

Singapore Brand Conference 2012  
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# Building a Brand by Making Customers' Lives Easier



**Dr Wu Dong Qing, MD & CEO**  
**Chemilink Technologies Group, Singapore**



**Singapore**

**Brand**

**Conference**

**29<sup>th</sup> March 2012**

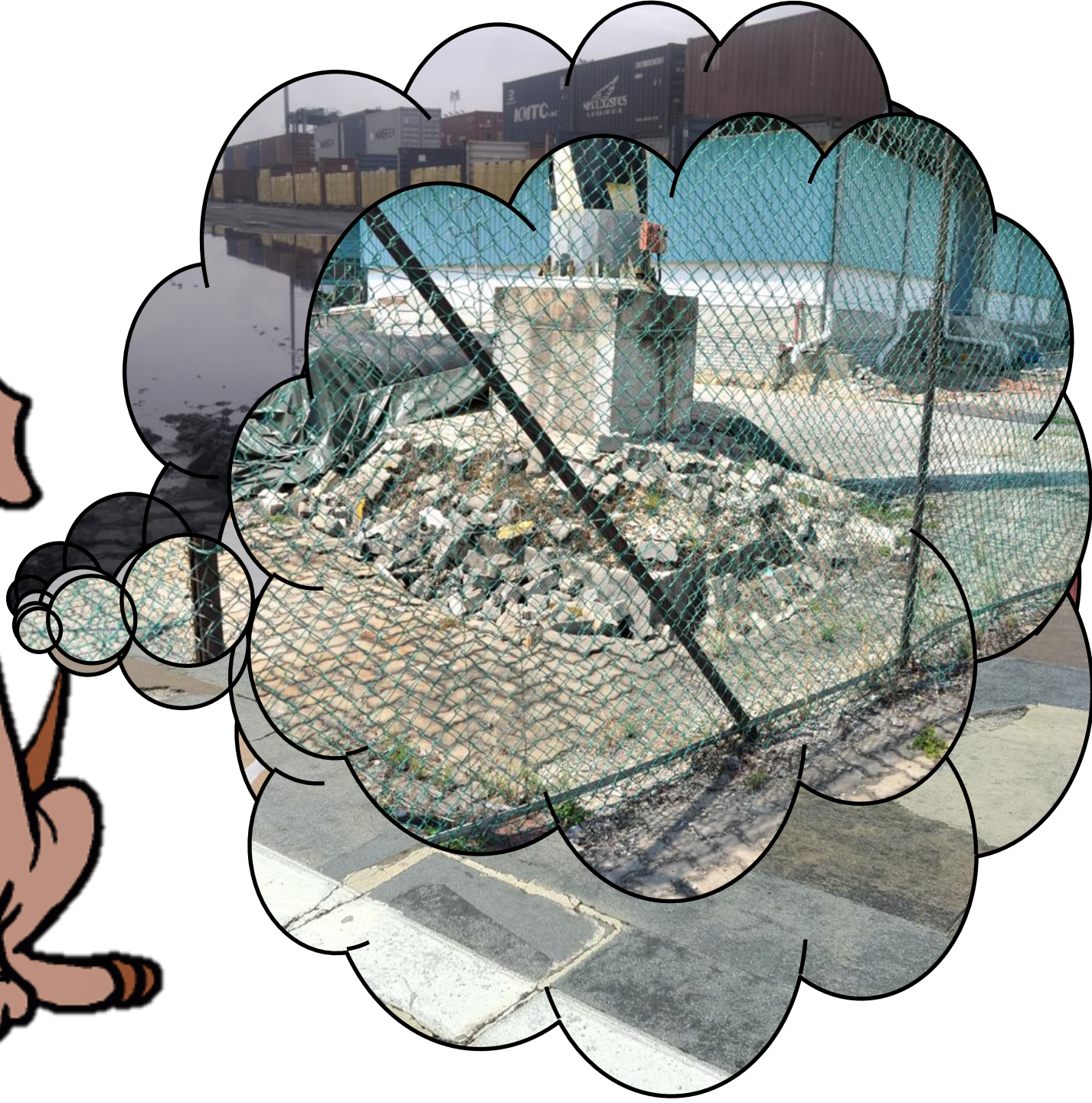
**Once upon  
a time....**

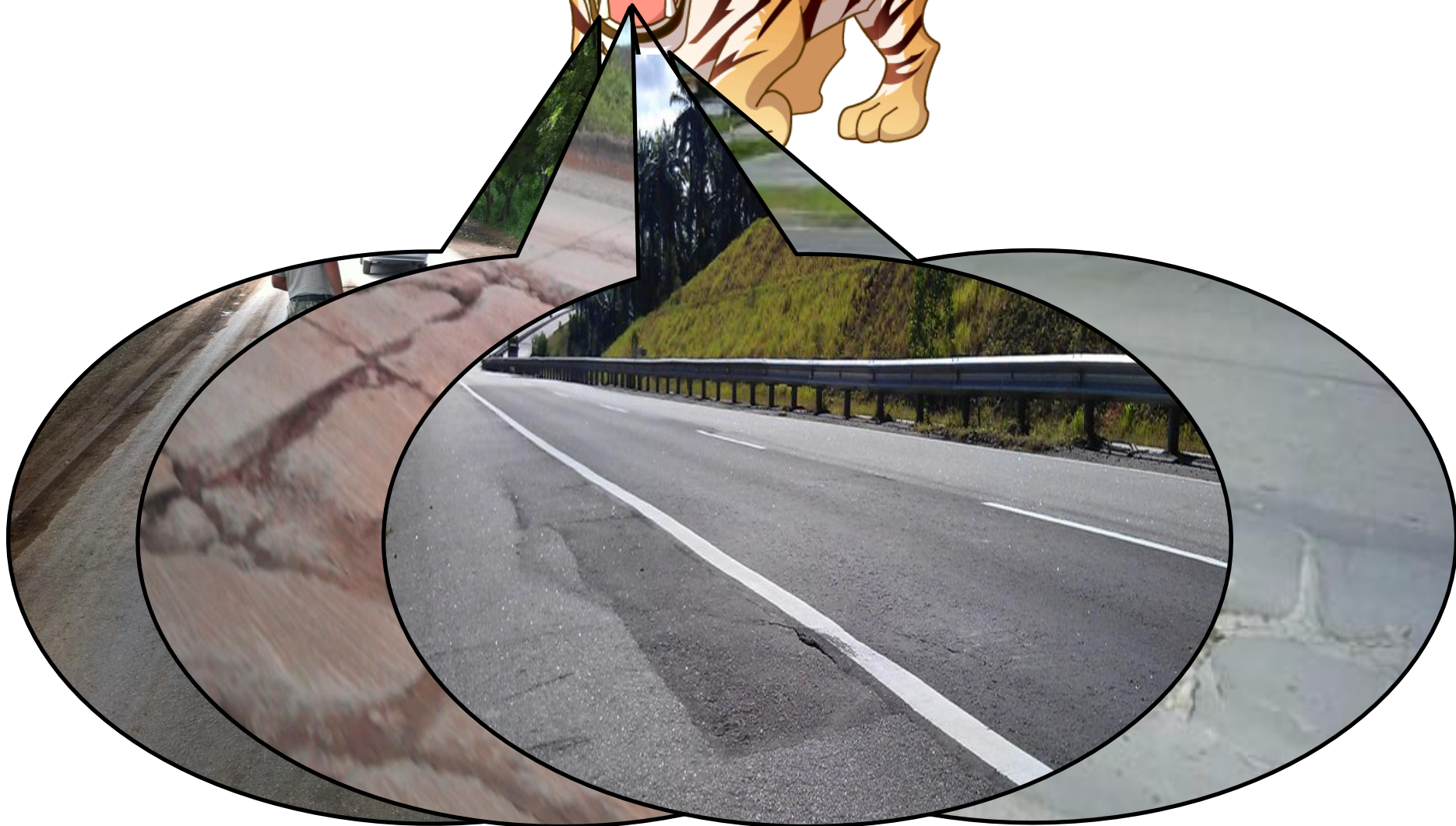


**Infrastructure  
Development  
Department always  
receives a lot of  
complaints about  
the damaged road.**









**Please  
Do not  
make  
our  
life  
miserable  
with bad  
pavements**





**Which**



**Who**



**How**



**Why**



**Where**



- HOME
- ABOUT US
- OUR PRODUCTS
- OUR SERVICES
- OUR PROJECTS
- RESEARCH & DEVELOPMENT
- CAREERS
- CONTACT



ZERO WASTE ENGINEERING

# Search engine

Chemilink's Global... Building Construction... Building Construction... Research & Development...

