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Soil Types, Excavation & Compaction

2 types of excavation


Non cohesive soil Cohesive soil



Compaction of soil using hydraulic tamper good for cohesive soils



Compaction of soil using a vibrating plate compactor good for non cohesive soils



2

Foundation types

Blocks and donuts



Imported fill GAP40
3% cement



Expanding
polyurethane



Concrete



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Question

- How is the soil moving as a result of pole overturning
- How can I insure soil compaction was correctly installed
- What can I do to improve foundation strength

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Hypothesis

Trees don't use breast blocks or donuts

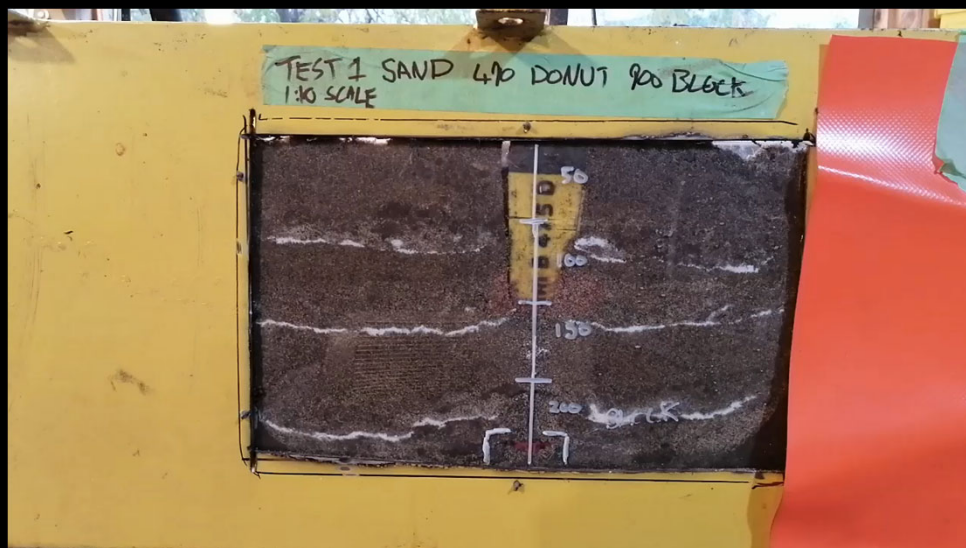


Donuts could be more use on top
"sort of"

