

<b>The Township of Horton Policy and Procedures</b>			
SECTION: TRANSPORTATION			POLICY #: T-05
POLICY: Road Surface Optimization, Preservation and Development Policy			
DATE: November 2021 By-law 2021-59	REV. DATE:	COVERAGE: Transportation & Environmental Services	PAGE #: 1 of 12

**POLICY STATEMENT:**

The Township of Horton has established a policy to ensure the roads network within Horton Township are constructed and maintained to a high quality which promotes life cycle optimization and preservation of the road network. This policy shall work in collaboration with the most current version of the Minimum Maintenance Standards for Municipal Highways with an objective to ensure that every maintenance dollar spent attains high life extension value with low cost per square meter over the life cycle of the roadway to sustain an average Ride Condition Rating (RCR) of 6 or higher and an average Pavement Condition Rating (PCR) of 60 or higher on the Pavement Condition Index (PCI) throughout the Township of Horton's road network.

**PROCEDURE:**

**Preservation and Optimization**

- 1.11 That the Township of Horton shall strive to maintain an average Pavement Condition Index rating (PCI) no lower than 60 over the entire paved roads network. See section 1.
- 1.12 That Annual Average Daily Traffic be the sole factor determining the surface course of a roadway or section of roadway. See section 2.
- 1.13 That all roads currently paved or double surface treated shall remain as such and not have the surface course downgraded for any reason other than temporarily for the purpose of construction or rehabilitation. Roadways that are under construction or rehabilitation shall have the pre-existing surface course reapplied by December 20<sup>th</sup> of the year of construction or rehabilitation. If construction proceeds into the next calendar year a temporary surface course acceptable to the Township, in written agreement between the contractor and the Township, must be applied by December 20<sup>th</sup> of the year that construction or rehabilitation began.
- 1.14 That the MTO pavement structural design guidelines for secondary highways shall be the standard for granular base equivalency (GBE) thickness acceptable for pavement application on any municipally maintained or assumed roadway within the Township of Horton. Granular base testing may be performed by Township staff or Contract.  
See section 3.
- 1.15 That prior to reconstruction of an existing paved roadway granular base testing may be requested, if staff or council believe the sub-base is insufficient or degraded, to confirm the granular base thickness is structurally sufficient. See section 3.

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- 1.16 That reclaimed Double Surface Treatment shall have a Granular Base Equivalency factor of 0.6 equivalent to Old Granular Base. See section 3.
- 1.17 That if the subgrade material is unknown or uncertain the highest GBE factor in the appropriate AADT column per section 3 of this document shall be the acceptable GBE for the roadway in question. See section 3.
- 1.18 That prior to upgrading an existing gravel roadway surface to a bituminous surface granular base testing must be performed to confirm the granular base thickness is structurally sufficient per the current AADT of the roadway. See Section 3.
- 1.19 That prior to reconstruction of an existing paved roadway a minimum of two preservation treatments or combination of treatments must be applied to the roadway. See section 7.
- 1.110 That prior to full reconstruction of any bituminous roadway the PCI rating must be in the 40<sup>th</sup> percentile or lower and preservation treatments deemed unfeasible to regain a sustainable PCI rating of 60 or above. See section 1.
- 1.111 That feasibility related to preservation versus reconstruction shall be determined by the Public Works Manager. If a divergence of opinion between Council and staff arises then an independent consultant or contractor may be requested to confirm in writing staff's categorization.
- 1.112 That brushing, grass cutting, ditch clean out, shouldering, cold patching and culvert replacements be deemed regular maintenance activities and not considered preservation treatments.
- 1.113 That any roadway receiving (DST) Double Surface Treatment shall have an AADT lower than 300 vehicles per day.
- 1.114 That any roadway prior to receiving (DST) Double Surface Treatment shall have a minimum granular base equivalency thickness of 350 millimetres and shall have no less than 200mm of granular A or granular M base material prior to application of DST. See section 3.

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### **Typical Road Profiles**

- 1.115 That the typical paved road profile within the Township of Horton shall be as shown in section 4 of this policy. Any road platform width alterations shall be pending approval of the Public Works Manager. See section 4.
- 1.116 That any terminated (dead end) roadway must have a typical cul-de sac turn around area. See section 5.

