CROWN CAPITAL ENTERPRISE LIMITED

WANCHAI, HONG KONG

RJSeal™ Application
Hang-Ning Expressway,
Huzhou, Zhejiang,
Peoples Republic of China

June 2005

TS^2 Consulting Inc.
Lamma, Hong Kong

CROWN CAPITAL ENTERPRISE LIMITED

RJSeal™ Application
Hang-Ning Expressway, Huzhou, Zhejiang, Peoples Republic of China

June 2005

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Hang-Ning Expressway, Huzhou, Zhejiang, Peoples Republic of China

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Application of RJSeal™
Hang-Ning Expressway, Huzhou, Zhejiang
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1.0 INTRODUCTION

Crown Capital Enterprise Limited of Hong Kong entered into an arrangement in June 2005 with the Hang-Ning Highway Maintenance Department, which is responsible for the maintenance of the Hang-Ning Expressway in proximity to the City of Huzhou. This arrangement calls for the analysis of the performance of RJSeal™, a sealer/rejuvenator for asphalt pavement on the Hang-Ning Expressway; near the City of Huzhou, some 55 km's north of Hangzhou, the Capital City of Zhejiang Province.

Zhejiang Province is situated immediately south of the municipality of Shanghai, which straddles the Yangtze (Chiang Jiang) River at it's mouth that enters the East China Sea. Zhejiang has a lengthy history related to the sea, with fishing villages and ports along the coastline that have supported trade with foreign countries since recorded time. Zhejiang province is bordered by Anhui, JiangXi and Fujian Provinces as well as Shanghai Municipality. The province is generally quite mountainous and the principal city is Hangzhou, which has a population of approximately 3 million and is also the capital city. Hangzhou was already a city of note in the Song Dynasty and Marco Polo languished there and wrote of the beauty of the West Lake and the surrounding area. The principal seaport is NingBo, which has grown to be a major container terminal along the southeastern coast of China and competes with Shanghai and Shenzhen for business. Zhejiang has seen a major growth in the highway system, in recent years, due to a government drive to build national highways linking Shanghai with major cities in the adjoining provinces and the massive increase in the world export trade. Hangzhou, lies some 250 kilometres south of Shanghai. See figure 1.0 for a map showing the location of Hangzhou and Zhejiang Province. The majority of the area lies at 60 to 70 metres in elevation. The regions' latitude (30 degrees north), mean that there are four seasons, with temperatures ranging from 45 Celsius in the long, hot summer to minus 2 Celsius in the short winter. There is a rainy season per-se, that occurs primarily in May thru August, but can extend into September and throughout the winter there are numerous showers and thunderstorms

In the immediate Hangzhou area, a significant consolidated sedimentary sequence predominates. Due to mountain building a significant number of hills and small mountains prevail, that have been gradually eroded and . afford excellent opportunities to see the bedrock. The asphalt in the area is manufactured from local materials, which is comprised of crushed and screened sandstone hauled in from local quarries, as well as washed gravels from the various rivers. The bitumen binder for the asphalt is sourced from

various locations. Since Zhejiang Province borders the East China Sea, the possibility of bitumen being sourced from offshore is a distinct possibility so refineries in Singapore and the like should not be forgotten.

