GOLDER
Member of WSP

Link between R&D, Design and Implementation

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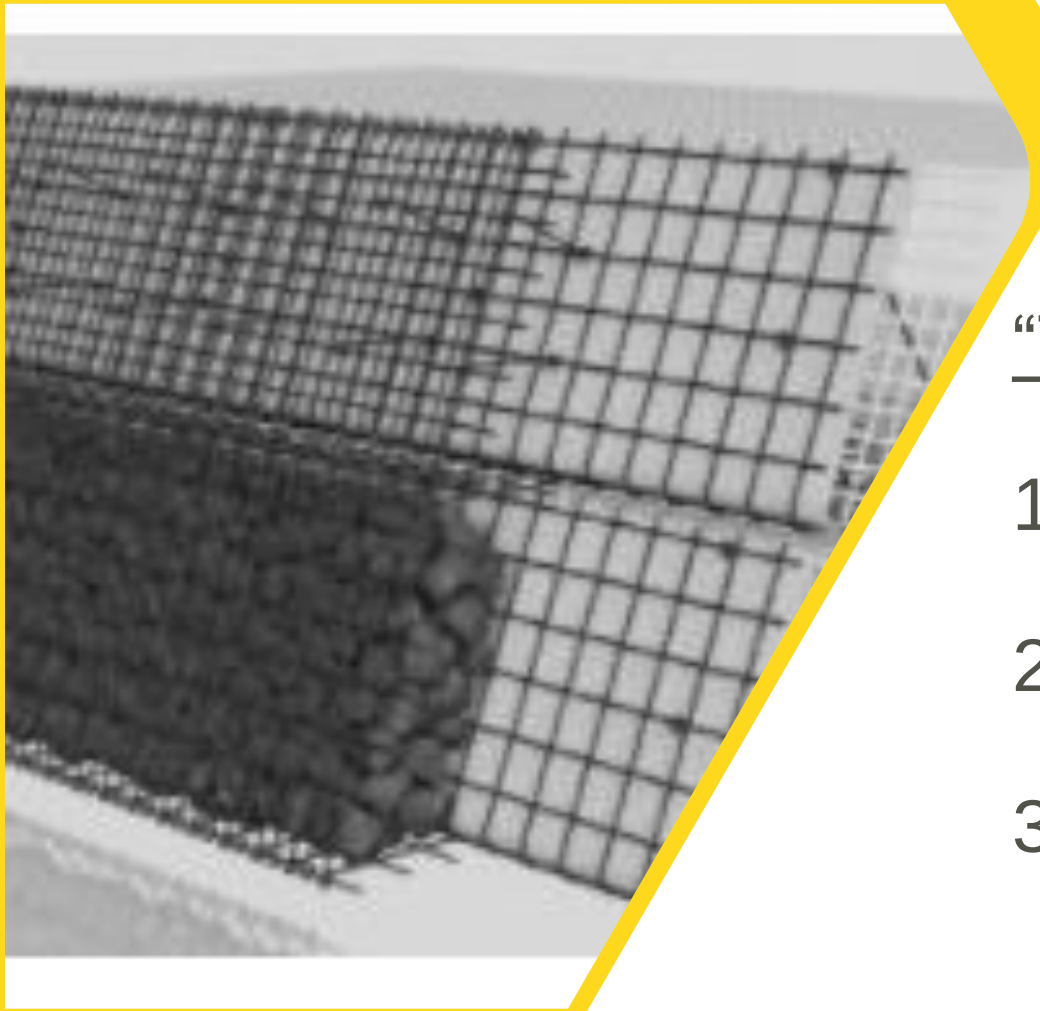


New Products

“Three Steps”

1. Need in Industry
2. Manufacturer opportunity
3. Engineering Information

Coordinated R&D

“The Three Organisation”

- Geosynthetics relative new industry
- Significant Innovation
- Generally - significant improvements in project outcomes

Responsibility:

- Supplier/product manufacturer/developer
- Designer
- Construction contractor

Owner of facility wants to gets benefit of system.