### **Development and Assumption by the Township**

- 1.117 Newly developed roadways shall be defined as the establishment of a new facility to be a part of the primary or secondary road system or the continuation of a developed establishment past an existing intersection to be a part of the primary or secondary road system.
- 1.118 That any newly developed roadway proposed for assumption shall have a hard top surface course that conforms with section 2 of this policy. The onus shall be on the developer to prove to the Township that the surface course proposed is adequate for any future development of the roadway and surrounding area.
- 1.119 Extension of a roadway shall be defined as adding to or continuing an established part of the primary or secondary road system that does not intersect another established part of the primary or secondary road system. If the roadway intersects any existing established roadway, it shall be considered newly developed.
- 1.120 Any extension of an existing roadway shall have a like for like surface that matches the existing roadway surface type.
- 1.121 That within 5 to 7 years of a roadway receiving (DST) Double Surface Treatment a Cape Seal, (SST) Single Surface Treatment with an emulsion overlay, or similar treatment must be applied to the roadway. See section 7.
- 1.122 That the cost to fulfil section 1.121 of this policy for any private road, proposed for assumption that has received a double surface treatment, shall be split 50/50 between the Township and the advocate. The payment shall be made to the Township of Horton by the advocate prior to the Township assuming the roadway. The cost shall be estimated by the Township of Horton's Public Works Manager.

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- 1.123 That any private roadway proposed to be assumed by the Township of Horton shall meet or exceed all terms of this policy. The onus shall be on the advocate of the proposal to assume the roadway to provide documented proof to Council and staff that all terms have been met or exceeded.

### **Dust Suppression**

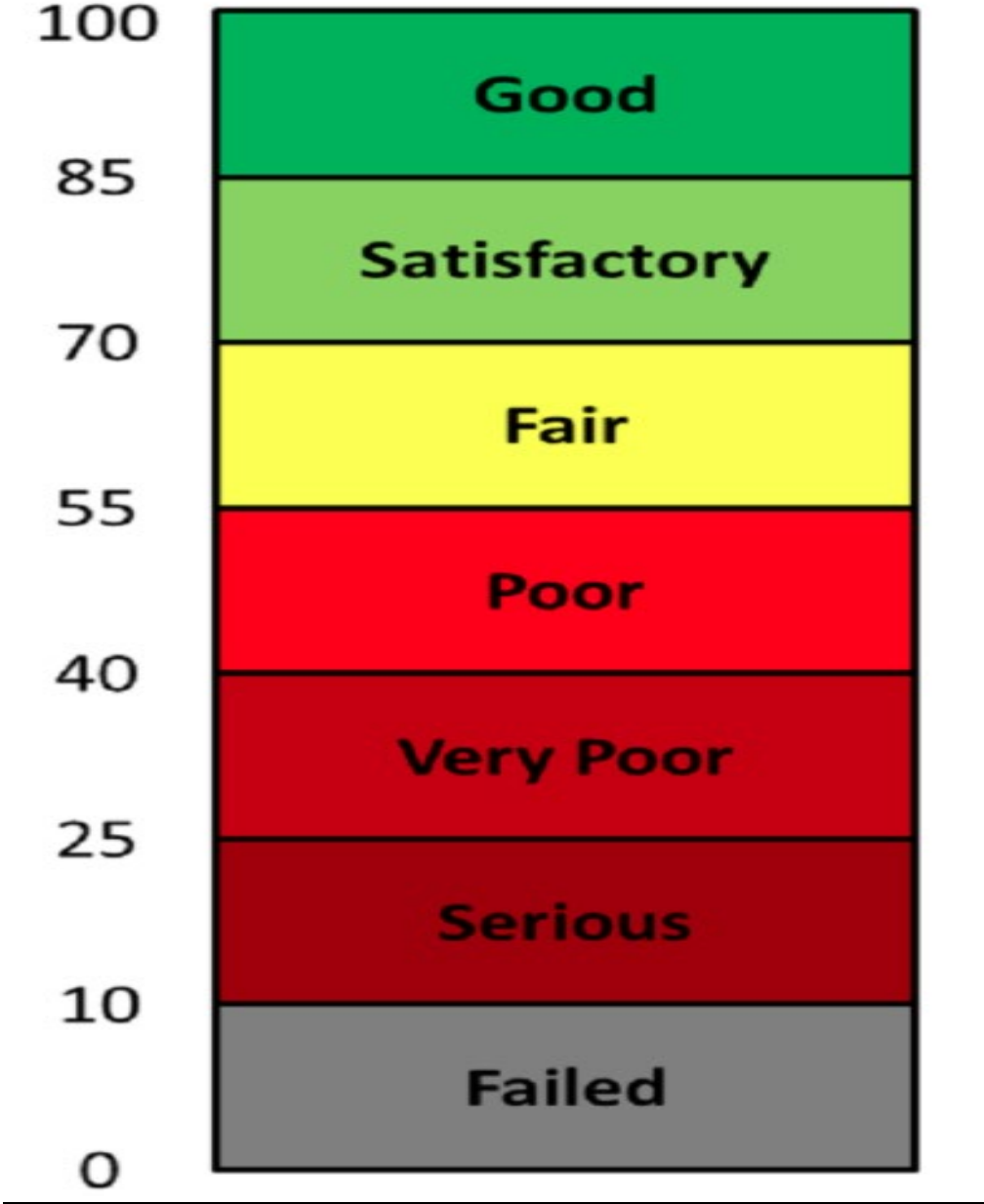
- 1.124 That only flake dust suppression treatments shall be applied to roadways with an AADT below 49, a maximum once per calendar year. Flake dust suppression shall not be added if the application shall exceed yearly budgetary limits. Road selection shall be in order of AADT determined by the Public Works Manager if budgetary limits are a factor. See section 2.
- 1.125 That liquid dust suppression treatments shall be applied to gravel roadways with an AADT above 50 a maximum of once per calendar year. Secondary flake dust suppression may be added as a secondary spot treatment at the discretion of the Public Works Manager a maximum of once per calendar year. Secondary flake dust suppression shall not be added if it shall exceed yearly budgetary limits. See section 2.

