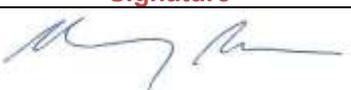


Springhill Rd Clearing Purpose Permit – A Report on Clearing Impact Mitigation and Avoidance by the Shire of Cuballing

Location : Cuballing, WA
Prepared for : Department of Water & Environmental Regulation and the Shire of Cuballing
Date : February 2026

Document status and review

Revision	Prepared By	Signature	Date Issued
0	Rod Munns		25 th February 2026

1. Introduction

Springhill Rd is one of the Shire of Cuballing's (SoC) Roads of Regional Significance (or 2040 Road), which are secondary sealed roads that link Regional towns and areas to the MRWA controlled road network and other 2040 roads. This entire road network is essentially the heavy freight network throughout the state of WA. The SoC receives limited Road Funding via the State Road Funds to Local Government Agreement (SRFLGA) each year to preserve / upgrade their 2040 Roads within their local Road Network. The SoC is planning to widen and upgrade 5.9km of the total 6.6km section of this road to the required Type 6 Standard Sealed Road with SRFLGA Funding, commencing in the 2026/27 Yr.

2. Background Information

Springhill Rd is one of the SoC's main sealed roads and links the Patmore Feedmill to the Wandering – Narrogin Rd on the south western end and the Cuballing Townsite and Great Southern Hwy on the north eastern end. It is a short link road at only 6.6km long. The Feedmill commenced operations mid year 2022, and since this time, the Heavy Vehicle counts have increased significantly along this road section. A summary of the Traffic Counts collected on Springhill Rd from 2011 to present day - are shown in Table 1 below.

SPRINGHILL RD – HISTORICAL ROAD COUNT SUMMARY					
SLK	DATE FROM	DATE TO	No. DAYS	AADT	ESA
1.20	11 April 2011	25 May 2011	44	74.7	30.0
1.20	17 March 2015	7 April 2015	21	77.1	20.6
6.5	6 June 2018	6 July 2018	30	88.9	24.6
6.5	6 July 2018	3 Jan 2019	181	77.2	13.2
3.2	7 Sept 2020	17 Dec 2020	101	91.5	17.7
3.2	17 Dec 2020	1 Aug 2021	227	81.7	27.4
PATMORE FEEDMILL LOCATED AT SLK 3.54, COMMENCED OPERATIONS MID YEAR 2022					
3.16	26 May 2023	3 Oct 2023	130	82.9	79.2
5.14	29 March 2024	24 June 2024	87	116.8	117.9
3.16	2 Oct 2024	25 Aug 2025	327	92.0	86.1
5.14	2 Oct 2024	25 Aug 2025	327	89.6	63.5

Table 1

In the last three (3) plus year period, since the Feedmill located at SLK 3.54 along this road has been operational, the Average Annual Daily Traffic (AADT) count has increased by over 16% and the Equivalent Standard Axles (ESA) Heavy Vehicle count has increased by 390%. The current Heavy Vehicle (ESA) count value is considered relatively high for a Local Government controlled road.

The existing Road Carriageway parameters comprise:

- Pavement width from 8.5 to 9.5m width
- Seal Width from 6.0 – 6.4m width
- Cleared width along this road currently, is generally from 13.0 to 15.0 m width.

The required Upgraded Type 6 Standard Road parameters comprise:

- a minimum 10.4m pavement width and
- a minimum 8.0m seal width (and wider around deficient radii curves)

These road upgrade parameters are in line with the SRFLGA Funding requirements design standards. This standard has been put in place to ensure that all of these types of LG managed Regionally Significant Sealed Distributor / Freight Roads are constructed to the same standard and subsequent permitted Heavy Vehicle level – to promote connectivity through the road network.

To construct the required wider pavement and provide sufficient table drainage to preserve the new road pavement well into the future (a desired pavement life of 40 years), the minimum desired road clear zone width is from 20.12m for Springhill Rd – the available width of the existing Road Reserve. Where these types of roads are located in flatter topography, a desired minimum 19m clear width would normally suffice, to provide room for suitable drainage infrastructure. However, the entire 6.6km length of Springhill Rd is located in undulating topography, and generally has high natural surface slopes aligned transverse to the road alignment (generally falling from the right hand to the left hand verge). As

a result, and in order to provide sufficient room for table drainage on the upstream verge and suitably designed embankment fill batter slopes to provide sufficient vehicle runoff recovery:

- on straight sections, a desired minimum clear width of 20m would generally be required (this is the width of the existing One (1) Chain Road Reserve) – see Figure 1.
- on curved sections where the superelevation slope is opposite to the natural surface slope across the road alignment, a desired minimum clear width of up to 28.5m would generally be required (this is greater than the width of the existing One (1) Chain Road Reserve) – see Figure 2.

While undulating topography can provide greater drainage effects (as a result of the natural surface slopes), where the natural surface slope is aligned transverse to the road alignment, there will often be sections where the road is aligned along the contour. In these sections, additional width is required for table drains to be deepened along the upstream verge, in order to provide sufficient grade to assist in conveying surface water along the road to the nearest intersecting waterway. Springhill Rd does have sections where this is the case.

The profile for the desired minimum 20.12m Clear Width (the existing Road Reserve width) on Springhill Rd, along straight sections and in less undulating areas, is shown in Figure 1, in Appendix 1 below. As can be seen, this permits a minimum width of 4.86m for each of: the table drain on the upstream verge; and the fill batter on the downstream verge. Given the topography with high natural surface slopes transverse to the road alignment (that is predominantly the case on this road), this clear width would be the bare minimum required to:

- construct a graded table drain on the upstream verge to convey surface water along flat (or on the contour) sections of any road, to the intersecting natural waterways (where culverts are located to convey surface water under the road).
- provide a maintained fill batter, free of infrangible objects (including trees) to provide sufficient room for vehicle runoff recovery.

In fact, there are many sections along Springhill Rd where the natural surface slope transverse to the road alignment, is so high, that a minimum 25+m wide clear width would be required to fit in the desired road carriageway with suitable drainage infrastructure. Obviously with an existing one (1) chain Road Reserve (20.12m), this amount of clear width is unavailable.

On those four (4) right hand curved sections along Springhill Rd, where the superelevation slope is opposite to the natural surface slope transverse to the road alignment, a desired minimum clear width of up to 28.5m would generally be required (this is greater than the width of the existing One (1) Chain Road Reserve). The right hand curve from SLK 1.94 to 2.00 is located in an area with extreme natural surface slope transverse to the road alignment, and this is the one section along the road where the most width would be desired to provide the desired carriageway and drainage infrastructure. For this reason, in Figure 2 in Appendix 1, I have included the Road Cross Section at SLK 1.97, to highlight why the extra clear width (to 28.52m width) would be desired – if clearing native vegetation, excising adjacent land and relocating telecom services were not expensive, difficult processes to achieve.