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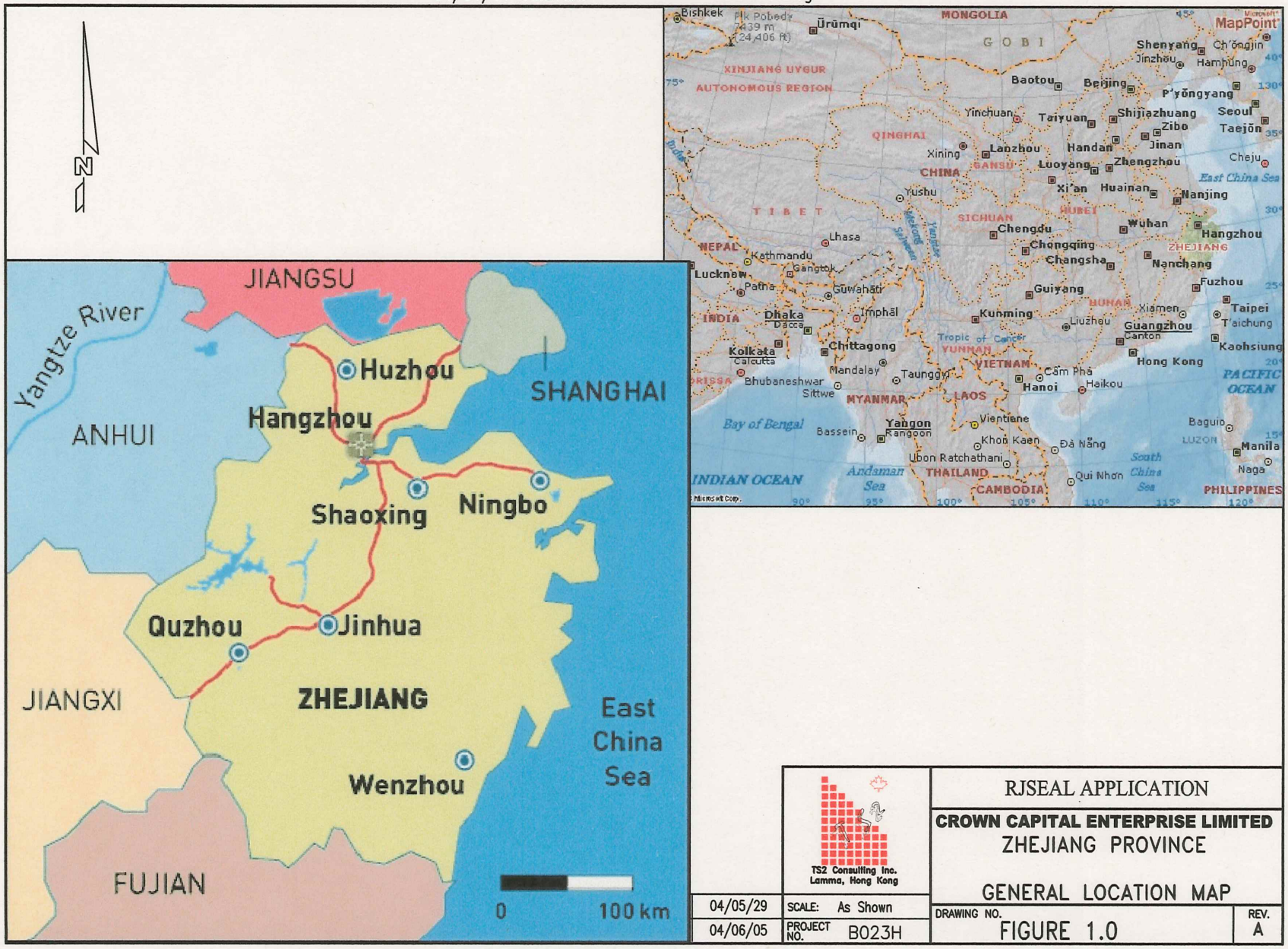

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RJSEAL APPLICATION

CROWN CAPITAL ENTERPRISE LIMITED

ZHEJIANG PROVINCE

GENERAL LOCATION MAP

04/05/29	SCALE: As Shown	DRAWING NO. FIGURE 1.0	REV. A
04/06/05	PROJECT NO. B023H		

Figure 1.0 General Location Plan

2.0 CO-OPERATIVE PROGRAM

The intent of the arrangement with Hang-Ning Expressway Maintenance Department, which is responsible for the Hang-Ning Expressway, is to demonstrate RJSeal™ at a location selected by the Maintenance Division. The Application will subsequently allow analysis of the performance of RJSeal™ on a variety of asphalt surfaces. An application was undertaken on the Hang-Ning Expressway, between Kilometre 40+000 and Kilometre 39+750, in the overtaking lane, on this four-lane divided highway, immediately west of the City of Huzhou. The work was undertaken on June 3, 2005. The portion of the highway that was treated is composed of asphalt pavement, nominally 12 centimetres thick, which overlays a silty sand.