### **Mandatory Yearly Review**

- 1.126 That this policy must be reviewed yearly by the applicable Committee, and the current Public Works Manager.
- 1.127 That immediately upon the retirement or resignation of the current Public Works Manager this policy shall be forfeited and must be reviewed for readoption by the current Council at the time of retirement or resignation.

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1. **(PCI) PAVEMENT CONDITION INDEX**



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**2. ROADS SURFACE AND DUST SUPRESSION TYPE BY (AADT)  
ANNUAL AVERAGE DAILY TRAFFIC:**

All surface courses listed below are minimum standards, surface courses of higher quality may be accepted upon approval of the Public Works Manager. No surface course shall be applied that conflicts with term 1.B of this policy.

<b>ANNUAL AVERAGE DAILY TRAFFIC (AADT)</b>	<b>DUST SUPRESSION TYPE AND APPLICATION</b>	<b>BITUMINIOUS SURFACE COURSES (LAYERS)</b>	<b>SURFACE TYPE</b>
<b>0-49</b>	<b>1 Application of flake per calendar year</b>	<b>0</b>	<b>Gravel</b>
<b>50-199</b>	<b>1 Application of liquid per calendar year</b>	<b>0</b>	<b>Gravel</b>
<b>200-399</b>	<b>NA</b>	<b>1</b>	<b>(DST) Double Surface Treatment or 50mm HL4</b>
<b>400-999</b>	<b>NA</b>	<b>1</b>	<b>50mm HL4 or 50mm HL3</b>
<b>1000+</b>	<b>NA</b>	<b>2</b>	<b>Top Course 50mm HL4 or 50mm HL3 Base Course 50mm HL8</b>