The Chemilink SS-100 Series  
Chemilink SS-200 series are  
Chemilink's commitment

SEARCHING.....n?

English version

materials... Read More

systematic... Read More

government-granted R&D... Read More

### Our Network

Since 1994, we have stepped out from Singapore and bring our products and technologies to the International market. We have done projects from...

Read More

### Business Opportunities

At Chemilink, we are constantly searching for potential partners to expand our reach in the Infrastructure and building construction industry.

Engine



**Dr. Wu Dong Qing**  
**Managing Director/CEO of**  
**Chemilink Technologies Group**

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Chemilink Stabilization/Rehabilitation/Recycling & Green Solutions

Advantages and Benefits

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- 3) Highways and Roads

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## 1. Introduction

### 1.1 Chemilink Technologies Group

- Chemilink Technologies Group Pte Ltd is a Singapore local SME.
- We are the supplier and specialist in green and effective engineering solutions & materials incorporated with R&D and manufacture activities.
- Our systematic technologies, products and application methodologies are trademarked under the “**CHEMILINK**” series.
- Chemilink premier, unique and innovative solutions have been proven by many iconic engineering projects for past about 20 years in international market, especially in South East Asia.

## 1.2 Corporate Position

### **Philosophy**

Towards a zero solid waste society

### **Vision**

The leading standard in Zero Waste Engineering.

### **Mission**

To construct environmentally friendly and sustainable infrastructure by investing in zero waste businesses, creating zero waste processes, employing and developing people with zero waste mindsets.

### **Value Proposition**

Fast construction of cost effective, eco-friendly and durable infrastructure through very innovative and sustainable engineering solutions.

### **Corporate Values**

Innovation & Passion, Process & Quality Driven Integrity & Honesty.

## **1. Introduction**

### **1.3 Chemilink Product Series and Professional Services**

#### **Product Series**

- 1) Chemilink **SS-100 Series** for Civil/Road/Pavement Construction
- 2) Chemilink **SS-200 Series** for Building Construction
- 3) Chemilink **SS-300 Series** for Solid Waste Management

#### **Professional Services**

- 1) Green and effective materials & products
- 2) Sustainable R&D / Project R&D with Customization and Localization.
- 3) Consultancy services including Pavement Design, Material Design and Construction Design.
- 4) Project Management

# 1. Introduction

## 1.4 Chemilink R&D Centre

- Research facility



### R&D Activities:

- Government funded research projects
- Engineering project R&D works
- Chemilink product upgrading and development



## **2. Chemilink Stabilization/Rehabilitation/Recycling and Green Solutions**

### **2.1 Difficulties of Pavement Construction in Tropical Region:**

- Swampy & soft ground, and lower land.
- Reverse climate conditions like rich rainfall and high water table.
- Poor geotechnical properties of in-situ soils, such as peaty and problematic soils.
- Lack of suitable construction sites and quarry materials.

### **Conventional Methods**

- Engaging a large quantity of quarry materials.
- Lower technical performances and durability.
- \* Eco & environmental issues and higher CO<sub>2</sub> emission.

## **2. Chemilink Stabilization/Rehabilitation/Recycling and Green Solutions**

- Soil stabilization: “To mix proper chemical or bio-chemical admixtures (or called Stabilizing Agent) with soils or solid construction wastes so as to significantly improve and increase the geotechnical properties of the stabilized materials in shallow base foundations”.
- Conventional stabilizing agents, such as cement, lime, fly-ashes and bituminous materials, have various limitations in tropical region in aspects of:
  - \* Technical performances
  - \* Application workability
  - \* Environmental pollutions
- A commonly used stabilizing agent --- Chemilink SS-108 sub-series products in South East Asia for past about 20 years
- Chemilink systematic green solutions for pavements
  - \* Designs; incorporated with project R&D
  - \* Materials
  - \* Application methodologies

## **2. Chemilink Stabilization/Rehabilitation/Recycling and Green Solutions**

### ***Total Green Concept ---***

**Green Product:** A substantial percentage of its raw materials include recycled waste materials such as agricultural bio-mass and mining wastes.

**Green Process:** The application of the stabilizing agents is green because the process reuses in-situ soils and/or waste materials, and thus minimizes the demand on fresh quarry materials and also reduces the removal of the soil as a waste. Besides quality performances with faster construction speed and longer durability, disturbance to natural environment and public is lesser.

**Green Result:** The stabilized soil is physically and chemically stable under the specified usage and therefore creates no environmental issues, which has been proven for past years too.