The age of the asphalt pavement is circa 2001. Keen interest was expressed in having the life of the asphalt pavement extended on this highway. The asphalt pavement has a number of lateral and linear cracks, which had recently been filled with road tar. However smaller cracks also exist and the road maintenance department wished to prevent water percolating through these smaller cracks in the asphalt pavement, thus softening the sub-grade. Furthermore, portions of the expressway, immediately to the north of the demonstration site are suffering from raveling and portions have been repaved. Refer to the inspection on May 26, contained in Appendix B. No doubt this is an indication that the surface wearing course is nearing the end of it's useful life. Even further north there are some sections that have recently had a slurry seal coating applied to counter this raveling problem. Also noticed were some sectors with a chip seal coating applied.

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 and recently in China 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 that outlines the experience with RJSeal™ at various locations in North America and South America as well as China. 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 other locations in the U.S.A. Since 2000, RJSeal™ has been demonstrated successfully at over fourty six (46) locations in China and fourty (40) commercial-scale applications have taken place at various locations, including Shenzhen, Kunming, Shanghai, QinHuangDao and DaQing.

4.0 TEST PROGRAM

Since Zhejiang Province is located in a semi-tropical climate (Latitude: 30 degrees North) at a low altitude (50 to 70 metres), it's a demanding setting for asphalt, given the year round warm climate (extremes of 45 Celsius in summer and minus 2 Celsius in the winter) and intense exposure to ultraviolet radiation, all which contribute to the oxidation and breakdown of the asphalt binder.

Zhejiang has the significant concentration of highways in China with some 4,000 kms of national and provincial highway. The Hang-Ning Expressway Maintenance Department is responsible for the maintenance of the Hang-Ning Expressway is definitely interested in determining how to economically extend the life of the asphalt road surface. To this end, they agreed to try RJSeal™ on Hang-Ning Expressway, immediately west of the City of Huzhou. See Figure 4.0, showing the location of this highway with respect to Huzhou and Zhejiang

On June 3, 2005 a test strip on the northbound overtaking lane of Hang-Ning Expressway, a four lane divided highway, was treated with RJSeal™. The location selected for an application of RJSeal™ was at the following geographic location:

Table 4.1		**Geographic Location of Test Strip on Hang-Ning Expressway**		
Test Strip		**System i.e. Geographic or Universal Transverse Mercator (UTM)**	**Northing**	**Easting**
Kilometre 40	South End	Geographic (deg, min)	30^0 50.13'	120^0 03.49'
		UTM Grid (51R) (metres)	3415095	218612

Figure 4.0 Specific Location Plan

Particulars of the test strip are shown in the table that follows:

Table 4.2				**Particulars of the Test Strip on Hang-Ning Expressway**							
Work Time	**Strip Width (m)**	**Strip Length (m)**	**Total Area (m^2)**	**Total Area ft^2 approx**	**RJSeal™ Applied**			**Application Rate**			
					US gals	Litres	Kgs	US Gal /yd^2	litres /m^2	m^2 /Litre	m^2 /Kg
09:00 – 14:30	3.7	250	925	1106	56	212	220	0.051	0.23	4.4	4.2

Subsequent inspection of the test strips, showed that the application rate of 4.2 m^2/kg was adequate for the asphalt pavement at this location

The 250 metre long application section on Hang-Ning Expressway is comprised of a hot mix asphalt pavement. See figure 4.0 for the location of the test strip with respect to the City of Huzhou is graphically shown in figure 4.1, which follows.

Figure 4.1 Test Strip on Hang-Ning Expressway.