Despite the above, and as a Strategy to reduce the Clear Width for the Road Upgrade Works, we have compromised the Road Carriageway Upgrade Design to fit within a minimum 16m Clear Width extent. This design Profile is shown in Figure 3 in Appendix 1. As can be seen, this permits a minimum width of only 2.8m for the table drain on the upstream verge and the fill batter on the downstream verge. For the upstream verge, this really only provides enough width for a Pavement Taper / Table Drain batter, with no backcut. These Table Drains will be constructed to a sub-standard at best, and we will be compromising the structural integrity of the road, via much reduced effectual drainage. This cause and effect is explained in section 3 below.

During recent planning to upgrade this section of the Springhill Rd, it became obvious that a Purpose Permit would need to be applied for, since the existing cleared width is less than the required compromised upgraded road carriageway clear width (of 16m).

3. Clearing Mitigation and Avoidance Strategy

The SoC have only been able to use one (1) strategy to reduce the clearing area impact. This has been to reduce the clearing width from a desired 20.12m (10.06m each way from centre line) to 16m (8.0m each way from road centre line). However, this strategy will add an ongoing additional financial burden to the SoC, via not having desired sufficiently sized table drains that:

- can be constructed with sufficient depth and grade to convey surface water away from the road carriageway into intersecting waterways
 - could otherwise be effectively and economically maintained via Grader as required.
- and will ultimately reduce the expected life of the upgraded pavements.

It is estimated that the reduction in Clear Width from the desired 20.12m (the existing road reserve) to the compromised 16m has reduced the clearing area impact by at least 140% (saving approximately 4.42 Ha of Native Vegetation from having to be cleared).

The SoC are unable to utilise any other strategy to avoid the Verge Clearing for the Upgrade of the Wandering – Narrogin Rd, including:

- shifting the road centreline to one side where verge vegetation is less prominent – which we are unable to implement due to the undulating terrain with mostly high natural surface slopes across the road alignment and a relative even spread of native vegetation over both verges.
- relocating the road alignment onto adjacent cleared freehold land, which is financially unviable.

When near suitably sized table drains are constructed (ie within a desired minimum clear width), these can generally be accessed and maintained via Grader in a productive and economic manner. Current SoC table drain maintenance costs via Grader on this type of sealed Distributor Road ranges from \$ 505 – 570 / km / side. As a result of the narrower table drains (within the 16m clear width), graders cannot always be utilised to maintain these insufficient width table drains, especially when trees are located on the edge of the table drain. In these instances, excavators and trucks are utilised to maintain these table drains as and when required. Apart from this generally resulting in often weed infested table drains that do not convey surface water away from the road carriageway in an effective manner, this type of maintenance operation can range in costs from \$ 15,000 – 18,000 / km / side. Due to its cost, this type of maintenance might only occur once every five (5) plus years. It is estimated that the additional annual costs to maintain the table drains along this 5.9km section of Springhill Rd will be in the vicinity of \$ 6,080.

The end result of not being able to construct sufficient sized table drains is the potential accelerated rate of failure of the road pavement. This is the case in undulating topography with road sections aligned on the contour, with prevalent clayey soils – which is the case on a considerable number of sections along the 5.9km section of Springhill Rd. In these road sections, it is imperative that table drains can be constructed to sufficient grade and depth to convey surface water along the road to the nearest natural waterways, and away from the road alignment. When surface water sits along the road alignment, it recharges into the insitu soil, weakening it (especially expansive clays as is common along this 5.9km section) and reducing its ability to support the pavement under heavy loading. This insitu soil weakening effect can reduce a pavement to 10% of its life under unfavourable circumstances, such as significant heavy traffic loading following significant prolonged wetter periods. The compromised table drains will not permit suitable table drains to always effectively convey surface water away from the road section, and the result for the SoC will be the potential reduced life of the Upgraded Road Sections.

The Upgrade Costs for this Road are expected to be in the vicinity of \$380,000 – 400,000 per km. With suitable table drainage we would be expecting a design pavement life of 40 years. Due to the compromised table drains, the likelihood is that over 30% of this pavement will likely only last 20 years on average. Using an average cost per km of \$390,000 / km, this 5.9km section of road would normally depreciate by \$57,500 per annum over its life. As a result of the compromised table drains this 5.9km road section will potentially depreciate at around \$ 74,800 per annum on average over its life, ultimately costing the SoC \$17,300 per annum. This section at 5.9km comprises only 4.3% of the SoC's main Sealed Distributor Road Network (of 135.53km), which currently all have many sections of compromised table drains, due to a lack of suitable clear width.

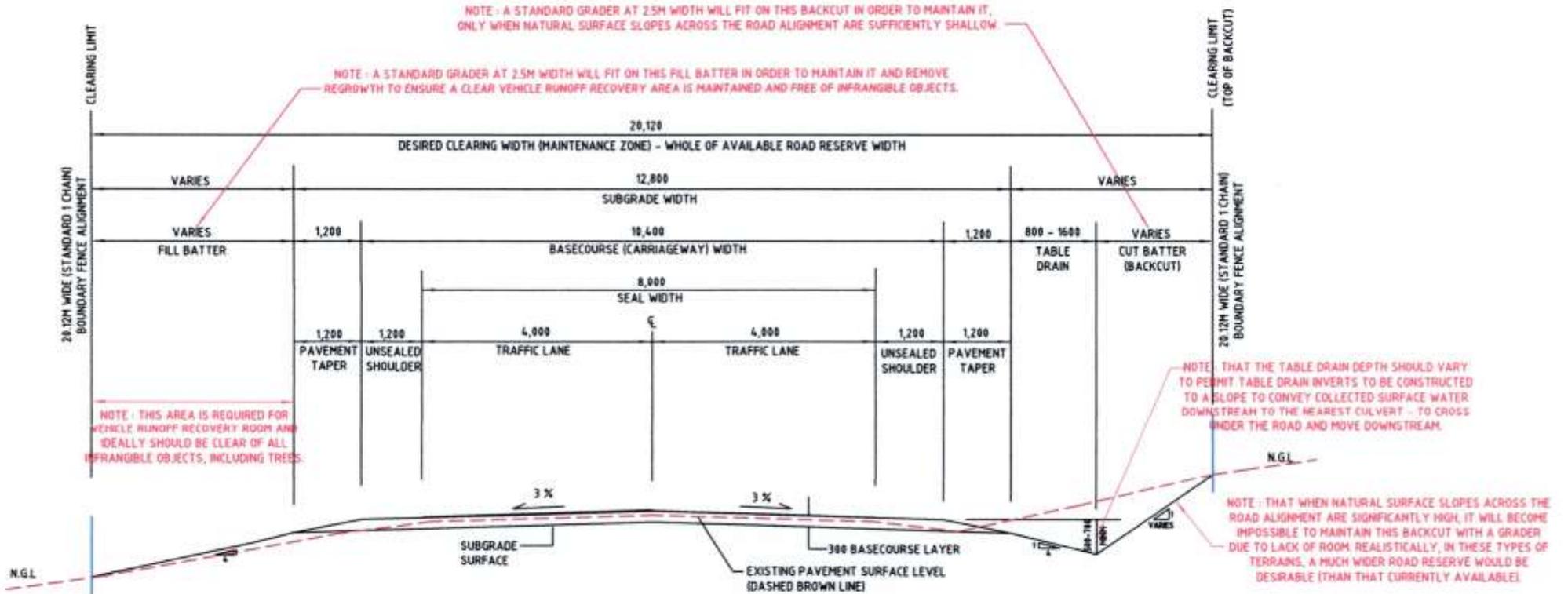
There are many photos of typical similar type sealed Wheatbelt Distributor roads showing accelerated deterioration (than above normal deterioration rate) in Appendix 4 below, as a result of poor, or lack of sufficient Table Drainage.

