

# **NEW LOW CARBON ROAD PAVEMENT CONSTRUCTION TECHNOLOGY**

**PRESENTATION BY:**

**NEW MIRAE CONSTRUCTION CO., LTD.**

# 1. Characteristics of the Road

<p><b>Cause: Turtle back cracking phenomenon caused by soft ground</b></p>	<p><b>Cause: Excavation phenomenon caused by poor drainage</b></p>	<p><b>Cause: Poor construction of the surface layer and base layer</b></p>	<p><b>Cause: Clay cannot be used in road construction due to its ability to absorb water</b></p>
			
<p><b>Countermeasures: Identify the cause of soft ground and reinforce the base layer</b></p>	<p><b>Countermeasures: Establishment of drainage measures</b></p>	<p><b>Countermeasures: Selection of substrata materials with strong water resistance</b></p>	<p><b>Countermeasures: Continuous maintenance with sandy soil or mixed stone mixed with a lot of sand or aggregates, or adopt NEW LOW CARBONROAD Construction Method</b></p>

## 2. The Need for Road Structural Changes

- ▶ **Road Paving Technology in Africa is Patterned on Western Climates**  
**These Countries have Cold Winters that requires Layers of Road Bed to Prevent Frostbite**
- ▶ **Africa has a Warm Climate all Year Round with Torrential Rains that Requires the Use of Materials with Strong Resistance to Water**  
**This Encourages the Hardening of In-situ Materials for Suitability to the Resistance of Water**

## 2-1. Comparison of road structures

Conventional construction method	New construction method
Surface layer(Heated Ascon 5cm)	
	Surface layer(Non heated ascon (0.7cm~1.4cm When needed))
Base layer(20mm or less,mixed stone 15cm)	Soil cement 15cm,Compressive strength More than 150kgf/cm <sup>2</sup>
Sub base layer (40mm or less,mixed stone 20cm)	Road bed filled up ground (Common condition)
Road bed filled up ground (Common condition)	

### 3. Improved Soil Cement Construction Method.

- ▶ Objective is to Obtain a Homogenous Mix by the Use of a Mixing Plant



# 4. Korea's Development

4-1. In half century – from one of the world's poorest countries (enduring colonization, fratricidal wars, and division)



## 4-2. The world's top 10 economic powers



4-3. agriculture, heavy chemical industry, shipbuilding, automobile industry, aviation and defense industry.

agriculture



Heavy chemical industry





## 5. Survival strategies

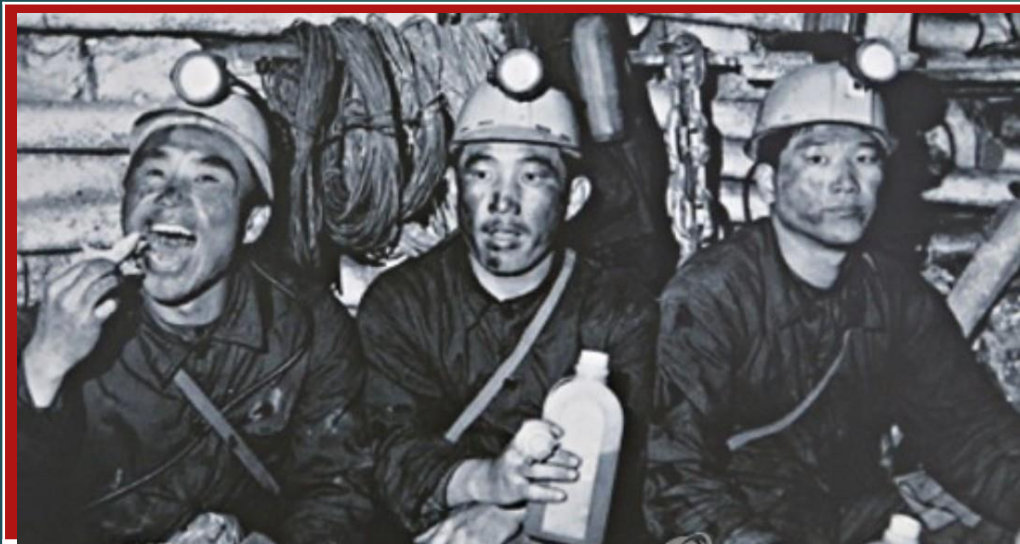
### 5-1. Annual Four-Seasonal Weather which poses Transitional Challenges

More than 18,000 dams have been built to secure water for agriculture, farmland has been cleared for mechanized agriculture, and rice varieties have been developed to achieve food self-sufficiency.