Figure 4.1 Test Strip on Hang-Ning Expressway

There is a slight camber to the road, which causes water to run off toward the shoulder, rather than puddle on the road. No significant oil spills were observed, just the occasional drop of transmission oil, crankcase oil or hydraulic fluid. The asphalt pavement surface was not appreciably worn with no rutting due to traffic wear. There was aging and oxidation of the bitumen, which extended to a depth of several millimetres. There were longitudinal cracks, and also lateral cracks, which had recently been filled with tar. The entire portion of the treated asphalt pavement section overlies a compacted silty-clay, sub-grade

RJSeal™ was applied, using a crew of 8 workers equipped with paint rollers. They applied the RJSeal™ in a uniform manner. Ambient temperatures at the time of the application on June 3 were in the 34 degree Celsius range, with humidity in the 35% range. Photos showing the test application of RJSeal™ follow in figures 4.2, 4.3 and 4.4. on the following pages.

A site visit on May 26, 2005 (Refer to Appendix B for more details) was made to check to entire test section prior to the application of the RJSealTM. This is pictorially shown in Figure 4.4 that follows.

Figure 4.2 Typical Application Procedure.

4.2	Typical Application Procedure

Figure 4.3 Finished Surface.

4.3	Finished Surface

Figure 4.4 Site visit - May 2005

Figure 4.4 Site Visit, May 26, 2005

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 on Hang-Ning Expressway.

Additional 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.

- Hydroplaning Potential
- Water Penetration
- Macrotexture (Depth of Texture)

At a later date, cores will be acquired from the asphalt pavement for laboratory testing and the following properties of the asphalt pavement will be determined:

- Viscosity
- Ductility
- Penetration
- Softening Point

4.2 Hydroplaning Potential

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 waterduring the field inspection on May 26, as concern has been expressed about hydroplaning on the RJSeal™ treated surface, versus the untreated surface. The procedure is documented in the ASTM Standard E2380-05. 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.

Figure 4.5 Outflow Meter

TS2

Figure 4.5 Outflow Meter

4.3 Water Penetration

Water Penetration Tests (China Testing Standard T 0730-2000) will be undertaken at several locations on the Hang-Ning Expressway on both treated and segment treated with RJSeal™. During the inspection on May 26, 2005, water was poured on the RJSeal™ treated segment and no water penetrated the asphalt pavement.

See Figure 4.6 that follows for a pictorial presentation of the Water Penetration Meter.

4.4 Macrotexture (Depth of Texture)

The sand patch test (ASTM Standard E965-96 OR China Standard T 0961-95) was used to ascertain the Pavement Macrotexture (Depth of Structure). Comparison at several locations on the untreated section in close proximity to the Water Penetration Meter tests during the field inspection on May 26. Results are presented in the field inspection report in Appendix B

See Figure 4.7 which follows, showing the sand patch testing procedure.

4.5 Ductility/Viscosity/Penetration Testing

This aspect of the testing is beyond the capabilities Crown Capital Enterprise Limited personnel and external assistance has been sought from outside experts in the field of Asphalt Testing. To this end, the Hang-Ning Expressway maintenance Department has retained an independent testing company in Xi'an, Shaanxi Province to conduct tests on the treated section. This will be reported separately.