The SoC will also take on considerable additional safety risks as a result of the reduced, compromised clear width and insufficient sized table drains. These are as a result of:

- reduced table drainage capacity, which during large rainfall events could cause surface water to back onto the carriageway surface, thereby increasing the risk of vehicles plaining off the carriageway surface into the verge, resulting in Injury and / or Fatality.
- less runoff recovery area for vehicles, and infrangible trees being located closer to the edge of running surface (than it otherwise should be - as suggested in Section 4.4 – Verges, in the Austroads Guide to Road Design Part 3: Geometric Design), thereby increasing the risk of vehicles that runoff the road carriageway, colliding with infrangible trees and resulting in Injury and / or Fatality.

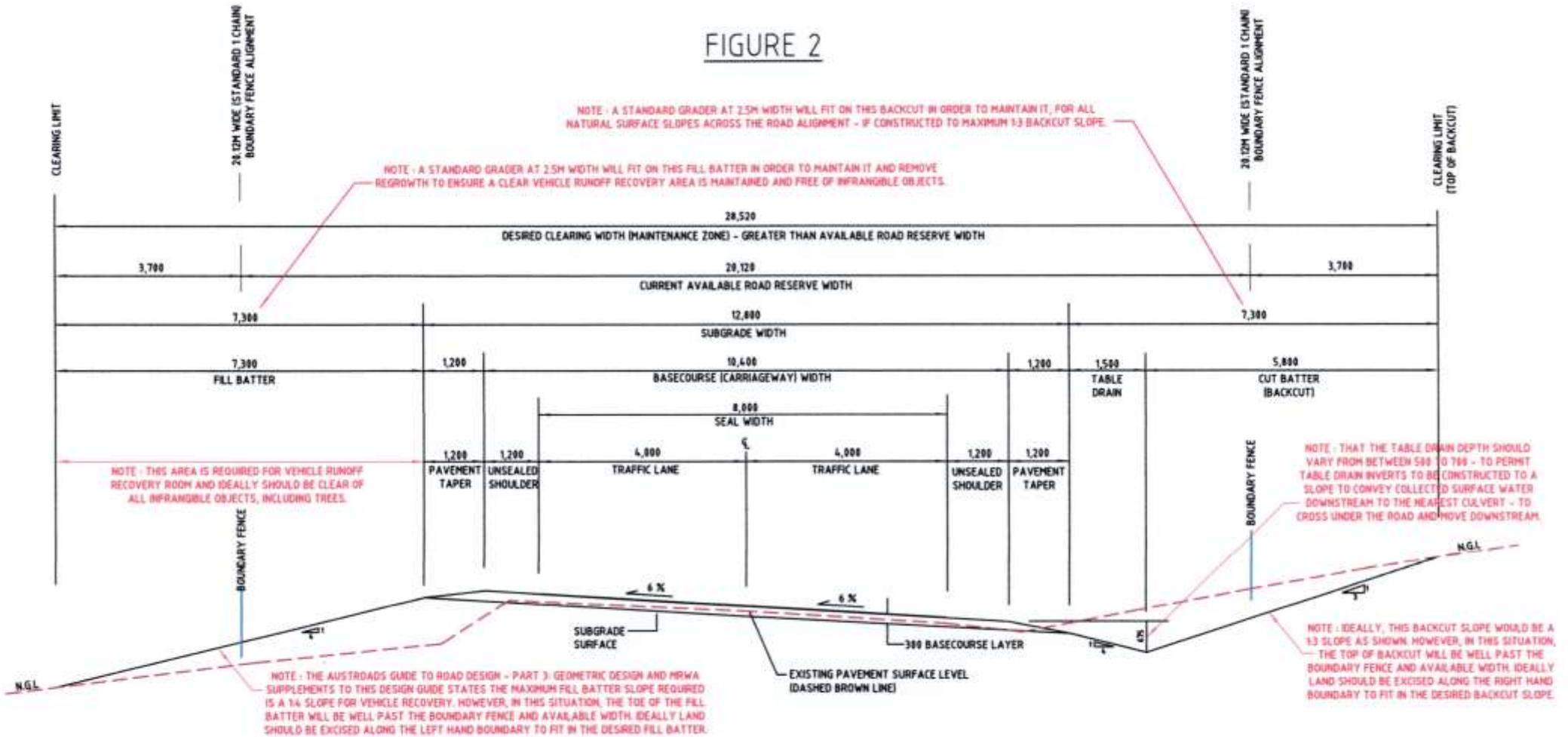
Appendix 1 – Desired and Compromised Road Profile Details

FIGURE 1



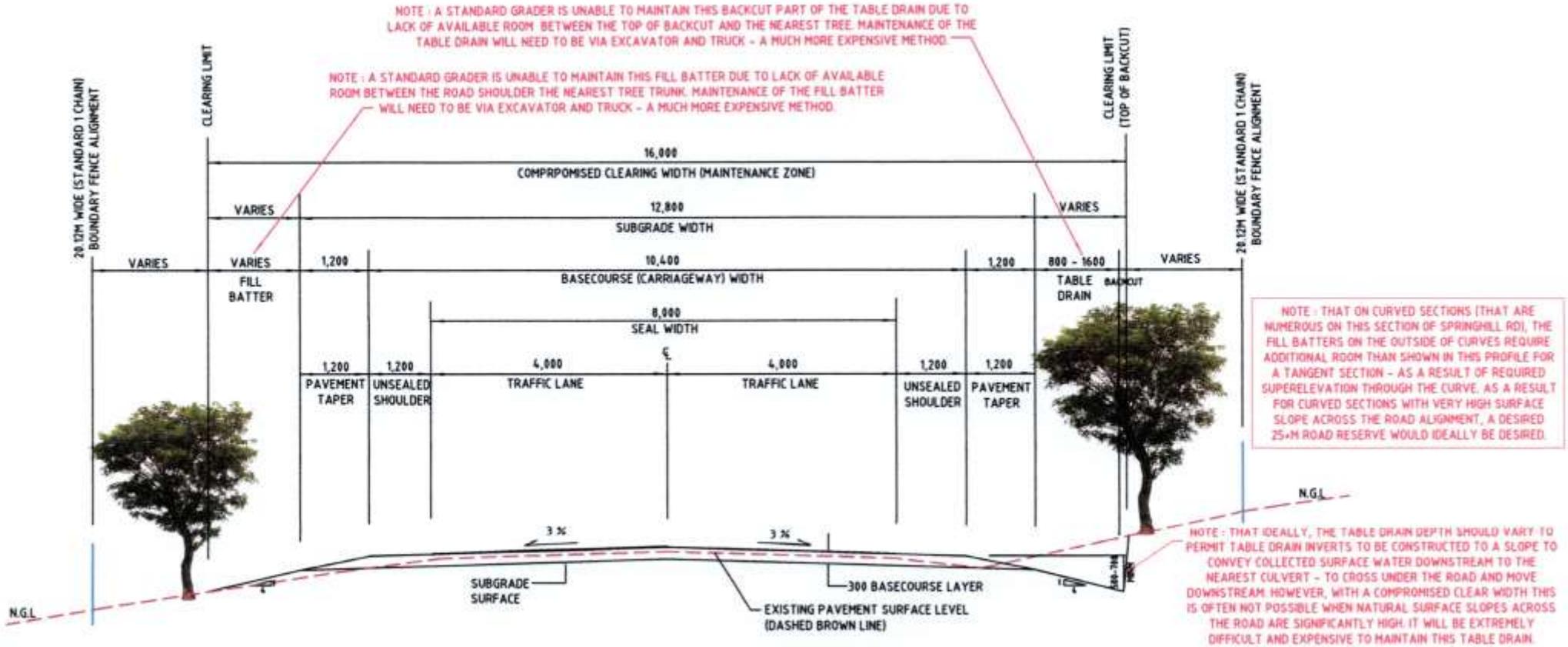
DESIRED STANDARD ROAD TYPE 6 PROFILE FOR UPGRADED OVERLAYED & RECONSTRUCTED SECTIONS ON SPRINGHILL RD ON THE TYPICALLY UNDULATING TOPOGRAPHY WITH HIGH NATURAL SURFACE SLOPE ACROSS THE ROAD ALIGNMENT- TANGENT SECTION SHOWN ONLY

