WP2 : Målinger på grout

- Indledende målinger inkonsistente
- Årsag:
  - Fluktuationer i omgivelsernes temperatur
  - Fugtighedsvariationer i prøverne
- Løsning:
  - Klimaskab
  - Standardiserede måleomstændigheder

Vötmaks

8,2-8,8
2-3
10-11
6-7

Caludutherm

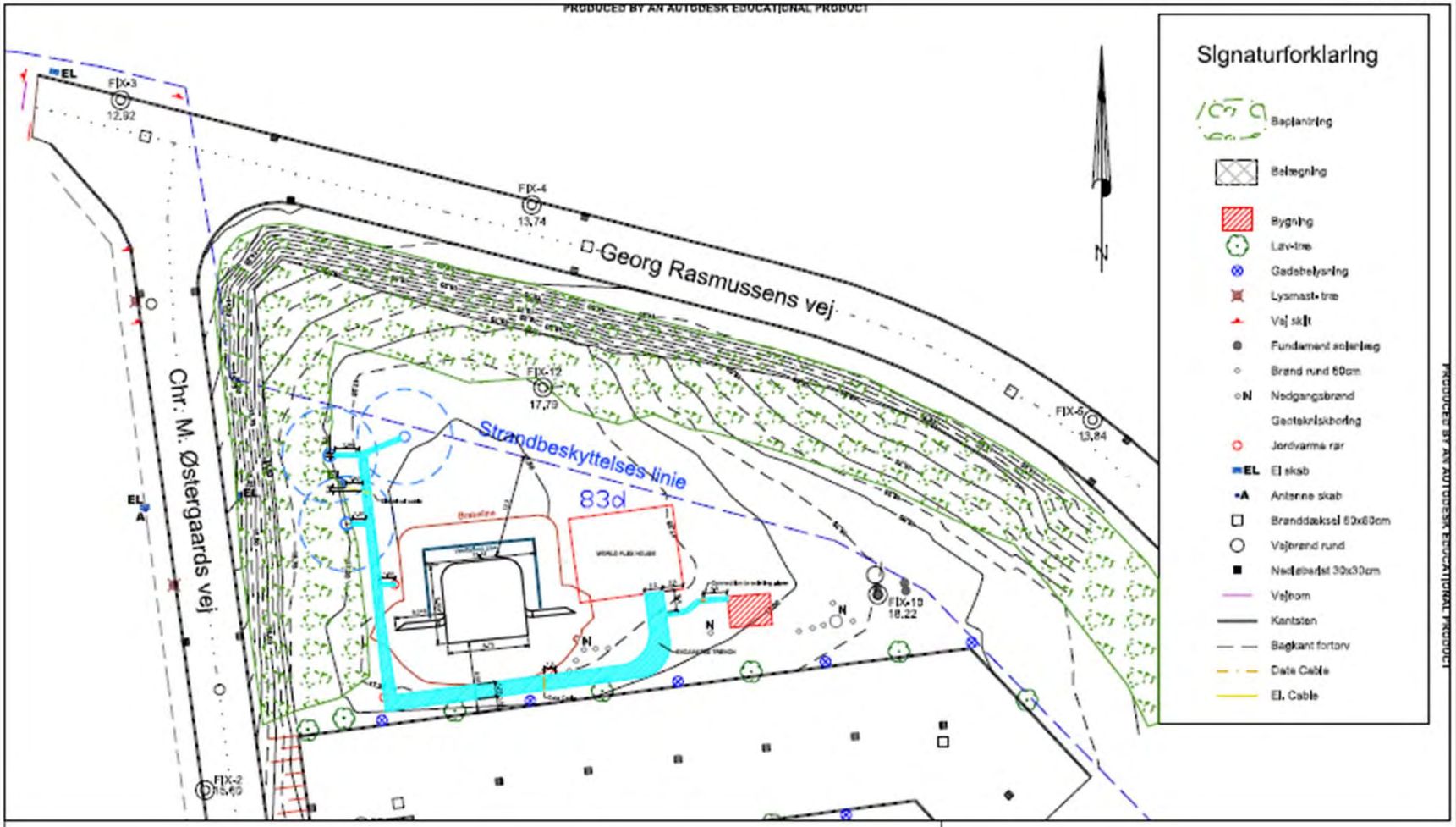
RMO HS
Caludutherm

WP4 : Testboringer
Kommende arbejder (marts 2012)