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### 3. ACCEPTABLE GRANULAR BASE EQUIVELANCY (GBE) THICKNESS

**Table 3.3.3 Structural Design Guidelines for Flexible Pavements (Thickness in mm) – Secondary Highways**

AADT	Pavement Structure Elements	Subgrade Material					
		Gravels and Sands Suitable as Gran-Borrow	SANDS AND SILTS			Lacustrine Clays	Varved & Leda Clays
			5-75µm <40%	5-75µm 40-55%	5-75µm >55%		
2000-3000 AADT	HM	90	90	90	90	90	90
	B	150	150	150	150	150	150
	SB**	—	300	450	600	450	800
	GBE	330	530	630	730	630	865
1500-2000 AADT	HM	50	50	50	50	50	50
	B	150	150	150	150	150	150
	SB**	—	250	300	450	300	450 (300-600)
	GBE	250	415	450	550	450	550 (450-650)
1000-1500 AADT	CL	50	50	50	50	50	50
	B	150	150	150	150	150	150
	SB**	—	250	300	450	300	450 (300-600)
	GBE	240	405	440	540	450	540 (450-640)
500-1000 AADT	ST*	—	—	—	—	—	—
	B	150	150	150	150	150	150
	SB*	—	150	250	300	250	350 (250-450)
	GBE	150	250	315	350	315	385 (315-450)
200-500 AADT	ST*	—	—	—	—	—	—
	B	150	150	150	150	150	150
	SB**	—	150	250	300	250	300
	GBE	150	250	315	350	315	350
Less than 200 AADT	Gravel	—	—	—	—	—	—
	B	100	100	100	100	100	100
	SB**	—	150	250	300	250	300
	GBE	100	200	265	300	265	300

**Notes:** All AADT Volumes refer to Present Traffic.

HM — Hot Mix Asphalt & Thickness

B — Base Thickness

SB — Subbase Thickness

GBE — Granular Base Equivalency Thickness

(1 mm HM = 2 mm B = 3 mm SB = 1.11)

CL — Cold Mixed, Cold Laid or Road Mixed Mulch

ST — Double Surface Treatment or Single Surface Treatment with Prime.

\* — Apply surface treatments 0.25 m wider than lane width.

\*\* — Proposed subbase thicknesses may be decreased or increased respectively, for harder or softer subgrade conditions in each category, except for varved and leda clay subgrade where exceptionally large ranges are shown.

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### Granular Base Equivalency Factors

New Materials	
Material	Equivalency Factor
New (or Recycled) Hot Mix Asphalt	2.0
Granular A in Base	1.0
Granular B in Subbase	0.67
Cement Treated Material in Subbase (with Gr. A in base)	1.4
Cement Treated Material in Base (no subbase)	1.8
Bituminous Treated Material in Base (with Gr. A in subbase)	1.5
Cold Mix	1.8
OGDL	1.0

Existing or Recycled Materials	
Material	Equivalency Factor
Full Depth Reclamation (FDR)	1.0
Full Depth Reclamation Expanded Asphalt Stabilization (EAS)	1.6
Cold In-place Recycling (CIR)	1.8
Cold In-place Recycled with Expanded Asphalt (CIREAM)	1.8
Old HMA	1.25
Old Granular Base	0.75
Old Granular Subbase	0.5

Reconstruction Projects	
Material	Equivalency Factor
Old Granular Base*	0.6
Old Granular Subbase*	0.4

