GRR Engineering
Date

Customer Business Name
Street address
City, State, zip

Attn: Customer Contact
P: xxx.xxx.xxxx
F: xxx.xxx.xxxx
E: xxxx@xxxxxxxxxxx.com

Re: Pavement Review Letter
Property Name
Property Street Name
City, State, Zip

Dear Mr. /Mrs. xxxx:

GRR Engineering (GRR) has completed our review of the asphalt pavement at the above-referenced site. The objective of the evaluation was to review the condition of the pavement, and provide recommendations for any repairs/improvements for your parking lot.

The pavement was observed by a GRR pavement engineer on June x, 20xx. Several areas of the pavement showed signs of distress, most commonly in the form of alligator cracking. However rutting and shoving were also observed in the entrance drive lane areas. In general, the disturbed pavement was limited to the travel lanes. However, limited disturbed pavement sections were observed in other areas. It is our understanding, based on our conversations with you, that the existing pavement was overlaid with another layer of asphalt concrete to cover the distresses six years ago.

I. PAVEMENT TESTING/STUDIES

Our recommendations are based upon results from the tests shown in the following table:

Test	Completed?	Comments
Site Visit	Yes	Date
Cores	Yes	Date
PCI	Yes	Date (See attachment I)
Patch Survey	Yes	Date – Partial patching required before overlay
Traffic assumption	Yes	Date

II. ROADWAY/PARKING LOT DESCRIPTION

The following table summarizes the functional classification, lane configuration of driveways and other roadway features for [property name]:

		Area (Sq. Yds)
Property Name	Xxxxxxx	
Functional Classification	Residential/Commercial	
Drive Lanes	Two to Three 12-foot lanes	xxxx
Parking Stalls	xx	xxxx
Other Features/Loading Docks	N/A	xxxx

See attached pictures [Appendix A] (pictures will be taken during assessment)

III. EXISTING PAVEMENT STRUCTURE

Based on information from construction history, coring data, and communication with [customer name] the roadway and parking lot has the following pavement structure:

Sections	***Pavement Structure***	***Year of Last Rehab.***
Roadway	X" of Asphalt Concrete over Y" of GAB	xxxx
Parking stalls	X' of Asphalt Concrete over Y" of GAB	xxxx

IV. PAVEMENT CONDITION SURVEY METHODOLOGY

In order to perform the pavement condition evaluation, the entire parking lot was broken down into a network of sections and sampling units. Sections were selected based on physical attributes dimensions, and maintenance. Sample units of each section were then surveyed to determine the section's overall pavement condition index (PCI) based on the 20 distress types for asphalt pavement surfaces (see **Appendix B**). As an example, the entire parking lot was divided into five sections and sample units of each pavement section were taken to determine the PCI. The number of sample units taken for each section was adjusted to most accurately represent the section's pavement condition. It typically followed the guidelines shown on the following table. A typical sample unit size was 500 to 2500 sq. ft.

Number of Sample Units per Section	**Number of Sample Units to Survey**
1 to 5 Sample Units	1 Sample Unit
6 to 10 Sample Units	2 Sample Units
11 to 15 Sample Units	3 Sample Units
16 to 40 Sample Units	4 Sample Units
Over 40 Sample Units	10%

The pavement maintenance and repair strategies will be determined by using following Table:

Maintenance & Repair Category	PCI	Condition
Re-construction	0 – 40	Poor. Includes reconstruction or strengthening GAB layers.
Base Rehabilitation	40 – 60	Medicore. In need of full depth asphalt reconstruction.
Structural Improvement	60 - 72	Fair. In need of strengthening the surface asphalt layers.
Preventive Maintenance	73 – 85	Good. In need of crack sealing or patching.
Routine Maintenance	86 – 95	Very Good. In need of seal coat.
Do Nothing	>95	Excellent. Do not need to repair.