FIGURE 2



DESIRED STANDARD ROAD TYPE 6 PROFILE FOR UPGRADED OVERLAYED & RECONSTRUCTED SECTIONS ON SPRINGHILL RD THROUGH THE CENTRE OF THE RIGHT HAND CURVE AT SLK 1.97 - WITH SUPERELEVATION SLOPE AGAINST THE VERY HIGH NATURAL SURFACE SLOPE ACROSS THE ROAD ALIGNMENT

FIGURE 3



COMPROMISED STANDARD ROAD TYPE 6 PROFILE FOR UPGRADED OVERLAYED & RECONSTRUCTED SECTIONS ON SPRINGHILL RD ON THE TYPICALLY UNDULATING TOPOGRAPHY WITH HIGH NATURAL SURFACE SLOPE ACROSS THE ROAD ALIGNMENT- TANGENT SECTION SHOWN ONLY

Appendix 2 – Road Count Data

Shire of Cuballing - Springhill Rd

TRAFFIC IN BOTH DIRECTIONS

Road Name	SLK	Location	Direction of Travel	Date From	Date To	No. Days	No. of Vehicles for AUSTRROADS 94 Vehicle Classes (from Classifier Reports)												Totals			
							Class	1	2	3	4	5	6	7	8	9	10	11				12
							ESA Multiplier	0.00	0.00	0.61	1.63	2.82	1.30	1.36	2.28	2.57	4.97	6.41				8.12
Springhill Rd	1.20	1.2km west of Cuballing Townsite	Both Traffic Lanes	11-Apr-11	25-May-11	44	Total Traffic	2302	214	303	246	18	7	36	15	79	29	38	0	3287	74.7	ADT
							Calculated ESA	0	0	185	401	51	9	49	34	203	144	244	0	1320	30.0	ESA
Springhill Rd	6.50	0.1km east of Wandering / Narrogin Rd	Both Traffic Lanes	17-Mar-15	07-Apr-15	21	Total Traffic	1339	100	74	33	4	1	5	8	15	4	37	0	1620	77.1	ADT
							Calculated ESA	0	0	45	54	11	1	7	18	39	20	237	0	432	20.6	ESA
Springhill Rd	6.50	0.1km east of Wandering / Narrogin Rd	Both Traffic Lanes	06-Jun-18	06-Jul-18	30	Total Traffic	1994	231	259	50	7	9	25	12	26	4	50	0	2667	88.9	ADT
							Calculated ESA	0	0	158	82	20	12	34	27	67	20	321	0	739	24.6	ESA
Springhill Rd	6.50	0.1km east of Wandering / Narrogin Rd	Both Traffic Lanes	06-Jul-18	03-Jan-19	181	Total Traffic	11535	742	1132	202	12	29	63	31	73	28	126	1	13974	77.2	ADT
							Calculated ESA	0	0	691	329	34	38	86	71	188	139	808	8	2390	13.2	ESA
Springhill Rd	3.20	0.3km north east of Grout Rd	Both Traffic Lanes	07-Sep-20	17-Dec-20	101	Total Traffic	7217	524	1016	177	23	31	57	35	109	14	41	0	9244	91.5	ADT
							Calculated ESA	0	0	620	289	65	40	78	80	280	70	263	0	1783	17.7	ESA
Springhill Rd	3.20	0.3km north east of Grout Rd	Both Traffic Lanes	17-Dec-20	01-Aug-21	227	Total Traffic	13599	953	2009	702	41	107	136	43	706	68	180	0	18544	81.7	ADT
							Calculated ESA	0	0	1225	1144	116	139	185	98	1814	338	1154	0	6214	27.4	ESA
PATMORE FEEDMILL LOCATED AT SLK 3.5 ALONG SPRINGHILL RD COMMENCED OPERATIONS MID YEAR 2022																						
Springhill Rd	3.16	0.3km north east of Grout Rd	Both Traffic Lanes	26-May-23	03-Oct-23	130	Total Traffic	7416	607	812	133	19	48	78	44	205	216	1195	0	10773	82.9	ADT
							Calculated ESA	0	0	495	217	54	62	106	100	527	1074	7660	0	10295	79.2	ESA
Springhill Rd	5.14	1.46km north east of Wandering / Narrogin Rd	Both Traffic Lanes	29-Mar-24	24-Jun-24	87	Total Traffic	6575	754	754	203	39	20	40	68	430	113	1163	0	10159	116.8	ADT
							Calculated ESA	0	0	460	331	110	26	54	155	1105	562	7455	0	10258	117.9	ESA
Springhill Rd	3.16	0.3km north east of Grout Rd	Both Traffic Lanes	02-Oct-24	25-Aug-25	327	Total Traffic	20126	1898	2657	521	26	122	190	233	669	311	3339	0	30092	92.0	ADT
							Calculated ESA	0	0	1621	849	73	159	258	531	1719	1546	21403	0	28160	86.1	ESA
Springhill Rd	5.14	1.46km north east of Wandering / Narrogin Rd	Both Traffic Lanes	02-Oct-24	25-Aug-25	327	Total Traffic	20941	2068	2082	539	20	65	143	159	760	157	2367	0	29301	89.6	ADT
							Calculated ESA	0	0	1270	879	56	85	194	363	1953	780	15172	0	20752	63.5	ESA

Class Speed Matrix

ClassMatrix-199

Site:

Springhill Rd.0.0N

Description:

At cemetery at speed change

Filter time:

9:00 Monday, 11 April 2011 => 6:44 Wednesday, 25 May 2011

SUC 1-2.

