
RACK3 age		6.0	0.0	0.0	0.0			6.0	6.0	6.0	6.0		9.7	9.7	9.7	9.7	0.0	0.0	9.7	0.0		0.0	0.0
RACK4 age		0.0	0.0	0.0	0.0			0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		0.0	0.0

Note: Orange and Yellow shading indicate the length reduces by at least 0.3 and 0.5km respectively for when FL=flushing excluded compared to when included (21.85 is the only texture threshold difference case)

There were differences in the average attained lives for different binder application rates for lower sample sites (< 4 km), the most notable being a difference of more than 5 years between the B130 & B80 rates for single coat grade 3 chipseals with > 800 hvpd in a low stress situation.

In general terms for the Napier- Hawkes Bay region, the most prevalent binder application rate for low stress situations was also the most prevalent for mid stress situations.

The degree of usefulness of repeating the above analysis for each region is arguably questionable on a regional level. Without any agreed matching of regions into similar groups analyses could be hindered by sufficient sample size at the detailed level of disaggregation considered necessary to enable fair comparison in the attained ages.

6 Discussion

With the level of disaggegation, it is not particularly easy to see some of the overall trends, such as the decrease in attained life with increasing stress.

The amount of emulsion usage for the historical layer 2 (that most recently resurfaced) is still comparatively low (as is the use of racked in seal). Accordingly there is merit in repeating this, albeit possibly for selected networks, in the future, noting however that the network boundaries are currently changing.

The NZ Transport Agency has indicated that recent work by John Patrick for Opus Research has indicated that it might be better in comparing the results between bitumens and emulsions by reporting the length of each surfacing category in particular age bands. The suggested bands are 4½ -6½; 6½ - 8½; 8½ - 10½; and 10½ - 12½ years average attained life.

This can be achieved by modifying the existing analysis tool to introduce a maximum attained life. Then the previous processing could be repeated for each age band, or alternatively the main layer 2 summary results sheet (smy2) copied to automatically give the results for each of the four age bands. The latter approach would however also require amending of the procedure for copy and pasting as values the summary results into the specific regional results sheet and would create larger files (slower to process).

Accordingly at this stage it is suggested that the simpler approach be adopted and analysis be targeted at specific networks. From the above results, suitable networks could include the following existing network regions.
North Island: Northland; West Waikato; Central Waikato; Taranaki
South Island: Nelson-Tasman; North Canterbury; South Canterbury; Coastal Otago; Southland

An example table is given in Table 2 for the Napier-Hawkes Bay region for the low stress situation for bituminous binders for the one and two coat seal surface categories. An additional age band >12½ years has been added for completeness.

Figure 1 graphs the tabulated values for convenience with the four ranges of heavy vehicle flows similarly combined into two ranges as previously. It is suggested to output the graphs rather than the tables, reproducing the low, mid and high stress situations for each selected region (suggest choose 8 regions) onto a single A4 page for easy comparison.

Table 2: Example output for different age bands for Napier-Hawkes Bay region

FL reason		included	included	excluded		excluded	excluded	excluded	excluded	excluded	excluded
Stress		Low	Low	Low		Low	Low	Low	Low	Low	Low
Bitumens		**Bit**	**Bit**	**Bit**		**Bit**	**Bit**	**Bit**	**Bit**	**Bit**	**Bit**
Texture		n/a	50 IL	50 TL		50 IL	50 IL	50 IL	50 IL	50 IL	50 IL
years		HB	4.5-99	4.5-99		sum	4.5-6.5	6.5-8.5	8.5-10.5	10.5-12.5	12.5-99
Surf Cat	HVPD					LFL50IIbit45	LFL50IIbit45	65.00	85.00	105.00	125
1C2 km	> 800		0.06	0.06		0.06	0.00	0.00	0.00	0.05	0.01
1C3 km			7.05	6.81		6.81	0.02	1.44	3.14	0.51	1.70
1C4 km			2.63	2.63		2.63	0.00	0.00	0.00	0.00	2.63
1C2 age		22.14	13.6	13.6		13.6	0.0	0.0	0.0	11.5	24.1
1C3 age		12.83	11.0	10.8		10.8	5.3	7.2	9.2	11.0	17.0
1C4 age		3.12	12.7	12.7		12.7	0.0	0.0	0.0	0.0	12.7
1C2 km	500-800		21.85	20.24		20.01	0.40	3.40	7.25	7.40	1.56
1C3 km			5.78	5.40		5.40	0.05	1.82	1.86	0.57	1.11
1C4 km			0.49	0.49		0.49	0.00	0.00	0.03	0.00	0.46
1C2 age			10.4	10.7		10.5	5.9	7.6	9.8	11.1	18.0
1C3 age			10.8	10.4		10.4	5.3	8.2	9.3	11.7	15.5
1C4 age			12.5	12.5		12.5	0.0	0.0	9.0	0.0	12.7
1C2 km	200-500		13.42	11.96		11.96	0.25	0.74	7.55	3.11	0.31
1C3 km			5.21	3.67		3.67	1.73	1.37	0.42	0.02	0.13
1C4 km			0.38	0.38		0.38	0.28	0.06	0.04	0.00	0.00
1C2 age		23.32	9.8	9.9		9.9	5.8	7.8	9.5	11.2	14.1
1C3 age		15.24	7.5	6.8		6.8	4.9	7.7	8.8	10.9	15.8
1C4 age		1.14	6.7	6.7		6.7	6.1	7.8	9.9	0.0	0.0
1C2 km	< 200		9.90	9.74		9.74	0.00	1.08	6.00	0.89	1.77
1C3 km			10.03	9.73		9.73	0.26	4.18	2.75	1.17	1.37
1C4 km			0.76	0.76		0.76	0.00	0.00	0.00	0.00	0.76
1C2 age			11.2	11.2		11.2	0.0	7.4	9.5	10.8	19.3
1C3 age			9.5	9.5		9.5	5.7	7.8	9.7	11.9	13.3
1C4 age			16.7	16.7		16.7	0.0	0.0	0.0	0.0	16.7
2C2 km	> 800		0.10	0.05		0.05	0.02	0.03	0.00	0.00	0.00
2C3 km			0.04	0.04		0.04	0.04	0.00	0.00	0.00	0.00
2C4 km			0.00	0.00			0.00	0.00	0.00	0.00	0.00
2C2 age		5.38	5.9	6.7		6.7	5.1	7.8	0.0	0.0	0.0
2C3 age		3.78	5.9	5.9		5.9	5.9	0.0	0.0	0.0	0.0
2C4 age							0.0	0.0	0.0	0.0	0.0
2C2 km	500-800		5.28	4.20		4.20	0.20	1.07	0.27	1.29	1.37
2C3 km			3.74	2.88		2.88	0.37	0.39	1.17	0.95	0.00
2C4 km			0.00	0.00			0.00	0.00	0.00	0.00	0.00
2C2 age			9.6	10.4		10.4	5.6	7.3	10.0	11.4	12.8
2C3 age			8.6	9.1		9.1	5.2	7.1	9.5	11.0	0.0
2C4 age							0.0	0.0	0.0	0.0	0.0
2C2 km	200-500		11.21	6.03		6.03	3.03	2.42	0.54	0.04	0.00
2C3 km			1.01	0.74		0.74	0.06	0.68	0.00	0.00	0.00
2C4 km			0.00	0.00			0.00	0.00	0.00	0.00	0.00
2C2 age		13.23	6.5	6.7		6.7	5.5	7.6	9.0	11.8	0.0
2C3 age		1.52	6.6	7.0		7.0	5.4	7.2	0.0	0.0	0.0
2C4 age							0.0	0.0	0.0	0.0	0.0
2C2 km	< 200		2.03	1.69		1.69	0.79	0.24	0.51	0.15	0.00
2C3 km			0.51	0.51		0.51	0.16	0.19	0.14	0.02	0.00
2C4 km			0.00	0.00			0.00	0.00	0.00	0.00	0.00
2C2 age			7.6	7.6		7.6	6.0	7.8	9.2	10.8	0.0
2C3 age			7.9	7.9		7.9	5.9	8.5	9.0	10.8	0.0
2C4 age							0.0	0.0	0.0	0.0	0.0

Note that the age band carriageway km values for lengths less than 0.030 km are greyed out.

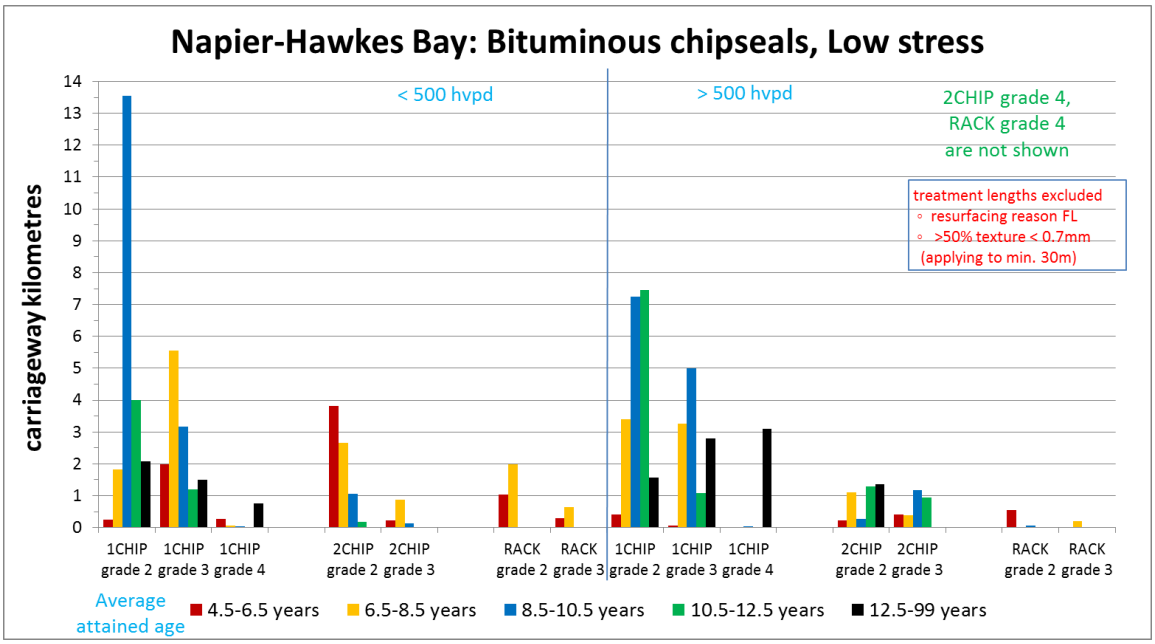


Figure 1 Example output graph investigating the results for different average attained age ranges

The example graph shows the carriageway length for each of the 5 average attained age ranges for each of the 9 surfacing categories for the <500 and > 500 heavy vehicles for day, for the low stress situation for the Napier-Hawkes Bay that relates solely to bituminous chipseals excluding those for which the resurfacing reason was flushing (FL) and/or at least 50% of the treatment length was < 0.7 mm (and at least 50m).

Examination of the graph enables the analyst to visually get an appreciation of the proportion of the surfacing category achieving for instance a lower than expected attained age.

For example, for first chip grade 3 chipseals and < 500 hvpd, the greatest length for one coat chipseals corresponded to achieving an average attained age of 8.5-10.5 years, while for two coat chipseals it was only 4.5-6.5 years and for racked in chipseals it was 6.5-8.5 years.

The attained age annual distribution is one of the outputs annotated on the detailed (type 3) graphs for a particular surface category selected by the analyst; it is also derived in the analysis procedure for computing the nominal forward works programme – refer to earlier 2013 reports by MWH provided to the Transport Agency.

7 Summary

The tool has again been further enhanced in response to more definitive queries by the Transport Agency. A series of graphs with some tabulated values have been produced to facilitate the gleaning of meaningful patterns and findings.

As noted above, there was the occasional unexpected results for certain surfacing categories when compared across al networks for different stress levels, which potentially warrant further investigation.

For the Napier- Hawkes Bay (test case) region, while the life of single coat chipseals decreased with increasing stress, for two coat and racked in chipseals increasing stress did not result in decreased average life. For low stress situations single coat chipseals performed better, suggesting that the use of two coat and racked in chipseals in low stress situations might be sub-optimal from an attained life performance objective. Single coat chipseals also performed better in mid (medium) and high stress situations.

For the Napier-Hawkes Bay region, the incorporation of the three alternative macrotexture criteria made no difference except for the least stringent criterion ("50 IL", 50% less than 0.7 mm) in one case only. However the exclusion of treatment lengths for which the reason for resurfacing was given as flushing (FL) did make a difference.

Currently in general there is a lack of historical chip seal surfaces where emulsions have been applied. The same lack of sufficient sample size at the detailed level applies to racked in seals and use of a variety of bituminous binder application rates.

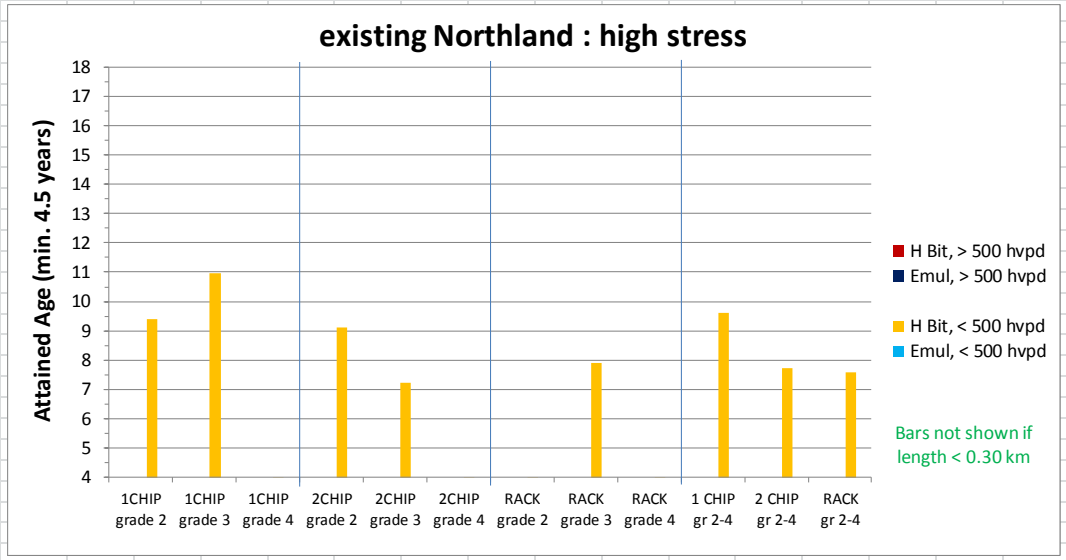
Notwithstanding this issue of low sample sizes, which should improve with time, by focussing on the most prevalent surfacing categories meaningful results have been obtained.

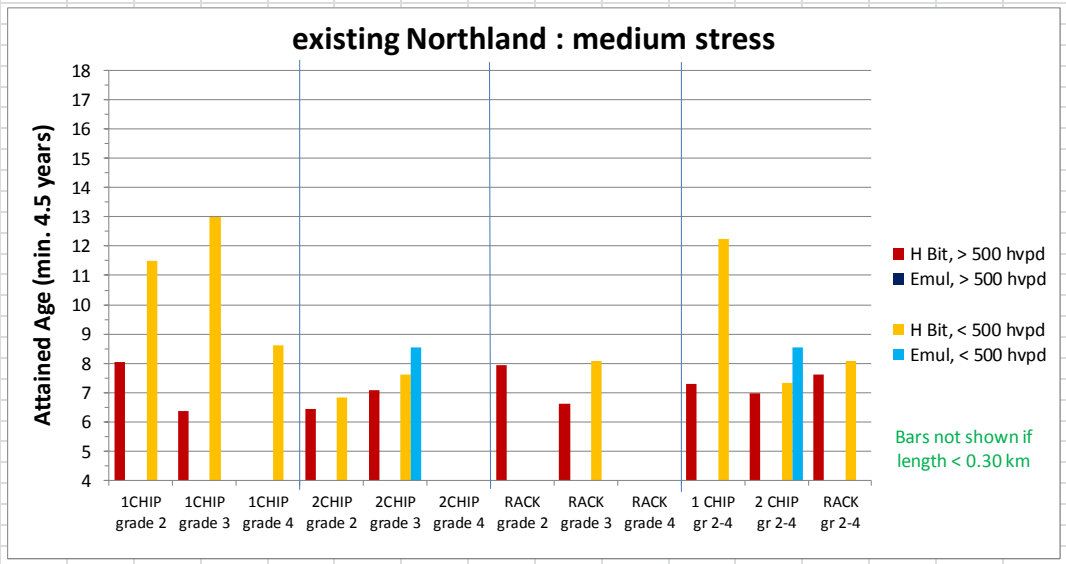
8 Recommendations

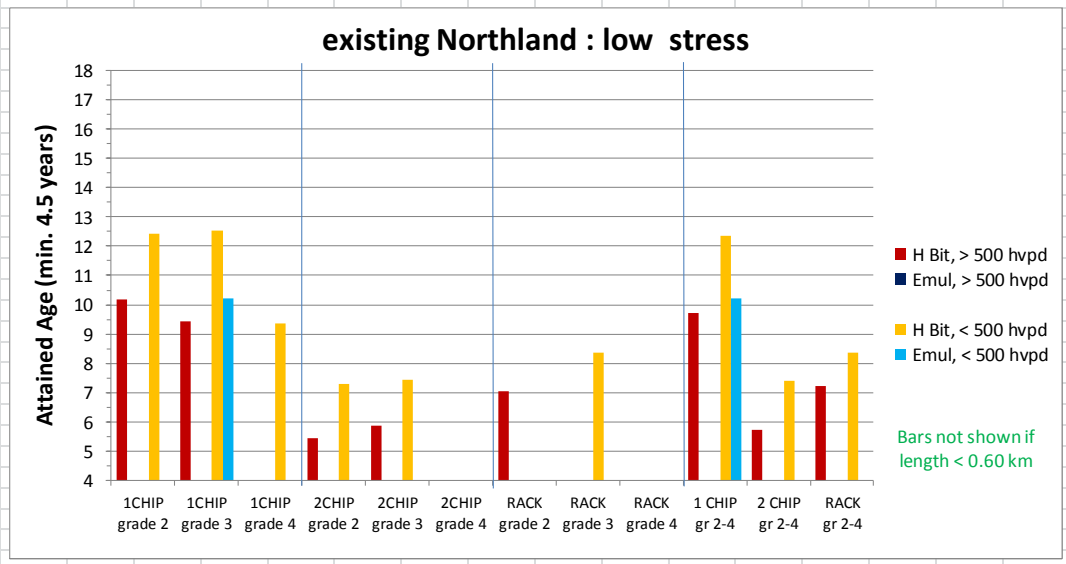
It is recommended that the analyses for the Napier - Hawkes Bay region be considered for repeating for another eight regions, being the same regions as those to be used for the additional age range analysis as suggested by the Transport Agency. In this respect it is suggested that the regions to be used are as follows:
North Island: Northland; West Waikato; Central Waikato; Taranaki
South Island: Nelson-Tasman; South Canterbury; Coastal Otago; Southland

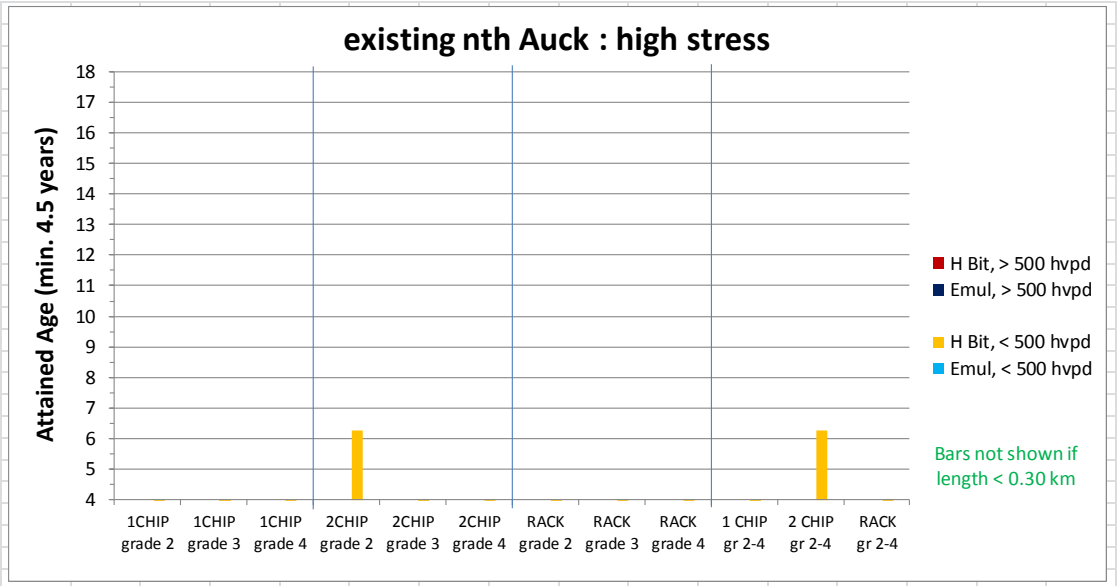
It is suggested that the analysis excluding those treatment lengths resurfaced due to flushing should also apply the least stringent macrotexture criterion ("50 IL", >=50% less than 0.7 mm).

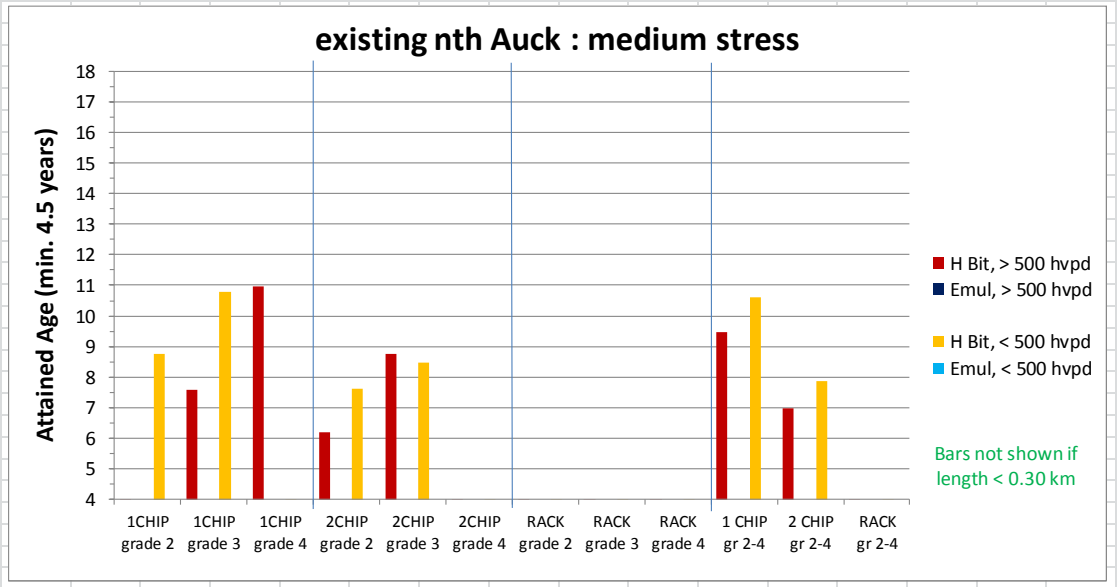
Appendix A: Average life charts for each surface category / binder / HV flow combination for each region by stress

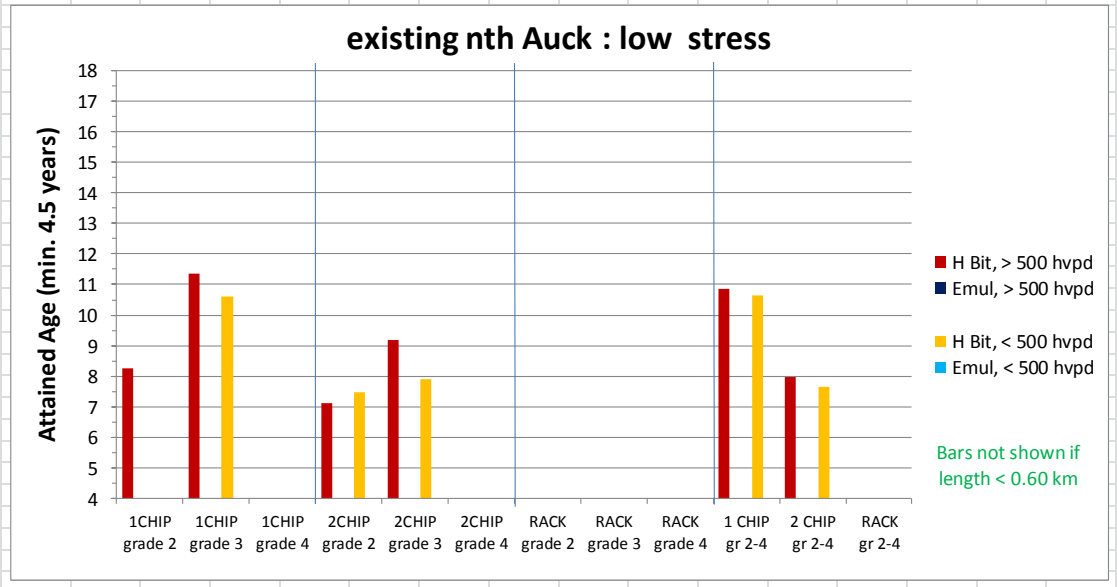


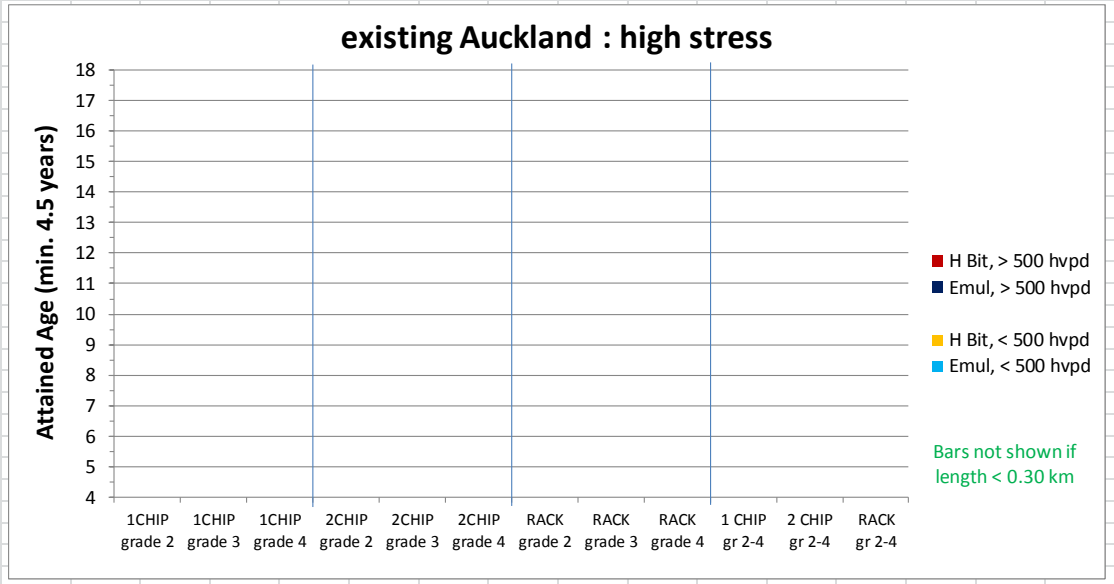


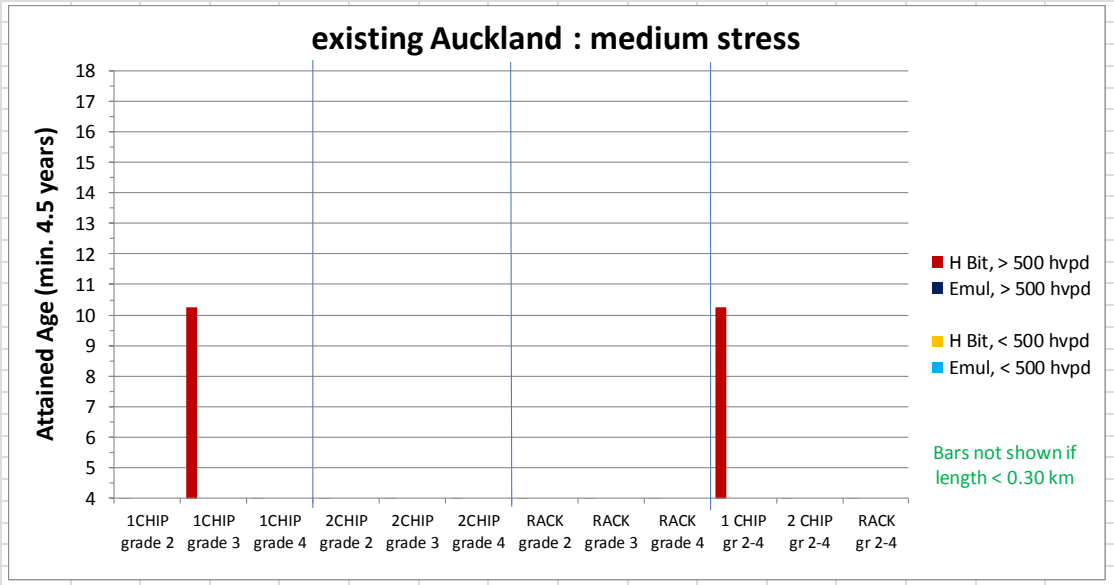


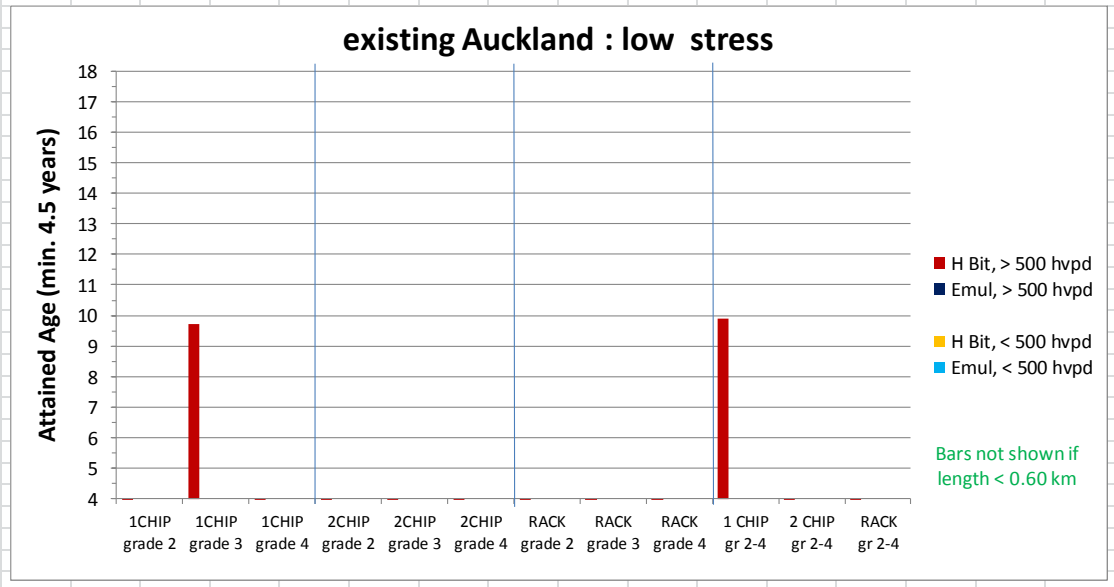

existing nth Auck : high stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

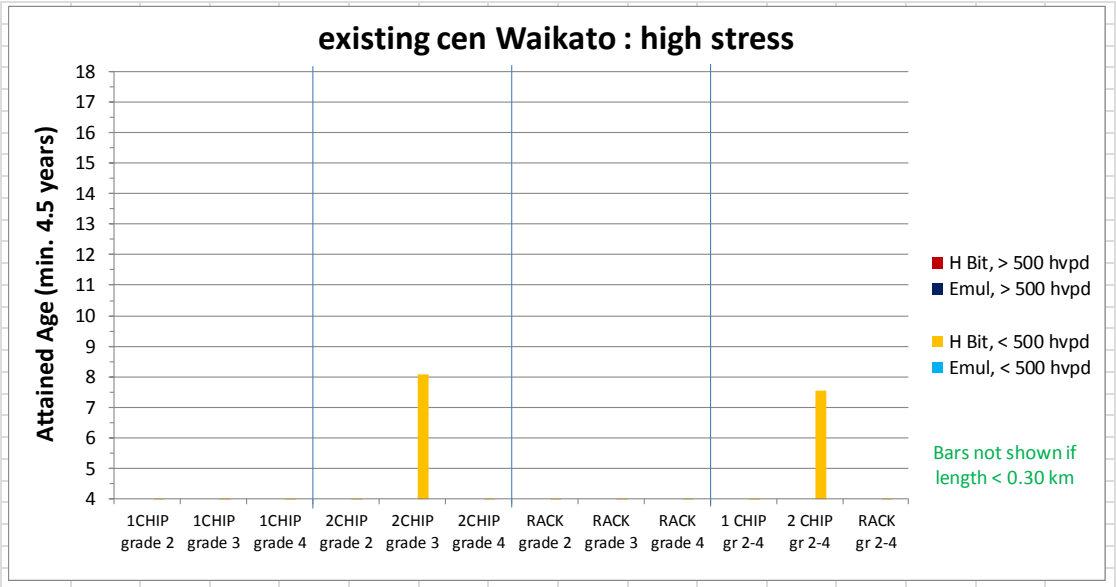

existing nth Auck : medium stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

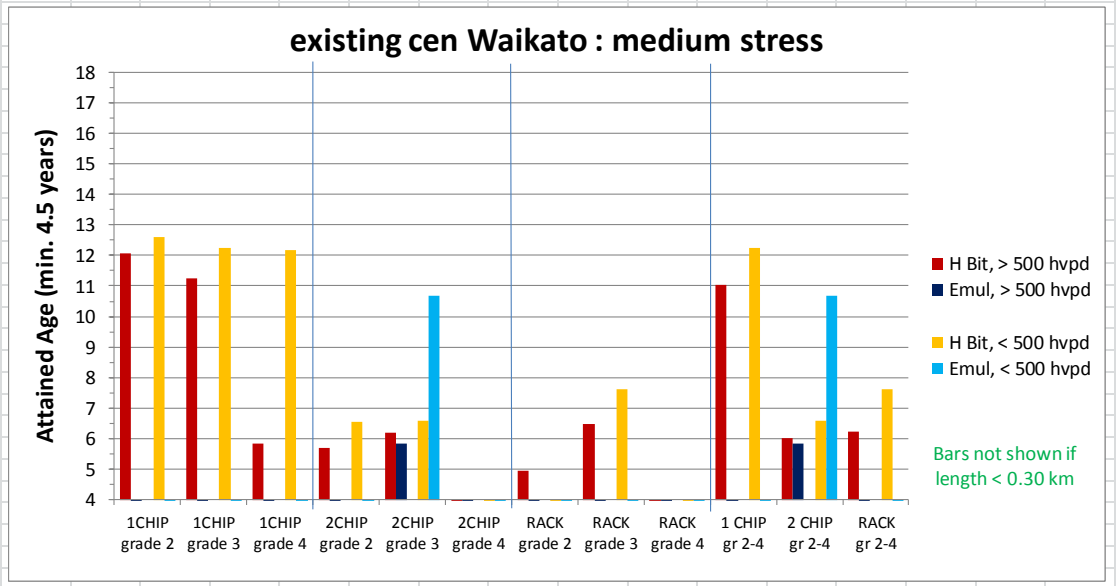

existing nth Auck : low stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.60 km

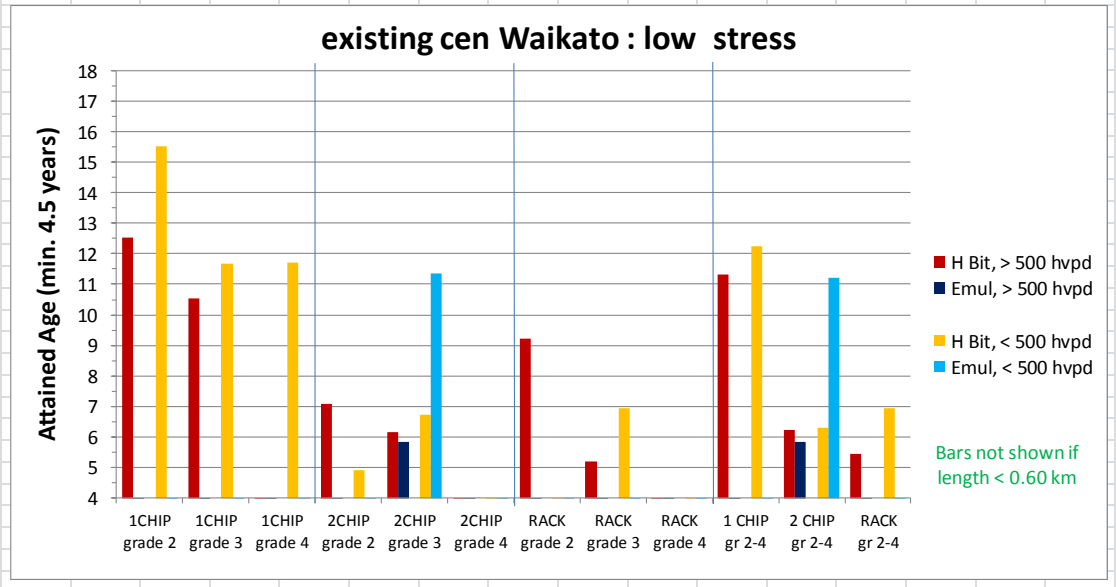

existing Auckland : high stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

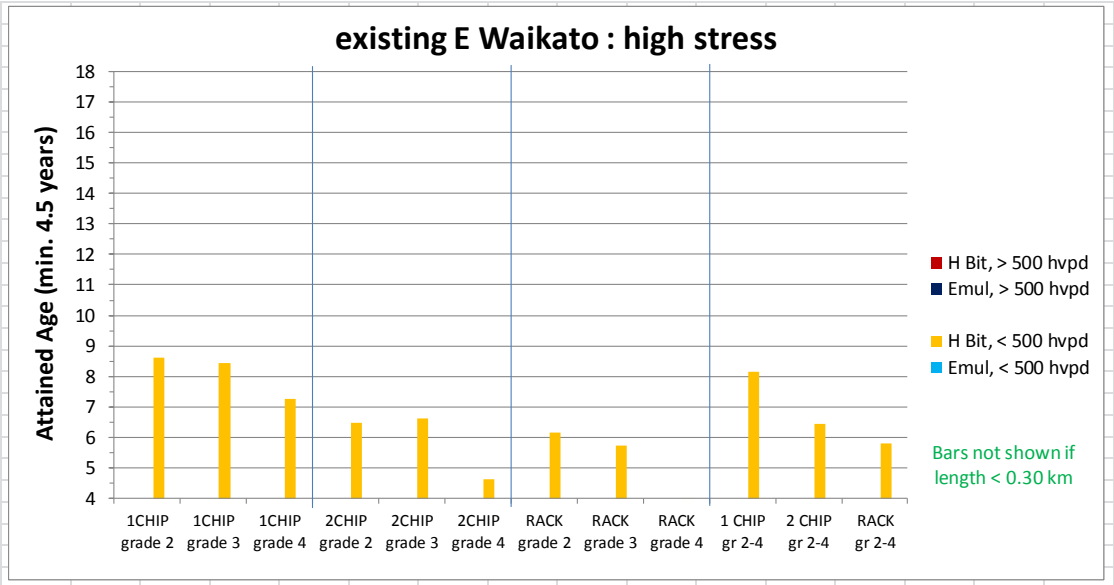

existing Auckland : medium stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

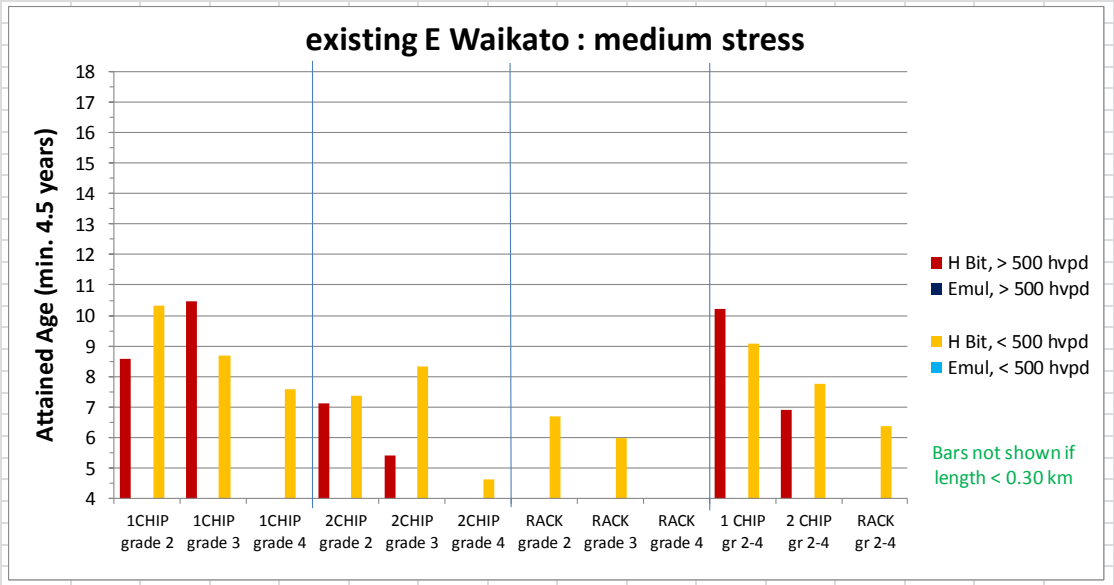

existing Auckland : low stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.60 km

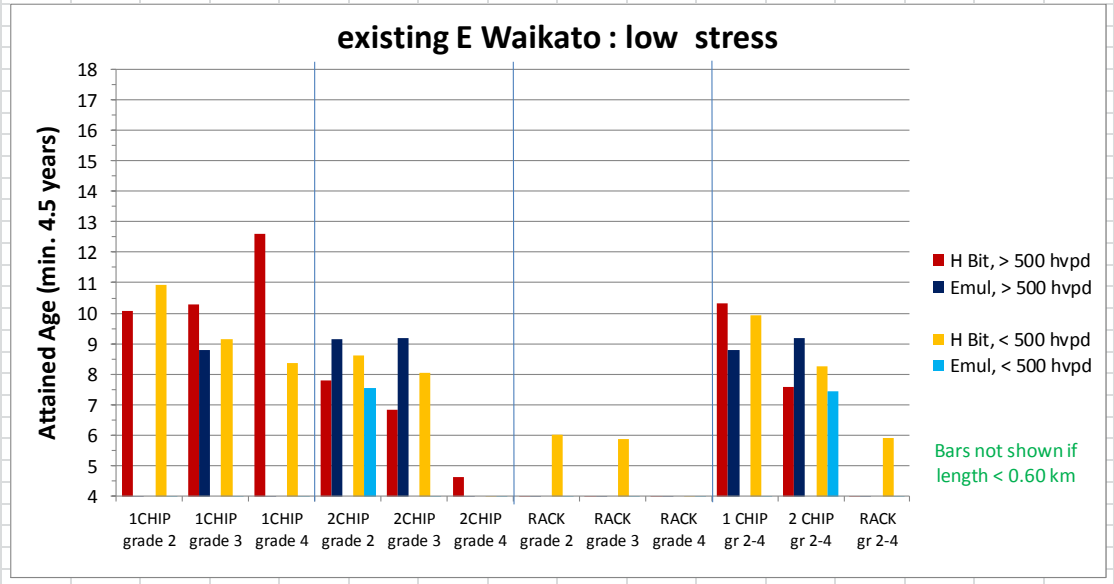

existing cen Waikato : high stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

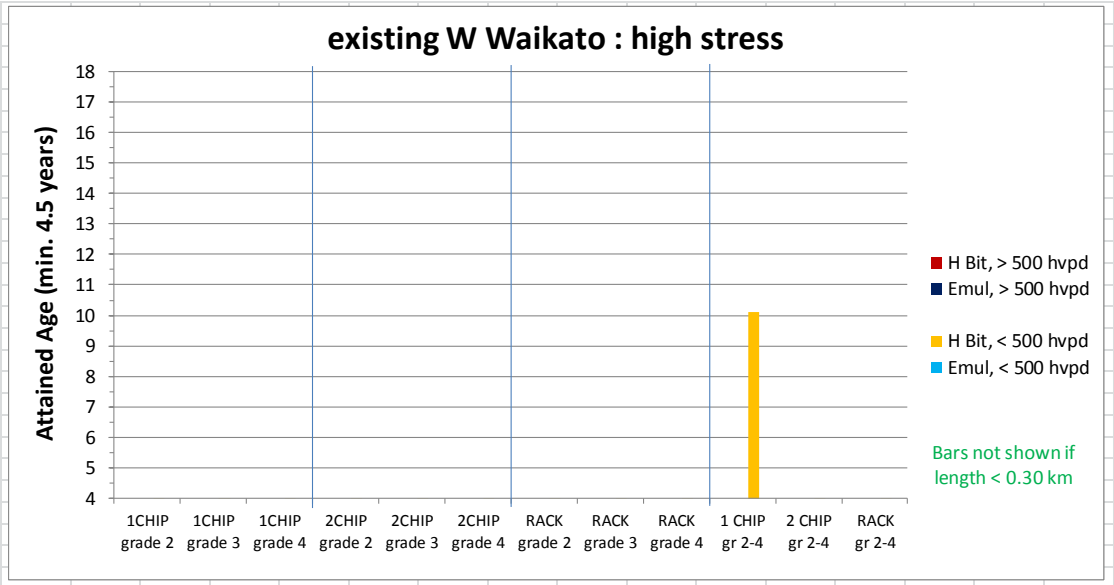

existing cen Waikato : medium stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

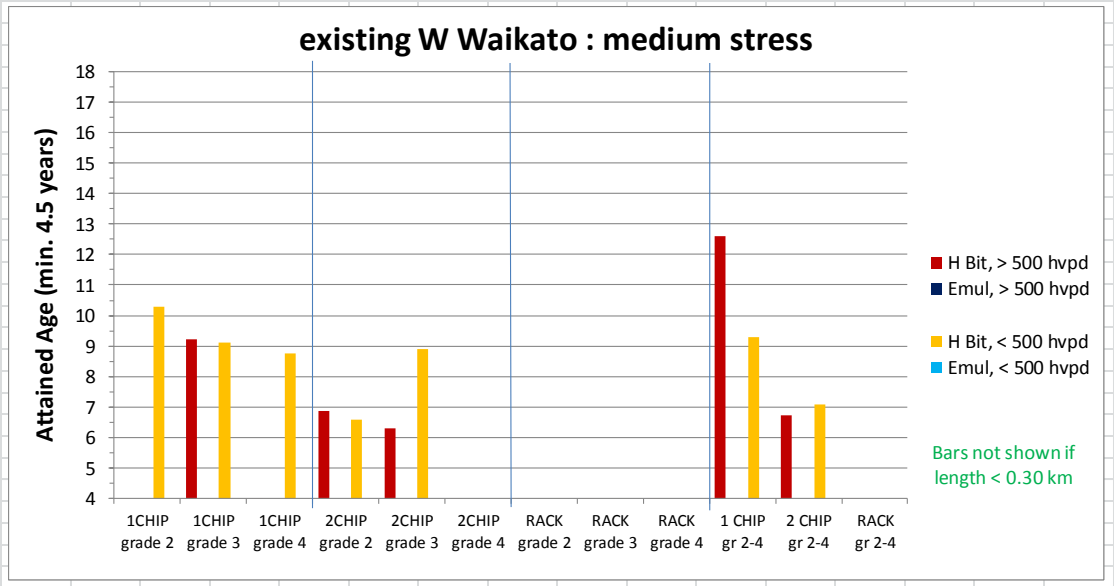

existing cen Waikato : low stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.60 km