Challenges:

1.= Time

Research Organisation: – ideas/concepts

- funding

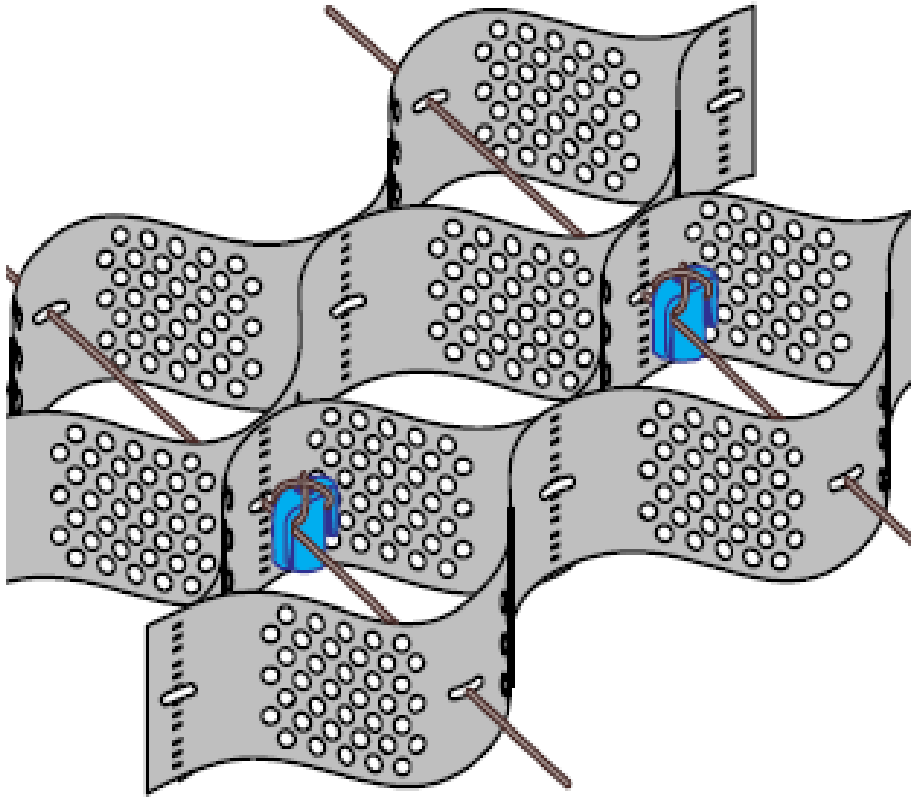
Manufacturer:

- cost of R&D
- predict type of need
- appropriate properties of materials/products

Designer:

- relies on existing information of products
- current projects needs – short time
- design responsibility

Project material specification steps



1. Designer identifies a functional need
2. Options of generic products
3. Limitations and costs
4. Related needs, e.g. space for anchorage
5. Draws on previous experience
   - Availability
   - Construction issues
6. Develops design based on analysis
7. Develops specification