Scheme:

Vehicle classification (AustRoads94)

Filter:

Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

		Class													
km/h	SV 1	SVT 2	TB2 3	TB3 4	T4 5	ART3 6	ART4 7	ART5 8	ART6 9	BD 10	DRT 11	TRT 12	Total		
10- 20	1	.	2	.	.	.	.	.	.	.	.	.	3	0.1%
20- 30	12	.	2	.	.	.	.	.	.	.	.	.	14	0.4%
30- 40	32	2	5	3	1	2	1	.	.	.	1	.	47	1.4%	
40- 50	54	10	9	5	1	1	1	.	2	.	1	.	84	2.6%	
50- 60	116	22	38	7	2	1	7	1	6	2	4	.	206	6.3%	
60- 70	312	39	73	42	2	.	8	3	21	7	5	.	512	15.6%	
70- 80	514	69	73	49	6	1	10	6	20	11	12	.	771	23.5%	
80- 90	586	50	52	79	6	1	7	3	17	5	7	.	813	24.7%	
90-100	377	20	23	43	.	.	1	2	9	4	5	.	484	14.7%	
100-110	174	2	21	18	.	1	1	.	4	.	2	.	223	6.8%	
110-120	75	.	4	.	.	.	.	.	.	.	1	.	80	2.4%
120-130	30	.	1	.	.	.	.	.	.	.	.	.	31	0.9%
130-140	14	.	.	.	.	.	.	.	.	.	.	.	14	0.4%
140-150	3	.	.	.	.	.	.	.	.	.	.	.	3	0.1%
150-160	2	.	.	.	.	.	.	.	.	.	.	.	2	0.1%
Total	2302	214	303	246	18	7	36	15	79	29	38	0	3287	100%	
	70.0%	6.5%	9.2%	7.5%	0.5%	0.2%	1.1%	0.5%	2.4%	0.9%	1.2%	0.0%			

PRE FSSOMIIL OPERATIONS
ADT = 74.7
ESA = 30.0.

146 DMS

Class Speed Matrix

ClassMatrix-200

Site: Springhill rd.0.0E
Description: Springhill rd 100m from Wandering Narrogin rd intersection suc 6.5
Filter time: 10:41 Tuesday, 17 March 2015 => 11:00 Tuesday, 7 April 2015
Scheme: Vehicle classification (AustRoads94)
Filter: CIs(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

km/h	Class												Total	
	SV 1	SVT 2	TB2 3	TB3 4	T4 5	ART3 6	ART4 7	ART5 8	ART6 9	BD 10	DRT 11	TRT 12		
10- 20	3	.	.	.	.	.	.	.	.	.	.	.	3	0.2%
20- 30	4	1	.	3	.	.	.	1	.	.	1	.	10	0.6%
30- 40	10	5	4	3	.	.	.	2	1	1	10	.	36	2.2%
40- 50	42	10	16	6	.	.	1	2	1	.	7	.	85	5.2%
50- 60	145	28	9	6	2	1	3	4	8	1	7	.	214	13.2%
60- 70	307	29	20	4	2	.	1	.	3	2	8	.	376	23.2%
70- 80	383	16	14	2	.	.	.	.	1	.	3	.	419	25.9%
80- 90	250	9	6	8	.	.	.	.	.	.	1	.	274	16.9%
90-100	120	2	2	1	.	.	.	.	.	.	.	.	125	7.7%
100-110	51	.	3	.	.	.	.	.	.	.	.	.	54	3.3%
110-120	18	.	.	.	.	.	.	.	.	.	.	.	18	1.1%
120-130	1	.	.	.	.	.	.	.	.	.	.	.	1	0.1%
130-140	4	.	.	.	.	.	.	.	.	.	.	.	4	0.2%
140-150	1	.	.	.	.	.	.	.	.	.	.	.	1	0.1%
150-160	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
Total	1339	100	74	33	4	1	5	8	15	4	37	0	1620	21 DAYS.
	82.7%	6.2%	4.6%	2.0%	0.2%	0.1%	0.3%	0.5%	0.9%	0.2%	2.3%	0.0%		

PRE FESOMIU OPERATIONS.

ADT = 77.1

ESA = 20.6.

Class Speed Matrix

ClassMatrix-201

Site: Springhill Road.0.0E
Description: SLK 6.50
Filter time: 8:19 Wednesday, 6 June 2018 => 10:27 Friday, 6 July 2018
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

km/h	Class												Total	
	SV 1	SVT 2	TB2 3	TB3 4	T4 5	ART3 6	ART4 7	ART5 8	ART6 9	BD 10	DRT 11	TRT 12		
10- 20	.	.	2	.	.	.	.	.	.	.	.	.	2	0.1%
20- 30	12	3	2	.	.	1	.	1	.	.	1	.	20	0.7%
30- 40	84	12	12	.	.	.	2	.	.	.	5	.	115	4.3%
40- 50	118	22	24	9	1	1	5	3	5	.	22	.	210	7.9%
50- 60	143	48	47	21	3	2	6	4	10	3	3	.	290	10.9%
60- 70	303	75	61	15	2	2	4	4	8	.	13	.	487	18.3%
70- 80	487	44	57	2	1	1	6	.	3	1	4	.	606	22.7%
80- 90	461	17	35	2	.	2	2	.	.	.	2	.	521	19.5%
90-100	251	5	13	1	.	.	.	.	.	.	.	.	270	10.1%
100-110	111	4	6	.	.	.	.	.	.	.	.	.	121	4.5%
110-120	17	1	.	.	.	.	.	.	.	.	.	.	18	0.7%
120-130	6	.	.	.	.	.	.	.	.	.	.	.	6	0.2%
130-140	1	.	.	.	.	.	.	.	.	.	.	.	1	0.0%
140-150	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
150-160	.	.	.	.	.	.	.	.	.	.	.	.	0	0.0%
Total	1994	231	259	50	7	9	25	12	26	4	50	0	2667	30 DAYS.
	74.8%	8.7%	9.7%	1.9%	0.3%	0.3%	0.9%	0.4%	1.0%	0.1%	1.9%	0.0%		

PRE FREQUENT OPERATIONS.
 ADT = 88.9
 ESA = 24.6.

