



Roadbond Service Company

In the past, the typical street reclamation practice for the City of Lewisville, TX was to recycle a street full-depth, add 6% Portland cement, blend and process the treated material, and then repave. In 2004, this practice was modified to use Roadbond EN 1 soil stabilizer plus 3% Portland cement on several street reclamation projects. The goal was to reduce shrinkage cracks commonly associated with Portland cement stabilization without sacrificing the resulting strength.

The trial streets were Marblehead, Laguna, Cedar Keys, Pebble Beach, and Tahoe. On May 5, 2016, the streets were tested for in-place CBR with a Kessler DCP. The device is hand held and is equipped with a 17.6 pound (7.98 kg) weight that drops from 22.6 inches (57.4 cm) and strikes an anvil. These blows drive a 7/8" (22.2 mm) diameter 60° cone into the ground. Measurements in millimeters of the penetration depth into the soil are recorded. Once the data is obtained, the number of



achieve a minimum of 25 mm of penetration. The actual penetration and blows required are recorded. The number of blows delivered and the total penetration is entered into the XL template to calculate CBR.

blows delivered to the anvil and the total depth of the penetration are entered into a Microsoft XL template that was developed by the US Army Corps of Engineers. The template converts the raw data to CBR. CBR is then easily converted to resilient modulus and used in pavement design.

A one-inch diameter hole was bored through the pavement to gain access to the treated base material at several locations. Once the treated material is accessed, the DCP is positioned and the weight is dropped 2 times to seat the cone into the soil. The initial depth is recorded and the weight is dropped a number of times to



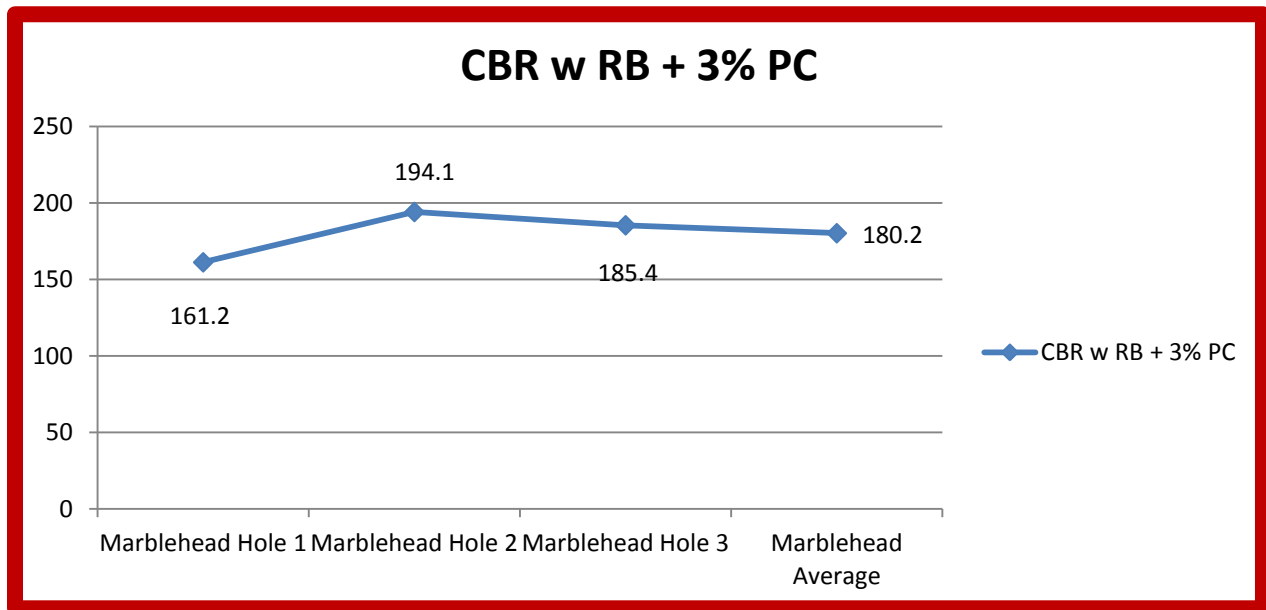


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The results of the Marblehead appear in the following table.

Marblehead 2004	RB + 3% PC
	Blows / mm
Hole 1	20 / 34
Hole 2	25 / 36
Hole 3	20 / 30
Average CBR	180.2

The following chart illustrates the CBR of Marblehead.