## **2. Chemilink Stabilization/Rehabilitation/Recycling and Green Solutions**

### ***Typical Achievable Results ---***

- CBR (California Bearing Ratio, %) : 30 ~ 200 or more (7-day)
- UCS (Unconfined Compressive Strength, MPa) : 0.75 ~ 6.00 (7-day)
- MR (Resilient Modulus, MPa) : 1,000 ~ 10,000 (7- to 28-day)

### ***Installation Process ---***

#### 1) In-situ mix



a) Spreading



b) In-situ Mixing



c) Compaction

### **Photo. 1. Typical In-Situ Mixing Process of Soil Stabilization**

(Photos source: Singapore Changi Airport Runway Widening)

#### 2) Plant Mix

## 2. Chemilink Stabilization/Rehabilitation/Recycling and Green Solutions

*Premier and Unique Engineering Models, such as ---*

- **“Floating” Semi-Rigid Platform** over swampy and soft ground.  
*(15-year highways/roads in swampy areas without major repairing)*
- **Anti-Cracking Performance** for high-grade flexible pavements.  
*(Examples: airport runways and taxiways with stabilized base & sub-base courses)*
- **Excellent Workability** for quick build and repair airport infrastructures under heavy operational limitations.  
*(Iconic project: Singapore Changi International Airport runways widening, featured by Discovery Channel in “Man Made Marvels” program and broadcasted since 2008)*



### **3. Advantages and Benefits**

**Higher Technical Performances** to form the semi-rigid platform

**Longer Pavement Lifespan** as proven by numerous projects for past 20 years

**Green Approach** in recycling/rehabilitation with lower CO2 emission

**Faster Construction** to complete projects even under various limitations

**Overall Cost Effectiveness** for both direct cost and long-term maintenance cost

## 4. Case Studies

### 4.1 Airfields – Singapore Changi International Airport Runways Widening (2005)

**Background:** 1<sup>st</sup> airport widening for A380; airport on reclaimed land with various filling materials; 4 working hours per night (day); total 16km by 4.5m; completion in 60 working days; no defects reported in past 6 years.

**Key Technical Merits:** Super fast and super strong; pioneer trial; to prove workability and performances of the systematic solution under extremely heavy operational conditions.

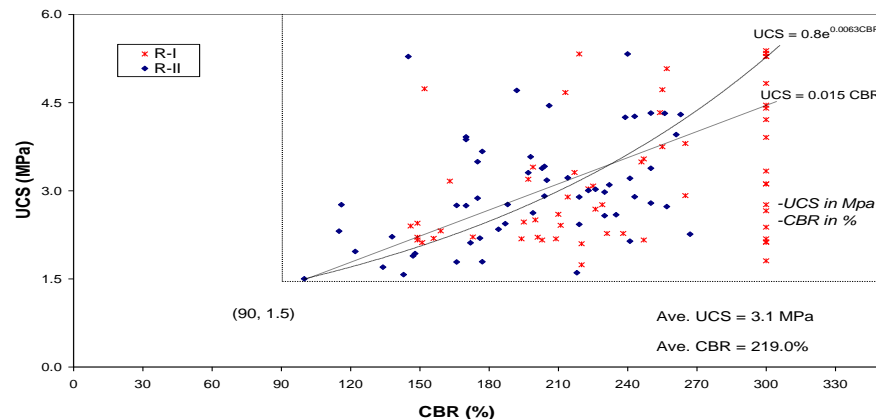


Fig. 1. UCS and CBR Results in Singapore Airport Runways Widening Project

## 4. Case Studies

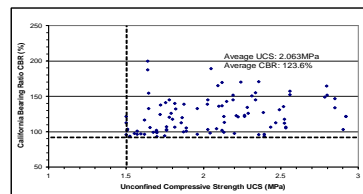
### 4.1 Airfields – Malaysia Senai International Airport Runway & Taxiway Widening (2007 & 2008)

**Background:** airport on lower land and soft ground; 4 working hours per night/day; total 8km by 7.5m; no defects including cracking reported in past years.

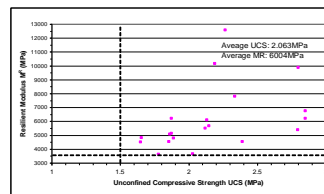
**Key Technical Merits:** technical challenges on poorer soil conditions.

