
Muddy Roads
012

IMPROVED PERFORMANCE of UNPAVED ROADS DURING SPRING THAW

"Muddy Roads in Vermont"

A Two Year Project Funded by VTrans (Materials & Research)

Research Team:

- James Olson, P.E., Ph.D. (Univ. of VT)
- Steve Farrington (Applied Research Assoc., So. Royalton)
- Karen Henry, Ph.D. (U.S.A.C.E.-CRREL)
- John Lens, P.E., M.S. (GeoDesign)

Objectives

Investigation of new and existing technologies that can mitigate loss of serviceability of unpaved roads in the Spring

Locate suitable sites in Towns near the research team and obtain Town support for the construction of test sections

Objectives (cont.)

Plan an instrumentation and monitoring program to evaluate changes over time for variables such as:

- Strength of the pavement profile
- Temperature vs. depth
- Soil moisture vs. depth
- Surface condition of the roads (visual)

Technologies considered

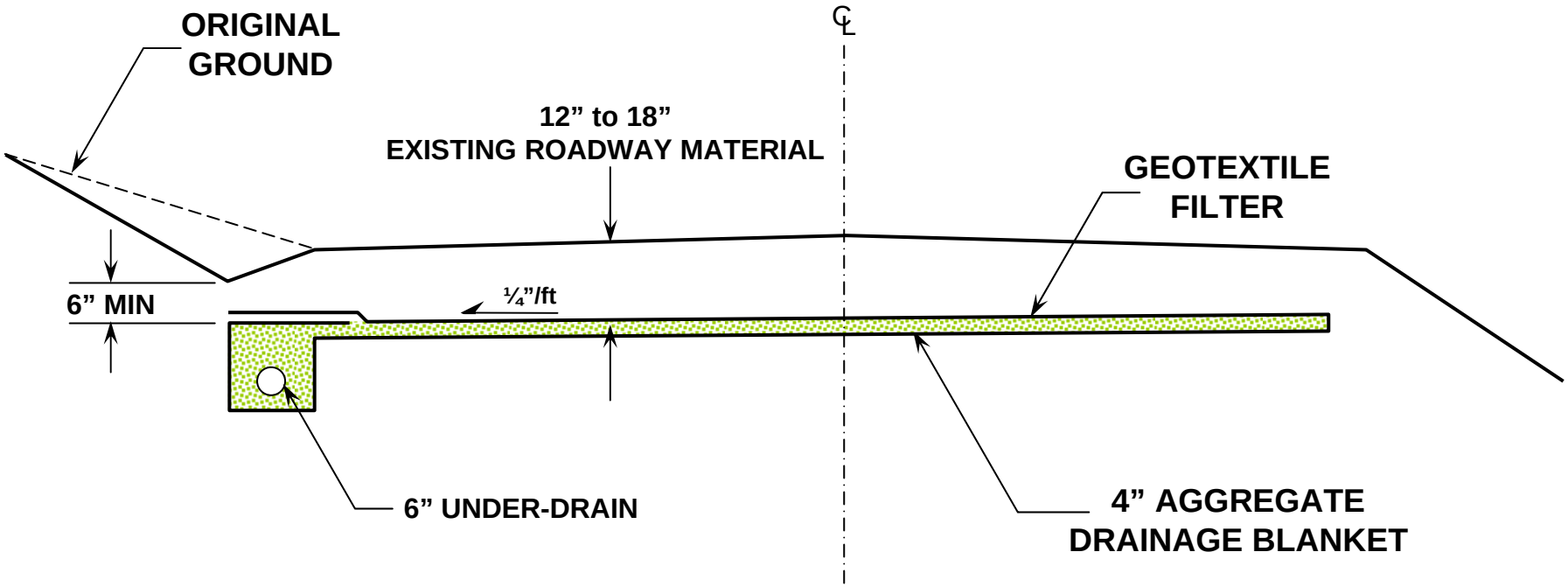
- Geosynthetics
  - geotextile reinforcement
  - geogrids
  - geocells
  - patented GCBD
- Drainage improvements
  - gravel wrapped in fabric; lateral drain
- Cement stabilization
- Asphalt emulsion stabilization
- Conventional reconstruction

