CROWN CAPITAL ENTERPRISE LIMITED

WANCHAI, HONG KONG

Demonstration of Rejuvaseal™ HongQiao Airport, Shanghai, Peoples Republic of China

November 2001

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Lamma, Hong Kong

TS² CONSULTING INC.

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November 30th, 2001

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

Attn: Charence Chiang
General Manager

Dear Charence

Re: Demonstration of RejuvaSeal™ at HongQiao Airport, Shanghai.

This is the final report on the demonstration of RejuvaSeal™ at the HongQiao Airport in Shanghai. On November 22nd, 2001, a demonstration strip was completed near the midpoint of this 3500 metre long runway. The strip was 170 metres in length and 5 metres wide and straddled the joint between the older (1992 vintage) asphalt pavement on the outside flanks and a new overlay (circa 1998) along the centre of the runway. I anticipate that a supplementary letter report will be supplied by the operations people on their observations and follow up inspection in early 2002.

Yours Sincerely

LICENSED PROFESSIONAL ENGINEER
A. G. SPEED
PROVINCE OF ONTARIO

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

Crown Capital Enterprise Limited.
RejuvaSeal Demo
HongQiao Airport - Shanghai

Demo Date	21-Nov-01
Prepared by	A.G. Speed
Updated by	A.G. Speed
Updated	26-Nov-01

Assumptions

Panels Lengtl	10.0	Metres
Panel Width	5.0	Metres
Panel Area	50.0	Sq Metres

Conversion Factors

US Gallon=	3.78	Litres
Sq Metre=	10.76	Sq Feet
Sq Metre=	1.20	Sq Yds

Crew Consist	No
Labourers	12
Truck Drive	1
Supervisor	1
Total	14

Work Schedule	Work Time (hrs)	No. of Panels	Test Length (m)	Total Area m^2	Total Area yd^2	RejuvaSeal Applied		Application Rate			14 Man Crew	
am/pm						US gals	litres	USGal /yd^2	Litres /m^2	m^2 /Litre	m^2 /man hr	yd^2 /man hr
23:30-01:25	1.92	17	170	850	1,016	95	359	0.093	0.42	2.37	31.7	37.9
Totals	1.92	17	170	850	1,016	95	359	0.093	0.42	2.37	31.7	37.9

FlowMeter Readings	Time (sec)	Location
November 23, 2001		
Untreated	**6**	0.5 m south of Test Strip on Old Pavement
Treated	**12**	0.5 m north on old pavement portion of Test Strip
Untreated	**5**	0.5 m south of Test Strip on Newer Pavement
Treated	**7**	0.5 m north on Newer Pavement portion of Test Strip
Treated	**3**	125 m north on Older, Slag treated Pavement portion of Test Strip
Treated	**3**	125 m north on Newer, Slag-treated Pavement portion of Test Strip

CROWN CAPITAL ENTERPRISE LIMITED

Demonstration of RejuvaSeal
HongQiao Airport, Shanghai,
Peoples Republic of China

November 2001

TABLE OF CONTENTS

Section	Description	Page
1.0	Introduction	1
2.0	Co-operative Program	3
3.0	RejuvaSeal™	4
3.1	Prior Experience	4
4.0	Test Program	5
4.1	RejuvaSeal™ Testing	13
4.2	Water Dissipation	13
4.3	Fuel Resistance Testing	16
4.4	Elasticity/Ductility Testing	16
5.0	Project Completion Schedule	17

FIGURES

No.	Description	Page
1.0	General Location Map	2
4.0	Specific Location Map	6
4.1	Demonstration Strip	7
4.2	Typical Preparation Procedure for RejuvaSeal™	10
4.3	Application of Nitoflor Hardtop Aggregate to RejuvaSeal™	11
4.4	Finished Surface	12
4.5	Humble Equipment Co. Outflow Meter	15
5.0	Project Completion Schedule	18

TABLES

No.	Description	Page
4.3	Geographic Location of Demo Site	8
4.4	Details of RejuvaSeal™ Demonstration Section on HongQiao Airport, Shanghai	9
4.5	Outflow Meter readings at Demo Site	15

CROWN CAPITAL ENTERPRISE LIMITED

Demonstration of RejuvaSeal
HongQiao Airport, Shanghai,
Peoples Republic of China

September 2001

APPENDICES

No.	Description
A	Rejuvaseal™ – Technical Seminar, Shanghai, China, August 2001
B	Rejuvaseal Descriptive Literature
C	Nitoflor Hardtop Aggregate Specification sheet

TS² Consulting Inc.
Lamma, Hong Kong

CROWN CAPITAL ENTERPRISE LIMITED

Demonstration of RejuvaSeal™
HongQiao International Airport, Shanghai Municipality
Peoples Republic of China

