ROADEX
Implementing Accessibility

Roads on Peat

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Inverness, 18 April 2011

Roads on Peat:

Outline:

- Peat
- Survey methods
- Construction methods
- Maintenance methods
- Wind farms

Floating road on peat, Ireland, 2010

ROADEX Roads on Peat

4 reports on the ROADEX website:

- ROADEX II Report, 2005
  "*Dealing with Bearing Capacity Problems on Low Volume Roads Constructed on Peat*"
- ROADEX II Guidelines, 2005
  "*Guidelines for the Management of Peat Slips on the Construction of Low Volume/Low Cost Roads over Peat*"
- ROADEX III Executive Summary, 2006
  "*Managing Peat Related Problems on Low Volume Roads*"
- FCE/SNH Report, 2010
  "Floating Roads on Peat"

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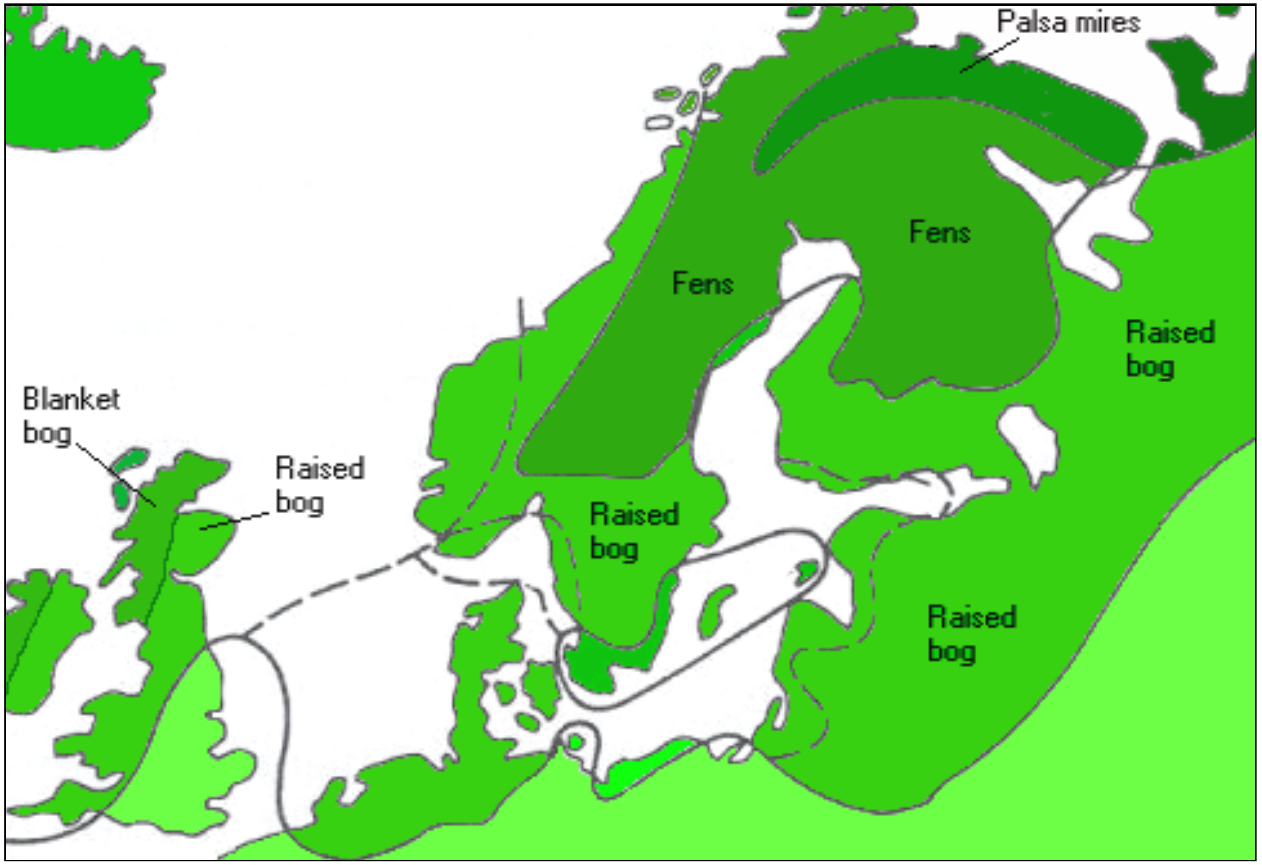
Peat across the Northern Periphery

- Palsa mires
- Fens
- Raised bogs
- Blanket Bogs



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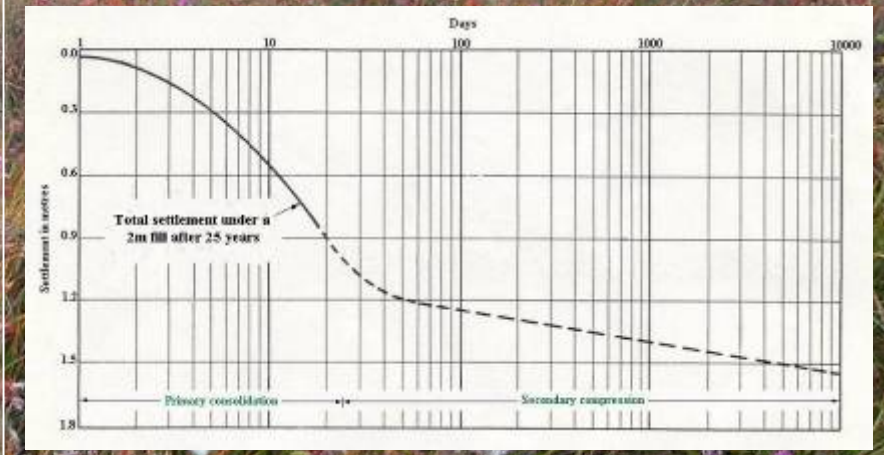
Peatlands:

- "swamps, mires, fens, and bogs"
- poor material for a road foundation?
- predominantly water + dead plant fragments
- up to 95% water, m/c up to 2000%
- variable shear strength, 2kPa to 40kPa
- primary consolidation & secondary compression
- settlement & deformation



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"The ROADEX method":

- Map the weak sections of road and FOCUS in on them
- Understand the processes causing the problems
- Innovate - find new 'fit for purpose' structures and treatments

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DATA COLLECTION:

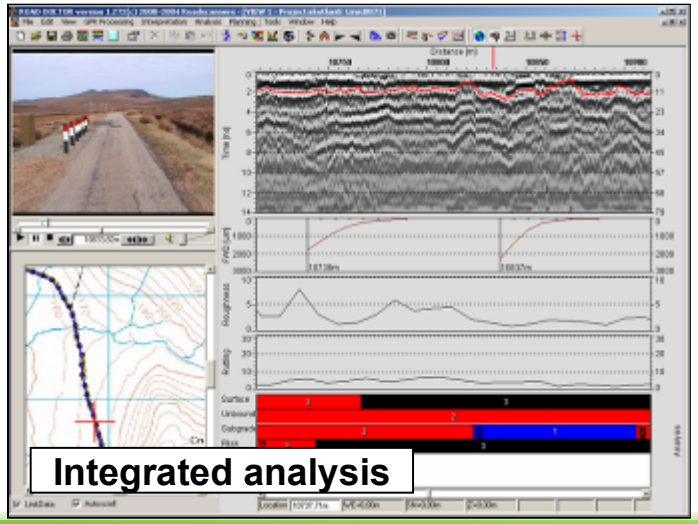
- **Falling Weight Deflectometer (FWD)**
  - bearing capacity of the road
- **Drill core data**
  - road structure verification & quality
- **Digital video**
  - pavement condition documentation
- **Profilometer**
- **Ground Penetrating Radar**
  - road structures
  - subgrade soil quality
  - reasons for road defects

DATA PROCESSING AND ANALYSIS:

