Earthworks

You said: "Sensitive land shaping must take precedence over long-term planting programmes."

We did:

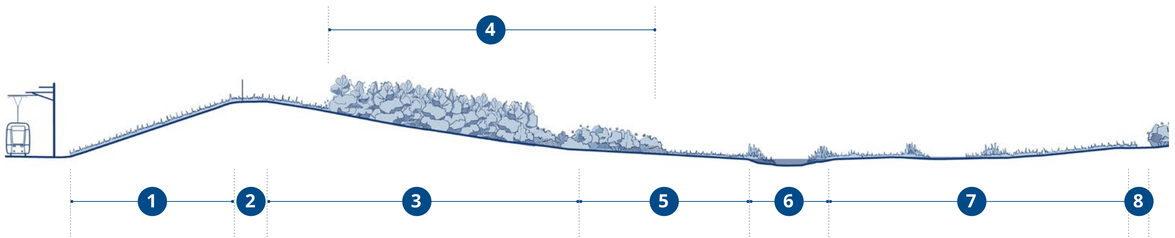
Consider placement of earthworks

The earthworks design has been configured to reflect the existing pattern of ridges and valleys which will wrap around the new railway footprint.

To achieve this, the ground profiles are created by placing the majority of the material from the tunnel excavation on land within the south east and south west area of the site, with relatively small volumes placed above the South Portal areas.