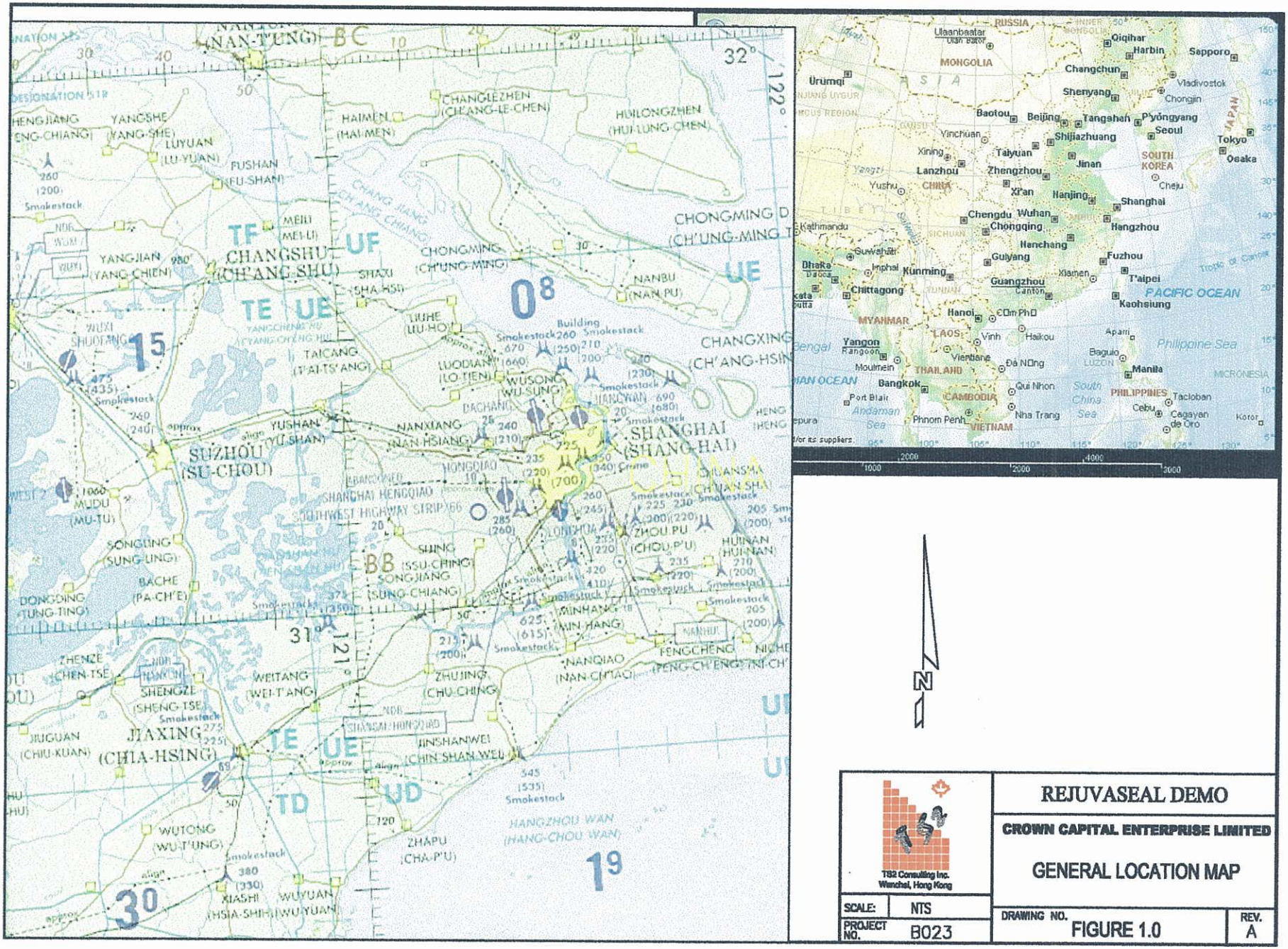
November 2001

1.0 INTRODUCTION

Crown Capital Enterprise Limited of Hong Kong entered into an arrangement in October 2001, with the Shanghai Airport Authority who manage HongQiao International Airport in Shanghai, China. This arrangement calls for the analysis of the performance of RejuvaSeal™, a sealer/rejuvenator for asphalt pavement on the sole runway at this international airport.

Shanghai is located on the Huangpu River near its confluence with the Yangtze (Chang Jiang) River and near the coast of the East China Sea. Shanghai is a Municipal District and reports directly to the Central Government in Beijing. Shanghai Municipality is bordered by JiangSu and Zhejiang Provinces. Shanghai has a unique history in that it was a town of middle importance until its strategic location, just 25 kilometres from the mouth of the Yangtze River was recognized by the colonial powers. Portions of it at one time hosted enclaves ceded to the American, British and French in 1842 by the Treaty of Nanjing following the Opium Wars. The presence of these nationals spurred the growth of Shanghai as a major trading center through the latter part of the 19th Century and into the early part of the 20th Century. More recently, Shanghai has seen a major growth due to a government drive to introduce High Technology Industries. This has been most evident in the Pudong area, which lies across the Huangpu River from central Shanghai. The present population of Shanghai is estimated at approximately 13 million. See figure 1.0 for a map showing the location of Shanghai. The majority of the area lies at 10 to 20 metres in elevation, on the extensive plain that borders the East China Sea. The regions' latitude (31 degrees north), mean that there are four seasons, with temperatures ranging from 45 Celsius in the long, hot summer to minus 5 Celsius in the short winter. The rainy season is primarily May thru August, but can extend into September.

In the immediate Shanghai area, a significant unconsolidated sedimentary sequence predominates and this is due to the site adjoining the delta of the Yangtze River. There are no outcrop exposures available. Drainage channels such as Wusong River (a.k.a. 'Suzhou Creek'), also afford no opportunities to see the bedrock. The asphalt in the area is manufactured from imported materials, which is comprised of crushed and screened sandstone hauled in from quarries in Zhejiang Province, as well as washed gravels from the various rivers. The bitumen binder for the asphalt is sourced from various locations. Since Shanghai is only 25 kilometres from the mouth of Yangtze River, which is navigable by ocean vessels, the possibility of bitumen being



TS2 Consulting Inc.
Wanchai, Hong Kong

SCALE:	NTS
PROJECT NO.	B023

REJUVASEAL DEMO

CROWN CAPITAL ENTERPRISE LIMITED

GENERAL LOCATION MAP

DRAWING NO.	REV.
FIGURE 1.0	A

Figure 1.0 General Location Plan

2.0 CO-OPERATIVE PROGRAM

The intent of the arrangement with Shanghai Airport Authority is to demonstrate RejuvaSeal™ to show its effectiveness in preventing water infiltration. The demonstration will subsequently allow analysis of the performance of Rejuvaseal™ on a variety of asphalt surfaces. A demonstration was undertaken on HongQiao International Airport on November 22, 2001. The north-south runway is 56 metres wide and 3500 metres long and composed of two different asphalt pavements. A central, 30 metre wide portion, which is an 8-centimetre overlay of 1998 vintage on top of a 8 centimetre base of 1992 vintage. The portions of asphalt pavement on either side of the 30-metre overlay are the original 16-centimetre thick asphalt pavement. Both asphalt pavements overlay cast-in-place concrete slabs. No details are known about the subgrade, but inspection of the shoulders show a sandy-silty material. No significant ditches are evident and it can be assumed that the water table is fairly high. The surface of the 1992 asphalt is quite smooth and concern had been expressed about hydroplaning during heavy rains. Furthermore, the 1992 asphalt pavement is approaching the end of its useful life and keen interest was expressed in having the life extended. The 1998 overlay is quite porous and the airport authority is concerned about water percolating through the asphalt and softening the sub-grade.

