



An Overview

SOIL STABILIZATION

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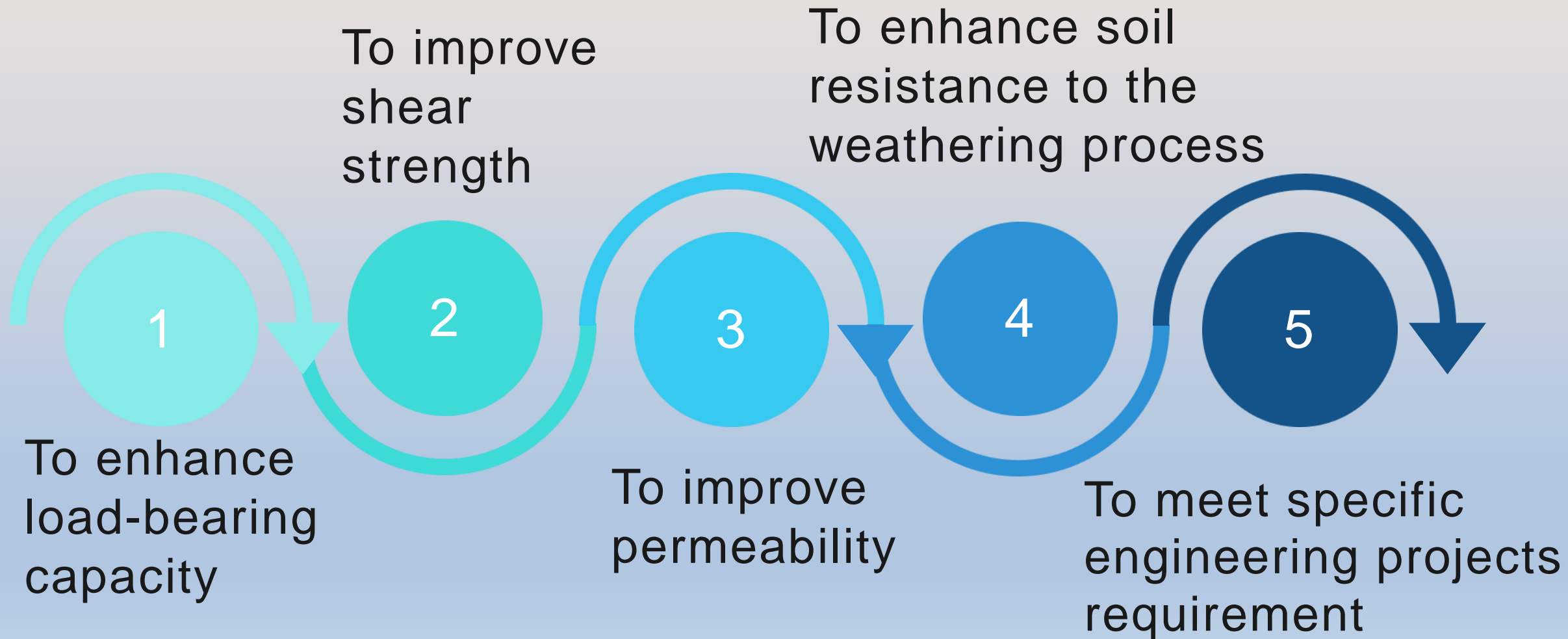
MAKMAL PENYELIDIKAN
GEOTEKNIK (MPG)