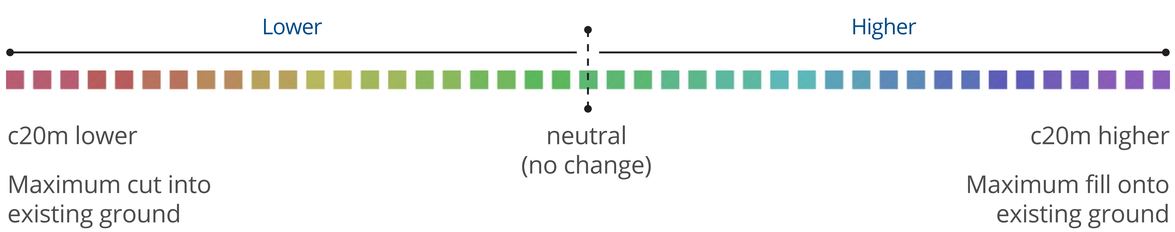
Key

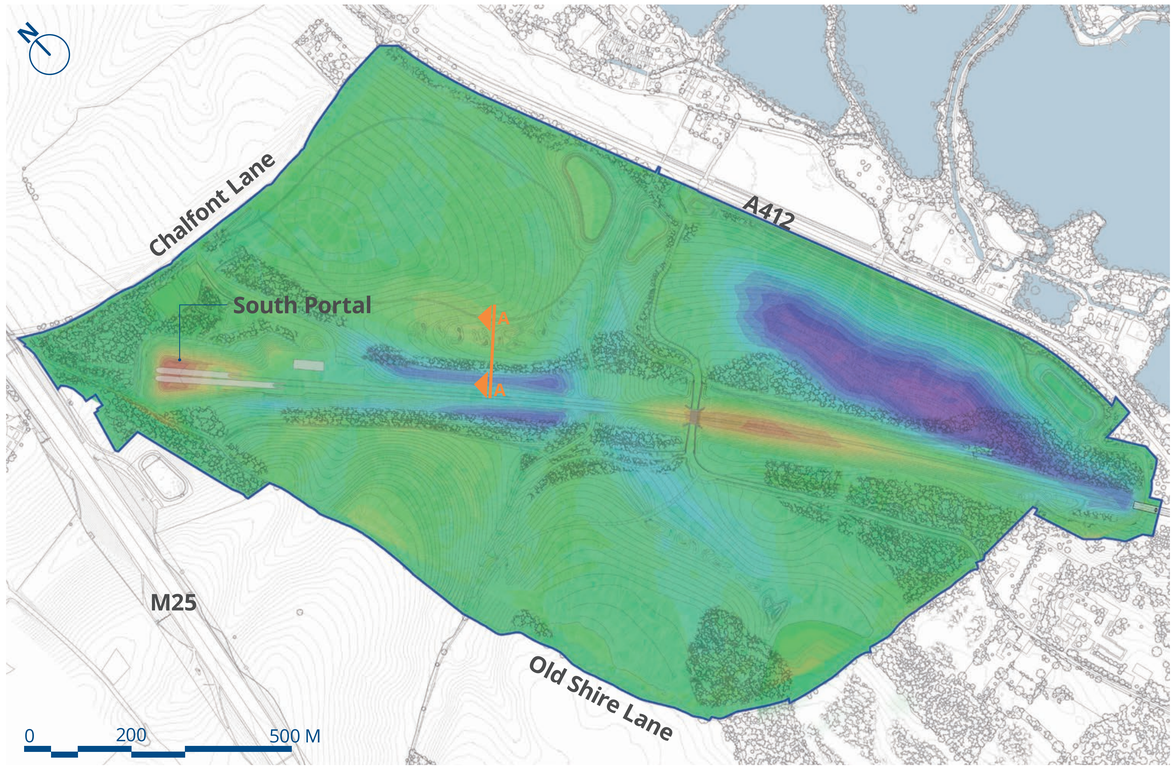
1. Earthworks designed for noise and visual attenuation
2. Rounded shoulders at transition points (flattened top for maintenance access)
3. Concave transition slope
4. Planting incorporated to soften appearance of slope
5. Gradual change in gradient at bottom of slope to flatter profile
6. Localised variations to break up slope - optimised for habitat purposes
7. Shallow profiles to control rate of surface water flows
8. Flat areas created to provide inclusive public access



Section A-A: principles of slope design

Key





Site plan - Cut / fill volumes compared with pre-mobilsation ground levels

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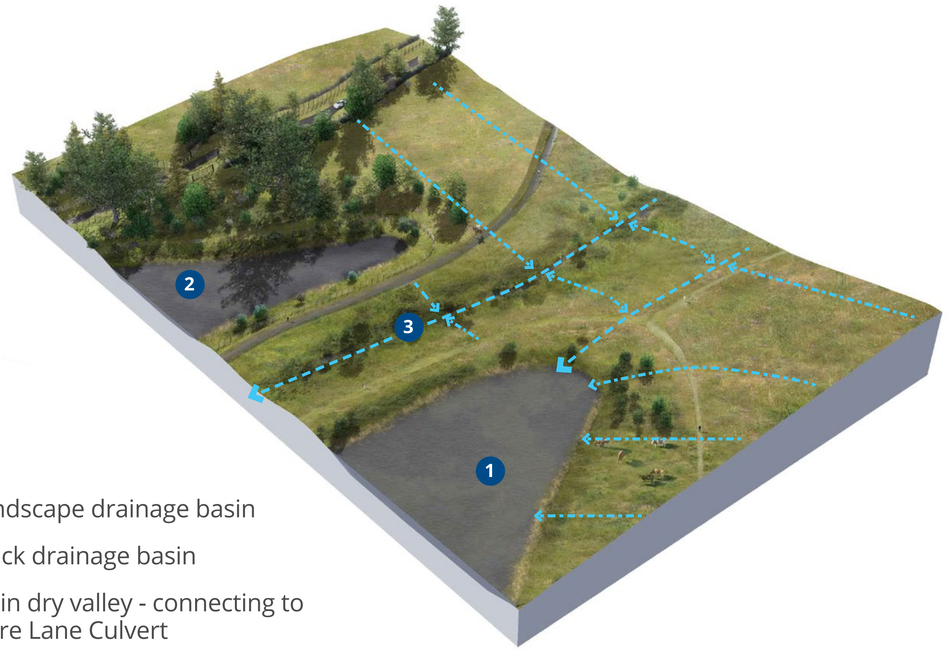
Earthworks - Drainage

We did:

Reinstate the natural drainage patterns

The permanent drainage proposals include the use of earthworks to create a series of crests and dry valleys to naturally direct and control water runoff.

