## Mitigating the Landscape and Visual Effects of Substations

Large substations can form obtrusive features in the rural and built environment and therefore concealing them from view as much as possible is generally desirable. Consideration of mitigation forms an important part of the EIA process.

### Site selection

The first step in mitigation of any development is the selection of a location which minimises the potential for effects to occur. Guidance on locating substations is contained in the ‘Supplementary Notes on the Siting of Substations’, part of the review of the ‘Holford Rules’ undertaken by National Grid (NG) and the Horlock Rules, NG’s own guidance on locating substations and other similar infrastructure. These documents place landscape and visual considerations central to the site selection process. The search area for a suitable location will primarily be technically driven, dependant on the strategic network connections required to tie into the substation. However, there is usually some flexibility in the finer positioning of the site. The ideal location from a landscape and visual perspective is one with good containment to minimise visual effects, and good opportunities to build on this in the implementation of mitigation (that is: a location where new earthworks or tree planting would not appear out of place).

### Mitigation through design

Mitigation through design is the second step in reducing landscape and visual effects and should be considered early in the EIA process. Although the substation layout and scale will be technically driven, measures can still be taken which can reduce visual effect:

- Orientating the substation to follow patterns and landform of the host landscape can help to ensure a good fit and limit requirements for additional earthworks. Where buildings form part of the development, an orientation can also be considered whereby the buildings are used to screen other more complex features from key views to create a simpler, less distracting feature.

- The finished platform level should be carefully considered to minimise the need for visible high embankments which also increase the height of infrastructure to be screened. On sloping sites, a tiered platform may sometimes be considered but it is important to compare the benefits of this with resultant increase in platform footprint.

- Siting the substation to allow access which does not lead to increased development footprint or additional obtrusive cut and built-up slopes will also help reduce adverse landscape and visual effect. A curve added to longer access tracks may also prevent a visual corridor.

- Drainage and SUDS proposals need to be taken into account and should be considered at an early stage to create a clear and well-structured design, and one which can be accurately assessed by practitioners.

- Other smaller considerations including softening the edges of built and cut slopes and rounding platform corners can further help to create a good transition between the platform and adjacent landscape.
Additional mitigation

The final stage of mitigation comprises the design of additional features to offset identified likely effects. Designed mitigation should be appropriate to the landscape setting and consideration should be given to existing landform and vegetation patterns. Mitigation will usually involve a combination of landform and planting. However, where the development is in an urban area, built structure may be the most appropriate mitigation.

Provision of tree planting can be difficult around a substation as wayleaves will be required for overhead lines, buried cables and access. The width of wayleaves will depend on technical and site specifics but usually an offset of around 5m for cables and at least 10m for overhead lines will be required. These wayleaves can lead to an appearance of disparate clumps of planting spaced around the substation with limited potential for screening. Bringing planting further back from the substation boundary to provide a broader swathe can help to overcome this by increasing screening angles and creating a better ratio between planted and unplanted areas. This gives an impression of a substation within woodland, rather than one surrounded by obvious screening belts. Lower growing scrub species can also be used to soften wayleave edges and extend screening. An uneven edge to the wayleave corridor is preferred, and in some instances it is possible to plant closer around the towers or poles where the swing of the line is less.

Targeted planting, offset from the substation, can also be appropriate in some cases to help soften or screen specific views.

Earthworks are often the main mitigation consideration and should be designed to reflect the surrounding landform character and patterns. Earthwork mounding may rise steeply from the substation platform, but should grade out with a natural profile on the outer side to tie into the surrounding landform. Tree planting in conjunction with earthworks provides additional screening and integration into the surrounding landscape. It is also important that any landform and planting mitigation ties in well with the landscape setting and does not itself become an incongruous feature.

In summary, the considered application of mitigation throughout the design process should achieve an outcome whereby the minimum of landscape and visual effects is achieved, thus realising the aims of the EIA process.

Eilidh Mackenzie, ASH design + assessment Ltd, September 2016.

For access to more EIA articles, case studies and hundreds of non-technical summaries of Environmental Statements visit:

http://www.iema.net/eia-quality-mark/