Step 2 – product information

Opportunities

Research organizations should link with industry

- Designers
- End users / contactors

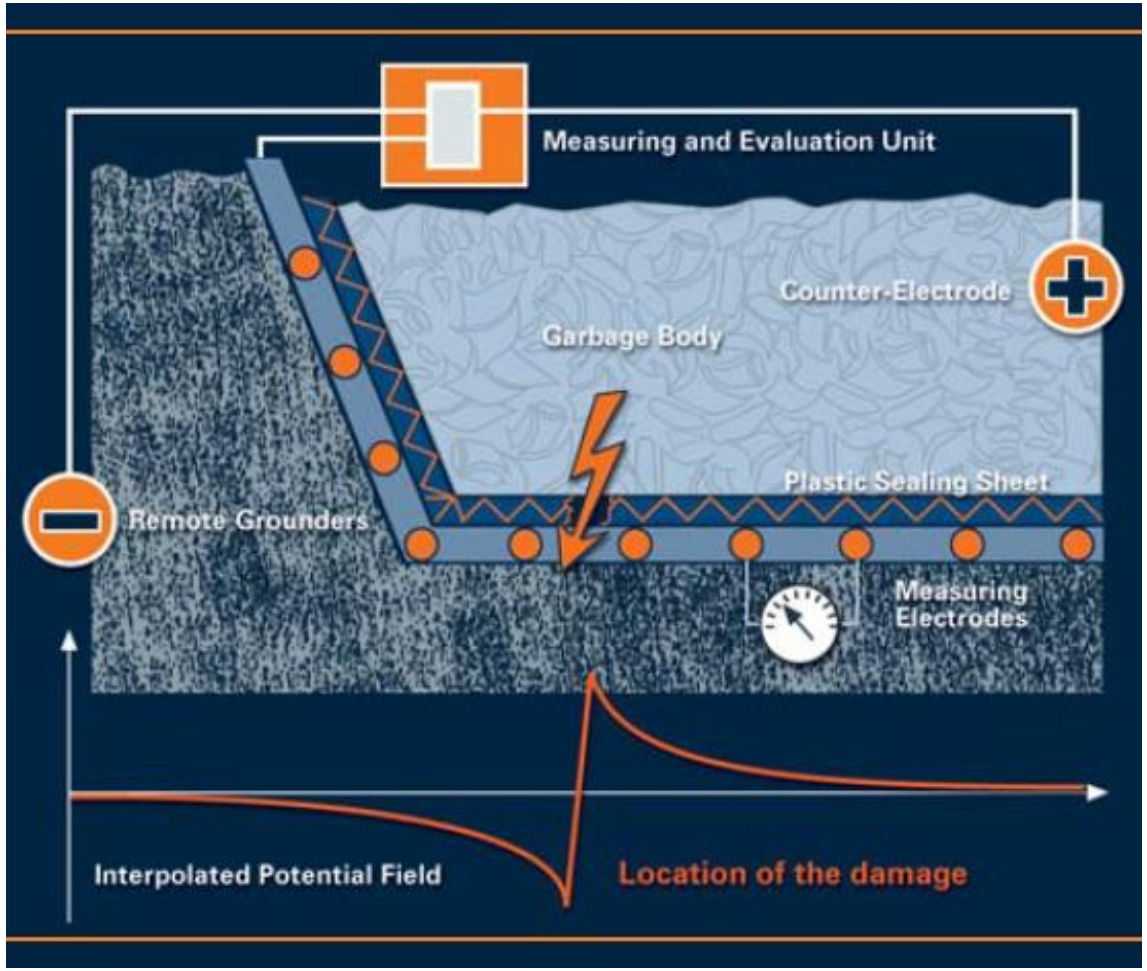
Manufacturers should link with seasoned Designers