Class Speed Matrix

ClassMatrix-202

Site: Springhill Road.0.0E
Description: SLK 6.50
Filter time: 10:31 Friday, 6 July 2018 => 12:53 Thursday, 3 January 2019
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

km/h	Class												Total	
	SV 1	SVT 2	TB2 3	TB3 4	T4 5	ART3 6	ART4 7	ART5 8	ART6 9	BD 10	DRT 11	TRT 12		
10- 20	9	.	4	3	.	.	.	.	.	.	.	.	16	0.1%
20- 30	81	16	22	7	1	.	.	.	3	.	2	.	132	0.9%
30- 40	539	19	70	12	.	.	1	1	3	2	29	.	676	4.8%
40- 50	640	29	68	32	1	6	5	5	8	9	51	1	855	6.1%
50- 60	581	104	110	54	3	6	16	13	23	9	17	.	936	6.7%
60- 70	1559	208	226	60	3	4	18	9	24	8	19	.	2138	15.3%
70- 80	2976	217	312	28	4	2	15	2	11	.	8	.	3575	25.6%
80- 90	2781	108	182	4	.	9	4	1	1	.	.	.	3090	22.1%
90-100	1610	36	86	2	.	2	3	.	.	.	.	.	1739	12.4%
100-110	558	4	39	.	.	.	1	.	.	.	.	.	602	4.3%
110-120	141	1	12	.	.	.	.	.	.	.	.	.	154	1.1%
120-130	41	.	1	.	.	.	.	.	.	.	.	.	42	0.3%
130-140	10	.	.	.	.	.	.	.	.	.	.	.	10	0.1%
140-150	3	.	.	.	.	.	.	.	.	.	.	.	3	0.0%
150-160	6	.	.	.	.	.	.	.	.	.	.	.	6	0.0%
Total	11535	742	1132	202	12	29	63	31	73	28	126	1	13974	131 DATS.
	82.5%	5.3%	8.1%	1.4%	0.1%	0.2%	0.5%	0.2%	0.5%	0.2%	0.9%	0.0%		

PRS FSSOMU OPERATIONS.
 ADT = 77.2
 ESA = 13.2.

Class Speed Matrix

ClassMatrix-203

Site: Springhill rd.0.0E
Description: SLK 3.20
Filter time: 13:50 Monday, 7 September 2020 => 8:11 Thursday, 17 December 2020
Scheme: Vehicle classification (AustRoads94)
Filter: CIs(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

km/h	Class												Total	
	SV 1	SVT 2	TB2 3	TB3 4	T4 5	ART3 6	ART4 7	ART5 8	ART6 9	BD 10	DRT 11	TRT 12		
10- 20	2	.	.	1	1	.	.	.	.	.	.	.	4	0.0%
20- 30	40	3	2	1	.	.	.	.	.	.	.	.	46	0.5%
30- 40	56	9	7	.	.	.	.	1	.	1	.	.	74	0.8%
40- 50	59	18	8	3	.	.	.	1	1	2	.	.	92	1.0%
50- 60	188	61	42	5	1	1	3	5	5	.	2	.	313	3.4%
60- 70	311	45	94	8	1	2	11	5	14	.	7	.	498	5.4%
70- 80	689	96	192	14	.	4	20	8	23	6	6	.	1060	11.5%
80- 90	1358	102	198	70	5	5	13	11	26	1	17	.	1806	19.5%
90-100	1738	97	192	69	6	13	9	3	33	3	4	.	2167	23.4%
100-110	1636	77	162	6	5	5	.	1	7	1	3	.	1903	20.6%
110-120	782	13	77	.	4	1	1	.	.	.	.	.	878	9.5%
120-130	225	3	33	.	.	.	.	.	.	.	.	.	261	2.8%
130-140	83	.	8	.	.	.	.	.	.	.	.	.	91	1.0%
140-150	26	.	1	.	.	.	.	.	.	.	.	.	27	0.3%
150-160	24	.	.	.	.	.	.	.	.	.	.	.	24	0.3%
Total	7217	524	1016	177	23	31	57	35	109	14	41	0	9244	101 DAYS
	78.1%	5.7%	11.0%	1.9%	0.2%	0.3%	0.6%	0.4%	1.2%	0.2%	0.4%	0.0%		

PRE FESDMU OPERATIONS.
 ADT = 91.5
 ESA = 17.7.

Class Speed Matrix

ClassMatrix-204

Site: Springhill rd.0.0E
Description: SLK 3.20
Filter time: 8:09 Thursday, 17 December 2020 => 20:10 Sunday, 1 August 2021
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

km/h	Class												Total	
	SV 1	SVT 2	TB2 3	TB3 4	T4 5	ART3 6	ART4 7	ART5 8	ART6 9	BD 10	DRT 11	TRT 12		
10- 20	11	.	2	.	.	.	.	.	.	.	.	.	13	0.1%
20- 30	74	2	6	4	1	.	2	.	5	.	.	.	94	0.5%
30- 40	94	8	19	10	.	.	3	.	18	5	1	.	158	0.9%
40- 50	190	45	39	31	1	2	5	2	97	4	5	.	421	2.3%
50- 60	359	85	83	36	2	3	9	13	104	12	12	.	718	3.9%
60- 70	756	107	152	75	.	7	18	12	161	11	49	.	1348	7.3%
70- 80	1725	194	289	125	3	27	41	9	113	14	16	.	2556	13.8%
80- 90	2781	249	414	215	4	22	33	6	99	12	47	.	3882	20.9%
90-100	3216	163	435	175	5	24	19	1	90	9	34	.	4171	22.5%
100-110	2652	74	284	30	13	15	5	.	19	1	16	.	3109	16.8%
110-120	1259	19	180	1	11	6	1	.	.	.	.	.	1477	8.0%
120-130	334	7	63	.	1	1	.	.	.	.	.	.	406	2.2%
130-140	104	.	26	.	.	.	.	.	.	.	.	.	130	0.7%
140-150	27	.	10	.	.	.	.	.	.	.	.	.	37	0.2%
150-160	17	.	7	.	.	.	.	.	.	.	.	.	24	0.1%
Total	13599	953	2009	702	41	107	136	43	706	68	180	0	18544	227 days
	73.3%	5.1%	10.8%	3.8%	0.2%	0.6%	0.7%	0.2%	3.8%	0.4%	1.0%	0.0%		

PRE REGIONAL OPERATIONS
ADT = 81.7.

ESA = 27.4 (NOTE - THIS ESA WOULD BE SIGNIFICANTLY
EASIER AS PREVIOUS LEVEL DUE TO
CONSTRUCTION HEAVY TRAFFIC - FOR
CONSTRUCTION OF REGIONAL THAT COMMENCED
LATE 2020).

Class Speed Matrix

ClassMatrix-205

Site: Springhill Road.0.1NS
Description: Springhill Road SLK 3.16
Filter time: 14:11 Friday, 26 May 2023 => 13:09 Tuesday, 3 October 2023
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

km/h	Class												Total	
	SV 1	SVT 2	TB2 3	TB3 4	T4 5	ART3 6	ART4 7	ART5 8	ART6 9	BD 10	DRT 11	TRT 12		
10- 20	4	.	3	.	.	.	.	.	.	.	.	.	7	0.1%
20- 30	17	.	3	1	2	.	.	.	2	.	2	.	27	0.3%
30- 40	112	3	.	.	1	.	.	.	1	15	73	.	205	1.9%
40- 50	116	16	19	11	.	1	1	6	10	52	215	.	447	4.1%
50- 60	173	45	48	10	.	.	1	7	27	28	264	.	603	5.6%
60- 70	410	58	91	30	3	.	12	14	47	46	427	.	1138	10.6%
70- 80	915	157	122	45	4	12	30	10	55	46	158	.	1554	14.4%
80- 90	1500	182	199	28	2	21	18	5	33	28	41	.	2057	19.1%
90-100	1802	114	176	7	6	8	12	1	26	1	14	.	2167	20.1%
100-110	1561	23	113	1	1	6	4	1	4	.	1	.	1715	15.9%
110-120	584	8	29	.	.	.	.	.	.	.	.	.	621	5.8%
120-130	155	1	5	.	.	.	.	.	.	.	.	.	161	1.5%
130-140	44	.	3	.	.	.	.	.	.	.	.	.	47	0.4%
140-150	19	.	1	.	.	.	.	.	.	.	.	.	20	0.2%
150-160	4	.	.	.	.	.	.	.	.	.	.	.	4	0.0%
Total	7416	607	812	133	19	48	78	44	205	216	1195	0	10773	130 DAYS.
	68.8%	5.6%	7.5%	1.2%	0.2%	0.4%	0.7%	0.4%	1.9%	2.0%	11.1%	0.0%		

POST FSSOMM OPERATION (COMMENCE OPERATION MID 2022).

