BIO-DEGRADABILITY OF JGT—DOES IT AFFECT EFFECTIVENESS?

There is hardly any difference between synthetic geotextiles (SGT) and Jute Geotextiles (JGT) functionally. As in the case of SGT, JGT perform the four major functions *viz.* separation, filtration, drainage and initial reinforcement, albeit for a shorter duration. The question often raised by civil engineers is as to how JGT could function after bio-degradation. This aspect was studied by Profs S D Ramaswamy & M A Aziz of Singapore National University way back in late 1980s (vide their paper presented in the International workshop on Geotextiles held on 22-29 November 1989). Their findings were—

- ✓ Percentage elongation at break of JGT is significantly lower than that of synthetic geotextiles (maximum 15% against more than 50 % of SGT)
- ✓ Substantial reduction (more than 50%) in rut depth under dynamic load tests with JGT
- ✓ Loss of strength of JGT after a year is not a deterrent as, by that time, JGT is seen to have helped in providing a self sustaining sub-grade for most type of soils
- ✓ The gain in strength of the sub-grade with time is compensated against the loss of strength of JGT within the same time frame

In another project undertaken by Jadavpur University, Kolkata under Prof N Som in 2005 with funding from National Jute Board (then JMDC) the last inference was corroborated. The findings are pointer to the fact that JGT and, for that matter, all geotextiles act as change agent to soil and trigger soil consolidation process after about 6 to 7 months as found by Ramaswamy & Aziz. Soil consolidation is a protracted process and may continue for years to attain the condition of 'effective stress'. In fact soil consolidation gets optimized after a short period varying between one year and one & half depending on the soil type and imposed load. In all the field trials conducted so long, sub-grade CBR% increased by at least 1.5 times the control value after about the period stated. Interestingly CBR% was seen to have progressively increased even after bio-degradation of JGT (3 to 4 times).

All the studies and field applications especially in road construction substantiate that bio-degradation of JGT is not a technical disadvantage as is commonly perceived.

4. FAQs

a) Is short life of JGT is a technical disadvantage?
   Reply—Already covered under Sl 5.
b) What is the extent of cost savings in case of use of JGT?
   Reply—Covered under sl (4).
c) Fluctuation in JGT rate affects estimation of project cost
   Reply—This is a problem as the end-users want to have a stable rate of JGT that will remain valid for at least a year. Rates incorporated in SoRs are usually not revised before a year. The matter has been taken up with IJMA.

BIO-DEGRADABILITY OF JGT—DOES IT AFFECT EFFECTIVENESS?

There is hardly any difference between synthetic geotextiles (SGT) and Jute Geotextiles (JGT) functionally. As in the case of SGT, JGT perform the four major functions *viz.* separation, filtration, drainage and initial reinforcement, albeit for a shorter duration. The question often raised by civil engineers is as to how JGT could function after bio-degradation. This aspect was studied by Profs S D Ramaswamy & M A Aziz of Singapore National University way back in late 1980s (vide their paper presented in the International workshop on Geotextiles held on 22-29 November 1989). Their findings were—

- ✓ Percentage elongation at break of JGT is significantly lower than that of synthetic geotextiles (maximum 15% against more than 50 % of SGT)
- ✓ Substantial reduction (more than 50%) in rut depth under dynamic load tests with JGT
- ✓ Loss of strength of JGT after a year is not a deterrent as, by that time, JGT is seen to have helped in providing a self sustaining sub-grade for most type of soils
- ✓ The gain in strength of the sub-grade with time is compensated against the loss of strength of JGT within the same time frame

In another project undertaken by Jadavpur University, Kolkata under Prof N Som in 2005 with funding from National Jute Board (then JMDC) the last inference was corroborated. The findings are pointer to the fact that JGT and, for that matter, all geotextiles act as change agent to soil and trigger soil consolidation process after about 6 to 7 months as found by Ramaswamy & Aziz. Soil consolidation is a protracted process and may continue for years to attain the condition of 'effective stress'. In fact soil consolidation gets optimized after a short period varying between one year and one & half depending on the soil type and imposed load. In all the field trials conducted so long, sub-grade CBR% increased by at least 1.5 times the control value after about the period stated. Interestingly CBR% was seen to have progressively increased even after bio-degradation of JGT (3 to 4 times).

All the studies and field applications especially in road construction substantiate that bio-degradation of JGT is not a technical disadvantage as is commonly perceived.