Independently verified and focused material properties for design

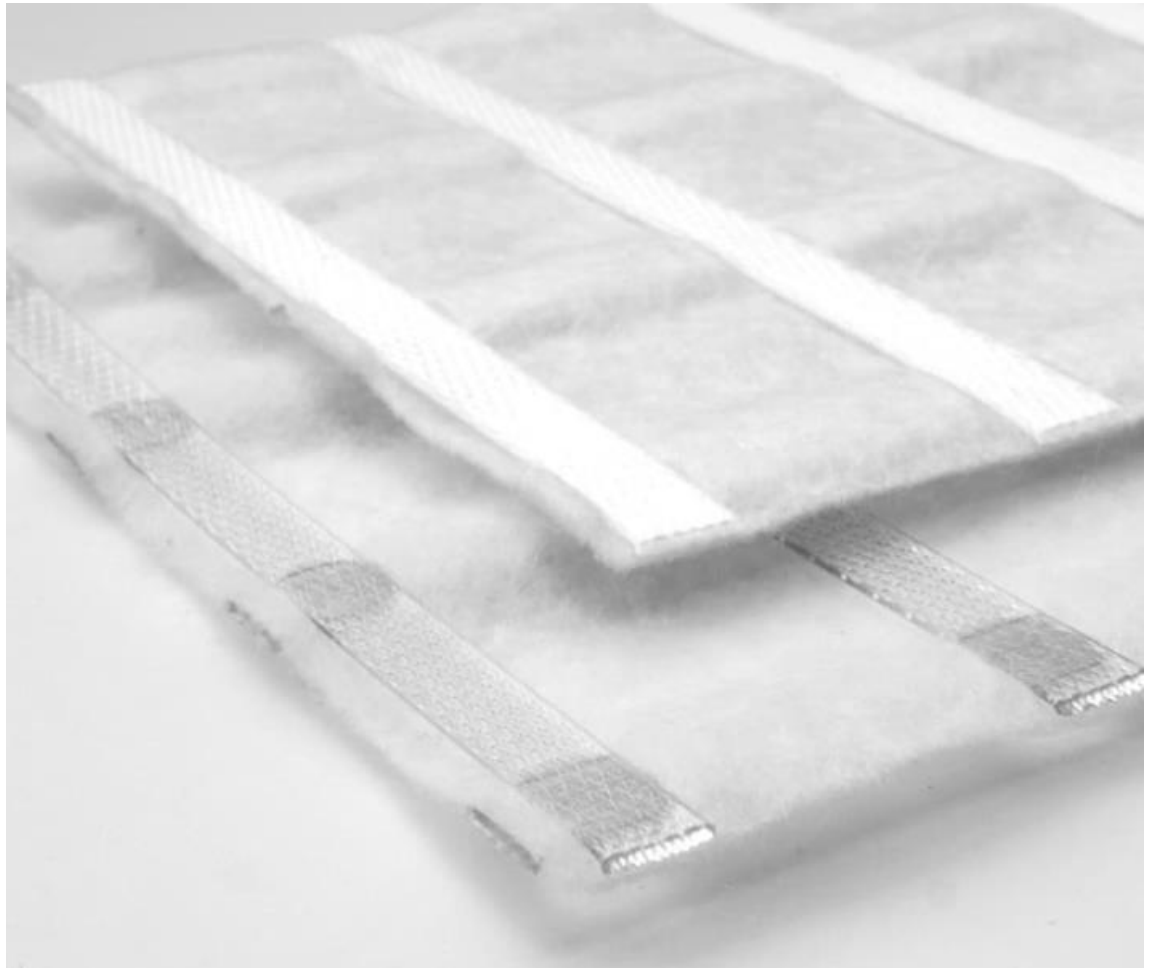
Appropriately trained Designers

Opportunity

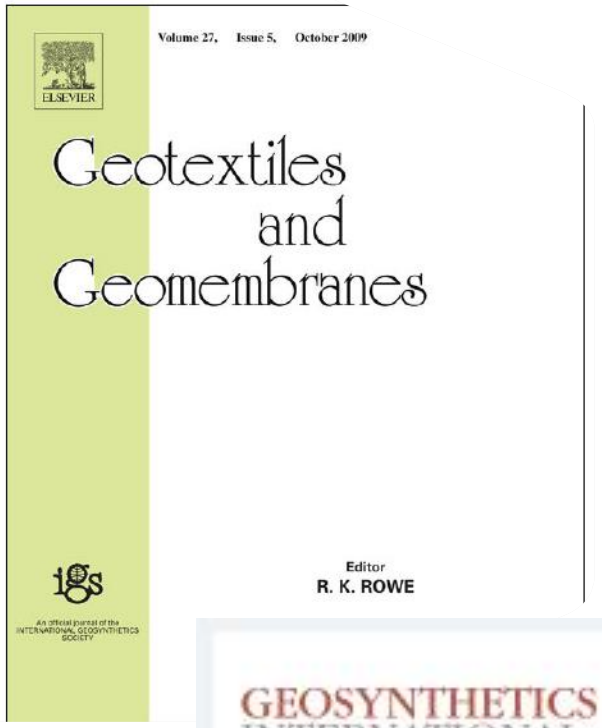
- Improved communication of product information – IP breaches on web
- Trusted advisors to industry
- Links with academia/research for improved industry specific information
- High quality QA to reward quality suppliers
- Changes to procurement processes



Designer risks



- Owner relies on Designer to make informed design decisions.
- Designer relies on reliable product information.
- The Design relies on materials being supplied that meet the product information
  - Level of Reliability
  - Design risk
  - Performance requirement wrt project
- Consultant X approved this product on other project – does not cut it!



R&D

- Needs independence for confidence
- Reputation of research organisation and lead
- Generally takes significant time
- R&D appropriate for industry applications
  - Funding
  - Support
- Good and extensive references of overall principals available
- Expand knowledge into specific products - IP

Suppliers & Manufacturers

Not supply material if not appropriate application.

Informed Designers are likely to do a reasonable job, with:

- Independent reliable information
- Designed for the project specific application/objectives

Independent verification / testing of supplied material

Questions

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