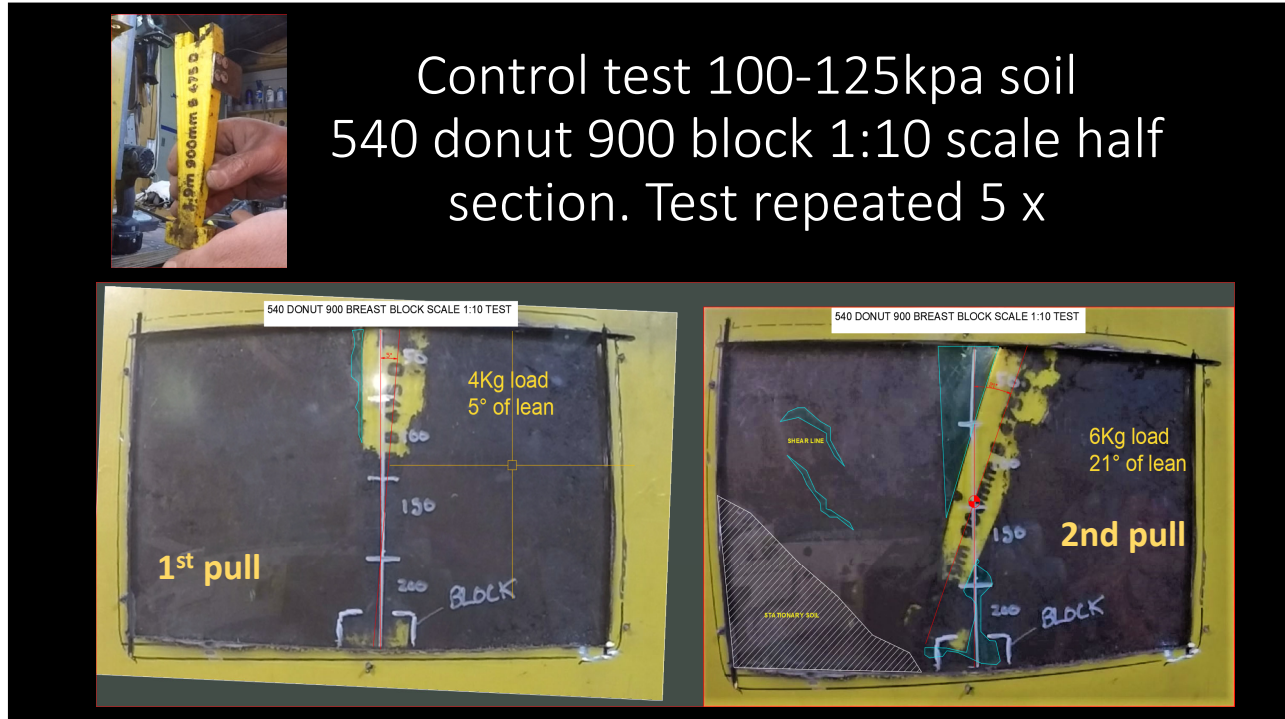


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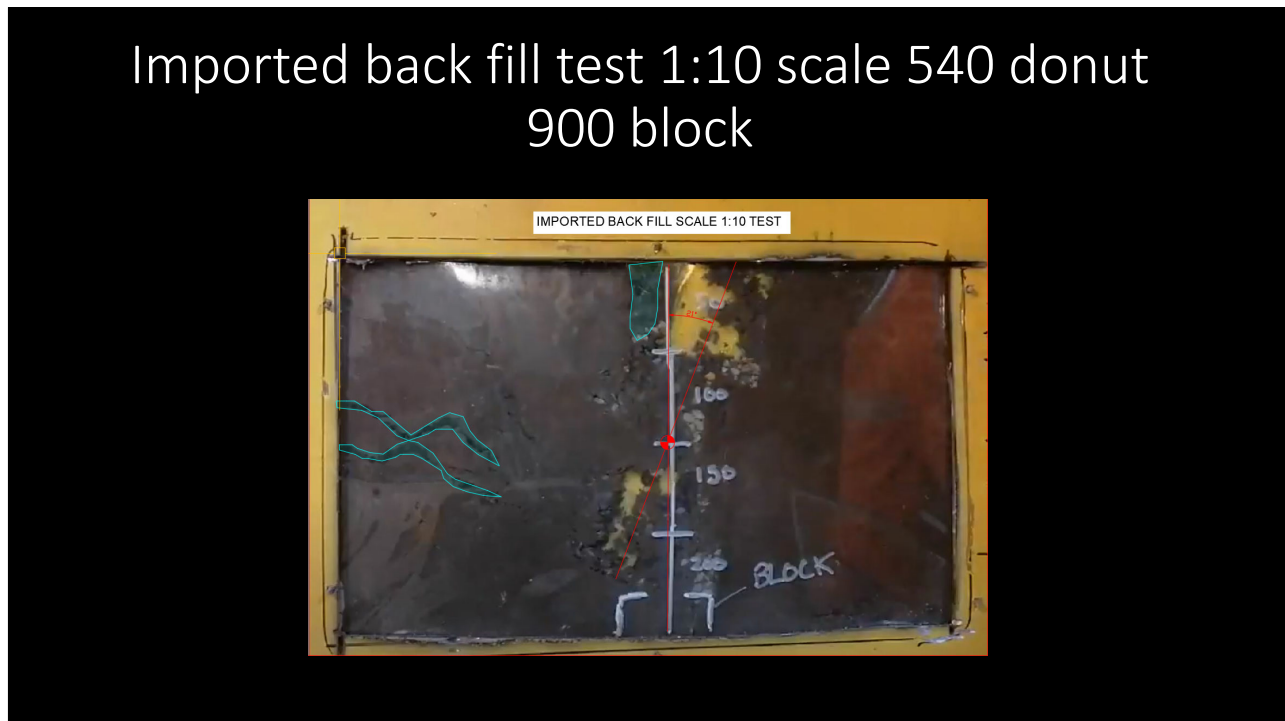
Test