V. PCI SUMMARY and RECOMMENDATIONS

PCI was calculated [see **Appendix C**] using ASTM D 6433 for each section, treatment options based on PCI, cost, and quantities are estimated for each treatment option and summarized below:

Parking Lot Section (see Appendix C for site map)	Maintenance & Repair Category	Quantity	Cost
Section 1	PCI – 81; Apply Crack Seal	Xxxx sq. yds	$ xxxx/sq. yd
Section 2	PCI – 48; Mill 4" existing asphalt and overlay with 2.5" thick base and 1.5" thick surface courses	Xxxx T of base mix Xxxx T of surface mix	$ xxx/base repair $xxx/surface repair
Section 3	PCI – 72; saw cut remove top 2" of asphalt and apply patch at selected locations [see site map in **Appendix D**] and apply seal coat	Xxx T for patching Xxx sq.yds for seal coat	$ xxx/patch $ xxx/seal coat

Section 4	PCI – 20; Needs to remove existing asphalt and GAB, construct 6" thick lift of GAB, 2.5" HMA base and 1.5" HMA surface.	Xxx T of GAB
		Xxx T of HMA for base
		Xxxx T of HMA surface
			$ xxx/ GAB
			$ xxx/HMA base
			$ xxx/HMA surface

Section 5	PCI – 96; this section was constructed recently, so do not need any repairs	N/A	N/A

GRR Engineering can help you select paving contractors by comparing bids (separate task order will be issued based up on request). We recommend to retain GRR Engineering as quality assurance representative for construction of this project and trust this letter satisfies your needs at this time. We look forward to assisting you in the completion of this project. Please feel free to contact us if you would like to discuss these recommendations further.

Sincerely,
GRR Engineering, Inc.

Chandra K. Akisetty, Ph.D., P.E. (MD#0043438, VA#0402051966)

GRR Engineering

2600 Marble Court

Forestville, MD 20747

Ph: 240.375.1443

Email: chandra@grrengineering.com

Appendix A: Site Pictures

Appendix B: PCI Survey Form

Route: _____ County: Section : _____ Sample Unit: _____

From: _____ To: Location: _____

Rater: _____ Date: Sample Unit Dimensions:_____

DISTRESS TYPES		
1. Alligator Cracking (sf)	7. Edge Cracking (lf)	13. Potholes (#)
2. Bleeding (sf)	8. Jt. Reflection Cracking (lf)	14. Railroad Crossing (sf)
3. Block Cracking (sf)	9. Lane/Shldr Drop Off (lf)	15. Rutting (sf)
4. Bumps and Sags (lf)	10. Long & Trans Cracking (lf)	16. Shoving (sf)
5. Corrugation (sf)	11. Patching & Util Cut Patching (sf)	17. Slippage Cracking (sf)
6. Depression (sf)	12. Polished Aggregate (sf)	18. Swell (sf)
		19. Weathering and Raveling (sf)

	Existing Distress Types						
L							
M							
H							

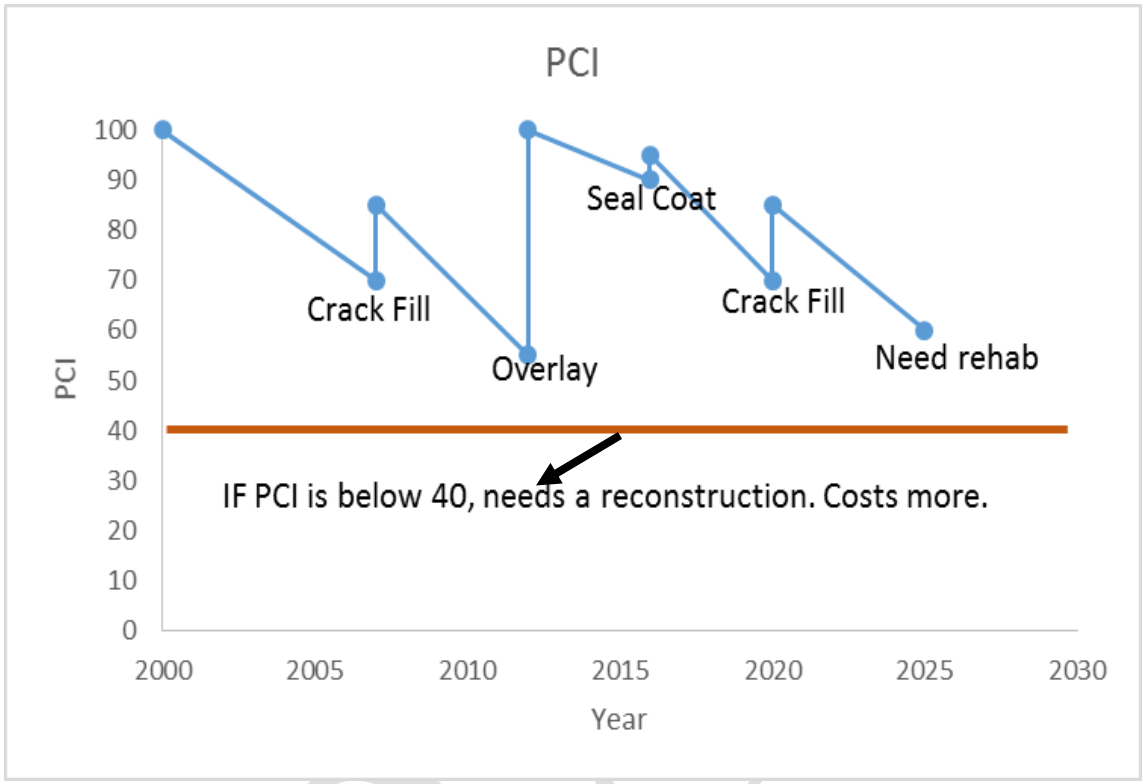
PCI Calculation				
Distress Type	Density	Severity	Deduct Value	
				PCI = 100- CDV = _____
				Rating = _____