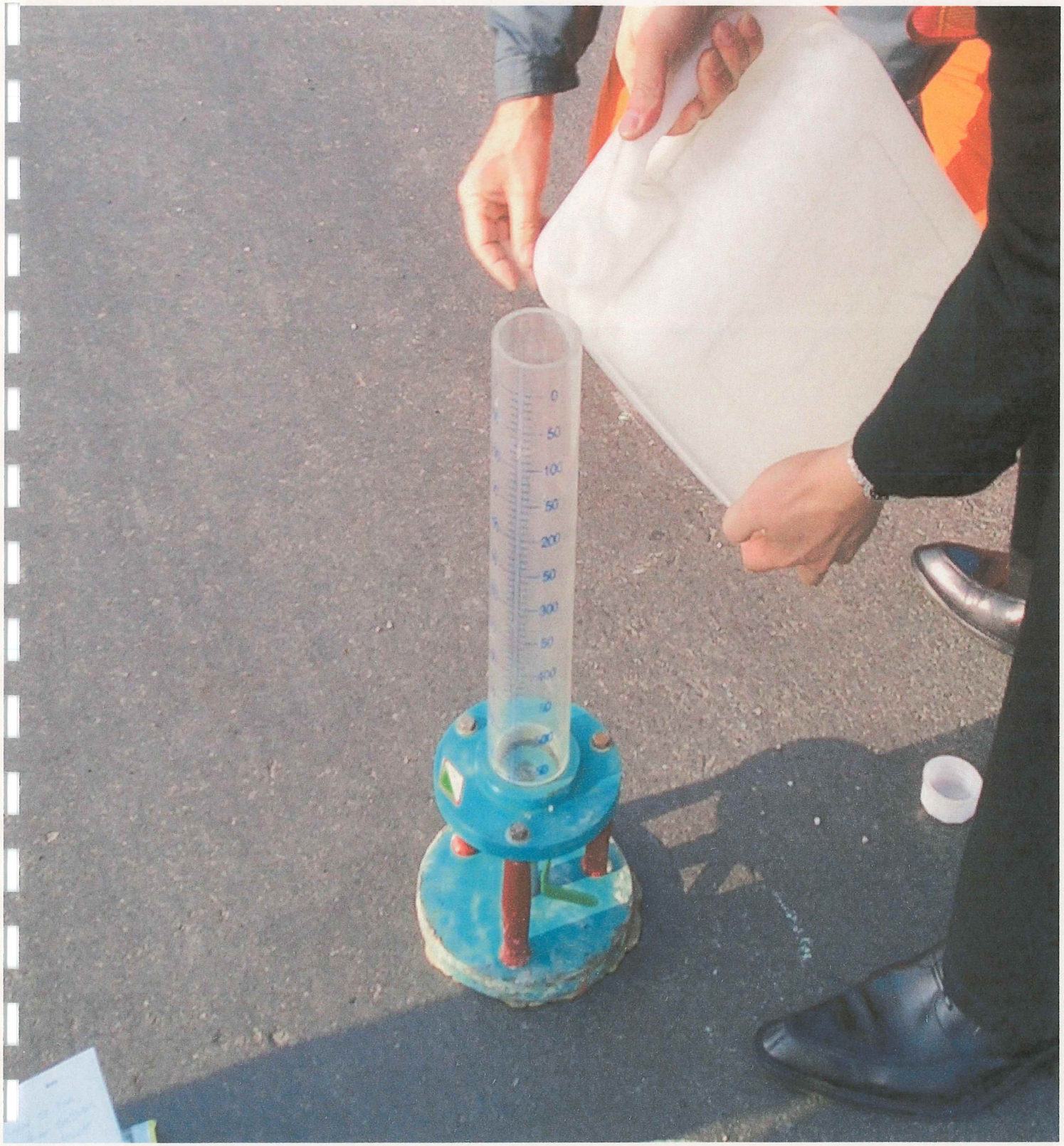


Figure 4.6 Water Penetration Test

Figure 4.6 Water Penetration Meter

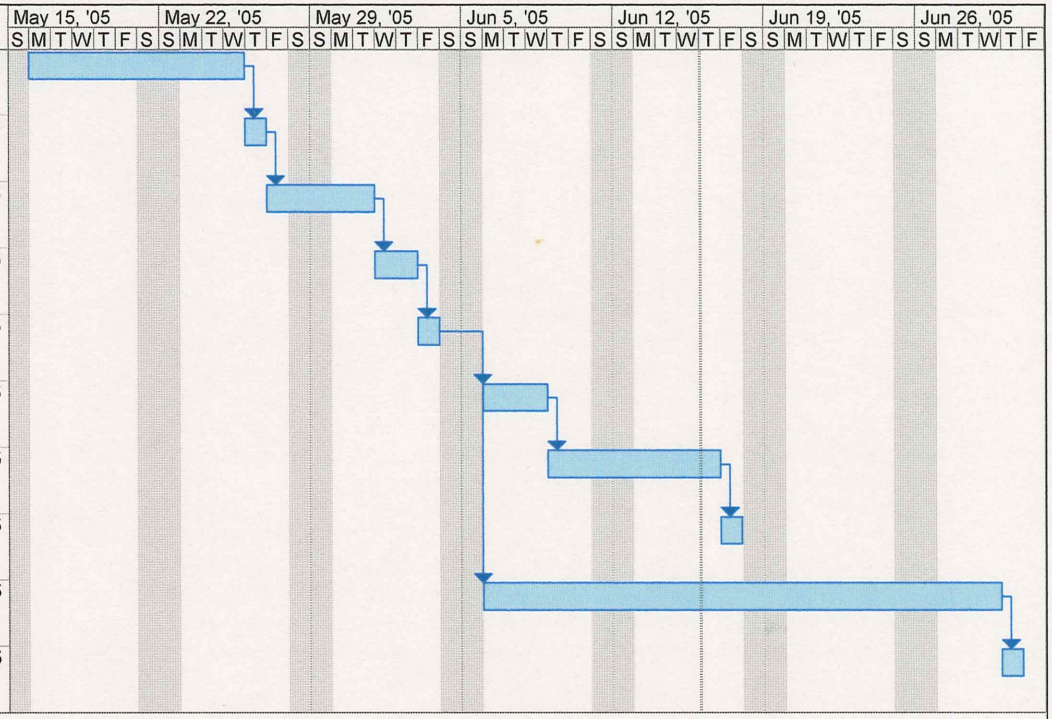
Figure 4.7 Sand Patch Test

Figure 4.7 Sand Patch Test

5.0 Test Completion Schedule

The technicians from the Xi'an testing laboratory, retained by the Hang-Ning Expressway Maintenance Department 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	Finish
1	Negotiations for Demo	8 days	Mon 5/16/05	Wed 5/25/05
2	Field Inspection	1 day?	Thu 5/26/05	Thu 5/26/05
3	Hiatus	3 days	Fri 5/27/05	Tue 5/31/05
4	Mobilization	2 days	Wed 6/1/05	Thu 6/2/05
5	RJSeal Demo	1 day?	Fri 6/3/05	Fri 6/3/05
6	Report Compilation	3 days	Mon 6/6/05	Wed 6/8/05
7	Hiatus	6 days	Thu 6/9/05	Thu 6/16/05
8	Report Completion	1 day?	Fri 6/17/05	Fri 6/17/05
9	Hiatus	18 days	Mon 6/6/05	Wed 6/29/05
10	Testing by Independent Lab	1 day?	Thu 6/30/05	Thu 6/30/05



Project: HangNing Schedule
Date: Thu 6/16/05

Task
Split
Progress
Milestone
Summary
Project Summary
External Tasks
External Milestone
Deadline

Figure 5.0 Test Completion Schedule

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 35 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 May 26, 2005 to Huzhou in Zhejiang Province, China to view the work, described in this report and facts on the application as reported to me by CK Ho, Project Manager on this project for Crown Capital Enterprise Limited.

Dated at Hong Kong, this 28TH day of June, 2005

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

CROWN CAPITAL ENTERPRISE LIMITED

WANCHAI, HONG KONG

RJSeal™ Application
Hang-Ning Expressway,
Huzhou, Zhejiang,
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June 2005

APPENDICES

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Appendix A

RJSeal™ Descriptive Literature

TS^2 Consulting Inc.
Lamma, Hong Kong

CROWN CAPITAL ENTERPRISE LIMITED

WANCHAI, HONG KONG

RJSeal™ Application
Hang-Ning Expressway, Huzhou, Zhejiang, Peoples Republic of China

June 2005

Appendix B

Site Inspection – May 26, 2005

TS^2 Consulting Inc.
Lamma, Hong Kong

TS² CONSULTING INC.