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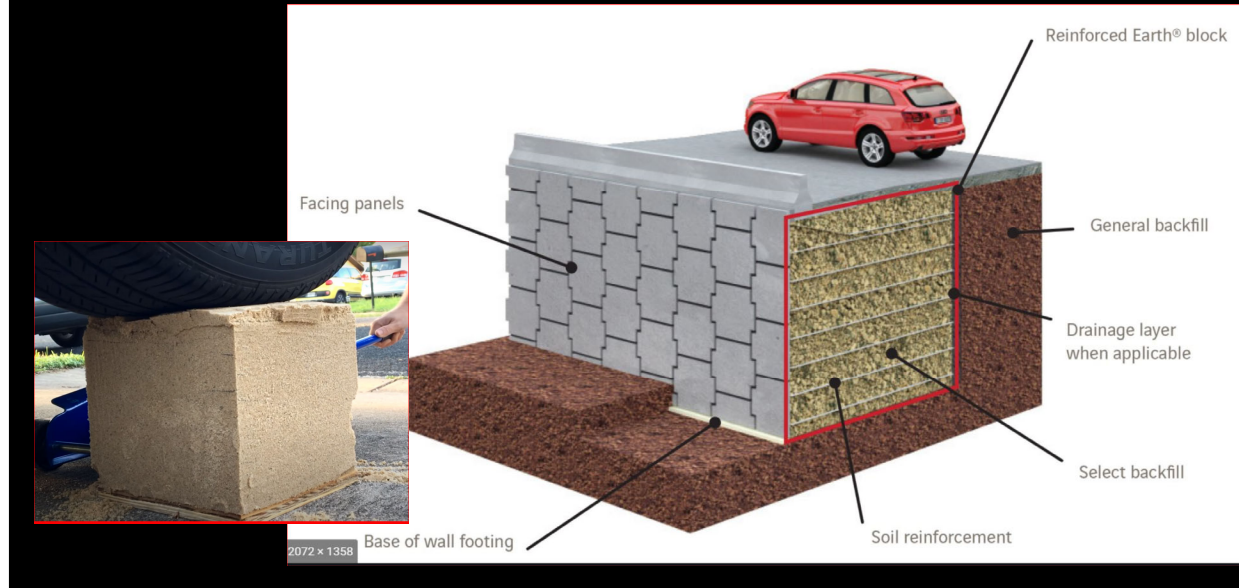