3.0 REJUVASEAL™

RejuvaSeal™ is a proprietary product that is supplied by Crown Capital Enterprise Limited of Wanchai, Hong Kong. Rejuvaseal™ 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. Rejuvaseal™ 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 provided to participants at a seminar held in Shanghai in August 2001. This outlines the experience with Rejuvaseal™ at various locations in North America and South America. Further information is available from Crown Capital Enterprise Limited. Rejuvaseal™ 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.

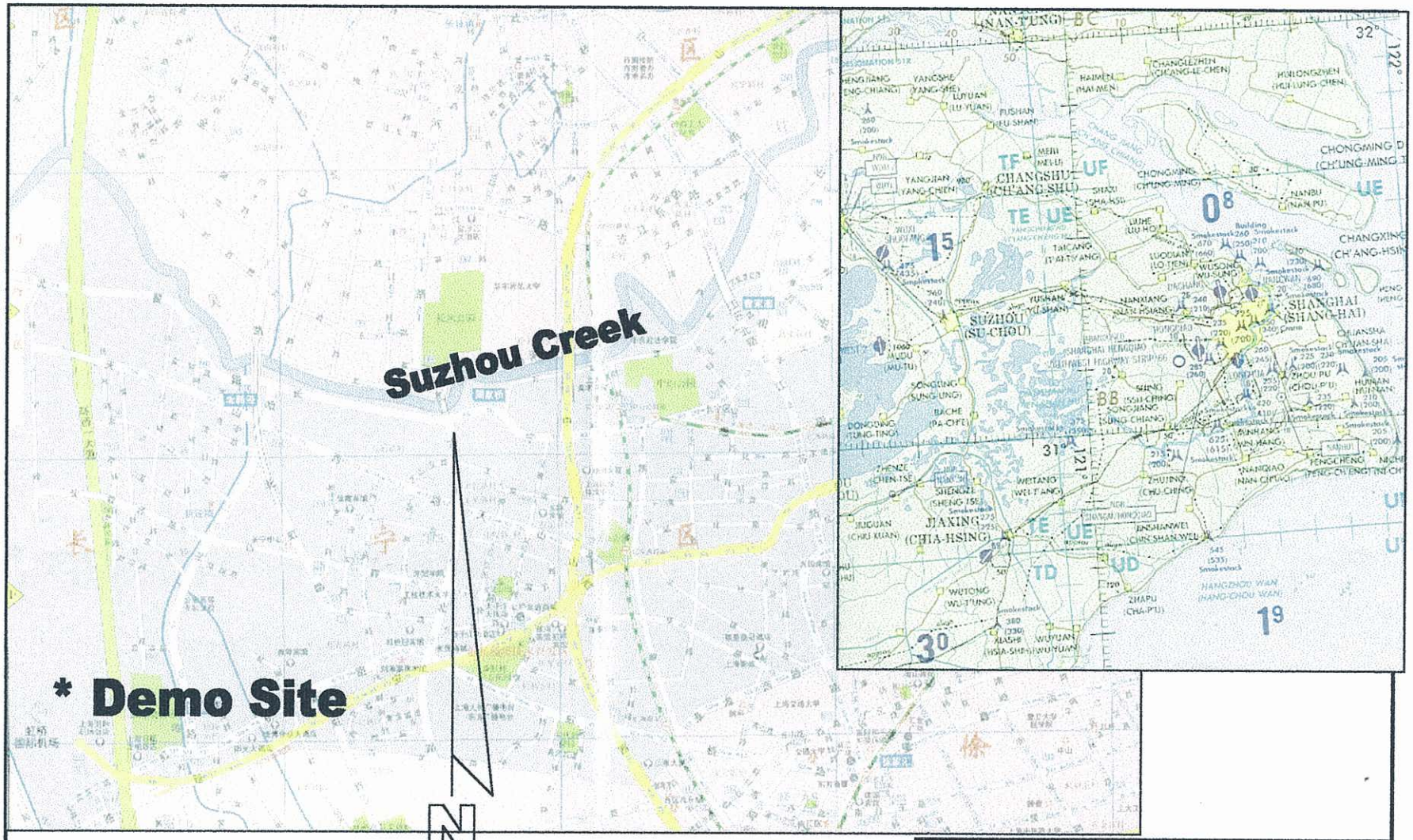
4.0 TEST PROGRAM

Since Shanghai is located in a semi-tropical climate (Latitude: 31 North) at a low altitude (10 to 20 metres), it's a demanding setting for asphalt, given the year round warm climate (extremes of 45 Celsius in summer and minus 5 Celsius in the winter) and intense exposure to ultraviolet radiation, all which contribute to the oxidation and breakdown of the asphalt binder.

The Shanghais Airport Authority is responsible for the maintenance and operation of the International Airport in Shanghai, which has seen a major growth in passenger and freight traffic in the last 10 years. It would appear that no plans are afoot to add an additional runway to cope with the increase in traffic and a new Airport in Pudong, some 25 kilometres east, will share the burden of air traffic to and from Shanghai.

The Shanghai is definitely interested in economically extending the life of the asphalt runway and to this end, has agreed to try RejuvaSeal™ on the sole runway at HongQiao International Airport, which is located in western Shanghai Municipality. The arrangement with Crown Capital led to the airport authority selecting an appropriate location for the testing of RejuvaSeal™. See Figure 4.0, showing the location of this airport with respect to Shanghai.

