Part 5

SOIL FIBER REINFORCEMENT

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- **The most difficult raveling problems usually occur on cuts in *weathered rock*, like those depicted here.**

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- **Soil Fiber Reinforcement**
- Fiberglass threads, termed "roving", can be used to reinforce cohesionless soils, like this cylinder of sand
- The volume of fiberglass fibers is between 0.10 and 0.20% of the weight of the soil mixture by weight

- The sand and fiber mixture can be sprayed onto a problem slope like shotcrete, creating a free-draining gravity retention structure. The roving is typically applied at a nominal rate of 20 m/sec.

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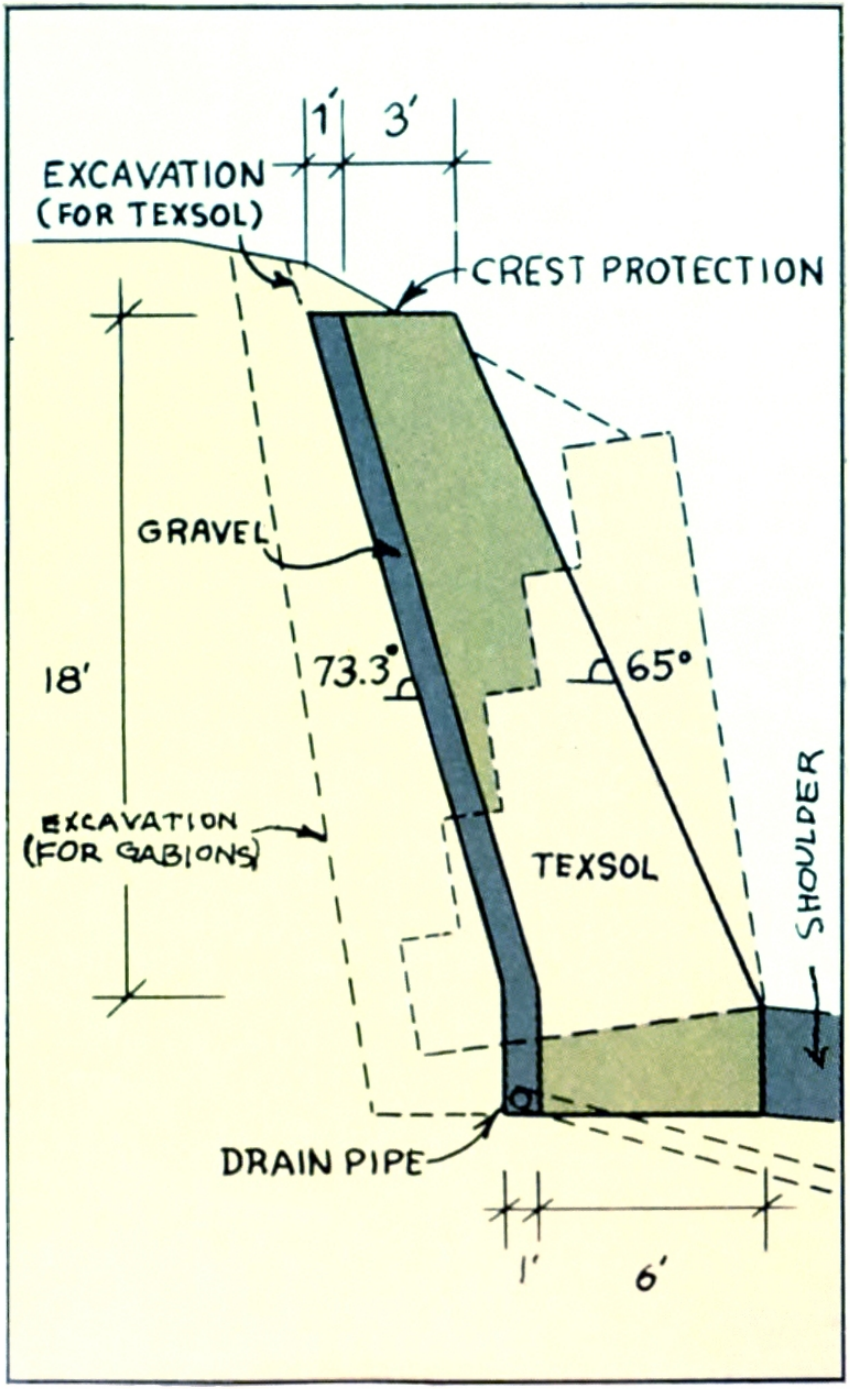

- Typical section through a Texsol **soil fiber reinforced** retention structure.
- Note blanket drain at back of structure
- Designed as a gravity retaining wall
- Embedded roving increases soil cohesion between 100 and 300 KN/m^2

- **Texsol fiber reinforced soil retaining wall shortly after construction, along existing mountain highway in Europe.**