- **'Road Doctor' by Roadscanners Oy**
- **ArcView**


FWD & GPS

GPR, GPS & Video


Integrated analysis

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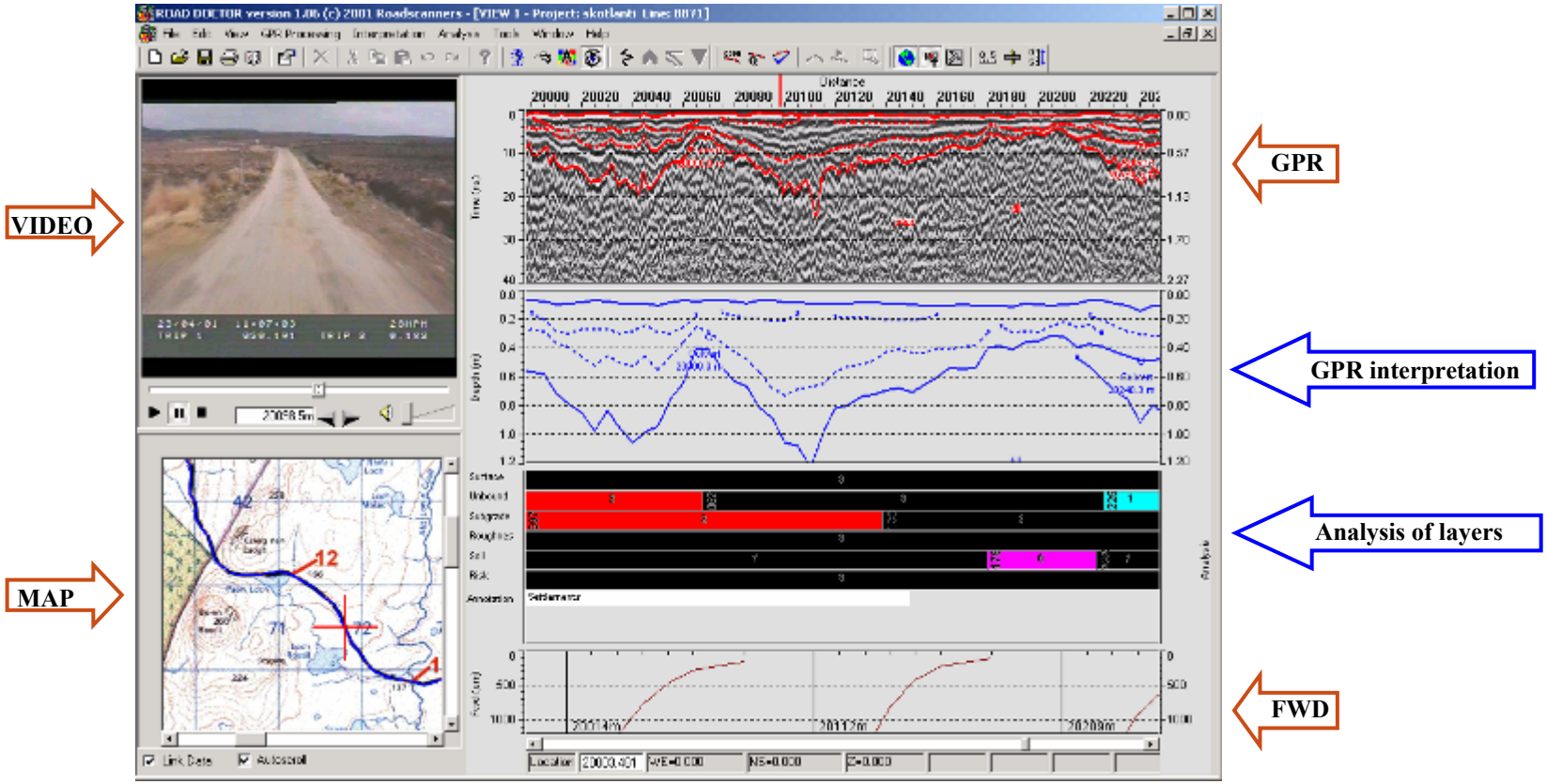
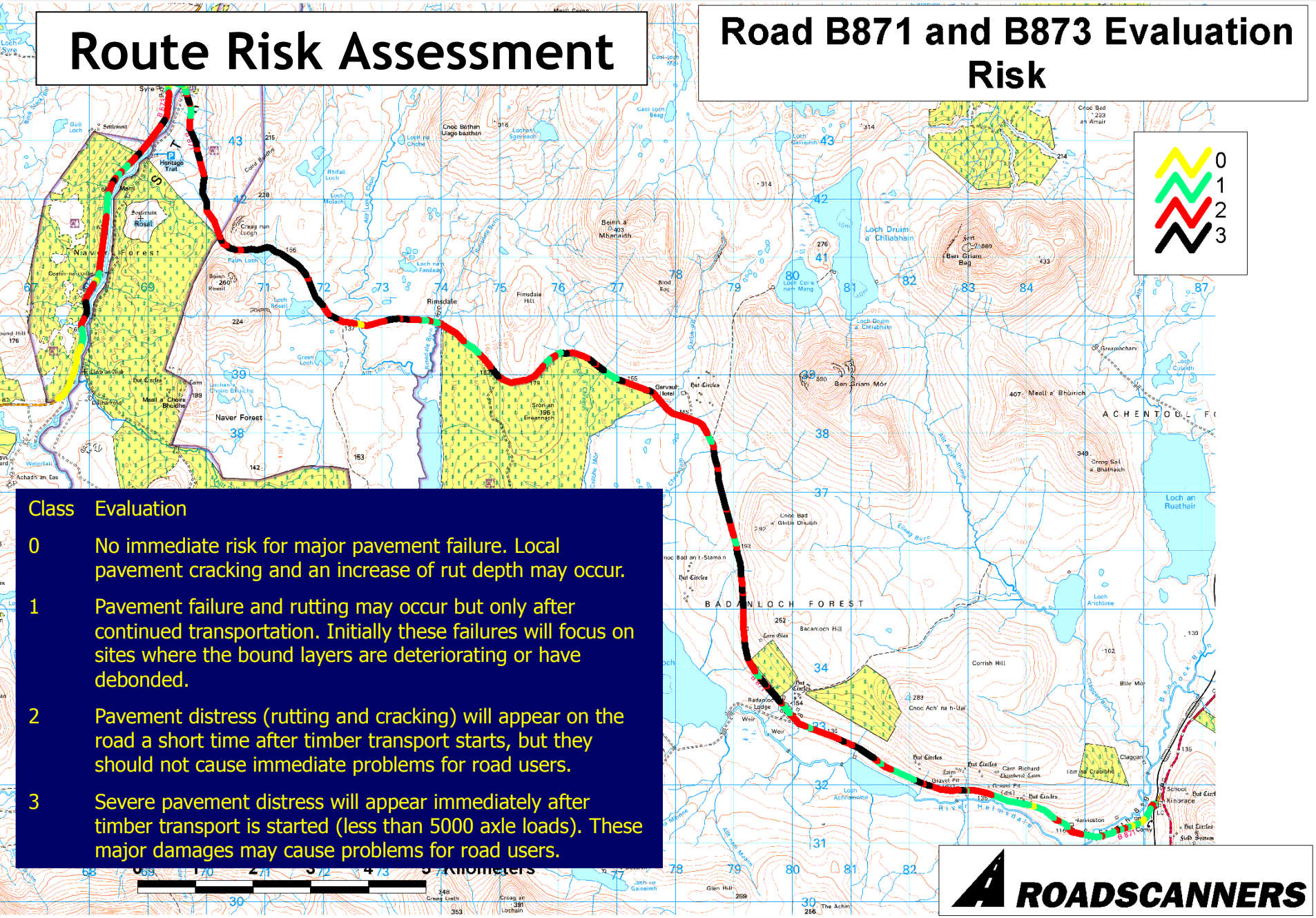
Integrated Analysis of survey data



Typical integrated analysis screen from "Road Doctor" software

Route Risk Assessment

Road B871 and B873 Evaluation Risk



Class	Evaluation
0	No immediate risk for major pavement failure. Local pavement cracking and an increase of rut depth may occur.
1	Pavement failure and rutting may occur but only after continued transportation. Initially these failures will focus on sites where the bound layers are deteriorating or have debonded.
2	Pavement distress (rutting and cracking) will appear on the road a short time after timber transport starts, but they should not cause immediate problems for road users.
3	Severe pavement distress will appear immediately after timber transport is started (less than 5000 axle loads). These major damages may cause problems for road users.