### GBE calculation example

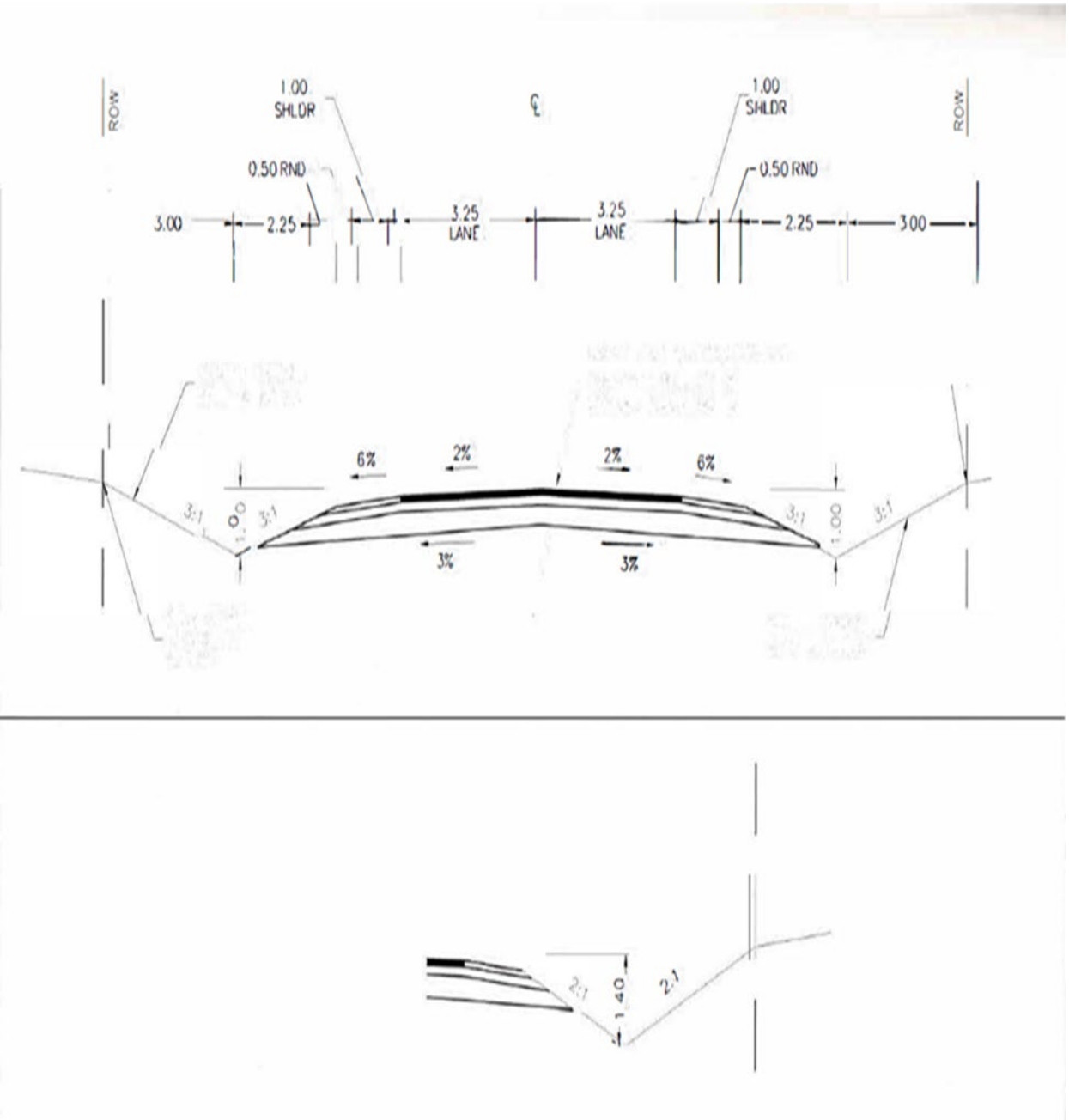
Component	Thickness	Granular Base Equivalency (GBE)
Hot mix asphalt	90 mm	$90 \times 2.0 = 180$
Granular base	150 mm	$150 \times 1.0 = 150$
Granular subbase	450 mm	$450 \times 0.667 = 300$
Total pavement thickness	690 mm	Total GBE = 630