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- Fiber reinforced soil wall after grass cover has germinated. The fiberglass roving is an effective tackifier, promoting seed adhesion and root penetration

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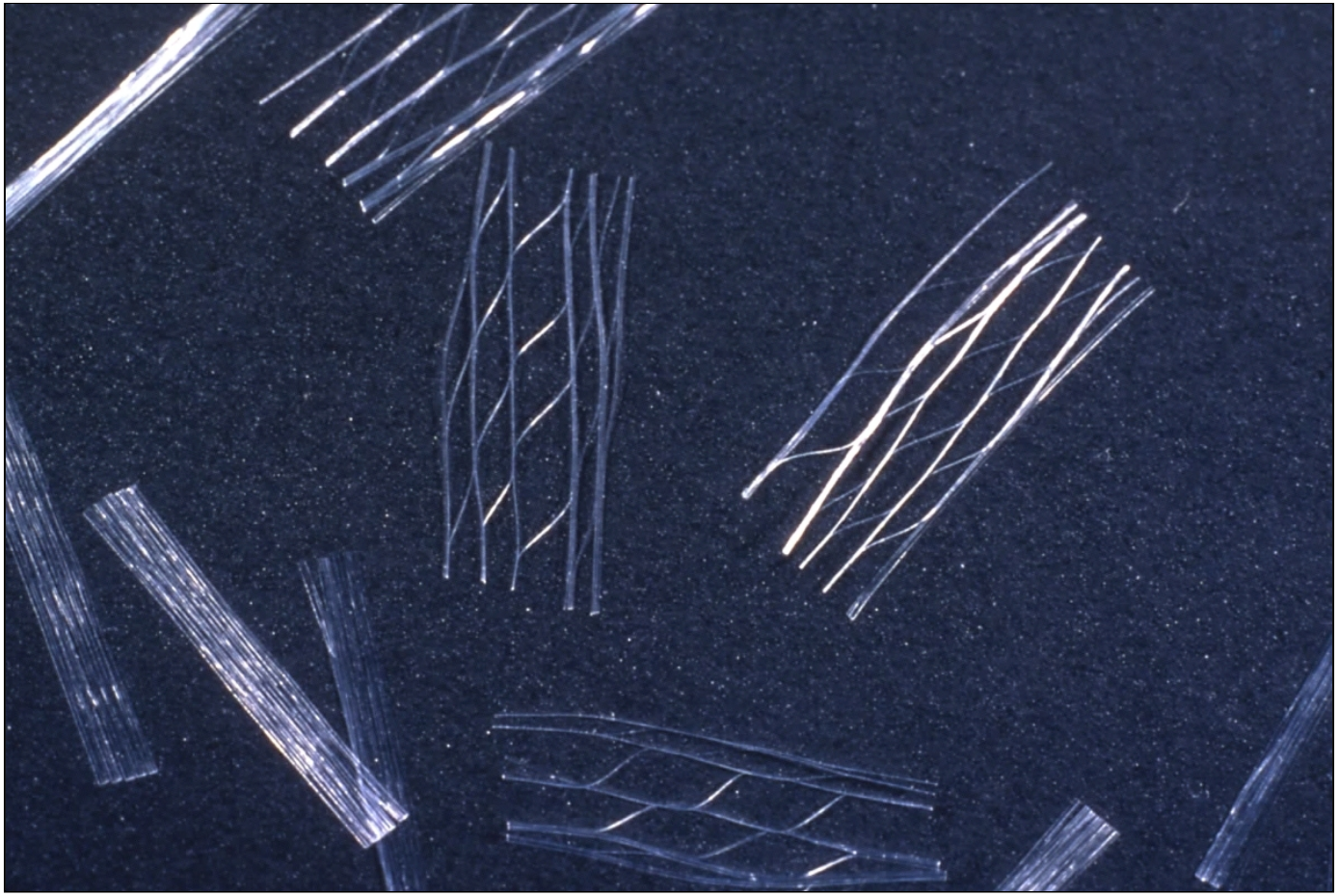

- **Geofibers©** are expandable polyproylene strands that are mixed with soils to increase their shear strength. Typical mixtures vary between 0.1 and 0.4% by weight.

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- **Geofibers** can be mixed with subgrade soils, as shown above. Their inclusion raises the maximum density about 5% and reduces the optimum moisture content of the compacted soil mixture about 5% as well.

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- **Geofibers are compacted into the soil using kneading compaction for cohesive soils and vibratory rollers for granular mixtures.**

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- **Erosion gullies** are a common problem on unprotected slopes, especially in low cohesion materials, like sand, dispersive clays, and soils containing gypsum
- Effective repairs can be made with Geofibers

- Test block using Geofiber-reinforced soil mixture sprayed onto the eroded cut slope, infilling the erosion gullies

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- Backhoe cutting inspection trench into the treated slope a year or so later, after **vegetation** had taken hold. **Revegetation** is increasingly valued for aesthetic reasons.

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