NO	LOCATION	DEPTH (mm)	INSITU MC (%)	OMC (%)	MDD (Mg/m <sup>3</sup> )	LL (%)	PI (%)	CLAY & SILT (%)	SAND (%)	GRAVEL (%)
		150~450 mm	depth at 350mm							
6	P6	350	23.59	15.00	1.74	73	36	54.80	32.40	12.80
7	P7	350	30.08	22.00	1.49	88	37	78.80	19.20	2.00
8	P8	350	41.63	18.00	1.54	76	31	70.40	2.60	27.00
11	P11	350	27.38	19.00	1.68	62	33	66.80	33.20	0.00
12	P12	350	38.74	19.00	1.55	79	46	82.70	17.20	0.10
13	P13	350	21.37	17.00	1.71	56	23	62.20	30.60	7.20

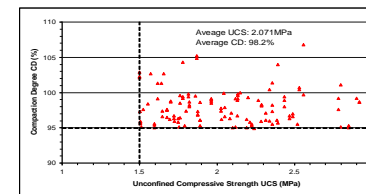
Table. 1. Typical Soil Investigation for Senai Airport Widening



a)UCS & CBR



b)UCS & MR



c)USC & CD

Fig. 2. Testing Results in Senai Airport Widening Projects



## **4. Case Studies**

### **4.2 Seaport Facilities – Indonesia Batam Shipyard (1997)**

**Background:** stabilized sub-base below reinforced concrete as the surface

**Key Technical Merits:** average construction rate - 8,000m<sup>2</sup>/day.



a) Manually Spreading



b) In-Situ Mixing and Compaction

**Photo. 4. Soil Stabilization in Progress in Shipyard**

## 4. Case Studies

### 4.2 Seaport Facilities – Malaysia Port Klang Container Yard Upgrading (2010)

**Background**: the biggest port in Malaysia; serious settlements; operational capacity far below the designed.

**Key Technical Merits**: to form semi-rigid platform by in-situ rehabilitation to eliminate differential settlement and minimize the total settlement rate.



a) Before Upgrading



b) Before and after  
Stabilization



c) Upgraded Yard  
Operations

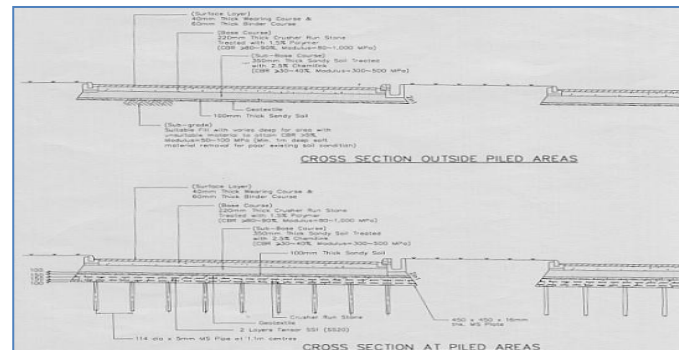
**Photo. 5. Upgrading of Port Klang Container Yard**

## 4. Case Studies

### 4.3 Highways & Roads – Brunei Jalan Tutong, Phase III (1997-1999)

**Background**: typical swampy area with peaty soils down to 30-50m deep; lower land next to a big rival; the original design with 100% pilling.

**Key Technical Merits**: to prove “Floating” Semi-Rigid Platform in both technical performances and durability; to eliminate differential settlement between non-settlement and free-settlement zones; no major repairing be done for past 12 years.



**Fig. 3. Typical Cross Sections at Free- and Non-Settlement Zones**

## 4. Case Studies

### 4.3 Highways & Roads – Brunei Jalan Tutong, Phase III (1997-1999)

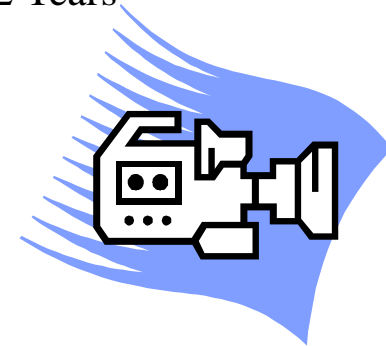


a) Opened Cross Section after 2 Years



b) Road after 12 Years

**Photo.6. Jalan Tutong, Phase III**



## 4. Case Studies

### 4.3 Highways & Roads – City Road Maintenance (2000)

**Key Technical Merits:** to complete road repairing by in-situ rehabilitation from middle night and to the next early morning to minimize the impacts to users.