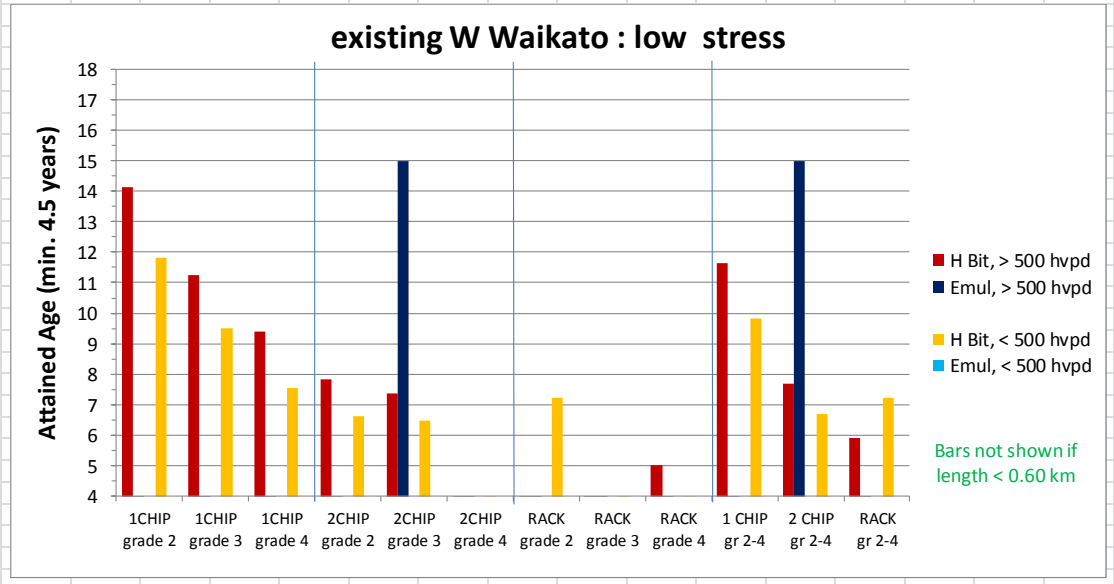

existing E Waikato : high stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

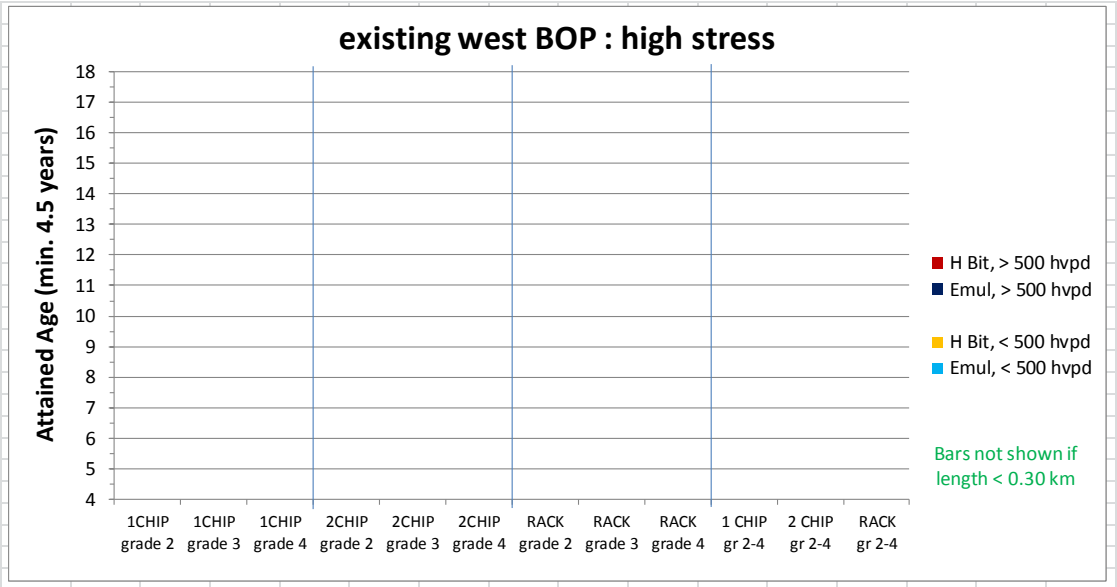

existing E Waikato : medium stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

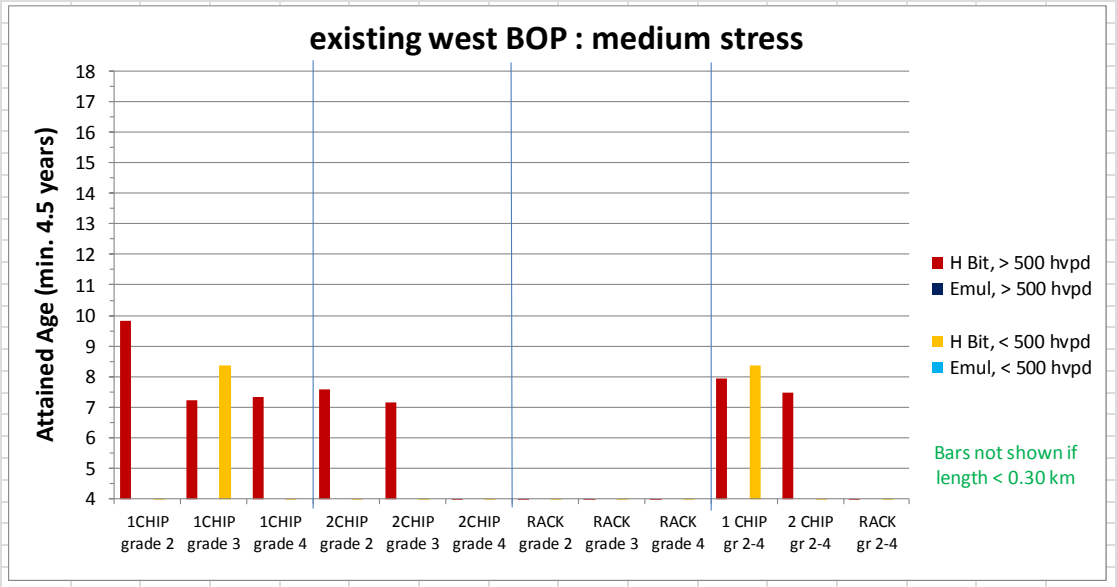

existing E Waikato : low stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.60 km

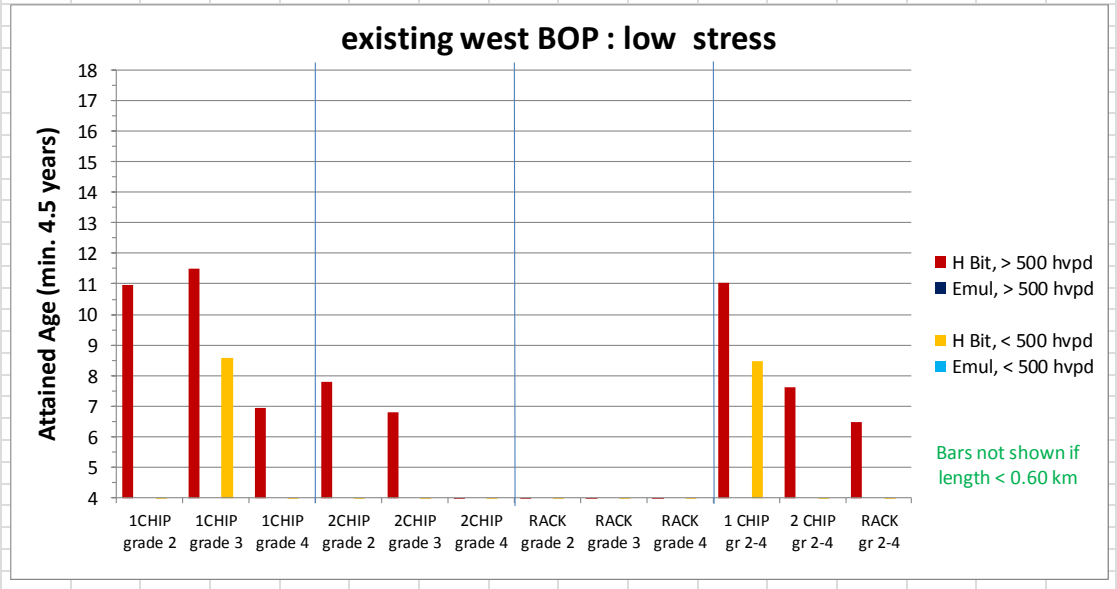

existing W Waikato : high stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

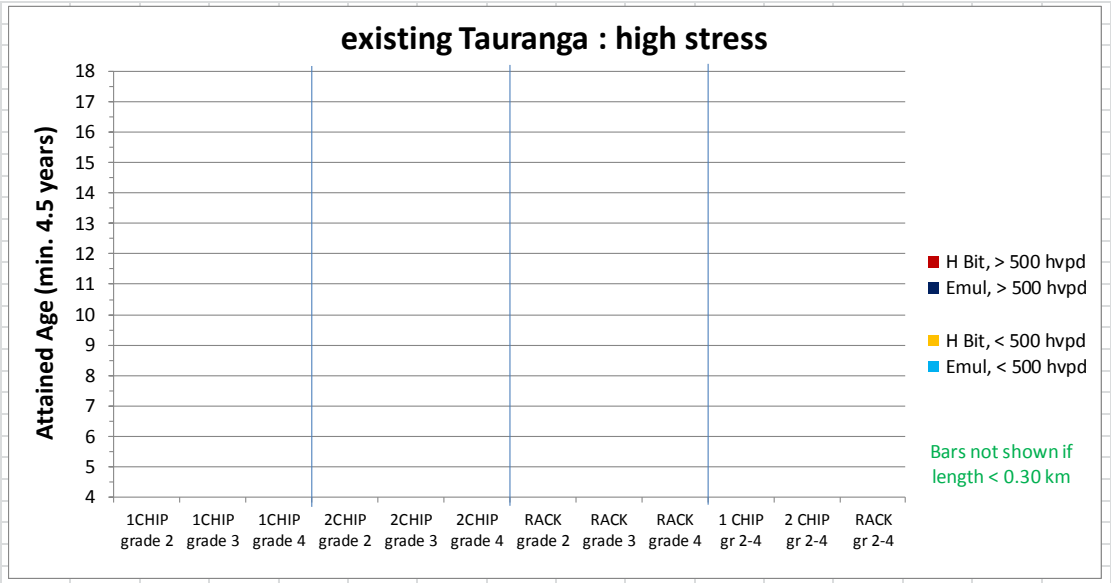

existing W Waikato : medium stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

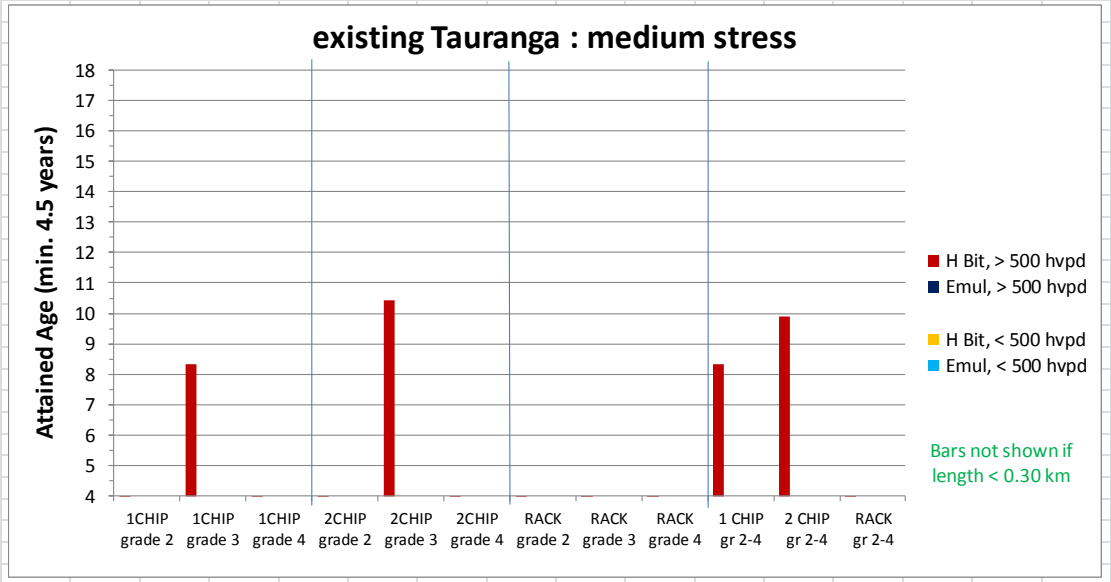

existing W Waikato : low stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.60 km

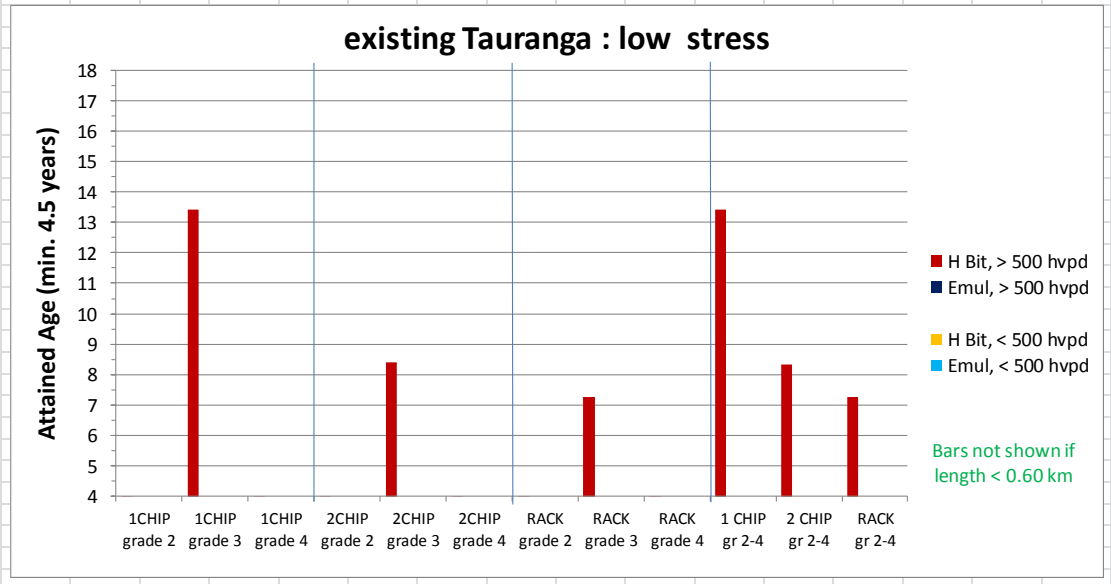

existing west BOP : high stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

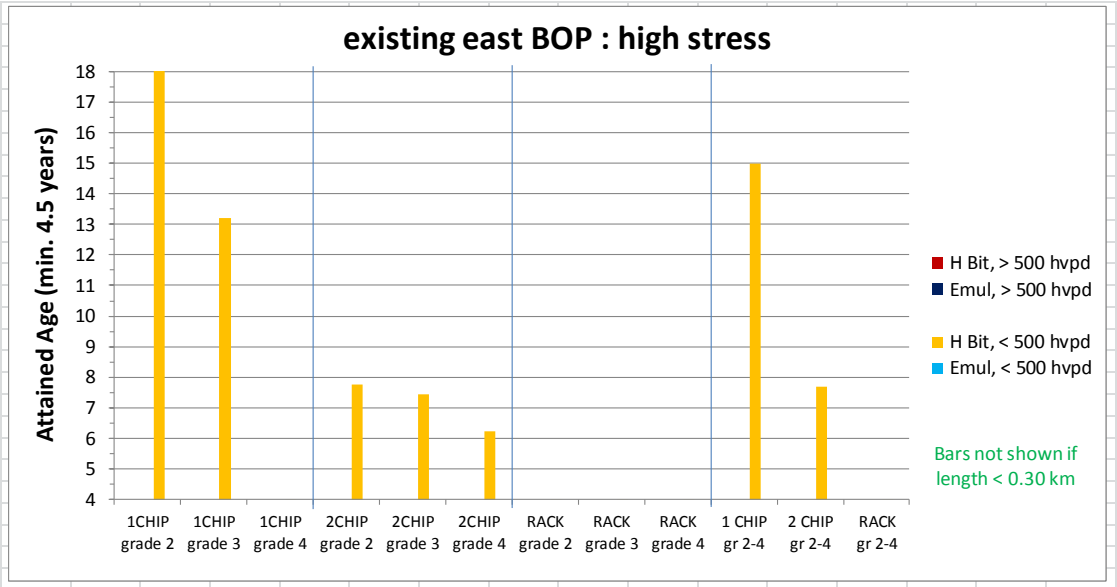

existing west BOP : medium stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

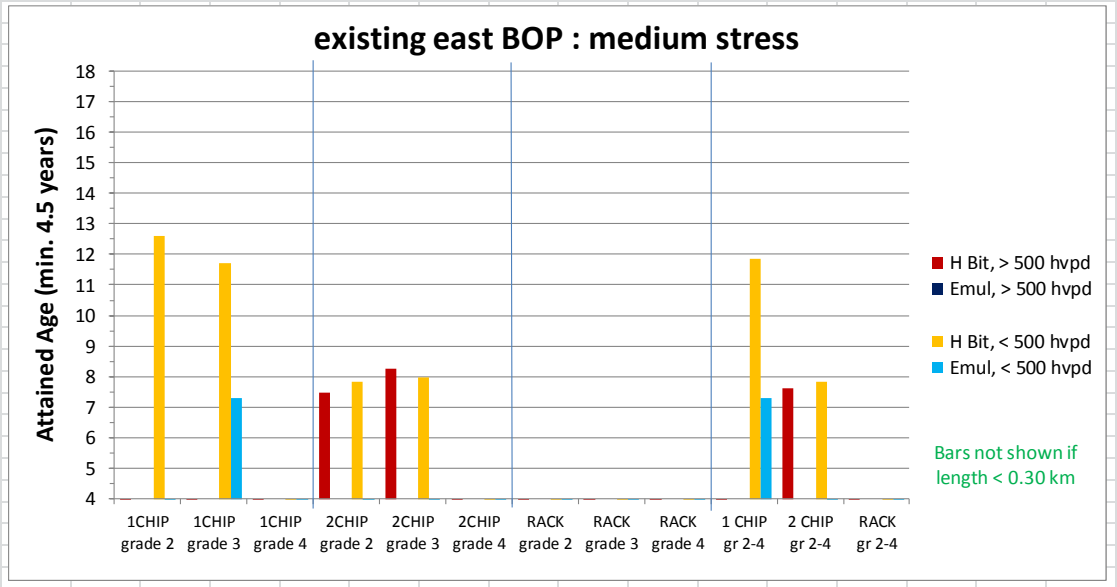

existing west BOP : low stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.60 km

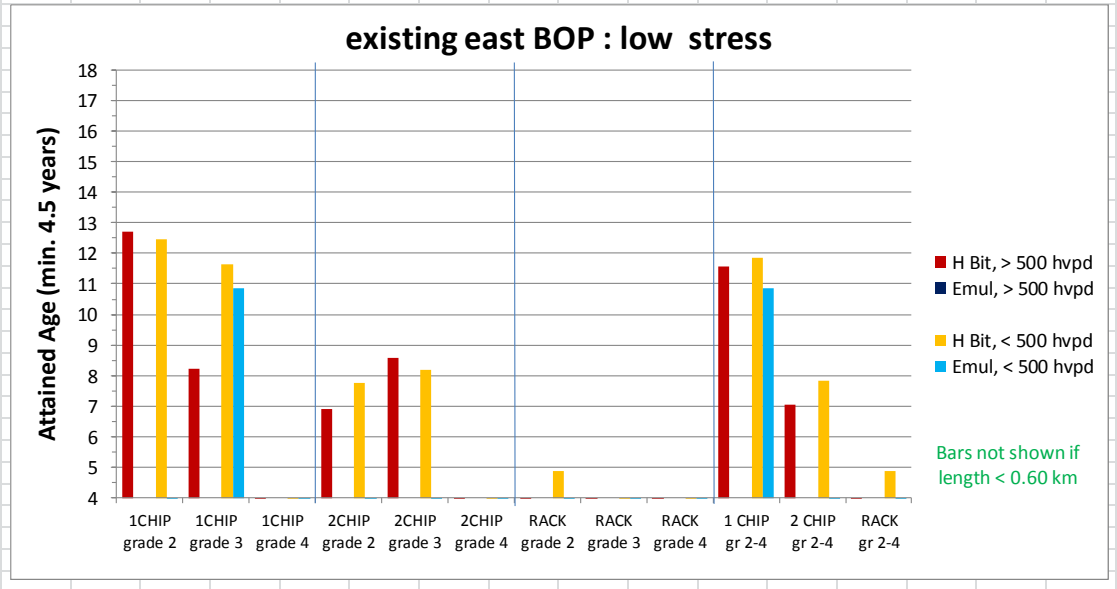

existing Tauranga : high stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

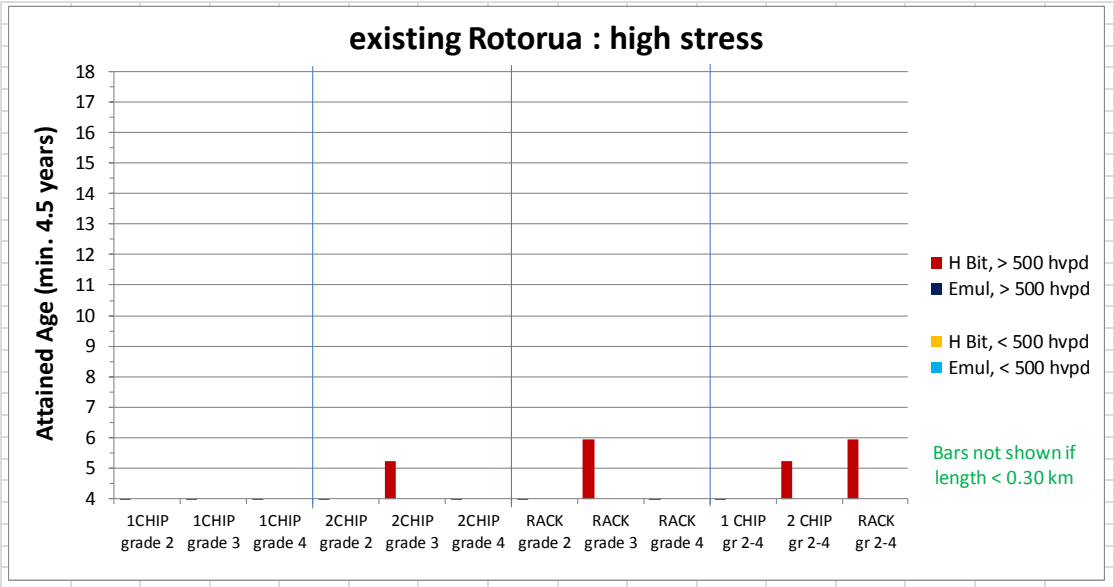

existing Tauranga : medium stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

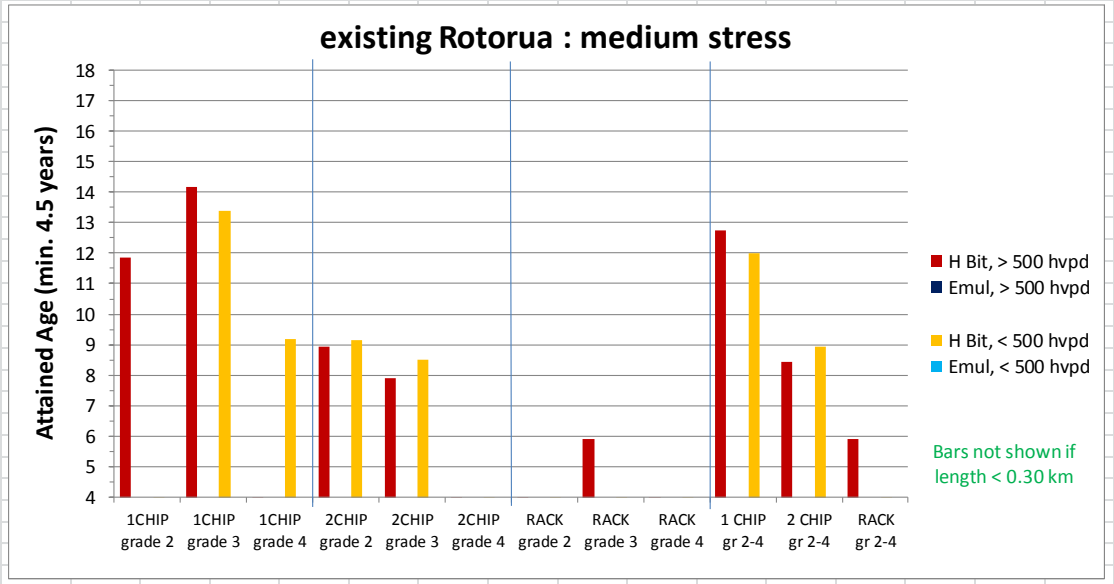

existing Tauranga : low stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.60 km

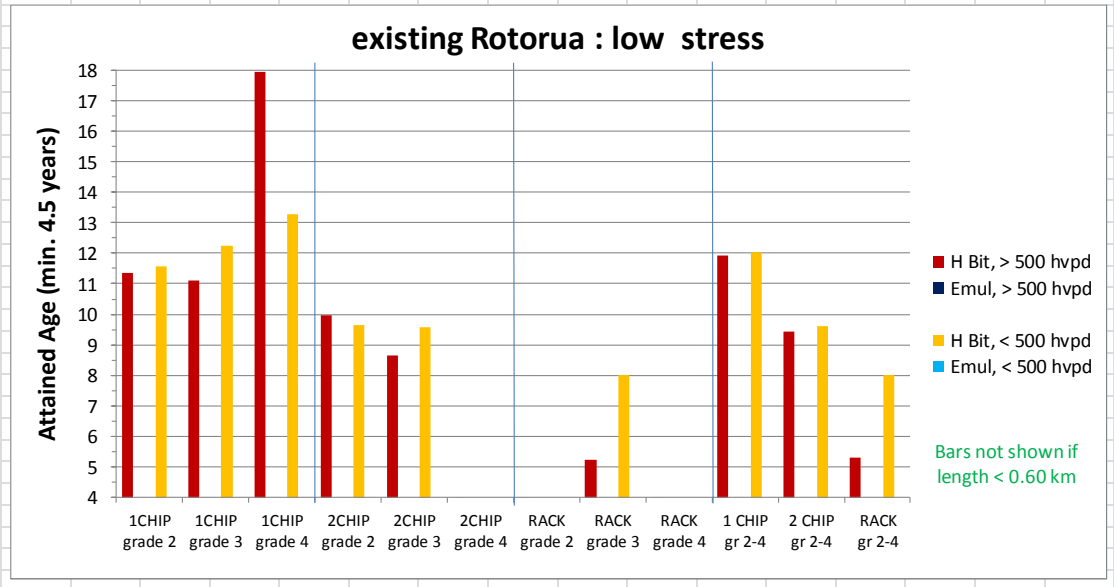

existing east BOP : high stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

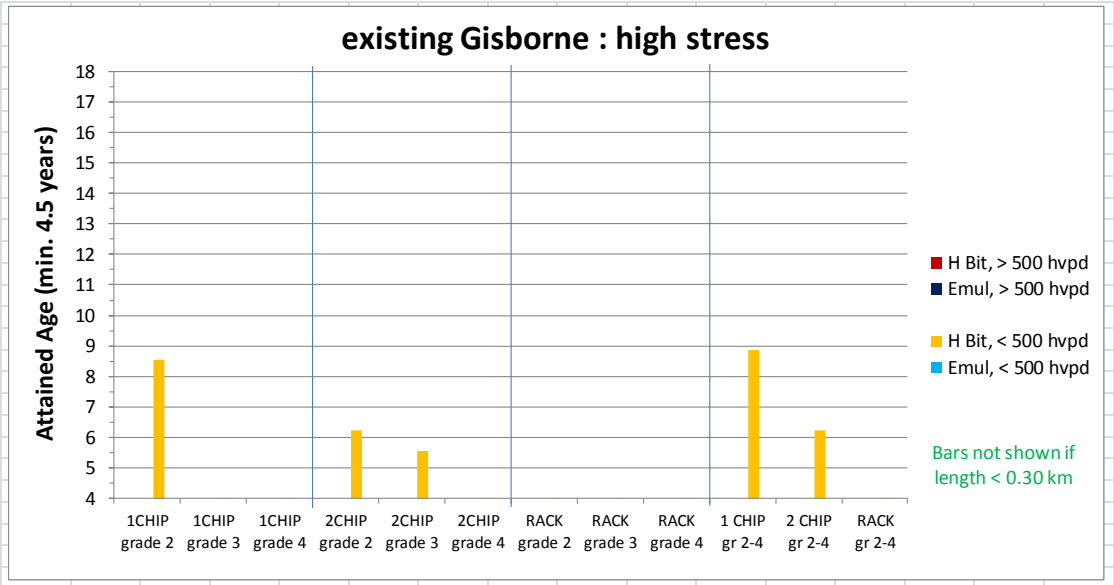

existing east BOP : medium stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

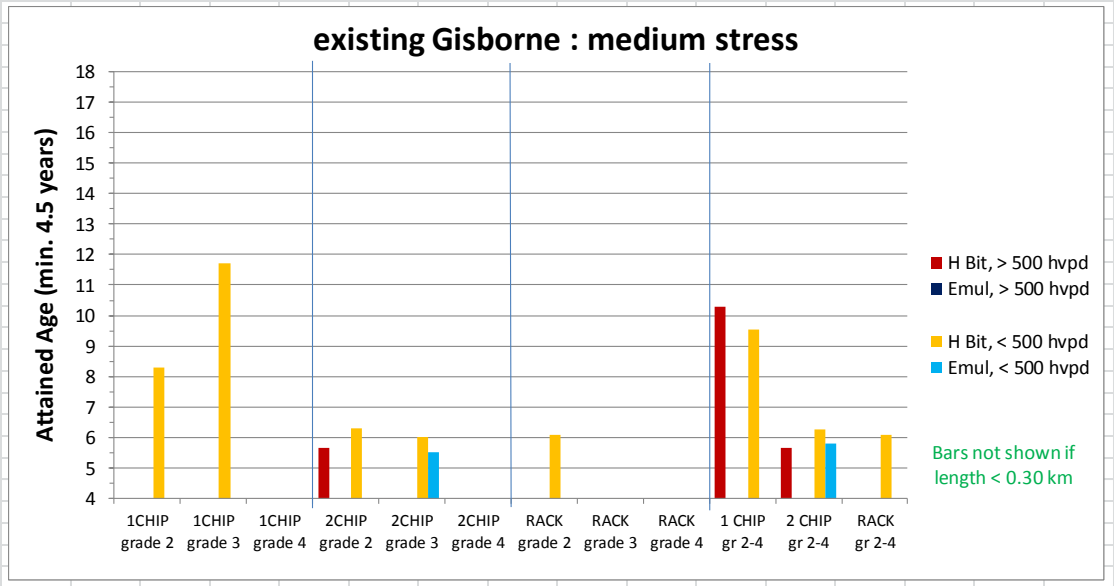

existing east BOP : low stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.60 km

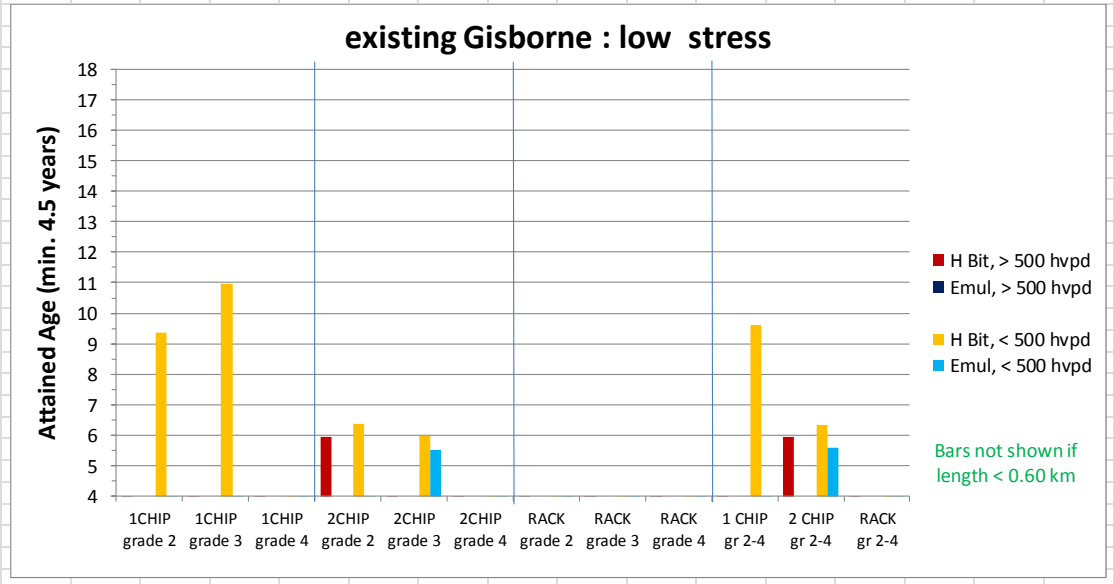

existing Rotorua : high stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

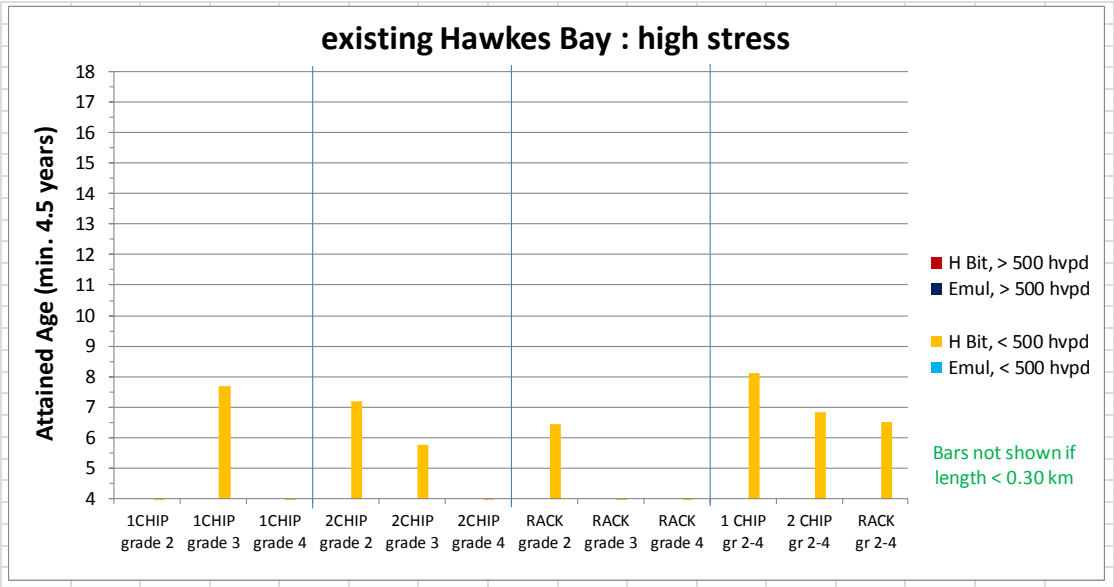

existing Rotorua : medium stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

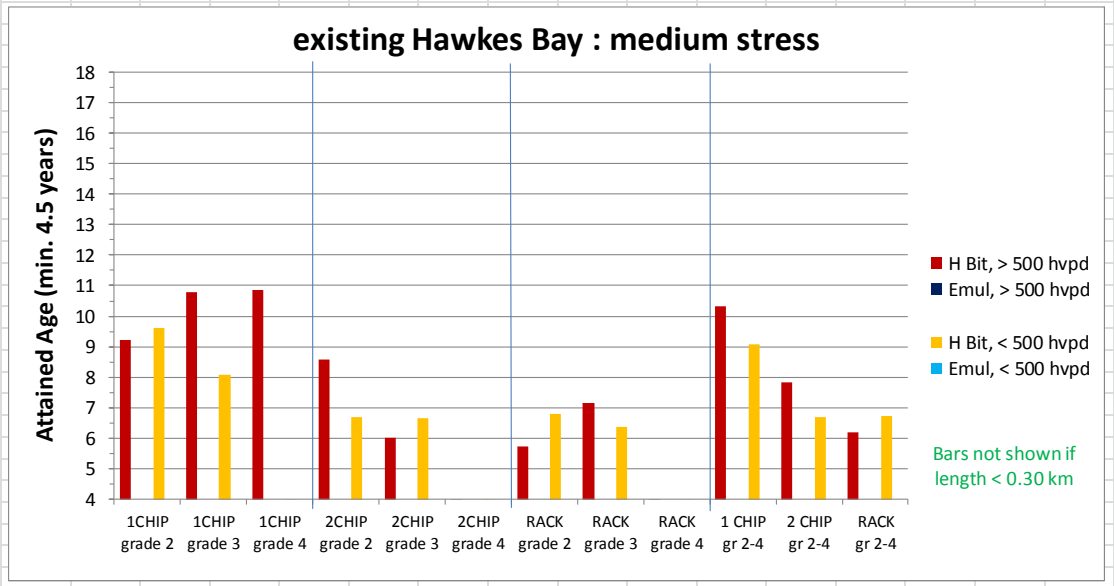

existing Rotorua : low stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.60 km

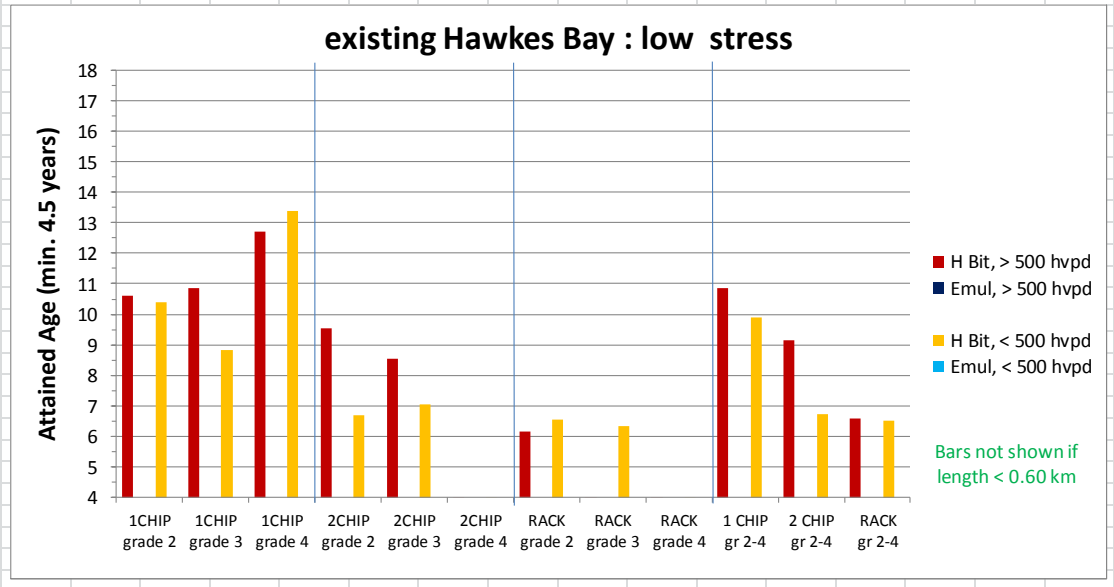

existing Gisborne : high stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

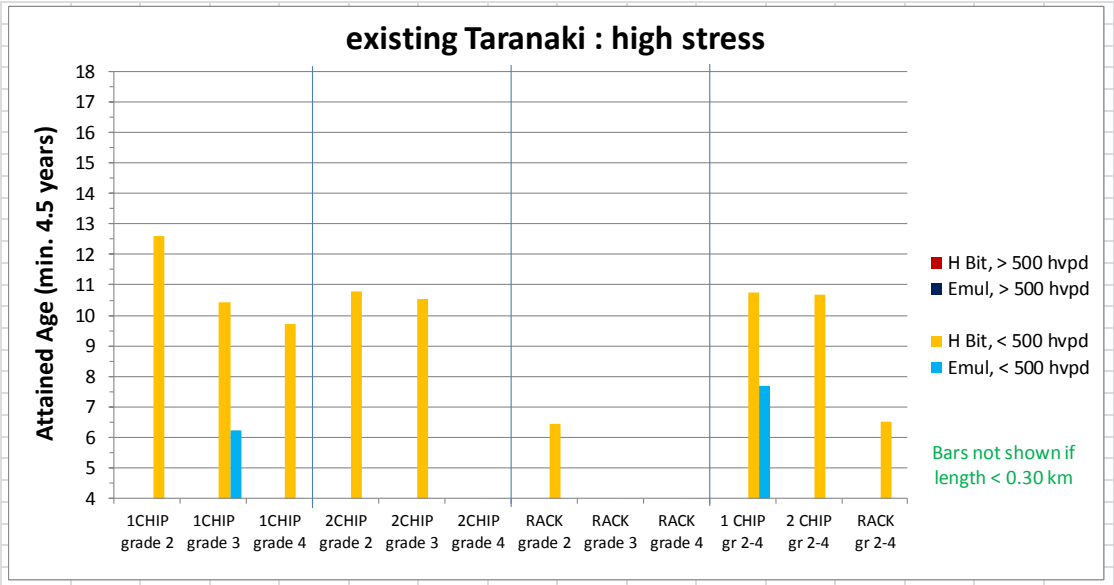

existing Gisborne : medium stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

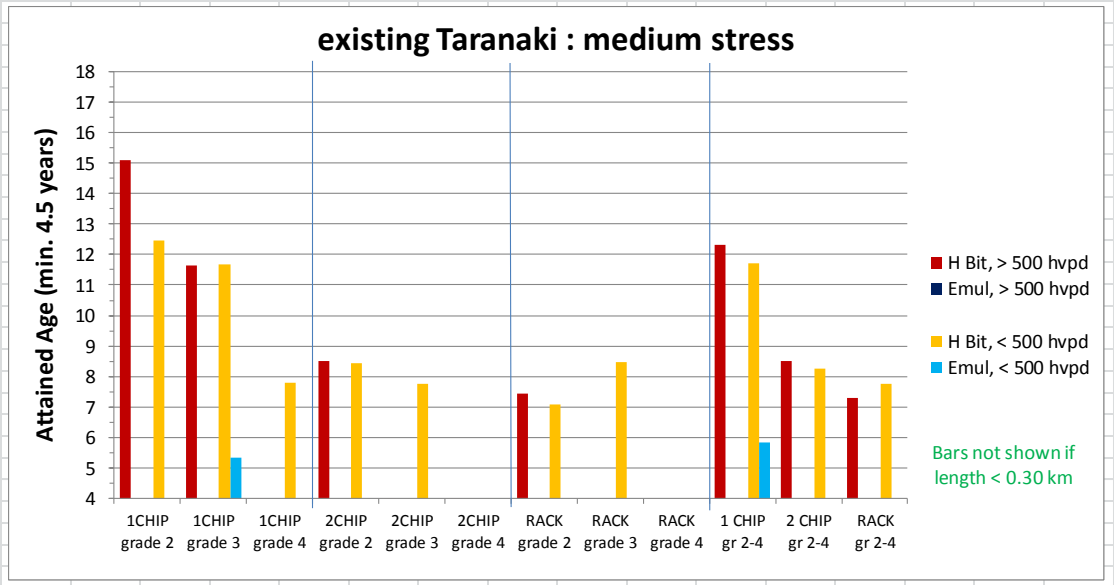

existing Gisborne : low stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.60 km

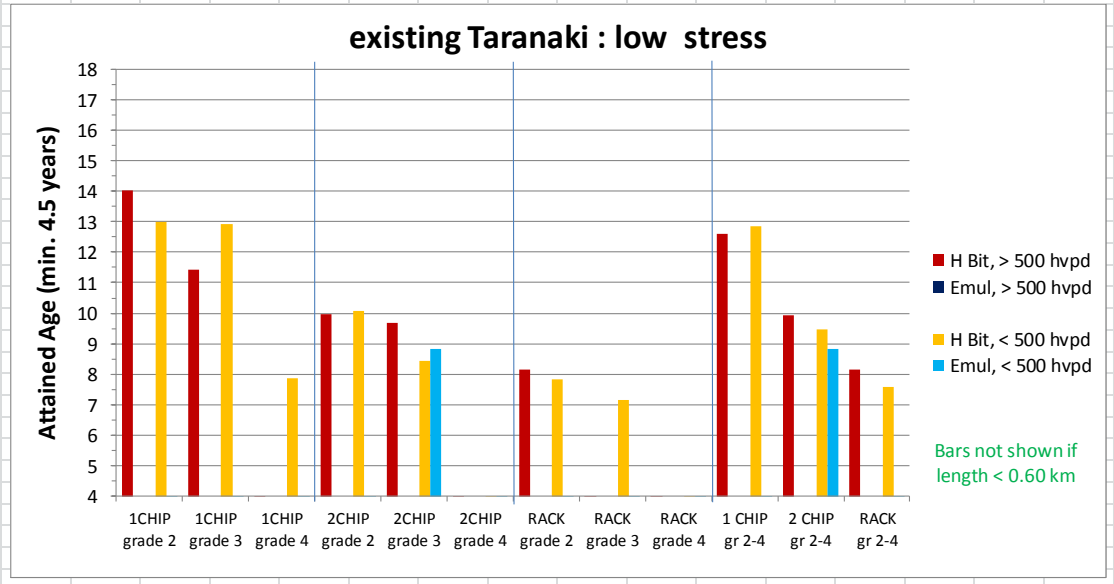

existing Hawkes Bay : high stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

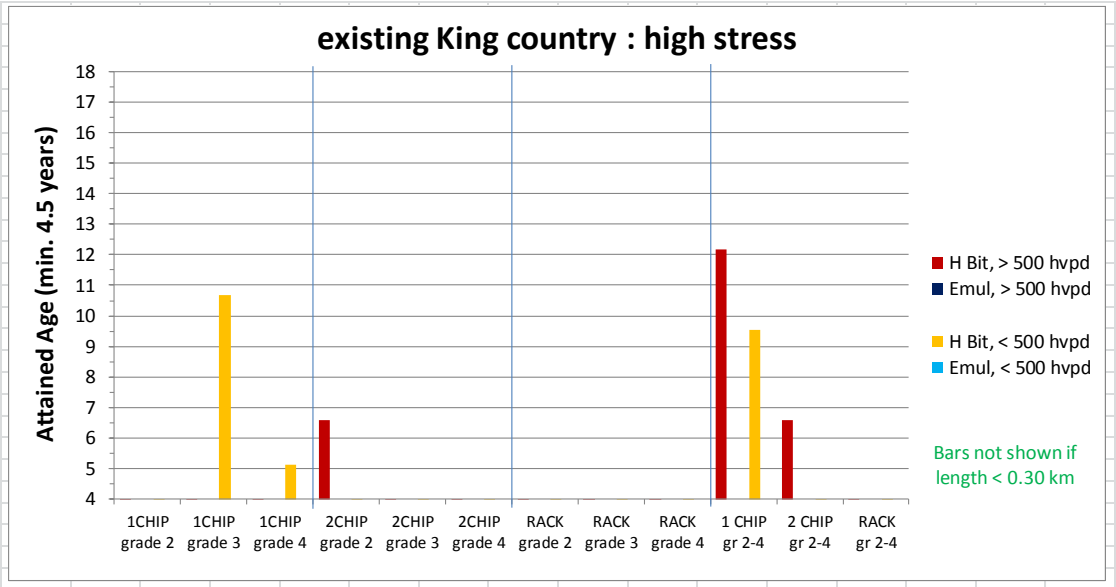

existing Hawkes Bay : medium stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

