

GSE - November 6, 2002 Cross Canada Lecture

TOPIC: Unexpected effects of natural and anthropogenic chemicals on construction

PRESENTATION BY: Dr. Stephan Jefferis, MA, MEng, MSc, PhD, CEng, FICE, CGeol, FGS, FRSA , University of Surrey, School of Engineering

From time to time chemicals present in the ground induce reactions which are sufficiently severe to cause structural damage or risks to the health and safety of construction workers or end users of construction work. Three classes of chemicals can be considered:

- chemicals present in the ground as a result of spills or deliberate deposit of wastes etc. These chemicals can be classed as contaminated land or landfill chemicals;
- chemicals naturally present in the ground;
- chemicals injected into the ground to modify its properties, for example, grouts to strengthen or water-tighten ground.

Over the last two decades there has been a substantial volume of work and conference activity on contaminated land and this has greatly increased the general awareness of the potential for problems from chemicals in the ground. In contrast, chemicals naturally present in the ground or deliberately introduced into the ground can lead to unexpected problems – especially if the project itself has caused changes in the chemical conditions in the ground which could not have been immediately predicted from the original site investigation. The presentation will give short case histories of some unexpected effects of species including sulphur, organic carbon, nitrogen and iron. No knowledge of chemistry is required to be frightened by some of these stories.

Professor Jefferis' experience is focused on the investigation and resolution of unusual materials and environmental problems typically associated with contaminated land, landfills or natural chemical and microbiological processes in the ground. He has specialized in materials durability in aggressive environments; development of in-ground technologies for control of contaminant migration; use of chemical and cementitious grouts for ground improvement and radioactive and toxic waste solidification; risk assessment and risk perception in relation to environmental problems; applications of bentonite, bentonite-cement and polymer slurries in diaphragm walling, cut-off walls, contaminated land and tunnelling; use of cement grouts for off-shore and other structural applications; non destructive investigation of materials. Professor Jefferis is the author of over 100 papers on contaminated land, construction materials, pollution control, etc.

Venue :Delta Edmonton South (4404 Gateway Boulevard)

Time :Lunch at 12:00 noon

Date :Wednesday, November 6, 2002

Cost : \$15 GSE Members, \$20 Non-members