- 3-4 boringer til 100 meters dybde
- 3 stk. med casing
- Evt. 1 stk. uden casing
- Enkelt U-sonde
- Dobbelt U-sonde
- Co-axial sonde
- Termisk respons test
- Opsætning af varmepumpe
- Sammenlignende drift

Udførte arbejder (marts 2013)

- 4 boringer til 100 meters dybde
- 3 stk. med casing
- 1 stk. uden casing
- 2 stk. enkelt U-sonde
- Dobbelt U-sonde
- Co-axial sonde
- Termisk respons test (påbegyndt)
- Opsætning af varmepumpe (indkøbt)
- Sammenlignende drift (afventer)

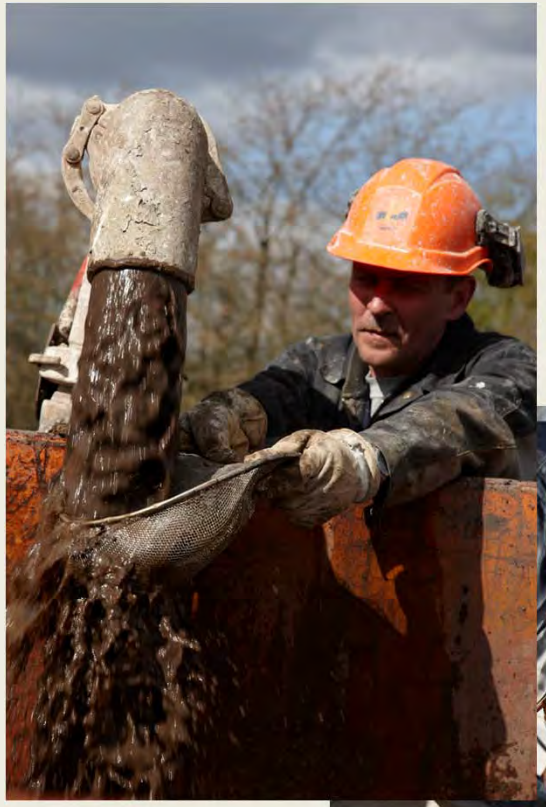

PRODUCED BY AN AUTODESK EDUCATIONAL PRODUCT
Signaturforklaring
Beplantning
Belægning
Bygning
Løv-tre
Gadebelysning
Lysmast-tre
Vej skilt
Fundament anlæg
Brønd rund 60cm
Nedgangsbrønd
Geotekniskboring
Jordvarme rør
El skab
Antenne skab
Brønddæksel 60x60cm
Vejbrønd rund
Nedløbsbrønd 30x30cm
Vejkant
Kantsten
Bagkant fortov
Data Cable
El. Cable
Georg Rasmussens vej
Chr. M. Østergaards vej
Strandbeskyttelses-linie
83d
FIX-3
12,92
FIX-4
13,74
FIX-12
17,79
FIX-5
13,84
FIX-10
18,22
FIX-2
15,49
EL
N
Målestok
10m
20m
30m
40m
50m
VIA UNIVERSITY COLLEGE, HORSENS DENMARK
PROJECT: SITE PLAN ENERGY PARK
DATE: 07.03.2013
SUBJECT: LAYOUT OF THE PIPES & CONNECTIONS
SCALE: 1:300
CREATED BY: YOVKO ANTONOV
CLASS:

VIA Drilling Site

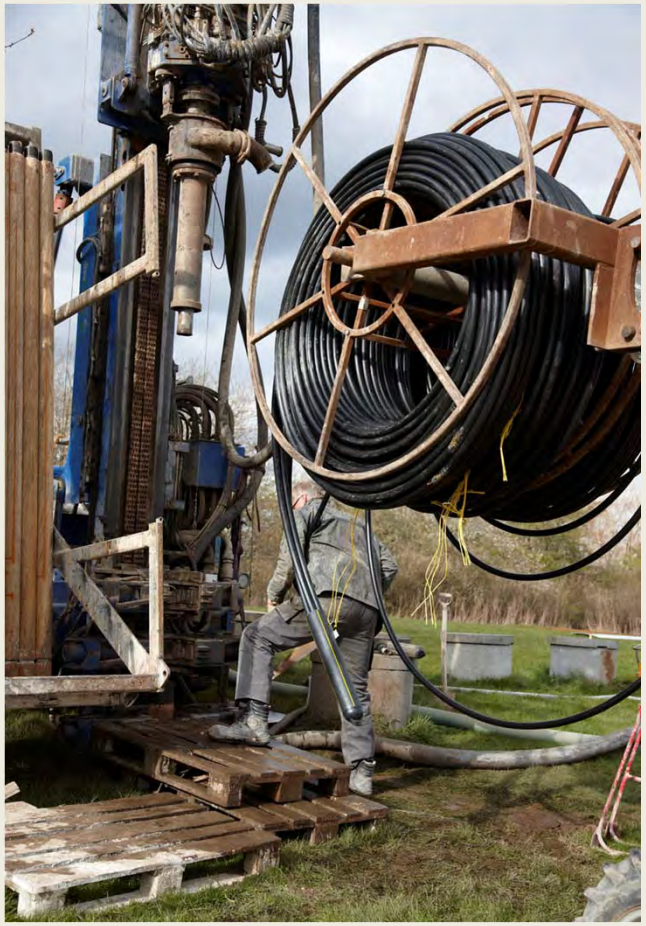
Uden casing

Med casing

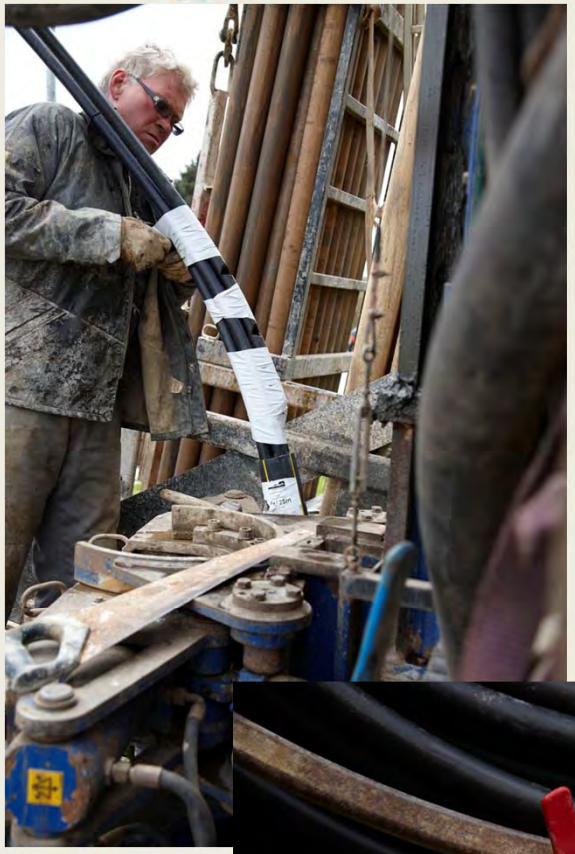
Jordprøver

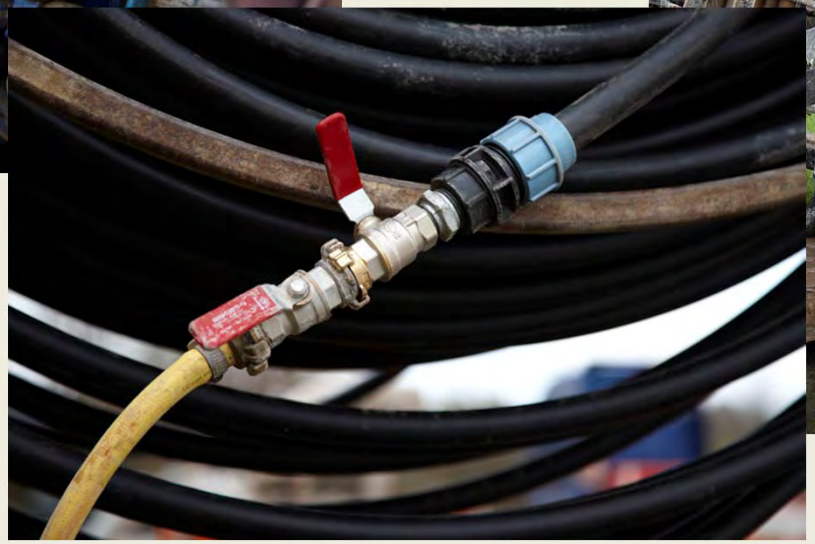


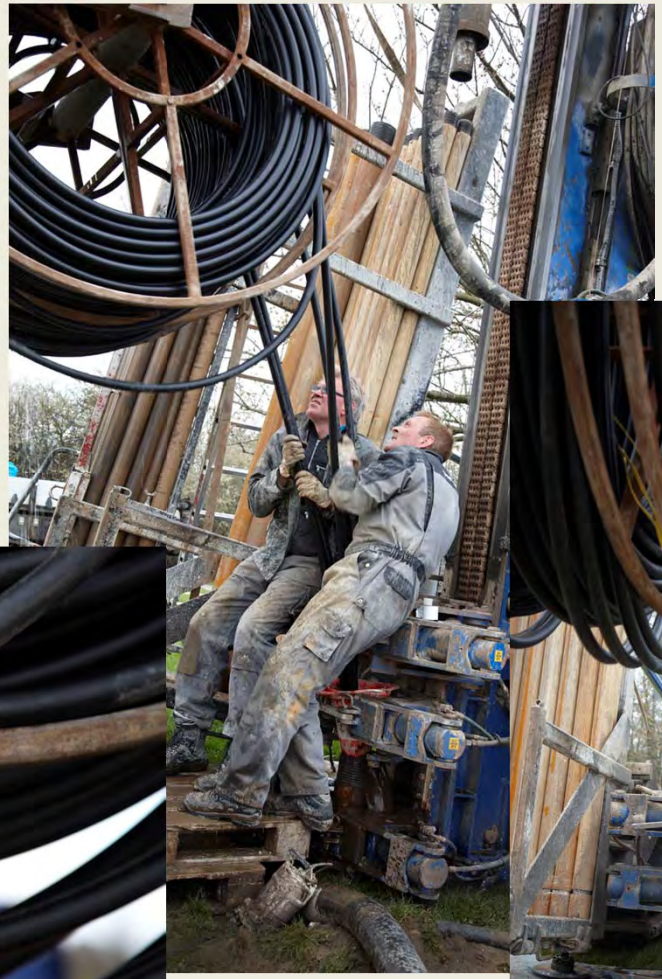
Klargøring til installation af BHE

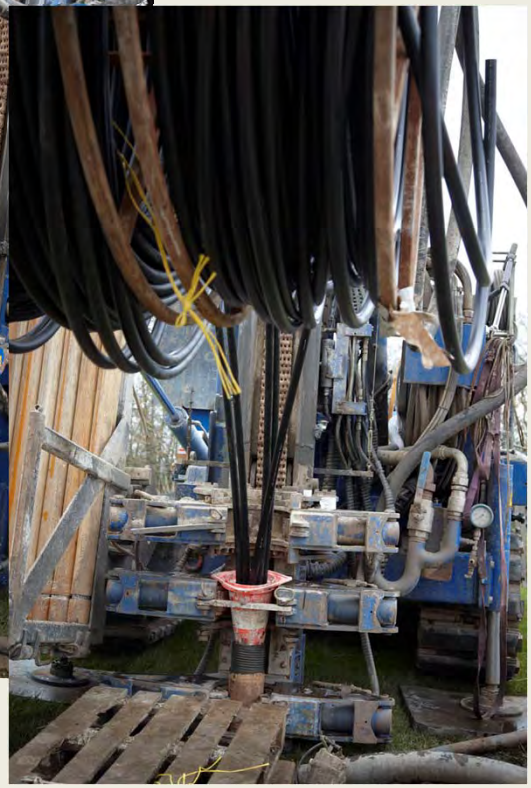


BHE-installation



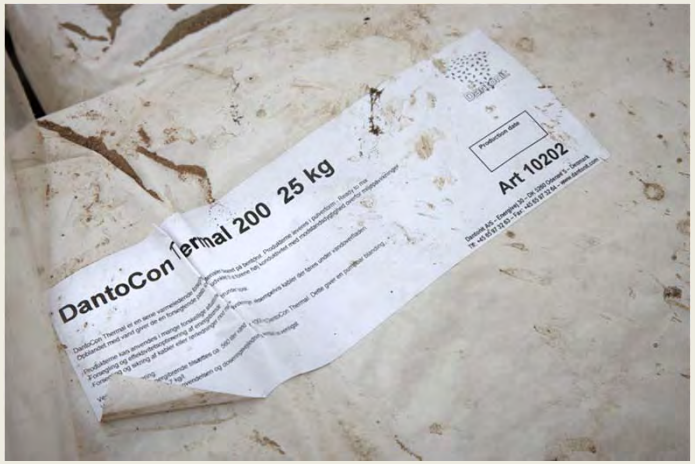






Co-axial BHE

Klargøring til grouting



Grouting

Forbindelsesledninger

Forsøgsanlæg

WP 4: TRT-udstyr

- Termisk respons test
  - Regulerbar cirkulationspumpe
  - Varmelegeme med kWh måler
  - Ultralyds flowmåler med datalogger
  - Manometre til tryktabsmåling og datalogning
  - Termometre med datalogger
  - Reference termometer