## 5-2. Lack of Natural Mineral Resources

With a small country, a large population, and a lack of underground resources, the only way to survive was to foster industry through exports and technological development. As a result, they participated in the World Skills Olympic Games and achieved excellent results, and many young people learned skills and earned money in mines and hospitals in developed countries such as Germany.



## 6. Balanced economic development

As Korea has done, a nation needs to invest in the following to provide for its people and for the overall achievement of economic growth

- Education is fundamental to any industry.
- Food self-sufficiency is a matter of survival. Now, in the face of many natural disasters due to global warming, grain production has plummeted. Many countries control grain exports.
- Infrastructure construction is the starting point of any industry. In particular, it is said that electricity is the rice of industry, and without electricity, factories cannot operate.
- A lot of roads and port facilities need to be built.
- The manufacturing of many small and medium-sized enterprises provides jobs for many people.

## 7. Technical Support Plan

- ▶ Plans to recruit locals. All construction sites carried out by the head office are designed to employ locals. We provide technical training.
- ▶ Recycling technology of construction waste using soil.
- ▶ Technology for the use of renewable energy to supply electricity to rural areas such as mountainous and remote areas. (Patent pending)
- ▶ Construction of an additive manufacturing plant to utilize soil.
- ▶ The ready-mixed concrete currently in use is produced by individuals on site, so the quality cannot be guaranteed. Public buildings that are used by many people can use products certified by the government. We are planning to establish a factory so that ready-mixed concrete and secondary products can be produced and supplied in certified factories.

## 8. Road Paving Technology Using Soil

- ▶ We breathe and drink water every day, but we forget the importance of air and water I step on the soil every day, but I don't think it's a valuable resource.

There is also a shortage of sand in Korea, so it is imported from overseas

- ▶ If you make good use of the characteristics of soil, you can replace sand or aggregate.
- ▶ In Korea, we have developed a technology that utilizes soil when there is no Infrastructure such as petrochemicals. I think this technology is the most Suitable technology in the era of global warming.

## 8-1. Road paving technology using soil



## 8-2. Road pavement technology using soil and cold asphalt (micro - surfacing)



## 8-3. Cement-concrete block replacement technology using soil



## 8-4. Various application technologies using soil





## 8-5. Use of inorganic additives.

- ▶ Our inorganic additives are a mixture of alkaline metals and alkaline earth metals, which can reduce the amount of cement by improving the function of cement in soil containing organic matter, and it does not pollute the surrounding soil even if cement is used, and it can **have a very good effect when used in cold or rainy areas.**



## 9. Asphalt paving technology.

Korea has a developed petrochemical industry, and road paving technology using by-products is very advanced. However, this technology should be gradually reduced as it is contrary to carbon neutrality. At the moment, in Liberia, it is necessary to go in the direction of a gradual reduction.



# 10. Shared Growth Plan

**What is needed for the development of this country now is technology.**

The process of growth and development is the same for individuals and nations. I hope that many young people from Liberia will go to Korea to earn money and study. South Korea has a severe shortage of labor. Currently, there are 2.5 million foreigners residing in Korea. South Korea was the poorest country in the world just half a century ago. Today, however, it is a country that is evenly developed in all areas.

**we would like to share with you many of the skills we have learned in the process of changing from the poorest country to a developed country in the shortest time.**

- ▶ 10-1. All Construction Sectors
- ▶ 10-2. Agriculture-related fields
- ▶ 10-3. Garbage disposal
- ▶ 10-4. Global Environmental Protection
- ▶ 10-5. All other fields necessary for national development

**New Mirae Construction Co., Ltd.**

**END OF POWER POINT**

**PRESENTATION**

**THANK YOU!!!!**

**New Mirae Construction Co., Ltd.**

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