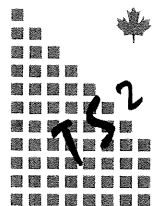


**CROWN CAPITAL ENTERPRISE
LIMITED**

WANCHAI, HONG KONG

**Demonstration of RJSeal™
S520 Highway, Shunde,
GuangDong Province,
Peoples Republic of China**

January 2004



**TS² Consulting Inc.
Lamma, Hong Kong**

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January 20, 2004

Crown Capital Enterprise Limited
B5, Centre Point Building
181 – 185 Gloucester Road,
Wanchai, Hong Kong.
Attn: Charence Chiang
General Manager

Dear Charence

Re: Demonstration of RJSealTM on S520 highway, Shunde, Guangdong.

This is the final report on the demonstration of RJSealTM on the S520 highway, Shunde, immediately west of the city of Shunde, Guangdong Province. This demonstration was undertaken on January 5, 2004 and encompassed three separate segments, collectively some 370 metres long, on both the northbound and southbound lanes of this six lane, divided highway. The principal interest of Shunde Heng Shun Communication Invest Management Corp, the road maintenance contractor was restoration of the asphalt pavement's ductility, as well as an improvement of the resistance to water penetration. Initial indications are that these requirements have been readily met.

Yours Sincerely

Anthony G. Speed, P.Eng. (Ontario, Canada)

Crown Capital Enterprise Limited.

RejuvaSeal Demo

Highway S320, Shunde, GuangDong

Demo Date

5-Jan-04

Prepared by

A.G. Speed

Updated by

A.G. Speed

Updated

Assumptions

Segment	Length (m)	Width (m)	Area (sq m)
No. 1	130	22.2	2886
No. 2	115	22.2	2553
No. 3	115	22.2	2553
	360		7992

Conversion Factors

US Gallon=	3.78	Litres
Sq Metre=	10.76	Sq Feet
Sq Metre=	1.20	Sq Yds
One Litre	1.04	kgs

Crew Consist

Labourers	20
Truck Driver	2
Supervisor	2
Total	24

Weather Conditions

Temperature 23 Celsius

Humidity 50%

Sunny

Rd surface Temp 25 Celsius

Work Schedule	Work Time (hrs)	Test Length (m)	Total Area m ²	Total Area yd ²	RejuvaSeal Applied			Application Rate				24 Man Crew	
					US gals	litres	kilograms	USGal /yd ²	Litres/m ²	m ² /Litre	m ² /Kg	m ² /man hr	yd ² /man hr
am/pm													
08.30-11.30	3.00	360.0	3,960	4,734	238	900	936	0.050	0.23	4.40	4.23	55.0	65.7
14.00-17.30	3.50	360.0	4,032	4,820	238	900	936	0.049	0.22	4.48	4.31	48.0	57.4
Totals	6.50	360.0	7,992	9,553	476	1,800	1,872	0.050	0.23	4.44	4.27	51.2	61.2

CROWN CAPITAL ENTERPRISE LIMITED

Demonstration of RJSeal S520 Highway, Shunde, Guangdong Province, Peoples Republic of China

January 2004

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CROWN CAPITAL ENTERPRISE LIMITED

**Demonstration of RJSeal
S520 Highway, Shunde, GuangDong Province
Peoples Republic of China**

January 2004

APPENDICES

<u>No.</u>	<u>Description</u>
A	RJSeal™ Descriptive Literature
B	Copper Slag Specifications



**TS² Consulting Inc.
Lamma, Hong Kong**

CROWN CAPITAL ENTERPRISE LIMITED

Demonstration of RJSeal™ S520, Shunde, GuangDong Province Peoples Republic of China

January 2003

1.0 INTRODUCTION

Crown Capital Enterprise Limited of Hong Kong entered into an arrangement with the Shunde Heng Shun Communication Invest Management Corp. of Shunde, in GuangDong Province, China in January 2003. This arrangement calls for the analysis of the performance of RJSeal™, a sealer/rejuvenator for asphalt pavement on roads within the jurisdiction of the Shunde Heng Shun Communication Invest Management Corp.