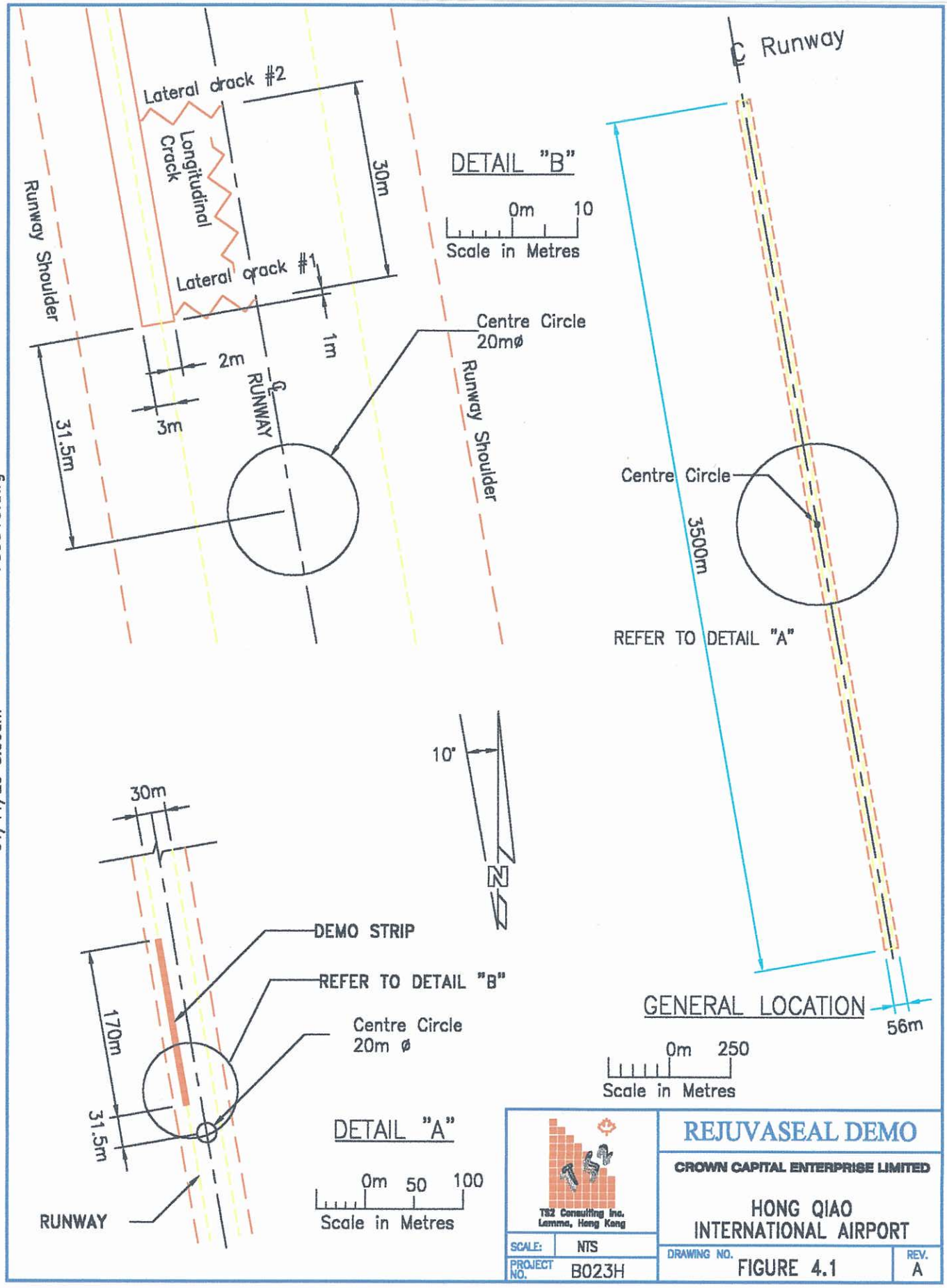
Inspection of the runway earlier in November by personnel from Crown Capital, led to the assumption that an application rate of 2.5 m^2/litre would be appropriate for the asphalt pavement on the runway. A 170 metre long demonstration strip on the western shoulder of the runway was undertaken, on November 22. The demonstration strip was 5 metres wide and straddled the joint between the 1998 overlay and the original 1992 asphalt surface. This strip covered approximately 2 metres of the overlay and 3 metres of the original asphalt pavement. The strip started 31 metres north of the center of the 3500 metre long runway. The location of the demonstration strip is graphically shown in figure 4.1, which follows.



TSZ Consulting Inc. Lamma, Hong Kong	REJUVASEAL DEMO
	CROWN CAPITAL ENTERPRISE LIMITED
	DETAILED LOCATION PLAN
SCALE: NTS	
PROJECT NO. B023C	DRAWING NO. FIGURE 4.0
	REV. A

Figure 4.0 Specific Location Plan

Figure 4.1 Demonstration Strip



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the demonstration strip at HongQiao International Airport was selected by the Shanghai Airport Authority and is geographically located as follows:

Table 4.3	Location of Demo Site	
System	**Northing**	**Easting**
Geographic (deg, min)	31^0 15.884'	121^0 36.707'
Universal Transverse Mercator Grid (metres) 51R	3459785	0367833

Work commenced on the demonstration section at 11:30 pm on November 21, on a cool, clear evening, where the air temperature was around 7 Celsius. The test section had no significant oil spills or fuel spills. There were longitudinal cracks (parallel to the centerline of the runway) near the centerline of the runway and lateral cracks every 5 metres, which match the joints in the underlying, cast in place concrete slabs. The aging and oxidation of the bitumen extends to a depth of several millimetres. The entire portion of the runway was on a compacted silty-clay, sub-grade

On November 21, an initial 10 metre long segment (panel) was marked off with a width of 5 metres. A five U.S. gallon (17.9 litres) pail of RejuvaSeal™ was assigned to this panel and applied with a paint roller in conjunction with roller pan. This appeared to be adequately cover, both the 1998 overlay and the older 1992, asphalt surface. Further panels were then marked off in 10 metre increments and RejuvaSeal™ was applied to each of the panels, using paint rollers and paint roller pans, to ensure uniformity in the application.

In total, 17 segments (panels) were marked off, with the length retained at 10 metres, although the rough surface on the overlay required more RejuvaSeal™ to effectively cover the surface. . The last panel was completed at 1:25 am on November 22. Portions of the original 1992 asphalt surface had been treated by an asphalt emulsion of some sort, at an earlier unstated time. This prior treatment of the asphalt pavement was evidently undertaken to stop water penetration, however this evidently had not worked.

