Southampton to London Pipeline Project

Non-technical summary of open-cut construction techniques through root protection areas in Queen Elizabeth Park, Farnborough.

This document builds on the description of open-cut construction techniques set out in the certified Code of Construction Practice (CoCP) and Site-Specific Plan (SSP) for Queen Elizabeth Park. It references the commitments contained in the consented Development Consent Order (DCO), which includes methods committed to in the certified outline Landscape and Environmental Management Plan (LEMP).

When undertaking works within root protection areas there are two key reference documents within the certified DCO and discharge plans. These are:

1. LEMP Appendix C: Approach to Ancient Woodland and Veteran Trees.
   Please note, in Rushmoor Borough, there is no ancient woodland within the Order Limits. There are several Veteran Trees within the Order Limits, and in Queen Elizabeth Park there are two veteran Trees (the beech tree known as the fairy tree, and a second beech tree). This document has been agreed with Natural England and the Forestry Commission and was certified within the Outline LEMP.

2. LEMP Appendix D: Methodology for working near trees.

These two documents set out the framework for the protection and health of retained trees during construction of the replacement pipeline. The project has also committed in the DCO to having works in RPAs supervised by the Environmental Clerk of Works (ECoW) and supported by an experienced arboriculturist. In Queen Elizabeth Park, this would mean that a specialist is actively supervising the open-cut works, providing direction, and if required, to stop works to protect and maintain the health of retained trees.

In addition, at the request of several Councils including Rushmoor Borough Council, the project has committed to following the British Standard 5837:2012 when undertaking works.

The typical structure of tree roots

To understand how installation of the replacement pipeline can be safely undertaken through root protection areas, it is first important to understand the typical structure of tree roots.

It is helpful to visualise root systems as a 'plate' under the tree. Tree roots prefer loose aerated soils, and so typically 90% of all roots form in the top 60cm of soil. They extend out from the tree horizontally in all directions, although if the top 60cm of soil is compacted, often due to paths, or other activity, then there may be fewer roots in these areas.

Typically, there are between 4 and 12 thick and woody tree roots (lateral roots) that are key to maintaining the stability of the tree. The number of lateral root increase from 4 to 12 as the tree ages and can be up to 30cm in diameter. These roots extend over 2-3m distance from the tree trunk where they are usually quickly taper to 2-5cm in diameter. At this point they are more flexible and contribute less to the stability of the tree overall. Finer roots then branch off from these thicker roots and are responsible for nutrient collection.

Constructing through root protection areas

The certified Queen Elizabeth Park Site-Specific Plan describes the approach to open-cut works. The recent updates to the alignment do not change this approach seen below:

"The project Environmental Clerk of Works and arboriculturist will monitor and provide advice when any works to trees, such as branch removal, are required. Hand digging and air lance techniques or similar British Standard–approved techniques will be utilised when excavating within the RPA"

A descriptive summary of "*excavating within the RPA"* is provided below.

When digging amongst roots, the project will use industry standard techniques to clear the trench while leaving established tree roots in pace. These techniques include;

- Hand digging: using hand tools to loosen, dig and remove soil.
- Air lances: these use pressured air to loosen the soil.
- Vacuum excavation: this sucks the loosened soil out of the trench.

This will create a trench that is crossed by tree roots, most of which are anticipated to be in the upper 60cm. While working around tree roots, following the British Standard 5837:2012, thicker roots would be wrapped and protected. Due to the typical structure of tree roots, the bottom half or more of the trench is unlikely to have roots crossing or projecting into it. To insert the pipe into the trench there are two options.

1. The installation team will carefully lift or move roots out of the way to insert the replacement pipe. The length of pipe inserted will depend on the formation of roots within the trench.

2. At a suitable location, the trench would be widened (a bell-hole) to allow a person to safely work within the trench. The pipe would be inserted and pushed under the area to avoid interactions with exposed roots. This bell-hole would also be used for the welding of the pipe. The most appropriate location is selected by the Construction Manager, following advice and agreement with the arboriculturist.

When working around trees, ground protection will be used in root protection areas to make sure that ground compaction does not occur. The existing hard surfacing will be used in the main with localised areas being protected with woodchip and/or track-matting.

Context regarding the updated alignment

The alignment in the certified Site-Specific Plan for Queen Elizabeth Park already crosses the root protection areas of the two veteran trees, as well as a number of other trees within the narrow working area for open-cut works. The updated alignment in the submitted SSP does not change the working methodology that the project has already committed to use for installation.