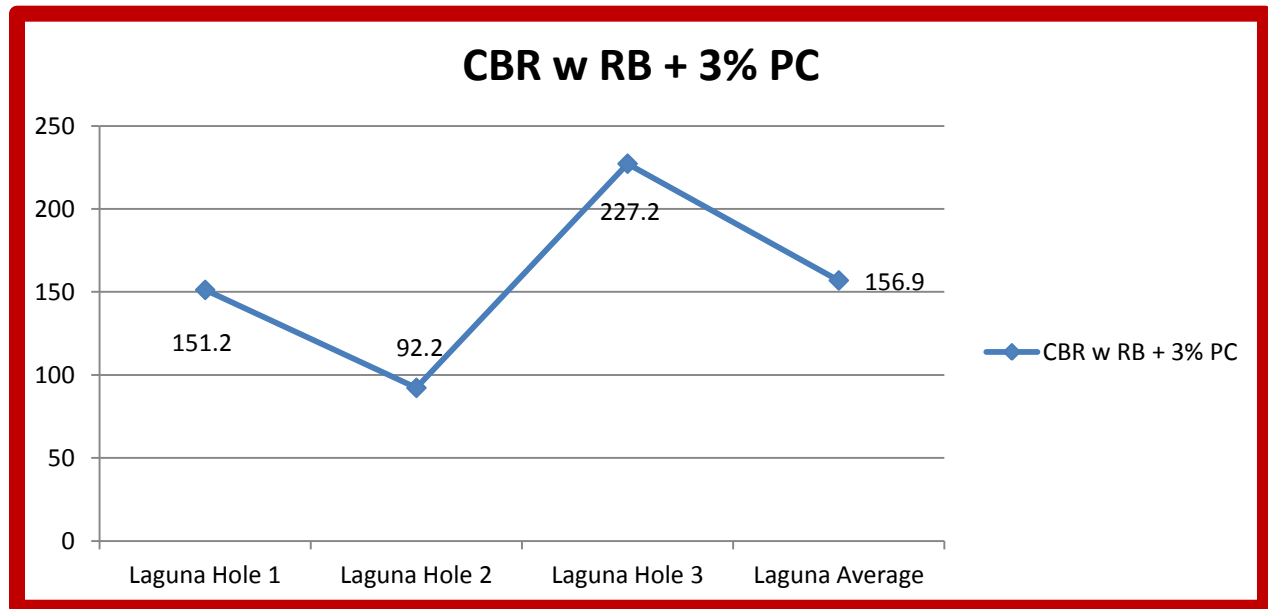


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The results of the Laguna appear in the following table.

Laguna 2004	RB + 3% PC
	Blows / mm
Hole 1	15 / 27
Hole 2	10 / 28
Hole 3	20 / 25
Average CBR	156.9

The following chart illustrates the CBR of Laguna.



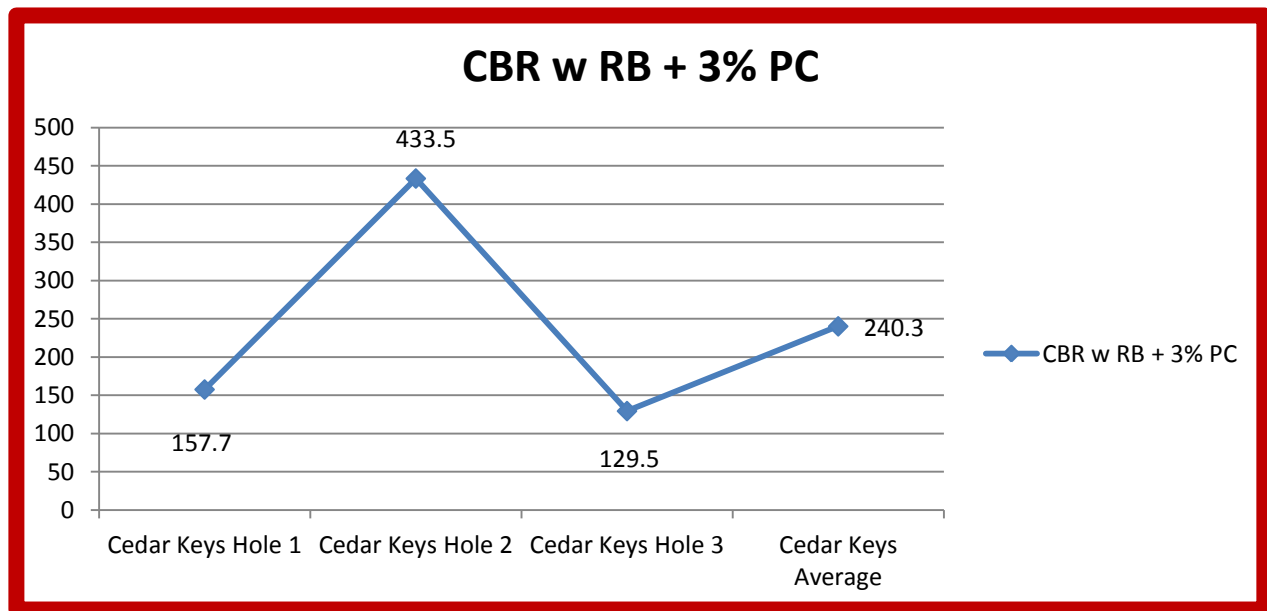


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The results of Cedar Keys appear in the following table.