a) Road Partially Closed during Night for Maintenance



b) Road Opened for Use in Next Morning

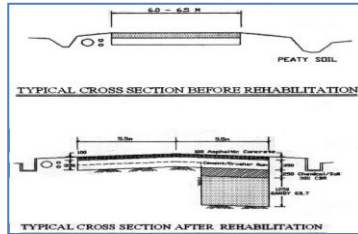


c) Cored Samples with Recycled In-Situ Materials

**Photo. 7. City Road Quick Maintenance**

## 4. Case Studies

### 4.3 Highways & Roads – Roads over Swampy and Soft Ground (1994 - 2011)



a) Typical Road Cross Section



b) Road after Years

**Photo. 8. Widening of Junjungang Road**



**Photo. 10. A Stabilized Road at Low-Lying Area (2004)**



a) Oil Field Road in Use



b) Sub-Grade Conditions

**Photo.11. A Stabilized Oil Road Access Under Heavier Loads (2002)**

## **5. Chemilink Branding Journey**

In order to penetrate into international market and with the funding from SPRING Singapore, Chemilink has engaged StrategiCom to implement branding exercise to communicate Chemilink Brand to the stakeholders and how Chemilink can help them to solve their civil engineering problems. Hence, to make their life easier.

The branding exercise consist of:

### 1) Brand Identity

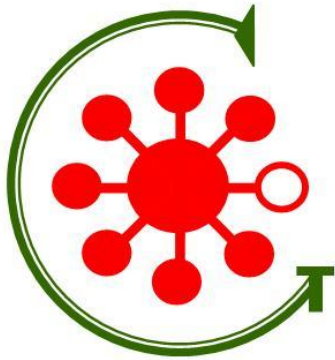
- Corporate Position
- Differentiation and Positioning Strategy
- Brand Concept
- Brand Communication

### 2) Visual Identity

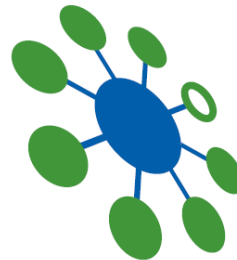
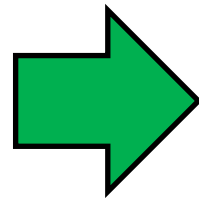
- Logo
- Website

## Chemilink Logo

The new logo is showing firm, Strong-edged and anchored, the capital font is symbolic of Chemilink's leadership in the industry that is rooted in cutting-edge research and development methods. It illustrate the formal, enterprising and technological nature of Chemilink's business.



**Before**



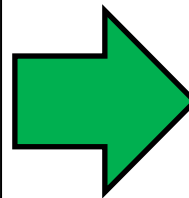
**CHEMILINK**  
ZERO WASTE ENGINEERING

**After**



# Website

The new website consists of sophisticated images and product information for visitors to read and download.