City of Shunde is located immediately south of Guangzhou in GuangDong Province, which is bordered by Fujian, JiangXi, Hunan, and GuangXi Provinces. Guangzhou has a lengthy history and extensive archival records exist, which document the growth of the City. Guangzhou is the capital city of GuangDong province and is a major service center for the area and in recent years has seen a major growth in population, along with significant construction due to the transfer of manufacturing from Hong Kong to the Pearl River Delta and in particular special economic development zone like the neighbouring cities of Shenzhen and Zhuhai. Guangzhou lies in the Pearl River Delta and hosts a port accessible to sea going vessels of Panamax Size and has a major container terminal for the export trade. The present population of Shunde and its suburbs and surrounding area is estimated at approximately 1 million. See figure 1.0 for a map showing the location of Shunde in GuangDong Province. The majority of the area lies at 10 to 15 metres in elevation, although mountains to the north and east hold some peaks that exceed 1,000 metres. The regions' latitude (23 degrees north), mean that there are four seasons, with temperatures ranging from 45 Celsius in the long, hot summer to 5 Celsius in the short winter. The rainy season is primarily May thru August, but can extend into September.

In the immediate Shunde area, a sequence of sedimentary rocks predominates, although some metamorphic rocks also occur. Due to the rock cuts along the highways, numerous rock outcrop exposures are available. The asphalt in the area is manufactured from local materials, which is comprised of crushed and screened sandstone, diorite, phylites and granite, as well as washed gravels from the various rivers. The bitumen binder for the asphalt is sourced from various locations. Since Shunde is immediately south of Guangzhou (HuangPu) a seagoing port on the Pearl River, which is navigable by oceangoing vessels, the possibility of bitumen being sourced from offshore is a distinct possibility so refineries in Singapore and the like should not be forgotten.



DESIGNED BY	TS2	04/01/08
DRAWN BY	TS	04/01/08

DRAWING NO.	FIGURE 1.0	REV. A
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2.0 CO-OPERATIVE PROGRAM

The intent of the arrangement with the Shunde Heng Shun Communication Invest Management Corp. of Shunde is to demonstrate RJSeal™ at different locations selected by their road maintenance department, which will subsequently allow analysis of the performance of RJSeal™ on a variety of asphalt surfaces. A demonstration was undertaken on January 5, 2003 on Highway S520, a six lane, divided highway. The demonstration strip was on both the northbound and southbound lanes. The highway treated, is an asphalt overlay, placed in 2001, which overlays a concrete base. No details are known about the subgrade, but inspection of the shoulder show a sandy-silty material. Knowing construction techniques in highways in China in general, minimal gravel would be used for an immediate coarse base, beneath the original concrete pavement. At the demonstration site, inspection of the asphalt pavement generally showed that there was not a significant amount of exposed aggregate although the bitumen was quite oxidized. Some reflective cracks existed, but were typically in the 1 to 1.5 mm width range. Some patches were evident in the asphalt overlay, no doubt attributable to failures in portions of the underlying concrete pavement.

3.0 RJSEAL™

RJSeal™ is a proprietary product that is supplied by Crown Capital Enterprise Limited of Wanchai, Hong Kong. RJSeal™ has been proven in numerous applications in North and South America to rejuvenate asphalt pavement at various stages of its life and economically extend the life of the pavement. RJSeal™ is a three component, asphalt sealer rejuvenator that is comprised of Coal Tar, Coal Tar Oils and Petroleum Solvents.

3.1 PRIOR EXPERIENCE

Refer to Appendix A for a copy of the brochure prepared by Crown Capital Enterprise Limited. This outlines the experience with RJSeal™ at various locations in China, North America and South America. Further information is available from Crown Capital Enterprise Limited. RJSeal™ has been used at numerous airports in North and South America, as well as highways in Alberta, Canada; Cearo State, Brazil and North Dakota and Texas, as well as other locations in the U.S.A. Since 2000, RJSeal™ has been demonstrated successfully at over thirty four (34) locations in China and fourteen (14) commercial-scale applications have taken place at various locations, including Shanghai and Kunming.