ADT = 82.9

ESA = 79.2

Class Speed Matrix

ClassMatrix-206

Site: Springhill Road.0.1NS
Description: Springhill Road SLK 5.14
Filter time: 8:14 Friday, 29 March 2024 => 10:29 Monday, 24 June 2024
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

		Class													
		SV	SVT	TB2	TB3	T4	ART3	ART4	ART5	ART6	BD	DRT	TRT	Total	
km/h		1	2	3	4	5	6	7	8	9	10	11	12		
10- 20		3	.	.	1	.	.	.	.	.	.	.	.	4	0.0%
20- 30		13	.	2	3	.	.	2	2	1	.	1	.	24	0.2%
30- 40		17	4	6	.	.	.	3	2	.	2	.	.	34	0.3%
40- 50		24	16	26	9	3	1	.	10	8	3	8	.	108	1.1%
50- 60		102	61	57	29	7	.	5	10	22	6	60	.	359	3.5%
60- 70		454	154	87	66	17	1	6	23	76	38	312	.	1234	12.1%
70- 80		937	234	181	63	8	9	14	16	156	44	405	.	2067	20.3%
80- 90		1664	172	158	25	3	4	7	5	129	17	273	.	2457	24.2%
90-100		1690	84	119	5	1	1	3	.	37	3	99	.	2042	20.1%
100-110		1088	26	74	2	.	3	.	.	1	.	5	.	1199	11.8%
110-120		457	3	38	.	.	1	.	.	.	.	.	.	499	4.9%
120-130		93	.	6	.	.	.	.	.	.	.	.	.	99	1.0%
130-140		23	.	.	.	.	.	.	.	.	.	.	.	23	0.2%
140-150		7	.	.	.	.	.	.	.	.	.	.	.	7	0.1%
150-160		3	.	.	.	.	.	.	.	.	.	.	.	3	0.0%
Total		6575	754	754	203	39	20	40	68	430	113	1163	0	10159	87 DAYS
		64.7%	7.4%	7.4%	2.0%	0.4%	0.2%	0.4%	0.7%	4.2%	1.1%	11.4%	0.0%		

POST FREEMIN OPERATIONS (COMMENCED OPERATIONS MID 2022)

ADT = 116.8

ESA = 117.9

Class Speed Matrix

ClassMatrix-207

Site: Springhill Road.0.1NS
Description: Springhill Road SLK 3.16
Filter time: 10:14 Wednesday, 2 October 2024 => 0:53 Monday, 25 August 2025
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

km/h	Class												Total		
	SV 1	SVT 2	TB2 3	TB3 4	T4 5	ART3 6	ART4 7	ART5 8	ART6 9	BD 10	DRT 11	TRT 12			
10- 20	7	.	2	1	.	.	.	.	.	.	.	.	10	0.0%
20- 30	40	4	10	7	.	.	1	.	2	.	20	.	84	0.3%	
30- 40	103	24	23	5	1	.	5	7	17	20	302	.	507	1.7%	
40- 50	307	62	37	36	.	5	3	19	83	93	921	.	1566	5.2%	
50- 60	436	128	107	39	4	4	13	55	165	47	846	.	1844	6.1%	
60- 70	924	254	213	108	7	7	21	51	124	50	904	.	2663	8.8%	
70- 80	2350	446	371	181	7	15	43	34	123	55	233	.	3858	12.8%	
80- 90	4354	488	557	92	3	23	47	35	93	36	77	.	5805	19.3%	
90-100	5002	334	504	46	1	22	45	20	52	8	28	.	6062	20.1%	
100-110	4025	129	395	6	3	32	12	12	10	2	8	.	4634	15.4%	
110-120	1903	25	271	.	.	10	.	.	.	.	.	.	2209	7.3%
120-130	496	4	114	.	.	2	.	.	.	.	.	.	616	2.0%
130-140	132	.	36	.	.	2	.	.	.	.	.	.	170	0.6%
140-150	33	.	12	.	.	.	.	.	.	.	.	.	45	0.1%
150-160	14	.	5	.	.	.	.	.	.	.	.	.	19	0.1%
Total	20126	1898	2657	521	26	122	190	233	669	311	3339	0	30092		<i>327 DAYS</i>
	66.9%	6.3%	8.8%	1.7%	0.1%	0.4%	0.6%	0.8%	2.2%	1.0%	11.1%	0.0%			

POST FIELDSHILL OPERATIONS (COMMENCED OPERATIONS MID 2022)

ADT = 92

ESA = 86.1

Class Speed Matrix

ClassMatrix-210

Site: Springhill Road.0.1NS
Description: Springhill Road SLK 5.14
Filter time: 10:21 Wednesday, 2 October 2024 => 7:00 Monday, 25 August 2025
Scheme: Vehicle classification (AustRoads94)
Filter: Cls(1-12) Dir(NESW) Sp(10,160) Headway(>0) Span(0 - 100) Lane(0-16)

km/h	Class												Total		
	SV 1	SVT 2	TB2 3	TB3 4	T4 5	ART3 6	ART4 7	ART5 8	ART6 9	BD 10	DRT 11	TRT 12			
10- 20	11	.	3	3	.	.	.	.	.	.	.	.	.	17	0.1%
20- 30	36	8	6	1	.	.	2	.	.	.	1	.	.	54	0.2%
30- 40	92	26	14	11	.	1	5	4	6	.	.	.	.	159	0.5%
40- 50	109	61	16	33	.	2	5	4	11	3	18	.	.	262	0.9%
50- 60	241	123	57	41	.	4	11	14	41	7	97	.	.	636	2.2%
60- 70	1068	363	152	104	6	5	22	28	131	23	549	.	.	2451	8.4%
70- 80	2923	557	514	183	5	13	42	42	285	65	873	.	.	5502	18.8%
80- 90	5379	520	538	122	5	17	42	50	208	41	639	.	.	7561	25.8%
90-100	5949	308	456	41	3	15	12	16	77	18	180	.	.	7075	24.1%
100-110	3765	89	204	.	1	5	2	1	.	.	10	.	.	4078	13.9%
110-120	1066	11	87	.	.	1	.	.	.	.	.	.	.	1165	4.0%
120-130	241	2	26	.	.	2	.	.	.	.	.	.	.	271	0.9%
130-140	51	.	9	.	.	.	.	.	.	.	.	.	.	60	0.2%
140-150	8	.	.	.	.	.	.	.	.	.	.	.	.	8	0.0%
150-160	2	.	.	.	.	.	.	.	.	.	.	.	.	2	0.0%
Total	20941	2068	2082	539	20	65	143	159	760	157	2367	0	29301		
	71.5%	7.1%	7.1%	1.8%	0.1%	0.2%	0.5%	0.5%	2.6%	0.5%	8.1%	0.0%			