ROADSCANNERS

Rehabilitation of Roads on Peat

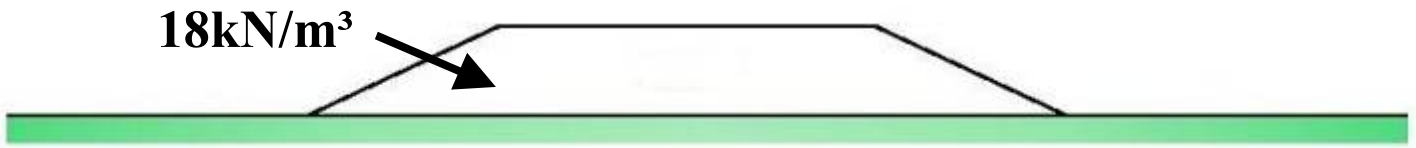
ROADEX methodology

Five stages:

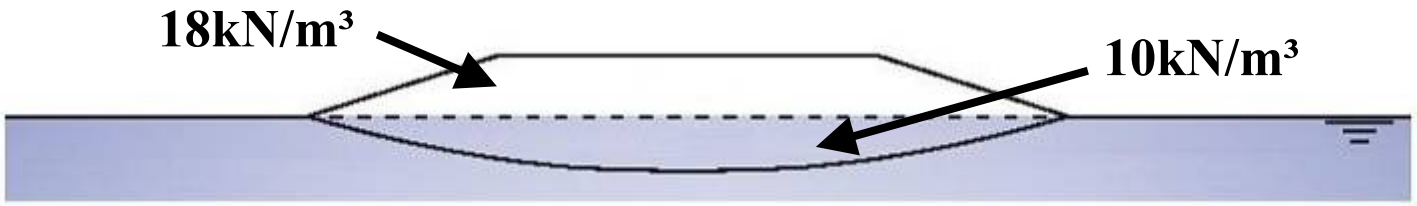
- collect data, identify the underlying problem through surveys
- analyse the collected data & understand the processes at work,
- innovate, select the most suitable rehabilitation measures,
- monitor the work during construction
- record and share the experience from the project

Rehabilitation of Roads on Peat

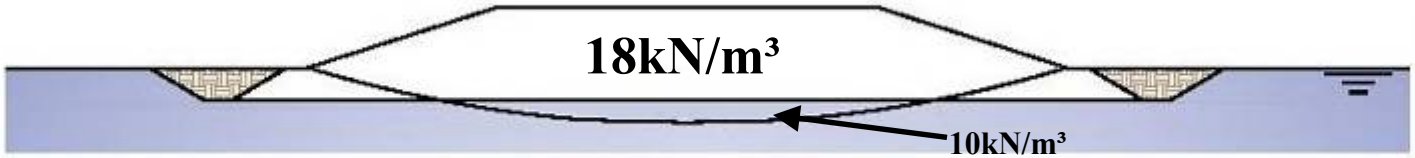
Buoyancy effects & “do no more harm”



Road on a sound foundation



Floating road on peat

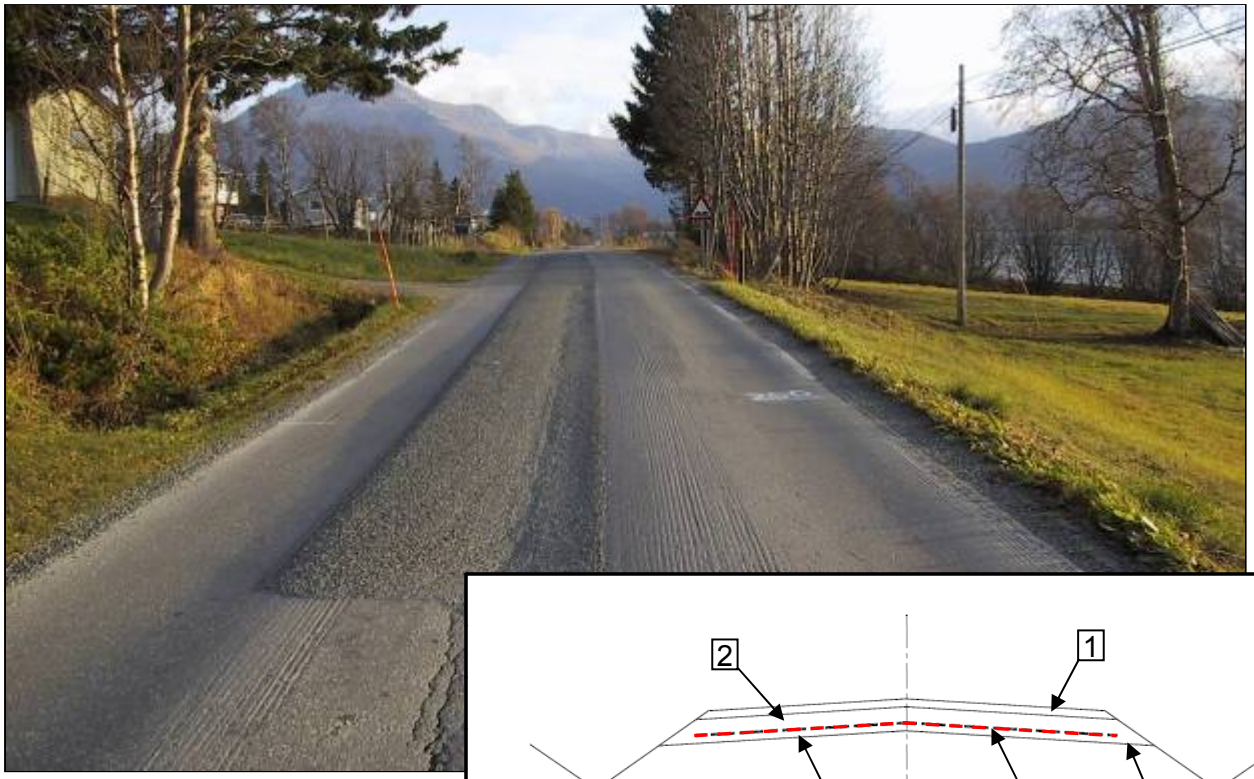


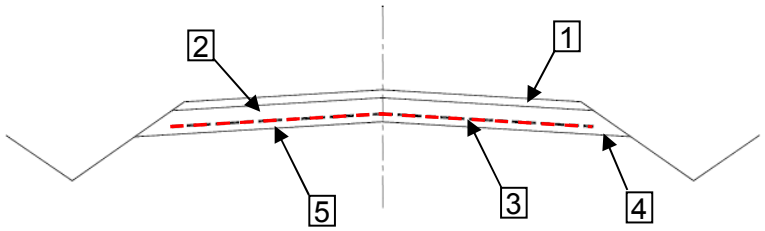
Effects of new drains on a floating road