In addition to the demonstration section, three cracks (two lateral and one longitudinal) were coated with RejuvSeal™. These were in proximity to the demonstration section. See figure 4.1 for location of these cracks. These were in the range of 4 millimetre to 8 millimetre width. These were subsequently filled with a crack sealant on the evening of Nov 23, using a caulking gun as an applicator. Specifics of the crack sealant are found in Appendix D

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

Table 4.4				Details on RejuvaSeal™ Demonstration Section on HongQiao International Airport						
Work Schedule	Work Time (hrs)	No. of Panels	Test Length (m)	Total Area m^2	Total Area yd^2	RejuvaSeal™ Applied		Application Rate		
						US gals	litres	US Gal /yd2	Litres /m2	m2 /Litre
23:30-01:25	1.92	17	170	850	1,016	95	359	0.093	0.42	2.37
Totals	1.92	17	170	850	1,016	95	359	0.093	0.42	2.37

In view of concern expressed by the Shanghai Airport Authority that the RejuvaSeal™ should not degrade the treated asphalt pavement with respect to its skid characteristics, Nitoflor Hardtop Aggregate (a topping mix), was applied to the surface immediately following the application of RejuvaSeal™. The application rate was approximately 0.2 kgs/sq metre (0.4 lbs/sq yard). This was applied to the most northerly panels treated (No. 8 thru No 17). Nitoflor is a product sold by Fosroc and was purchased in Hong Kong. Further information on this Nitoflor product is contained in the Fosroc information sheet for this product in Appendix C. The approximate size consist for Nitoflor Hardtop Aggregate is stated as follows: >98% passing #8 mesh (2.5 mm) and <5% passing #30 mesh (0.5mm).

Ambient temperatures at the time of the application were in the 5 to 7 degree Celsius range, with humidity in the 50% range. The application ceased at 1:25 pm and the runway remained closed until 4:00 am on November 22. Photos showing the test application of RejuvaSeal™ follow in figures 4.2, 4.3 and 4.4. on the following pages.

The site was visited on November 23 around 1:00 am and a difference was readily perceived between the RejuvaSeal™ treated section and the adjoining untreated asphalt. The Nitoflor Hardtop Aggregate remained on the surface of the runway and had cemented to the RejuvSeal™, however until more traffic has had the opportunity to travel over this section, retention of the product cannot be assessed. Little to no carryover of the RejuvaSeal™ was observed from the airplane tires. So it can be assumed that either the RejuvaSeal™ was dry by early morning or no aircraft tires or maintenance vehicles had passed over the panel. For now, the former is assumed.

Figure 4.2: Typical Preparation Procedure for RejuvaSeal TM

4.3	Application of Fosroc Nitoflor hardtop Aggregate to RejuvaSeal^{TM}.

Figure 4.3: Applying Coat of Nitoflor Aggregate to RejuvaSeal TM

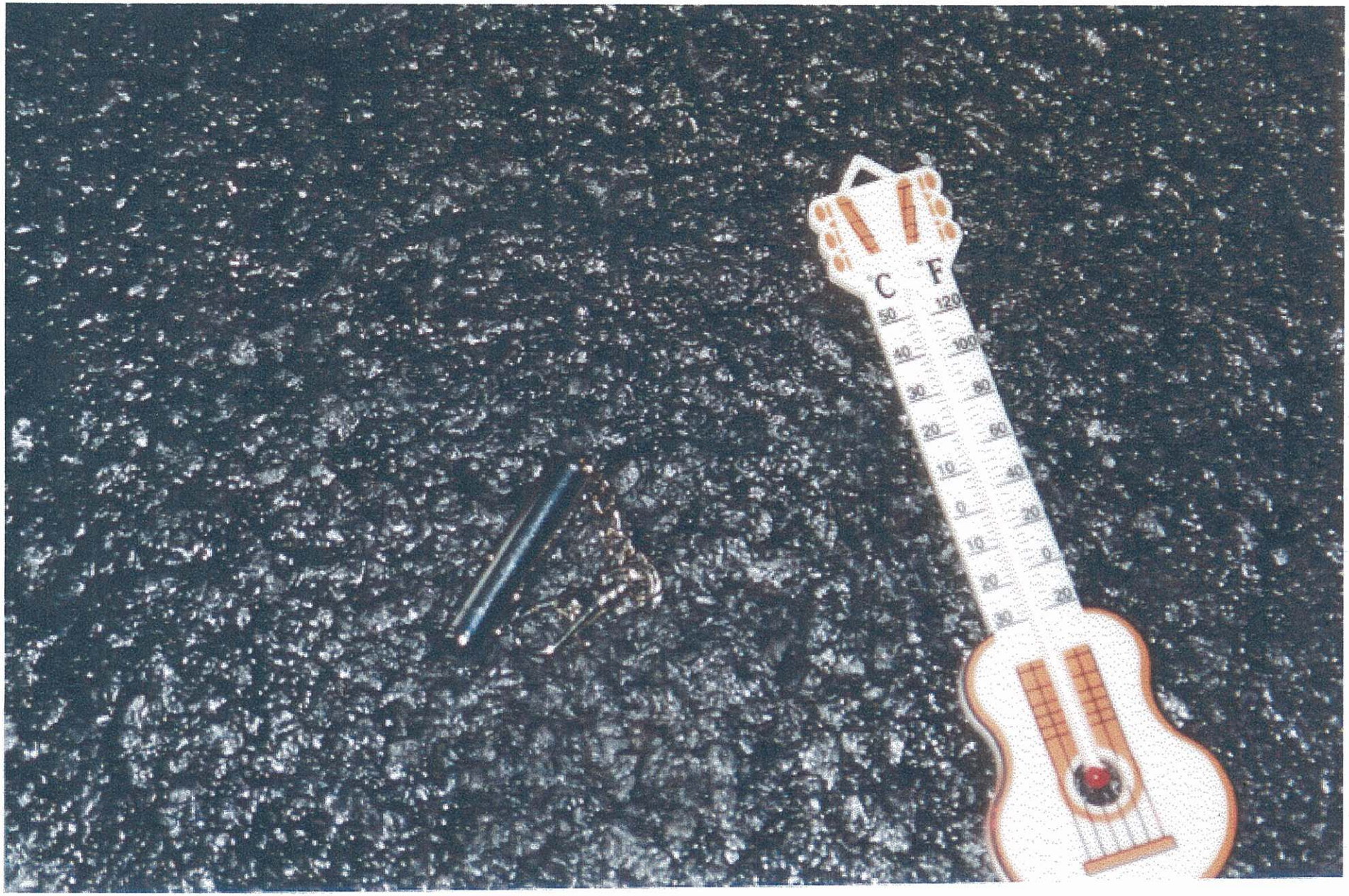


Figure 4.4: Finished RejuvaSeal ™ Surface

Figure 4.4 Finished RejuvaSeal™ Surface

4.1 RejuvaSeal™ Testing

To date the comparison of the asphalt treated with Rejuvaseal™ has been compared on a subjective basis over a very short period at the test site on HongQiao International Airport. 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
- Elasticity/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 RejuvaSeal™ 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.