4.0 TEST PROGRAM

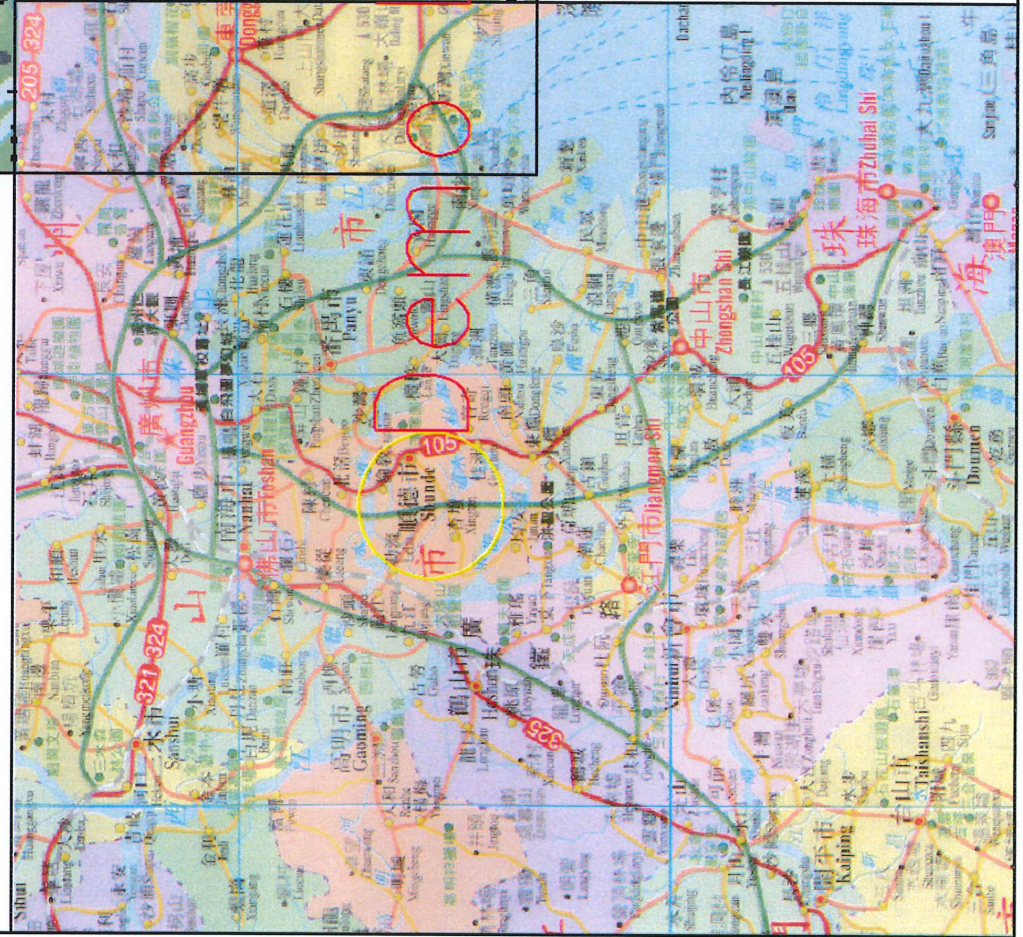
Since Guangdong Province is located in a tropical climate (Latitude: 23 degrees North) at a low altitude (10 to 15 metres), it's a demanding setting for asphalt, given the year round warm climate (extremes of 46 Celsius in summer and 5 Celsius in the winter) and intense exposure to ultraviolet radiation, all which contribute to the oxidation and breakdown of the asphalt binder.