Products selected and company support

Geocells – 4” depth and 6” depth provided by Presto Geosystems

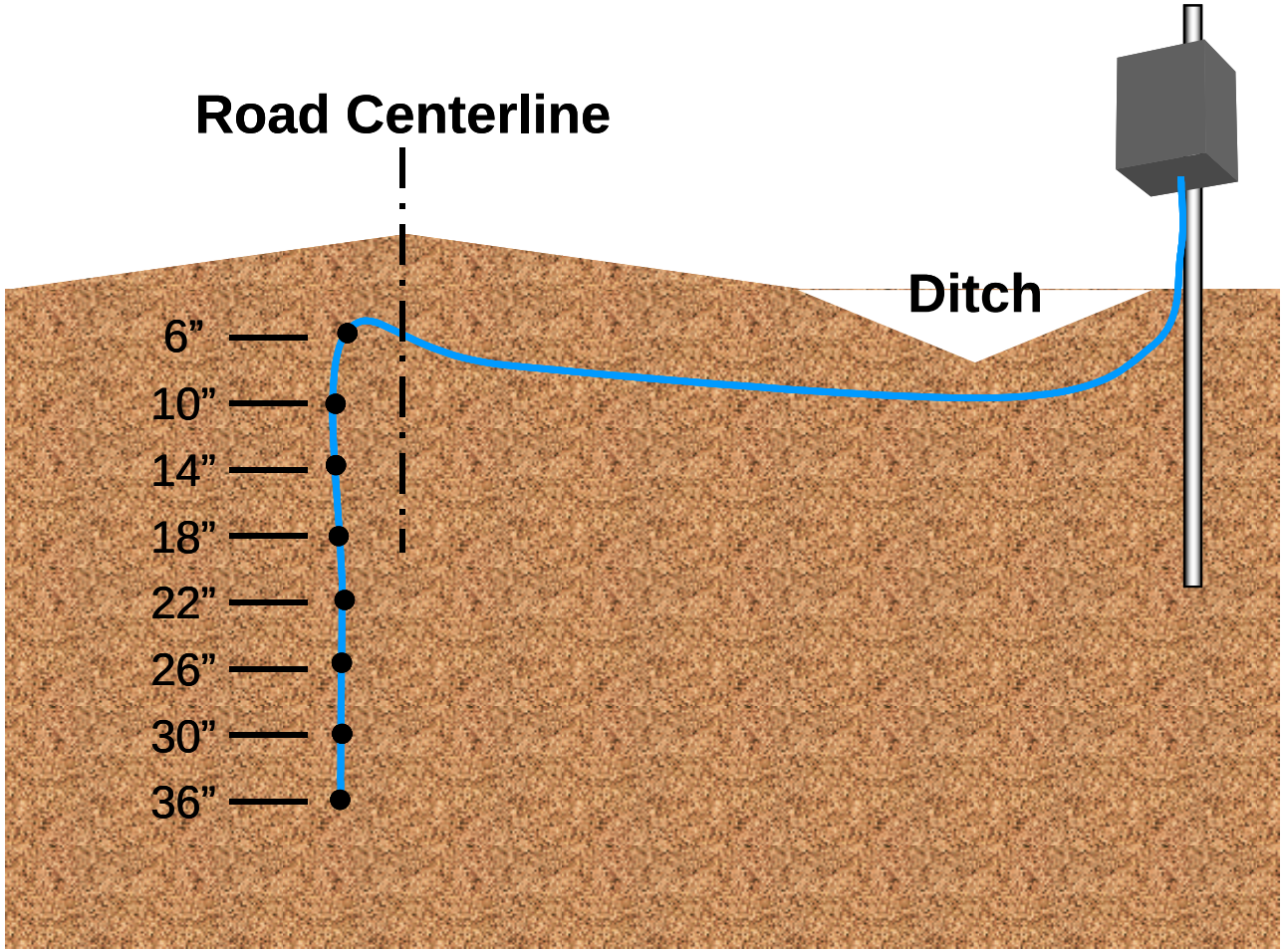
Tensar Geogrid – two strengths of biaxial grid provided by Contech

Cement – 250 bags of Portland cement to each site provided by the No. East Cement Suppliers group (STG and SGI)


ORIGINAL GROUND
℄
12” to 18”
EXISTING ROADWAY MATERIAL
GEOTEXTILE FILTER
6” MIN
¼”/ft
6” UNDER-DRAIN
4” AGGREGATE DRAINAGE BLANKET