P Carlsten SGI

Rehabilitation of Roads on Peat

Minor carriageway settlement and irregularities





No	Layer
1	Wearing course
2	Basecourse
3	Steel grid
4	Geotextile
5	Excavation limit

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Use of steel grids:

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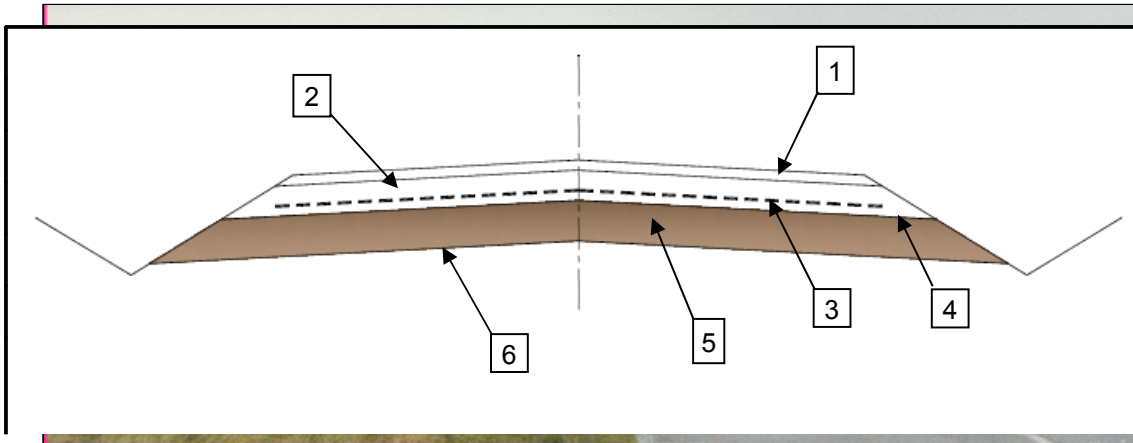
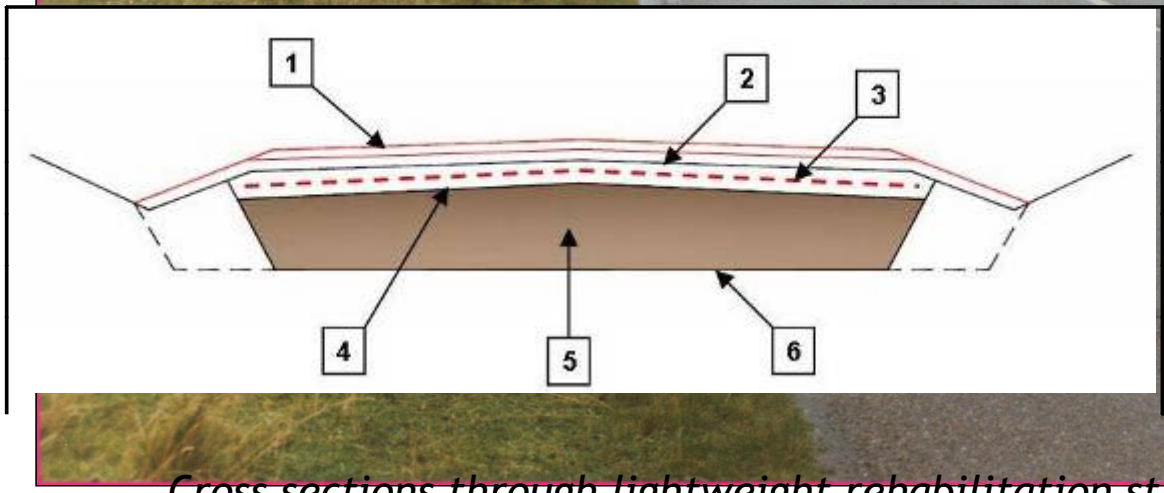
Carriageway settlement



No	Layer
1	Wearing course
2	Basecourse
3	Steel grid
4	Geotextile
5	Road layers
6	Geotextile



No	Layer
1	Wearing course
2	Basecourse
3	Steel grid
4	Geotextlle
5	LW material
6	Geotextile

Cross sections through lightweight rehabilitation structures

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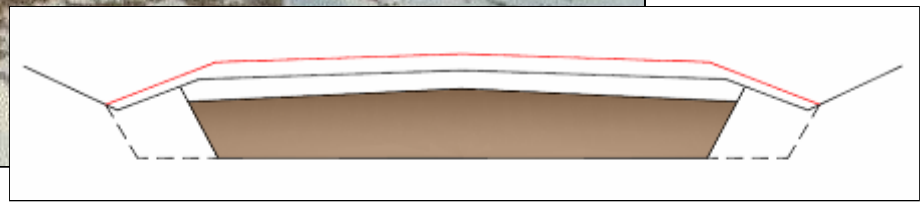
ROADEX sharing experience