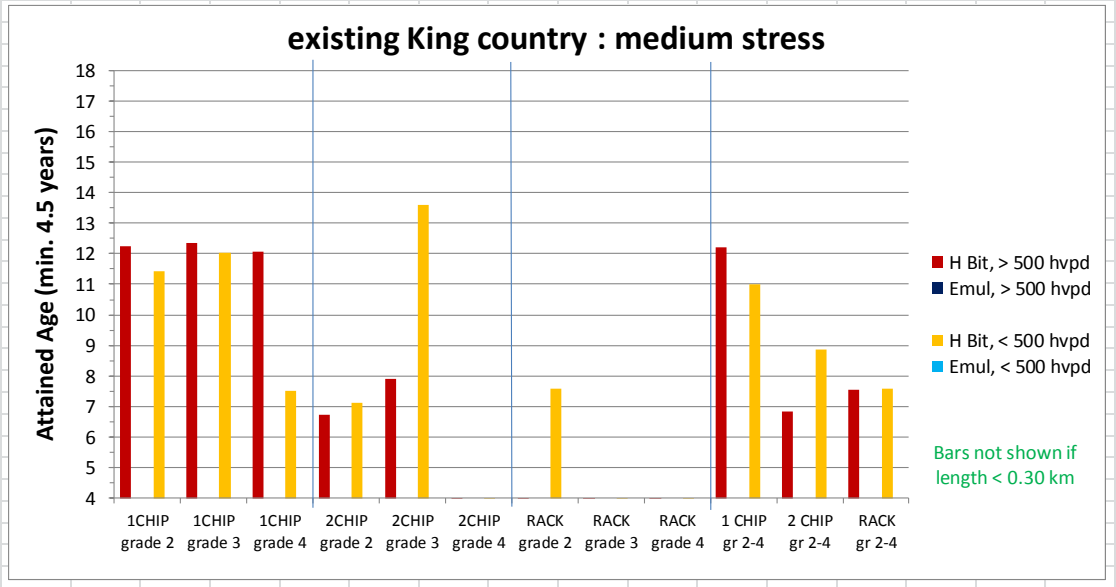

existing Hawkes Bay : low stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.60 km

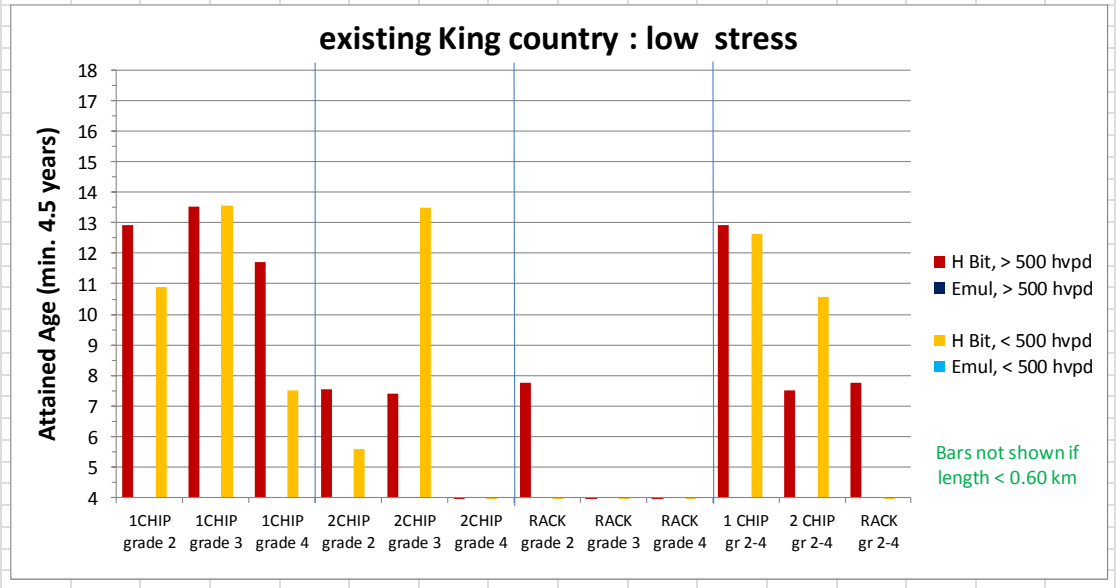

existing Taranaki : high stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

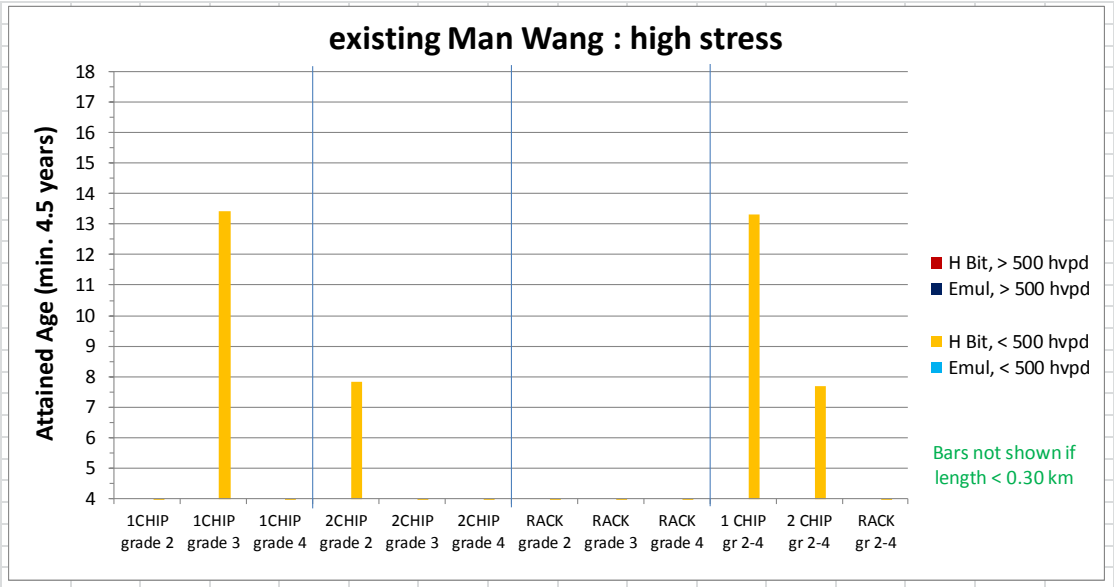

existing Taranaki : medium stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

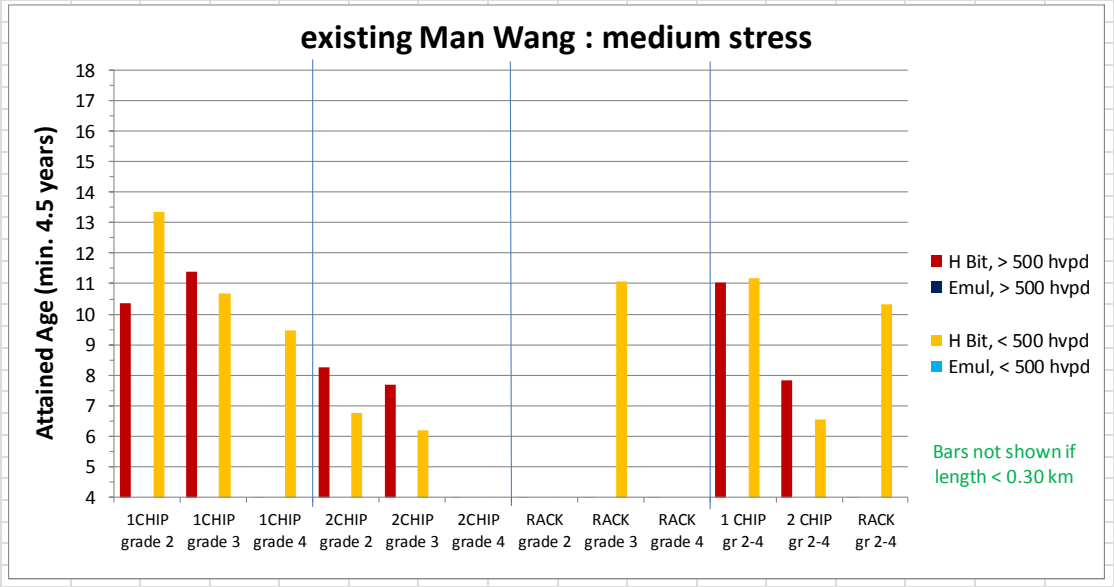

existing Taranaki : low stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.60 km

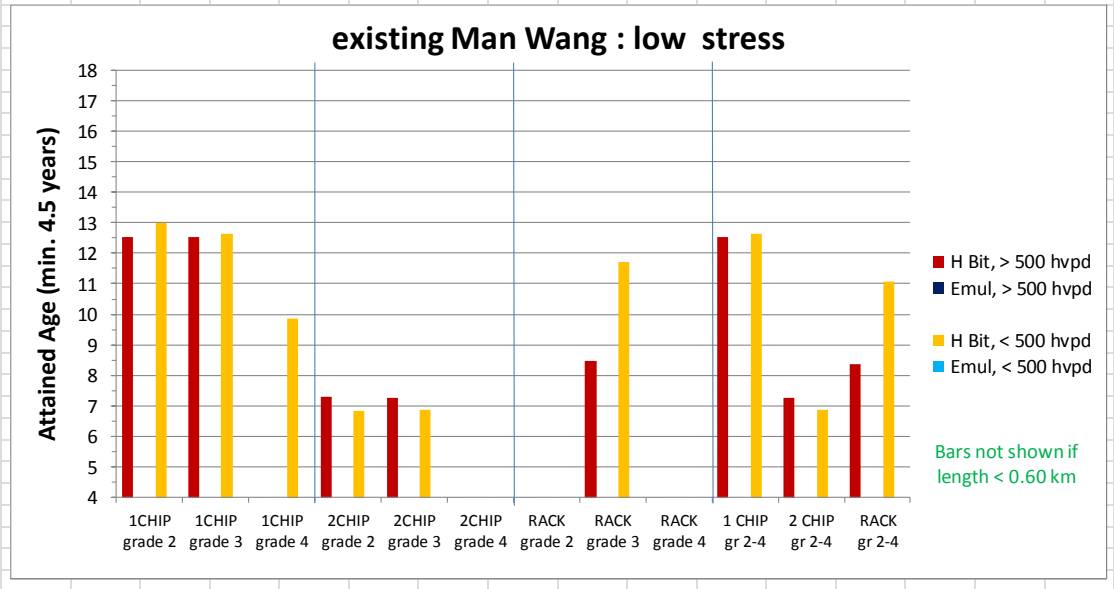

existing King country : high stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

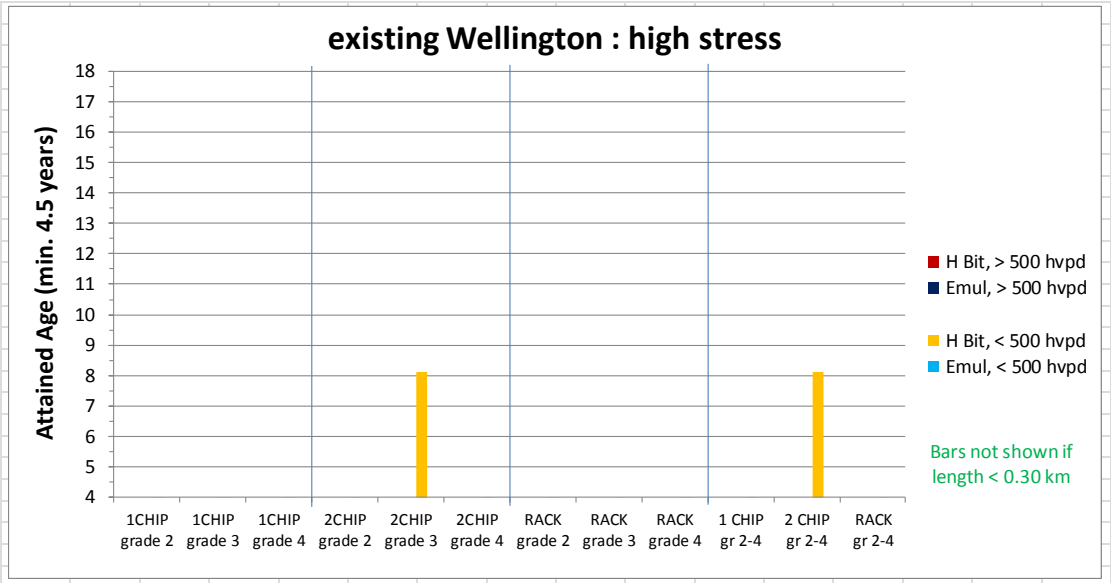

existing King country : medium stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

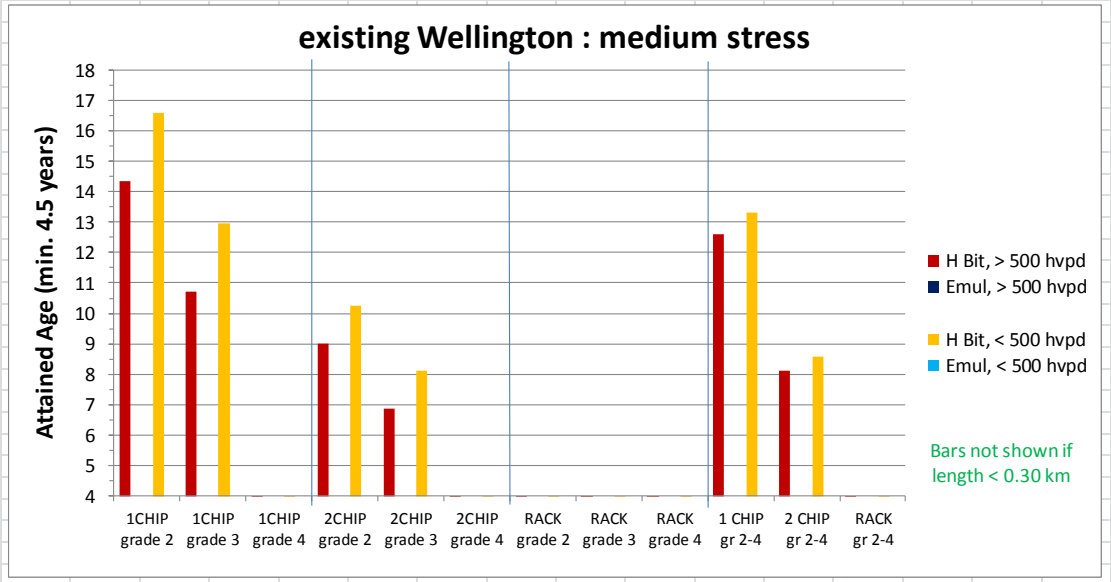

existing King country : low stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.60 km

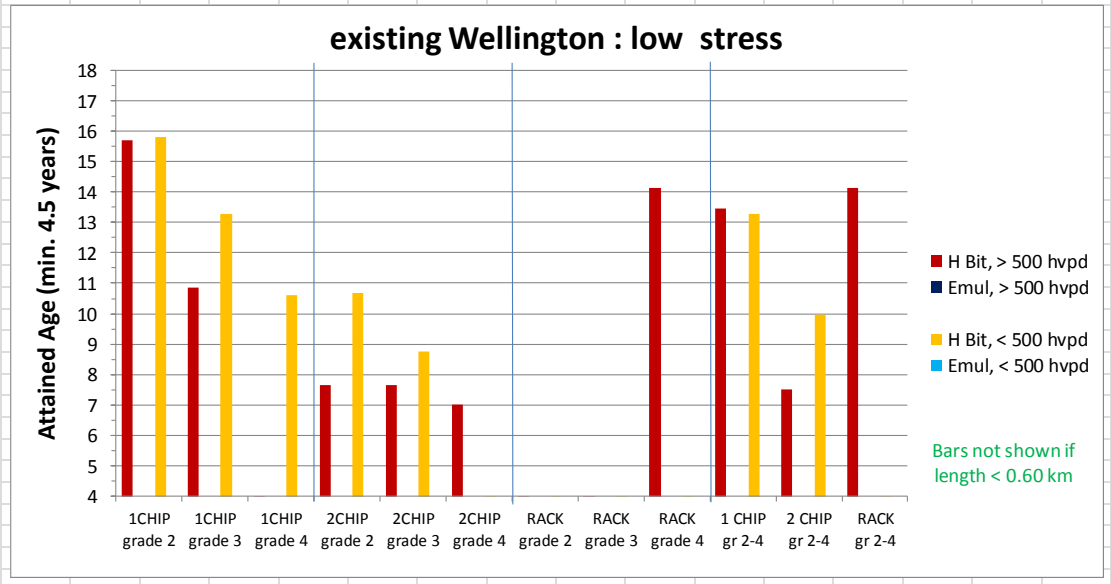

existing Man Wang : high stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

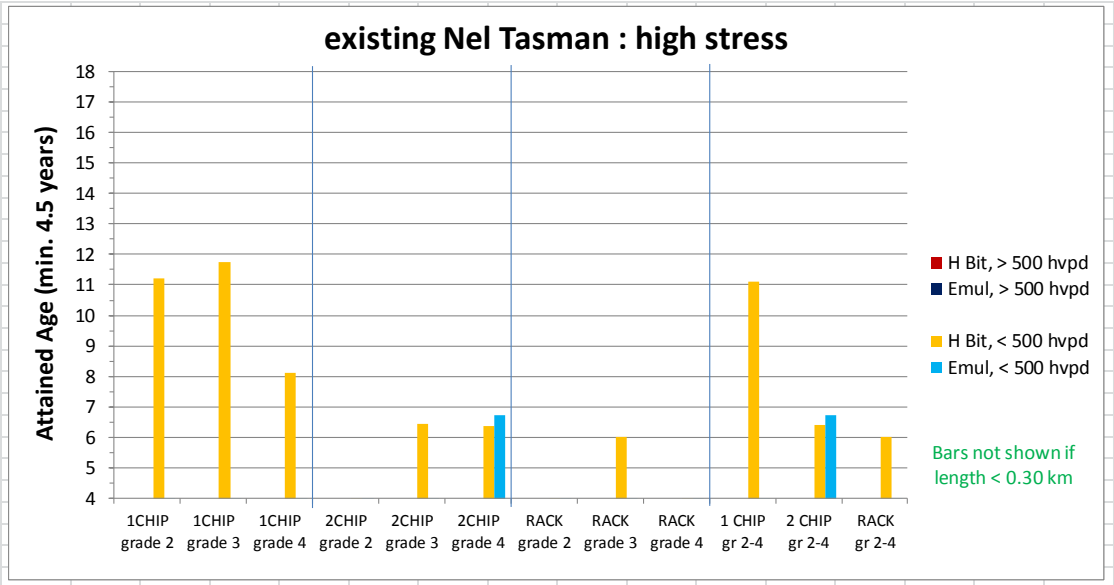

existing Man Wang : medium stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

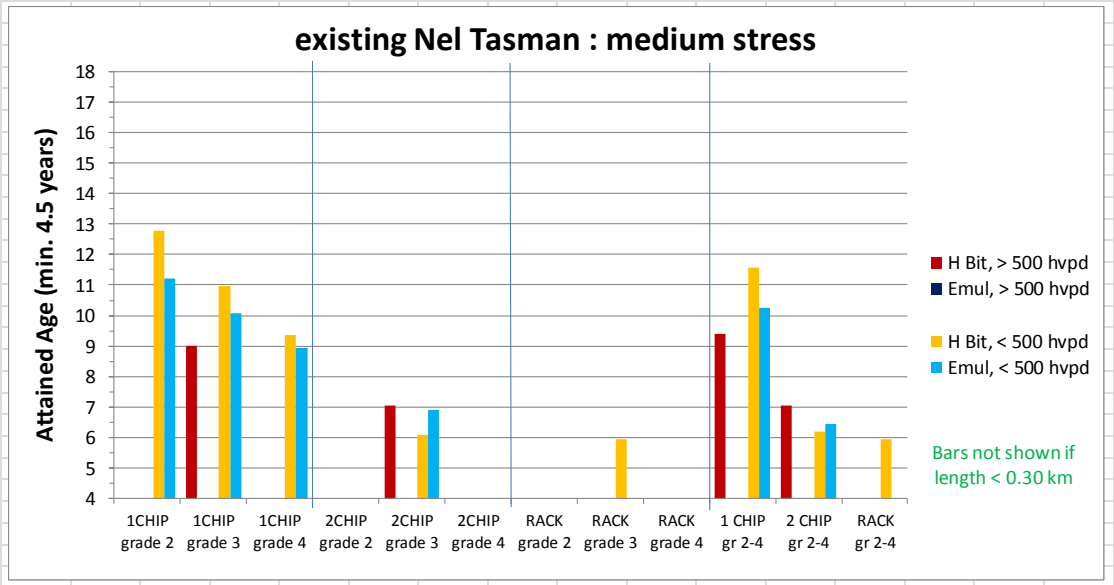

existing Man Wang : low stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.60 km

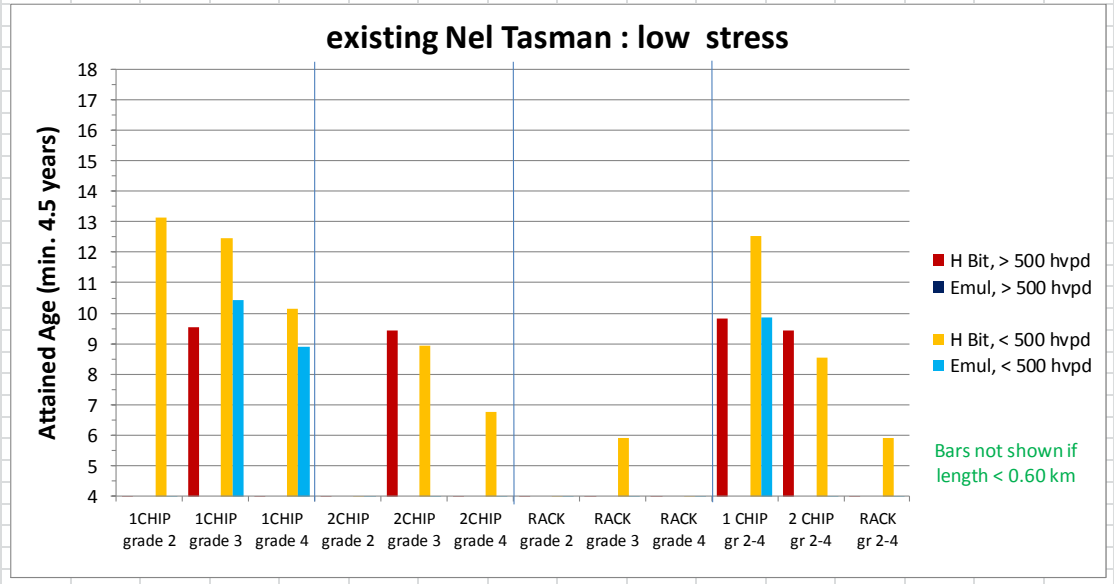

existing Wellington : high stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

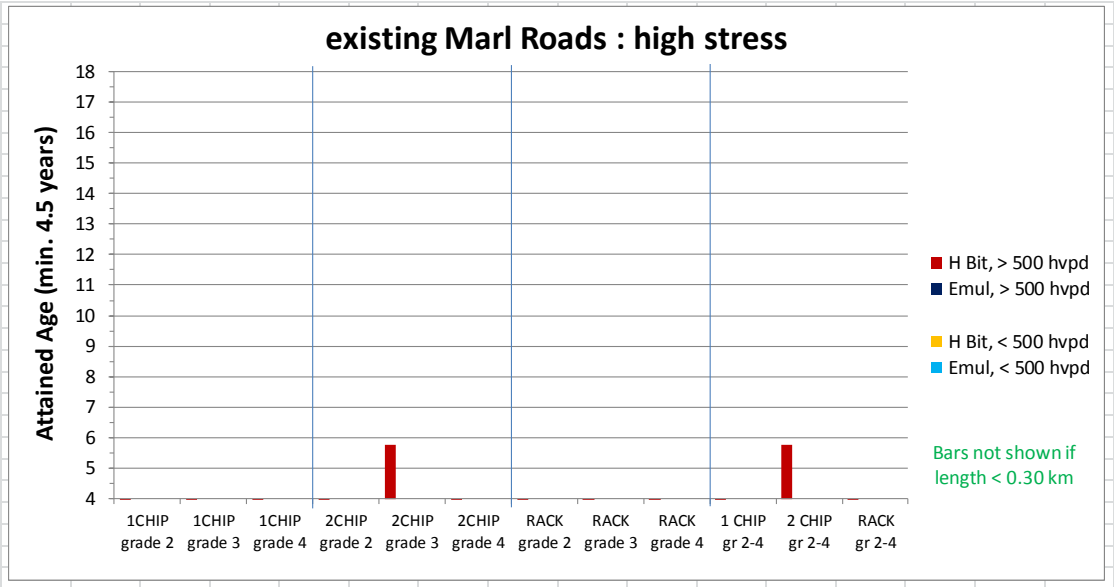

existing Wellington : medium stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

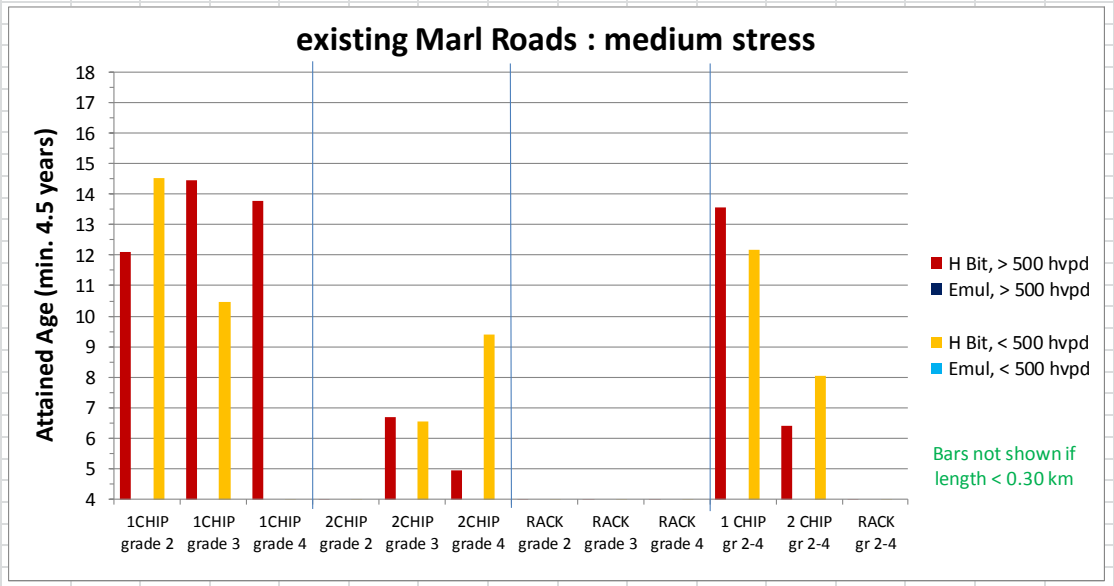

existing Wellington : low stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.60 km

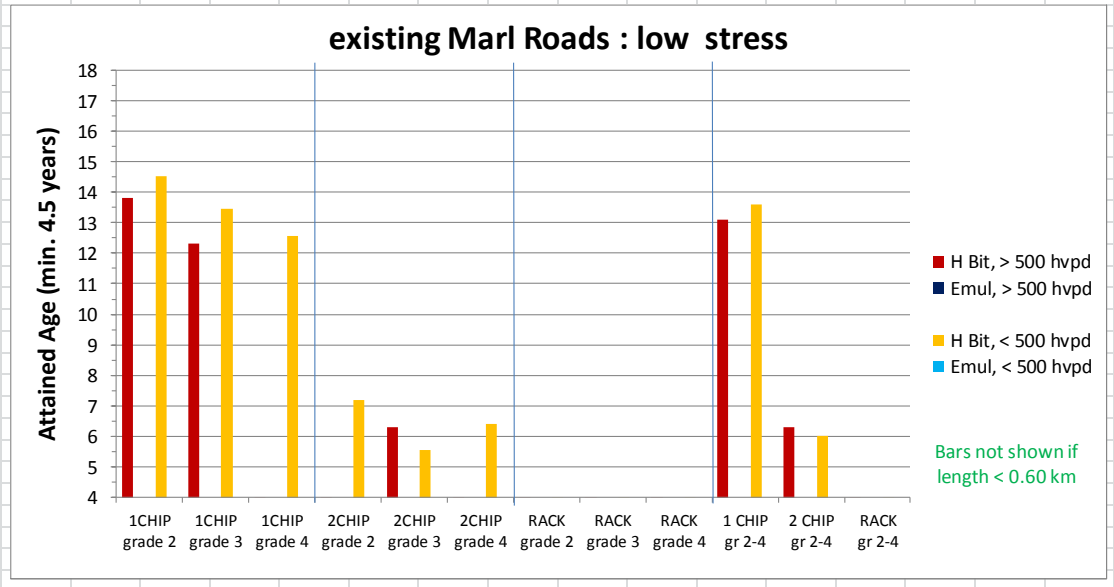

existing Nel Tasman : high stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

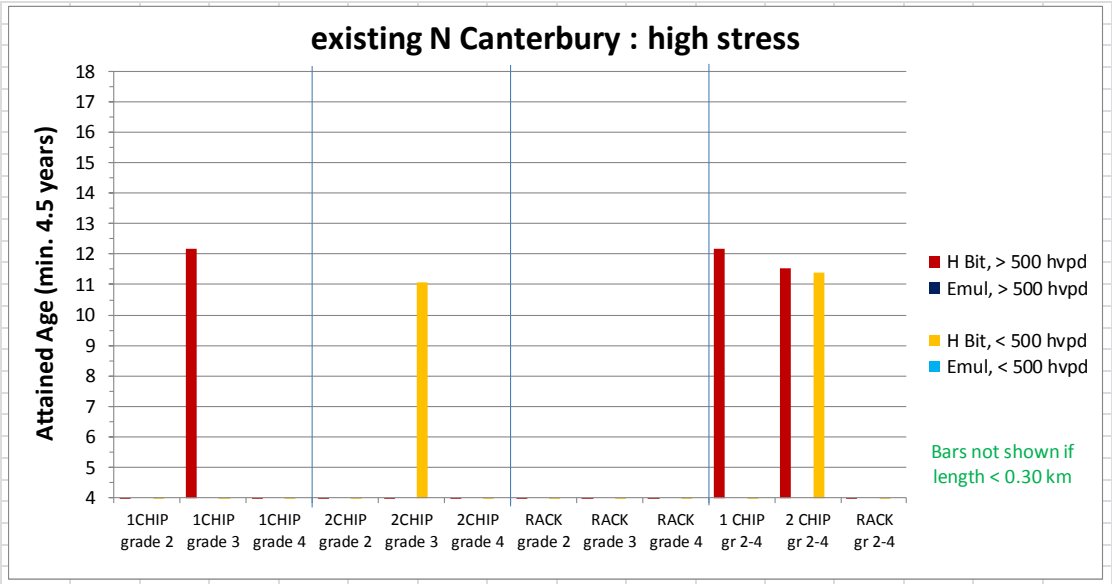

existing Nel Tasman : medium stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

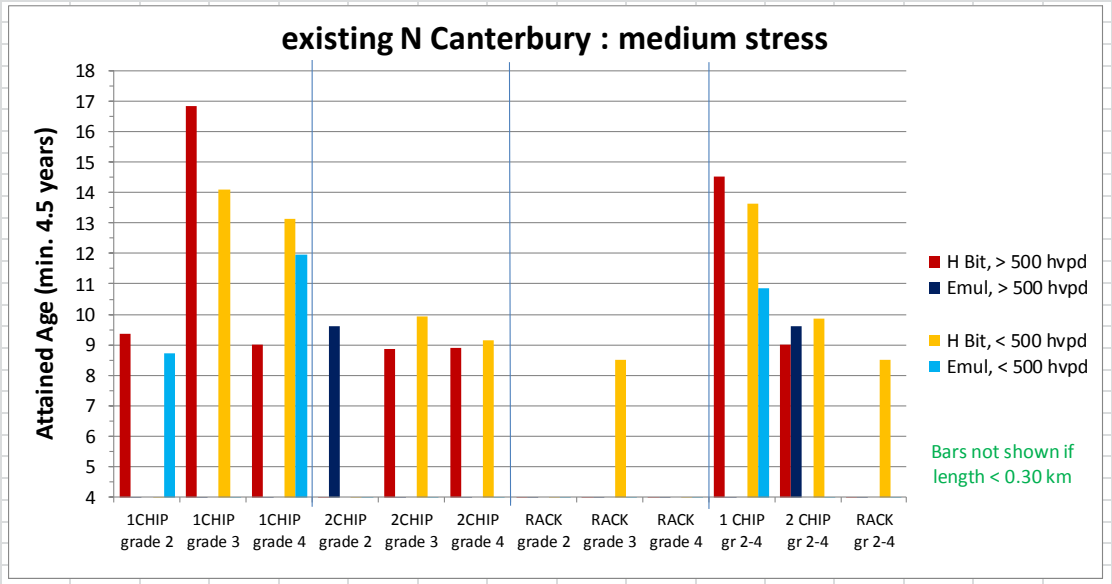

existing Nel Tasman : low stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.60 km

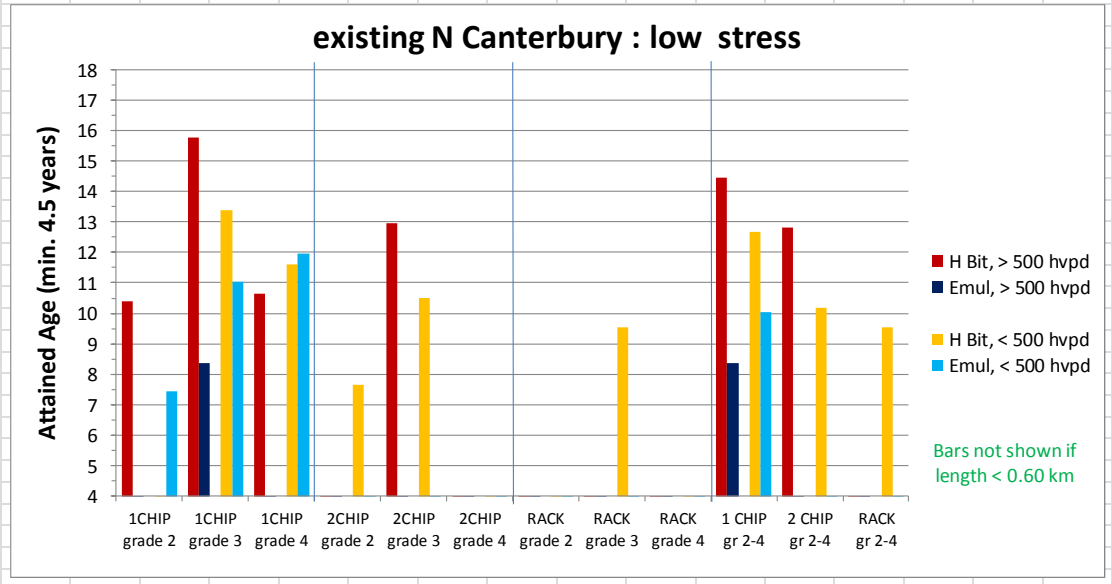

existing Marl Roads : high stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

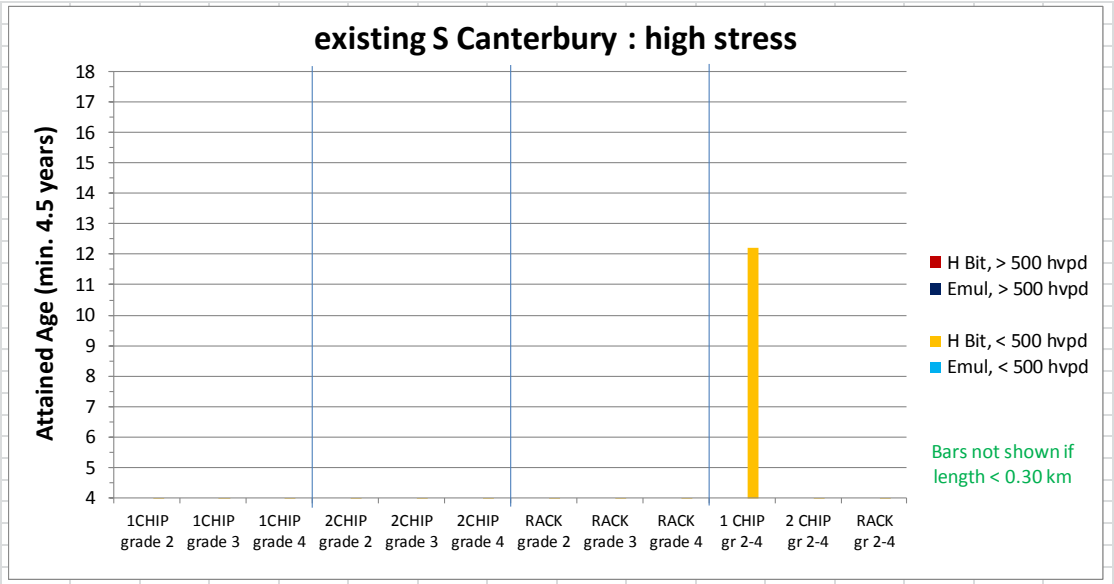

existing Marl Roads : medium stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km

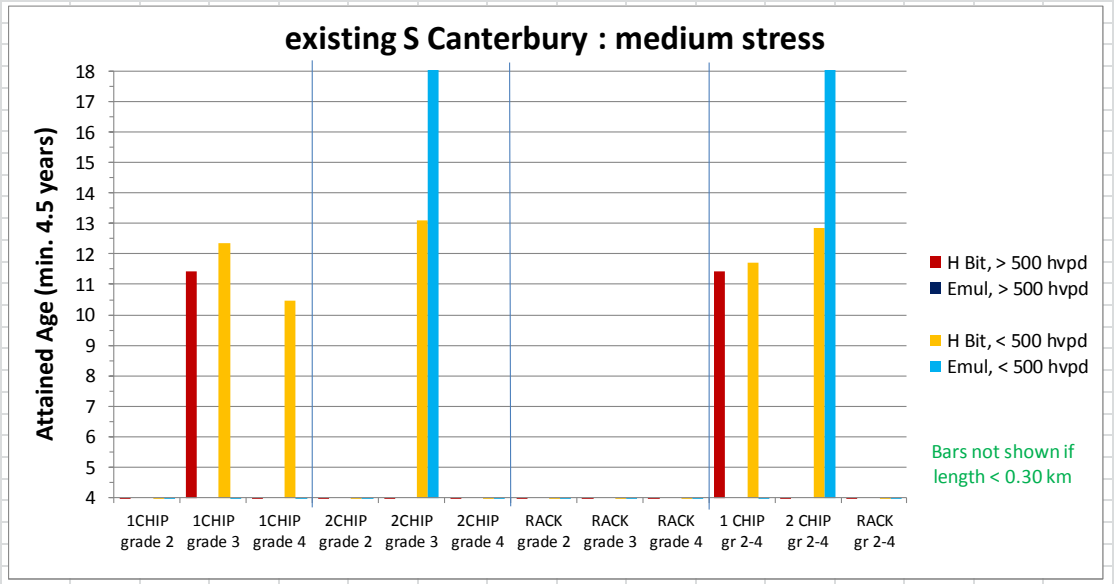

existing Marl Roads : low stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.60 km


existing N Canterbury : high stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km


existing N Canterbury : medium stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km


existing N Canterbury : low stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.60 km


existing S Canterbury : high stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km


existing S Canterbury : medium stress
Attained Age (min. 4.5 years)
18
17
16
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11
10
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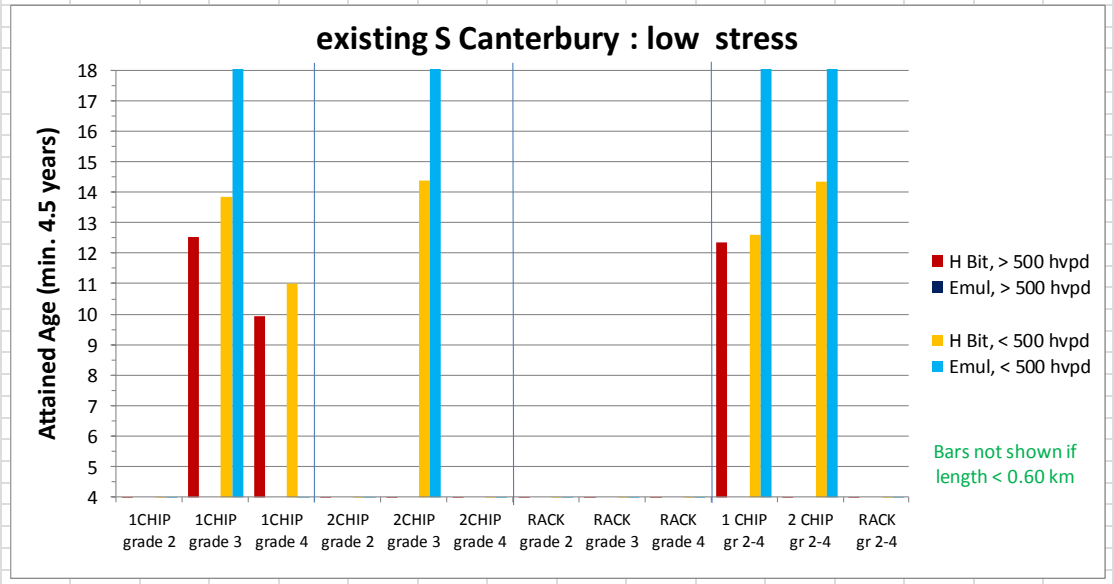
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km


existing S Canterbury : low stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
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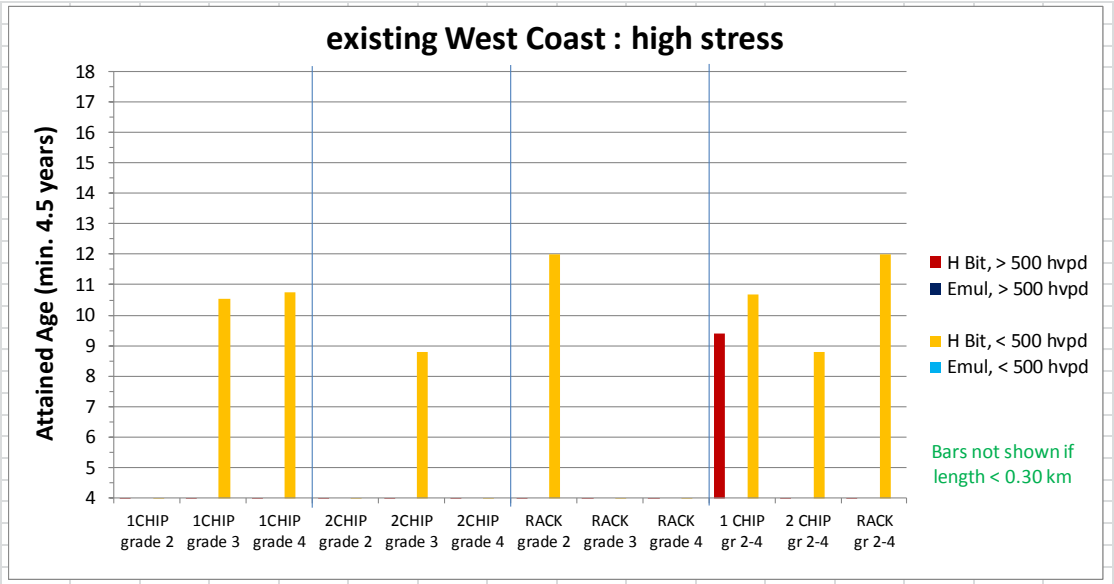
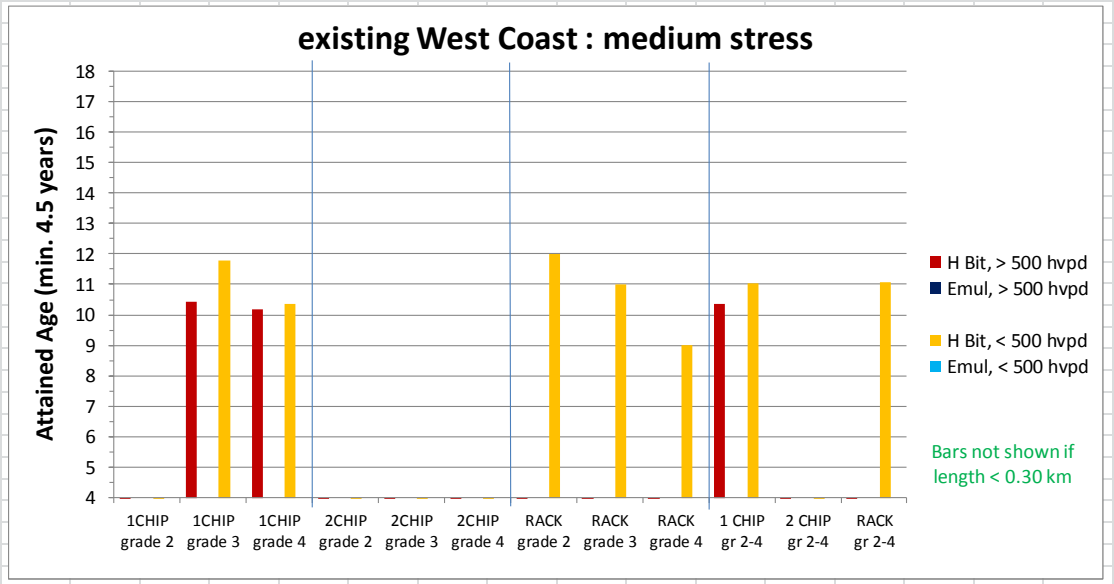
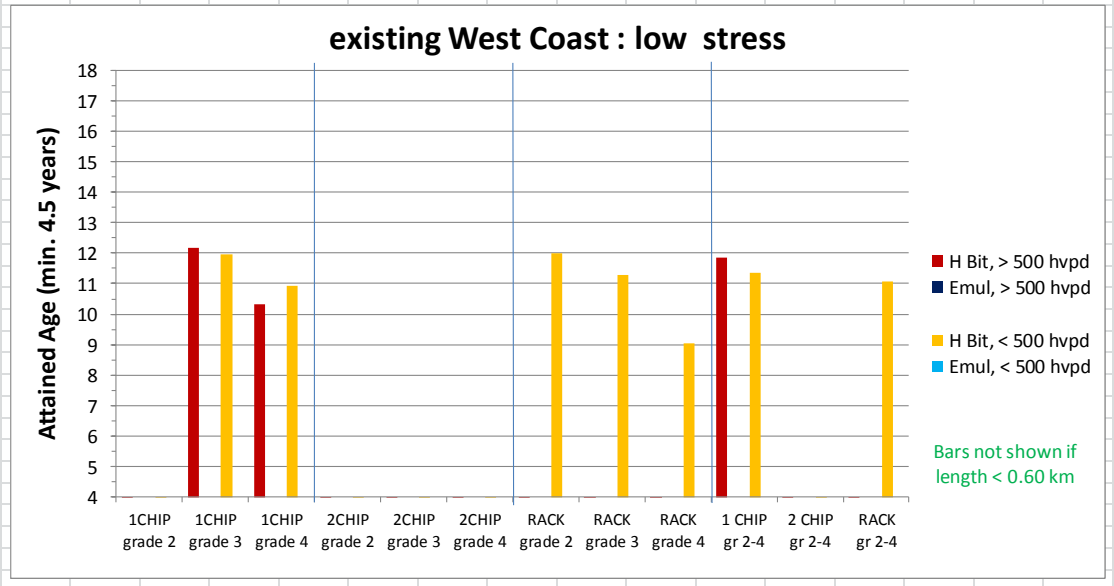
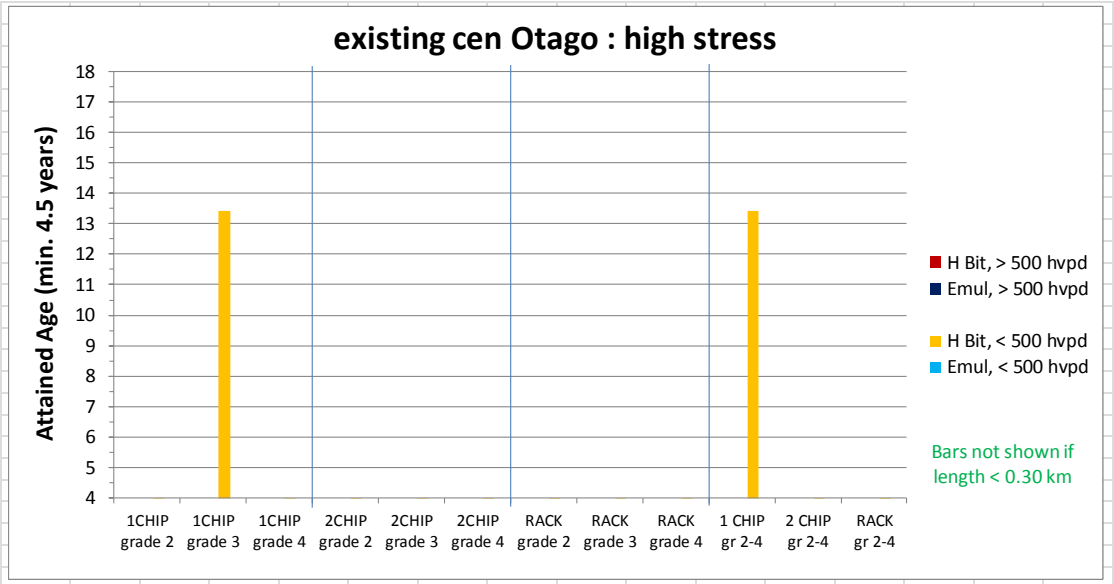
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.60 km