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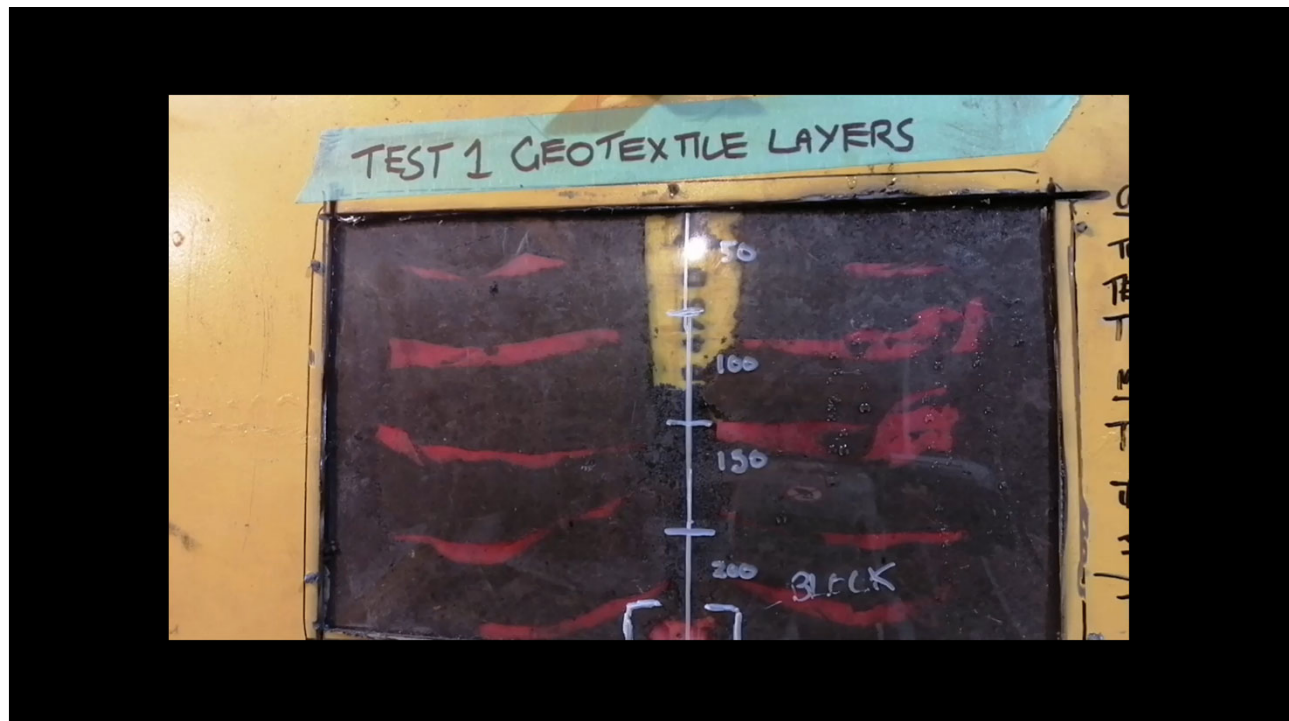


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Geotextile & mechanical reinforced earth

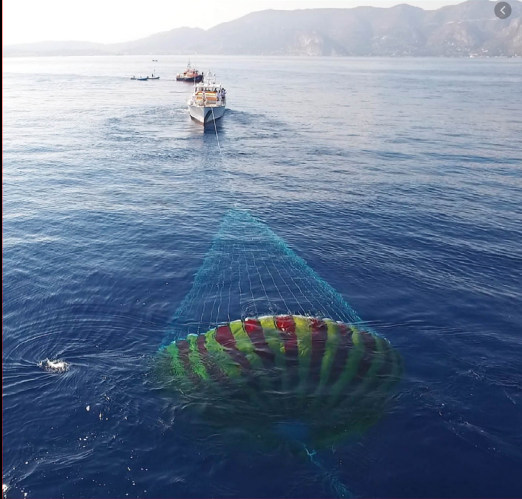


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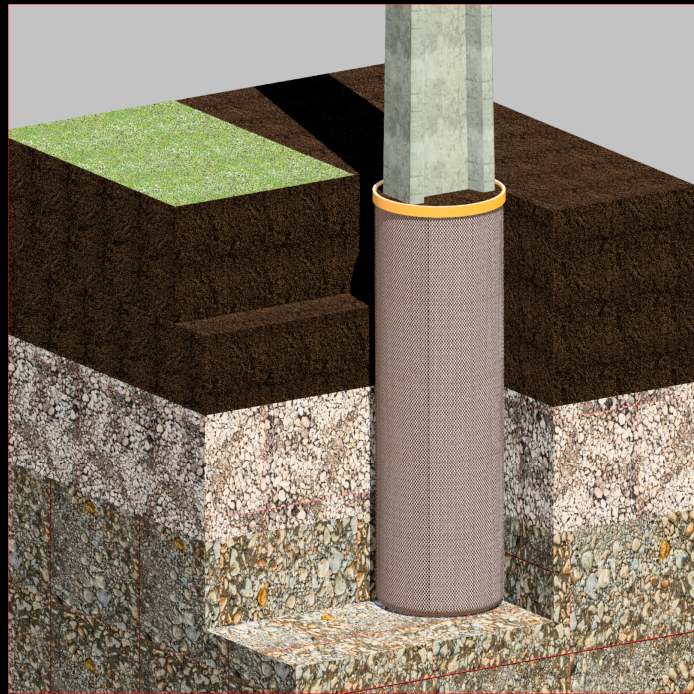
Prototyping