Forssa-Somero Road, Finland



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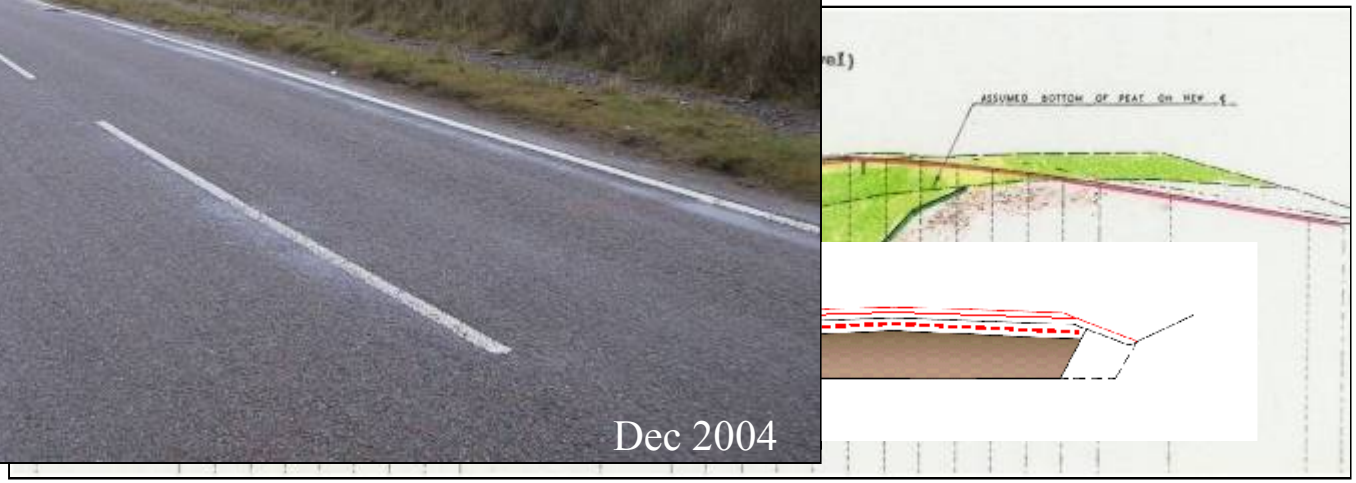
A837 Ledbeg, Scotland



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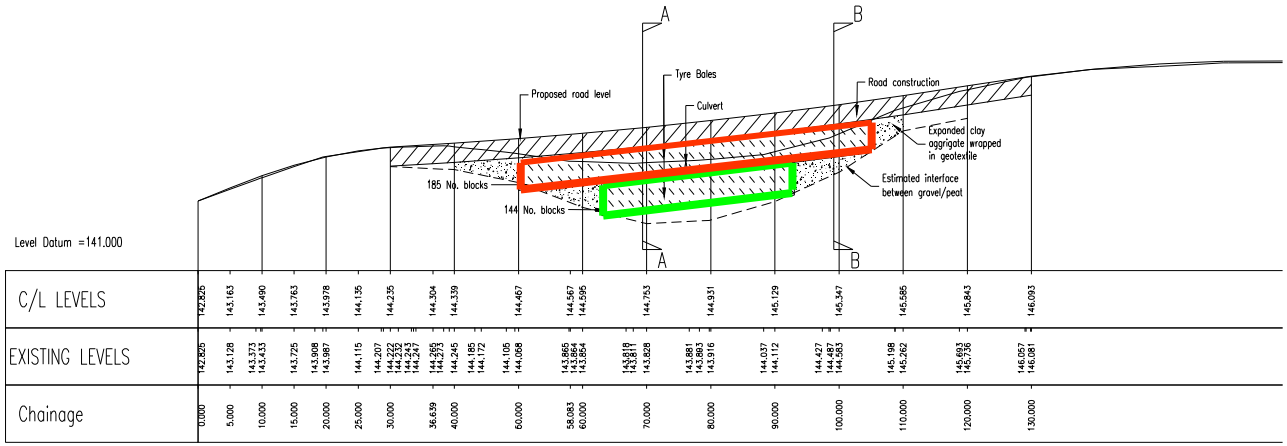
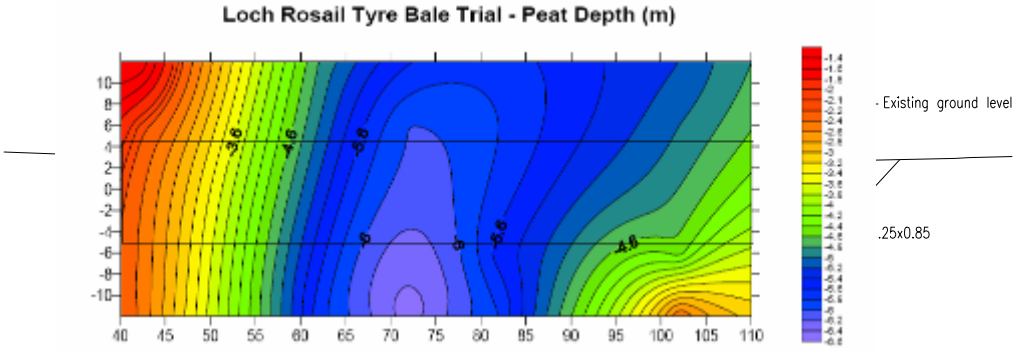
B871 Loch Rosail Tyre Bale Embankment





