CLAIMS

1. A method of constructing an underground tunnel, the method comprising the steps of:

drilling a first bore along a first predetermined path through underlying geology, the first bore having a length of at least 25m;

drilling a plurality of second bores along respective second predetermined paths through the underlying geology, each of the respective second predetermined paths being substantially parallel to the first predetermined path in order for the plurality of second bores alone, or a combination of the plurality of second bores and the first bore together, to define a substantially prism-shape region having a cross-section of a geometric shape along an entire length of the first and second bores, the geometric shape and a size of that shape being constant along the entire length;

lining any one of the first bore and the plurality of second bores with a liner, the liner having holes therein;

treating the underlying geology through the holes in specific pre-defined directions, in advance of excavating the material in order to increase efficiency of excavating the material; and

excavating material within the substantially prism-shape region to form a tunnel.

2. The method of claim 1, wherein excavating material within the substantially prism-shape region to form a tunnel is carried out from a tunnelling shield, the tunnelling shield comprising a plurality of probes on a leading edge thereof, each probe of the plurality of probes aligned with a respective bore of the first bore and plurality of second bores, each probe equipped with optionally interchangeable tools that allows each probe to excavate from within the first and/or second bores.

3. The method of either one of claim 1 or claim 2, wherein treating comprises hydraulic fracturing of the material within the substantially prism-shape region.

4. The method of any preceding claim, wherein treating comprises stabilising the underlying geology outside the substantially prism-shape region.

5. A system for constructing an underground tunnel according to the method of any preceding claim, the system comprising:

directional drilling equipment configured to drill the first bore and the plurality of second bores;

liners disposed within any one of the first bore and the plurality of second bores, the liner having holes therein;

treating equipment configured to treat the underlying geology through the holes in specific pre-defined directions, in advance of excavating the material in order to increase efficiency of excavating the material; and

excavation equipment configured to excavate the material within the substantially prism-shape region defined by the first bore and the plurality of second bores to form a tunnel.

CLAIMS

1. A method of constructing an underground tunnel, the method comprising the steps of:

drilling a first bore along a first predetermined path through underlying geology, the first bore having a length of at least 25m;

drilling a plurality of second bores along respective second predetermined paths through the underlying geology, each of the respective second predetermined paths being substantially parallel to the first predetermined path in order for the plurality of second bores alone, or a combination of the plurality of second bores and the first bore together, to define a substantially prism-shape region having a cross-section of a geometric shape along an entire length of the first and second bores, the geometric shape and a size of that shape being constant along the entire length;

lining any one of the first bore and the plurality of second bores with a liner, the liner having holes therein;

treating the underlying geology through the holes in specific pre-defined directions, in advance of excavating material in order to increase efficiency of excavating the material; and

excavating the material within the substantially prism-shape region to form the tunnel.

2. A method according to Claim 1, in which excavating the material within the substantially prism-shape region to form the tunnel is carried out from a tunnelling shield, the tunnelling shield comprising a plurality of probes on a leading edge thereof, each probe of the plurality of probes aligned with a respective bore of the first bore and plurality of second bores, each probe equipped with optionally interchangeable tools that allows each probe to excavate from within the first and/or second bores.

3. A method according to Claim 1 or 2, in which the step of treating the underlying geology comprises hydraulic fracturing of the material within the substantially prism-shape region.

4. A method according to Claim 1, 2 or 3, in which the step of treating the underlying geology comprises stabilising the underlying geology outside the substantially prism-shape region.

5. A system for constructing an underground tunnel according to the method of any preceding claim, the system comprising:

directional drilling equipment configured to drill the first bore and the plurality of second bores;

liners disposed within any one of the first bore and the plurality of second bores, the liners having holes therein;

treating equipment configured to treat the underlying geology through the holes in specific pre-defined directions, in advance of excavating material in order to increase efficiency of excavating the material; and

excavation equipment configured to excavate the material within the substantially prism-shape region defined by the first bore and the plurality of second bores to form the tunnel.