existing West Coast : high stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km


existing West Coast : medium stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km


existing West Coast : low stress
Attained Age (min. 4.5 years)
18
17
16
15
14
13
12
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.60 km


existing cen Otago : high stress
Attained Age (min. 4.5 years)
18
17
16
15
14
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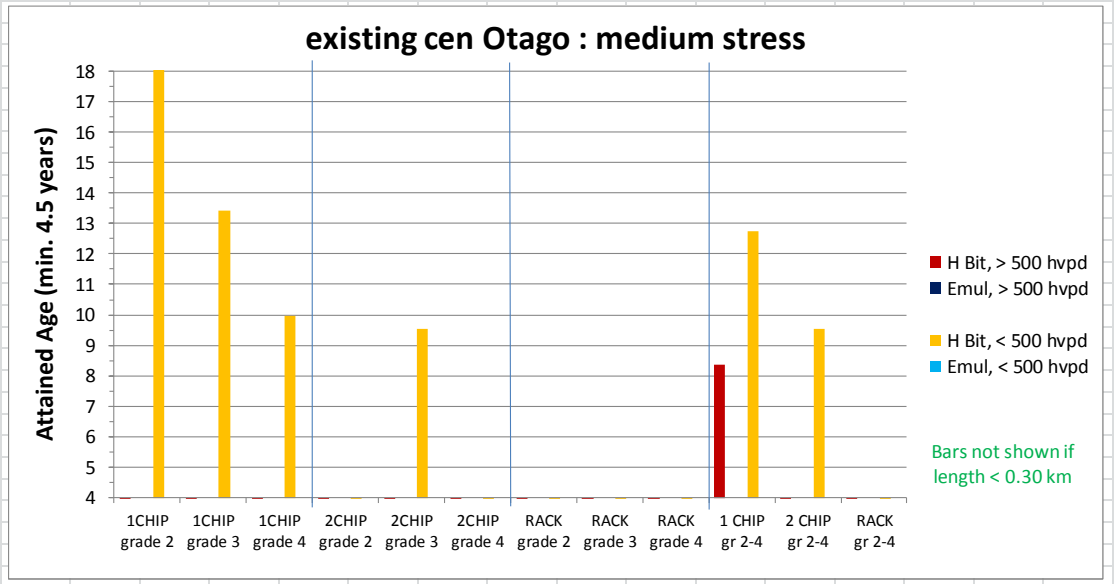
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km


existing cen Otago : medium stress
Attained Age (min. 4.5 years)
18
17
16
15
14
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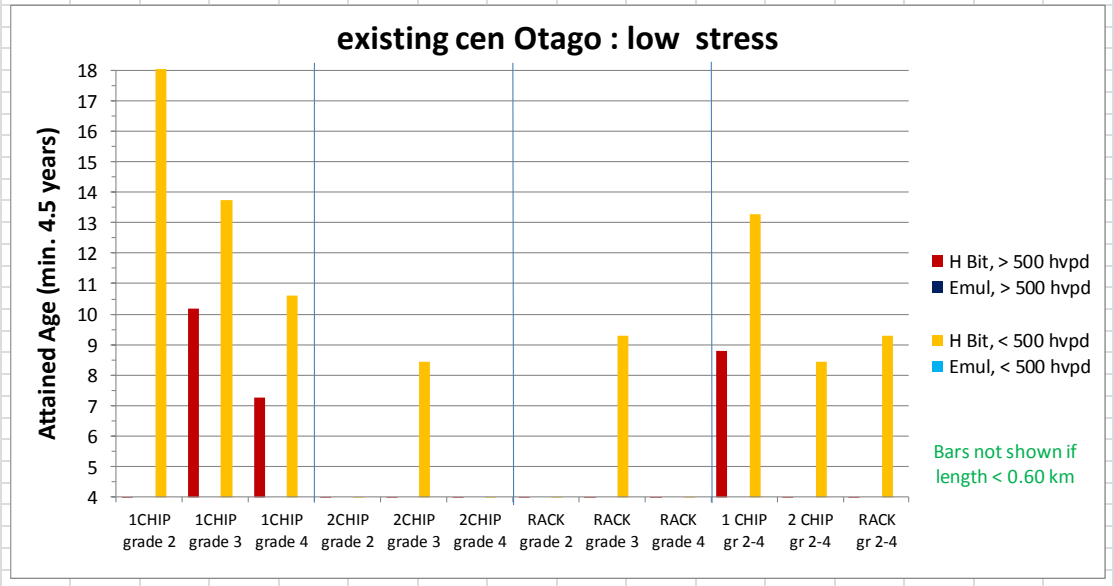
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km


existing cen Otago : low stress
Attained Age (min. 4.5 years)
18
17
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11
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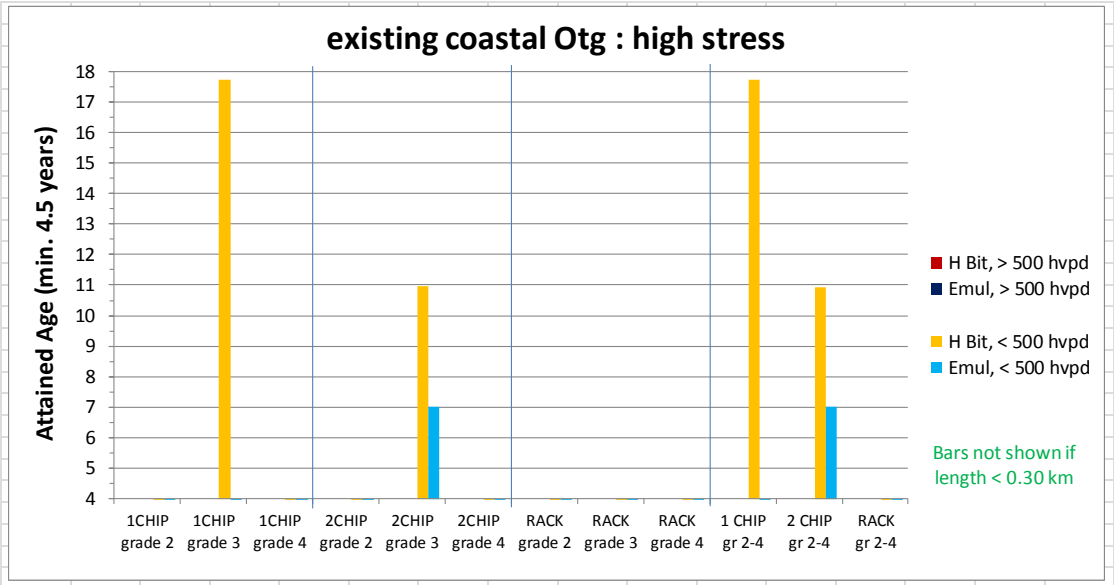
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.60 km


existing coastal Otg : high stress
Attained Age (min. 4.5 years)
18
17
16
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10
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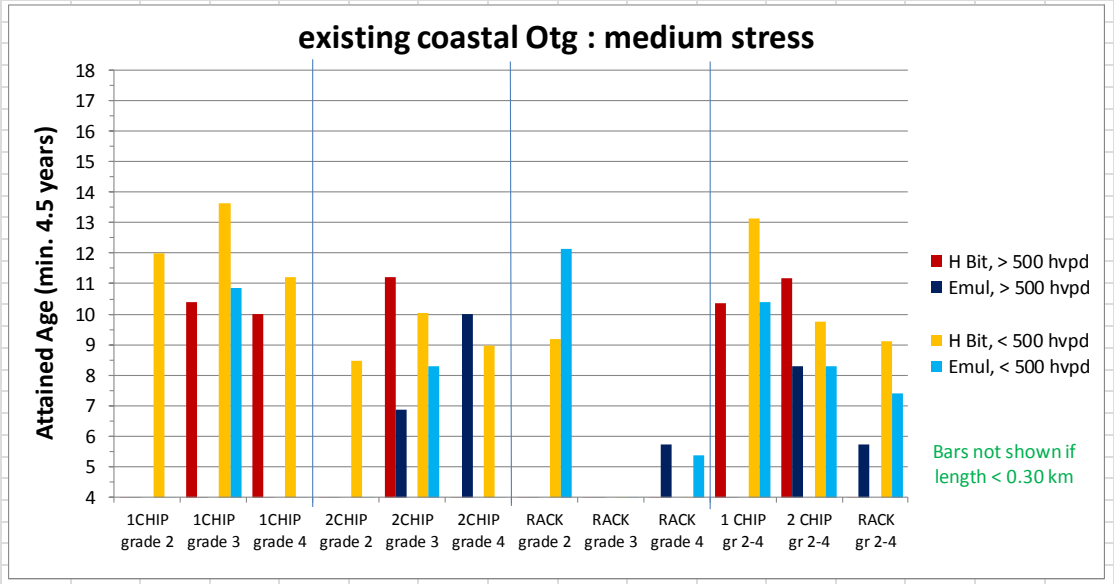
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km


existing coastal Otg : medium stress
Attained Age (min. 4.5 years)
18
17
16
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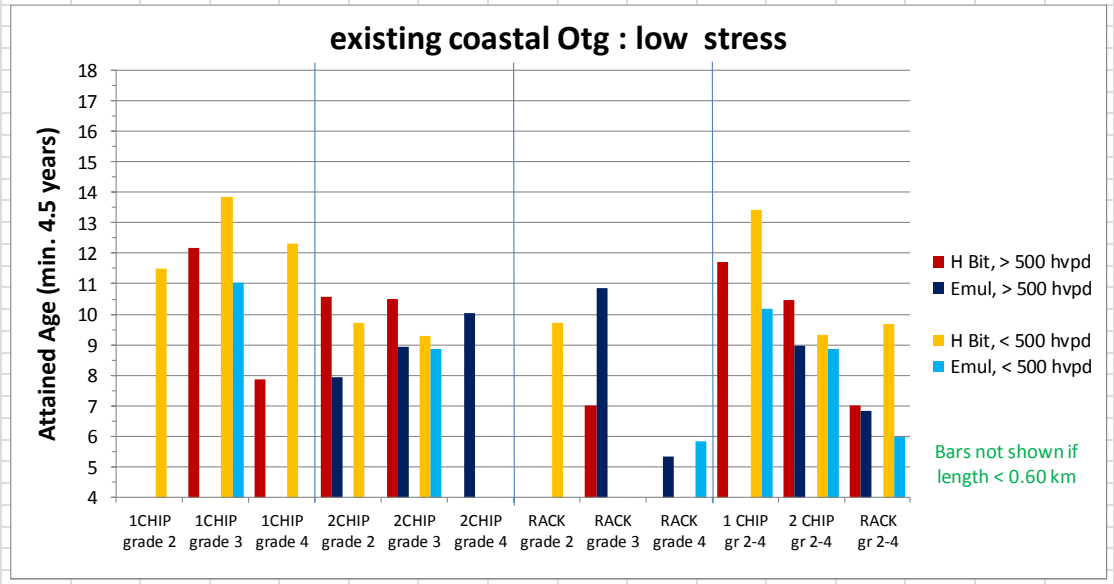
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km


existing coastal Otg : low stress
Attained Age (min. 4.5 years)
18
17
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11
10
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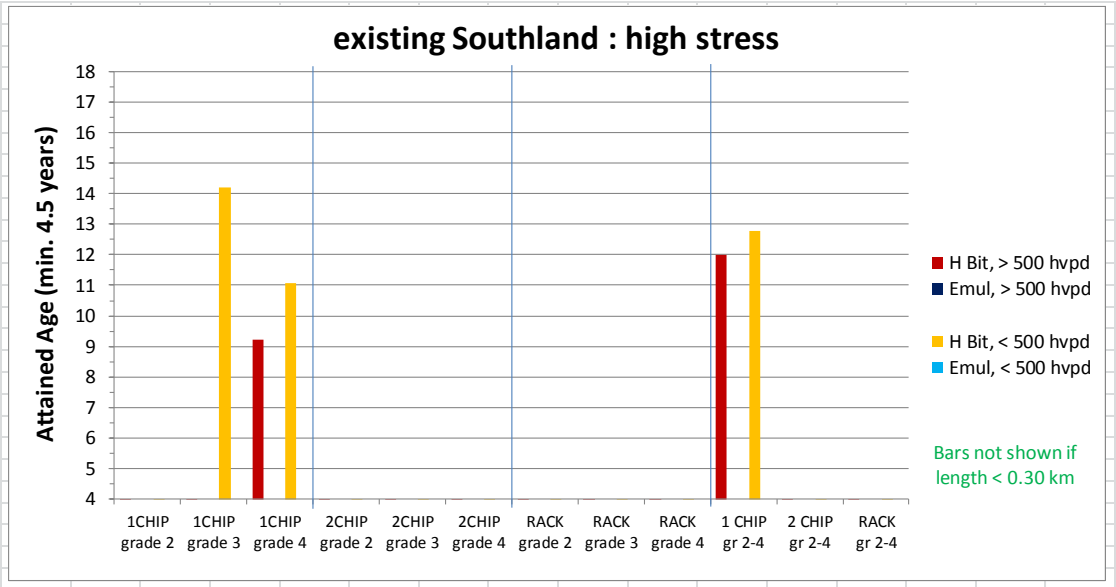
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.60 km


existing Southland : high stress
Attained Age (min. 4.5 years)
18
17
16
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6
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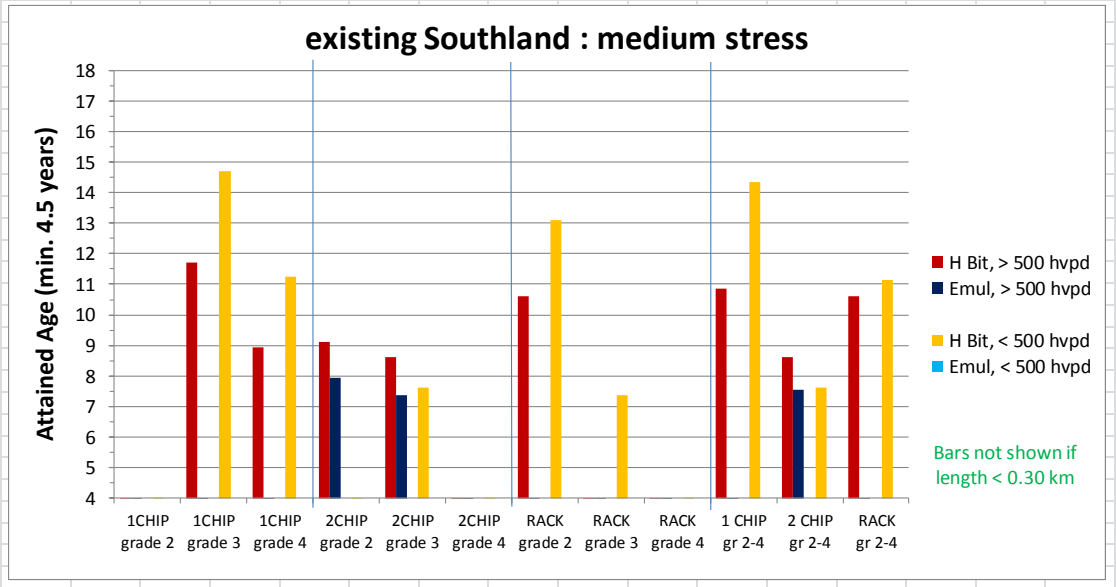
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km


existing Southland : medium stress
Attained Age (min. 4.5 years)
18
17
16
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14
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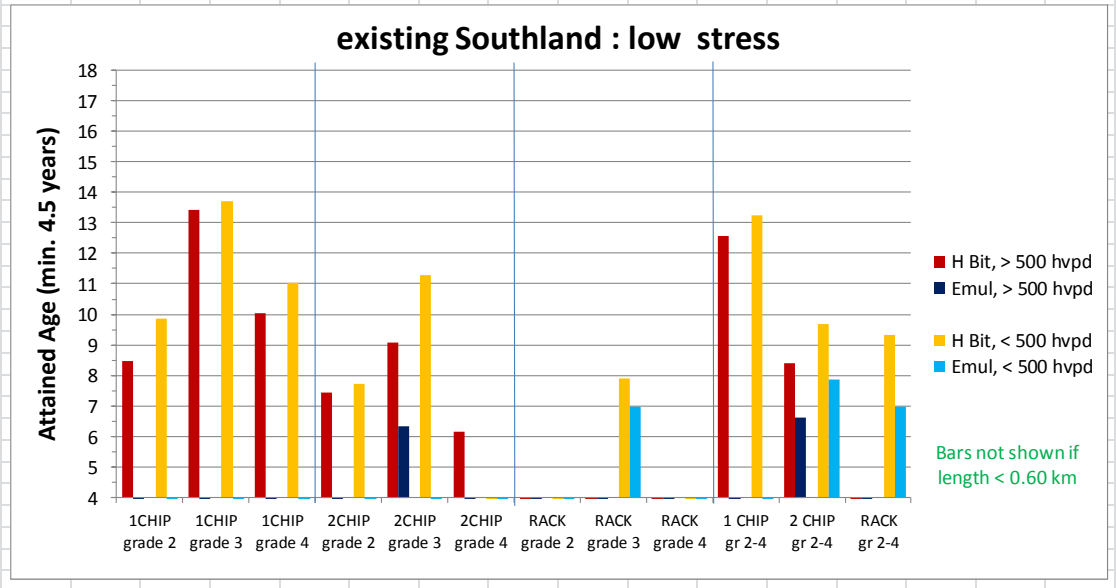
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.30 km


existing Southland : low stress
Attained Age (min. 4.5 years)
18
17
16
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14
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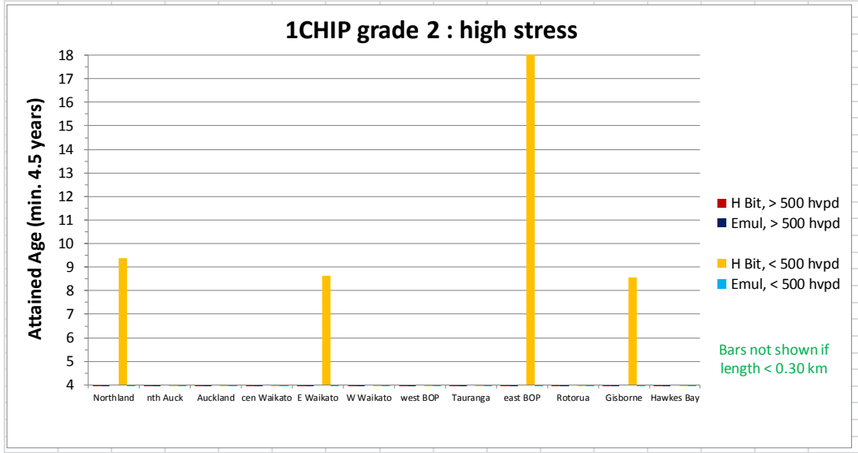
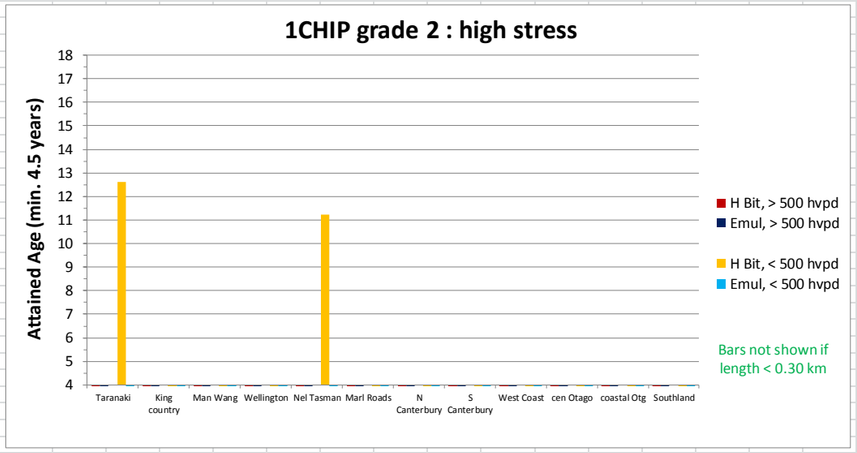
11
10
9
8
7
6
5
4
1CHIP grade 2
1CHIP grade 3
1CHIP grade 4
2CHIP grade 2
2CHIP grade 3
2CHIP grade 4
RACK grade 2
RACK grade 3
RACK grade 4
1 CHIP gr 2-4
2 CHIP gr 2-4
RACK gr 2-4
H Bit, > 500 hvpd
Emul, > 500 hvpd
H Bit, < 500 hvpd
Emul, < 500 hvpd
Bars not shown if length < 0.60 km

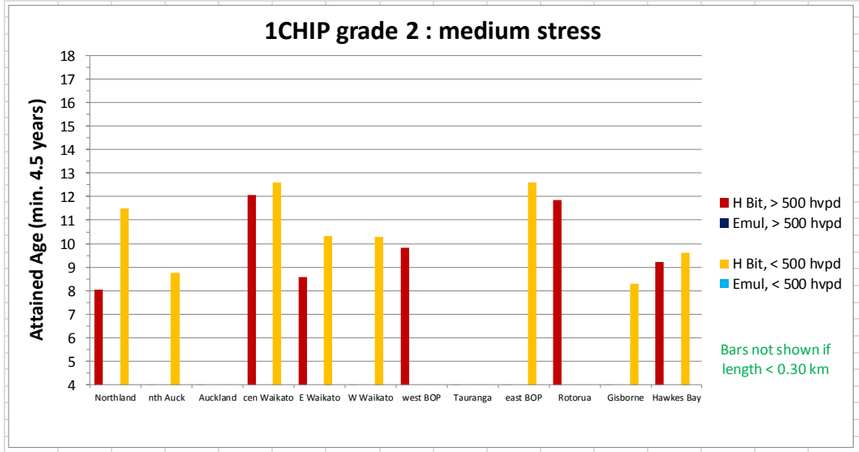
Appendix B: Average life charts for each surface category / binder / HV flow combination for each region by stress



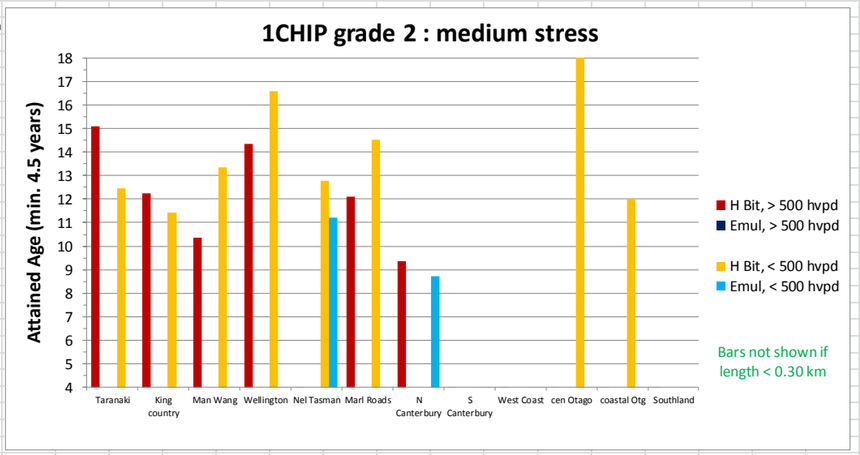
457.24 Carriageway kilometres

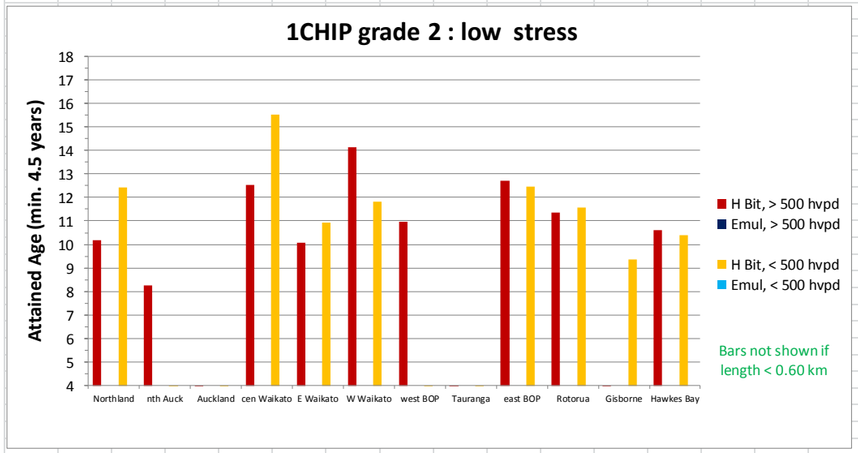
Existing Network	Bitumen < 500 hvpd	Bitumen > 500 hvpd	Emulsion < 500 hvpd	Emulsion > 500 hvpd
Northland	5.33	0.00	0.00	0.00
nth Auck	0.00	0.00	0.00	0.00
Auckland	0.00	0.00	0.00	0.00
cen Waikato	0.03	0.03	0.00	0.00
E Waikato	2.20	0.00	0.00	0.00
W Waikato	0.30	0.01	0.00	0.00
west BOP	0.00	0.00	0.00	0.00
Tauranga	0.00	0.00	0.00	0.00
east BOP	0.48	0.00	0.00	0.00
Rotorua	0.00	0.00	0.00	0.00
Gisborne	0.84	0.00	0.00	0.00
Hawkes Bay	0.29	0.00	0.00	0.00
Taranaki	2.57	0.00	0.16	0.00
King country	0.00	0.14	0.00	0.00
Man Wang	0.01	0.00	0.00	0.00
Wellington	0.05	0.06	0.00	0.00
Nel Tasman	0.77	0.00	0.00	0.00
Marl Roads	0.02	0.00	0.00	0.00
N Canterbury	0.00	0.00	0.00	0.00
S Canterbury	0.00	0.00	0.00	0.00
West Coast	0.00	0.00	0.00	0.00
cen Otago	0.00	0.00	0.00	0.00
coastal Otg	0.00	0.00	0.00	0.00
Southland	0.00	0.09	0.00	0.00
ALL NZ SH	12.88	0.33	0.16	0.00
13.37	96.4%	2.4%	1.2%	0.0%



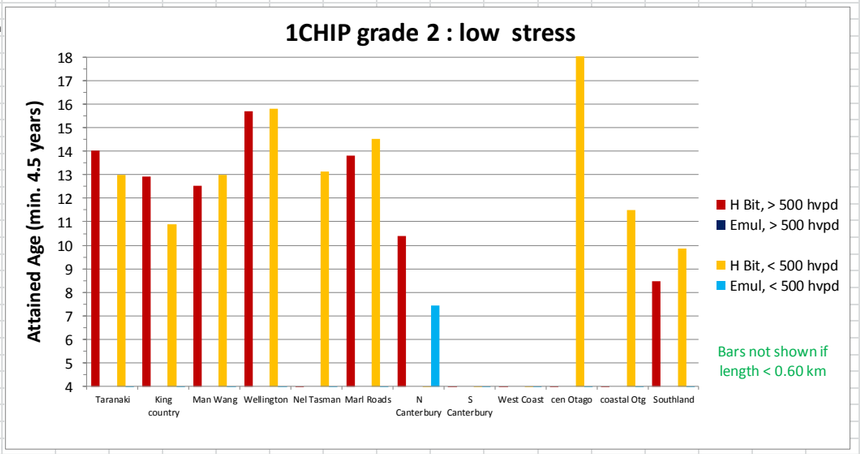


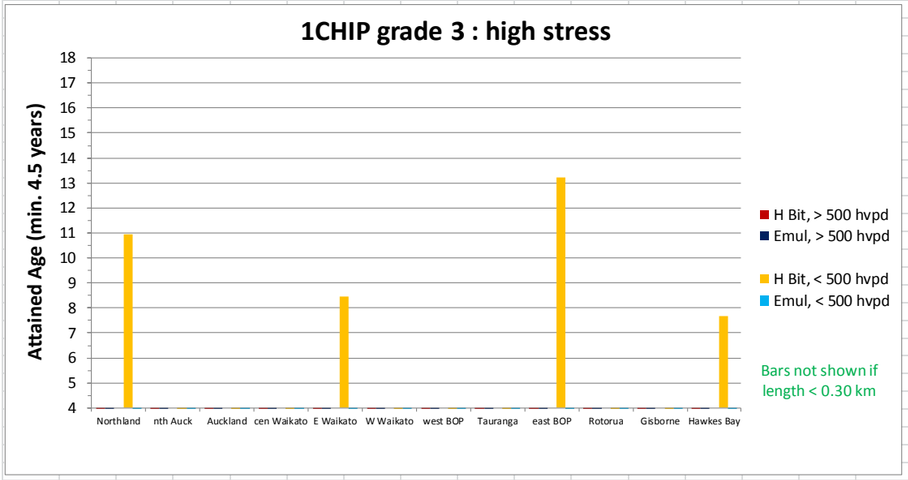
Existing Network	Bitumen < 500 hvpd	Bitumen > 500 hvpd	Emulsion < 500 hvpd	Emulsion > 500 hvpd
Northland	11.64	0.69	0.00	0.00
nth Auck	0.32	0.03	0.00	0.00
Auckland	0.00	0.00	0.00	0.00
cen Waikato	1.54	1.72	0.00	0.00
E Waikato	5.49	0.62	0.00	0.00
W Waikato	0.79	0.29	0.00	0.00
west BOP	0.03	2.05	0.00	0.00
Tauranga	0.00	0.01	0.00	0.00
east BOP	1.33	0.12	0.00	0.00
Rotorua	0.10	0.34	0.00	0.00
Gisborne	4.47	0.10	0.00	0.00
Hawkes Bay	8.51	1.10	0.00	0.00
Taranaki	9.09	1.20	0.04	0.00
King country	1.49	1.85	0.00	0.00
Man Wang	1.95	3.22	0.00	0.00
Wellington	0.69	1.45	0.00	0.00
Nel Tasman	8.41	0.28	0.61	0.00
Marl Roads	1.16	2.00	0.00	0.00
N Canterbury	0.00	0.63	0.57	0.00
S Canterbury	0.00	0.00	0.00	0.00
West Coast	0.00	0.00	0.00	0.00
cen Otago	0.32	0.00	0.00	0.00
coastal Otg	2.04	0.00	0.00	0.00
Southland	0.00	0.00	0.00	0.00
ALL NZ SH	59.34	17.70	1.21	0.00
78.25	75.8%	22.6%	1.6%	0.0%





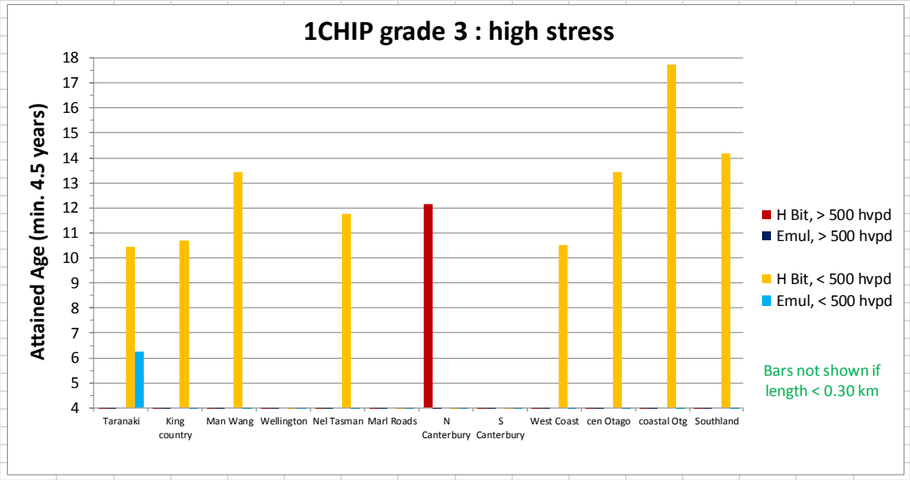
Existing Network	Bitumen < 500 hvpd	Bitumen > 500 hvpd	Emulsion < 500 hvpd	Emulsion > 500 hvpd
Northland	28.35	2.59	0.00	0.00
nth Auck	0.29	0.75	0.00	0.00
Auckland	0.00	0.08	0.00	0.00
cen Waikato	7.44	14.98	0.00	0.00
E Waikato	14.67	15.59	0.00	0.00
W Waikato	8.77	4.95	0.00	0.00
west BOP	0.49	7.12	0.00	0.00
Tauranga	0.00	0.00	0.00	0.00
east BOP	5.00	2.15	0.00	0.00
Rotorua	4.87	6.00	0.00	0.00
Gisborne	21.11	0.24	0.00	0.00
Hawkes Bay	23.32	22.14	0.00	0.00
Taranaki	27.00	12.65	0.15	0.00
King country	3.59	8.11	0.00	0.00
Man Wang	12.94	43.19	0.00	0.00
Wellington	0.90	12.59	0.00	0.00
Nel Tasman	23.09	0.56	0.48	0.00
Marl Roads	7.20	10.13	0.00	0.00
N Canterbury	0.00	0.95	1.18	0.00
S Canterbury	0.00	0.00	0.00	0.00
West Coast	0.00	0.00	0.00	0.00
cen Otago	0.89	0.00	0.00	0.00
coastal Otg	6.40	0.18	0.00	0.00
Southland	1.77	0.81	0.00	0.00
ALL NZ SH	198.06	165.74	1.81	0.00
365.61	54.2%	45.3%	0.5%	0.0%

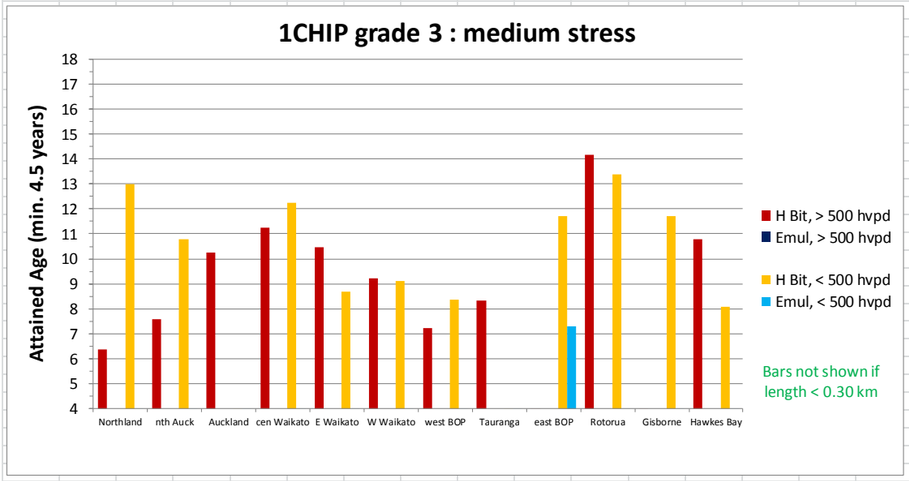




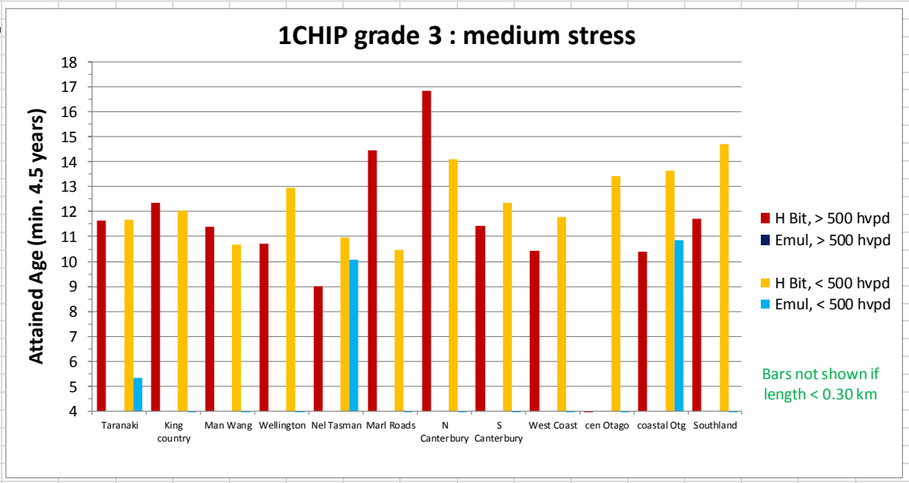
1502.50 Carriageway kilometres

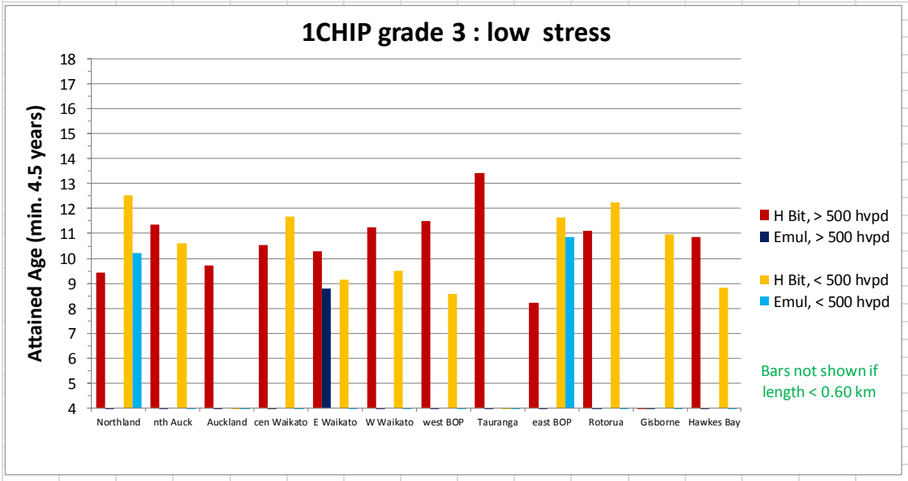
Existing Network	Bitumen < 500 hvpd	Bitumen > 500 hvpd	Emulsion < 500 hvpd	Emulsion > 500 hvpd
Northland	0.86	0.00	0.00	0.00
nth Auck	0.03	0.00	0.00	0.00
Auckland	0.00	0.00	0.00	0.00
cen Waikato	0.08	0.01	0.00	0.00
E Waikato	3.49	0.27	0.00	0.00
W Waikato	0.07	0.02	0.00	0.00
west BOP	0.00	0.13	0.00	0.00
Tauranga	0.00	0.00	0.00	0.00
east BOP	0.90	0.00	0.00	0.00
Rotorua	0.00	0.00	0.00	0.00
Gisborne	0.20	0.00	0.00	0.00
Hawkes Bay	1.28	0.01	0.00	0.00
Taranaki	12.21	0.00	0.38	0.00
King country	1.24	0.16	0.00	0.00
Man Wang	1.38	0.13	0.00	0.00
Wellington	0.21	0.01	0.00	0.00
Nel Tasman	1.90	0.00	0.00	0.00
Marl Roads	0.25	0.07	0.00	0.00
N Canterbury	0.08	0.37	0.00	0.00
S Canterbury	0.28	0.00	0.00	0.00
West Coast	1.15	0.23	0.00	0.00
cen Otago	1.40	0.00	0.00	0.00
coastal Otg	0.60	0.00	0.00	0.00
Southland	0.40	0.08	0.00	0.00
ALL NZ SH	27.99	1.49	0.38	0.00
29.86	93.8%	5.0%	1.3%	0.0%



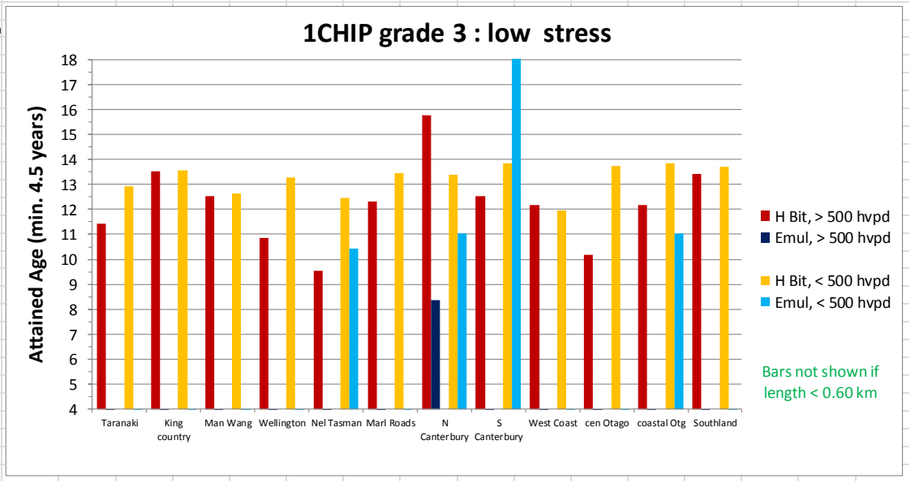


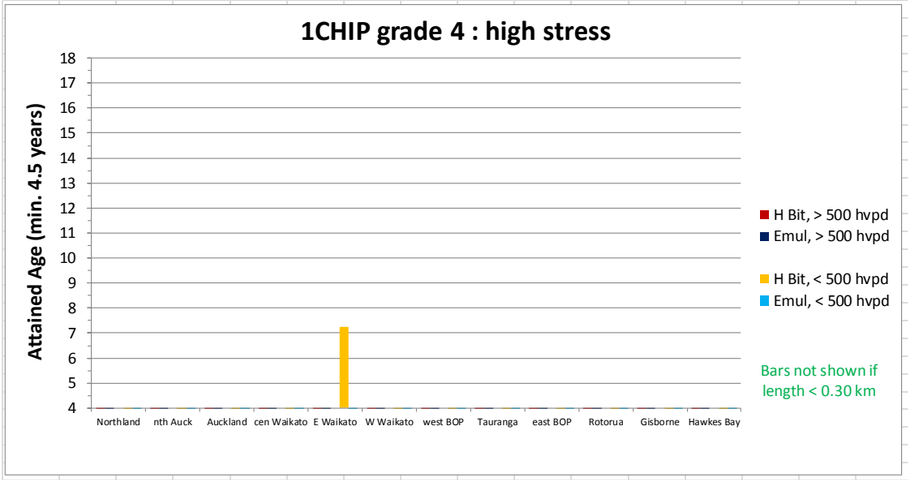
Existing Network	Bitumen < 500 hvpd	Bitumen > 500 hvpd	Emulsion < 500 hvpd	Emulsion > 500 hvpd
Northland	14.32	0.60	0.30	0.00
nth Auck	3.26	0.32	0.02	0.00
Auckland	0.00	0.38	0.00	0.00
cen Waikato	10.17	2.94	0.00	0.00
E Waikato	4.19	1.67	0.00	0.00
W Waikato	3.54	0.52	0.00	0.00
west BOP	1.82	4.77	0.00	0.00
Tauranga	0.00	0.78	0.00	0.00
east BOP	6.98	0.00	0.59	0.00
Rotorua	0.83	0.34	0.00	0.00
Gisborne	2.58	0.20	0.00	0.00
Hawkes Bay	4.30	1.81	0.00	0.00
Taranaki	28.18	5.05	0.43	0.00
King country	7.48	2.88	0.00	0.00
Man Wang	7.05	6.56	0.00	0.00
Wellington	3.43	1.30	0.00	0.00
Nel Tasman	13.87	1.84	0.36	0.00
Marl Roads	1.61	3.13	0.00	0.00
N Canterbury	6.18	2.48	0.00	0.00
S Canterbury	5.51	1.39	0.01	0.00
West Coast	13.99	3.16	0.00	0.00
cen Otago	27.70	0.27	0.00	0.00
coastal Otg	31.96	5.42	0.72	0.11
Southland	25.79	7.80	0.00	0.30
ALL NZ SH	224.74	55.59	2.42	0.41
283.17	79.4%	19.6%	0.9%	0.1%