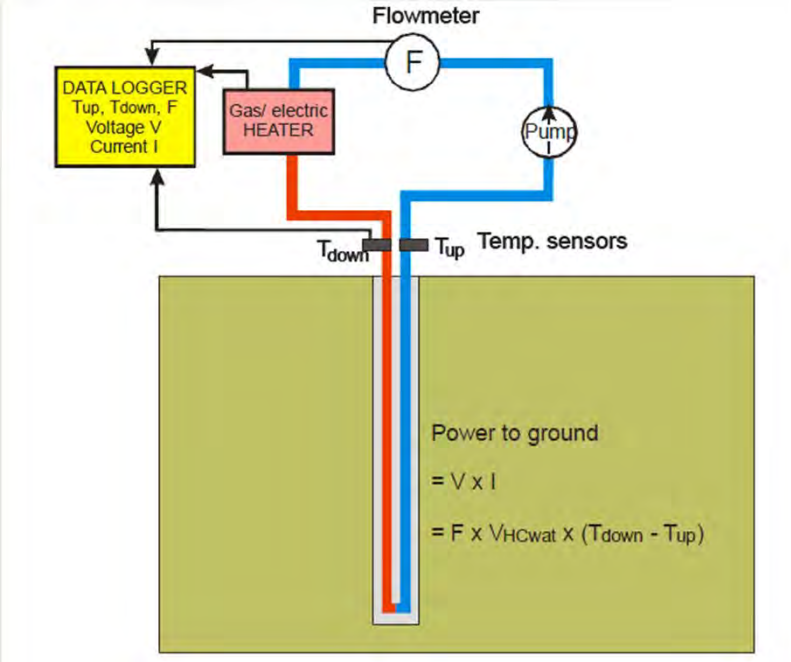
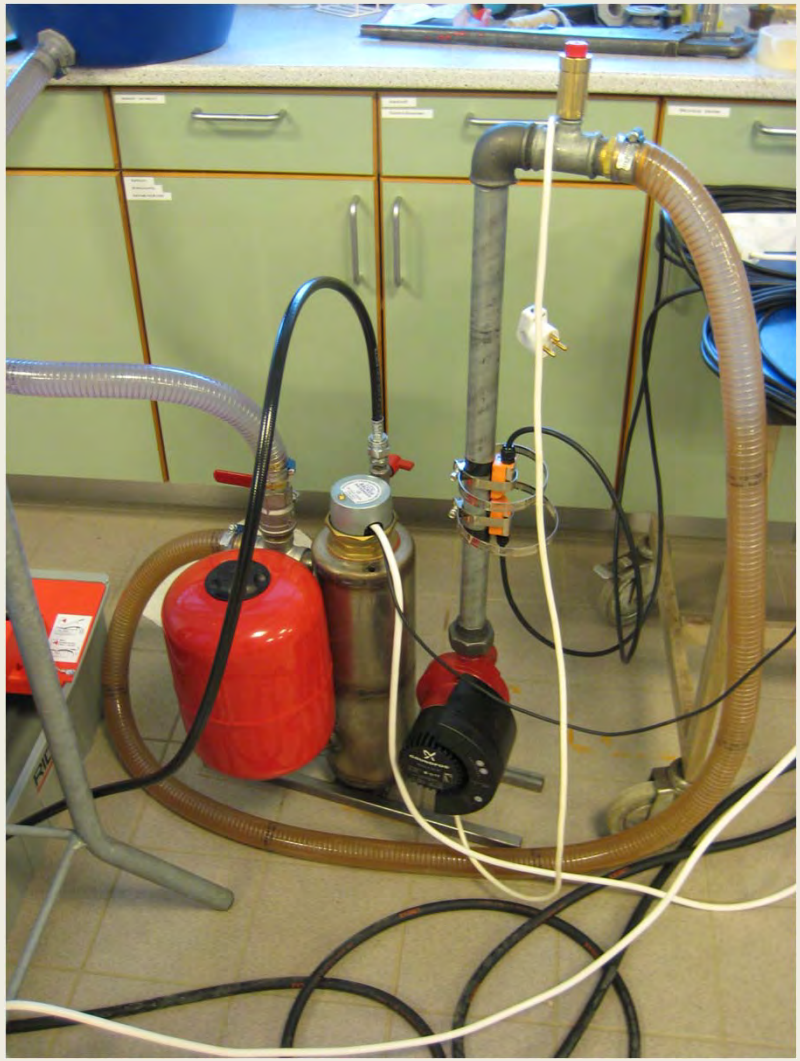