Cedar Keys 2004	RB + 3% PC
	Blows / mm
Hole 1	15 / 26
Hole 2	37 / 26
Hole 3	10 / 31
Average CBR	240.3

The following chart illustrates the CBR comparison of Cedar Keys.



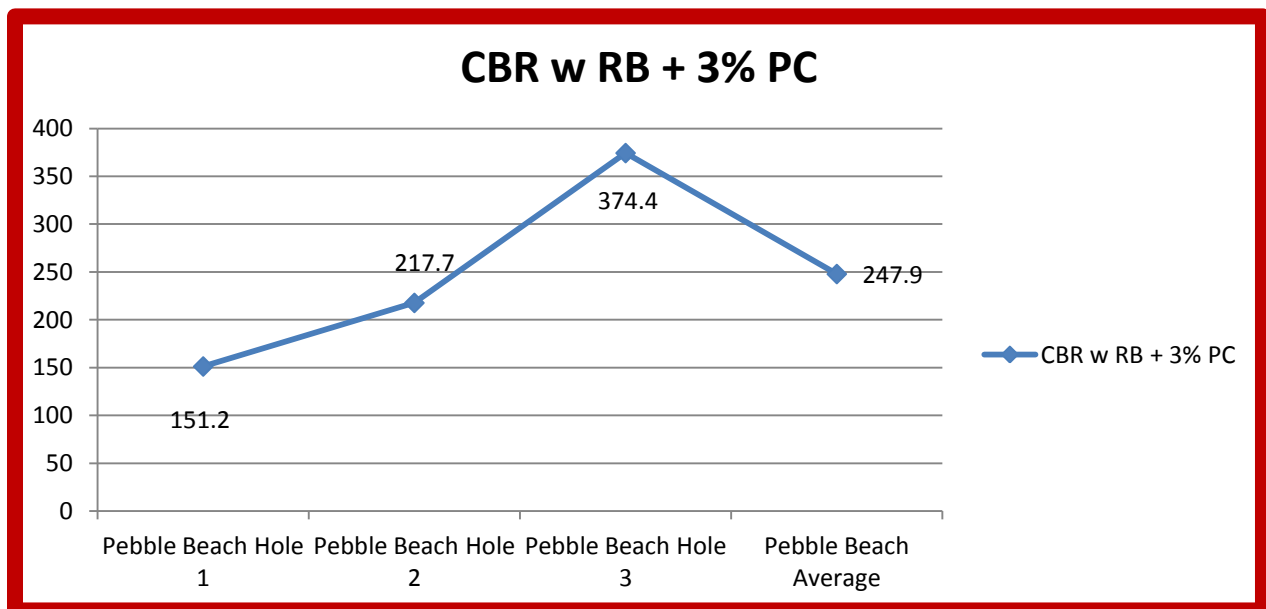


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The results of Pebble Beach appear in the following table.

Pebble Beach 2004	RB + 3% PC
	Blows / mm
Hole 1	20 / 36
Hole 2	20 / 26
Hole 3	30 / 24
Average CBR	247.9

The following chart illustrates the CBR comparison of Pebble Beach.



