G and E Times

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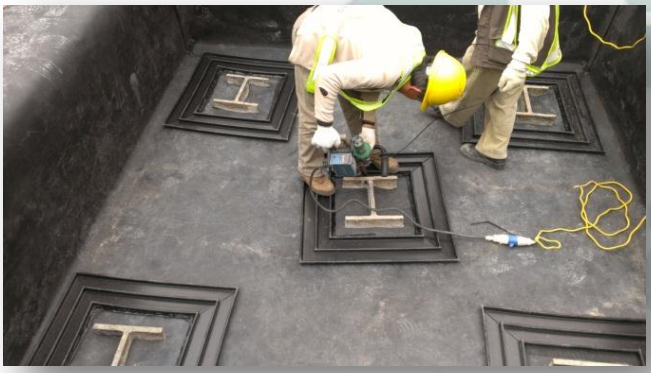
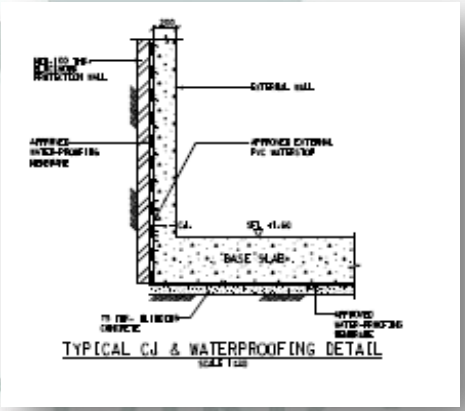
Basement Waterproofing with HPDE Membrane as External Tanking

HDPE membrane has found application in waterproofing the basement structure of the switchgear building at Stonecutter's Island Sewage Treatment Works (HATS stage 2A Upgrading Works, DC/2009/10). The basement invert was lined with a 1.5 mm flexible membrane up to the pile cap, base slab was constructed on the membrane, wall structure was then built from the slab, eventually the membrane is extended from the pile cap to the crest, resembling a barrier system compatible to external tanking. Complete encapsulation is formed to isolate the entire basement structure from underground water ingress.

HDPE membrane has high abrasive toughness resistance to construction activities, is impermeable, inert to most aggressive effluent and offers a 100 years design life. Proprietary welding technique and testing method ensure individual panels are sealed as one single integral unit. Special installation details are designed at the invert to come around H pile and king post penetration, and at the structure crest above ground level where membrane terminates. Assurance to watertight is warranted.





Special details to H pile penetration at the invert

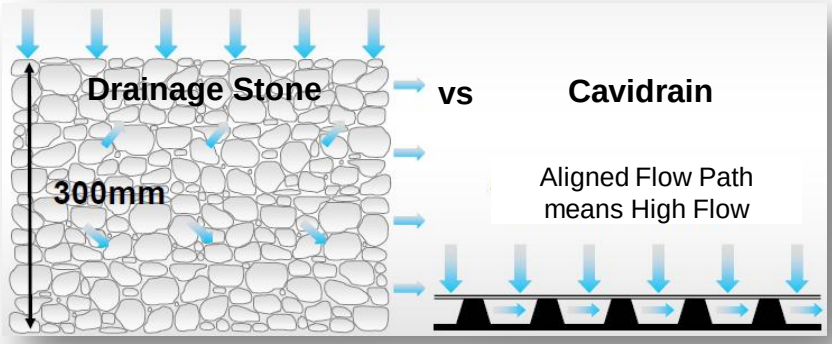
HDPE membrane at the invert formation accommodating pile cap, ground beam and base slab

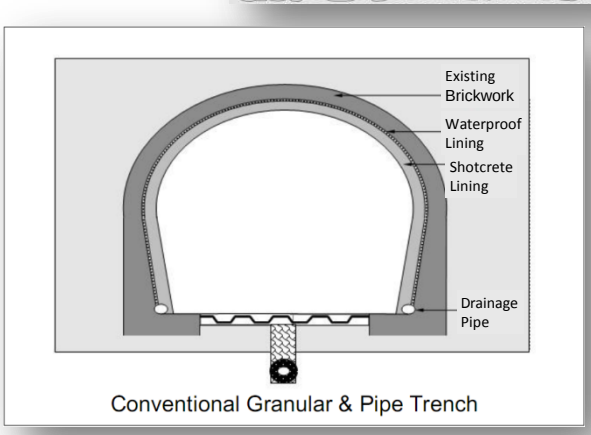
New Application

Save Cost by Using Geosynthetic Drainage for Tunnel

Traditional methods of tunnel drainage utilizes granular material which is a difficult and time consuming operation. Cavidrain is a geocomposite that enables fast track construction by providing invert concrete base slab with effective flow paths, replacing conventional granular. Cavidrain can also be extended to the vault and served as a drained waterproofing liner behind tunnel permanent lining.