The Shunde Heng Shun Communication Invest Management Corp. of Shunde is responsible for approximately 500 kilometres of highway, The Shunde Heng Shun Communication Invest Management Corp. of Shunde is definitely interested in determining how to economically extend the life of the asphalt road surface. To this end, the Shunde Heng Shun Communication Invest Management Corp. of Shunde has agreed to try RJSeal™ on Highway S520. The arrangement led to selection of an appropriate location for the testing of RJSeal™ on Highway S520 See Figure 4.0, showing the location of this Highway with respect to Shunde.

The demonstration section on the S520 is located just west of the City of Shunde. See figure 4.0, which follows, for a location of the general locale.

The section chosen for the demonstration is geographically located as follows:

Table 4.1		Location of Demo Site	
Location	System	Northing	Easting
North End	Geographic (deg, min)	22 ⁰ 51.105'	113 ⁰ 16.969'
	Universal Transverse Mercator Grid (49Q)(metres)	2528930	0734246
South End	Geographic (deg, min)	22 ⁰ 50.880'	113 ⁰ 17.064'
	Universal Transverse Mercator Grid (49Q)(metres)	2528518	0734415



RJSEAL APPLICATION

CROWN CAPITAL ENTERPRISE LIMITED

DETAILED LOCATION MAP

DRAWING NO. **FIGURE 4.0** REV. **A**

SCALE: **NTS**
PROJECT: **B023E**

Work commenced on the demonstration section at 9:30 am on January 5, on a cool morning, where the temperature was approximately 17 Celsius. A test strip, 370 metres long, on both the northbound lanes and southbound of highway S520 was treated. The test section was not one continuous unit, but three individual segments, namely: 130 metres, 125 metres and 115 metres respectively (from south to north respectively), interspersed with short segments of concrete pavement. The width of each side of the divided highway was 11.1 metres and comprise of three lanes, each 3.75 metres wide with a minimal shoulder on the inside and outside lanes.

The test section is located on a straight section with a gradient of 0.5% for the most part. There is a slight camber to the road which causes water to run off toward the shoulder, rather than puddle on the road. The asphalt surface on the section treated, was reputedly 2 years old (2001 vintage). No significant oil spills were observed, just the occasional drop of transmission oil, crankcase oil or hydraulic fluid. The surface was not appreciably worn, with no noticeable rutting due to traffic wear. There were some reflective cracks from the underlying concrete pavement, usually in the 0.5 to 1.5 mm width. The oxidation of the bitumen extended to a depth of several millimetres. The concrete pavement was on a compacted silty-clay, sub-grade

The RJSeal™ was applied to each of the panels, using paint rollers with a crew of 18 men, two truck drivers and 2 supervisors.

Details of the application are summarized in the table that follows:

Table 4.2				Details on RJSeal™ Demonstration Section on Highway S520					
Work Schedule	Work Time (hrs)	Test Length (m)	Total Area m ²	RJSeal™ Applied			Application Rate		
				US gals	litres	Kgs	US Gal /yd ²	m ² /Litre	m ² /Kg
08:30-11:30	3.00	370	4070	265	1000	1040	0.054	4.07	3.91
14:00-17:30	3.50	370	4144	265	1000	1040	0.053	4.14	3.98
Totals	6.50	370	8214	529	2000	2080	0.054	4.11	3.95

Ambient temperatures at the time of the application were in the 17 degree Celsius range in the early morning but it warmed up to approximately 23 Celsius by mid-afternoon. Humidity was in the 65% range. The RJSeal™ application commenced on the inner lanes first and ceased at 11:30 am and those lanes remained closed until 2:00 pm on January 5, when they were re-opened for traffic. Then the outer lanes were treated with RJSeal™ and these were re-opened for traffic at 6 pm. Photos showing the test application of RJSeal™ follow in figures 4.1, 4.2 on the following pages.