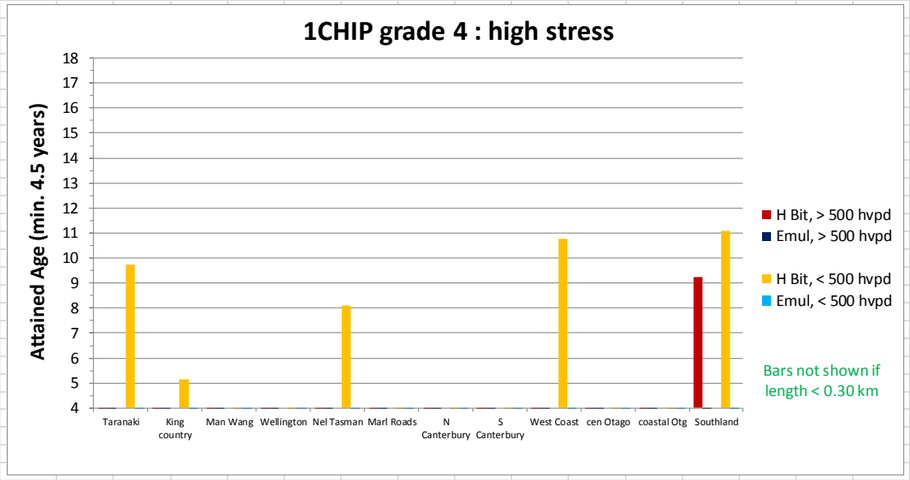
Existing Network	Bitumen < 500 hvpd	Bitumen > 500 hvpd	Emulsion < 500 hvpd	Emulsion > 500 hvpd
Northland	48.28	6.81	1.04	0.00
nth Auck	4.56	4.03	0.00	0.00
Auckland	0.00	1.88	0.00	0.00
cen Waikato	37.07	22.62	0.00	0.00
E Waikato	8.40	10.08	0.00	0.60
W Waikato	17.26	12.87	0.00	0.00
west BOP	2.64	8.12	0.00	0.00
Tauranga	0.00	3.04	0.00	0.00
east BOP	14.73	0.73	3.51	0.00
Rotorua	5.94	4.80	0.00	0.00
Gisborne	3.75	0.25	0.00	0.00
Hawkes Bay	15.24	12.83	0.00	0.00
Taranaki	70.32	14.66	0.17	0.00
King country	12.95	15.45	0.00	0.00
Man Wang	33.27	41.02	0.00	0.00
Wellington	23.06	10.82	0.00	0.00
Nel Tasman	27.23	6.72	1.09	0.00
Marl Roads	22.39	9.63	0.00	0.22
N Canterbury	38.38	30.29	0.99	1.39
S Canterbury	33.08	21.86	13.37	0.00
West Coast	53.98	22.31	0.00	0.00
cen Otago	116.81	1.83	0.00	0.00
coastal Otg	105.77	41.28	0.82	0.23
Southland	90.51	76.27	0.00	0.22
ALL NZ SH	785.61	380.21	20.99	2.67
1189.47	66.0%	32.0%	1.8%	0.2%

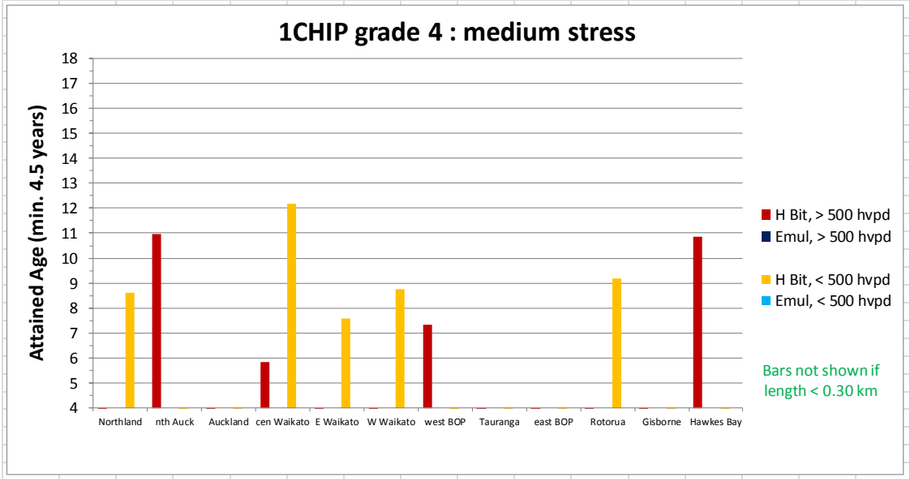




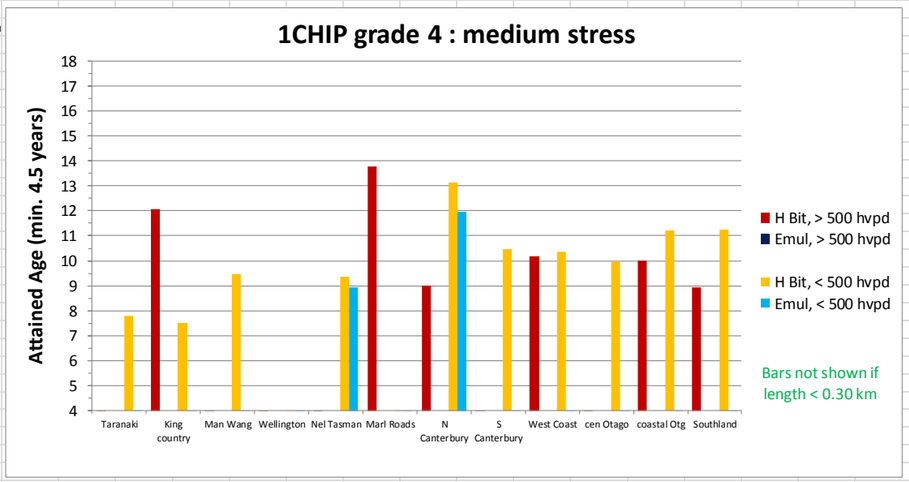
378.89 Carriageway kilometres

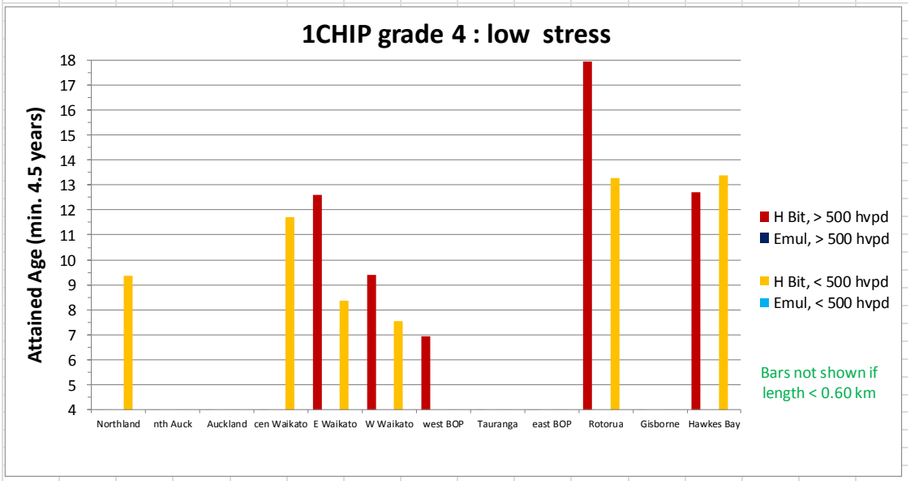
Existing Network	Bitumen < 500 hvpd	Bitumen > 500 hvpd	Emulsion < 500 hvpd	Emulsion > 500 hvpd
Northland	0.00	0.00	0.00	0.00
nth Auck	0.00	0.00	0.00	0.00
Auckland	0.00	0.00	0.00	0.00
cen Waikato	0.00	0.00	0.00	0.00
E Waikato	2.34	0.00	0.00	0.00
W Waikato	0.02	0.00	0.00	0.00
west BOP	0.00	0.00	0.00	0.00
Tauranga	0.00	0.00	0.00	0.00
east BOP	0.00	0.00	0.00	0.00
Rotorua	0.00	0.00	0.00	0.00
Gisborne	0.00	0.00	0.00	0.00
Hawkes Bay	0.04	0.00	0.00	0.00
Taranaki	1.04	0.00	0.00	0.00
King country	0.33	0.25	0.00	0.00
Man Wang	0.08	0.00	0.03	0.00
Wellington	0.03	0.00	0.00	0.00
Nel Tasman	0.42	0.00	0.00	0.00
Marl Roads	0.00	0.00	0.00	0.00
N Canterbury	0.20	0.00	0.00	0.00
S Canterbury	0.23	0.00	0.00	0.00
West Coast	2.71	0.20	0.00	0.00
cen Otago	0.00	0.00	0.00	0.00
coastal Otg	0.00	0.00	0.00	0.00
Southland	0.33	0.30	0.00	0.00
ALL NZ SH	7.76	0.75	0.03	0.00
8.53	90.9%	8.8%	0.3%	0.0%



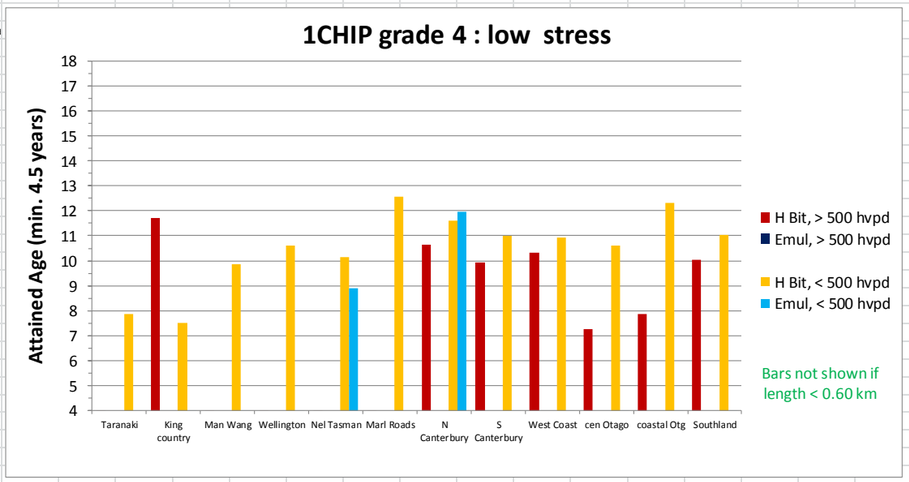


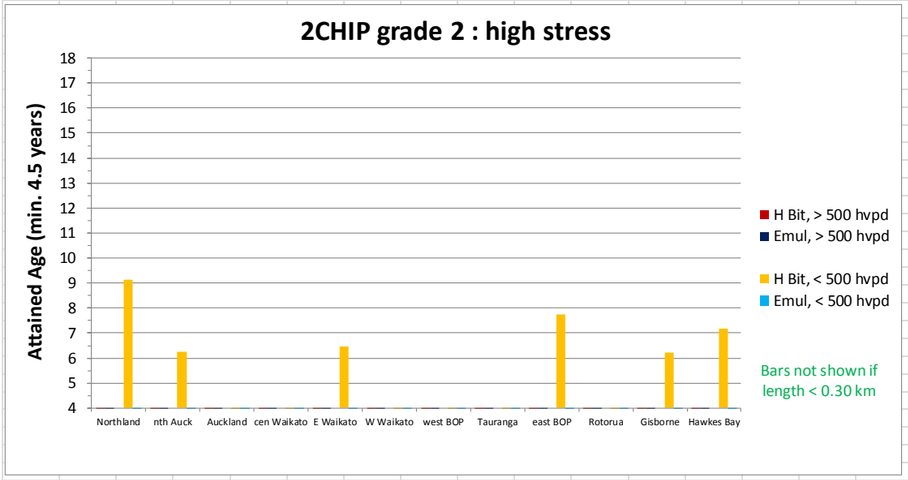
Existing Network	Bitumen < 500 hvpd	Bitumen > 500 hvpd	Emulsion < 500 hvpd	Emulsion > 500 hvpd
Northland	0.54	0.00	0.00	0.00
nth Auck	0.00	0.47	0.00	0.00
Auckland	0.00	0.00	0.00	0.00
cen Waikato	1.97	0.45	0.00	0.00
E Waikato	3.45	0.11	0.00	0.00
W Waikato	0.57	0.23	0.00	0.00
west BOP	0.02	1.01	0.00	0.00
Tauranga	0.00	0.00	0.00	0.00
east BOP	0.00	0.00	0.00	0.00
Rotorua	0.35	0.06	0.00	0.00
Gisborne	0.00	0.00	0.00	0.00
Hawkes Bay	0.00	0.71	0.00	0.00
Taranaki	1.44	0.00	0.00	0.00
King country	2.39	3.47	0.00	0.00
Man Wang	0.34	0.00	0.01	0.00
Wellington	0.21	0.00	0.00	0.00
Nel Tasman	0.78	0.00	0.38	0.00
Marl Roads	0.00	0.58	0.00	0.00
N Canterbury	5.78	0.45	1.10	0.00
S Canterbury	2.72	0.00	0.00	0.00
West Coast	16.08	1.50	0.00	0.00
cen Otago	7.63	0.19	0.00	0.00
coastal Otg	7.24	0.47	0.07	0.00
Southland	3.04	3.37	0.00	0.00
ALL NZ SH	54.54	13.05	1.56	0.00
69.15	78.9%	18.9%	2.3%	0.0%





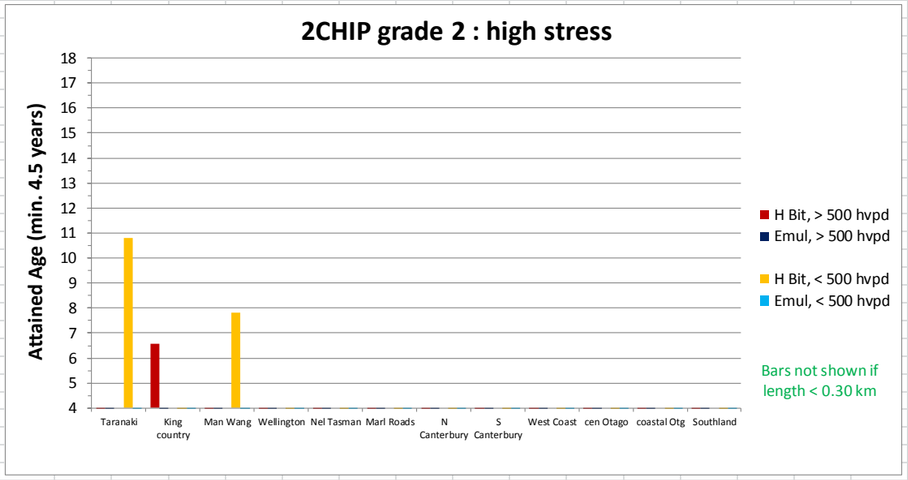
Existing Network	Bitumen < 500 hvpd	Bitumen > 500 hvpd	Emulsion < 500 hvpd	Emulsion > 500 hvpd
Northland	3.33	0.27	0.00	0.00
nth Auck	0.00	0.57	0.00	0.00
Auckland	0.00	0.00	0.00	0.00
cen Waikato	6.91	0.06	0.00	0.00
E Waikato	4.92	1.85	0.00	0.00
W Waikato	5.06	3.14	0.00	0.00
west BOP	0.00	0.75	0.00	0.00
Tauranga	0.00	0.00	0.00	0.00
east BOP	0.00	0.00	0.00	0.00
Rotorua	0.70	1.22	0.00	0.00
Gisborne	0.05	0.00	0.00	0.00
Hawkes Bay	1.14	3.12	0.00	0.00
Taranaki	1.81	0.00	0.00	0.00
King country	1.09	7.64	0.00	0.00
Man Wang	1.53	0.42	0.04	0.00
Wellington	0.85	0.00	0.00	0.00
Nel Tasman	5.10	0.00	1.27	0.00
Marl Roads	3.57	0.16	0.00	0.00
N Canterbury	24.96	9.50	1.11	0.00
S Canterbury	26.02	1.84	0.00	0.41
West Coast	74.26	5.04	0.00	0.00
cen Otago	22.08	1.70	0.00	0.00
coastal Otg	31.37	4.95	0.14	0.00
Southland	16.29	24.76	0.00	0.23
ALL NZ SH	231.03	66.99	2.55	0.64
301.21	76.7%	22.2%	0.8%	0.2%

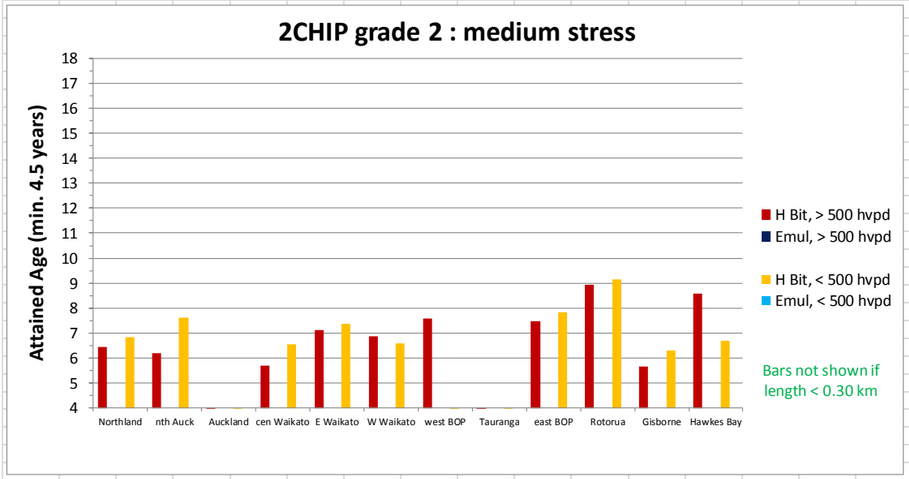




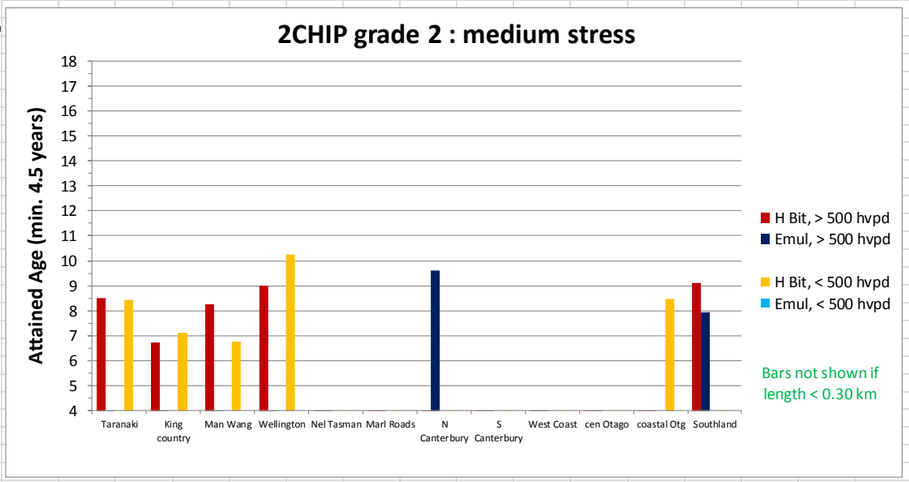
491.26 Carriageway kilometres

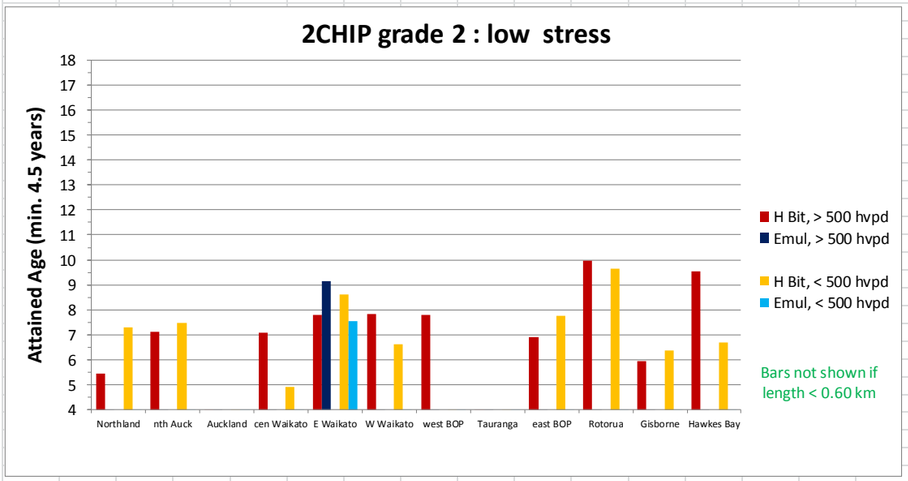
Existing Network	Bitumen < 500 hvpd	Bitumen > 500 hvpd	Emulsion < 500 hvpd	Emulsion > 500 hvpd
Northland	1.27	0.00	0.00	0.00
nth Auck	0.40	0.00	0.00	0.00
Auckland	0.00	0.00	0.00	0.00
cen Waikato	0.11	0.00	0.00	0.00
E Waikato	6.67	0.00	0.00	0.00
W Waikato	0.00	0.00	0.00	0.00
west BOP	0.00	0.00	0.00	0.00
Tauranga	0.00	0.00	0.00	0.00
east BOP	16.55	0.22	0.00	0.00
Rotorua	0.00	0.00	0.00	0.00
Gisborne	16.62	0.00	0.00	0.00
Hawkes Bay	3.08	0.00	0.00	0.00
Taranaki	4.85	0.00	0.00	0.00
King country	0.16	0.64	0.00	0.00
Man Wang	0.30	0.00	0.00	0.00
Wellington	0.00	0.00	0.00	0.00
Nel Tasman	0.00	0.00	0.00	0.00
Marl Roads	0.00	0.00	0.00	0.00
N Canterbury	0.00	0.29	0.00	0.02
S Canterbury	0.00	0.00	0.00	0.00
West Coast	0.00	0.00	0.00	0.00
cen Otago	0.00	0.00	0.00	0.00
coastal Otg	0.17	0.00	0.00	0.00
Southland	0.00	0.00	0.00	0.00
ALL NZ SH	50.19	1.15	0.00	0.02
51.36	97.7%	2.2%	0.0%	0.0%



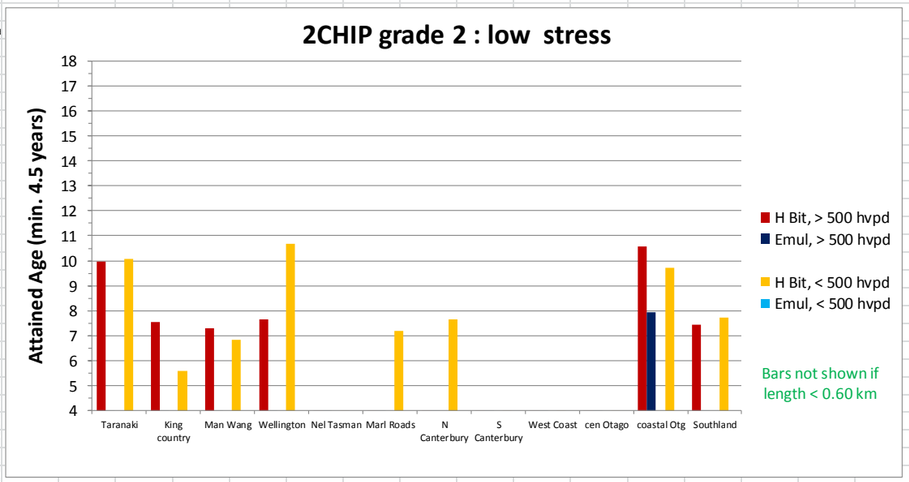


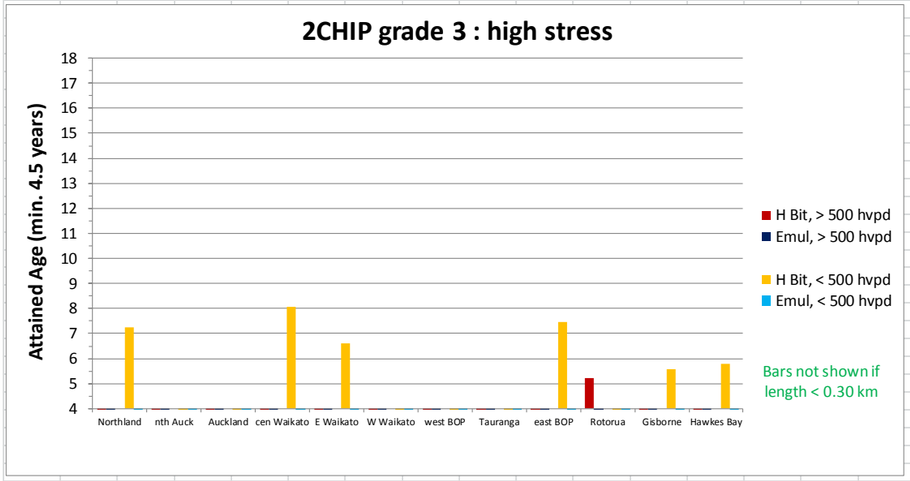
Existing Network	Bitumen < 500 hvpd	Bitumen > 500 hvpd	Emulsion < 500 hvpd	Emulsion > 500 hvpd
Northland	4.42	1.18	0.00	0.00
nth Auck	2.03	3.09	0.00	0.00
Auckland	0.00	0.00	0.00	0.00
cen Waikato	0.78	2.55	0.00	0.00
E Waikato	8.49	4.95	0.13	0.00
W Waikato	1.73	2.11	0.00	0.00
west BOP	0.00	4.81	0.00	0.00
Tauranga	0.00	0.17	0.00	0.00
east BOP	37.49	2.58	0.00	0.00
Rotorua	3.33	5.26	0.00	0.00
Gisborne	39.02	0.47	0.28	0.00
Hawkes Bay	6.84	3.77	0.00	0.00
Taranaki	6.83	1.11	0.00	0.00
King country	2.16	4.73	0.00	0.00
Man Wang	1.30	1.09	0.00	0.00
Wellington	0.33	2.04	0.00	0.00
Nel Tasman	0.11	0.00	0.01	0.00
Marl Roads	0.00	0.00	0.00	0.00
N Canterbury	0.25	0.06	0.00	0.40
S Canterbury	0.00	0.00	0.00	0.00
West Coast	0.00	0.00	0.00	0.00
cen Otago	0.00	0.00	0.00	0.00
coastal Otg	1.26	0.01	0.00	0.10
Southland	0.00	0.42	0.00	0.30
ALL NZ SH	116.35	40.40	0.42	0.80
157.97	73.7%	25.6%	0.3%	0.5%





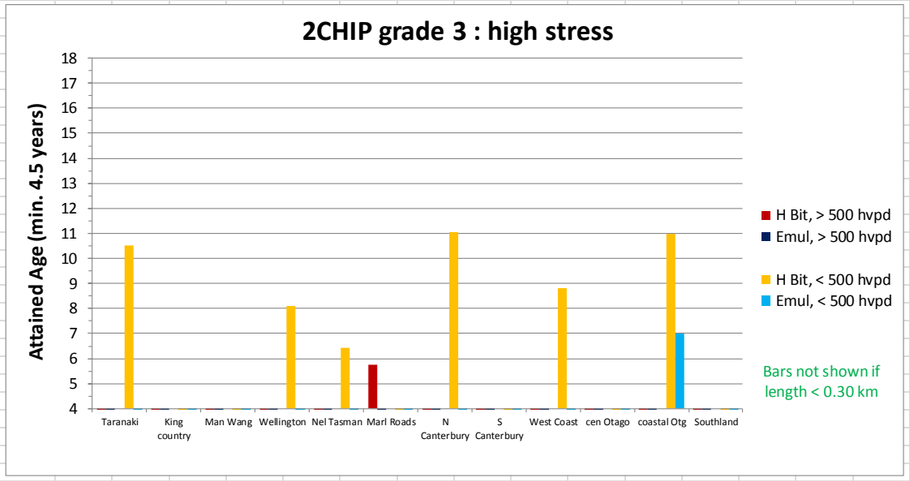
Existing Network	Bitumen < 500 hvpd	Bitumen > 500 hvpd	Emulsion < 500 hvpd	Emulsion > 500 hvpd
Northland	2.93	2.18	0.00	0.00
nth Auck	1.50	3.32	0.00	0.00
Auckland	0.00	0.00	0.00	0.00
cen Waikato	0.97	1.42	0.03	0.00
E Waikato	13.02	18.45	1.21	0.98
W Waikato	1.11	11.25	0.00	0.00
west BOP	0.00	13.41	0.00	0.00
Tauranga	0.00	0.17	0.00	0.00
east BOP	51.70	15.32	0.00	0.00
Rotorua	11.40	22.54	0.01	0.00
Gisborne	48.38	1.08	0.05	0.00
Hawkes Bay	13.23	5.38	0.00	0.00
Taranaki	7.51	3.08	0.00	0.00
King country	1.21	6.87	0.00	0.02
Man Wang	1.17	3.98	0.00	0.00
Wellington	1.32	2.80	0.00	0.00
Nel Tasman	0.11	0.00	0.00	0.00
Marl Roads	0.66	0.00	0.00	0.00
N Canterbury	1.36	0.06	0.00	0.11
S Canterbury	0.00	0.00	0.00	0.00
West Coast	0.00	0.00	0.00	0.00
cen Otago	0.07	0.00	0.00	0.00
coastal Otg	2.57	2.54	0.00	0.67
Southland	2.49	1.38	0.55	0.41
ALL NZ SH	162.69	115.22	1.84	2.19
281.94	57.7%	40.9%	0.7%	0.8%

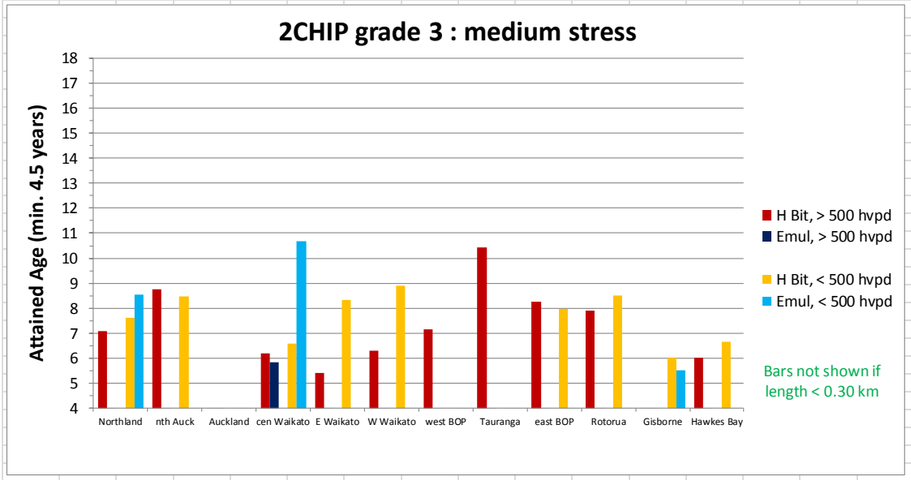




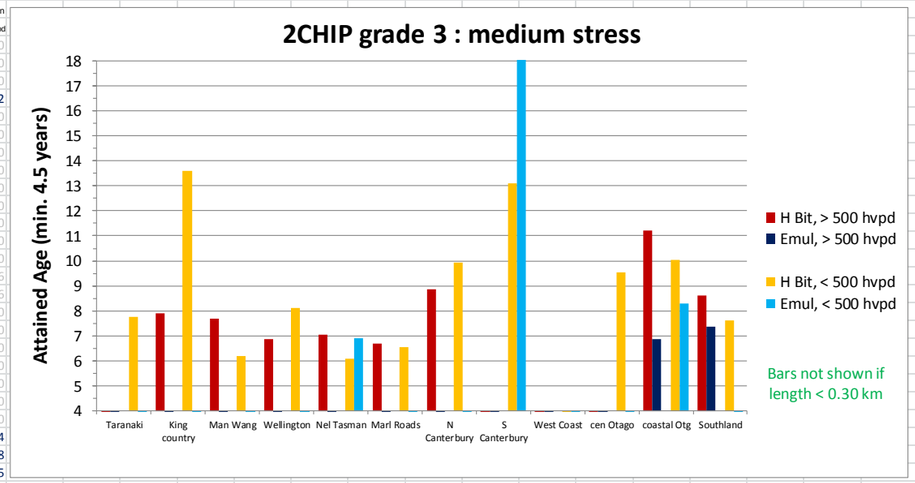
345.48 Carriageway kilometres

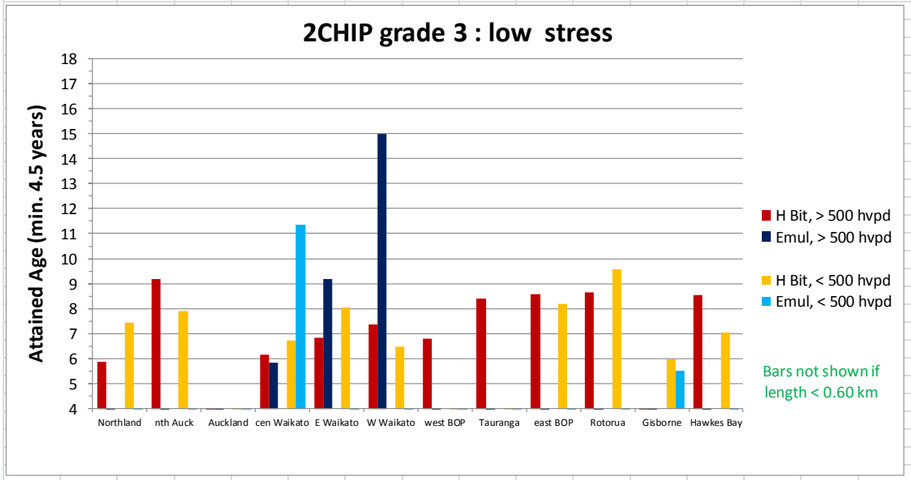
Existing Network	Bitumen < 500 hvpd	Bitumen > 500 hvpd	Emulsion < 500 hvpd	Emulsion > 500 hvpd
Northland	3.81	0.00	0.00	0.00
nth Auck	0.00	0.00	0.00	0.00
Auckland	0.00	0.00	0.00	0.00
cen Waikato	0.55	0.01	0.00	0.00
E Waikato	2.63	0.00	0.00	0.00
W Waikato	0.06	0.00	0.00	0.00
west BOP	0.00	0.00	0.00	0.00
Tauranga	0.00	0.00	0.00	0.00
east BOP	2.05	0.00	0.00	0.00
Rotorua	0.14	0.40	0.00	0.00
Gisborne	0.34	0.00	0.05	0.00
Hawkes Bay	0.96	0.01	0.00	0.00
Taranaki	3.78	0.00	0.10	0.00
King country	0.00	0.00	0.00	0.00
Man Wang	0.24	0.17	0.00	0.00
Wellington	2.31	0.00	0.00	0.00
Nel Tasman	2.32	0.00	0.00	0.00
Marl Roads	0.00	0.50	0.00	0.00
N Canterbury	0.50	0.11	0.13	0.00
S Canterbury	0.00	0.00	0.02	0.00
West Coast	0.55	0.00	0.00	0.00
cen Otago	0.00	0.00	0.00	0.00
coastal Otg	0.35	0.00	1.12	0.00
Southland	0.00	0.04	0.00	0.00
ALL NZ SH	20.57	1.22	1.42	0.00
23.22	88.6%	5.3%	6.1%	0.0%



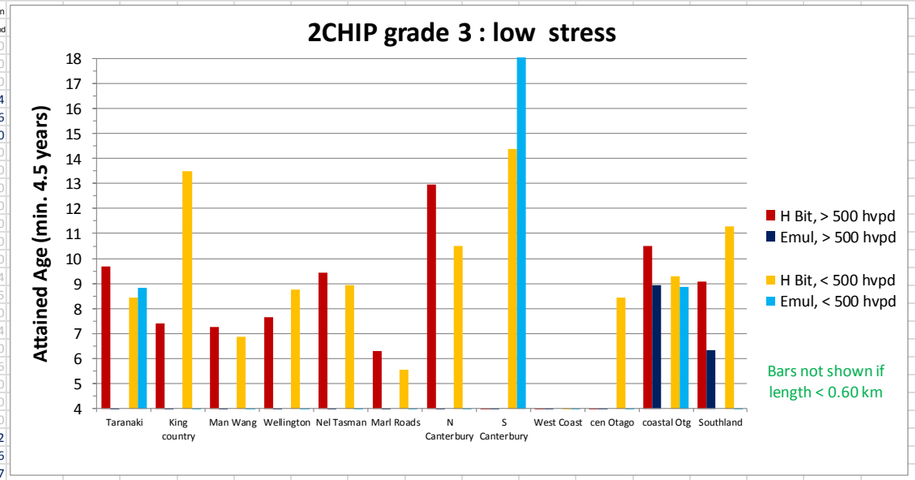


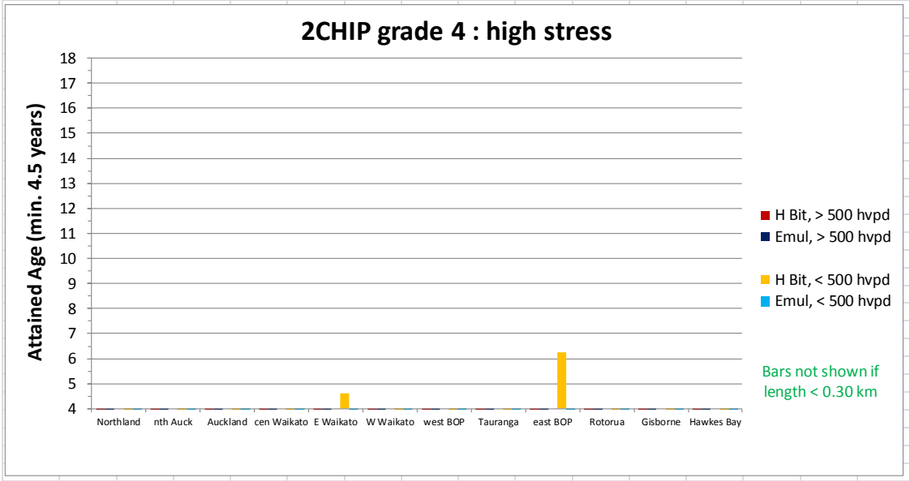
Existing Network	Bitumen < 500 hvpd	Bitumen > 500 hvpd	Emulsion < 500 hvpd	Emulsion > 500 hvpd
Northland	7.04	5.91	0.46	0.00
nth Auck	0.85	1.37	0.00	0.00
Auckland	0.00	0.00	0.00	0.00
cen Waikato	5.22	4.26	0.31	0.62
E Waikato	8.17	0.48	0.00	0.00
W Waikato	0.45	0.71	0.00	0.00
west BOP	0.27	1.64	0.00	0.00
Tauranga	0.00	0.68	0.00	0.00
east BOP	7.90	0.66	0.00	0.00
Rotorua	1.71	4.60	0.00	0.00
Gisborne	2.19	0.00	1.16	0.00
Hawkes Bay	1.74	1.54	0.00	0.00
Taranaki	2.89	0.00	0.15	0.00
King country	0.79	0.49	0.00	0.26
Man Wang	0.87	3.18	0.00	0.26
Wellington	1.16	1.49	0.00	0.00
Nel Tasman	5.18	0.64	0.44	0.00
Marl Roads	0.34	2.77	0.00	0.00
N Canterbury	5.30	0.48	0.23	0.00
S Canterbury	2.26	0.00	0.36	0.00
West Coast	0.00	0.00	0.00	0.00
cen Otago	3.38	0.19	0.00	0.00
coastal Otg	6.81	0.67	4.40	0.44
Southland	0.39	0.56	0.07	0.58
ALL NZ SH	64.87	32.32	7.58	2.15
106.93	60.7%	30.2%	7.1%	2.0%





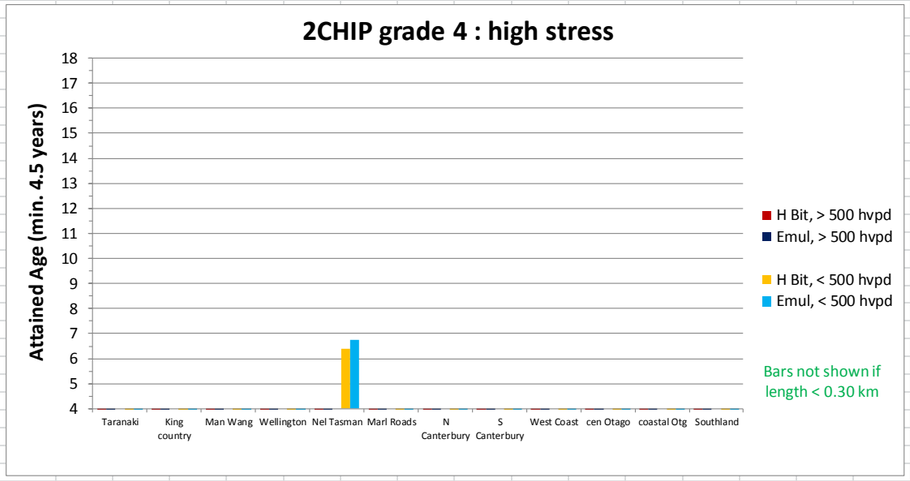
Existing Network	Bitumen < 500 hvpd	Bitumen > 500 hvpd	Emulsion < 500 hvpd	Emulsion > 500 hvpd
Northland	5.59	4.08	0.00	0.00
nth Auck	1.01	2.32	0.00	0.00
Auckland	0.00	0.00	0.00	0.00
cen Waikato	3.07	13.25	0.91	0.84
E Waikato	14.03	2.94	0.13	1.46
W Waikato	1.95	4.44	0.00	1.50
west BOP	0.59	3.50	0.00	0.00
Tauranga	0.00	0.99	0.00	0.00
east BOP	11.39	1.68	0.00	0.00
Rotorua	6.61	14.78	0.00	0.00
Gisborne	4.61	0.00	1.23	0.00
Hawkes Bay	1.52	3.78	0.00	0.00
Taranaki	4.71	0.70	0.73	0.00
King country	2.08	2.33	0.00	0.04
Man Wang	1.35	7.86	0.00	0.05
Wellington	0.77	3.27	0.00	0.00
Nel Tasman	5.62	0.69	0.04	0.14
Marl Roads	2.51	4.58	0.00	0.00
N Canterbury	9.58	5.53	0.22	0.06
S Canterbury	7.63	0.00	4.63	0.00
West Coast	0.01	0.01	0.00	0.00
cen Otago	11.66	0.07	0.00	0.00
coastal Otg	16.13	2.06	3.08	1.12
Southland	3.06	3.86	0.24	0.76
ALL NZ SH	115.46	82.69	11.21	5.97
215.33	53.6%	38.4%	5.2%	2.8%

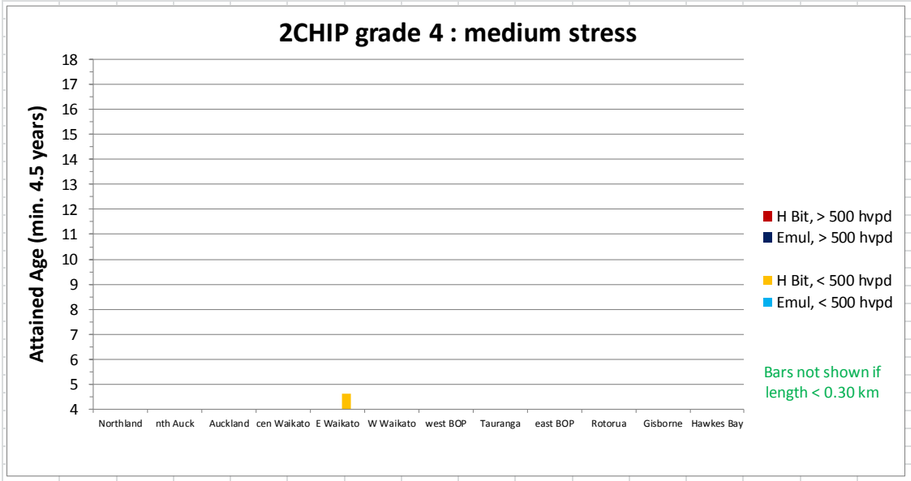




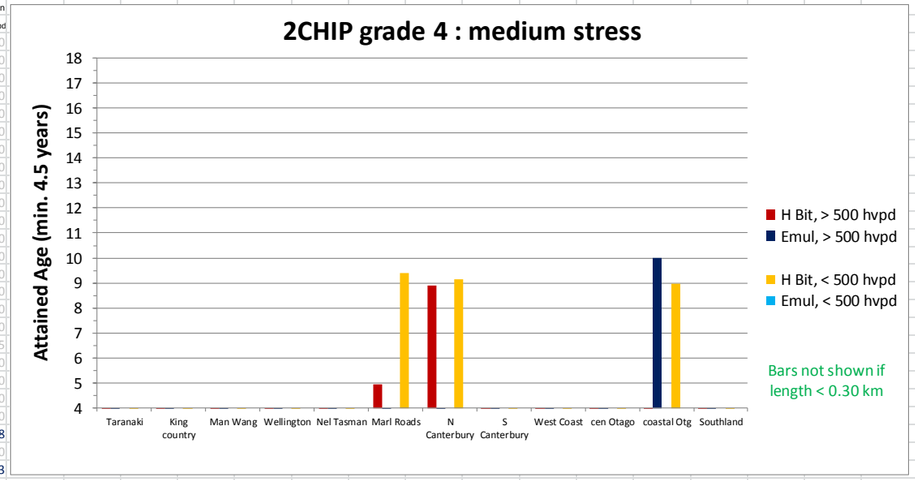
14.67 Carriageway kilometres

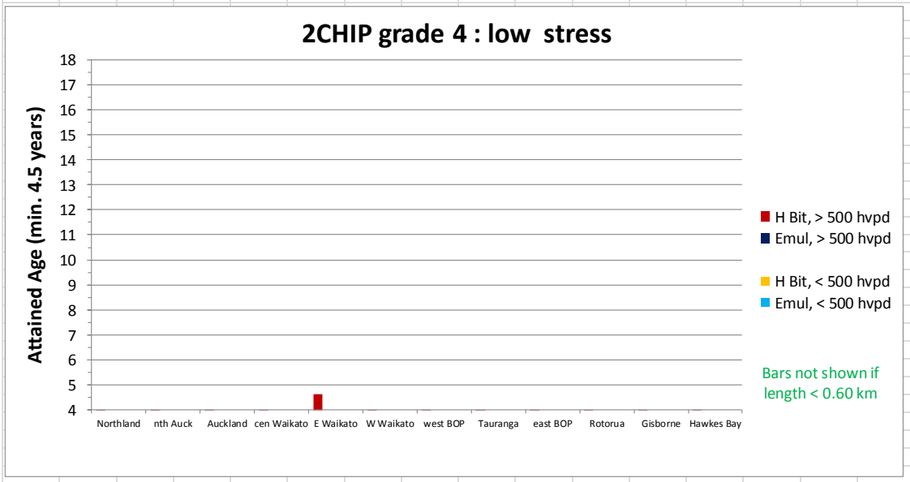
Existing Network	Bitumen < 500 hvpd	Bitumen > 500 hvpd	Emulsion < 500 hvpd	Emulsion > 500 hvpd
Northland	0.00	0.00	0.00	0.00
nth Auck	0.00	0.00	0.00	0.00
Auckland	0.00	0.00	0.00	0.00
cen Waikato	0.00	0.00	0.00	0.00
E Waikato	0.31	0.00	0.00	0.00
W Waikato	0.00	0.00	0.00	0.00
west BOP	0.00	0.00	0.00	0.00
Tauranga	0.00	0.00	0.00	0.00
east BOP	0.40	0.00	0.00	0.00
Rotorua	0.00	0.00	0.00	0.00
Gisborne	0.00	0.00	0.00	0.00
Hawkes Bay	0.00	0.00	0.00	0.00
Taranaki	0.00	0.00	0.00	0.00
King country	0.00	0.00	0.00	0.00
Man Wang	0.00	0.00	0.00	0.00
Wellington	0.00	0.00	0.00	0.00
Nel Tasman	0.58	0.00	0.56	0.00
Marl Roads	0.00	0.00	0.00	0.00
N Canterbury	0.07	0.00	0.00	0.00
S Canterbury	0.00	0.00	0.00	0.00
West Coast	0.00	0.00	0.00	0.00
cen Otago	0.00	0.00	0.00	0.00
coastal Otg	0.00	0.00	0.00	0.00
Southland	0.12	0.00	0.00	0.00
ALL NZ SH	1.48	0.00	0.56	0.00
2.03	72.6%	0.0%	27.4%	0.0%