In addition, a series of ditches, drainage basins and underground pipes are used to deal with surface water from the track, vegetated areas and highways; ensuring that the rate at which surface water is taken off the site and enters the wider drainage system is the same as before construction of the railway.

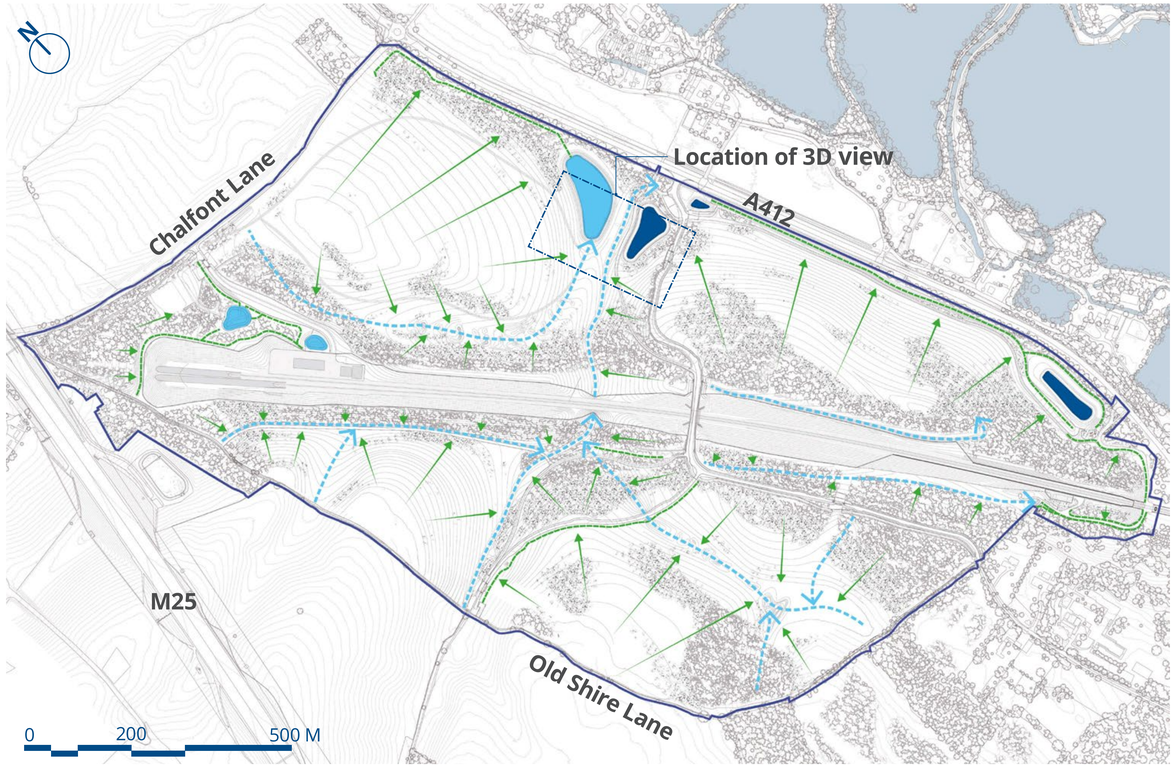


1. Landscape drainage basin
2. Track drainage basin
3. Main dry valley - connecting to Shire Lane Culvert

3D view - Track and landscape drainage design principles

Key

- Landscape drainage basin
- Track and highways drainage basin
- Landscape dry valley
- Landscape drainage ditch
- Landscape surface water drainage flow



Site plan - Track and landscape drainage strategy

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Earthworks - Noise

You said: "Any land shaping should be done to minimise noise impacts as well as visual ones."