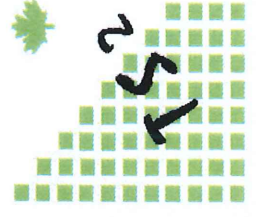
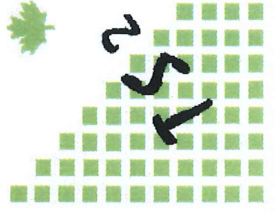


Figure 4.1 Typical Application Procedure for RJSeal



Figure 4.2 Finished RJSeal Surface.



Copper slag was applied to the treated surface shortly after the RJSeal™ was applied. Some 2 tonnes of copper slag was applied to the entire 8,214 square metre demonstration area by hand. Refer to Appendix B for specifications of this copper slag. See figure 4.3 showing the spreading of the copper slag by hand.

The site was visited on January 6 around 9:30 am and a difference was readily perceived between the RJSeal™ treated section and the adjoining untreated portion. A jack-knife was used to dig two small holes in the asphalt pavement, to a depth of 3 centimetres, some 50 metres north of the start point (south end) of the demonstration (test) section, to determine the penetration of the RJSeal™. This was one day after the application of RJSeal™ and at these two locations the newly rejuvenated surface was evident, by the black resilient surface layer, which was now approximately 1 millimetre thick. Below that depth, the grey, oxidized layer of asphalt was evident. The surface was dry. See figure 4.4 for details on the road on inspection, the day following the application of RJSeal™.

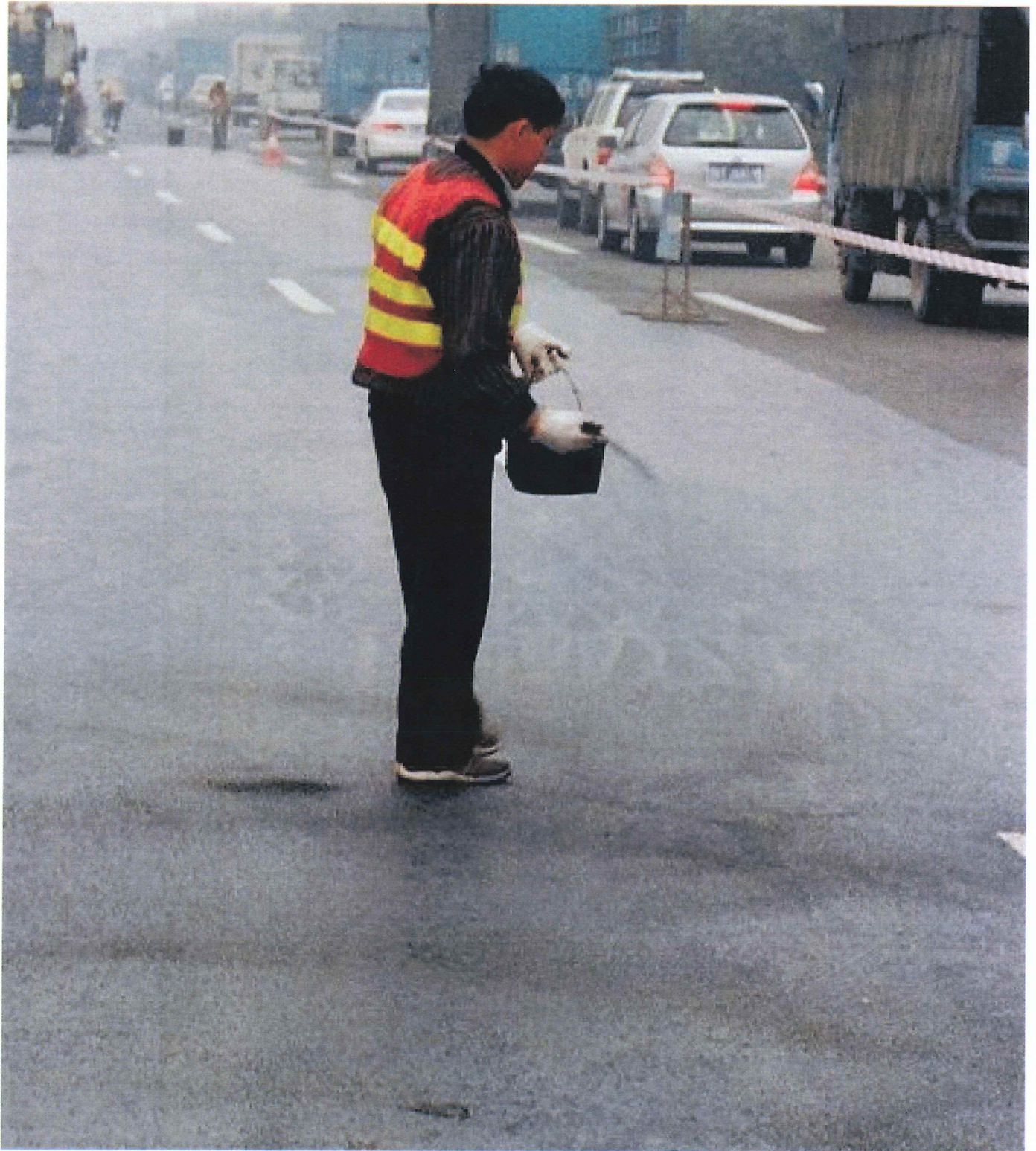
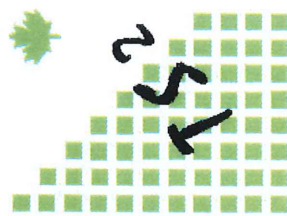