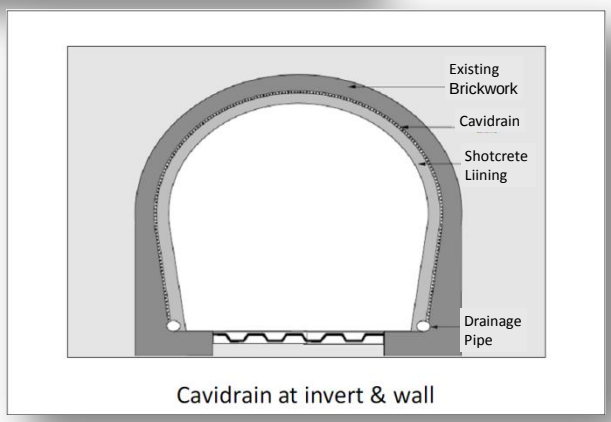
Cavidrain maximizes the available internal space. It comes in prefabricated panel of standard size, is very easy and quick to install by placing and taping panel side by side concrete can be cast directly on Cavidrain. Loading and transmissivity tests have demonstrated the long term performance reliability. Cavidrain can be a very cost effective drainage system





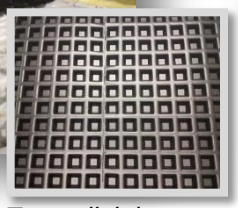
Conventional Granular & Pipe Trench

VS



Cavidrain at invert & wall


Installation of Cavidrain


Two adjoining panels of Cavidrain


Application of Cavidrain at Contract No. WIL 704, March 2012

Technical Note

GSE Conductive Lining - Waterproofing Membrane that can be Tested for Integrity Prior to Commissioning

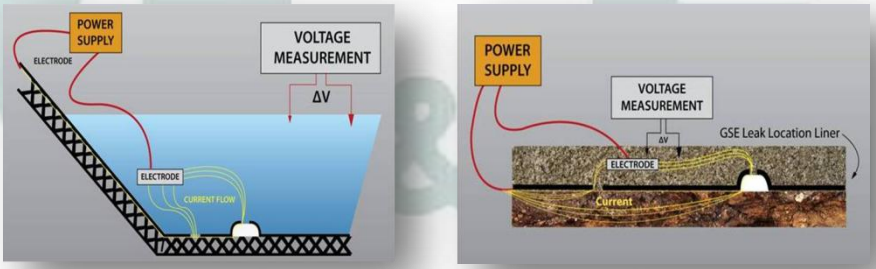
Electrical leak location tests can locate leaks and defects post installation of the geomembrane system before and after covering with soil and water. The technique requires a conductive substrate. GSE **NEW** Leak Location Liner incorporates a thin electrically conductive layer on the bottom surface of an insulating geomembrane which allows it to be 100% sparked tested for defects in the field per ASTM D7240. Photos below show the spark tester that is used for locating leaks on the exposed conductive geomembrane. Any penetration in the liner will automatically transmit a visible spark from the charged undersurface as the probe passes over and set off an audible alarm.

Spark tester set up

Spark testing on jobsite

Spark testing performed with ATV

Electrical leak detection survey is currently the most effective and practical means of locating leaks in installed geomembrane after covering with soil and water, as detailed in ASTM D7007. With the use of electrically conductive geomembrane, leak detection survey can be performed more thorough and accurate over a variety of soil-moisture conditions and liner contact situations. Below photos show schematic diagrams of improved leak surveys using electrically conductive geomembrane without grounding sources concerns even on slopes, under the wrinkles, multi-layer system, or after covering with soil and water.



Leak detection survey using electrically conductive geomembranes after covering with soil and water

Opinion Column

Flexible Barrier Specialist on Channelizing Debris Flow

Georgio Giacchetti, Maccaferri's flexible barrier specialist presented the design to channelize debris flow barrier and the concept of utilizing existing rockfall barrier in the open hillside debris flow situation. Most practitioners and governing bodies were visited during the week in late January. It is hoped that through this interaction, more practical design approach can be adopted to alleviate complex analysis and expensive field trial.

For Your Information

Announcing Maccaferri Day

Labor and operators' safety in tunnel construction are tightly linked with engineering choices, as much as the necessity of reduced time and cost, therefore it is of paramount importance to address them properly from the earliest stage of design.

How you approach tunnel designing is perhaps worth spending a few moment with Maccaferri. We are organizing a Maccaferri Day in coming May/June to bring forward the awareness of:

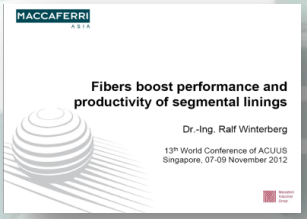
- *Steel Fiber Reinforced Concrete application and design for temporary, final and segmental lining*
- *Improvement of ground characteristics enhancement technique ahead of excavation*
- *New tubular arch tunnel support system*

SFRC segmental liner

Tubular tunnel support

Shotcrete with steel fiber

Technical development, design principle and case histories will be highlighted. Maccaferri's Technical Director for Tunneling, Ir Riccardo Perlo and Dr Ralf Winterberg, Fiber Specialist will be updating with you the latest technology of SFRC and tunneling projects in Asia.



Details of the experience sharing and invitations will be notified shortly.

G and E Organized Seminar on Geotextile

G and E is also planning a series of 1-2 hours lunch seminar at convenient locations free of charge, inviting expert to brush up on topics of application, design, specifications, installation and pricing of interesting geosynthetics such as goetextile or geocomposite. Given the opportunity for interaction, the construction industry will hopefully be better informed. Nannette at nannette@g-and-e.com would be pleased to hear your thoughts of participation.

Reader's Response

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G and E Company Limited
14th Floor, Kiu Yin Commercial Building, 361-363 Lockhart Road, Wanchai, Hong Kong
Tel: 2570 0103 Fax: 2570 0089 e-mail: wing@g-and-e.com website: www.g-and-e.com