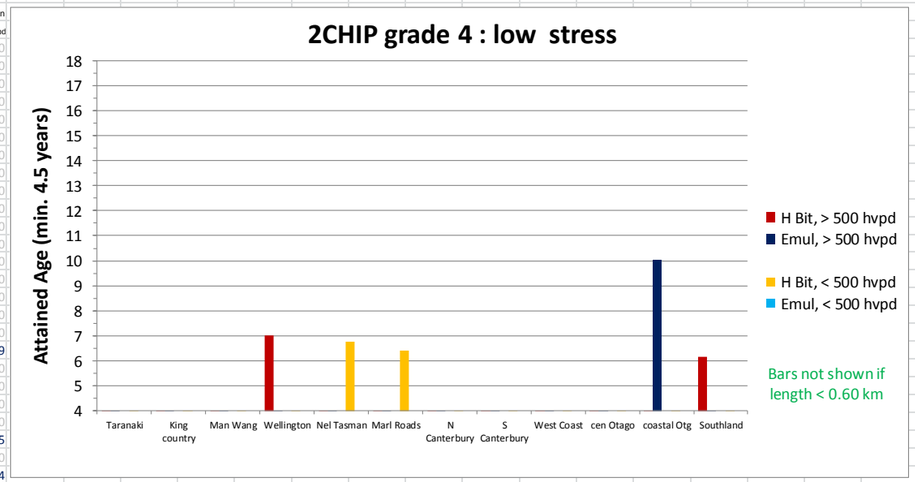


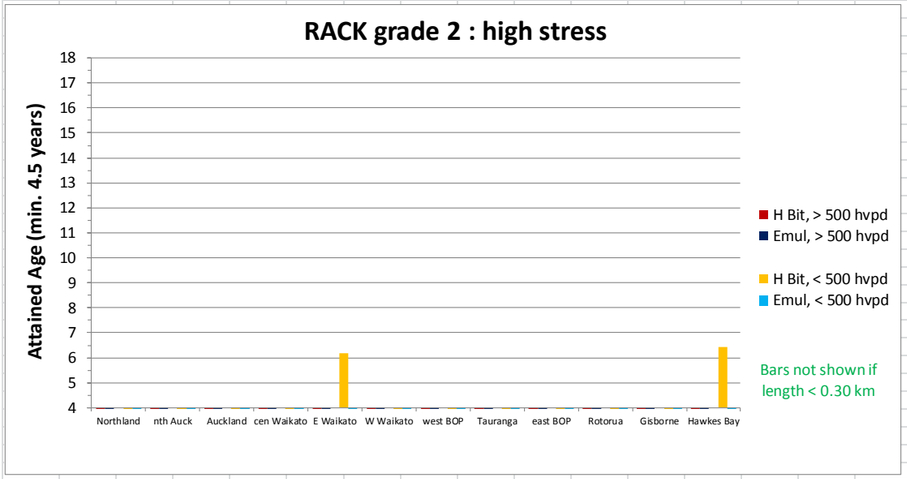
Existing Network	Bitumen < 500 hvpd	Bitumen > 500 hvpd	Emulsion < 500 hvpd	Emulsion > 500 hvpd
Northland	0.00	0.00	0.00	0.00
nth Auck	0.00	0.00	0.00	0.00
Auckland	0.00	0.00	0.00	0.00
cen Waikato	0.00	0.00	0.00	0.00
E Waikato	0.47	0.12	0.00	0.00
W Waikato	0.00	0.00	0.00	0.00
west BOP	0.00	0.00	0.00	0.00
Tauranga	0.00	0.00	0.00	0.00
east BOP	0.09	0.00	0.00	0.00
Rotorua	0.00	0.00	0.00	0.00
Gisborne	0.00	0.00	0.00	0.00
Hawkes Bay	0.00	0.00	0.00	0.00
Taranaki	0.00	0.00	0.00	0.00
King country	0.00	0.00	0.00	0.00
Man Wang	0.00	0.00	0.00	0.00
Wellington	0.00	0.00	0.00	0.00
Nel Tasman	0.28	0.00	0.22	0.00
Marl Roads	0.37	0.51	0.00	0.15
N Canterbury	0.63	0.36	0.00	0.00
S Canterbury	0.15	0.00	0.00	0.00
West Coast	0.00	0.00	0.00	0.00
cen Otago	0.00	0.00	0.00	0.00
coastal Otg	0.33	0.00	0.00	0.38
Southland	0.02	0.10	0.00	0.00
ALL NZ SH	2.33	1.09	0.22	0.53
4.18	55.9%	26.2%	5.3%	12.7%





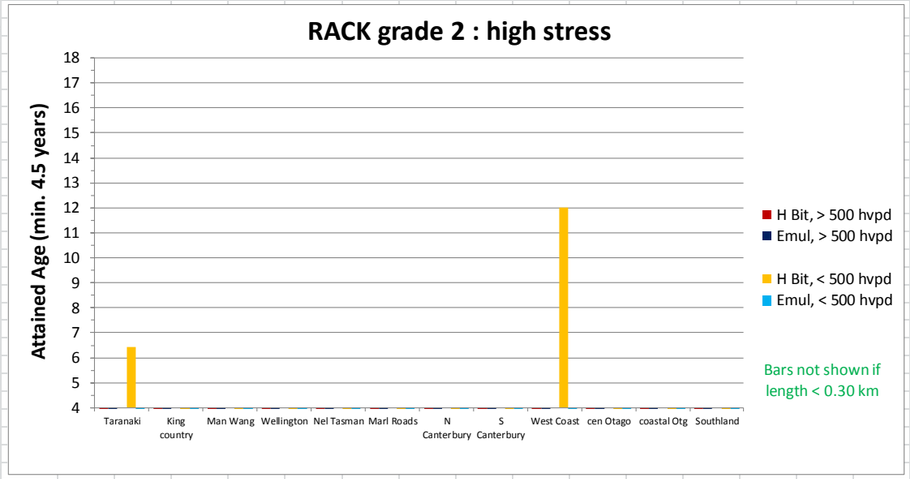
Existing Network	Bitumen < 500 hvpd	Bitumen > 500 hvpd	Emulsion < 500 hvpd	Emulsion > 500 hvpd
Northland	0.00	0.00	0.00	0.00
nth Auck	0.00	0.00	0.00	0.00
Auckland	0.00	0.00	0.00	0.00
cen Waikato	0.00	0.00	0.00	0.00
E Waikato	0.42	0.63	0.00	0.00
W Waikato	0.05	0.00	0.00	0.00
west BOP	0.00	0.00	0.00	0.00
Tauranga	0.00	0.00	0.00	0.00
east BOP	0.06	0.05	0.00	0.00
Rotorua	0.00	0.00	0.00	0.00
Gisborne	0.00	0.00	0.00	0.00
Hawkes Bay	0.00	0.00	0.00	0.00
Taranaki	0.00	0.00	0.00	0.00
King country	0.00	0.00	0.00	0.00
Man Wang	0.00	0.00	0.00	0.00
Wellington	0.00	1.57	0.00	0.00
Nel Tasman	1.32	0.00	0.43	0.00
Marl Roads	1.08	0.00	0.05	0.49
N Canterbury	0.55	0.16	0.00	0.00
S Canterbury	0.03	0.00	0.00	0.00
West Coast	0.00	0.00	0.00	0.00
cen Otago	0.00	0.00	0.00	0.00
coastal Otg	0.22	0.11	0.00	0.65
Southland	0.00	0.60	0.00	0.00
ALL NZ SH	3.72	3.13	0.48	1.14
8.46	44.0%	36.9%	5.6%	13.4%

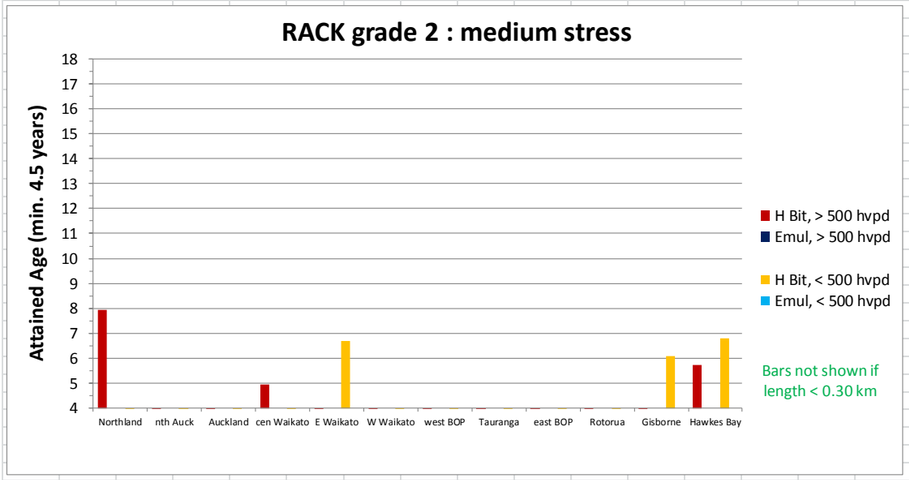




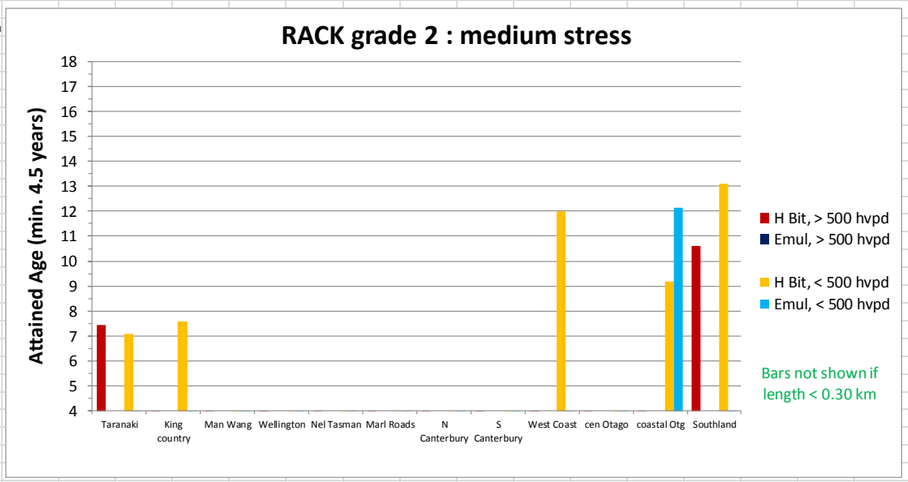
41.78 Carriageway kilometres

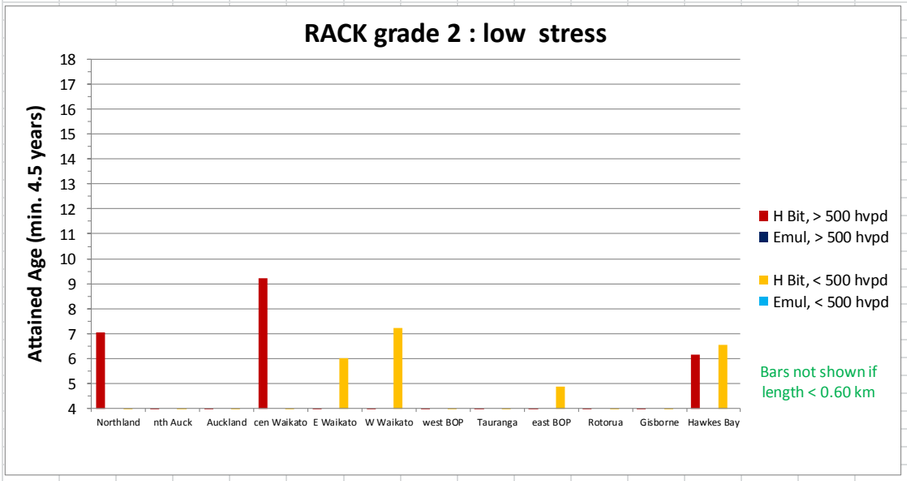
Existing Network	Bitumen < 500 hvpd	Bitumen > 500 hvpd	Emulsion < 500 hvpd	Emulsion > 500 hvpd
Northland	0.16	0.00	0.00	0.00
nth Auck	0.00	0.00	0.00	0.00
Auckland	0.00	0.00	0.00	0.00
cen Waikato	0.00	0.00	0.00	0.00
E Waikato	0.38	0.00	0.00	0.00
W Waikato	0.29	0.00	0.00	0.00
west BOP	0.00	0.00	0.00	0.00
Tauranga	0.00	0.00	0.00	0.00
east BOP	0.00	0.00	0.00	0.00
Rotorua	0.00	0.00	0.00	0.00
Gisborne	0.00	0.00	0.00	0.00
Hawkes Bay	0.71	0.00	0.00	0.00
Taranaki	0.53	0.00	0.00	0.00
King country	0.27	0.00	0.00	0.00
Man Wang	0.00	0.00	0.00	0.00
Wellington	0.00	0.00	0.00	0.00
Nel Tasman	0.00	0.00	0.00	0.00
Marl Roads	0.00	0.00	0.00	0.00
N Canterbury	0.00	0.00	0.00	0.00
S Canterbury	0.00	0.00	0.00	0.00
West Coast	0.33	0.00	0.00	0.00
cen Otago	0.00	0.00	0.00	0.00
coastal Otg	0.00	0.00	0.00	0.00
Southland	0.00	0.00	0.00	0.00
ALL NZ SH	2.68	0.00	0.00	0.00
2.68	100.0%	0.0%	0.0%	0.0%



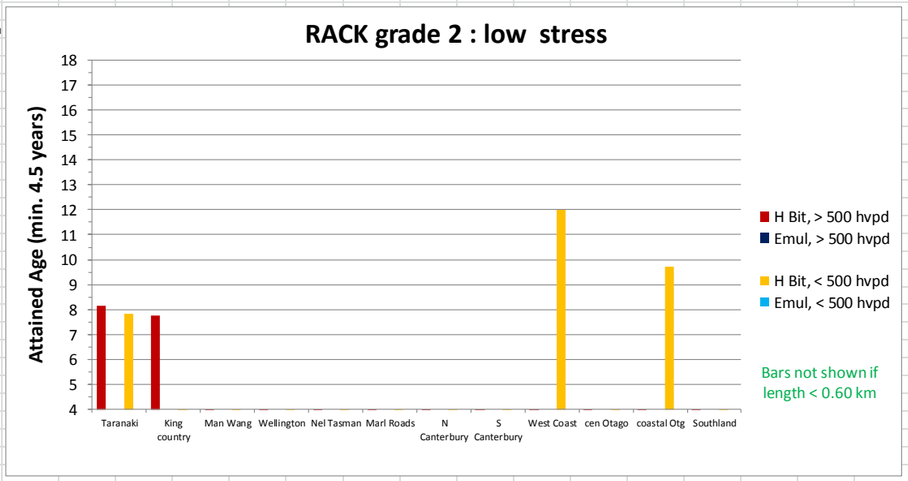


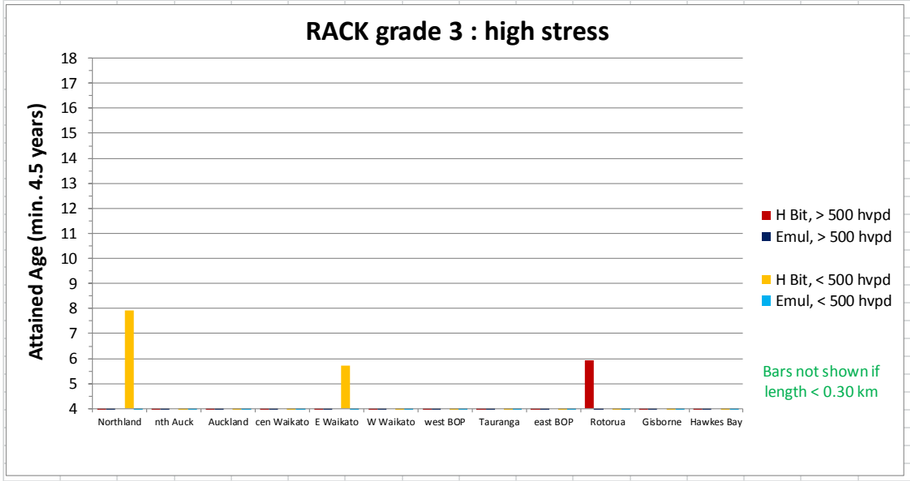
Existing Network	Bitumen < 500 hvpd	Bitumen > 500 hvpd	Emulsion < 500 hvpd	Emulsion > 500 hvpd
Northland	0.09	1.10	0.00	0.00
nth Auck	0.00	0.00	0.00	0.00
Auckland	0.00	0.00	0.00	0.00
cen Waikato	0.00	0.77	0.00	0.00
E Waikato	3.18	0.00	0.00	0.00
W Waikato	0.11	0.14	0.00	0.00
west BOP	0.00	0.16	0.00	0.00
Tauranga	0.00	0.00	0.00	0.00
east BOP	0.00	0.00	0.00	0.00
Rotorua	0.00	0.00	0.00	0.00
Gisborne	0.42	0.00	0.00	0.00
Hawkes Bay	3.79	0.74	0.00	0.00
Taranaki	1.55	1.21	0.00	0.00
King country	1.98	0.26	0.00	0.00
Man Wang	0.13	0.00	0.00	0.00
Wellington	0.00	0.00	0.00	0.00
Nel Tasman	0.00	0.00	0.00	0.00
Marl Roads	0.00	0.00	0.00	0.00
N Canterbury	0.00	0.00	0.00	0.00
S Canterbury	0.00	0.00	0.00	0.00
West Coast	1.62	0.00	0.00	0.00
cen Otago	0.00	0.00	0.00	0.00
coastal Otg	0.32	0.00	0.40	0.00
Southland	0.99	0.30	0.00	0.00
ALL NZ SH	14.18	4.67	0.40	0.00
19.25	73.7%	24.3%	2.1%	0.0%





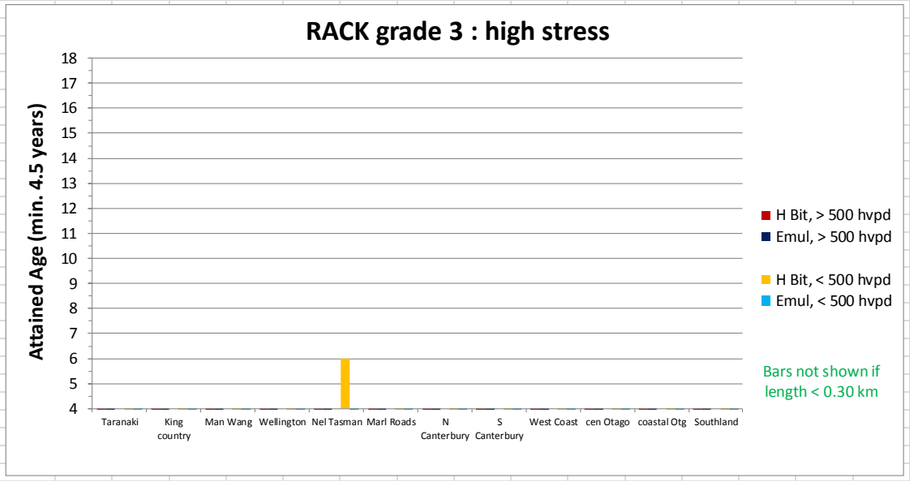
Existing Network	Bitumen < 500 hvpd	Bitumen > 500 hvpd	Emulsion < 500 hvpd	Emulsion > 500 hvpd
Northland	0.00	1.14	0.00	0.00
nth Auck	0.00	0.00	0.00	0.00
Auckland	0.00	0.00	0.00	0.00
cen Waikato	0.07	1.05	0.00	0.00
E Waikato	0.64	0.27	0.00	0.00
W Waikato	0.71	0.25	0.00	0.00
west BOP	0.00	0.57	0.00	0.00
Tauranga	0.00	0.00	0.00	0.00
east BOP	0.68	0.00	0.00	0.00
Rotorua	0.00	0.07	0.00	0.06
Gisborne	0.08	0.00	0.00	0.00
Hawkes Bay	3.14	0.69	0.00	0.00
Taranaki	2.24	2.79	0.00	0.00
King country	0.50	0.71	0.00	0.00
Man Wang	0.08	0.04	0.00	0.00
Wellington	0.00	0.00	0.00	0.00
Nel Tasman	0.00	0.00	0.00	0.00
Marl Roads	0.00	0.00	0.00	0.00
N Canterbury	0.00	0.00	0.00	0.00
S Canterbury	0.00	0.00	0.00	0.00
West Coast	0.77	0.00	0.00	0.00
cen Otago	0.00	0.00	0.00	0.00
coastal Otg	2.21	0.00	0.11	0.00
Southland	0.44	0.57	0.00	0.00
ALL NZ SH	11.55	8.13	0.11	0.06
19.86	58.2%	41.0%	0.6%	0.3%

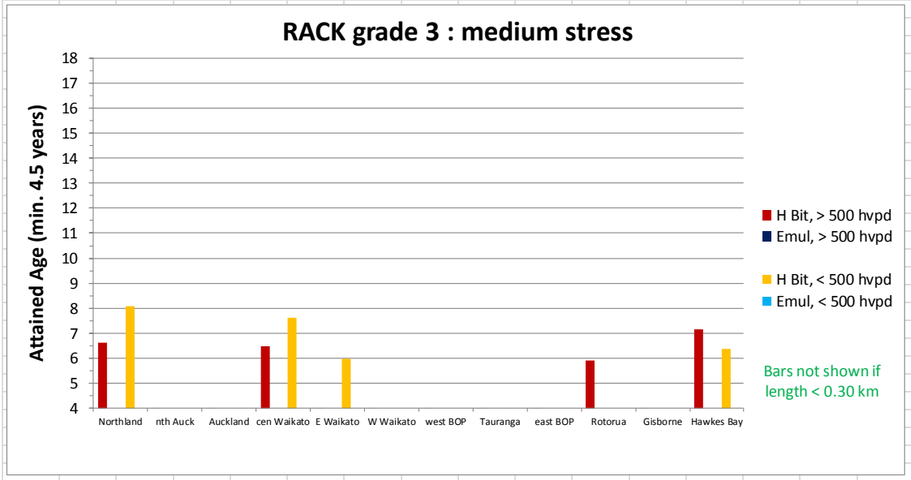




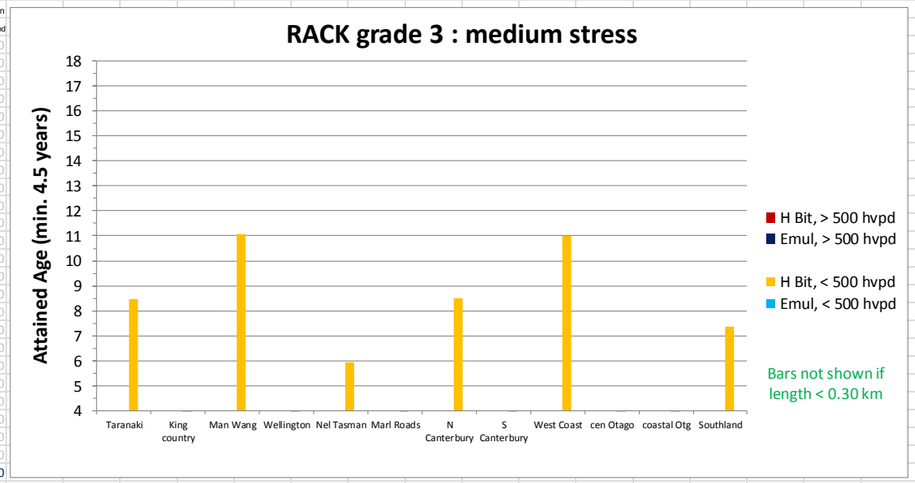
85.59 Carriageway kilometres

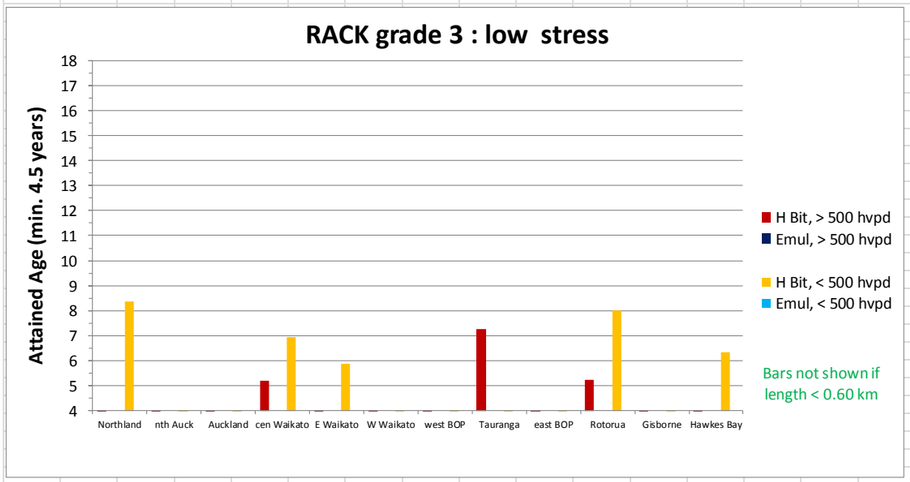
Existing Network	Bitumen < 500 hvpd	Bitumen > 500 hvpd	Emulsion < 500 hvpd	Emulsion > 500 hvpd
Northland	0.45	0.00	0.00	0.00
nth Auck	0.00	0.00	0.00	0.00
Auckland	0.00	0.00	0.00	0.00
cen Waikato	0.26	0.00	0.00	0.00
E Waikato	2.24	0.00	0.00	0.00
W Waikato	0.00	0.00	0.00	0.00
west BOP	0.19	0.00	0.00	0.00
Tauranga	0.00	0.00	0.00	0.00
east BOP	0.00	0.00	0.00	0.00
Rotorua	0.00	0.50	0.00	0.00
Gisborne	0.00	0.00	0.00	0.00
Hawkes Bay	0.22	0.03	0.00	0.00
Taranaki	0.21	0.00	0.00	0.00
King country	0.00	0.07	0.00	0.00
Man Wang	0.11	0.00	0.00	0.00
Wellington	0.00	0.00	0.00	0.00
Nel Tasman	0.42	0.00	0.00	0.00
Marl Roads	0.00	0.00	0.00	0.00
N Canterbury	0.00	0.00	0.00	0.00
S Canterbury	0.00	0.00	0.00	0.00
West Coast	0.00	0.00	0.00	0.00
cen Otago	0.00	0.00	0.00	0.00
coastal Otg	0.00	0.00	0.08	0.00
Southland	0.17	0.00	0.00	0.00
ALL NZ SH	4.27	0.60	0.08	0.00
4.96	86.2%	12.2%	1.6%	0.0%



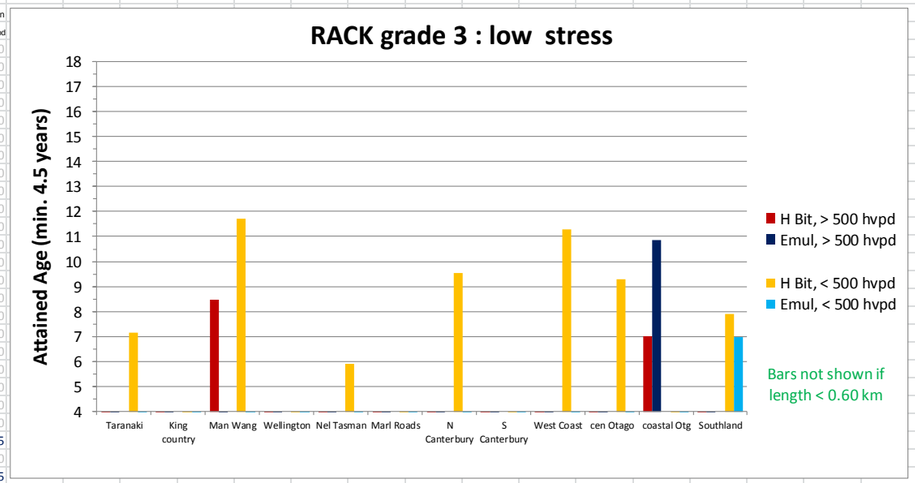


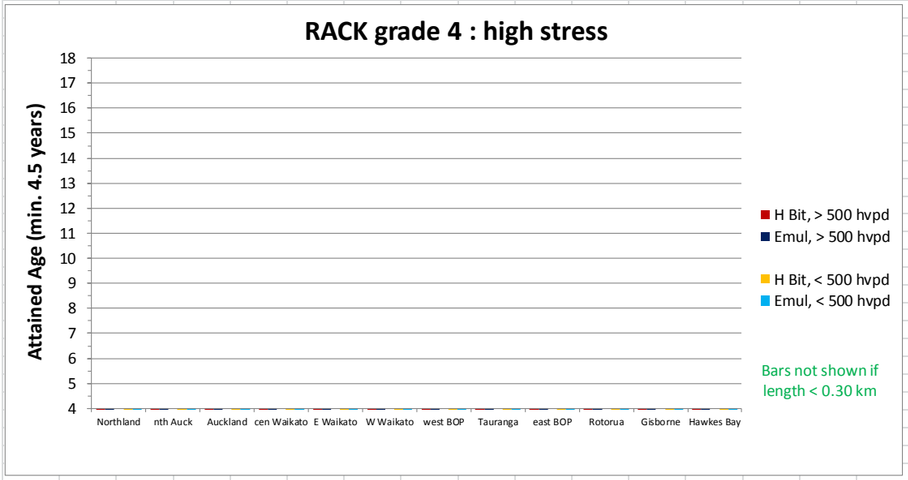
Existing Network	Bitumen < 500 hvpd	Bitumen > 500 hvpd	Emulsion < 500 hvpd	Emulsion > 500 hvpd
Northland	3.98	0.32	0.17	0.00
nth Auck	0.00	0.00	0.00	0.00
Auckland	0.00	0.00	0.00	0.00
cen Waikato	0.80	3.99	0.00	0.00
E Waikato	2.53	0.00	0.00	0.00
W Waikato	0.00	0.00	0.00	0.00
west BOP	0.00	0.09	0.00	0.00
Tauranga	0.00	0.21	0.00	0.00
east BOP	0.10	0.05	0.00	0.00
Rotorua	0.00	1.68	0.00	0.00
Gisborne	0.00	0.00	0.00	0.00
Hawkes Bay	0.91	0.35	0.00	0.00
Taranaki	1.41	0.21	0.00	0.00
King country	0.00	0.05	0.00	0.00
Man Wang	0.97	0.15	0.00	0.00
Wellington	0.00	0.00	0.00	0.00
Nel Tasman	2.06	0.00	0.00	0.00
Marl Roads	0.00	0.00	0.00	0.00
N Canterbury	1.87	0.00	0.00	0.00
S Canterbury	0.00	0.00	0.00	0.00
West Coast	3.60	0.00	0.00	0.00
cen Otago	0.08	0.00	0.00	0.00
coastal Otg	0.13	0.09	0.06	0.00
Southland	0.52	0.00	0.00	0.00
ALL NZ SH	18.97	7.19	0.23	0.00
26.38	71.9%	27.2%	0.9%	0.0%



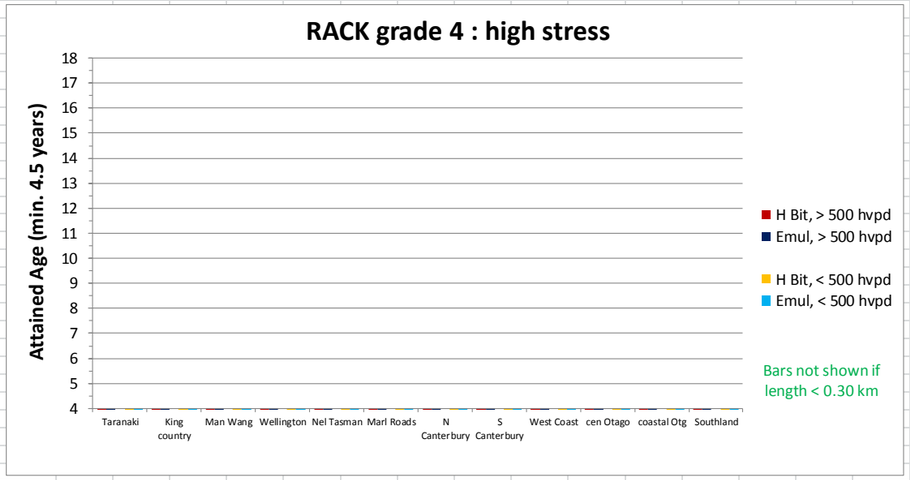


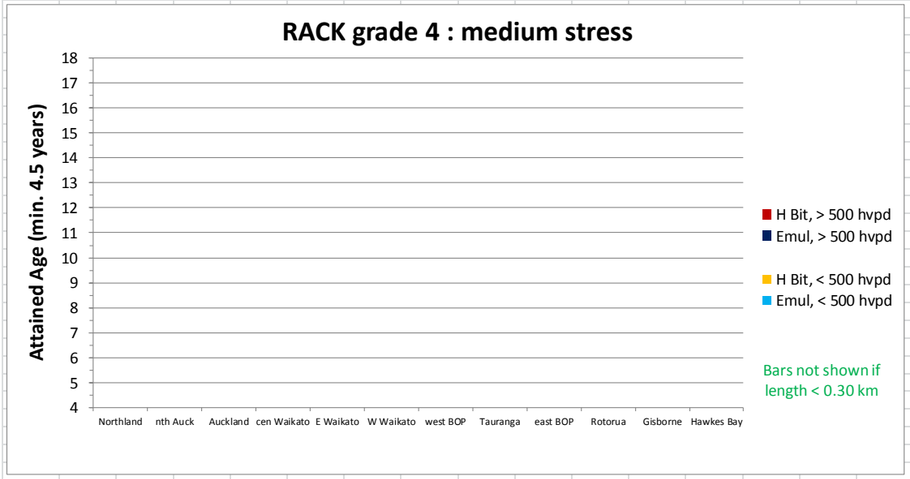
Existing Network	Bitumen < 500 hvpd	Bitumen > 500 hvpd	Emulsion < 500 hvpd	Emulsion > 500 hvpd
Northland	1.91	0.31	0.17	0.00
nth Auck	0.00	0.00	0.00	0.00
Auckland	0.00	0.00	0.00	0.00
cen Waikato	3.50	16.27	0.00	0.00
E Waikato	2.04	0.02	0.00	0.00
W Waikato	0.00	0.00	0.00	0.00
west BOP	0.02	0.57	0.00	0.00
Tauranga	0.00	2.84	0.00	0.00
east BOP	0.03	0.00	0.00	0.00
Rotorua	1.12	0.88	0.00	0.00
Gisborne	0.00	0.00	0.00	0.00
Hawkes Bay	0.96	0.38	0.00	0.00
Taranaki	1.43	0.09	0.00	0.00
King country	0.00	0.00	0.00	0.00
Man Wang	0.78	1.39	0.00	0.00
Wellington	0.00	0.00	0.00	0.00
Nel Tasman	1.78	0.00	0.00	0.00
Marl Roads	0.00	0.00	0.00	0.00
N Canterbury	3.06	0.00	0.00	0.00
S Canterbury	0.00	0.00	0.00	0.00
West Coast	7.66	0.00	0.00	0.00
cen Otago	1.45	0.00	0.00	0.00
coastal Otg	0.07	2.54	0.06	0.65
Southland	1.37	0.00	0.91	0.00
ALL NZ SH	27.16	25.30	1.14	0.65
54.25	50.1%	46.6%	2.1%	1.2%



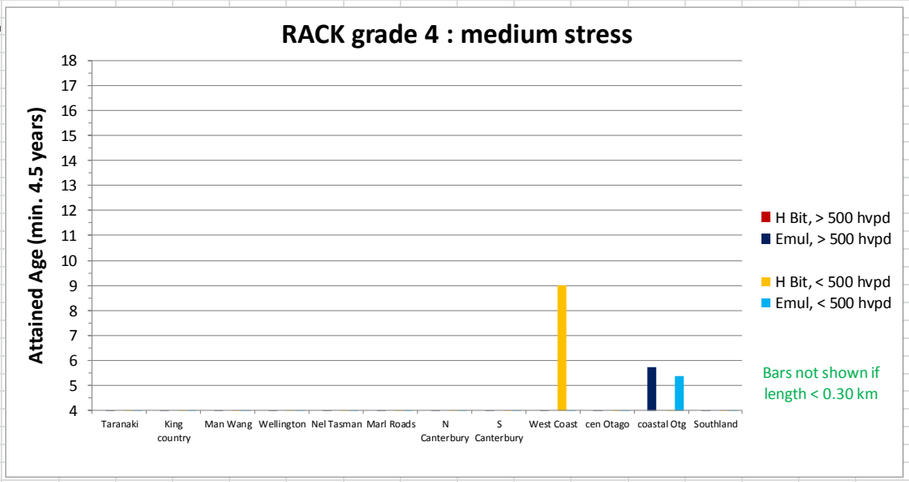


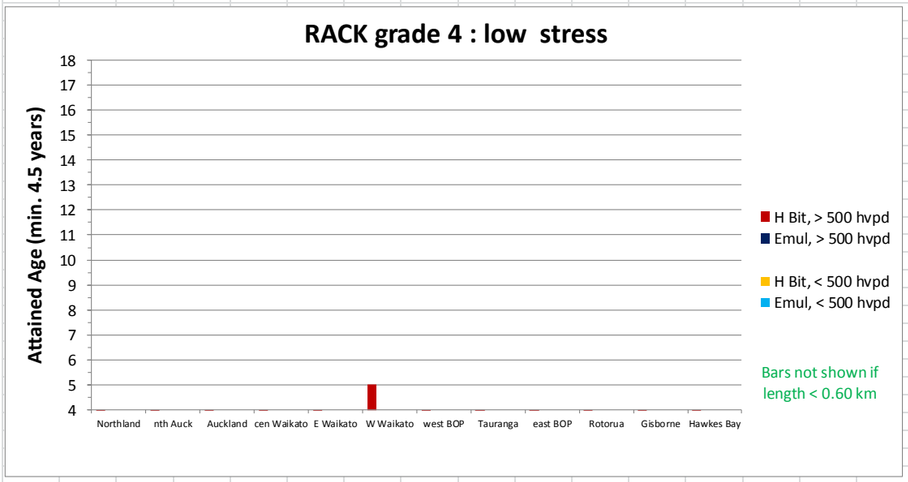
13.91	Carriageway kilometres			
Existing	Bitumen	Bitumen	Emulsion	Emulsion
Network	< 500 hvpd	> 500 hvpd	< 500 hvpd	> 500 hvpd
Northland	0.00	0.00	0.00	0.00
nth Auck	0.00	0.00	0.00	0.00
Auckland	0.00	0.00	0.00	0.00
cen Waikato	0.00	0.00	0.00	0.00
E Waikato	0.00	0.00	0.00	0.00
W Waikato	0.00	0.00	0.00	0.00
west BOP	0.00	0.00	0.00	0.00
Tauranga	0.00	0.00	0.00	0.00
east BOP	0.00	0.00	0.00	0.00
Rotorua	0.00	0.00	0.00	0.00
Gisborne	0.00	0.00	0.00	0.00
Hawkes Bay	0.00	0.00	0.00	0.00
Taranaki	0.00	0.00	0.00	0.00
King country	0.00	0.00	0.00	0.00
Man Wang	0.00	0.00	0.00	0.00
Wellington	0.00	0.00	0.00	0.00
Nel Tasman	0.00	0.00	0.00	0.00
Marl Roads	0.00	0.00	0.00	0.00
N Canterbury	0.00	0.00	0.00	0.00
S Canterbury	0.00	0.00	0.00	0.00
West Coast	0.00	0.00	0.00	0.00
cen Otago	0.00	0.00	0.00	0.00
coastal Otg	0.00	0.00	0.00	0.00
Southland	0.00	0.00	0.00	0.00
ALL NZ SH	0.00	0.00	0.00	0.00
0.00	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!



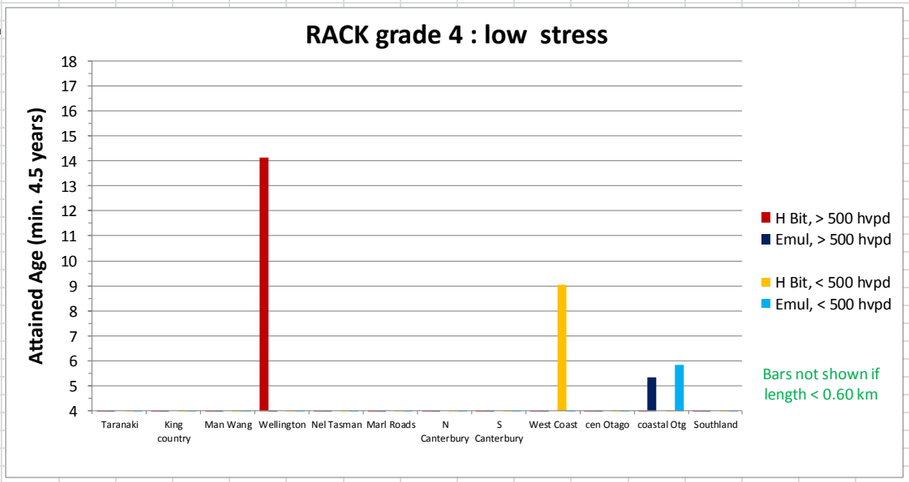


Existing	Bitumen	Bitumen	Emulsion	Emulsion
Network	< 500 hvpd	> 500 hvpd	< 500 hvpd	> 500 hvpd
Northland	0.00	0.00	0.00	0.00
nth Auck	0.00	0.00	0.00	0.00
Auckland	0.00	0.00	0.00	0.00
cen Waikato	0.00	0.00	0.00	0.00
E Waikato	0.00	0.00	0.00	0.00
W Waikato	0.00	0.00	0.00	0.00
west BOP	0.00	0.00	0.00	0.00
Tauranga	0.00	0.00	0.00	0.00
east BOP	0.00	0.00	0.00	0.00
Rotorua	0.00	0.00	0.00	0.00
Gisborne	0.00	0.00	0.00	0.00
Hawkes Bay	0.00	0.00	0.00	0.00
Taranaki	0.00	0.00	0.00	0.00
King country	0.00	0.00	0.00	0.00
Man Wang	0.00	0.00	0.00	0.00
Wellington	0.00	0.00	0.00	0.00
Nel Tasman	0.00	0.00	0.00	0.00
Marl Roads	0.00	0.00	0.00	0.00
N Canterbury	0.00	0.00	0.00	0.00
S Canterbury	0.00	0.00	0.00	0.00
West Coast	0.60	0.00	0.00	0.00
cen Otago	0.00	0.00	0.00	0.00
coastal Otg	0.00	0.00	0.93	1.39
Southland	0.00	0.00	0.00	0.00
ALL NZ SH	0.60	0.00	0.93	1.39
2.92	20.7%	0.0%	31.8%	47.5%





Existing	Bitumen	Bitumen	Emulsion	Emulsion
Network	< 500 hvpd	> 500 hvpd	< 500 hvpd	> 500 hvpd
Northland	0.00	0.00	0.00	0.00
nth Auck	0.00	0.00	0.00	0.00
Auckland	0.00	0.00	0.00	0.00
cen Waikato	0.00	0.00	0.00	0.00
E Waikato	0.00	0.00	0.00	0.00
W Waikato	0.00	1.40	0.00	0.00
west BOP	0.00	0.00	0.00	0.00
Tauranga	0.00	0.00	0.00	0.00
east BOP	0.01	0.00	0.00	0.00
Rotorua	0.00	0.00	0.00	0.00
Gisborne	0.00	0.00	0.00	0.00
Hawkes Bay	0.00	0.00	0.00	0.00
Taranaki	0.00	0.00	0.00	0.00
King country	0.00	0.00	0.00	0.00
Man Wang	0.00	0.00	0.00	0.00
Wellington	0.00	1.52	0.00	0.00
Nel Tasman	0.00	0.00	0.00	0.00
Marl Roads	0.00	0.00	0.00	0.00
N Canterbury	0.00	0.00	0.00	0.00
S Canterbury	0.00	0.00	0.00	0.00
West Coast	1.11	0.00	0.00	0.00
cen Otago	0.00	0.00	0.00	0.00
coastal Otg	0.00	0.00	5.20	1.75
Southland	0.00	0.00	0.00	0.00
ALL NZ SH	1.12	2.92	5.20	1.75
10.99	10.2%	26.5%	47.3%	15.9%