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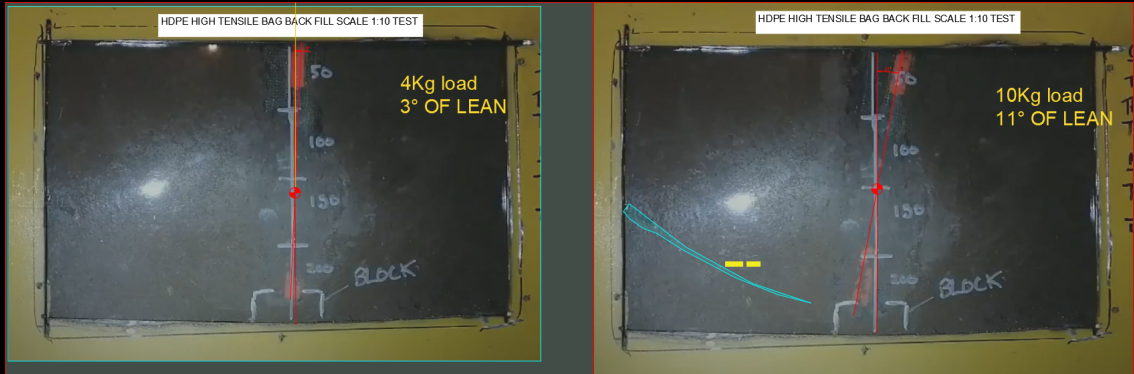
Dirt Bag Design

Compacted natural soil into high tensile
HDPE geotechnical fabric
Soil is held by tension.



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Dirt bag test 1: 10 scale 600mm diameter 2 x stronger than control



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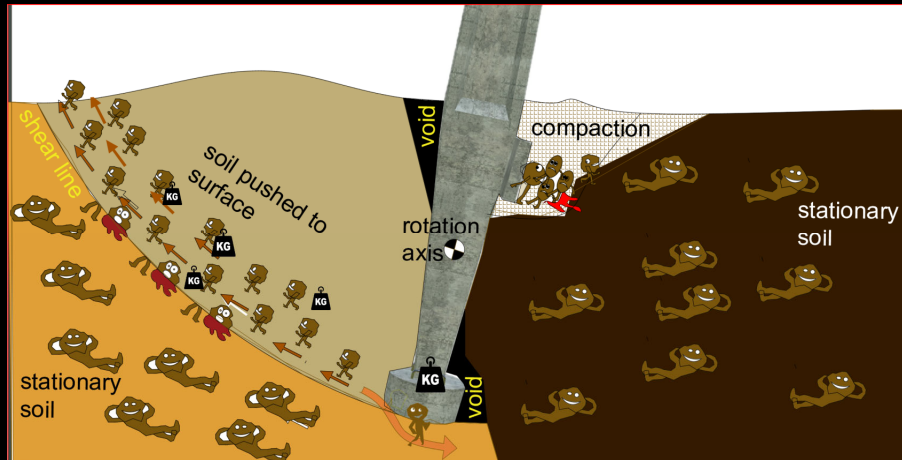
Time To Scale Up



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Conclusion

Controlling the shearing of soil is the best design



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Mechanical soil reinforcement

- Is 1.7 to 2 x stronger than the control method in all soil types tested
- Controls the shear lines in soil
- The weight is 2% of the control method
- Made from recycled HDPE
- Controls contraction and expansion of soil due to moisture change
- Will never rot or rust

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Donuts on top.....sort of
2000kg mass compaction
method removed after 3 to
6 months