We did:

Design earthworks to mitigate noise impacts

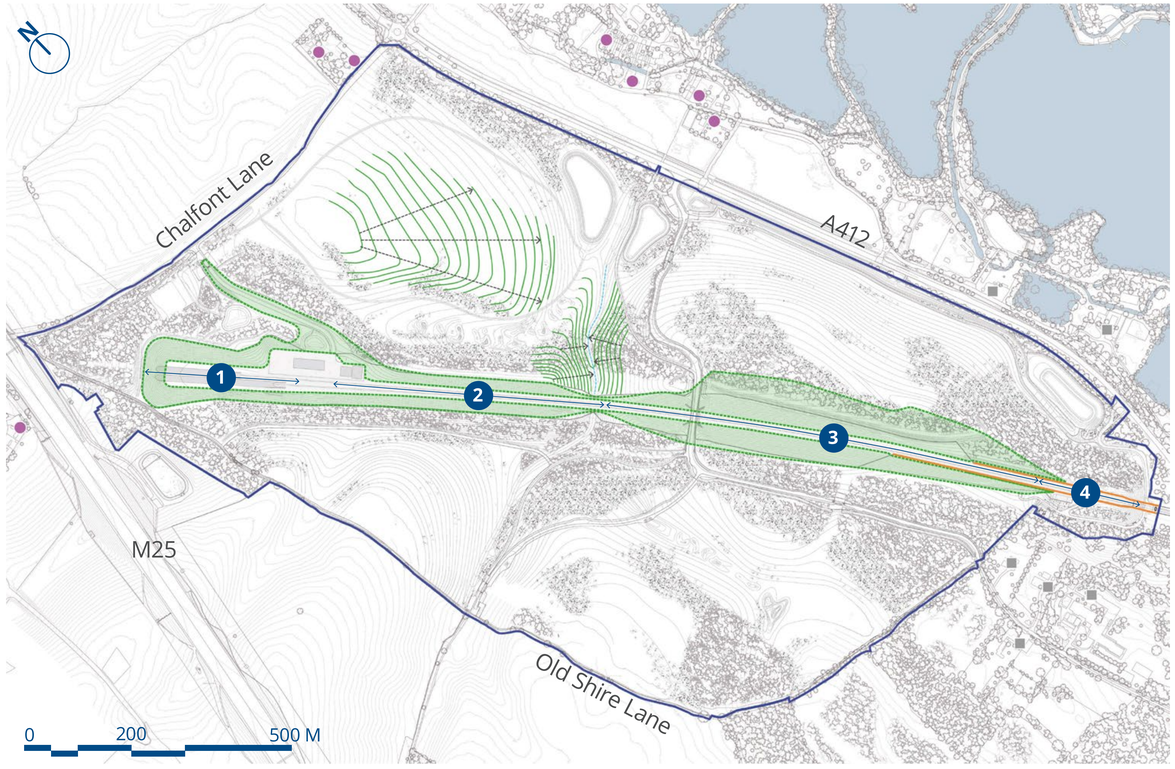
Our earthworks are designed to provide a barrier to operational noise. This will reduce the effect of the noise caused by the railway on the receptors identified in the Environmental Statement. We are also creating noise attenuation barriers along the Colne Valley Viaduct North Embankment as illustrated.

Noise assessment modelling has been used to achieve the best combination of acoustic screening performance whilst being sympathetic to the other aims of the landscape design.

Visualisation - View from the Tilehouse Lane viewing area looking north west (Year 15)

Key

- Receptor location
- Receptor location (Colne Valley Viaduct)
- North Embankment noise barrier
- 1 Chiltern tunnel South Portal cutting
- 2 West Hyde embankment - false cutting
- Landscape earthworks noise mitigation
- Landscape earthworks refinement to mitigate noise impacts from Shire Lane culvert
- 3 Tilehouse Lane cutting
- 4 Colne Valley Viaduct north embankment



Site plan - Noise mitigation earthworks

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