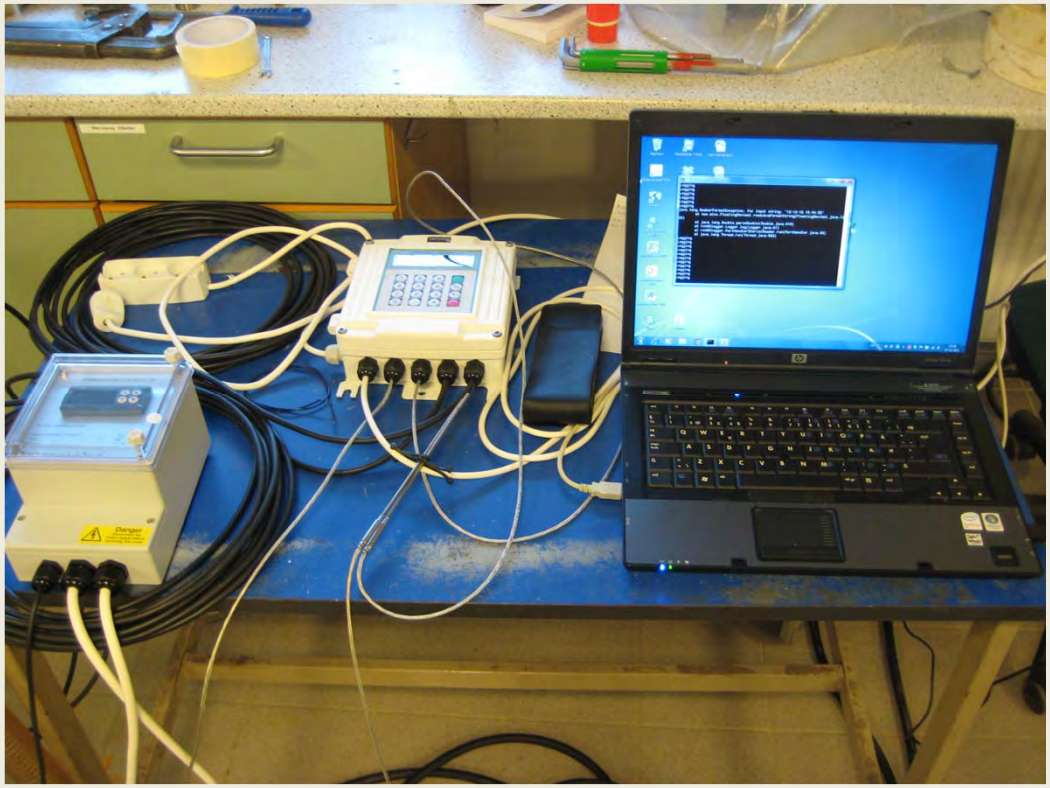