Figure 4.3 Slag Application by Hand





Figure 4.4 Inspection of RJSeal Surface
on following day



4.1 RJSeal™ Testing

To date the comparison of the asphalt treated with RJSeal™ has been compared on a subjective basis over a very short period at the test site on the S520. Testing equipment brought to the site for comparison on a more disciplined, objective basis solely consisted of an Outflow meter manufactured by Humble Equipment Co. of Reston, Louisiana, U.S.A. This was to establish the Water Dissipation (Hydroplaning Comparison)

Testing equipment will be brought to the site for comparison on a more disciplined, objective basis in the future, and to this end, the following tests will be undertaken.

- Fuel Resistance Comparison
- Viscosity/Ductility Testing

4.2 Water Dissipation

An “Outflow Meter” manufactured in the U.S.A. by Humble Equipment Company of Ruston, Louisiana and sold under the trademark “Outflow Meter” (see figure 4.5) was used to measure the asphalt pavement’s capability to dissipate water, as concern has been expressed about hydroplaning on the RJSeal™ treated surface, versus the untreated surface. The Outflow Meter gives readings in seconds for the dissipation of a known quantity of water. It is suggested that any readings between 3 and 10 seconds are satisfactory results for an asphalt surface, if hydroplaning is to be minimized.

Initially readings were taken with this aforesaid Outflow Meter at two locations on the portion of the Highway selected for the test. The results are shown in the table that follows:

Table 4.5		Outflow Meter Readings		
Test	Location relative to the shoulder on northbound lane	Location relative to start of demo sect'n	Before RJSeal™ (secs)	After RejuvSeal™ & Slag(secs)
One	4.8 m west	2 m north	10*	n/a
Two	4.9 m west	2 m north	n/a	4*

* These readings are acceptable from a skid resistance viewpoint.