$180 + 150 + 300 = 630$  Total GBE



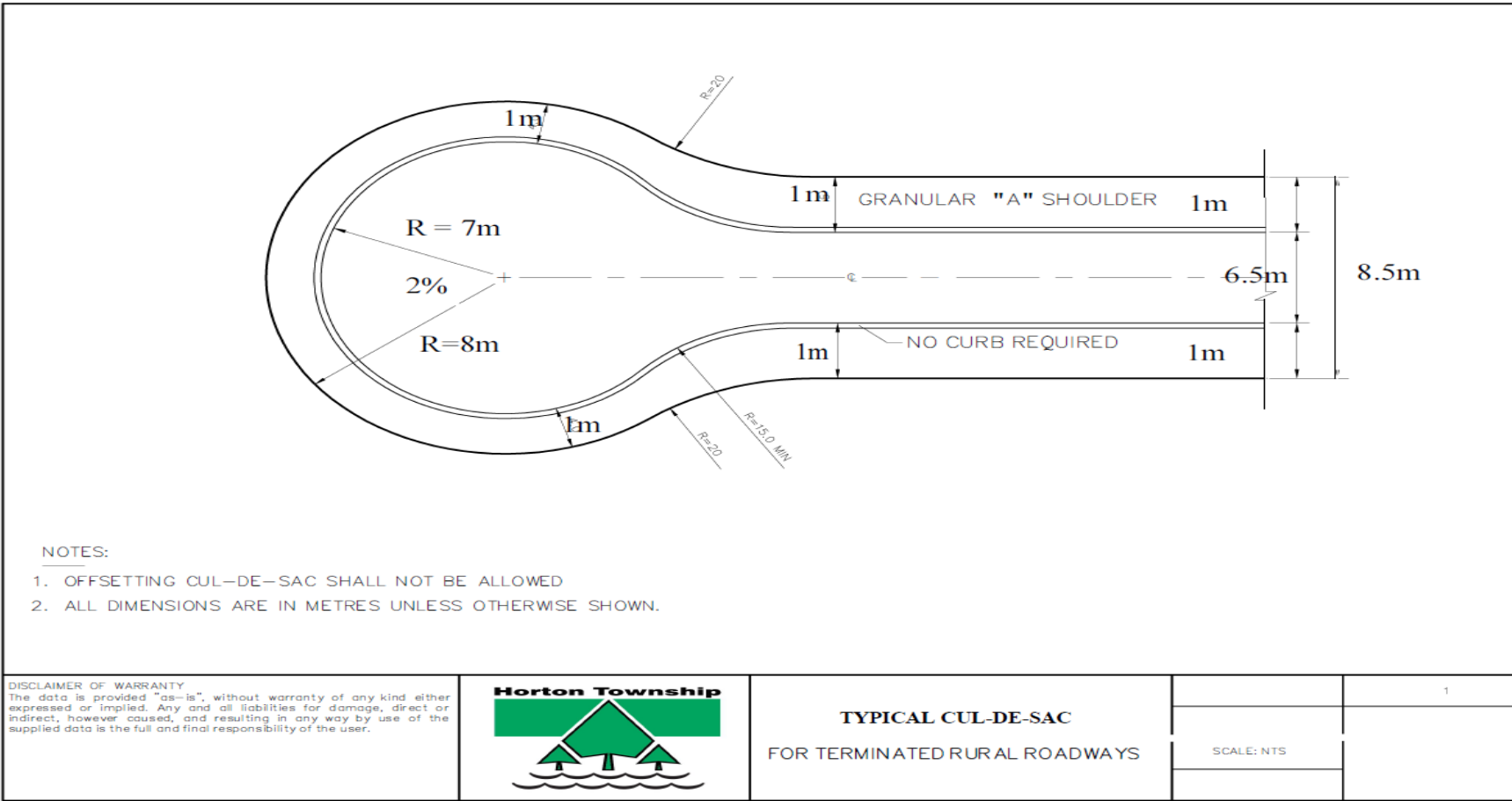
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**4. TYPICAL PAVED ROAD PROFILE**



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**5. TYPICAL CUL DE SAC TURN AROUND**