Soil Stabilization

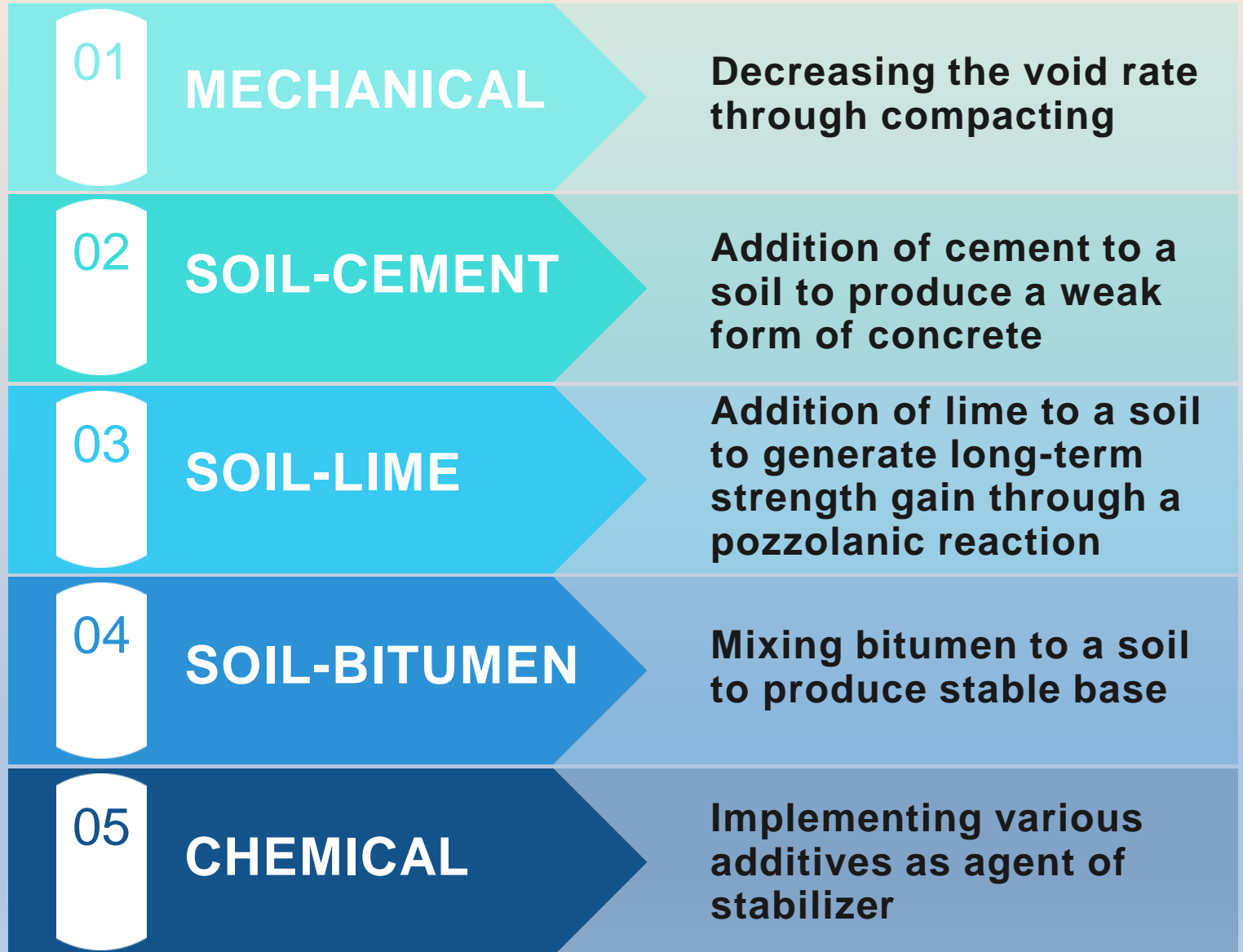
A process of mixing other substances/materials with original soft ground/ expansive soil in attempt to improve the geotechnical properties for particular construction.



Soil Stabilization Purposes



Soil Stabilization Methods



Categories of Soil Stabilizer



1

**Non-
cementitious
additives**

Stone dust, quarry dust, aggregate waste, rock waste powder, crusher dust, granite saw dust, sand

2

**Supplementary
cementitious
additives**

Lime, fly ash, ground-granulated blast furnace (GGBS), cement kiln dust, lime kiln dust, silica fume.

3

**Chemical
additives**

CaCl_2 , KCL, Na_2SiO_3 , FeCl_3 , $\text{Mg}(\text{OH})_2$, $\text{Na}(\text{OH})$, NaCL, MgCl_2 , Al_2Cl_3

Source: Reddy & Tahasildar, 2015



Silica fume

Industrial
waste



Fly ash



Incinerator
waste

Soil Stabilizer from Solid Waste



Cement dust



Quarry dust

Mineral
waste



Marble dust

Domestic
waste

Agricultural
waste



Rice Husk Ash

Significance of using solid wastes



26 juta tan sisa pepejal terkawal yang dijana setiap tahun

Sumber: Pelan Tindakan Komprehensif Pengurusan Sisa Pepejal 2015 – 2020 (Cetakan tahun 2014)

Operationalising the Twelfth Malaysia Plan, 2021-2025

12MP

Environmental Sustainability

Conservation and preservation

- Climate change mitigation and adaptation
- Disaster risk management
- Disaster risk insurance scheme



- Green technology
- Management of green and blue economy
- Biodiversity conservation
- Sustainable forest management
- Sustainable Consumption & Production
- Energy efficiency
- Renewable energy
- Integrated water resource management
- Marine litter
- Waste as commodity
- Circular economy – reducing waste and creating value from waste
- Valuing ecosystem services
- Carbon Tax

Conclusion

1. Soil Stabilization can improve the performance of existing soil.
2. Soil stabilization provides a solution to soft ground/expansive soil.
3. The most commonly soil-cement, soil-lime and soil-bitumen stabilization have been used in JKR's Project. By soil stabilization, the cost of the project also can be reduced.

Way forward

1. Currently, CREaTE is doing research on the effectiveness of Nano Polymer as soil stabilizer
2. Solid waste as soil stabilizer :
 - ☒ Alternative method.
 - ☒ Reduce the quantity of solid waste in Malaysia
 - ☒ Eco-friendly and Sustainable