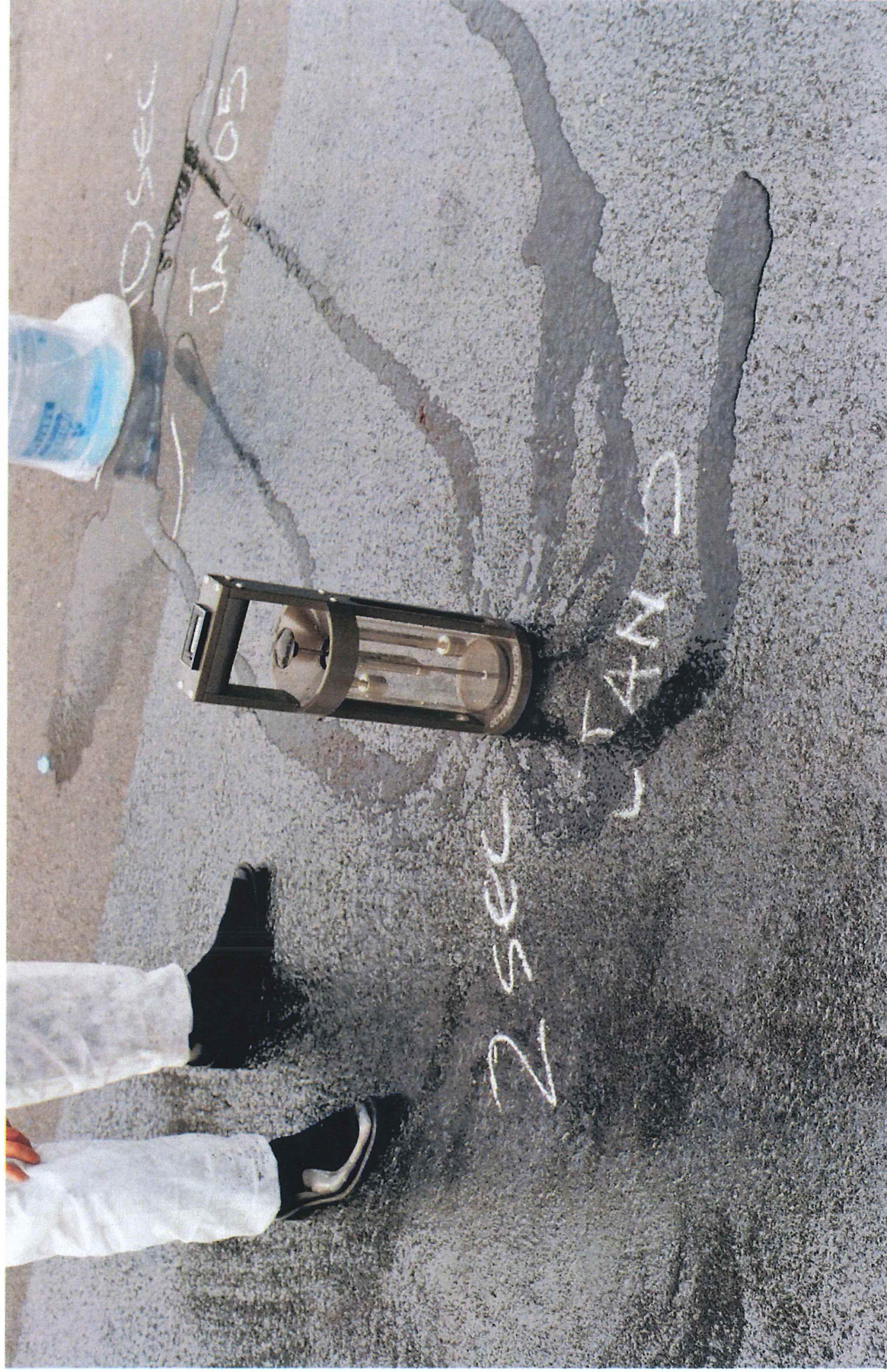
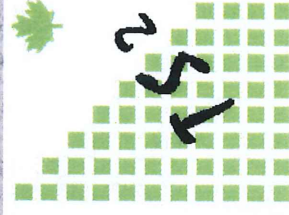


Figure 4.5
Humble Equipment Co. Outflow Meter



4.3 Fuel Resistance Comparison

Fuel Resistance Comparison will be undertaken on several sections of the untreated and RJSeal™ treated sections in close proximity to the Outflow meter tests in the near future. This comparison will consist of pouring about a cupful of diesel fuel onto the road surface and then later checking the penetration of the fuel. If the fuel readily penetrated the asphalt pavement surface, then resistance to this form of chemical attack was presumed to be lower than if the fuel pooled on the surface of the asphalt pavement and slowly evaporated.