Number of deducts > 5 points				
Deduct Total				
Corrected Deduct Value (CDV)				

Appendix C: PCI Calculations for Each Section of Pavement

Appendix D: Site Map

PCI CURVE:



Glossary:

Alligator Cracking: Interconnected cracks forming a series of small blocks resembling an alligator skin or chicken wire.

Asphalt Overlay: One or more courses of asphalt construction on an existing pavement. It may include levelling course to correct the contour of the old pavement, followed by uniform course/s to provide needed thickness.

Bleeding: The upward movement of asphalt in asphalt pavement resulting in the formation of a film of asphalt on the surface.

Corrugations: A form of plastic movement typified by ripples across the pavement surface.

Crack fill: Sealing and filling asphalt concrete pavement cracks is a common road maintenance activity. Specialized materials are placed into or above cracks to prevent the intrusion of water and incompressible material into the cracks and to reinforce the adjacent pavement.

Depression: Localized low areas of limited size which may or may not be accompanied by cracking.

Design Period: The number of years from initial application of traffic until first planned major resurfacing or overlay. This term should not be confused with pavement life or Analysis Period.

Disintegration: The breaking up of a pavement into small, loose fragments due to traffic, weathering, improper mix design or poor construction.

Edge Crack: Edge cracks are longitudinal cracks near the edge of the pavement with or without transverse cracks branching towards the shoulder.

Foamed Stabilized Base (FSB): FSB is a stabilized recycled asphalt mix, which can be made with 100% recycled asphalt millings or recycled concrete by adding some virgin foamed asphalt and Portland cement together. This is cost effective and serves the same purpose of HMA base course, if placed and compacted properly.

Longitudinal Cracking: A crack that follows a course approximately parallel to the centerline.

Patching: It is a common method of treating localized distress of a pavement by removing existing asphalt, replacing with new asphalt and compact it. Patching will be done to protect the structural integrity of pavement.

Pavement Condition Index (PCI): PCI is a numerical index between 0 and 100 which is used to indicate the general condition of a pavement. It is a statistical measure and requires manual survey of the pavement.

Potholes: Bowl-shaped holes of varying sizes in the pavement, resulting from localized disintegration.

Ravelling: Ravelling is the progressive loss of surface material by weathering and/or traffic abrasion.

Rutting: Channelized depressions which may develop in the wheel tracks of an asphalt pavement.

Seal Coat: Asphalt seal coats are composed of a thin layer of an asphalt material such as cutbacks, asphalt emulsions, or paving-grade asphalt cement. Modifiers are often added to the asphaltic liquid mixture and may include rubber, latex, polymers, and rejuvenators.

Shoving: A form of plastic movement resulting in localized bulging of the pavement.

Slippage Cracks: Cracks, sometimes crescent shaped, that point in the direction of thrust of the wheels on pavement surface.

Upheaval: The localized upward displacement of a pavement due to swelling of the subgrade or some portion of the pavement structure.