(British Virgin Islands Incorporated) website: http://ts2.stormloader.com

China (Office)
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广东省惠州市望江上府上先路42号4楼

May 30, 2005

Crown Capital Enterprise Limited
B5, Centre Point Bldg.
181 – 185 Gloucestor Road
Wanchai, Hong Kong

Attn: Charencce Chiang
General Manager

Inspection of the Hang-Ning Expressway on May 26, 2005,

This letter summarizes my findings following an inspection of a portion of the Hang-Ning Expressway (Km 40 to Km 34), just north of the HuZhou exit, on May 26, 2005. The intent of the inspection wa to determine if this location would be a suitable site for a demonstration application of RJSeal™. The inspection was conducted in conjunction with the following personnel:

- Hang-Ning Expressway Maintenance Department's Engineering Group,
- CCEL's local agent(s) from Hangzhou,
- Mr Liu from the Shanghai office of Sundata (Mr Bai's group) and
- Angela Fung from CCEL's Hong Kong office.

The Hang-Ning Expressway runs from Hangzhou in Zhejiang Province to Nanjing in Anhui Province, some 300 kilometres to the north-east of Hangzhou. See figure appended showing location of the Highway. The asphalt pavement is supposedly 3 to 4 years old. The two northbound lanes of this four lane divided highway, which were inspected just to the northeast of the HuZhou exit (approximately 50 kilometres north of Hangzhou), is deteriorating quite fast, with significant rutting and ravelling (loss of fines) of the asphalt pavement.

At kilometre marker 40, 36 and 34, (The Toll Gate at the start of the Expressway in Hangzhou is kilometre marker 98) field tests were conducted with the outflow

meter and the sand patch test. At Km marker #40 the road surface was quite smooth and two tests with the outflow meter turned up reading of 18 seconds and 37 seconds. This locale seemed like a good candidate for RJSeal™ as minimal rutting and no ravelling had occurred. However the two other locales tested (Km 36 and 34) had Outflow Meter readings of 2 seconds....indicative of a rough surface, which is attributable to the ravelling. In fact the ravelling is excessive and this area is not a good candidate for the RJSeal Demo.

Particulars of the field test results are summarized in the tables that follows:

Location Nominal	Geographic Location	North	East	Location of test in Driving Lane	Outflow Meter (sec)	Sand Patch Depth of Structure (mm)
Kilometre 40	Geographic	30° 50.13'	120° 03.49'	East Wheel Path	18	0.26
	UTM – 51R	3415095	0218612	West Wheel Path	37	n/a
Kilometre 36	Geographic	30° 52.98'	120° 02.03'	East Wheel Path	2	2.21
	UTM – 51R	3420410	0216418	West Wheel Path	2	n/a
Kilometre 34	Geographic	30° 53.91'	120° 01.50'	East Wheel Path	4	n/a
	UTM – 51R	3422150	0215624	West Wheel Path	2	n/a

An "Outflow Meter" manufactured in the U.S.A. by Humble Equipment Company of Ruston, Louisiana and sold under the trademark "Outflow Meter" was used to measure the asphalt pavement's macrotexture. The procedure is documented in the ASTM Standard E2380-05. 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 pavement surface, if hydroplaning is to be minimized.

The sand patch test (ASTM Standard E965-96 OR China Standard T 0961-95) was used to ascertain the Pavement Macrotexture (Depth of Structure). Comparison was undertaken in close proximity to the Outflow Meter tests. The readings taken indicate that the road surface is VERY SMOOTH at Km 40 whereas at Km 36 and Km 35, the road surface sufficiently rough, to minimize problems with skidding, especially when raining.

Freshly re-paved sections immediately to the north of the section where testing was conducted are evident and overlays of chip seal and slurry seal were also evident in the adjoining southbound lanes, indicating that the asphalt pavement has reached the end of its useful life. It should be noted that the initial 45 kilometres of the expressway running north from Hangzhou are quite good with minimal patches and linear or lateral cracks and only minimal rutting and negligible ravelling. This could be attributable to the fact that this section was either completed later than the northern section OR the contractor supplied a better quality asphalt mixture for paving.

It is recommended that no trial with RJSeal be conducted at these two latter locations (Km 36 and Km 34) as sooner or later the highway maintenance department will have to either re-pave this section or do some slurry or chipseal overlay to provide a smooth running surface, in which case the RJSeal™ Demonstration Strip would be covered and not serve any useful purpose.

