



Notes on Enviro Span Installations on Problematic Soils in Remote and Difficult Access (organic or plastic soils)

There are special circumstances for Enviro Span installations that can occur in areas of compressible organic soils (e.g. muskegs) or possibly in very deformable plastic soils (e.g. saturated clays). Particularly in Canada, there are vast areas of resource extraction that must be accessed via very difficult muskeg conditions. These conditions require innovative methods in order to succeed and are commonly accessed with such methods as geotextiles, geogrid, corduroy, etc.

Crossings like this are a composite of the approaches and the arch (the whole is greater than the sum of the parts) and they should be installed as an integrated unit. By integrating all of the parts of the installation, one can generate an installation that will “float” on top of the problematic soil as a unit. Also, due to the overall elasticity of the installation and the Enviro Span itself, such a crossing will survive and perform even with substantial movement in the compressible or plastic soils. The following describes one way of achieving this:

1. Construct the base for the approaches with a combination of corduroy and structural geotextile and/or grid. Since mineral soils and/or gravel for fill are often at a premium in such locations, the use of these other materials will allow construction where otherwise, it might not be possible.
2. At the stream bank, allow the geotextile to extend well past the edge of the stream. Place the footing log on top of the textile at the stream bank and then wrap the textile around the footing log and lay it back over on top of the approach.
3. Set the Enviro Span up on the textile wrapped footings.
4. Then lay textile over top of the arch and extend it well out onto the approaches.
5. Then add fill over top of everything to lock it all together into an integrated unit.
6. In situations where suitable fill material is extremely sparse, corduroy may be used to supplement the fill in the approaches (right where the approach is the deepest, adjacent to the arch) so more of the good fill available for the top of everything. Make sure to “cushion” the arch with some softer fill prior to laying in the supplemental corduroy fill.

7. At this point, you will have a composite installation that spreads the footing load out onto the larger footprint of the approaches. This approach uses the same concept as other methods of crossing compressible organics (muskeg) by simply distributing loads over the largest possible footprint.

Note: Additionally, when it is time to place the arch on top of the log footings, it can be done by hand (just two people to place it and throw on the collars) and no machine has to walk right to the edge of the creek with the possibility of disturbing the area any more than necessary. Once the arch is set upon the footings, then the hoe can start working toward the arch with the fill so that by the time the machine reaches the creek, it is walking on the thickest part of the fill. The other approach can then be completed from the arch outward because the arch is narrow enough for the hoe to reach over it to get the fill started on the other side. In this way, there is no need for the equipment to cross the stream at any time during the installation.

Ron Hammerstedt

Enviro Span in a “floating” crossing over a string bog in the James Bay Lowlands of Ontario.





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