Portable Dynamic Cone Penetrometer

In-Situ Instrument Array



March 10, 2003

March 10, 2003

March 26, 2003

March 26, 2003

March 28, 2003

March 28, 2003

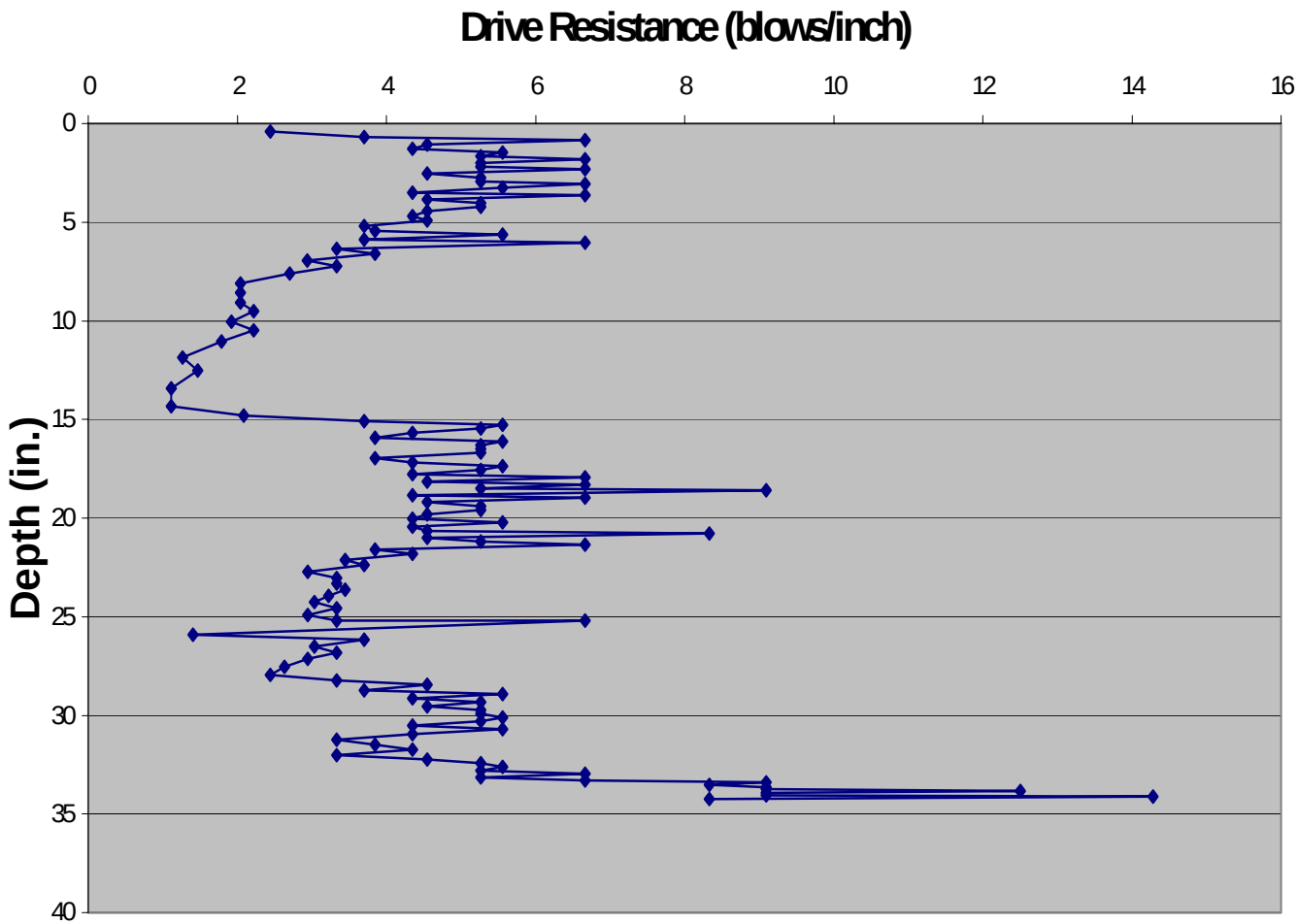
March 28, 2003

April 1, 2003

April 1, 2003

April 1, 2003

Driving Resistance vs. Depth
Geocell #1n - 4/15/03



April 8, 2003

April 8, 2003

April 8, 2003

April 10, 2003

Preliminary Cost Data

4” deep geocells @ $4.50/sq. yd.	= $63,360 per mile
6” deep geocells @ $6.75/sq. yd.	= $95,040 per mile
Tensar geogrid @ $1.60/sq. yd.	= $22,528 per mile
Tensar geogrid @ $2.80/sq. yd.	= $39,424 per mile
Cement additive @ $5.50/bag	= $72,600 per mile
Cement additive @ $7.15/bag	= $93,380 per mile
Patented GCBD @ $5.25/sq. yd.	= $73,920 per mile
Geotextile separator @ $1.08/sq.yd.	= $15,210 per mile

Labor costs (est.) @ $800 to $1000 per day adds $47,520 per mile

The End of