

Sustainable Design

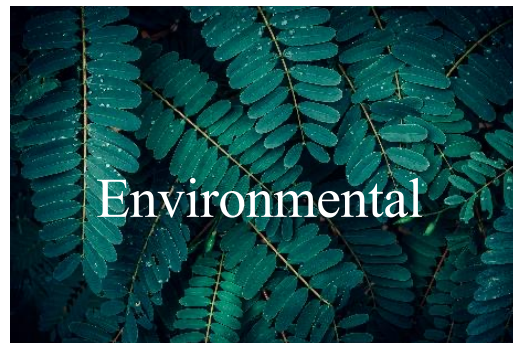
Electricity Infrastructure

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What is Sustainable Design?

Sustainable design is an approach to designing products, buildings, systems, or services that integrates environmental and social factors into design, while also considering economic factors. The goal is to create solutions that are efficient, responsible, and long-lasting.



What do these mean in practice?



Decarbonisation of
materials and
operations

Nature-based
solutions

Climate resilience
and adaptation

Social Value &
Equity

Circular Economy

Biodiversity Net
Gain



Sustainable Network Infrastructure

Embedding across the asset lifecycle

- Sustainable planning and design
 - Thorough geotechnical characterization of the site
 - Optimized alignment selection to minimize excavation needs
 - Value engineering
 - Modular construction approaches
- Manufacture
 - Sustainable materials – concrete, steel
 - Reduction and reuse of materials
 - More efficient processes
- Construction and installation
 - Sustainable installation techniques – transport, construction, remediation
 - Reuse of spoil
 - Nature based solutions instead of (over)engineering
- Operational
 - Applying coatings to existing OHL to increase heat dissipation (improve life)
 - Innovation to reduce need for on-site surveys
- Decommissioning
 - Recycling of recovered components

National Grid Electricity Transmission

Great Grid Partnership

In April 2024, Arup were appointed as one of NGET's two consulting partners to form the Great Grid Partnership. Our role is to provide engineering design, consenting and environmental advice and expertise.

As part of the AECOM Arup JV, the work includes the outline design and planning consents for individual schemes within the programme through DCOs (entailing technical and environmental design and preparation, as well as stakeholder engagement on the plans).

Arup is delivering stakeholder engagement, EIA and consultation services for NGET's biggest DCOs:

- Grimsby to Warpole (ENV, CON, Design)
- Weston Marsh to New Market Harborough (ENV, CON, DES)
- Scottish Borders to Carlisle (ENV, CON, DES)
- Newcastle to Carlisle (ENV, CON, DES)
- Norwich to Tilbury (Detailed Design)
- Tilbury to Grain (Detailed Design)



For illustrative purposes only



Key

- Indicative haul roads and bellmouths
- Indicative working areas
- Indicative size of compounds



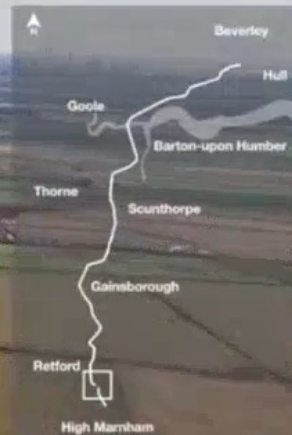
Scheme phase

- Pre-construction
- Construction
- Operation



Route section

- 1. Skidby to Creyke Beck
- 2. A63 dual carriageway to Skidby
- 3. River Ouse crossing to A63
- 4. River Ouse crossing
- 5. Luddington to River Ouse crossing
- 6. M180 motorway to Luddington
- 7. Graizelound to M180 motorway
- 8. Chesterfield Canal to Graizelound
- 9. A620 to Chesterfield Canal
- 10. Fledborough to A620
- 11. High Marnham to Fledborough



Travelling South to North

Construction
North Humber to High Marnham
Section 10 | Fledborough to A620

nationalgrid

Nature-based Solutions



Nature-based solutions (NbS) is an umbrella term for interventions that are designed with nature to restore ecosystems, reverse biodiversity loss, manage water and tackle the negative effects of climate change on infrastructure and society.

They tend to be specific to the application and desired outcome. Can fulfil other sustainable design aspects. Can be applied at local or regional level.

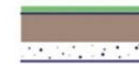
Nature-based Solutions

Electricity networks

- Flooding and subsidence mitigation
 - Rain gardens
 - Watercourse restoration and renaturalisation
 - Regeneration of forested areas and habitats
 - Bioswales
 - Deep rooted vegetation
 - Permeable paving
- Benefits:
 - Improved biodiversity
 - Habitat restoration
 - CO2 sequestration
 - Reduced pollution



Wet Woodland



Soil Management



Peat Management



Large Woody Debris



Buffer Strip



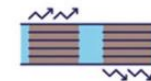
Tree Planting



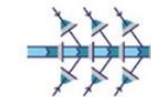
Runoff Attenuation Feature



Floodplain Reconnection



Gully Stuffing



Grip Blocking

ARUP