4.4 Viscosity/Ductility Testing

This aspect of the testing is beyond the capabilities of the field equipment available to both Crown Capital Enterprise Limited and RJSeal™ personnel and as such, external assistance has been sought from outside experts in the field of Asphalt Testing. To this end, Dr John Emery in Toronto, Canada has been contacted for advise on independent testing.

5.0 Test Completion Schedule

The team of technicians from the Hong Kong office will be dispatched to undertake further testing on the trial section in the near future. The projected completion of this testing is scheduled as shown in the following chart.

ID	Task Name	Duration	Start	er	1st Quarter			2nd Quarter			3rd Quarter			4th Quarter			1st Quarter			
					Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar
1	Travel to GuangZhou and Shunde	1d	Sun 1/4/04																	
2	Application of RJSeal .	1d	Mon 1/5/04																	
3	Inspection of Demo Section	1d	Tue 1/6/04																	
4	Hiatus	8d	Wed 1/7/04																	
5	Inspection of Demo Section	1d	Mon 1/19/04																	
6	Prepare draft report on RJSeal Demo and Testing	7d	Tue 1/20/04																	
7	Hiatus	28d	Thu 1/29/04																	
8	Laboratory Testing of core samples	20d	Tue 3/9/04																	
9	Hiatus	8d	Tue 4/6/04																	
10	Prepare final report	4d	Fri 4/16/04																	
11	Submit final report	1d	Thu 4/22/04																	

Task

Progress

Milestone

Summary

Rolled Up Task

Rolled Up Milestone

Rolled Up Progress

CROWN CAPITAL ENTERPRISE LIMITED

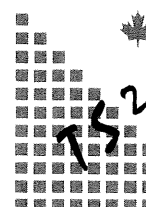
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January 2004

APPENDICES

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B	Copper Slag Specifications



**TS² Consulting Inc.
Lamma, Hong Kong**

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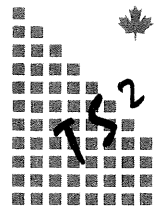
WANCHAI, HONG KONG

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January 2004

Appendix A

RJSeal™ Descriptive Literature



**TS² Consulting Inc.
Lamma, Hong Kong**

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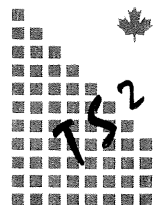
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**Demonstration of RJSeal™
S520 Highway, Shunde,
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January 2004

Appendix B

Copper Slag Specifications



**TS² Consulting Inc.
Lamma, Hong Kong**

CROWN CAPITAL ENTERPRISE LIMITED

Demonstration of RJSeal S520 Highway, Shunde, Guangdong Province, Peoples Republic of China

January 2004

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6.0 Qualifications

STATEMENT OF QUALIFICATIONS

I, Anthony G. Speed of Hong Kong in the Special Administrative Region of China, DO HEREBY CERTIFY.

- I. THAT I am a Consulting Engineer, with offices at 2/F, 81 Po Wah Yuen, Lamma Island, Hong Kong
- II. THAT I am a 1968 graduate of the University of Saskatchewan, Canada with a Bachelor of Science Degree in Mining Engineering.
- III. THAT I am currently registered and in good standing as a Professional Engineer with the Association of Professional Engineers of Ontario, and New Brunswick, Canada
- IV. THAT my 30 years of continuous experience in mining, major civil engineering works (earth moving, highway and mining construction) has exposed me to a broad knowledge of mining and heavy civil engineering construction and allowed considerable familiarization with road construction and asphalt pavement.
- V. THAT this report is based on my visit on January 5, 2003 to Shunde, GuangDong Province, China to view the test section, described in this report and facts as reported to me by Ekman Tang, of Crown Capital Enterprise Limited who supervised the actual RJSeal™ application on January 5. 2003

Dated at Hong Kong, this _____ day of January, 2004



Anthony G. Speed, P.Eng. (Ontario and New Brunswick, Canada)