Before

After 25

## **Chemilink's Quest for Banding**

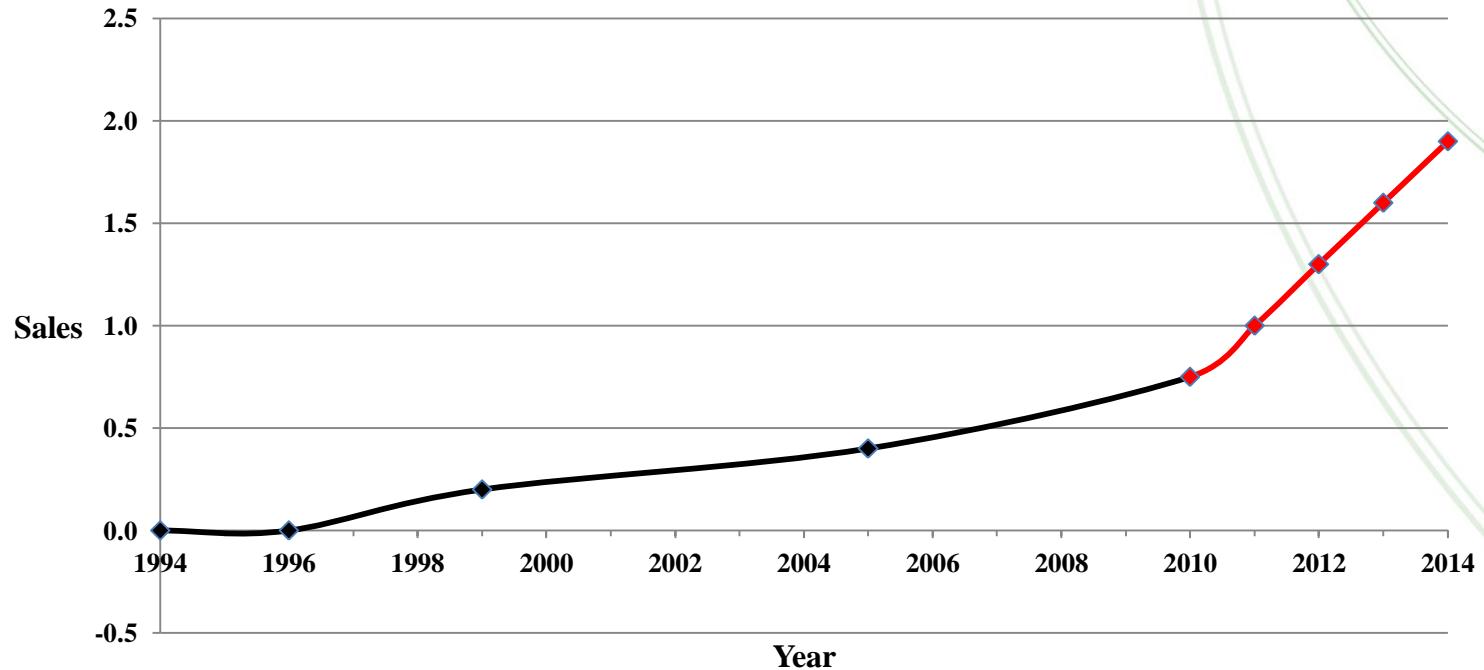
- ❖ Communicate to both internal & external audiences;
- ❖ Create awareness & recognition of Chemilink's brand;
- ❖ A unique identity that is sustainable;
- ❖ A green technology company;
- ❖ A company with strong & various R&D capability.

## **Benefits derived from the Branding Exercise**

- ❖ Clear corporate identity which is easily understood & remembered by staff as well as our clients;
- ❖ A clear set of business objectives, strategies and direction emerged along with the exercise;
- ❖ A strong corporate image which projects Green technology message;
- ❖ Better illustration of the company's other technology capability.

With the Chemilink brand successfully implemented, Chemilink's turnover and market value has increased.

### Bussiness Growth



# BUSINESS GROWTH

## Testimonials from customers

We are proud to present our customers' testimonial on products and services.

from Singapore Changi Airport



from Malaysia Senai Airport



## **6. Conclusions**

- 1) Chemilink soil stabilization is a green and effective approach for pavement construction in tropical region so as to make the users' lives much easier.
- 2) The stabilization with green product, green process and green result can maximize the usage of in-situ or local soils and some construction wastes so as to obviously minimize the impacts to natural environment and significantly reduce the CO<sub>2</sub> emission.
- 3) Based the comprehensive case studies, the systematic solution of soil stabilization introduced in the paper has been proven for past 20 years to deliver higher technical parameters and performances with fast construction and thus to provide longer pavement lifespan and overall cost effectiveness.
- 4) The branding has strengthened Chemilink premier, innovative and leading well-proven systems internally and externally, and thus has provided customers more comprehensive and reliable engineering solutions to settle their difficulties.

(and furthermore ...)

## Essences of Innovative Solutions

*--- Premier, Unique & Innovative Solutions to Address Civil Engineering's Challenges ---*

- *“Floating” Semi-Rigid Platform*
- *Anti-Cracking Performance*
- *Excellent Workability*
- *Semi-Rigid Pavement*
- *Reduce, Reuse & Recycle (3R)*

**After gone through  
many sessions of  
thorough consideration,  
Chemilink Stabilization  
Technologies is adopted  
to rehabilitate the  
roads/airport/seaport  
pavements.**





**ROAD  
WORK  
AHEAD**



**After**  
**Chemilink**  
**Applications**







**Since then,  
Any complaint from  
Public regarding  
pavement issue, the  
answer as below.**

**Don't Ask Me,  
Ask **CHEMILINK!****

**The power  
of**

**Chemilink  
Technologies**



**Thank You for Your Attention!**

Acknowledged

Lim Cheng Hui / Nancy Lim  
/ Kenny Lim / Jessy Zeng