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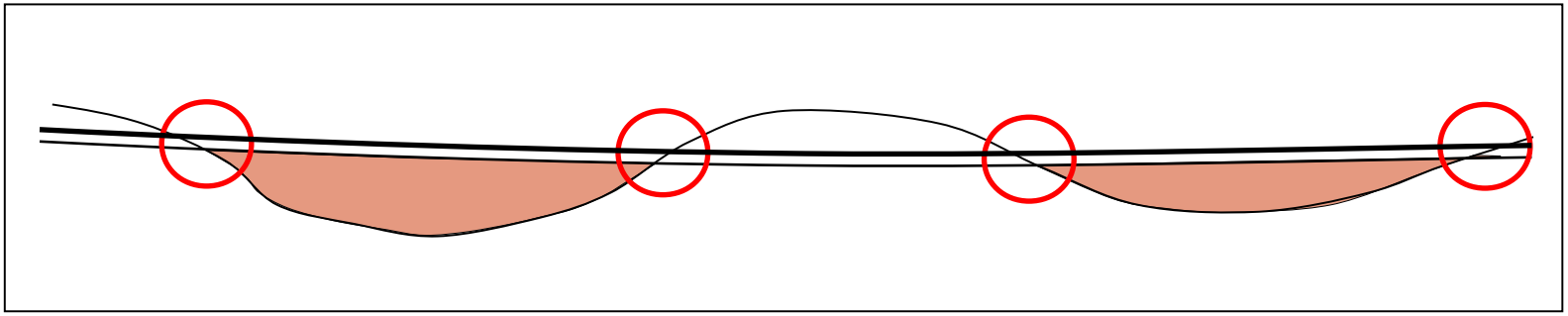
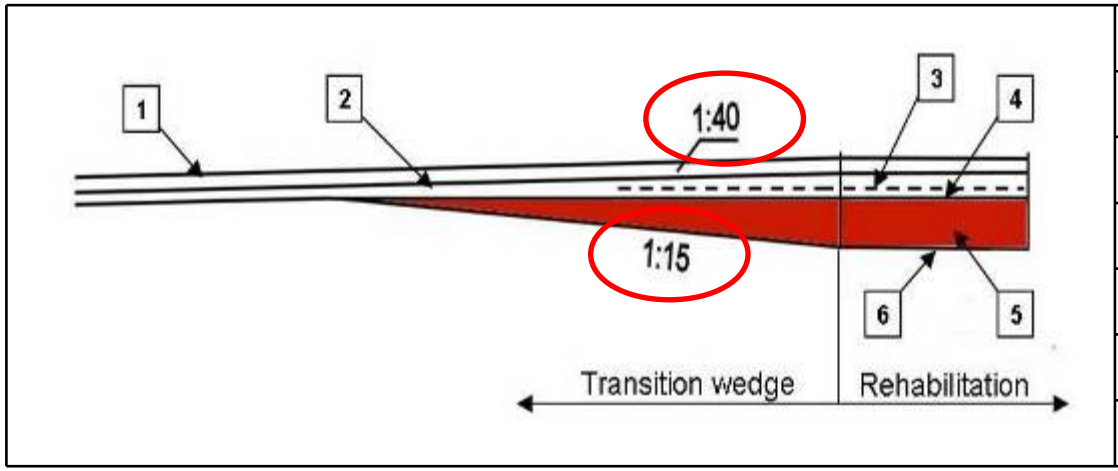
Rehabilitation of Roads on Peat

Use of tyre bales in a forest road, Ireland, 2006 (J Dempsey)

Rehabilitation of Roads on Peat

Transition wedges





No	Layer
1	Wearing course
2	Basecourse
3	Steel grid
4	Geotextile
5	LW material
6	Geotextile

Longitudinal section through a transition wedge

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Rehabilitation of Roads on Peat

Summary:

- Identify the underlying problems through survey
- Understand the processes causing the problems
- Innovate - find ‘fit for purpose’ solutions
- Try not cause any further harm
- Be innovative – and share knowledge, even the failures!

Windfarm access roads on peat

FCE/SNH “Floating Roads on Peat” guidelines

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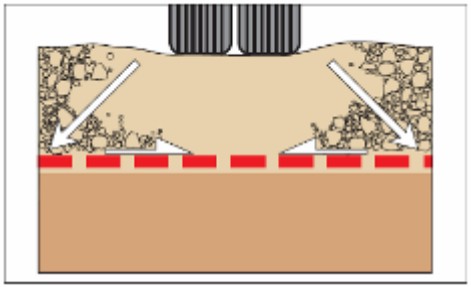
Windfarm access roads on peat