Appendix C: National Summary Results

																												layer: 2=most recent			surf_fn: 2nd coats & reseals			
D Wanty, MWH Wgtn					2 pages re 24 surfacing categories across the current 24 state highway networks and 9 pages re binder/emulsion analysis by horiz curvature and traffic stress																							binder: B; poly %: >=0; ramps?: N; pvt type: T; HZS:L;widen?: 3.0/1.5						
draft at 30 Oct 2013					IMPORTANT NOTE: The results are provisional, based on RAMM records downloaded mid-end Oct 2013 without further checking. Interpret and use with caution.																							unless stated otherwise, sub-areas=ALL						
type	code	16.5	NL	P5	AK	CW	EW	WW	BW	TG	BE	RD	GB	HB	TW	P6	WM	WN	NN	MR	NC	SC	WC	OC	CO	SL	0	Group	Group	Group	Group	Group	Group	All NZ
size	processed?		existing	existing	existing	existing	existing	existing	existing	existing	existing	existing	existing	existing	existing	existing	existing	existing	existing	existing	existing	existing	existing	existing	existing	existing	2	1	2	3	4	5	6	>0
hierarchy	network		Northland	nth Auck	Auckland	cen Waikato	E Waikato	W Waikato	west BOP	Tauranga	east BOP	Rotorua	Gisborne	Hawkes Bay	Taranaki	King country	Man Wang	Wellington	Nel Tasman	Marl Roads	Canterbury	Canterbury	West Coast	cen Otago	coastal Otg	Southland		key urban Ak,Tg,Wn	northern Nth Island	Bay of Plenty	southern Nth Island	northern Sth Island	southern Sth Island	sealed State Highways
	Group4		2	1	1	2	3	2	3	1	3	3	4	3	4	2	4	1	5	5	5	6	5	6	6	6		106.796	559.607	415.553	455.691	779.649	########	3587.581
TOP: 1/2/R; Flex; all binders			403.61	92.78	4.71	117.48	331.26	154.88	22.19	2.67	266.06	167.23	199.72	116.28	315.96	252.53	725.9	62.89	167.78	142.22	303.78	248.34	208.91	342.66	150.18	239.03								
1C: urban	c'way km	314	11.87	0.00	0.00	6.83	12.03	5.03	1.15	2.04	2.91	1.42	2.68	5.03	16.84	2.12	7.14	1.48	3.49	0.46	13.84	3.46	8.72	1.27	5.32	10.72		3.52	25.85	22.54	26.65	26.51	20.77	125.84
1C: rural	c'way km	314	271.02	5.45	0.26	276.70	94.33	33.38	51.39	4.36	38.50	22.13	38.91	183.61	215.63	73.26	316.54	49.98	120.93	95.83	245.85	94.03	261.61	150.51	194.82	420.43		60.05	654.36	389.95	571.07	724.21	859.79	3259.44
2C: urban	c'way km	314	38.11	6.45	3.08	3.79	36.25	17.93	2.74	8.73	17.37	17.26	16.78	19.52	40.84	19.23	26.90	7.49	7.04	4.58	35.36	28.96	38.03	4.42	20.69	20.65		25.75	79.05	93.15	84.53	85.00	74.72	442.20
2C: rural	c'way km	314	388.27	86.33	1.68	254.58	316.97	173.05	94.49	12.93	270.31	155.91	265.40	281.69	547.24	249.88	148.08	59.36	219.80	146.39	393.81	425.55	553.46	365.17	502.86	321.90		160.30	1065.78	1119.36	960.73	1313.45	1615.48	6235.10
AC: urban	c'way km	314	19.70	9.72	13.78	8.25	12.67	41.62	3.92	37.37	2.59	17.02	1.49	6.38	21.15	4.44	10.20	38.29	13.82	8.41	67.86	14.06	7.14	4.21	26.37	24.84		99.17	74.01	42.58	32.84	97.22	69.48	415.29
AC: rural	c'way km	314	20.78	22.53	50.37	7.07	51.18	26.10	11.55	11.23	7.45	2.24	0.68	11.81	5.20	6.31	6.10	38.78	15.08	6.34	19.37	0.99	5.67	0.66	17.46	6.66		122.91	60.26	84.22	11.97	46.46	25.75	351.57
M'way all	c'way km	324	0.00	0.00	403.52	0.00	0.00	58.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	117.17	0.00	0.00	11.95	0.00	0.00	0.00	0.00	0.00		520.69	58.39	0.00	0.00	11.95	0.00	591.03
Other: all	c'way km		0.54	0.11	0.67	1.61	0.80	1.87	0.19	0.14	0.00	0.00	4.85	0.59	5.43	0.52	1.25	1.59	5.56	0.46	1.85	2.80	0.00	15.60	31.83	3.68		2.52	4.53	1.58	11.53	7.87	53.91	81.94
ALL	(smylaid)	324	750.29	130.60	473.37	558.83	524.22	357.36	165.44	76.80	339.13	215.96	330.78	508.63	852.33	355.75	516.21	314.13	385.71	262.45	789.88	569.85	874.64	541.83	799.36	808.88		994.90	2022.23	1753.38	1699.31	2312.68	2719.91	11502.40
2CHIP:all	% c'way km	104	0.54	0.71	0.01	0.21	0.63	0.43	0.13	0.03	0.78	0.77	0.60	0.23	0.37	0.71	0.14	0.20	0.43	0.54	0.39	0.44	0.23	0.63	0.19	0.30		0.16	0.46	0.52	0.35	0.35	0.36	0.38
~% 1st coats	(flex+rigid)	174	0.06	0.00	0.05	0.03	0.04	0.08	0.02	0.15	0.01	0.01	0.06	0.05	0.02	0.07	0.01	0.03	0.01	0.07	0.06	0.03	0.02	0.01	0.01	0.02		47.18	113.04	55.41	38.07	88.42	46.17	388.29
LAYER 2: 2/R;Flex;all binders			43.45	0.00	25.56	15.64	21.41	27.61	4.09	11.27	2.55	3.20	18.86	24.12	14.10	26.30	5.11	10.35	4.69	17.95	49.11	14.83	16.75	5.61	11.28	14.42								
1CHIP	num TL	306	6	5	5	8	5	8	18	1	0	0	0	7	0	8	24	50	0	0	0	0	0	0	0	0		61	30	30	24	0	0	145
2	c'way km	0	1.46	0.77	0.75	0.54	1.63	2.32	2.61	0.01	0.00	0.00	0.00	2.21	0.00	1.61	2.96	13.21	0.00	0.00	0.00	0.00	0.00	0.00	0	0		15	6	6	3	0	0.00	30.08
R1																																		
	avg life	0	7.64	0.00	8.82	11.16	7.43	14.01	7.68	7.89	0.00	0.00	0.00	12.43	0.00	10.44	9.85	15.96	0.00	0.00	0.00	0.00	0.00	0.00	0	0.00		14.76	11.21	9.25	9.85			12.39
	std dev	306	0.52	0.00	2.13	2.10	0.28	1.05	2.82	0.00	0.00	0.00	0.00	7.07	0.00	1.89	2.13	4.50	0.00	0.00	0.00	0.00	0.00	0.00	0	0.0		5.7	2.9	5.1	2.1	0.0	0.00	5.43
1CHIP	num TL	306	62	8	0	72	97	47	49	0	20	28	0	77	101	22	243	11	15	56	0	0	0	0	2	6		19	203	271	344	71	8	916
2	c'way km	0	9.17	0.92	0.00	11.91	20.41	10.98	9.15	0.00	2.48	6.64	0.00	19.90	15.05	5.04	47.20	2.33	1.03	9.49	0.00	0.00	0.00	0.00	0.20	1.69		3.2	37.1	58.6	62.2	10.5	1.9	173.60
R2																																		
	avg life	0	12.53	0.00	0.00	12.18	10.08	12.64	10.09	0.00	12.00	11.40	0.00	10.47	14.03	13.40	11.98	15.12	12.60	11.97	0.00	0.00	0.00	0.00	7.80	10.11		10.86	12.57	10.44	12.48	12.03	9.87	11.72
	std dev	306	3.16	0.00	0.00	2.91	3.51	4.98	5.12	0.00	2.69	1.26	0.00	2.12	3.50	5.37	4.56	6.93	1.99	3.91	0.00	0.00	0.00	0.00	1.29	4.05		9.0	4.1	3.3	4.4	3.8	3.9	4.2
1CHIP	num TL	306	281	4	0	36	145	13	0	0	32	13	83	117	161	53	62	7	177	102	28	0	0	2	10	2		11	383	307	306	307	14	1328
2	c'way km	0	36.27	0.06	0.00	8.56	16.70	1.88	0.00	0.00	4.23	5.10	16.84	18.78	22.90	6.86	11.87	0.61	25.23	12.51	4.03	0.00	0.00	0.11	3.90	0.97		1	54	45	52	42	5	197
R3																																		
	avg life	0	10.85	0.00	0.00	14.01	10.39	10.17	0.00	0.00	11.70	11.33	9.44	9.59	12.20	12.08	13.59	9.37	13.46	12.85	9.01	0.00	0.00	27.06	10.63	9.69		8.52	11.49	10.29	11.62	12.85	10.81	11.51
	std dev	306	4.77	0.00	0.00	3.96	3.27	1.51	0.00	0.00	2.64	2.07	2.62	1.73	4.66	4.03	2.91	0.56	5.12	4.08	2.18	0.00	0.00	0.00	3.30	0.38		2.7	4.6	2.6	4.1	4.8	3.8	4.2
1CHIP	num TL	306	120	0	0	23	16	0	0	0	35	0	94	101	161	22	3	0	38	28	0	0	0	5	22	0		0	165	152	258	66	27	668
2	c'way km	0	14.21	0.00	0.00	4.97	1.11	0.00	0.00	0.00	2.37	0.00	10.42	14.74	17.69	2.62	0.04	0.00	8.12	4.24	0.00	0.00	0.00	1.10	4.71	0.00		0	22	18	28	12	6	86
R4																																		
	avg life	0	9.91	0.00	0.00	14.74	10.51	0.00	0.00	0.00	15.73	0.00	8.38	10.66	12.36	7.93	13.00	0.00	11.28	16.17	0.00	0.00	0.00	18.61	12.05	0.00			10.77	11.31	10.89	12.96	13.29	11.41
	std dev	306	4.27	0.00	0.00	1.48	3.14	0.00	0.00	0.00	4.38	0.00	2.07	3.60	2.23	2.42	2.42	0.00	2.58	3.23	0.00	0.00	0.00	0.64	0.83	0.00		0.0	4.3	4.1	2.9	3.7	2.7	3.7
1CHIP	num TL	306	15	18	28	8	20	39	27	19	0	3	0	14	2	17	34	41	8	0	3	4	0	0	0	0		106	79	64	36	11	4	300
3	c'way km	0	3.32	2.75	2.36	4.72	3.86	8.78	3.74	3.36	0.00	0.50	0.00	6.50	0.33	2.27	3.27	5.74	2.78	0.00	0.90	4.52	0.00	0.00	0.00	0.00		14.2	19.1	14.6	3.6	3.7	4.5	59.71
R1																																		
	avg life	0	10.06	0.00	9.71	11.37	10.77	10.96	4.94	13.34	0.00	11.94	0.00	10.93	13.17	13.87	9.86	14.10	9.50	0.00	15.93	12.22	0.00	0.00	0.00	0.00		10.46	11.25	9.39	10.17	11.07	12.22	10.60
	std dev	306	1.06	0.00	1.29	3.31	1.61	2.02	0.67	5.29	0.00	0.39	0.00	3.80	0.00	2.52	2.45	4.10	3.56	0.00	0.00	0.32	0.00	0.00	0.00	0.00		6.5	2.6	3.8	2.5	4.1	0.3	4.2
1CHIP	num TL	306	58	20	0	93	61	98	125	8	5	29	0	43	139	29	305	38	38	21	66	52	189	3	196	248		66	278	263	444	314	499	1864
3	c'way km	0	11.84	2.39	0.00	17.84	10.17	16.52	16.71	0.70	0.73	4.17	0.00	6.90	21.27	5.36	62.77	14.24	8.74	2.30	18.27	16.77	55.10	0.89	46.74	92.64		17.3	51.6	38.7	84.0	84.4	157.1	433.07
R2																																		
	avg life	0	9.72	0.00	0.00	10.60	9.89	10.02	9.62	5.71	8.24	11.24	0.00	10.42	11.47	13.61	12.59	12.43	11.29	10.30	13.59	13.04	11.77	10.32	11.74	13.32		10.45	10.52	9.98	12.30	12.07	12.80	11.95
	std dev	306	2.73	0.00	0.00	3.94	2.51	3.81	4.71	1.38	0.46	3.30	0.00	3.34	2.99	2.73	4.14	4.36	2.47	3.08	4.83	2.61	1.66	2.04	3.67	4.62		5.9	3.7	3.8	3.9	2.9	4.2	4.1
1CHIP	num TL	306	362	72	0	125	157	44	0	1	19	41	25	73	333	125	140	84	272	150	294	136	186	375	205	584		157	656	290	498	902	1300	3803
3	c'way km	0	60.99	7.82	0.00	19.84	14.45	9.66	0.00	0.19	2.61	7.48	2.66	10.39	67.57	18.96	20.59	20.64	34.21	20.79	69.81	47.26	41.04	111.66	43.59	129.18		28.6	109.4	34.9	90.8	165.9	331.7	761.38
R3																																		
	avg life	0	12.15	0.00	0.00	9.77	8.59	9.08	0.00	7.21	8.81	12.05	14.84	7.92	13.20	13.40	10.87	11.27	9.15	12.79	14.15	11.88	12.04	12.93	13.78	12.98		8.17	11.67	9.15	12.72	12.43	12.91	12.25
	std dev	306	3.17	0.00	0.00	3.11	3.99	3.30	0.00	0.00	1.26	3.86	3.07	3.02	4.43	2.66	3.20	3.80	3.75	4.35	4.06	2.10	2.34	3.05	3.32	5.21		6.0	3.4	3.9	4.3	4.1	4.0	4.2
1CHIP	num TL	306	46	0	0	126	28	0	0	0	167	0	53	85	531	110	47	0	180	101	24	45	0	227	425	0		0	282	280	631	305	697	2195
3	c'way km	0	8.41	0.00	0.00	33.15	1.34	0.00	0.00	0.00	24.12	0.00	4.39	12.33	49.59	13.70	3.98	0.00	24.77	17.14	6.68	30.67	0.00	52.35	97.91	0.00		0.0	55.3	37.8	58.0	48.6	180.9	380.52
R4																																		
	avg life	0	13.87	0.00	0.00	12.12	6.18	0.00	0.00	0.00	11.80	0.00	8.99	9.32	11.05	12.29	13.37	0.00	12.52	12.79	12.35	17.52	0.00	14.65	13.74	0.00			12.43	10.79	11.06	12.59	14.65	13.13
	std dev	306	4.22	0.00	0.00	5.31	3.08	0.00	0.00	0.00	3.13	0.00	2.17	2.10	3.54	3.39	2.59	0.00	4.53	3.02	2.82	4.71	0.00	3.42	3.98	0.00		0.0	4.8	3.2	3.5	3.8	4.2	4.3
1CHIP	num TL	306	2	8	1	0	9	23	5	0	0	3	0	2	0	22	0	1	0	0	0	0	0	0	0	0		10	47	19	0	0	0	76
4	c'way km	0	0.24	0.33	0.04	0.00	0.68	4.78	0.53	0.00	0.00	0.30	0.00	0.39	0.00	3.66	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.5	8.7	1.9	0.0	0.0	0.0	11.03
R1																																		
	avg life	0	13.42	0.00	7.00	0.00	0.92	6.44	6.93	0.00	0.00	9.62	0.00	9.04	0.00	13.06	0.00	3.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		1.44	9.43	5.62				8.44
	std dev	306	0.00	0.00	0.00	0.00	2.19	3.21	0.95	0.00	0.00	1.39	0.00	0.00	0.00	1.40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		2.4	4.2	4.0	0.0	0.0	0.0	4.6
1CHIP	num TL	306	3	8	0	3	18	17	29	0	0	20	0	11	1	23	18	0	5	1	15	3	163	4	27	49		8	46	78	19	184	83	418
4	c'way km	0	0.97	1.50	0.00	0.05	3.51	2.37	3.87	0.00	0.00	1.95	0.00	3.44	0.25	4.34	1.44	0.00	0.45	0.01	3.51	2.25	39.25	1.89	6.01	17.36		1.5	7.7	12.8	1.7	43.2	27.5	94.40
R2																																		
	avg life	0	9.76	0.00	0.00	7.04	8.84	8.34	4.88	0.00	0.00	15.96	0.00	12.74	7.23	11.20	10.39	0.00	6.20	7.96	11.32	9.96	10.78	7.27	7.98	10.82		0.00	10.12	9.78	9.93	10.77	9.89	10.14
	std dev	306	0.61	0.00	0.00	2.90	5.10	3.13	1.82	0.00	0.00	6.63	0.00	0.04	0.00	4.47	3.20	0.00	0.00	0.00	3.54	0.91	2.16	0.00	2.09	2.02		0.0	4.0	5.5	3.2	2.3	2.3	3.4

hierarchy	network		Northland	nth Auck	Auckland	cen Waikato	E Waikato	W Waikato	west BOP	Tauranga	east BOP	Rotorua	Gisborne	Hawkes Bay	Taranaki	King country	Man Wang	Wellington	Nel Tasman	Marl Roads	Canterbury	Canterbury	West Coast	cen Otago	coastal Otg	Southland	key urban Ak,Tg,Wn	northern Nth Island	Bay of Plenty	southern Nth Island	northern Sth Island	southern Sth Island	sealed State Highways
1CHIP	num TL	306	27	0	0	18	125	16	0	0	0	5	3	4	21	41	9	13	63	21	105	28	259	2	57	112	13	102	134	33	448	199	929
4	c'way km	4	3.48	0.00	0.00	1.53	11.30	3.50	0.00	0.00	0.00	0.08	0.47	0.42	2.28	5.24	0.97	1.36	11.86	4.72	28.83	14.90	64.51	0.08	14.29	31.01	1.4	13.7	11.8	3.7	109.9	60.3	200.81
R3																																	
	avg life	4	4.77	0.00	0.00	10.07	7.64	7.97	0.00	0.00	0.00	11.85	4.07	7.05	6.51	9.30	9.07	8.62	9.07	11.74	12.17	10.12	10.80	12.66	13.13	10.12	8.62	7.90	7.65	6.87	11.01	10.84	10.46
	std dev	306	3.82	0.00	0.00	5.76	2.25	2.94	0.00	0.00	0.00	1.72	0.00	1.47	2.00	4.71	1.50	3.87	1.51	3.39	2.81	2.11	2.36	0.00	3.55	1.92	3.9	4.7	2.3	2.3	2.6	2.8	3.1
1CHIP	num TL	306	13	0	0	28	0	2	0	0	0	0	1	5	25	24	2	0	7	2	36	60	0	115	89	0	0	67	5	28	45	264	409
4	c'way km	4	1.88	0.00	0.00	9.70	0.00	0.38	0.00	0.00	0.00	0.00	0.05	0.76	2.03	3.04	0.08	0.00	0.19	0.10	14.28	27.19	0.00	29.63	24.45	0.00	0.0	15.0	0.8	2.2	14.6	81.3	113.74
R4																																	
	avg life	4	8.26	0.00	0.00	10.09	0.00	8.13	0.00	0.00	0.00	0.00	8.33	16.68	10.24	6.66	12.62	0.00	12.40	1.09	8.79	11.07	0.00	10.43	11.40	0.00		9.12	16.68	10.29	8.79	10.94	10.45
	std dev	306	0.54	0.00	0.00	4.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.73	1.32	1.35	2.49	0.00	2.17	0.00	3.02	1.12	0.00	1.42	3.62	0.00	0.0	3.8	0.7	1.5	3.1	2.3	2.8
2CHIP	num TL	306	7	8	5	6	32	38	0	14	11	19	0	5	0	0	13	48	1	0	0	0	0	0	0	0	75	51	67	13	1	0	207
2	c'way km	4	1.17	0.79	0.43	0.55	6.23	9.45	0.00	1.85	0.27	3.89	0.00	2.20	0.00	0.00	1.98	6.58	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.7	11.2	12.6	2.0	0.0	0.0	35.43
R1																																	
	avg life	4	4.81	0.00	1.10	5.06	5.60	6.27	0.00	8.20	5.15	9.08	0.00	9.69	0.00	0.00	8.26	7.00	5.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.40	6.06	7.38	8.26	5.28		6.74
	std dev	306	1.18	0.00	0.15	2.96	3.17	4.18	0.00	3.32	0.00	0.95	0.00	1.59	0.00	0.00	2.16	1.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.1	4.0	3.0	2.2	0.0	0.0	3.4
2CHIP	num TL	306	151	22	5	118	38	42	65	3	2	95	0	37	9	19	166	75	26	32	44	20	151	25	78	48	105	330	237	175	253	171	1271
2	c'way km	4	17.72	3.32	0.34	17.13	4.86	2.67	7.67	0.35	0.26	16.29	0.00	3.41	1.21	2.08	15.35	4.37	3.23	3.62	6.37	1.43	14.41	2.90	8.05	8.84	8.4	39.6	32.5	16.6	27.6	21.2	145.86
R2																																	
	avg life	4	5.43	0.00	0.99	5.76	6.25	4.61	6.34	4.75	1.68	8.00	0.00	5.17	6.75	7.93	5.96	8.92	9.52	6.05	10.50	7.90	9.56	8.69	7.25	6.77	4.89	5.65	7.00	6.02	9.31	7.29	6.88
	std dev	306	2.18	0.00	0.34	1.91	2.59	2.78	2.23	0.27	1.94	2.07	0.00	1.77	3.94	2.26	3.03	2.20	4.37	2.60	5.90	3.24	2.31	1.36	3.09	3.39	4.6	2.2	2.4	3.1	4.0	3.1	3.4
2CHIP	num TL	306	299	22	0	118	173	32	0	0	89	65	18	43	104	37	19	5	382	134	264	68	191	332	102	75	27	486	370	141	971	577	2572
2	c'way km	4	25.68	2.10	0.00	13.99	17.44	3.90	0.00	0.00	10.43	10.86	3.60	3.96	11.48	3.22	3.32	0.58	27.93	11.45	31.53	12.07	18.12	57.12	9.41	13.41	2.7	46.8	42.7	18.4	89.0	92.0	291.59
R3																																	
	avg life	4	6.13	0.00	0.00	5.62	6.24	5.32	0.00	0.00	8.20	8.99	5.91	6.17	7.91	4.26	10.24	9.88	5.49	5.36	8.66	9.78	10.50	9.06	8.81	7.97	2.15	5.78	7.41	7.94	7.62	8.97	7.69
	std dev	306	2.62	0.00	0.00	1.82	2.66	2.42	0.00	0.00	1.96	2.66	1.60	1.31	2.38	1.84	4.04	1.61	2.48	2.20	3.94	4.01	1.69	2.01	2.98	3.50	4.1	2.4	2.7	3.0	3.6	2.7	3.2
2CHIP	num TL	306	8	0	0	39	86	0	0	0	149	0	56	15	60	9	55	0	38	27	102	13	0	122	121	0	0	56	250	171	167	256	900
2	c'way km	4	0.52	0.00	0.00	4.30	10.05	0.00	0.00	0.00	13.11	0.00	6.03	1.20	3.47	0.29	3.95	0.00	3.18	3.03	22.86	0.72	0.00	32.05	22.76	0.00	0.0	5.1	24.4	13.5	29.1	55.5	127.51
R4																																	
	avg life	4	4.66	0.00	0.00	6.91	8.04	0.00	0.00	0.00	8.01	0.00	5.83	7.34	11.66	5.70	7.84	0.00	5.88	4.85	10.50	6.34	0.00	10.14	9.17	0.00		6.61	7.99	7.93	9.41	9.69	8.99
	std dev	306	3.82	0.00	0.00	3.30	2.20	0.00	0.00	0.00	1.53	0.00	1.05	1.64	4.96	4.27	0.52	0.00	2.36	1.29	3.22	3.46	0.00	2.04	2.65	0.00	0.0	3.5	1.8	3.5	3.7	2.4	3.0
2CHIP	num TL	306	2	3	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	6	0	0	0	0	9
3	c'way km	4	0.34	0.18	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.2	1.3	0.0	0.0	0.0	0.0	1.49
R1																																	
	avg life	4	4.00	0.00	0.00	0.00	0.00	10.95	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.18					8.10
	std dev	306	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	3.0	0.0	0.0	0.0	0.0	4.1
2CHIP	num TL	306	14	7	0	0	2	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	7	14	3	0	0	0	24
3	c'way km	4	1.56	0.64	0.00	0.00	0.59	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.6	1.6	0.8	0.0	0.0	0.0	3.01
R2																																	
	avg life	4	3.12	0.00	0.00	0.00	6.39	0.00	0.00	0.00	0.00	0.00	0.00	8.67	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.12	7.01				3.50
	std dev	306	0.62	0.00	0.00	0.00	2.74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.0	0.6	2.5	0.0	0.0	0.0	2.8
2CHIP	num TL	306	25	0	0	3	8	0	0	0	0	0	0	0	0	0	0	0	0	0	5	18	1	22	0	0	0	28	8	0	6	40	82
3	c'way km	4	1.59	0.00	0.00	0.34	0.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.59	4.68	0.01	8.25	0.00	0.00	0.0	1.9	0.7	0.0	1.6	12.9	17.16
R3																																	
	avg life	4	2.67	0.00	0.00	7.78	9.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.66	13.76	7.75	7.90	0.00	0.00		3.58	9.69		6.67	10.02	8.97
	std dev	306	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	1.48	0.00	0.86	0.00	0.00	0.0	2.2	0.0	0.0	0.1	3.0	3.5
2CHIP	num TL	306	0	0	0	0	0	0	0	0	0	0	0	0	0	15	0	0	0	0	0	16	0	0	0	0	0	15	0	0	0	16	31
3	c'way km	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.76	0.00	0.00	0.00	0.00	0.00	9.56	0.00	0.00	0.00	0.00	0.0	2.8	0.0	0.0	0.0	9.6	12.32
R4																																	
	avg life	4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.63	0.00	0.00	0.00	0.00	0.00	17.22	0.00	0.00	0.00	0.00		13.63				17.22	16.42
	std dev	306	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.96	0.00	0.00	0.00	0.00	0.00	2.90	0.00	0.00	0.00	0.00	0.0	1.0	0.0	0.0	0.0	2.9	3.0
RACK	num TL	306	1	0	0	5	0	0	3	10	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	10	6	4	0	0	0	20
3	c'way km	4	0.20	0.00	0.00	3.03	0.00	0.00	0.44	3.06	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.1	3.2	0.6	0.0	0.0	0.0	6.88
R1																																	
	avg life	4	5.81	0.00	0.00	4.77	0.00	0.00	4.30	7.33	0.00	0.00	0.00	6.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	7.33	4.84	4.93				5.95
	std dev	306	0.00	0.00	0.00	0.17	0.00	0.00	0.00	1.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.3	0.3	1.1	0.0	0.0	0.0	1.5
RACK	num TL	306	9	0	0	107	1	0	45	2	0	39	0	12	13	1	18	0	0	2	2	20	331	0	12	1	2	117	97	31	335	33	615
3	c'way km	4	0.97	0.00	0.00	24.82	0.02	0.00	4.95	0.04	0.00	4.84	0.00	0.66	0.97	0.01	2.19	0.00	0.00	0.08	0.08	4.13	36.21	0.00	3.11	2.23	0.0	25.8	10.5	3.2	36.4	9.5	85.30
R2																																	
	avg life	4	6.63	0.00	0.00	4.92	5.30	0.00	3.91	2.76	0.00	5.92	0.00	6.99	5.63	2.16	8.03	0.00	0.00	0.48	8.89	9.91	10.44	0.00	7.01	7.47	2.76	4.98	5.04	7.29	10.41	8.38	7.77
	std dev	306	2.43	0.00	0.00	1.26	0.00	0.00	0.99	1.81	0.00	1.45	0.00	1.60	1.98	0.00	3.34	0.00	0.00	0.00	0.59	1.67	2.90	0.00	2.53	0.53	1.8	1.4	1.7	3.2	2.9	2.3	3.4
RACK	num TL	306	75	0	0	70	69	0	0	0	6	3	1	31	85	3	5	0	78	0	96	25	220	0	4	30	0	148	109	91	394	59	801
3	c'way km	4	7.31	0.00	0.00	10.37	6.83	0.00	0.00	0.00	0.19	0.19	0.05	2.29	6.69	0.13	0.05	0.00	6.57	0.00	18.76	4.83	27.64	0.00	0.19	2.25	0.0	17.8	9.5	6.8	53.0	7.3	94.32
R3																																	
	avg life	4	7.70	0.00	0.00	5.55	5.85	0.00	0.00	0.00	4.80	3.52	4.16	5.85	6.29	6.28	5.68	0.00	4.97	0.00	10.58	9.80	9.72	0.00	7.99	7.13		6.44	5.78	6.27	9.44	8.93	8.24
	std dev	306	1.63	0.00	0.00	2.08	0.82	0.00	0.00	0.00	0.70	2.60	0.00	1.79	3.39	0.55	0.93	0.00	1.58	0.00	4.15	2.37	2.69	0.00	2.37	2.72	0.0	2.2	1.2	3.4	3.6	2.8	3.5
RACK	num TL	306	0	0	0	26	0	0	0	0	4	0	0	2	61	0	34	0	0	0	45	25	0	5	14	0	0	26	6	95	45	44	216
3	c'way km	4	0.00	0.00	0.00	3.68	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.02	3.56	0.00	2.83	0.00	0.00	0.00	8.09	3.81	0.00	1.96	0.95	0.00	0.0	3.7	0.1	6.4	8.1	6.7	24.94
R4																																	
	avg life	4	0.00	0.00	0.00	2.44	0.00	0.00	0.00	0.00	2.71	0.00	0.00	7.87	9.40	0.00	9.95	0.00	0.00	0.00	10.23	10.13	0.00	9.01	3.79	0.00		2.44	4.43	9.64	10.23	8.91	8.56
	std dev	306	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	1.16	0.00	0.00	1.83	5.23	0.00	2.78	0.00	0.00	0.00	3.13	1.84	0.00	0.69	1.86	0.00	0.0	0.6	2.8	4.3	3.1	2.7	4.1

1CHIP, low stress

hierarchy	network		Northland	nth Auck	Auckland	cen Waikato	E Waikato	W Waikato	west BOP	Tauranga	east BOP	Rotorua	Gisborne	Hawkes Bay	Taranaki	King country	Man Wang	Wellington	Nel Tasman	Marl Roads	Canterbury	Canterbury	West Coast	cen Otago	coastal Otg	Southland	key urban Ak,Tg,Wn	northern Nth Island	Bay of Plenty	southern Nth Island	northern Sth Island	southern Sth Island	sealed State Highways
1CHIP	km: grade 2	6	1.32	0.32	0.01	4.29	10.96	2.32	6.23	0.00	0.00	1.94	0.00	0.06	3.68	4.82	16.02	7.85	0.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	8.18	12.75	19.20	19.70	2.00	0.00	61.83
layer 2	km: grade 3	8	1.84	4.03	1.88	6.38	8.81	4.86	3.87	2.71	0.00	2.41	0.00	7.05	5.91	2.99	22.29	3.63	0.00	1.14	12.61	17.71	0.00	0.57	12.64	10.11	12.25	16.07	22.14	28.21	13.74	41.04	133.44
HCV R1	km: grade 4	10	0.27	0.57	0.00	0.03	0.97	2.51	0.75	0.00	0.00	0.27	0.00	2.63	0.00	2.43	0.19	0.00	0.00	0.01	2.59	0.00	0.00	0.00	0.89	2.43	0.57	5.23	4.62	0.19	2.60	3.32	16.53
Low stress	age: grade 2	7	10.0	7.7	21.5	12.2	10.1	14.0	9.2	0.0	0.0	11.8	0.0	13.6	12.7	11.9	11.8	16.7	0.0	9.5	0.0	0.0	0.0	0.0	0.0	0.0	16.4	12.2	10.0	11.9	9.5		11.9
4613	age: grade 3	9	9.4	11.3	9.7	10.2	10.7	11.2	7.9	14.4	0.0	10.3	0.0	11.0	10.9	13.7	13.2	14.0	0.0	12.2	14.7	13.0	0.0	11.7	11.4	14.2	12.6	11.0	10.3	12.7	14.5	12.8	12.3
binder B*	age: grade 4	11	12.7	11.0	0.0	9.1	12.1	8.9	7.0	0.0	0.0	28.7	0.0	12.7	0.0	15.0	13.5	0.0	0.0	8.0	11.1	0.0	0.0	0.0	8.7	12.1	11.0	12.0	12.6	13.5	11.1	11.2	11.8
1CHIP	km: grade 2	6	1.27	0.43	0.07	10.69	4.63	2.63	0.89	0.00	2.15	4.06	0.24	22.08	8.97	3.29	27.17	4.74	0.56	8.14	0.95	0.00	0.00	0.00	0.18	0.81	5.24	17.87	33.79	36.37	9.65	0.99	103.91
layer 2	km: grade 3	8	4.97	0.00	0.00	16.24	1.27	8.02	4.25	0.33	0.73	2.39	0.25	5.78	8.75	12.46	18.73	7.19	6.72	8.50	17.69	4.15	22.31	1.26	28.64	66.16	7.52	41.68	14.42	27.73	55.21	100.20	246.76
HCV R2	km: grade 4	10	0.00	0.00	0.00	0.03	0.88	0.63	0.00	0.00	0.00	0.95	0.00	0.49	0.00	5.21	0.23	0.00	0.00	0.15	6.92	1.84	5.04	1.70	4.06	22.33	0.00	5.87	2.32	0.23	12.11	29.93	50.46
Low stress	age: grade 2	7	10.3	8.7	12.9	12.7	10.0	14.2	23.2	0.0	12.7	11.1	7.8	10.6	14.6	14.5	13.0	13.9	12.9	14.9	10.4	0.0	0.0	0.0	8.2	8.5	13.5	13.1	11.1	13.4	14.3	8.4	12.6
4619	age: grade 3	9	9.4	0.0	0.0	10.7	7.3	11.3	14.7	5.0	8.2	12.0	12.1	10.8	11.8	13.5	11.8	9.3	9.6	12.4	16.5	10.7	12.2	9.5	12.5	13.3	9.1	11.5	11.7	11.8	13.3	12.9	12.4
binder B*	age: grade 4	11	0.0	0.0	0.0	6.4	13.1	11.3	0.0	0.0	0.0	14.9	0.0	12.5	0.0	10.2	8.2	0.0	0.0	13.8	10.5	9.9	10.3	7.3	7.7	9.8		10.3	13.7	8.2	10.4	9.4	9.9
1CHIP	km: grade 2	6	13.02	0.29	0.00	3.46	13.91	8.77	0.49	0.00	3.82	4.87	11.41	13.42	11.71	1.96	12.77	0.81	11.32	2.84	0.00	0.00	0.00	0.04	1.56	0.95	1.10	27.20	36.51	35.89	14.16	2.55	117.41
layer 2	km: grade 3	8	23.12	0.38	0.00	6.82	6.77	16.48	2.64	0.00	0.83	5.94	0.64	5.21	23.08	2.39	20.91	13.64	9.50	4.53	33.73	17.61	53.79	54.86	28.10	68.84	14.01	48.81	21.39	44.63	101.55	169.40	399.79
HCV R3	km: grade 4	10	0.31	0.00	0.00	0.45	4.50	4.68	0.00	0.00	0.00	0.67	0.00	0.38	1.24	0.06	1.53	0.80	3.37	0.00	13.00	1.05	73.50	0.07	5.62	11.10	0.80	5.51	5.54	2.77	89.87	17.84	122.32
Low stress	age: grade 2	7	13.4	11.5	0.0	16.1	11.0	11.8	8.0	0.0	11.2	11.6	10.3	9.8	12.8	12.9	13.0	16.4	14.6	12.0	0.0	0.0	0.0	27.1	8.3	9.7	15.1	13.2	10.6	12.1	14.1	9.1	12.1
4625	age: grade 3	9	11.8	9.5	0.0	12.3	8.6	9.5	8.6	0.0	8.6	12.2	10.0	7.5	11.6	12.3	12.6	13.7	10.2	14.5	13.6	12.5	12.0	12.7	14.1	14.4	13.6	11.1	9.3	12.0	12.4	13.6	12.6
binder B*	age: grade 4	11	12.0	0.0	0.0	14.1	8.6	7.5	0.0	0.0	0.0	13.4	0.0	6.7	6.5	9.6	9.8	10.8	10.0	0.0	12.6	9.7	11.0	12.7	12.9	11.9	10.8	8.3	9.0	8.3	11.2	12.1	11.0
1CHIP	km: grade 2	6	15.33	0.00	0.00	3.99	0.76	0.00	0.00	0.00	1.18	0.00	9.70	9.90	15.29	1.63	0.16	0.09	11.77	4.36	0.00	0.00	0.00	0.85	4.84	0.82	0.09	20.94	11.84	25.15	16.13	6.51	80.66
layer 2	km: grade 3	8	25.16	4.19	0.00	30.25	1.63	0.78	0.00	0.00	13.91	0.00	3.11	10.03	47.24	10.56	12.36	9.43	17.73	17.86	4.66	15.47	0.19	61.95	77.66	21.67	13.61	66.74	25.56	62.71	40.44	176.76	385.82
HCV R4	km: grade 4	10	3.03	0.00	0.00	6.46	0.42	0.38	0.00	0.00	0.00	0.03	0.05	0.76	0.57	1.03	0.00	0.05	1.74	3.57	11.96	24.98	0.75	22.01	25.75	5.19	0.05	10.89	1.21	0.62	18.02	77.92	108.71
Low stress	age: grade 2	7	11.6	0.0	0.0	15.0	9.1	0.0	0.0	0.0	16.5	0.0	8.3	11.2	13.2	8.5	10.2	10.7	11.7	16.1	0.0	0.0	0.0	18.9	12.5	10.0	10.7	12.0	11.6	11.3	12.9	13.0	12.0
4628	age: grade 3	9	13.2	10.7	0.0	11.5	11.5	9.9	0.0	0.0	11.8	0.0	11.2	9.5	13.6	13.8	12.7	12.6	13.7	13.2	12.0	15.4	12.8	14.7	13.8	11.3	12.0	12.5	10.9	13.3	13.3	13.9	13.2
binder B*	age: grade 4	11	9.1	0.0	0.0	11.5	6.0	8.1	0.0	0.0	0.0	11.5	8.3	16.7	10.8	7.4	25.3	6.3	10.5	12.6	10.5	11.1	9.2	10.6	12.2	9.3	6.3	10.4	12.8	10.7	10.9	11.2	11.1
1CHIP	km: grade 2	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
layer 2	km: grade 3	8	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	1.39	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	1.57	0.00	2.17
HCV R1	km: grade 4	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.41
Low stress	age: grade 2	7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0							
5813	age: grade 3	9	0.0	0.0	0.0	0.0	8.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.6	8.3	0.0	0.0	0.0	0.0	0.0			8.8		8.4		8.5
binder E*	age: grade 4	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.1	0.0	0.0	0.0	0.0						10.1	10.1
1CHIP	km: grade 2	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
layer 2	km: grade 3	8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.23	0.22	0.00	0.00	0.00	0.00	0.04	0.45	0.49
HCV R2	km: grade 4	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.23	0.23
Low stress	age: grade 2	7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0							
5819	age: grade 3	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.0	0.0	0.0	0.0	0.0	12.2	8.0					13.0	10.1	10.4
binder E*	age: grade 4	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.0						8.0	8.0
1CHIP	km: grade 2	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.48	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.58	0.00	0.58
layer 2	km: grade 3	8	1.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.99	0.00	0.00	0.00	0.35	0.00	0.00	1.04	0.00	0.00	0.99	0.35	2.39
HCV R3	km: grade 4	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.08	0.00	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.57	0.00	0.61
Low stress	age: grade 2	7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.2	0.0	12.6	0.0	0.0	0.0	0.0	0.0					11.4		11.4
5825	age: grade 3	9	10.2	0.0	0.0	0.0	6.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.0	0.0	0.0	0.0	8.6	0.0		10.2	6.4		11.0	8.6	10.3
binder E*	age: grade 4	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.0	0.0	9.0	0.0	11.9	0.0	0.0	0.0	0.0	0.0				18.0	11.5		12.0
1CHIP	km: grade 2	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00	1.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	1.08	0.00	1.23
layer 2	km: grade 3	8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.51	0.00	0.00	0.00	0.17	0.00	0.00	0.00	1.09	0.00	0.00	13.37	0.00	0.00	0.47	0.00	0.00	0.00	3.51	0.17	1.09	13.83	18.60
HCV R4	km: grade 4	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.19	0.00	0.61	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	1.80	0.14	1.94
Low stress	age: grade 2	7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.2	0.0	0.0	0.0	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0				11.2	7.0		7.5
5828	age: grade 3	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.8	0.0	0.0	0.0	5.6	0.0	0.0	0.0	10.4	0.0	0.0	21.0	0.0	0.0	12.9	0.0			10.8	5.6	10.4	20.7	18.1
binder E*	age: grade 4	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.9	0.0	12.0	0.0	0.0	0.0	5.1	0.0					9.9	5.1	9.6

2CHIP, low stress

hierarchy	network		Northland	nth Auck	Auckland	cen Waikato	E Waikato	W Waikato	west BOP	Tauranga	east BOP	Rotorua	Gisborne	Hawkes Bay	Taranaki	King country	Man Wang	Wellington	Nel Tasman	Marl Roads	Canterbury	Canterbury	West Coast	cen Otago	coastal Otg	Southland	key urban Ak,Tg,Wn	northern Nth Island	Bay of Plenty	southern Nth Island	northern Sth Island	southern Sth Island	sealed State Highways
2CHIP	km: grade 2	10	2.08	2.35	0.00	0.06	11.22	2.51	9.22	0.17	2.24	7.38	0.00	0.10	0.68	1.12	3.29	2.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.87	5.77	30.15	3.97	0.00	0.00	44.75
layer 2	km: grade 3	12	2.81	0.63	0.00	4.37	1.70	2.77	2.87	0.99	0.16	4.95	0.00	0.04	0.14	0.59	5.73	2.91	0.00	0.98	3.93	0.00	0.00	0.00	0.00	0.00	4.53	10.53	9.71	5.86	4.91	0.00	35.55
HCV R1	km: grade 4	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.57	0.00	0.00	0.00	0.00	0.00	1.57
Low stress	age: grade 2	11	5.4	6.9	0.0	14.3	7.3	7.3	7.2	7.8	5.7	10.1	0.0	5.9	10.1	7.1	7.3	6.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.9	6.6	7.9	7.7			7.6
4683	age: grade 3	13	5.0	9.1	0.0	6.3	7.5	7.9	7.0	8.4	5.1	9.6	0.0	5.9	9.4	10.2	7.8	7.7	0.0	5.7	14.4	0.0	0.0	0.0	0.0	0.0	8.1	6.6	8.4	7.9	12.7		8.3
binder B*	age: grade 4	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0				5.0		7.0
2CHIP	km: grade 2	10	0.10	0.97	0.00	1.36	7.24	8.74	4.19	0.00	13.09	15.15	1.08	5.28	2.41	5.75	0.69	0.45	0.00	0.00	0.06	0.00	0.00	0.00	2.54	1.38	1.42	15.95	44.95	4.17	0.06	3.92	70.47
layer 2	km: grade 3	12	1.28	1.68	0.00	8.88	1.24	1.67	0.63	0.00	1.52	9.83	0.00	3.74	0.56	1.73	2.13	0.36	0.69	3.61	1.59	0.00	0.01	0.07	2.06	3.86	2.04	13.56	16.96	2.69	5.91	5.99	47.14
HCV R2	km: grade 4	14	0.00	0.00	0.00	0.00	0.63	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.11	0.60	0.00	0.00	0.68	0.00	0.16	0.71	1.55
Low stress	age: grade 2	11	6.3	7.7	0.0	6.8	8.4	8.0	9.1	0.0	7.1	9.9	5.9	9.6	10.0	7.6	7.5	11.8	0.0	0.0	11.7	0.0	0.0	0.0	10.6	7.4	9.0	7.7	8.7	8.5	11.7	9.5	8.6
4689	age: grade 3	13	7.7	9.2	0.0	6.1	6.0	6.5	6.0	0.0	8.9	8.1	0.0	8.6	9.7	6.4	5.7	7.3	9.4	6.4	9.3	0.0	8.1	8.9	10.5	9.1	8.9	6.3	8.1	6.6	7.6	9.6	7.6
binder B*	age: grade 4	15	0.0	0.0	0.0	0.0	4.6	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.9	0.0	0.0	0.0	6.6	6.1			4.7		8.9	6.2	5.8
2CHIP	km: grade 2	10	0.91	0.75	0.00	0.22	10.12	1.11	0.00	0.00	21.28	11.40	16.91	11.21	2.95	0.74	1.17	0.55	0.11	0.66	0.01	0.00	0.00	0.00	0.89	0.00	1.30	2.98	54.00	21.03	0.78	0.89	80.97
layer 2	km: grade 3	12	4.09	0.47	0.00	0.71	9.31	1.71	0.59	0.00	4.07	5.99	2.81	1.01	2.23	0.00	0.86	0.40	4.28	0.19	6.76	2.18	0.01	1.90	1.68	1.66	0.87	6.52	20.96	5.90	11.24	7.42	52.90
HCV R3	km: grade 4	14	0.00	0.00	0.00	0.00	0.42	0.05	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.08	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.05	0.48	0.00	1.08	0.03	1.63
Low stress	age: grade 2	11	6.6	7.0	0.0	5.1	8.8	6.6	0.0	0.0	7.6	9.6	6.4	6.5	8.3	4.9	6.8	8.4	11.1	7.2	9.2	0.0	0.0	0.0	9.1	0.0	7.6	6.1	8.0	6.7	7.8	9.1	7.6
4695	age: grade 3	13	7.4	7.1	0.0	8.4	7.9	6.7	8.3	0.0	8.6	9.7	5.9	6.6	8.4	0.0	6.2	7.3	9.9	6.9	10.3	14.7	7.7	5.2	10.9	14.0	7.2	7.3	8.5	6.9	10.1	11.2	8.9
binder B*	age: grade 4	15	0.0	0.0	0.0	0.0	4.6	16.8	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.4	0.0	8.9	0.0	0.0	0.0	0.0		16.8	4.7		6.4	8.9	6.3
2CHIP	km: grade 2	10	2.02	0.75	0.00	0.75	2.90	0.00	0.00	0.00	30.43	0.00	31.47	2.03	4.55	0.47	0.00	0.77	0.00	0.00	1.35	0.00	0.00	0.07	1.68	2.49	1.52	3.24	35.35	36.02	1.35	4.24	81.72
layer 2	km: grade 3	12	1.50	0.54	0.00	2.35	4.72	0.24	0.00	0.00	7.33	0.62	1.81	0.51	2.47	2.08	0.49	0.37	1.34	2.33	2.82	5.45	0.00	9.76	14.45	1.40	0.91	6.17	13.18	4.77	6.48	31.06	62.57
HCV R4	km: grade 4	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.32	0.00	0.55	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.00	1.87	0.22	2.09
Low stress	age: grade 2	11	7.6	7.9	0.0	4.9	7.9	0.0	0.0	0.0	7.9	0.0	6.4	7.6	11.2	6.6	0.0	12.3	0.0	0.0	7.6	0.0	0.0	10.2	10.1	7.7	10.1	6.8	7.9	7.0	7.6	8.7	7.5
4698	age: grade 3	13	7.5	8.6	0.0	6.2	8.3	4.5	0.0	0.0	8.0	8.5	6.1	7.9	8.5	13.5	8.0	10.3	5.9	5.4	11.0	14.3	0.0	9.1	9.1	8.1	9.3	8.9	8.1	7.6	8.0	10.0	9.1
binder B*	age: grade 4	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.8	0.0	10.8	0.0	0.0	0.0	9.0	0.0					8.0	9.0	8.1
2CHIP	km: grade 2	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
layer 2	km: grade 3	12	0.00	0.00	0.00	0.00	1.46	1.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.22	0.31	0.00	1.50	1.46	0.00	0.06	0.53	3.55
HCV R1	km: grade 4	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.49	0.00	0.49
Low stress	age: grade 2	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0							
5883	age: grade 3	13	0.0	0.0	0.0	0.0	9.2	15.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0	9.1	6.2		15.0	9.2		6.0	7.4	11.3
binder E*	age: grade 4	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2	0.0	0.0	0.0	0.0	0.0	0.0					5.2		5.2
2CHIP	km: grade 2	10	0.00	0.00	0.00	0.00	0.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.67	0.41	0.00	0.02	0.98	0.00	0.11	1.08	2.19
layer 2	km: grade 3	12	0.00	0.00	0.00	0.84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.05	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.90	0.45	0.00	0.88	0.00	0.05	0.14	1.34	2.41
HCV R2	km: grade 4	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.65
Low stress	age: grade 2	11	0.0	0.0	0.0	0.0	9.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1	0.0	0.0	0.0	0.0	9.6	0.0	0.0	0.0	8.0	7.1		6.1	9.2		9.6	7.6	8.4
5889	age: grade 3	13	0.0	0.0	0.0	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	12.1	0.0	7.3	0.0	0.0	0.0	0.0	0.0	8.9	6.4		5.8		12.1	7.3	8.1	7.3
binder E*	age: grade 4	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0						10.0	10.0
2CHIP	km: grade 2	10	0.00	0.00	0.00	0.03	1.20	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.55	0.00	0.03	1.21	0.00	0.00	0.55	1.79
layer 2	km: grade 3	12	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.07	0.00	0.00	0.00	2.19	0.19	0.00	0.00	0.13	0.00	0.11	2.38	2.63
HCV R3	km: grade 4	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.31	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.00	0.36
Low stress	age: grade 2	11	0.0	0.0	0.0	6.4	7.5	0.0	0.0	0.0	0.0	9.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8		6.4	7.6			5.8	7.0
5895	age: grade 3	13	0.0	0.0	0.0	0.0	6.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	5.1	0.0	0.0	0.0	9.7	14.4			6.4		6.3	10.1	9.7
binder E*	age: grade 4	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	6.3	0.0	0.0	0.0	0.0	0.0	0.0					5.6		5.6
2CHIP	km: grade 2	10	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.00	0.00	0.06
layer 2	km: grade 3	12	0.00	0.00	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	1.23	0.00	0.73	0.00	0.00	0.00	0.00	0.00	0.15	4.63	0.00	0.00	0.89	0.05	0.00	0.91	0.00	1.96	0.15	5.57	8.59
HCV R4	km: grade 4	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.12
Low stress	age: grade 2	11	0.0	0.0	0.0	0.0	5.4	0.0	0.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			5.4	7.1			6.9
5898	age: grade 3	13	0.0	0.0	0.0	11.4	0.0	0.0	0.0	0.0	0.0	0.0	5.5	0.0	8.8	0.0	0.0	0.0	0.0	0.0	11.3	19.8	0.0	0.0	6.9	6.2		11.4		6.7	11.3	17.6	14.4
binder E*	age: grade 4	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0					7.8		7.8

