

Concept/Feasibility/Design	Construction	Operation
<p>Environmental cost-benefit analysis for the whole life cycle of the project as part of the feasibility study.</p> <p>Tender evaluation criteria – tenderers will be favoured if they can demonstrate commitment to corporate social responsibility (and hence sustainability), e.g. CAT scores.</p> <p>Contract – include requirements/targets for environmental performance e.g. audit scores, minimising waste to landfill, participation in CEEQUAL and Considerate Constructors Scheme, use of recycled construction materials etc.</p> <p>Scheme design could include the use of low-impact modes of transport, e.g. barges or rail rather than lorries for spoil and segments.</p> <p>Reuse of spoil on site, e.g. for use in embankments elsewhere on a road scheme. Hindhead had a muck balance so all spoil was reused.</p> <p>Avoid sensitive areas for flora and fauna, or archaeology.</p> <p>Position of shafts or portals to minimise impact on local residents and the environment.</p> <p>Traffic management plans.</p> <p>Consideration of visual impact of the site during construction and operation.</p> <p>Consideration of potential effects of predicted climate change scenarios.</p> <p>Environmental Risk Assessments and Pollution Control Plans.</p> <p>Consideration of wider social impacts of the project and the effects of the completed project on the human environment.</p> <p>Desk study and site investigation reports prepared on past and current land uses and land quality, including soil, groundwater, gas, residual man-made structures and surrounding land uses.</p> <p>Calculation of land take of different scheme designs, process designs and layouts.</p> <p>Consideration of the conservation of topsoils, subsoil, and conservation or use of on-site mineral resources.</p> <p>Methods of contaminated land remediation.</p> <p>Landscape and visual issues.</p> <p>Opportunity to introduce new public amenity features or improve existing ones.</p> <p>Conservation or enhancement of existing ecological features.</p> <p>Features of archaeological interest.</p> <p>Consideration of the impact of construction on a groundwater aquifer used for water supply.</p> <p>Life-cycle energy analysis of key materials to be used in construction.</p> <p>Consideration of energy consumption during construction.</p> <p>Consideration of energy consumption during operation and maintenance, e.g. reflectance of walls of a road tunnel to minimise energy demand of lighting.</p> <p>Community consultation.</p>	<p>Environmental management and audits.</p> <p>Training and toolbox talks.</p> <p>Spoil – reuse, recycle or minimise.</p> <p>Waste – separate, reuse, recycle or minimise (by good housekeeping and careful storage of materials or use of ‘Lean’ business improvement practices).</p> <p>Source materials locally where possible.</p> <p>Modes of transport.</p> <p>Encourage staff to use public transport, walk or cycle to/from site.</p> <p>Employ local labour.</p> <p>Involvement in the local community.</p> <p>Use biodegradable lubrication in the TBM.</p> <p>EPB TBMs – careful selection of conditioning agents.</p> <p>TBM grout – non-polluting and non-migrating.</p> <p>Use recycled aggregates.</p> <p>Reduce consumption of potable water, e.g. close loop on dewatering or drainage water reuse on site rather than sending to waste.</p> <p>Water discharge monitoring.</p> <p>Selection of key subcontractors –include an assessment of their CSR/environmental performance.</p> <p>Set environmental performance targets for the Operational Phase.</p> <p>Value Engineering to improve whole-life environmental performance.</p> <p>Protection of trees and plants that are to be retained.</p> <p>Protection of protected species.</p> <p>Control and management of invasive plant species.</p> <p>Use of historically appropriate materials.</p> <p>Procurement, maintenance and use of plant to minimise energy consumption. Consider energy efficiency and energy type. Maintain plant to maximise fuel efficiency.</p> <p>Consider use of energy from renewable sources.</p> <p>Use timber from sustainably-managed sources, e.g. FSC certified.</p> <p>Timing of deliveries to minimise disruption caused by construction traffic.</p> <p>Minimise impact of noise and vibration.</p> <p>Minimise impact of dust and odours.</p> <p>Keep roads clean.</p> <p>Minimise light spillage to surrounding areas.</p> <p>Minimise visual impact of the construction site.</p> <p>Community consultation.</p>	<p>Measures in place to prevent pollution or contamination of the site and local area.</p> <p>Maintenance of plant and training of operators to maximise energy efficiency.</p> <p>Optimisation of programmable lighting and ventilation to minimise energy use.</p> <p>Consider obtaining energy from renewable sources.</p>