Sincerely

Anthony G. Speed, P. Eng. (Ontario & new Brunswick, Canada)

Field Inspection - May 26, 2005

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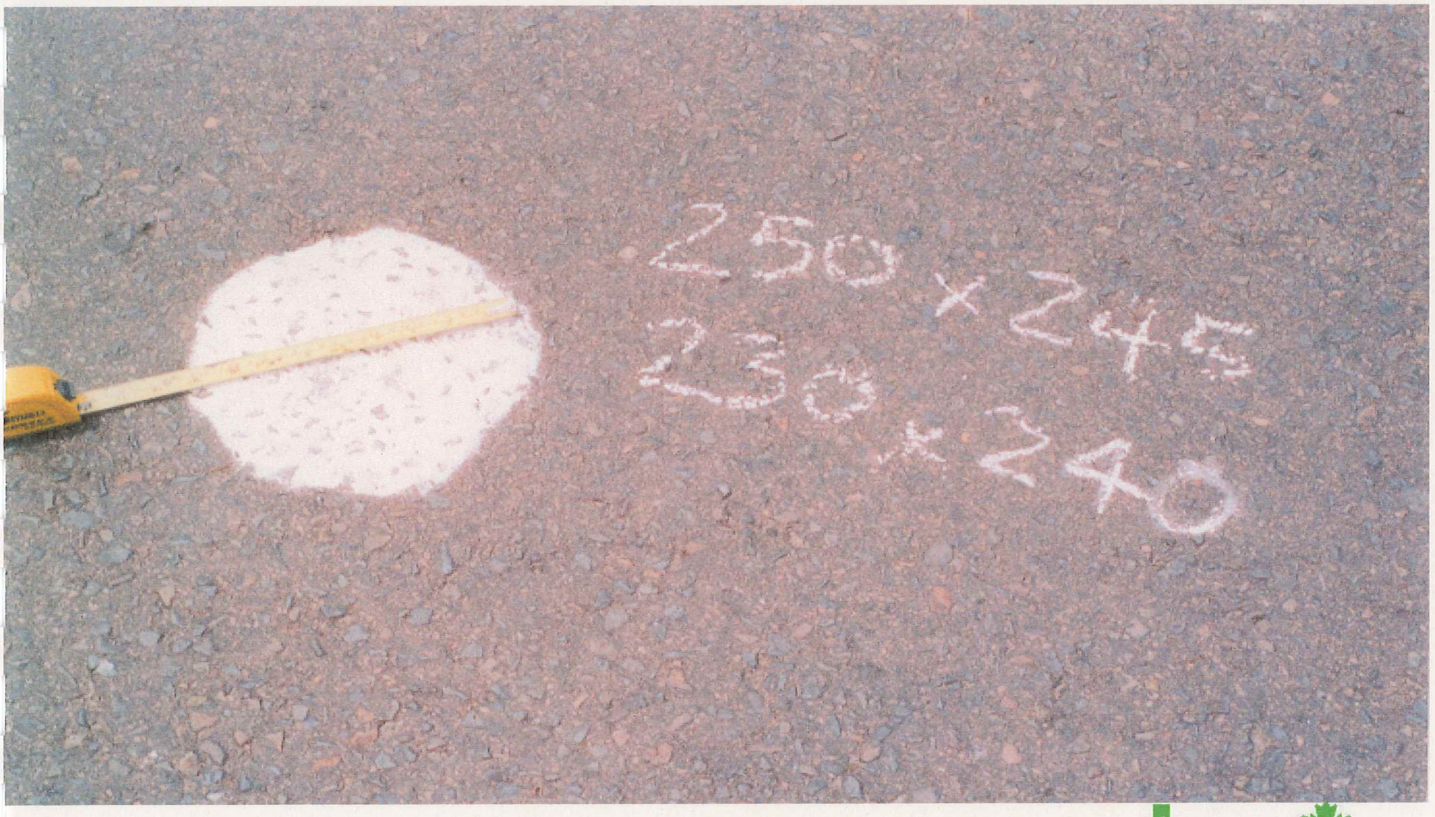

Testing - Km 36 - May 26, 2005