POST FEEDMILL OPERATIONS (COMMENCED OPERATIONS MID 2022)

ADT = 89.6

ESA = 63.5

Appendix 3 – Proposed Clearing Area Plans



Springhill Rd - Verge Clearing Areas - Sheet 1

0 55 110 220 Meters



Springhill Rd - Verge Clearing Areas - Sheet 2

0 55 110 220 Meters



Springhill Rd - Verge Clearing Areas - Sheet 3

0 55 110 220 Meters



Springhill Rd - Verge Clearing Areas - Sheet 4

0 55 110 220 Meters

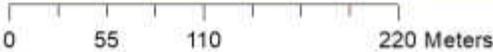


Springhill Rd - Verge Clearing Areas - Sheet 5

0 55 110 220 Meters



Springhill Rd - Verge Clearing Areas - Sheet 6



Appendix 4 – Photos showing Pavement Failures on Various Wheatbelt Roads due to Poor Drainage



Photo of Pavement Failure on the Goomalling / Calingiri Rd at SLK 5.10 due to non-adequate table drainage and / or subsequent lack of maintenance.



Photo of Pavement Failure on the Goomalling / Calingiri Rd at SLK 6.76 due to non-adequate table drainage and / or subsequent lack of maintenance.



Photo of Pavement Failure on the Goomalling / Calingiri Rd at SLK 10.90 due to non-adequate table drainage and / or subsequent lack of maintenance.



Photo of Pavement Failure on the Goomalling / Calingiri Rd at SLK 11.64 due to non-adequate table drainage and / or subsequent lack of maintenance. Note the surface water sitting in the drain.



Photo of Pavement Failure on the Goomalling / Calingiri Rd at SLK 24.78 due to non-adequate table drainage and / or subsequent lack of maintenance.



Photo of Pavement Failure on the Goomalling / Calingiri Rd at SLK 26.92 due to non-adequate table drainage and / or subsequent lack of maintenance.



Photo of Pavement Failure on the Kellerberrin / Bencubbin Rd at SLK 13.48 due to non-adequate table drainage and / or subsequent lack of maintenance.



Photo of Pavement Failure on the Kellerberrin / Bencubbin Rd at SLK 16.69 due to non-adequate table drainage and / or subsequent lack of maintenance.



Photo of Pavement Failure on the Kellerberrin / Bencubbin Rd at SLK 22.37 due to non-adequate table drainage and / or subsequent lack of maintenance.



Photo of poorly maintained table drain on the Kellerberrin / Yoting Rd at SLK 17.58 due to insufficient table drain width to allow easy maintenance via Grader. Note this pavement has been upgraded relatively recently and has not had sufficient time to develop potential failure areas.



Photo of poorly maintained table drain on the Kellerberrin / Yoting Rd at SLK 19.63 due to insufficient table drain width to allow easy maintenance via Grader. Note this pavement has been upgraded relatively recently and has not had sufficient time to develop potential failure areas.



Photo of poorly maintained table drain on the Kellerberrin / Yoting Rd at SLK 19.66 due to insufficient table drain width to allow easy maintenance via Grader. Note this pavement has been upgraded relatively recently and has not had sufficient time to develop potential failure areas.



Photo of poorly maintained table drain on the Kellerberrin / Yoting Rd at SLK 20.18 due to insufficient table drain width to allow easy maintenance via Grader. Note this pavement has been upgraded relatively recently and has not had sufficient time to develop potential failure areas.



Photo of poorly maintained table drain on the Kellerberrin / Yoting Rd at SLK 20.27 due to insufficient table drain width to allow easy maintenance via Grader. Note this pavement has been upgraded relatively recently and has not had sufficient time to develop potential failure areas.



Photo of well shaped road carriageway and table drains on the York / Merredin Rd (MRWA controlled Highway) at SLK 83.66 with well maintained (via Grader) table drains.



Photo of Pavement Failure on the Pingelly / Alderside Rd at SLK 3.89 due to non-adequate table drainage and / or subsequent lack of maintenance.



Photo of Pavement Failure on the Pingelly / Alderside Rd at SLK 4.61 due to non-adequate table drainage and / or subsequent lack of maintenance.



Photo of poorly maintained table drain on the Pingelly / Alderside Rd at SLK 8.53 due to insufficient table drain width to allow easy maintenance via Grader. Note this pavement has no adjacent pavement failures due to the slope on land that is assisting conveying surface water along the table drain. This is evident from the scouring.



Photo of Pavement Failure on the Pingelly / Alderside Rd at SLK 4.61 due to no adequate table drain and / or lack of maintenance. This pavement failure is the result of no crossover pipe to convey surface water under the crossing and this water has penetrated the underlying soil, resulting in this pavement failure downstream.



Photo of Pavement Failure on the Pingelly / Alderside Rd at SLK 8.73 due to non-adequate table drainage and / or subsequent lack of maintenance.



Photo of Pavement Failure on the Great Southern Highway (MRWA Controlled Rd) at SLK 142.53 due ponding of surface water from no downstream drainage to run water away from pavement (above ground water main has hindered either proper downstream drain construction or limited maintenance of).



Photo of Pavement Failure on the Great Southern Highway (MRWA Controlled Rd) at SLK 143.15 due ponding of surface water from no downstream drainage to run water away from pavement (above ground water main has hindered either proper downstream drain construction or limited maintenance of).



Photo of Pavement Failure on the Great Southern Highway (MRWA Controlled Rd) at SLK 143.20 due ponding of surface water from no downstream drainage to run water away from pavement (above ground water main has hindered either proper downstream drain construction or limited maintenance of).



Photo of well shaped road carriageway and table drains on the Great Southern Highway (MRWA controlled Highway) at SLK 148.30 with well maintained (via Grader) table drains. Note the shedding of surface water along the table drain following a large rain event.



Photo of well shaped road carriageway and table drains on the Great Southern Highway (MRWA controlled Highway) at SLK 149.35 with well maintained (via Grader) table drains. Note the shedding of surface water along the table drain following a large rain event.



Photo of poorly maintained table drain on the Goomalling / Merredin Rd (MRWA Controlled Hwy) at SLK 102.47 due to insufficient table drain maintenance. Note the surface water sitting in the table drain due to the vegetation in the table drain preventing it from flowing downstream. This has resulted in surface water penetrating the underlying insitu soil, weakening it and causing the adjacent pavement failure.