Readings were taken with this aforesaid Outflow Meter at two locations immediately south of the demonstration portion of the runway. These readings were taken at 1:30 am on November 23. Further readings were taken on the treated surface, immediately north of the south boundary of the demonstration section and then again on Panel 14. The results are shown in the table that follows:

Table 4.5		**Outflow Meter Readings**			
Test	Vintage of Asphalt Surface	Location relative to center line of the runway	Location relative to center point of runway	Untreated asphalt surface (secs)	Asphalt after RejuvaSea[ITM] treatment (secs)
One	1998	14 metres west	30 m north	5	n/a
Two	1992	17 metres west	30 m north	6	n/a
Three	1998	14 metres west	32 m north	n/a	7
Four	1992	17 metres west	32 m north	n/a	12
Five	1998	14 metres west	170 m north	n/a	3
Six	1992	17 metres west	150 m north	n/a	3

- **These readings are quite acceptable from a skid resistance viewpoint, with the exception of Test No. Four.**

figure 4.5 Humble Equipment Company, "Outflow Meter"

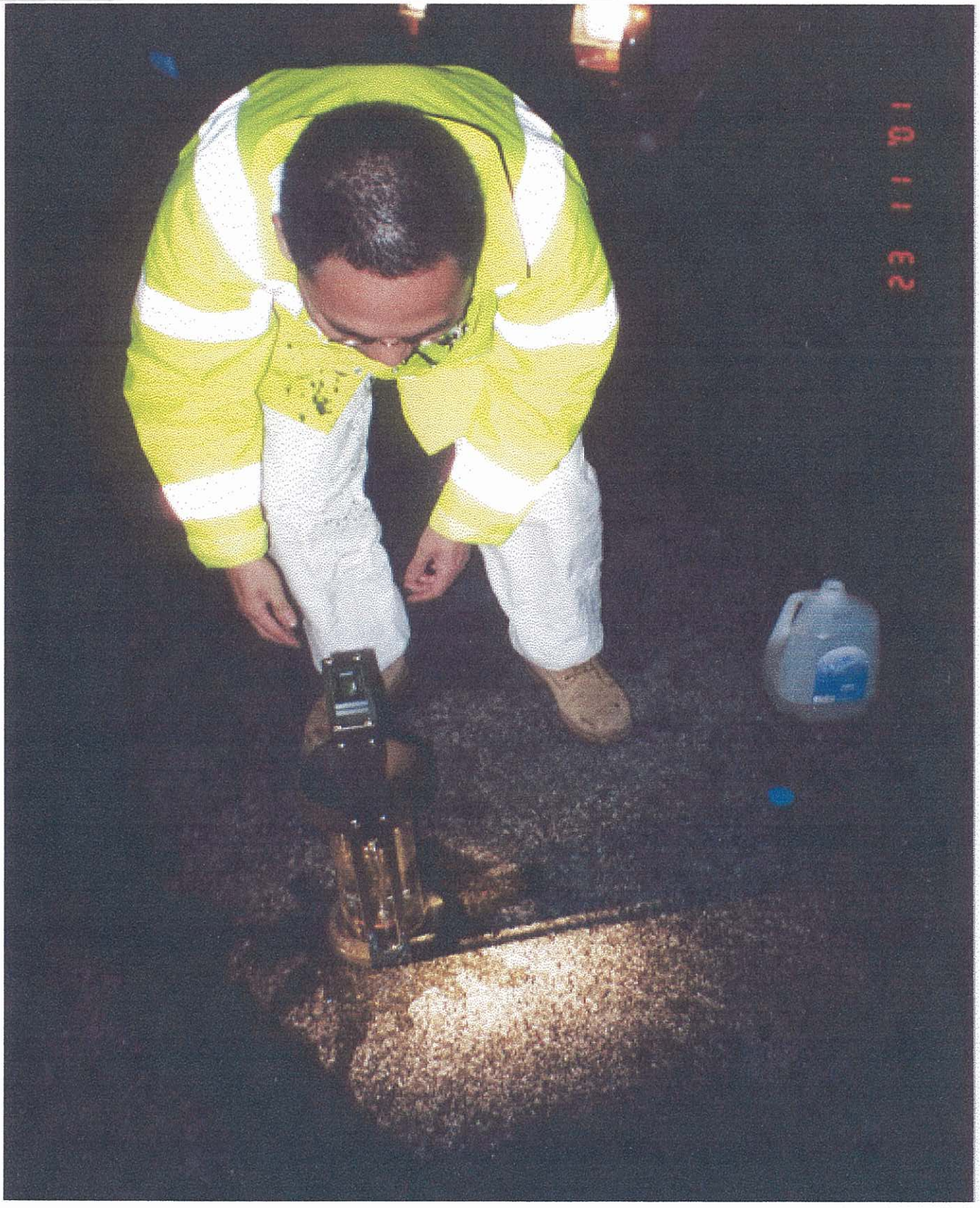


Figure 4.5: Humble Equipment Co."Outflow Meter".

