

SPEC COMPANY LIMITED

4-5-5 Shimotakaido Suginami Tokyo JAPAN Zip code: 168-0073

Website: <http://spec-env.jp> Facebook: @speccompanylimited



OUR VISION

MAKE A FUTURE ROADS WITH STEIN

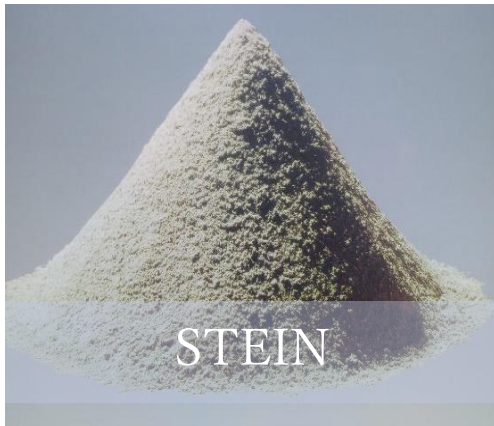
OUR MISSION

Using STEIN, a soil hardening agent developed in Japan in 1975, we aim to further utilize the technology that has been used in the construction of unpaved roads and waterways in Japan for infrastructure development overseas. By hardening the soil at the site and making it hard enough to build roads and waterways, construction can be done in a short period of time and at a low cost.

Improve the quality of life by developing roads and improve the access to markets, schools, and hospitals difficult, and roads that can cause health hazards due to dust in the dry season. Furthermore, we will realize access to the water necessary for daily life and agriculture for all people by developing ponds that can store water and waterways that can spread water from water sources over a wide area.

OUR PRODUCT

The soil hardening agent STEIN was originally developed in 1975 as a product to prevent the elution of heavy metals. The developer used a hardening technology to prevent substances such as hexavalent chromium and lead, which are harmful to the human body from the factory into the soil and water. From the beginning, it was used for construction of domestic roads, agricultural roads, and waterways. Soil also contains various substances, each of which has a positive or negative electric potential like a magnet, so STEIN attracts these substances like a magnet. Many of the STEIN roads constructed in Japan have been further surfaced to provide a stronger road. The STEIN Road is the first step in developing such a future stable road.



WAY OF CONSTRUCTION



Soil inspection

- Investigation of soil particle size, water content, density, liquid plasticity limit, etc.
- Determine the optimal STEIN mixing ratio according to the target strength



Mixing STEIN and soil

- Stir after determining the mixing ratio (10-20% STEIN mixing is common)
- Mixing using machine such as excavator and tractor



Compaction

- After mixing, flatten surface with motor grader
- Compaction with vibration or tire roller



Continue watering and curing at least 3 days

ADVANTAGES OF STEIN

The major advantages of the STEIN method are its low cost and strength. In terms of cost, if asphalt pavement is 100, STEIN can pave a road at a cost of about 40 to 60.

1. STEIN makes it possible to create structures such as roads and waterways using the soil of the site as aggregate. Therefore, there is no need to carry out the excavated soil or put in other aggregates, so there is no need to worry about soil disposal.
2. A tractor for agitating the soil and STEIN, a heavy machine such as a stabilizer, and a roller for compaction are sufficient for construction, and no special machine is required.
3. The mixing ratio of STEIN and soil varies depending on the soil quality, but in general the necessary STEIN is 10-15%, and most of the structures are made by hardening the soil.
4. The construction thickness is 15~30cm and vehicles can pass through, so there is no need to divide the layer into surface layer, foundation, and roadbed.
5. It is not necessary to impose large-scale regulations for a long period of time because roads can be opened for general vehicles 24 hours after the completion of mixing, compaction, and watering.
6. The target strength is set at 30 kg /cm² or more, and it takes about two weeks after construction to finally reach the strength of 60 kg/cm². The load on the tires of the car is 7kg/cm² regardless of the weight of the cargo, so it is strong enough for vehicles to pass through.
7. Annual maintenance is not required, and running costs are low because ruts, deformation, cracks, and erosion caused by heat are less likely to occur. The service life is generally 10 years, and in Japan it has a track record of 45 years.

OUR PROJECTS

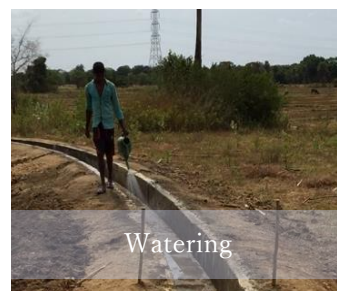
<JICA project in Cambodia>

Installed a machine to mix STEIN elements and cement in Cambodia. Great expectations were placed on construction using the soil itself instead of building materials such as gravel and crushed stone. Enforcement on roads and irrigation facilities using STEIN made in Cambodia.



<Water construction project in Sri Lanka>

We outsourced manufacturing to a local cement company, exported only the STEIN element from Japan, manufactured it locally, and implemented construction with the participation of residents. For the vertical channel, a formwork was used, and a mixture of STEIN and soil was poured into the gap, waited for it to harden sufficiently, and then the formwork was removed. In the trapezoidal canal, a mixture of STEIN and soil was spread on the slope, and the slope was compacted by manually hitting the slope with a board. Convenience of construction was highly evaluated even when compared with concrete. No erosion or cracks after the rainy season were observed.



<Water pond construction in Kenya>

In Kenya, rural areas lack running water and need to store rainfall, but paved dams and waterways are scarce. Therefore, STEIN, which is easier than concrete pavement and more durable than waterproof sheets, was used to construct a pond to hold domestic and agricultural water. The site in the photo was commissioned by an individual who owns large-scale farmland and was used as a reservoir for fish farming.



Pond for fish nursery



Use red raddish soil

<Community road pavement in Refugee settlement in Kenya>

We did 500m road pavement between the community center and public space managed by UN-Habitat in Kalobeyei Refugee Settlement, where refugees live together with the Turkana tribe, a host community adjacent to Kakuma Refugee Camp, which accepts refugees from South Sudan, the Democratic Republic of the Congo, etc. About 40 workers were recruited from refugees and host communities. The site is covered with volcanic ash soil, and when it rains, it is washed and traffic is cut off. By using the soil for construction, the road became passable even in the rainy season.



Excavate soil



Mixer



Compaction



Watering



After pavement