The interlock mechanism



Mechanically stabilised embankment with geogrids

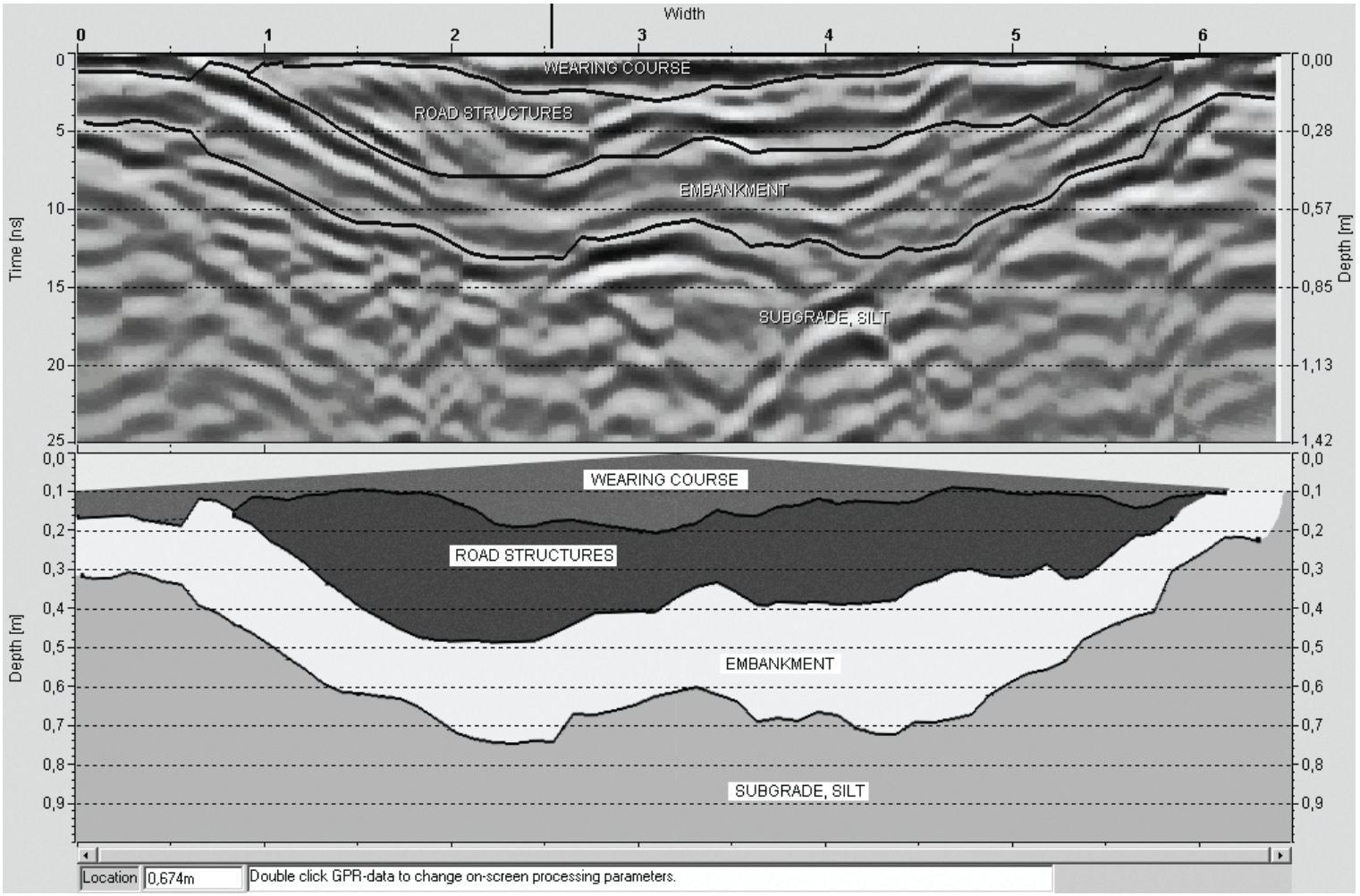
Windfarm access roads on peat

Windfarm access roads on peat

Floating roads on peat - research

GPR cross-section

Floating roads on peat - research



Typical floating gravel road cross-section with GPR

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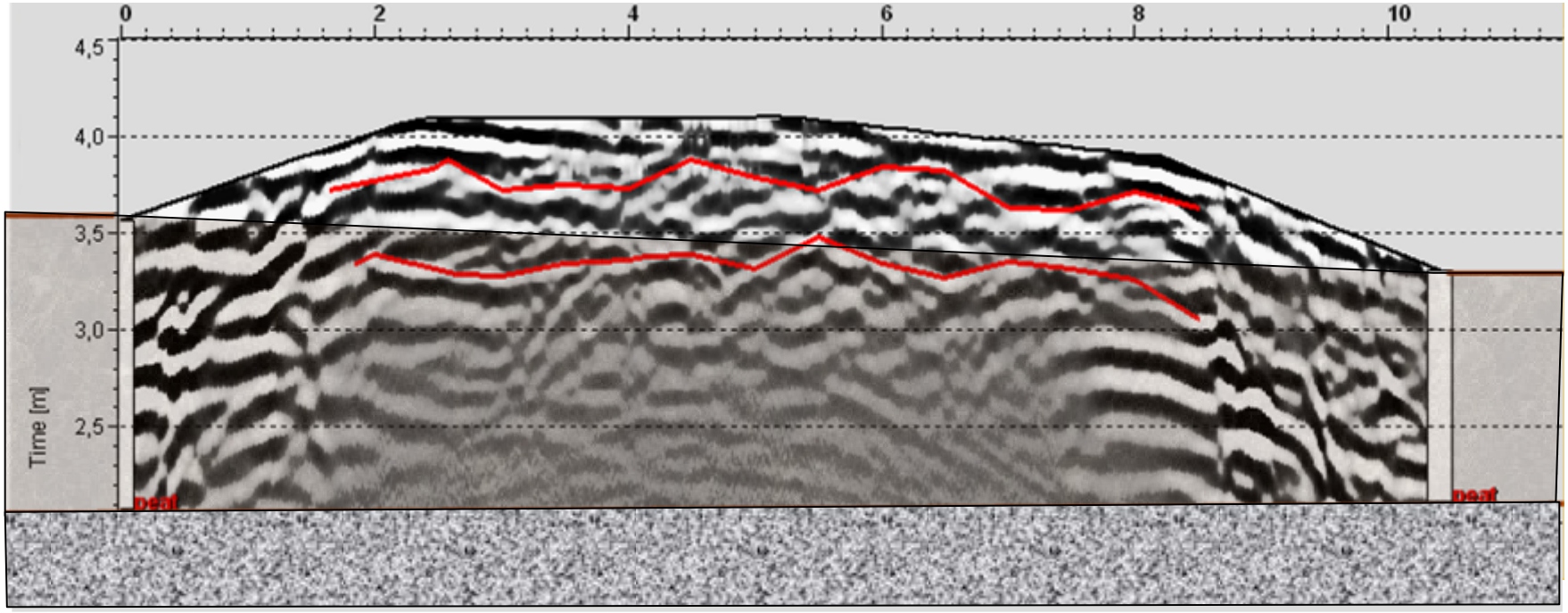
Floating roads on peat - research



GPR cross section with a two grid system

Iron age trackway, c4,000 BC, Derraghan, County Longford, Ireland

Thank you
www.roadex.org