4.3 Fuel Resistance Comparison

Fuel Resistance Comparison will be undertaken on several sections of the untreated and RejuvaSeal™ 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 Elasticity/Ductility Testing

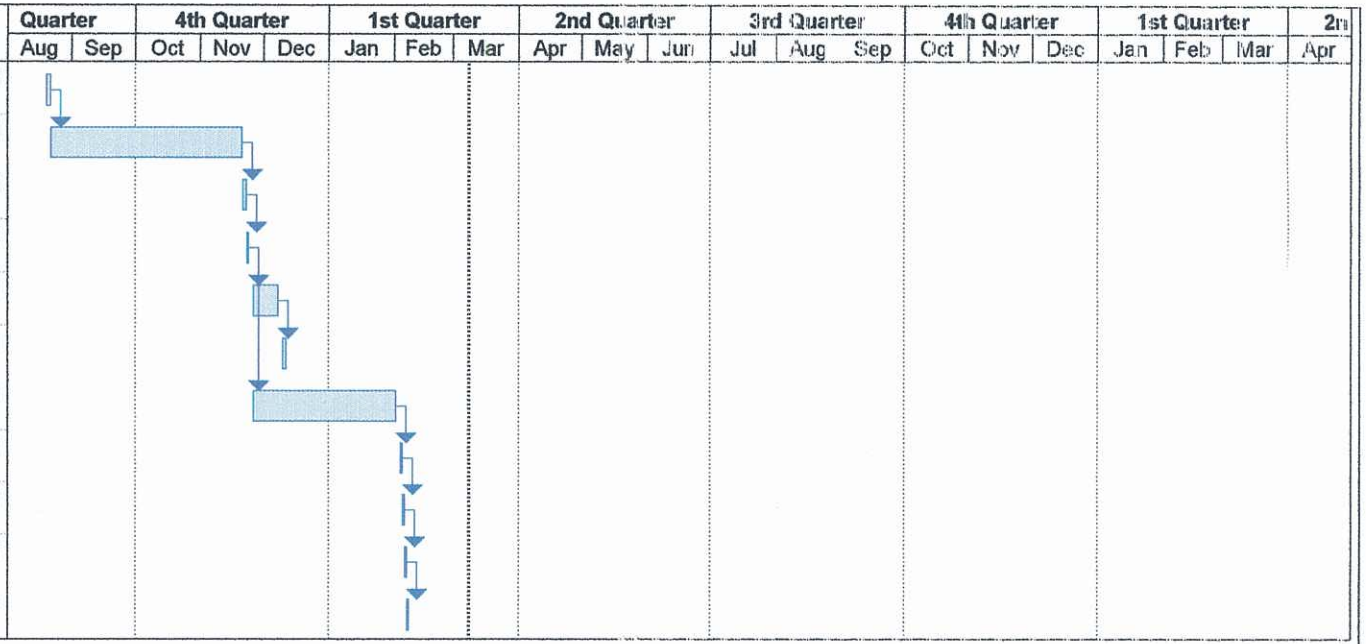
This aspect of the testing is beyond the capabilities of the field equipment available to both Crown Capital Enterprise Limited and RejuvaSeal™ personnel and as such, external assistance has been sought from outside experts in the field of Asphalt Testing. To this end, Dr John Emery in Toronto, Canada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

Figure 5.0 Project Completion Schedule

ID	Task Name	Duration
1	Seminar in Shanghai	2d
2	Hiatus	65d
3	Demonstration Section	2d
4	Inspection of Demo Section	1d
5	Prepare draft report	10d
6	Submit report	2d
7	Hiatus	50d
8	Inspection of Demo strip	1d
9	Skid test using Airport Authority Equipment	1d
10	Revise draft report	1d
11	Prepare and Submit final report	1d



Project: ChengDusched
Date: Mar 8

Task
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress

CROWN CAPITAL ENTERPRISE LIMITED

WANCHAI, HONG KONG

Demonstration of Rejuvaseal™ HongQiao Airport, Shanghai, Peoples Republic of China

November 2001

APPENDICES

No.	Description
A	Rejuvaseal™ – Technical Seminar, Shanghai, China, August 2001
B	Rejuvaseal™ Descriptive Literature
C	Nitoflor Hardtop Aggregate Specification sheet

TS² Consulting Inc.
Lamma, Hong Kong

CROWN CAPITAL ENTERPRISE LIMITED

WANCHAI, HONG KONG

Demonstration of Rejuvaseal™ HongQiao Airport, Shanghai, Peoples Republic of China

November 2001

Appendix A

Rejuvaseal™ – Technical Seminar, Shanghai, Peoples Republic of China, August 2001

TS² Consulting Inc.
Lamma, Hong Kong

CROWN CAPITAL ENTERPRISE LIMITED
中 怡 企 業 發 展 有 限 公 司

RejuvaSeal™ 沥再生

Asphalt Pavement Rejuvenator
沥青路面再生密封剂

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May 2001

沥再生 RejuvaSeal™

	页
Ⅰ. 概述	1
Ⅱ. 产品资料	
A. 新一代的沥青路面再生密封剂	2
B. 产品规范	3-5
C. 部份施用现场名单	6-7
Ⅲ. 技术数据事项	
A. 独立实验室之测试结果	8
B. 芯样测试步骤	9-10
Ⅳ. 应用须知	
A. 安全事项	11
B. 施工前测试之要求	12
Ⅴ. 质量保证	
Ⅵ. 美国联邦航空局之第 44 号工程法令	

附件 I. 一些使用沥再生的现场照片

附件 II. 沥再生 RejuvaSeal™ - 沥青再生密封剂时代来临 - 摘自 (2001 年国际机场科技)

附件 III. 加拿大国防部的执行测试概论 - 1999 年 9 月 24 日至 10 月 10 日之沥青路面之处理

中怡

中怡企业发展有限公司
Crown Capital Enterprise Limited

沥再生 – 技术交流会
RejuvaSeal ™ - Technical Seminar

中国上海
Shanghai, China

二零零一年八月二十日
20 August 2001

Registration and Reception

Introduction

Welcoming Speech

RejuvaSeal ™ – An Introduction

Road Demonstration Projects

Question and Answer Session

Buffet Lunch

中怡

中怡企业发展有限公司
Crown Capital Enterprise Limited

沥再生 – 技术交流会
RejuvaSeal ™ - Technical Seminar

中国上海
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WANCHAI, HONG KONG

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November 2001

Appendix B

Rejuvaseal™ Descriptive Literature

TS^2 Consulting Inc.
Lamma, Hong Kong

CROWN CAPITAL ENTERPRISE LIMITED

WANCHAI, HONG KONG

Demonstration of Rejuvaseal™ HongQiao Airport, Shanghai, Peoples Republic of China

November 2001

Appendix C

Nitoflor Hardtop Aggregate

Specification Sheet

TS² Consulting Inc.
Lamma, Hong Kong

Nitoflor Hardtop Aggregate

FOSROC

The right chemistry for construction

Monolithic surface hardening compound

Uses

Nitoflor Hardtop Aggregate provides a highly abrasion resistant surface to concrete floors by the dry shake method which ensures the hard wearing surface bonds monolithically to the base concrete. It is ideally suited for all industrial areas subject to heavy traffic, e.g. loading bays, trucking lanes, car parks, workshops, machine shops, ramps and spillways.