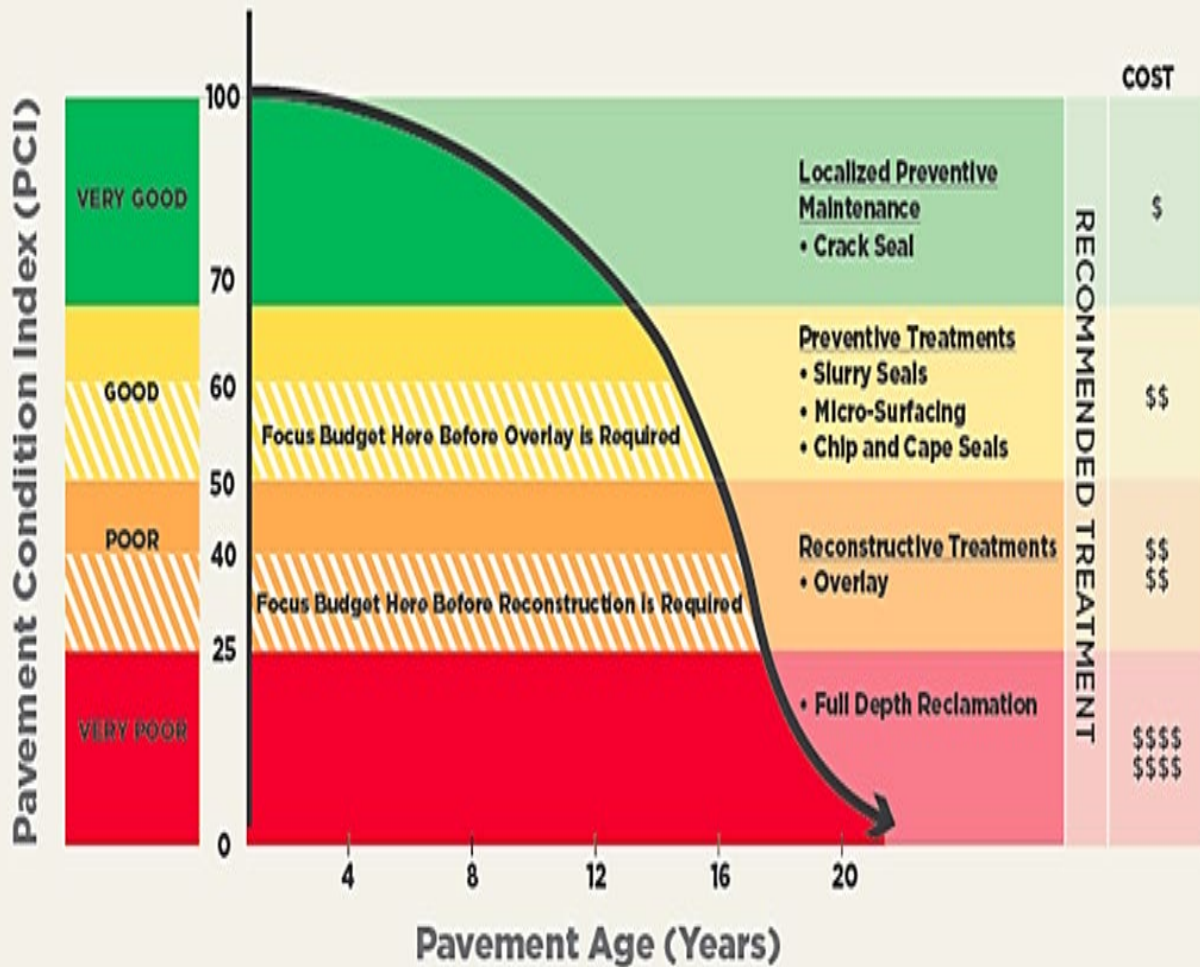


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**6. THE CONCEPT OF PRESERVATION**

THE CONCEPT OF PAVEMENT PRESERVATION

**CATCH STREETS BEFORE THEY FAIL**



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**7. PAVEMENT OPTIMIZATION AND PRESERVATION PROCEDURE:**

- i. One treatment or a combination of treatments from category I.
- ii. One treatment from category II or combination of treatments from category I and II.
- iii. Staff evaluates further preservation feasibility.
- iv. If preservation deemed unfeasible then reconstruct the roadway.

**Category I preservation treatment options (PCI) rating between 60 and 100)**

- i. Crack seal
- ii. Fog seal
- iii. Slurry seal
- iv. Micro surfacing
- v. Cape seal
- vi. Ultra-thin hot mix asphalt
- vii. Chip seal
- viii. Micro Milling
- ix. Hot in place asphalt Recycling
- x. Combination of treatments from category I
- xi. Other treatments applicable to PCI rating

**Category II preservation treatment options (PCI) rating between 40-59)**

- i. Cape seal
- ii. Chip seal
- iii. Scrub seal
- iv. Micro milling
- v. Hot in place asphalt recycling
- vi. Combination of treatments from category I and II
- vii. Other treatments applicable to PCI rating

**Reconstruction (PCI) rating below 40 and preservation deemed unfeasible)**

- i. Granular base testing as necessary
- ii. Brushing as necessary
- iii. Ditching and culvert replacements as necessary
- iv. Full depth pulverization of existing surface (depth between 200 -250mm)
- v. Additional granular material added (minimum 100mm Granular "A")
- vi. Pave with applicable surface for Annual Average Daily Traffic