RACK, low stress

hierarchy	network		Northland	nth Auck	Auckland	cen Waikato	E Waikato	W Waikato	west BOP	Tauranga	east BOP	Rotorua	Gisborne	Hawkes Bay	Taranaki	King country	Man Wang	Wellington	Nel Tasman	Marl Roads	Canterbury	Canterbury	West Coast	cen Otago	coastal Otg	Southland		key urban Ak,Tg,Wn	northern Nth Island	Bay of Plenty	southern Nth Island	northern Sth Island	southern Sth Island	sealed State Highways
RACK	km: grade 2	12	0.00	0.00	0.00	0.03	0.64	0.71	0.00	0.00	0.00	0.00	0.08	2.57	1.48	0.33	0.08	0.00	0.00	0.00	0.00	0.00	0.77	0.00	0.86	0.44		0.00	1.07	3.21	1.64	0.77	1.29	7.98
layer 2	km: grade 3	14	1.59	0.00	0.00	3.20	1.20	0.00	0.02	0.00	0.03	1.12	0.00	0.95	0.33	0.00	0.01	0.00	1.14	0.00	1.06	0.00	7.66	0.00	0.00	1.37		0.00	4.79	3.31	0.34	9.86	1.37	19.67
HCV R3	km: grade 4	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.11	0.00	0.00	0.00		0.00	0.00	0.00	0.00	1.11	0.00	1.11
Low stress	age: grade 2	13	0.0	0.0	0.0	7.1	6.0	7.2	0.0	0.0	0.0	0.0	6.0	6.7	8.4	7.4	4.9	0.0	0.0	0.0	0.0	0.0	12.0	0.0	9.2	13.8			7.3	6.5	8.1	12.0	10.8	8.2
4730	age: grade 3	15	8.2	0.0	0.0	7.0	5.6	0.0	4.8	0.0	5.0	8.0	0.0	6.3	11.1	0.0	6.0	0.0	5.4	0.0	8.7	0.0	11.3	0.0	0.0	7.9			7.4	6.6	11.0	10.3	7.9	8.8
binder B*	age: grade 4	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	0.0	0.0	0.0						9.0		9.0
RACK	km: grade 2	12	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.68	0.00	0.00	0.57	0.76	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.36	0.00		0.00	0.21	1.25	0.76	0.00	1.36	3.57
layer 2	km: grade 3	14	0.32	0.00	0.00	0.30	0.84	0.00	0.00	0.00	0.00	0.00	0.00	0.01	1.10	0.00	0.77	0.00	0.64	0.00	2.00	0.00	0.00	1.45	0.07	0.00		0.00	0.62	0.85	1.86	2.63	1.52	7.49
HCV R4	km: grade 4	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.01	0.00	0.00	0.00	0.01
Low stress	age: grade 2	13	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	4.9	0.0	0.0	6.0	6.7	7.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.1	0.0			7.8	5.4	6.7		10.1	7.6
4733	age: grade 3	15	9.1	0.0	0.0	6.5	6.2	0.0	0.0	0.0	0.0	0.0	0.0	6.0	6.0	0.0	11.8	0.0	6.8	0.0	10.0	0.0	0.0	9.3	7.9	0.0			7.9	6.2	8.4	9.2	9.2	8.5
binder B*	age: grade 4	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				5.0				5.0
RACK	km: grade 2	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.06	0.00	0.00	0.00	0.06
layer 2	km: grade 3	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00		0.00	0.00	0.00	0.00	0.00	0.65	0.65
HCV R1	km: grade 4	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.65	0.00		0.00	0.00	0.00	0.00	0.00	0.65	0.65
Low stress	age: grade 2	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				4.8				4.8
5918	age: grade 3	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.8	0.0							10.8	10.8
binder E*	age: grade 4	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0							5.0	5.0
RACK	km: grade 2	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
layer 2	km: grade 3	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
HCV R2	km: grade 4	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.10	0.00		0.00	0.00	0.00	0.00	0.00	1.10	1.10
Low stress	age: grade 2	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
5924	age: grade 3	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
binder E*	age: grade 4	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.5	0.0							5.5	5.5
RACK	km: grade 2	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
layer 2	km: grade 3	14	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.91		0.00	0.17	0.00	0.00	0.00	0.91	1.08
HCV R3	km: grade 4	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.51	0.00		0.00	0.00	0.00	0.00	0.00	4.51	4.51
Low stress	age: grade 2	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
5930	age: grade 3	15	9.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0			9.3				7.0	7.3
binder E*	age: grade 4	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	0.0							5.8	5.8
RACK	km: grade 2	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.00		0.00	0.00	0.00	0.00	0.00	0.11	0.11
layer 2	km: grade 3	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00		0.00	0.00	0.00	0.00	0.00	0.06	0.06
HCV R4	km: grade 4	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.69	0.00		0.00	0.00	0.00	0.00	0.00	0.69	0.69
Low stress	age: grade 2	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.1	0.0							12.1	12.1
5933	age: grade 3	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.1	0.0							7.1	7.1
binder E*	age: grade 4	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	0.0							5.9	5.9

1CHIP, mid stress

hierarchy	network		Northland	nth Auck	Auckland	cen Waikato	E Waikato	W Waikato	west BOP	Tauranga	east BOP	Rotorua	Gisborne	Hawkes Bay	Taranaki	King country	Man Wang	Wellington	Nel Tasman	Marl Roads	Canterbury	Canterbury	West Coast	cen Otago	coastal Otg	Southland	key urban Ak,Tg,Wn	northern Nth Island	Bay of Plenty	southern Nth Island	northern Sth Island	southern Sth Island	sealed State Highways
1CHIP	km: grade 2	6	0.68	0.03	0.00	0.41	0.40	0.00	1.62	0.01	0.00	0.00	0.00	0.00	0.15	0.72	1.11	0.25	0.00	0.91	0.00	0.00	0.00	0.00	0.00	0.00	0.29	1.81	2.02	1.26	0.91	0.00	6.28
layer 2	km: grade 3	8	0.27	0.32	0.38	0.50	1.60	0.51	3.47	0.53	0.00	0.17	0.00	0.00	0.82	0.40	4.96	0.52	0.00	0.15	0.44	1.39	0.00	0.00	0.25	0.43	1.75	1.68	5.23	5.78	0.59	2.07	17.09
HCV R1	km: grade 4	10	0.00	0.47	0.00	0.00	0.01	0.00	1.01	0.00	0.00	0.00	0.00	0.35	0.00	1.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.47	1.94	1.38	0.00	0.00	0.17	3.95
Mid stress	age: grade 2	7	8.0	5.9	0.0	8.9	7.8	0.0	10.3	7.9	0.0	0.0	0.0	0.0	21.1	8.6	9.1	16.0	0.0	12.2	0.0	0.0	0.0	0.0	0.0	0.0	14.8	8.4	9.8	10.6	12.2		10.1
8613	age: grade 3	9	4.6	7.6	10.2	13.2	10.6	9.1	6.3	9.9	0.0	14.9	0.0	0.0	10.4	13.6	12.1	9.9	0.0	12.2	18.0	11.4	0.0	0.0	13.5	12.1	9.6	10.6	7.9	11.9	16.5	11.8	10.5
binder B*	age: grade 4	11	0.0	11.0	0.0	0.0	9.9	0.0	7.3	0.0	0.0	0.0	0.0	12.7	0.0	13.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.8	0.0	11.0	13.3	8.7			10.8	11.3
1CHIP	km: grade 2	6	0.01	0.00	0.00	1.31	0.23	0.29	0.43	0.00	0.12	0.34	0.10	1.10	1.05	1.13	2.11	1.20	0.28	1.10	0.63	0.00	0.00	0.00	0.00	0.00	1.20	2.74	2.21	3.26	2.01	0.00	11.42
layer 2	km: grade 3	8	0.32	0.00	0.00	2.44	0.07	0.02	1.30	0.25	0.00	0.17	0.20	1.81	4.23	2.48	1.60	0.78	1.84	2.98	2.04	0.00	3.16	0.27	5.17	7.37	1.03	5.26	3.36	6.03	10.01	12.81	38.50
HCV R2	km: grade 4	10	0.00	0.00	0.00	0.45	0.09	0.23	0.00	0.00	0.00	0.06	0.00	0.36	0.00	1.54	0.00	0.00	0.00	0.58	0.45	0.00	1.50	0.19	0.30	3.37	0.00	2.21	0.51	0.00	2.53	3.85	9.10
Mid stress	age: grade 2	7	12.3	0.0	0.0	13.0	9.9	18.9	8.0	0.0	11.4	11.9	7.2	9.2	14.2	14.6	11.0	14.0	12.0	12.0	9.4	0.0	0.0	0.0	0.0	0.0	14.0	14.3	9.6	11.9	11.2		12.1
8619	age: grade 3	9	7.9	0.0	0.0	10.9	7.1	14.3	9.6	5.0	0.0	13.5	11.8	10.8	11.9	12.2	9.1	11.2	9.0	14.6	16.6	0.0	10.4	9.1	10.3	11.7	9.7	11.3	10.4	11.1	12.6	11.1	11.4
binder B*	age: grade 4	11	0.0	0.0	0.0	5.8	16.9	12.3	0.0	0.0	0.0	9.7	0.0	9.0	0.0	10.5	0.0	0.0	0.0	13.8	9.0	0.0	10.2	7.3	9.6	8.9		9.7	10.5		10.8	8.9	9.7
1CHIP	km: grade 2	6	3.20	0.29	0.00	0.54	3.80	0.79	0.03	0.00	0.62	0.10	1.15	3.56	2.01	0.97	1.88	0.69	2.28	0.52	0.00	0.00	0.00	0.07	0.00	0.00	0.98	5.50	8.11	5.04	2.80	0.07	22.49
layer 2	km: grade 3	8	5.95	0.01	0.00	1.83	3.65	3.54	1.82	0.00	0.70	0.83	0.16	2.05	5.31	0.61	5.75	1.63	2.92	0.01	3.89	3.22	13.47	11.10	7.22	24.52	1.64	11.92	9.05	11.22	20.29	46.06	100.17
HCV R3	km: grade 4	10	0.00	0.00	0.00	0.34	3.14	0.57	0.02	0.00	0.00	0.31	0.00	0.00	1.01	0.81	0.34	0.21	0.49	0.00	2.95	0.31	16.08	0.01	1.93	2.69	0.21	1.72	3.46	1.35	19.51	4.94	31.20
Mid stress	age: grade 2	7	12.4	8.8	0.0	10.2	11.2	10.3	8.0	0.0	12.3	10.3	8.3	9.5	11.5	12.3	13.6	16.6	16.3	11.3	0.0	0.0	0.0	27.1	0.0	0.0	14.3	11.8	10.6	11.5	15.4	27.1	11.9
8625	age: grade 3	9	12.2	26.0	0.0	12.0	8.5	9.1	8.4	0.0	8.2	13.4	12.6	6.9	12.7	10.6	9.9	13.0	7.7	19.1	14.6	11.6	11.8	12.8	13.8	14.9	13.0	11.2	8.6	11.3	11.7	14.0	12.4
binder B*	age: grade 4	11	12.0	0.0	0.0	16.2	7.7	8.8	6.3	0.0	0.0	8.7	0.0	0.0	6.6	9.0	9.5	8.2	9.3	0.0	15.2	10.2	10.4	12.7	11.9	11.4	8.2	10.3	7.8	7.3	11.1	11.5	10.5
1CHIP	km: grade 2	6	8.45	0.03	0.00	1.00	1.69	0.00	0.00	0.00	0.71	0.00	3.32	4.95	7.08	0.52	0.07	0.00	6.13	0.64	0.00	0.00	0.00	0.25	2.04	0.00	0.03	9.96	7.34	10.47	6.77	2.29	36.85
layer 2	km: grade 3	8	8.38	3.25	0.00	8.35	0.54	0.00	0.00	0.00	6.29	0.00	2.42	2.25	22.87	6.87	1.30	1.80	10.95	1.61	2.29	2.29	0.52	16.61	24.73	1.27	5.05	23.59	9.08	26.59	15.36	44.90	124.57
HCV R4	km: grade 4	10	0.54	0.00	0.00	1.63	0.31	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.43	1.58	0.00	0.00	0.29	0.00	2.83	2.41	0.00	7.62	5.31	0.35	0.00	3.75	0.35	0.43	3.12	15.69	23.34
Mid stress	age: grade 2	7	11.2	7.8	0.0	13.9	8.2	0.0	0.0	0.0	12.8	0.0	8.3	9.6	12.8	9.8	8.2	0.0	11.5	17.1	0.0	0.0	0.0	17.8	12.0	0.0	7.8	11.4	9.6	11.3	12.0	12.6	11.2
8628	age: grade 3	9	13.6	10.7	0.0	12.3	9.8	0.0	0.0	0.0	12.1	0.0	11.6	9.1	11.4	12.2	13.9	12.9	11.8	10.4	13.2	13.4	12.8	13.9	13.6	11.9	11.5	12.7	11.2	11.6	11.9	13.6	12.5
binder B*	age: grade 4	11	8.6	0.0	0.0	11.3	6.0	0.0	0.0	0.0	0.0	12.6	0.0	0.0	10.8	6.8	0.0	0.0	9.5	0.0	11.0	10.5	0.0	10.0	11.0	10.0		9.0	6.8	10.8	10.9	10.4	10.2
1CHIP	km: grade 2	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
layer 2	km: grade 3	8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HCV R1	km: grade 4	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mid stress	age: grade 2	7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0							
9813	age: grade 3	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0							
binder E*	age: grade 4	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0							
1CHIP	km: grade 2	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
layer 2	km: grade 3	8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.30	0.00	0.00	0.00	0.00	0.00	0.41	0.41
HCV R2	km: grade 4	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mid stress	age: grade 2	7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0							
9819	age: grade 3	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.3	8.0						8.1	8.1
binder E*	age: grade 4	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0							
1CHIP	km: grade 2	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.61	0.00	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.81	0.00	0.81
layer 2	km: grade 3	8	0.30	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.34	0.00	0.02	0.30	0.00	0.00	0.00	0.34	0.65
HCV R3	km: grade 4	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.03	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.05	0.00	0.06
Mid stress	age: grade 2	7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.2	0.0	12.0	0.0	0.0	0.0	0.0	0.0					11.4		11.4
9825	age: grade 3	9	10.1	14.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.1	0.0	14.1	10.1				8.1	9.2
binder E*	age: grade 4	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	9.0	0.0	11.9	0.0	0.0	0.0	0.0	0.0				8.2	10.1		9.9
1CHIP	km: grade 2	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.37	0.00	0.41
layer 2	km: grade 3	8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.59	0.00	0.00	0.00	0.43	0.00	0.00	0.00	0.36	0.00	0.00	0.01	0.00	0.00	0.38	0.00	0.00	0.00	0.59	0.43	0.36	0.39	1.77
HCV R4	km: grade 4	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	1.08	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	1.43	0.07	1.50
Mid stress	age: grade 2	7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.4	0.0	0.0	0.0	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0				12.4	7.0		7.5
9828	age: grade 3	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.3	0.0	0.0	0.0	5.3	0.0	0.0	0.0	10.1	0.0	0.0	20.9	0.0	0.0	13.3	0.0			7.3	5.3	10.1	13.5	8.8
binder E*	age: grade 4	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.9	0.0	12.0	0.0	0.0	0.0	5.4	0.0					11.2	5.4	11.0

2CHIP, mid stress

hierarchy	network		Northland	nth Auck	Auckland	cen Waikato	E Waikato	W Waikato	west BOP	Tauranga	east BOP	Rotorua	Gisborne	Hawkes Bay	Taranaki	King country	Man Wang	Wellington	Nel Tasman	Marl Roads	Canterbury	Canterbury	West Coast	cen Otago	coastal Otg	Southland		key urban Ak,Tg,Wn	northern Nth Island	Bay of Plenty	southern Nth Island	northern Sth Island	southern Sth Island	sealed State Highways
2CHIP	km: grade 2	10	0.64	2.86	0.00	0.00	1.82	0.17	3.35	0.17	0.21	1.25	0.00	0.13	0.09	0.46	1.02	1.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		4.32	1.26	6.77	1.11	0.00	0.00	13.46
layer 2	km: grade 3	12	2.43	0.58	0.00	1.13	0.44	0.16	1.01	0.68	0.11	1.56	0.00	0.02	0.00	0.02	2.14	0.40	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00		1.66	3.74	3.14	2.14	0.06	0.00	10.74
HCV R1	km: grade 4	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.51	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.51	0.00	0.51
Mid stress	age: grade 2	11	6.6	6.1	0.0	0.0	6.7	10.1	6.9	7.8	7.1	10.5	0.0	6.5	5.1	6.3	8.3	7.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		6.6	7.0	7.5	8.0			7.2
8683	age: grade 3	13	5.8	8.2	0.0	6.3	5.3	6.6	7.9	10.4	5.1	9.2	0.0	11.6	0.0	6.1	7.4	5.1	0.0	17.1	0.0	0.0	0.0	0.0	0.0	0.0		8.3	6.0	8.1	7.4	17.1		7.3
binder B*	age: grade 4	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0						5.0		5.0
2CHIP	km: grade 2	10	0.55	0.23	0.00	2.55	3.13	1.94	1.46	0.00	2.37	4.00	0.47	3.64	1.02	4.28	0.07	0.75	0.00	0.00	0.06	0.00	0.00	0.00	0.01	0.42		0.98	9.31	14.60	1.56	0.06	0.43	26.94
layer 2	km: grade 3	12	3.48	0.79	0.00	3.13	0.04	0.55	0.64	0.00	0.55	3.04	0.00	1.52	0.00	0.47	1.04	1.10	0.64	2.71	0.48	0.00	0.00	0.19	0.67	0.56		1.89	7.63	5.79	1.04	3.83	1.41	21.59
HCV R2	km: grade 4	14	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.10		0.00	0.00	0.12	0.00	0.36	0.10	0.58
Mid stress	age: grade 2	11	6.3	6.9	0.0	5.7	7.3	6.6	9.2	0.0	7.5	8.4	5.6	8.6	8.8	6.8	7.8	11.6	0.0	0.0	11.0	0.0	0.0	0.0	10.3	9.1		10.5	6.4	8.2	7.8	11.0	9.1	7.6
8689	age: grade 3	13	8.0	9.2	0.0	6.2	6.9	6.2	6.0	0.0	8.9	7.2	0.0	5.9	0.0	8.0	8.3	7.5	7.1	6.4	8.9	0.0	0.0	9.3	11.2	8.6		8.2	7.1	6.9	8.3	6.8	9.9	7.4
binder B*	age: grade 4	15	0.0	0.0	0.0	0.0	4.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.9	0.0	0.0	0.0	0.0	6.3				4.6		8.9	6.3	7.6
2CHIP	km: grade 2	10	2.08	1.44	0.00	0.42	5.71	1.73	0.00	0.00	8.46	3.33	15.07	5.45	3.87	0.21	1.30	0.33	0.11	0.00	0.00	0.00	0.00	0.00	0.30	0.00		1.77	4.45	22.94	20.24	0.11	0.30	49.80
layer 2	km: grade 3	12	3.88	0.00	0.00	1.27	2.73	0.45	0.27	0.00	0.97	1.66	0.41	1.17	1.09	0.00	0.65	0.95	2.65	0.23	2.72	0.76	0.00	0.36	0.57	0.39		0.95	5.60	6.79	2.14	5.60	2.08	23.16
HCV R3	km: grade 4	14	0.00	0.00	0.00	0.00	0.47	0.00	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37	0.00	0.15	0.00	0.00	0.00	0.02		0.00	0.00	0.56	0.00	0.37	0.17	1.10
Mid stress	age: grade 2	11	6.3	7.5	0.0	8.1	7.3	6.6	0.0	0.0	7.7	9.2	6.1	6.6	7.3	9.1	6.8	10.2	11.1	0.0	0.0	0.0	0.0	0.0	7.5	0.0		8.0	6.7	7.5	6.3	11.1	7.5	7.0
8695	age: grade 3	13	7.6	0.0	0.0	8.8	8.1	8.9	8.8	0.0	8.1	8.5	6.6	6.3	6.0	0.0	5.9	7.9	5.9	7.2	10.2	12.6	0.0	6.2	8.4	7.6		7.9	8.0	7.9	6.1	8.0	9.4	7.9
binder B*	age: grade 4	15	0.0	0.0	0.0	0.0	4.6	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.4	0.0	8.9	0.0	0.0	0.0	7.1				4.7		9.4	8.7	6.9
2CHIP	km: grade 2	10	2.34	0.59	0.00	0.36	2.79	0.00	0.00	0.00	29.03	0.00	23.95	1.39	2.96	1.94	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.96	0.00		0.59	4.64	33.21	26.91	0.25	0.96	66.55
layer 2	km: grade 3	12	3.16	0.85	0.00	3.95	5.44	0.00	0.00	0.00	6.93	0.05	1.78	0.57	1.80	0.79	0.22	0.21	2.52	0.11	2.59	1.50	0.00	3.02	6.24	0.00		1.06	7.90	12.99	3.80	5.22	10.75	41.72
HCV R4	km: grade 4	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.63	0.00	0.00	0.00	0.33	0.00		0.00	0.00	0.00	0.00	0.90	0.33	1.23
Mid stress	age: grade 2	11	7.3	7.8	0.0	4.8	7.5	0.0	0.0	0.0	7.8	0.0	6.4	7.3	10.0	6.9	0.0	0.0	0.0	0.0	9.9	0.0	0.0	0.0	8.7	0.0		7.8	7.0	7.8	6.8	9.9	8.7	7.4
8698	age: grade 3	13	7.7	8.5	0.0	5.9	8.5	0.0	0.0	0.0	8.0	9.2	5.9	7.4	8.8	13.6	7.0	9.1	6.3	5.1	9.7	13.3	0.0	9.9	10.2	0.0		8.6	7.4	8.2	7.3	8.0	10.5	8.5
binder B*	age: grade 4	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.1	0.0	9.2	0.0	0.0	0.0	9.0	0.0						8.2	9.0	8.4
2CHIP	km: grade 2	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
layer 2	km: grade 3	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00		0.00	0.00	0.00	0.00	0.00	0.09	0.09
HCV R1	km: grade 4	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.15	0.00	0.15
Mid stress	age: grade 2	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
9883	age: grade 3	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.8	0.0							6.8	6.8
binder E*	age: grade 4	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2	0.0	0.0	0.0	0.0	0.0	0.0						5.2		5.2
2CHIP	km: grade 2	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00	0.00	0.00	0.10	0.30		0.00	0.00	0.00	0.00	0.40	0.40	0.80
layer 2	km: grade 3	12	0.00	0.00	0.00	0.62	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.58		0.00	0.88	0.00	0.26	0.00	0.93	2.06
HCV R2	km: grade 4	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.00		0.00	0.00	0.00	0.00	0.00	0.38	0.38
Mid stress	age: grade 2	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.6	0.0	0.0	0.0	8.0	7.9						9.6	7.9	8.8
9889	age: grade 3	13	0.0	0.0	0.0	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	12.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.9	7.4			5.8		12.1		7.2	7.2
binder E*	age: grade 4	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	0.0							10.0	10.0
2CHIP	km: grade 2	10	0.00	0.00	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.13	0.00	0.01	0.00	0.14
layer 2	km: grade 3	12	0.46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.44	0.00	0.00	0.00	0.00	0.00	2.81	0.07		0.00	0.46	0.00	0.00	0.44	2.88	3.78
HCV R3	km: grade 4	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.10	0.00	0.10
Mid stress	age: grade 2	11	0.0	0.0	0.0	0.0	9.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0				9.1		11.0		9.2
9895	age: grade 3	13	8.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.9	0.0	0.0	0.0	0.0	0.0	9.1	14.4			8.5			6.9	9.3	8.9
binder E*	age: grade 4	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0						5.0		5.0
2CHIP	km: grade 2	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.28	0.00	0.00	0.28
layer 2	km: grade 3	12	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	1.16	0.00	0.15	0.00	0.00	0.00	0.00	0.00	0.23	0.36	0.00	0.00	1.59	0.00		0.00	0.31	0.00	1.31	0.23	1.94	3.80
HCV R4	km: grade 4	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.12	0.00	0.12
Mid stress	age: grade 2	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					7.1			7.1
9898	age: grade 3	13	0.0	0.0	0.0	10.7	0.0	0.0	0.0	0.0	0.0	0.0	5.5	0.0	8.8	0.0	0.0	0.0	0.0	0.0	11.3	19.2	0.0	0.0	6.8	0.0			10.7		5.9	11.3	9.1	8.2
binder E*	age: grade 4	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0						5.8		5.8

RACK, mid stress

hierarchy	network		Northland	nth Auck	Auckland	cen Waikato	E Waikato	W Waikato	west BOP	Tauranga	east BOP	Rotorua	Gisborne	Hawkes Bay	Taranaki	King country	Man Wang	Wellington	Nel Tasman	Marl Roads	Canterbury	Canterbury	West Coast	cen Otago	coastal Otg	Southland		key urban Ak,Tg,Wn	northern Nth Island	Bay of Plenty	southern Nth Island	northern Sth Island	southern Sth Island	sealed State Highways
RACK	km: grade 2	12	1.10	0.00	0.00	0.00	0.00	0.14	0.16	0.00	0.00	0.00	0.00	0.67	0.54	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16		0.00	1.24	0.83	0.54	0.00	0.16	2.76
layer 2	km: grade 3	14	0.20	0.00	0.00	2.17	0.00	0.00	0.09	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.21	2.37	0.09	0.00	0.00	0.00	2.68
HCV R1	km: grade 4	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mid stress	age: grade 2	13	7.9	0.0	0.0	0.0	0.0	11.0	5.4	0.0	0.0	0.0	0.0	5.3	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.1			8.3	5.3	7.0		10.1	7.2
8718	age: grade 3	15	5.8	0.0	0.0	6.2	0.0	0.0	5.1	8.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		8.9	6.2	5.1				6.4
binder B*	age: grade 4	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
RACK	km: grade 2	12	0.00	0.00	0.00	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.67	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14		0.00	1.03	0.07	0.67	0.00	0.14	1.91
layer 2	km: grade 3	14	0.12	0.00	0.00	1.81	0.00	0.00	0.00	0.00	0.05	1.68	0.00	0.35	0.21	0.05	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.00		0.00	1.98	2.08	0.35	0.00	0.09	4.51
HCV R2	km: grade 4	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mid stress	age: grade 2	13	0.0	0.0	0.0	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.0	7.8	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.2			5.7	10.0	7.8		11.2	7.0
8724	age: grade 3	15	8.0	0.0	0.0	6.8	0.0	0.0	0.0	0.0	5.0	5.9	0.0	7.1	6.3	6.3	4.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.1	0.0			6.9	6.1	5.6		10.1	6.5
binder B*	age: grade 4	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
RACK	km: grade 2	12	0.00	0.00	0.00	0.00	3.00	0.11	0.00	0.00	0.00	0.00	0.42	3.58	0.72	1.19	0.13	0.00	0.00	0.00	0.00	0.00	1.62	0.00	0.32	0.99		0.00	1.30	6.58	1.27	1.62	1.31	12.09
layer 2	km: grade 3	14	3.20	0.00	0.00	0.10	1.79	0.00	0.00	0.00	0.09	0.00	0.00	0.90	0.47	0.00	0.03	0.00	1.43	0.00	1.31	0.00	3.60	0.00	0.00	0.52		0.00	3.30	2.78	0.50	6.34	0.52	13.44
HCV R3	km: grade 4	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.60	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.60	0.00	0.60
Mid stress	age: grade 2	13	0.0	0.0	0.0	0.0	6.7	4.9	0.0	0.0	0.0	0.0	6.1	6.8	8.8	7.5	4.9	0.0	0.0	0.0	0.0	0.0	12.0	0.0	9.2	13.1			7.3	6.8	7.5	12.0	12.1	8.2
8730	age: grade 3	15	7.8	0.0	0.0	9.0	5.9	0.0	0.0	0.0	4.9	0.0	0.0	6.3	11.1	0.0	6.0	0.0	5.5	0.0	7.8	0.0	11.0	0.0	0.0	7.4			7.9	6.0	10.8	9.1	7.4	8.1
binder B*	age: grade 4	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.0	0.0	0.0	0.0						9.0		9.0
RACK	km: grade 2	12	0.09	0.00	0.00	0.00	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.83	0.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.87	0.39	0.83	0.00	0.00	2.09
layer 2	km: grade 3	14	0.78	0.00	0.00	0.70	0.75	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.94	0.00	0.94	0.00	0.63	0.00	0.56	0.00	0.00	0.08	0.13	0.00		0.00	1.49	0.76	1.88	1.19	0.21	5.53
HCV R4	km: grade 4	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mid stress	age: grade 2	13	9.0	0.0	0.0	0.0	6.5	0.0	0.0	0.0	0.0	0.0	0.0	6.7	5.7	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			7.9	6.6	5.7			6.8
8733	age: grade 3	15	9.0	0.0	0.0	7.4	6.2	0.0	0.0	0.0	4.9	0.0	0.0	9.7	7.2	0.0	11.2	0.0	6.8	0.0	10.2	0.0	0.0	9.2	8.9	0.0			8.3	6.2	9.2	8.4	9.0	8.4
binder B*	age: grade 4	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
RACK	km: grade 2	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
layer 2	km: grade 3	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
HCV R1	km: grade 4	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00		0.00	0.00	0.00	0.00	0.00	0.26	0.26
Mid stress	age: grade 2	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
9918	age: grade 3	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
binder E*	age: grade 4	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0							5.0	5.0
RACK	km: grade 2	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
layer 2	km: grade 3	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
HCV R2	km: grade 4	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.13	0.00		0.00	0.00	0.00	0.00	0.00	1.13	1.13
Mid stress	age: grade 2	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
9924	age: grade 3	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
binder E*	age: grade 4	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	0.0							5.9	5.9
RACK	km: grade 2	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
layer 2	km: grade 3	14	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.17	0.00	0.00	0.00	0.00	0.17
HCV R3	km: grade 4	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.53	0.00		0.00	0.00	0.00	0.00	0.00	0.53	0.53
Mid stress	age: grade 2	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
9930	age: grade 3	15	9.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			9.3					9.3
binder E*	age: grade 4	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2	0.0							5.2	5.2
RACK	km: grade 2	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00		0.00	0.00	0.00	0.00	0.00	0.40	0.40
layer 2	km: grade 3	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00		0.00	0.00	0.00	0.00	0.00	0.06	0.06
HCV R4	km: grade 4	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.40	0.00		0.00	0.00	0.00	0.00	0.00	0.40	0.40
Mid stress	age: grade 2	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.1	0.0							12.1	12.1
9933	age: grade 3	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.1	0.0							7.1	7.1
binder E*	age: grade 4	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.6	0.0							5.6	5.6

1CHIP, high stress

hierarchy	network		Northland	nth Auck	Auckland	cen Waikato	E Waikato	W Waikato	west BOP	Tauranga	east BOP	Rotorua	Gisborne	Hawkes Bay	Taranaki	King country	Man Wang	Wellington	Nel Tasman	Marl Roads	Canterbury	Canterbury	West Coast	cen Otago	coastal Otg	Southland		key urban Ak,Tg,Wn	northern Nth Island	Bay of Plenty	southern Nth Island	northern Sth Island	southern Sth Island	sealed State Highways
1CHIP	km: grade 2	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
layer 2	km: grade 3	8	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.01	0.00	0.27	0.13	0.00	0.00	0.41
HCV R1	km: grade 4	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
High stress	age: grade 2	7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
12613	age: grade 3	9	0.0	0.0	0.0	0.0	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	18.1	8.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		8.1		9.0	18.1			11.8
binder B*	age: grade 4	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
1CHIP	km: grade 2	6	0.00	0.00	0.00	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09		0.06	0.17	0.00	0.00	0.00	0.09	0.33
layer 2	km: grade 3	8	0.00	0.00	0.00	0.01	0.00	0.02	0.13	0.00	0.00	0.00	0.00	0.01	0.00	0.16	0.00	0.00	0.00	0.07	0.37	0.00	0.23	0.00	0.00	0.08		0.00	0.19	0.14	0.00	0.68	0.08	1.08
HCV R2	km: grade 4	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.00	0.00	0.30		0.00	0.25	0.00	0.00	0.20	0.30	0.75
High stress	age: grade 2	7	0.0	0.0	0.0	9.4	10.1	13.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	0.0	17.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	25.2		17.7	7.7	10.1			25.2	14.4
12619	age: grade 3	9	0.0	0.0	0.0	15.3	0.0	12.9	21.1	0.0	0.0	0.0	0.0	9.8	0.0	14.0	0.0	0.0	0.0	21.5	12.2	0.0	9.4	0.0	0.0	7.5			14.0	20.3		12.2	7.5	13.2
binder B*	age: grade 4	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	13.9	0.0	0.0	0.0	0.0	0.0	0.0	9.4	0.0	0.0	9.2			13.9			9.4	9.2	10.8
1CHIP	km: grade 2	6	1.01	0.00	0.00	0.03	1.71	0.30	0.00	0.00	0.00	0.00	0.00	0.04	0.01	0.00	0.00	0.05	0.39	0.02	0.00	0.00	0.00	0.00	0.00	0.00		0.05	1.34	1.75	0.01	0.41	0.00	3.55
layer 2	km: grade 3	8	0.00	0.00	0.00	0.00	2.66	0.07	0.00	0.00	0.00	0.00	0.02	0.19	0.36	0.00	0.01	0.00	0.18	0.00	0.00	0.22	1.15	0.21	0.00	0.40		0.00	0.07	2.85	0.38	1.33	0.83	5.46
HCV R3	km: grade 4	10	0.00	0.00	0.00	0.00	1.22	0.02	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	2.71	0.00	0.00	0.33		0.00	0.02	1.26	0.00	2.78	0.33	4.39
High stress	age: grade 2	7	11.6	0.0	0.0	8.0	8.2	9.7	0.0	0.0	0.0	0.0	0.0	9.1	7.3	0.0	0.0	24.1	12.2	19.6	0.0	0.0	0.0	0.0	0.0	0.0		24.1	11.1	8.2	7.3	12.5		10.0
12625	age: grade 3	9	0.0	0.0	0.0	0.0	8.4	12.9	0.0	0.0	0.0	0.0	8.7	9.4	13.3	0.0	5.1	18.0	14.2	16.9	0.0	12.3	10.5	12.0	0.0	14.2		18.0	12.9	8.5	12.9	11.0	13.1	10.2
binder B*	age: grade 4	11	0.0	0.0	0.0	0.0	8.1	5.1	0.0	0.0	0.0	0.0	0.0	9.9	0.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0	10.8	0.0	0.0	11.1			5.1	8.2		10.6	11.1	9.9
1CHIP	km: grade 2	6	4.32	0.00	0.00	0.00	0.49	0.00	0.00	0.00	0.48	0.00	0.84	0.25	2.57	0.00	0.01	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	4.32	1.22	3.41	0.38	0.00	9.33
layer 2	km: grade 3	8	0.86	0.03	0.00	0.08	0.83	0.00	0.00	0.00	0.90	0.00	0.18	1.09	11.86	1.24	1.37	0.21	1.72	0.25	0.08	0.06	0.00	1.19	0.60	0.00		0.24	2.18	2.81	13.41	2.04	1.85	22.53
HCV R4	km: grade 4	10	0.00	0.00	0.00	0.00	1.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.04	0.33	0.08	0.03	0.35	0.00	0.20	0.23	0.00	0.00	0.00	0.00		0.03	0.33	1.11	1.12	0.55	0.23	3.37
High stress	age: grade 2	7	8.9	0.0	0.0	0.0	10.2	0.0	0.0	0.0	18.2	0.0	8.6	9.9	12.6	0.0	9.0	0.0	10.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0			8.9	13.3	11.6	10.2		10.5
12628	age: grade 3	9	11.0	10.6	0.0	16.0	8.5	0.0	0.0	0.0	13.2	0.0	10.3	7.4	10.3	10.7	13.5	14.9	11.5	11.9	15.6	16.6	0.0	13.7	17.7	0.0		14.4	11.0	9.6	10.7	11.7	15.1	11.1
binder B*	age: grade 4	11	0.0	0.0	0.0	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.7	5.1	12.1	6.3	8.5	0.0	13.0	11.1	0.0	0.0	0.0	0.0		6.3	5.1	6.3	9.9	10.1	11.1	8.3
1CHIP	km: grade 2	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
layer 2	km: grade 3	8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
HCV R1	km: grade 4	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
High stress	age: grade 2	7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
13813	age: grade 3	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
binder E*	age: grade 4	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
1CHIP	km: grade 2	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
layer 2	km: grade 3	8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
HCV R2	km: grade 4	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
High stress	age: grade 2	7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
13819	age: grade 3	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
binder E*	age: grade 4	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
1CHIP	km: grade 2	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
layer 2	km: grade 3	8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
HCV R3	km: grade 4	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.03	0.00	0.00	0.03
High stress	age: grade 2	7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
13825	age: grade 3	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
binder E*	age: grade 4	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	8.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					8.2			8.2
1CHIP	km: grade 2	6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.16	0.00	0.00	0.16
layer 2	km: grade 3	8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.38	0.00	0.00	0.38
HCV R4	km: grade 4	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
High stress	age: grade 2	7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	11.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					11.2			11.2
13828	age: grade 3	9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0					6.2			6.2
binder E*	age: grade 4	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								

2CHIP, high stress

hierarchy	network		Northland	nth Auck	Auckland	cen Waikato	E Waikato	W Waikato	west BOP	Tauranga	east BOP	Rotorua	Gisborne	Hawkes Bay	Taranaki	King country	Man Wang	Wellington	Nel Tasman	Marl Roads	Canterbury	Canterbury	West Coast	cen Otago	coastal Otg	Southland	key urban Ak,Tg,Wn	northern Nth Island	Bay of Plenty	southern Nth Island	northern Sth Island	southern Sth Island	sealed State Highways
2CHIP	km: grade 2	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.00	0.00	0.00	0.14
layer 2	km: grade 3	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.17	0.00	0.00	0.17
HCV R1	km: grade 4	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High stress	age: grade 2	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			6.0				6.0
12683	age: grade 3	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2	0.0	0.0	0.0	0.0	10.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			5.2	10.3			10.1
binder B*	age: grade 4	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0							
2CHIP	km: grade 2	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00	0.64	0.00	0.00	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.64	0.08	0.00	0.29	0.00	1.01
layer 2	km: grade 3	12	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.39	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.50	0.11	0.00	0.00	0.00	0.00	0.04	0.00	0.01	0.40	0.00	0.60	0.04	1.05
HCV R2	km: grade 4	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High stress	age: grade 2	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.3	0.0	0.0	0.0	0.0	6.6	0.0	0.0	0.0	0.0	11.7	0.0	0.0	0.0	0.0	0.0		6.6	6.3		11.7		8.0
12689	age: grade 3	13	0.0	0.0	0.0	8.0	0.0	0.0	0.0	0.0	0.0	5.2	0.0	6.0	0.0	5.0	0.0	0.0	0.0	5.8	11.1	0.0	0.0	0.0	0.0	7.8		7.8	5.2		6.7	7.8	6.2
binder B*	age: grade 4	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0							
2CHIP	km: grade 2	10	0.02	0.00	0.00	0.00	2.89	0.00	0.00	0.00	0.38	0.00	4.09	2.22	0.55	0.00	0.30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	5.49	4.95	0.00	0.00	10.45
layer 2	km: grade 3	12	0.32	0.00	0.00	0.02	0.75	0.06	0.00	0.00	0.17	0.00	0.21	0.85	0.00	0.00	0.05	2.31	0.65	0.00	0.04	0.00	0.55	0.00	0.00	0.00	2.31	0.40	1.76	0.26	1.23	0.00	5.96
HCV R3	km: grade 4	14	0.00	0.00	0.00	0.00	0.31	0.00	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.48	0.00	0.07	0.12	0.67
High stress	age: grade 2	11	6.0	0.0	0.0	0.0	6.4	0.0	0.0	0.0	6.1	8.0	5.8	6.4	9.9	0.0	7.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0		6.0	6.4	6.3			6.4
12695	age: grade 3	13	4.9	0.0	0.0	11.9	6.4	7.2	0.0	0.0	7.1	0.0	5.2	5.9	0.0	0.0	10.0	8.1	7.8	0.0	10.1	0.0	8.8	0.0	0.0	0.0	8.1	5.6	6.2	6.1	8.3		7.3
binder B*	age: grade 4	15	0.0	0.0	0.0	0.0	4.6	0.0	0.0	0.0	5.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	15.1	0.0	0.0	0.0	0.0	0.0	0.0	7.1			4.8		15.1	7.1	6.3
2CHIP	km: grade 2	10	1.25	0.40	0.00	0.11	3.78	0.00	0.00	0.00	16.18	0.00	12.53	0.86	4.29	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.17	0.00	0.40	1.53	20.82	16.82	0.00	0.17	39.74
layer 2	km: grade 3	12	3.49	0.00	0.00	0.53	1.89	0.00	0.00	0.00	1.88	0.14	0.13	0.11	3.78	0.00	0.19	0.00	1.67	0.00	0.46	0.00	0.00	0.00	0.35	0.00	0.00	4.02	4.02	4.10	2.13	0.35	14.61
HCV R4	km: grade 4	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.51	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.00	0.58	0.00	0.81
High stress	age: grade 2	11	9.2	6.2	0.0	4.9	6.5	0.0	0.0	0.0	7.8	0.0	6.4	9.2	10.9	5.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	10.9	0.0	6.2	8.4	7.6	7.5		10.9	7.6
12698	age: grade 3	13	7.4	0.0	0.0	7.9	6.7	0.0	0.0	0.0	7.5	7.7	6.1	4.6	10.5	0.0	7.0	0.0	5.9	0.0	11.1	0.0	0.0	0.0	11.0	0.0		7.5	7.0	10.2	7.0	11.0	8.2
binder B*	age: grade 4	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.2	0.0	14.0	0.0	0.0	0.0	0.0	0.0			7.0		6.2		6.4
2CHIP	km: grade 2	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
layer 2	km: grade 3	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HCV R1	km: grade 4	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High stress	age: grade 2	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0							
13883	age: grade 3	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0							
binder E*	age: grade 4	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0							
2CHIP	km: grade 2	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02
layer 2	km: grade 3	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
HCV R2	km: grade 4	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High stress	age: grade 2	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	9.6	0.0	0.0	0.0	0.0	0.0					9.6		9.6
13889	age: grade 3	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0							
binder E*	age: grade 4	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0							
2CHIP	km: grade 2	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
layer 2	km: grade 3	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.95	0.00	0.00	0.00	0.00	0.00	0.00	0.95	0.95
HCV R3	km: grade 4	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
High stress	age: grade 2	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0							
13895	age: grade 3	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.6	0.0						6.6	6.6
binder E*	age: grade 4	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0							
2CHIP	km: grade 2	10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
layer 2	km: grade 3	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.13	0.02	0.00	0.00	0.17	0.00	0.00	0.00	0.00	0.15	0.13	0.19	0.47
HCV R4	km: grade 4	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.56	0.00	0.56
High stress	age: grade 2	11	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0							
13898	age: grade 3	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	0.0	8.8	0.0	0.0	0.0	0.0	0.0	11.3	18.9	0.0	0.0	9.0	0.0				7.8	11.3	10.1	9.7
binder E*	age: grade 4	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0					6.7		6.7

RACK, high stress

hierarchy	network		Northland	nth Auck	Auckland	cen Waikato	E Waikato	W Waikato	west BOP	Tauranga	east BOP	Rotorua	Gisborne	Hawkes Bay	Taranaki	King country	Man Wang	Wellington	Nel Tasman	Marl Roads	Canterbury	Canterbury	West Coast	cen Otago	coastal Otg	Southland		key urban Ak,Tg,Wn	northern Nth Island	Bay of Plenty	southern Nth Island	northern Sth Island	southern Sth Island	sealed State Highways
RACK	km: grade 2	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
layer 2	km: grade 3	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
HCV R1	km: grade 4	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
High stress	age: grade 2	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
12718	age: grade 3	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
binder B*	age: grade 4	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
RACK	km: grade 2	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
layer 2	km: grade 3	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.50	0.00	0.03	0.00	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.07	0.53	0.00	0.00	0.00	0.60
HCV R2	km: grade 4	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
High stress	age: grade 2	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
12724	age: grade 3	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.9	0.0	8.0	0.0	6.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			6.3	6.1				6.1
binder B*	age: grade 4	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
RACK	km: grade 2	12	0.00	0.00	0.00	0.00	0.28	0.29	0.00	0.00	0.00	0.00	0.00	0.71	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.00	0.00	0.00		0.00	0.29	0.99	0.53	0.33	0.00	2.13
layer 2	km: grade 3	14	0.26	0.00	0.00	0.00	1.47	0.00	0.19	0.00	0.00	0.00	0.00	0.22	0.00	0.00	0.00	0.00	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.17		0.00	0.26	1.88	0.00	0.12	0.17	2.42
HCV R3	km: grade 4	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
High stress	age: grade 2	13	0.0	0.0	0.0	0.0	5.6	4.9	0.0	0.0	0.0	0.0	0.0	6.4	6.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	12.0	0.0	0.0	0.0			4.9	6.2	6.4	12.0		7.0
12730	age: grade 3	15	7.1	0.0	0.0	0.0	5.3	0.0	4.8	0.0	0.0	0.0	0.0	6.7	0.0	0.0	0.0	0.0	5.9	0.0	0.0	0.0	0.0	0.0	0.0	6.9			7.1	5.4		5.9	6.9	5.7
binder B*	age: grade 4	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
RACK	km: grade 2	12	0.16	0.00	0.00	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.44	0.11	0.00	0.00	0.00	0.54
layer 2	km: grade 3	14	0.19	0.00	0.00	0.26	0.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.00	0.11	0.00	0.31	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.46	0.77	0.32	0.31	0.00	1.85
HCV R4	km: grade 4	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
High stress	age: grade 2	13	6.7	0.0	0.0	0.0	7.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			7.3	7.5				7.3
12733	age: grade 3	15	9.0	0.0	0.0	8.1	6.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	6.6	0.0	10.8	0.0	6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			8.5	6.6	8.1	6.0		7.2
binder B*	age: grade 4	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
RACK	km: grade 2	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
layer 2	km: grade 3	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
HCV R1	km: grade 4	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
High stress	age: grade 2	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
13918	age: grade 3	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
binder E*	age: grade 4	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
RACK	km: grade 2	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
layer 2	km: grade 3	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
HCV R2	km: grade 4	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
High stress	age: grade 2	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
13924	age: grade 3	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
binder E*	age: grade 4	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
RACK	km: grade 2	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
layer 2	km: grade 3	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
HCV R3	km: grade 4	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
High stress	age: grade 2	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
13930	age: grade 3	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
binder E*	age: grade 4	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
RACK	km: grade 2	12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
layer 2	km: grade 3	14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00		0.00	0.00	0.00	0.00	0.00	0.08	0.08
HCV R4	km: grade 4	16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00	0.00	0.00
High stress	age: grade 2	13	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								
13933	age: grade 3	15	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	7.1	0.0							7.1	7.1
binder E*	age: grade 4	17	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0								