Advantages

- Provides hard, abrasion resistant floors
- Provides high impact resistance
- Forms a monolithic bond with base concrete
- Good non-slip properties
- Easy and economical to apply

Description

Nitoflor Hardtop Aggregate is a quality controlled hardwearing aggregate selected for its physical properties of abrasion and wear resistance as well as shape and grading.

Nitoflor Hardtop Aggregate dry mixed with Portland Cement cures monolithically to provide a dense floor surface.

Technical support

Fosroc offers comprehensive technical support, including help at the design stage, application advice and on the site problem solving. Specifiers and contractors are encouraged to contact our trained staff for answers to their questions.

Properties

Nitoflor Hardtop Aggregate has been tested to ASTM.D4060 - Taber Abrader and BS 6431 - Part 20 (Wet Abrasive Method), alongside concrete mortar control panels. The test results show that Nitoflor Hardtop Aggregate improves the abrasion resistance of plain concrete by over 200%.

Compressive Strength (BS.6319.Pt.1.) At water contents equivalent to those obtained in practical applications, the typical 28 day strength of Nitoflor Hardtop Aggregate cubes exceeds 60 Mpa.

Mohs Hardness	>6
Specific Gravity	3.1
Corrosive Elements	None
Sieve Analysis # 8 (2.5mm)	>98% passing
#30 (0.5mm)	< 5% passing

Specification clauses

All base slab concrete areas so designated shall be applied with monolithic hard wearing, abrasion resistant floor hardener tested to BS 6431-Part 20 (Wet Abrasive Method), such as Nitoflor Hardtop Aggregate manufactured by Fosroc Ltd.

Application instructions

Base Concrete

The base concrete should have a minimum cement content of 300kg/m³. The concrete mix should be designed to minimise segregation and bleeding. Free water:cement ratios of less than 0.55 are required. The concrete should have a slump of between 75 and 100mm.

The base concrete should be laid and compacted in accordance with good concrete practice. Accurate finished profile and minimum laitence build up should be ensured. Particular attention should be paid to bay edges and corners to ensure full compaction.

Vacuum dewatering is not recommended when w/c ratios of less than 0.55 have been used.

Mixing

The following proportions should be dry-mixed together:

100kg Nitoflor Hardtop Aggregate
50kg Cement

Care should be taken to ensure that the two components are thoroughly mixed together. Mechanical mixing is preferred.

Application

It is recommended that the floor be marked off into bays of known area. Sufficient material should then be laid out to meet the required spread rates.

Application of Hardtop Aggregate can begin when the base concrete has stiffened to the point when light foot traffic leaves an imprint of about 3mm. Any bleed water should have evaporated now.

Hardtop Aggregate mix is applied in two application stages.

(a) The first application is made using 1/2 to 2/3 of the material required for the eventual end use. Hardtop Aggregate mix is evenly broadcast onto the concrete surface. When the material becomes uniformly dark by the absorption of moisture from the concrete this first application can be floated. Wooden floats, or, on large areas a power float may be used. It is important, however, that the surface is not over-worked.

(b) Immediately after floating, the remaining Hardtop Aggregate mix is thrown evenly over the surface. Again moisture is absorbed and the surface can be floated in the same way as before.

Final finishing of the floor using the blades of a power float can be carried out when the floor has stiffened sufficiently so that damage will not be caused.

Limitations

1. **Timing of Application**
   Timing of the application of the Hardtop Aggregate mix is important. Too early and excess water will be absorbed and the resultant floor surface will be of lower strength and subject to dusting. Also the dense aggregate of Hardtop Aggregate mix could sink and be lost from the surface. Too late and insufficient moisture will be available to completely hydrate the Hardtop Aggregate mix. Crazing and pitting of the surface are likely to result.

2. **Bay Edges**
   Where bay edges are likely to suffer particularly heavy impact or wear these can be given additional protection. Immediately after the base concrete is levelled, sprinkle Hardtop Aggregate mix on a strip 100-150mm wide along the bay edges. Steel trowel into the surface.

   Areas where saw-cut transverse control joints are located can also be pretreated in this manner.

3. **Curing**
   Tests have shown that proper curing of concrete floors treated with products such as Hardtop Aggregate mix is essential to ensure the physical properties of the floor.

   The most efficient method of curing is to use Fosroc Concure curing membranes which conform to ASTM and DOT specifications. However, in indoor applications where curing conditions are less arduous and breakdown of the membrane slower, alternative approved methods of curing such as polythene sheeting are acceptable.

4. **Surface Treatments**
   Because of the high density, low porosity surface finish of floors treated with Hardtop Aggregate mix, subsequent surface finishes are not recommended.

Estimating

Pack sizes

Nitoflor Hardtop Aggregate	50 kg bags

Coverage

Dry-mixed Nitoflor Hardtop Aggregate is applied at different rates per m² to provide floor surfaces suitable for different types of industrial use.

Application rate (Mixed)	Intended traffic use
2.5 kg/m²	Light vehicular
3.5 kg/m²	Heavy vehicular & storage
5.0 kg/m²	Aisleways & industrial
7.5 kg/m²	Severe impact & abrasion

Storage

There is no minimum shelf life for Hardtop Aggregate. Bags should be stored in dry conditions.

Precautions

Health & safety

Portland cement is alkaline when in contact with water. Avoid prolonged contact with the skin. Any eye contamination should be washed immediately with plenty of clean water and medical advice sought.

For additional information please consult your local Fosroc office for a copy of the products health and safety datasheet.

Hardtop Aggregate is non-flammable.

Additional Information

Fosroc offers a comprehensive range of products for all types of specialist floor applications. This range provides solutions to satisfy the most critical conditions to ensure the safe working environment required from industrial and heavily trafficked floors.

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Important note