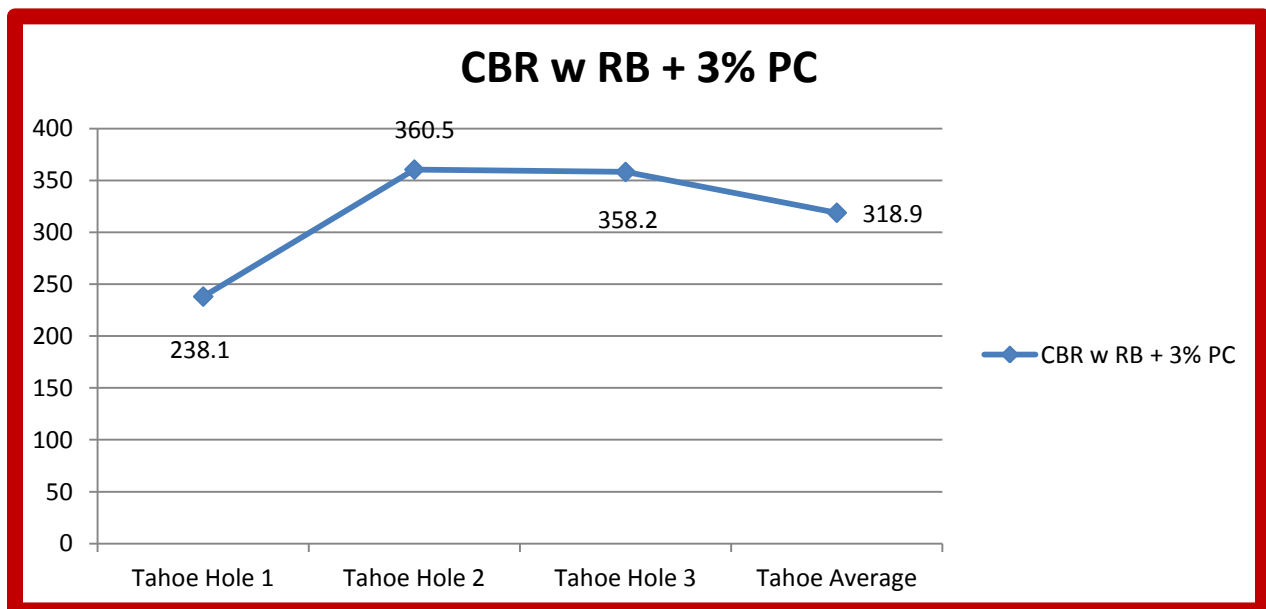


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The results of Tahoe appear in the following table.

Tahoe 2004	RB + 3% PC
	Blows / mm
Hole 1	25 / 30
Hole 2	35 / 29
Hole 3	30 / 25
Average CBR	318.9

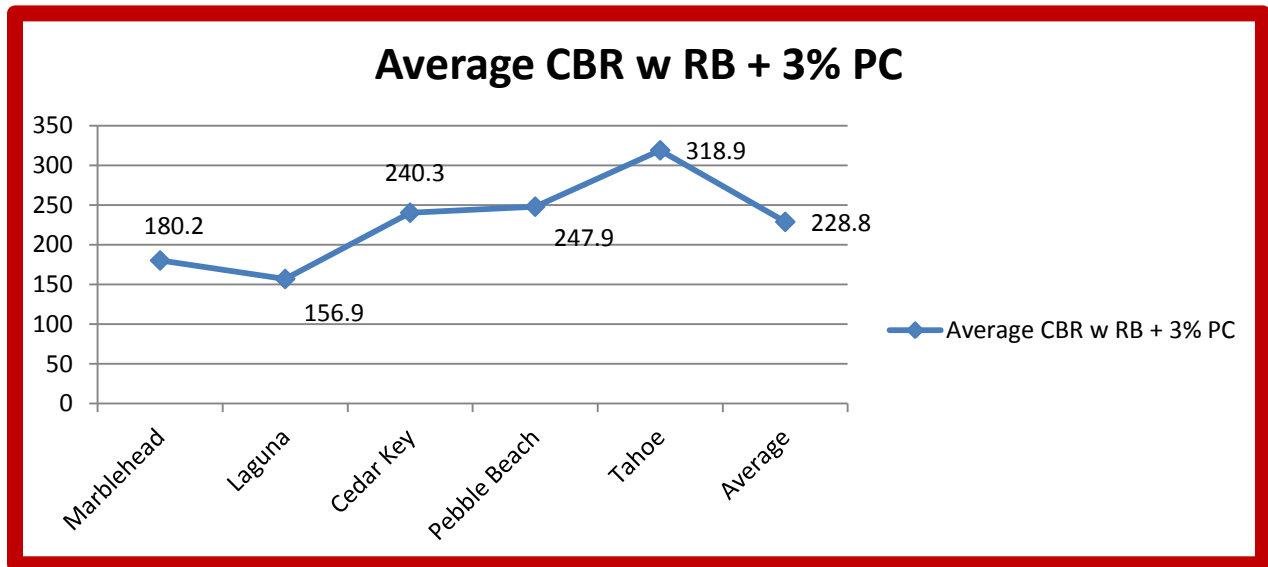
The following chart illustrates the CBR comparison of Tahoe.





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The following chart summarizes the combined CBR of all five streets.



Since these trials were installed in 2004, the City of Lewisville has fully implemented the Roadbond EN 1 plus 3% Portland cement program for street reclamation. It is evident from the test results that this plan results in long-term base strength.

Roadbond EN 1 and reduced rates of Portland cement causes significantly fewer cracks in the pavement, and therefore requires less maintenance over time. In addition to that, owing to the environmental impact of Portland cement production, transportation, and installation, Roadbond EN 1 with less Portland cement is an eco-friendly strategy for street construction and maintenance.