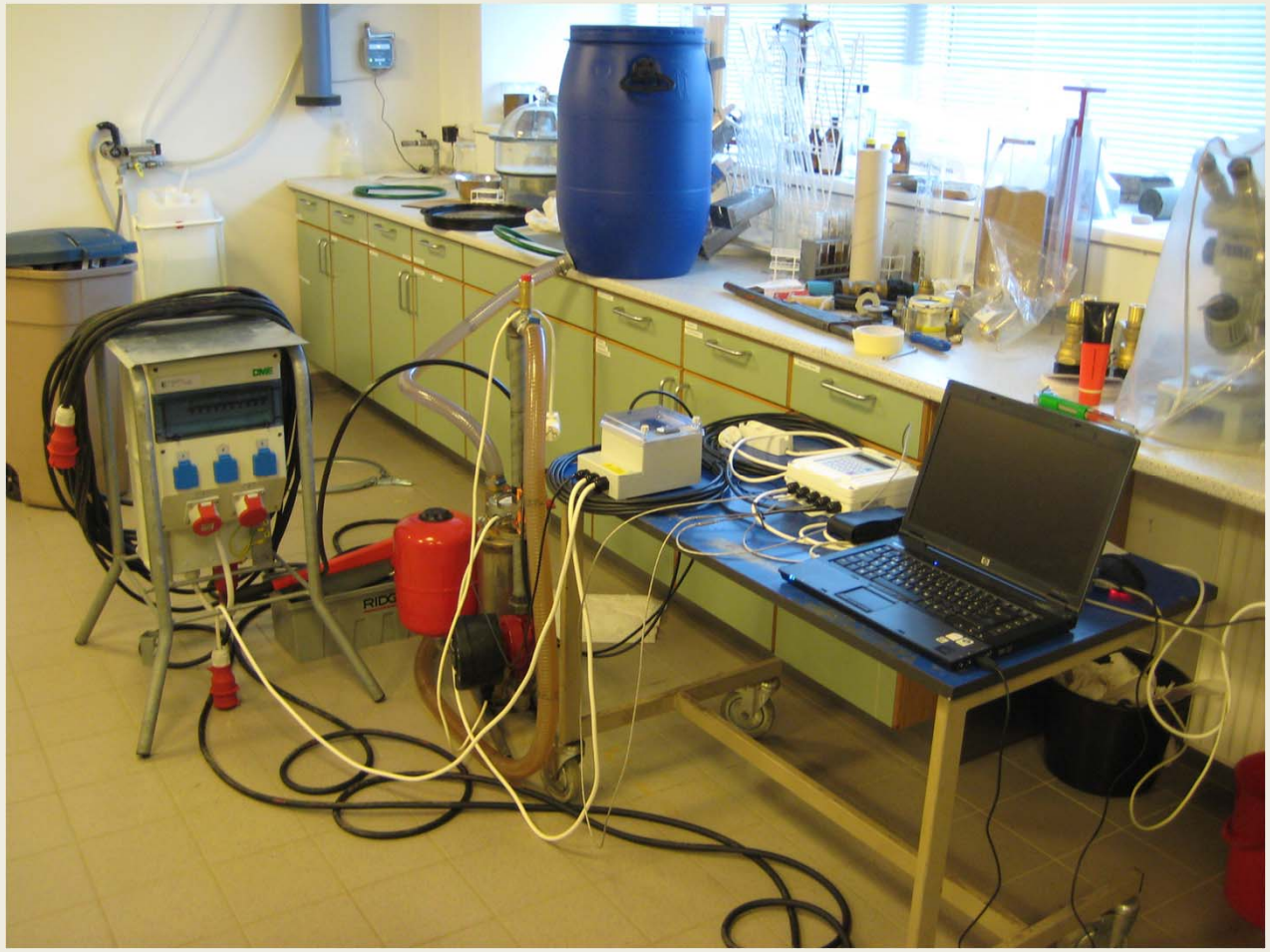
Figure 6. Schematic thermal response test set-up

Opbygning af TRT-udstyr





Opbygning af TRT-udstyr



TRT I felten

WP6 : Kurser og kursusmateriale (VIA)

- Shallow Geothermal Systems
  - 4 ECTS
  - Afholdt 3 gange, i alt ca. 100 studerende
  - Mundtlig eksamen
- Sustainable Energy
  - 4 ECTS
  - Afholdt 2 gange, i alt ca. 100 studerende
  - Mundtlig eksamen
- Kommende fag: Thermogeologisk Modellering
- Kommende kursus: For installatører, borefolk, kommuner mm.

Shallow Geothermal Systems, indhold:

- Facts about the thermal properties of different rock and soil types
- Influence of groundwater on borehole heat exchangers
- Construction of boreholes and design and dimensioning of borehole heat exchangers
- Thermal response test
- Energy storage and balanced heat abstraction
- Modelling software Earth Energy Designer (EED)
- Function and quality control
- Legislation and conflicts of interest
- Case studies

Sustainable Energy, indhold:

- Energy savings
- Shallow geothermal energy
- Heat pumps
- Thermal solar heating systems
- Combustion of biomass
- District heating
- Photo Voltaic

Udvalgte spin-off projekter