

Featured Technical Topic Summary

FGI Monthly Members Meeting

Friday, June 2, 2023



TOPIC: Longevity of Geonets and Geotextiles

Each month Tim Stark introduces a new technical topic for discussion and possible action. This month's topic is: "Longevity of Geonets and Geotextiles". This topic generated significant discussion with the main "take-aways" being listed below:

1. Longevity of Geonets

Little performance specifications

No longer using an AOS requirement; no FOS

Civil v. Environmental grade geotextiles -

What is happening under the geomembrane?

Research – check embedment of geonet on GM without a cushion GT – when to transition to a composite
Industry moving to composites from sands and gravels – so check compatibility of nets with flexible GMs –
Brian and Rohit webinar on net and 40 mil GM

2. Longevity of Geotextiles

Little performance specifications

No longer using an AOS requirement; no FOS

Civil v. Environmental grade geotextiles -

Are geotextiles chemically resistant to liquids being contained?

Kerry Rowe – double composite liner system – GCL geotextile decomposed

No specs to excavate and check the geonet and geotextile

Intercell berm excavations look good –

Compatibility b/t net and GTs – Polyester & Polypropylene GTs -

Compatibility b/t net and GMs – use same resin for both – no spec requiring same resin as GM

"The need to consider the service life of all components of a modern MSW landfill liner system." R. Kerry Rowe; J. Reinert; Y. Li; R. Awad, Waste Management Vol. 161, 15 April 2023, pp. 43-51

Field test LDZ with dye liquid – limitations – Good Case Study

Potable water applications – is it leakage or groundwater by checking chlorine level b/c groundwater consumes chlorine

Drainage for gas relief – is good application

3. Leak Testing Mechanical Attachments

- i. Cannot conduct electronic leak locate survey near metal attachments because of interference so need some other type of testing of attachments

- ii. Place ballast tubes around penetration, inject air below geomembrane, soap the attachment, and watch for bubbles along or around attachment
- iii. Thermal imaging – not tried yet but possibly effective on sunny day to measure cooler air being pumped below geomembrane and exiting at leak(s) along attachment
- iv. Vacuum below the geomembrane in tank or attachment and listen for vacuum sound along attachment
- v. Vacuum Acoustic Leak Identification (VALID) method – apply vacuum between primary and secondary geomembranes and listen for vacuum sound along attachments; tests both geomembranes; the top surface of the geomembrane is scanned with ultrasonic microphones that can detect distinctive sounds of a vacuum leak.
- vi. Smoke Test – smoke exits at attachment surrounded by ballast tubes
- vii. Spark test with material embed but cannot be used at landfills and oil and gas sites
- viii. Vacuum boxes for strips and corners but limited because not straight segments for box
- ix. Dye test – divers places dye along attachment or concrete joint and see if dye disappears into attachment or crack (see video)

4. **Leak Testing Pipe Boots**

- i. Spark test with wire below pipe boot
- ii. Vertical pipe boot can be air lance tested
- iii. Pipe clamps can degrade and should be checked and/or replaced
- iv. Collar weld on Slope Pipe Boot is difficult and should be checked first – This is weld underneath or on downslope side of pipe
- v. Cannot use spark test in landfills and oil and gas sites
- vi. Try eliminating pipe boots in landfills
- vii. Apply vacuum under the pipe boot and listen for vacuum sound along attachment

5. **Preventive Measures**

- i. Coat entire attachment/connection with Fluid Applied Membrane (elastomer) – durable with time
- ii. Epoxy can be brittle so use something more flexible, i.e., Fluid Applied Membrane
- iii. Caulking around attachments may not be suitable because of freeze-thaw cycles and dirt can make caulk ineffective – less durable than Fluid Applied Membrane
- iv. Concrete or concrete joints can leak so the concrete must be tested possibly with the dye test

6. **Installation Details**

- i. Mechanical attachment and pipe boot details (see **Figure 1 below**) are available on the FGI website using the following QR code.



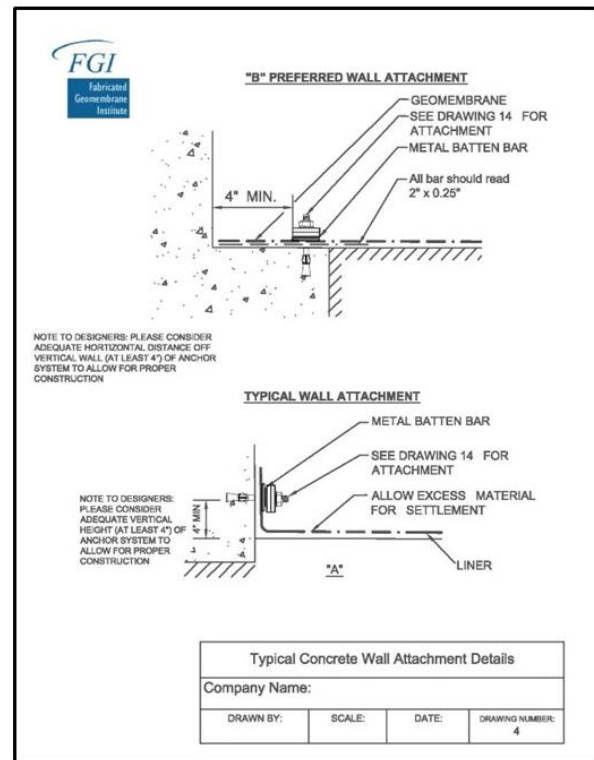
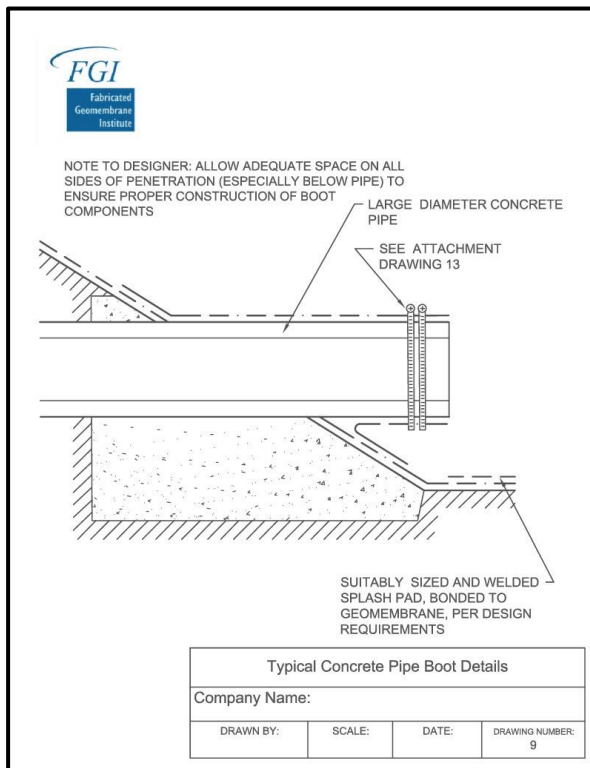


Figure 1. Sample pipe boot and wall attachment details available on FGI Website (www.fabricatedgeomembrane.com).