SP MANWEB

The North Wales Wind Farms Connection Project

Environmental Statement Chapter 3 - Alternatives and Design Evolution

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The North Wales Wind Farms Connection Project

Environmental Statement

Chapter 3 Alternatives and Design Evolution

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This Chapter does not have any Appendices:

Reference is also made to the following documents:

DCO Document Reference	Document
5.1	North Wales Wind Farm Connections Project: Consultation Report (March 2015); SP Manweb
6.17	Proposed Underground Cable; St Asaph Substation to the Terminal Point (Appendix 1.2 to this ES)
7.1	Design and Construction Report
7.3	North Wales Wind Farm Connections Project; Strategic Options Report, SP Manweb
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3 ALTERNATIVES AND DESIGN EVOLUTION

3.1 Introduction

3.1.1 Schedule 4 Part 1 of the EIA Regulations 2009 state that an ES should include:

> *"An outline of the main alternatives studied by the applicant and an indication of the main reasons for the applicant's choice, taking into account the environmental effects."*

3.1.2 This Chapter provides an overview of the alternatives considered by SP Manweb from the initial assessment of strategic options through to the selection of the Final Route Alignment which is the subject of the application for a DCO. It also outlines how the double wood pole design that is proposed has been selected.

3.2 Strategic Options

3.2.1 The Strategic Options Report (SOR)[1] identified that the Wind Farms triggered the requirement for new infrastructure in the form of a new 132kV circuit (and new 33/132kV substation), as the capacity of the existing circuit is fully utilised. The SOR considered a number of connection options to connect the four wind farms to the existing grid network, including existing substation sites in Wrexham and Flintshire as well as the selected site at St Asaph. The assessment considered the landscape and visual implications of each option and included a preliminary environmental appraisal.

3.2.2 The strategic options considered are summarised in Section 1.4 of this ES, and comprised:

- DN: Do nothing - discounted as it would be a breach of SP Manweb's distribution licence statutory obligation;
- CEN: Connect to existing network - discounted as the existing network is already close to capacity, and would therefore be in breach of SP Manweb's distribution licence statutory obligations;
- GC: New Grid Supply Point near Corwen – discounted as the associated equipment and construction costs would be much greater than a 132 kV overhead line and would therefore not meet the requirement placed on SP Manweb by the Electricity Act 1989 to develop and maintain an economical system of electricity transmission;
- BL: 132 kV connection to the existing substation at Brymbo or Legacy - approximately 35km of new overhead line would be needed and a route would cross the Clwydian Range Area of Outstanding Natural Beauty (AONB), considered a strategic environmental constraint;
- CQ: 132 kV connection to Connah's Quay - new network infrastructure and approximately 36km of new overhead line would be needed, and a route would cross the Clwydian Range AONB, considered a strategic environmental constraint;

[1] North Wales Wind Farm Connections Project; Strategic Options Report, SP Manweb (DCO Document Ref 7.3)

- H: 132 kV connection to Holywell - new network infrastructure and approximately 30km of new overhead line would be needed, and a route would cross the Clwydian Range AONB, considered a strategic environmental constraint;
- SA: 132 kV connection to St Asaph – new network infrastructure required, approximately 20km[2] of new overhead line would be needed;
- D: 132 kV connection to Dolgarrog – required new network infrastructure, approximately 35km of new overhead line, a new 132 kV substation at Dolgarrog, and uprating the 132 kV circuit between Dolgarrog and St Asaph; and
- T: 132 kV connection to Trawsfynydd - new network infrastructure and approximately 45km of new overhead line would be needed. Trawsfynydd is situated within the Snowdonia National Park which is considered a strategic environmental constraint.

3.2.3 The SOR concluded that the preferred option was for a 132 kV circuit to be constructed from SSA A northwards to the existing St Asaph substation.

3.3 Identification of Route Corridors

3.3.1 Following the identification of the preferred strategic option a number of route corridors were identified.

3.3.2 A route corridor is an area of land through which a new connection may potentially be routed, usually 1km wide.

3.3.3 The 'North Wales Wind Farms Connection Route Corridor Report' (May 2013)[3]:

- outlined the type of development for which routeing is required;
- set out the methodology used to develop the route corridor options;
- identified and assessed the technical, economic, planning and environmental constraints to be taken into account in developing routeing options; and
- identified, described and appraised route corridor options, culminating in the selection of a Preferred Route Corridor.

3.3.4 The iterative routeing process identified three broad route corridors (Red, Green, Blue), and links between those corridors (Blue/Red and Blue/). The report therefore considered five potential route corridors (Red, Green, Blue, Blue/Red and Blue/Green), (see Figure 3.1[4]) all of which were considered to be technically and environmentally feasible.

[2] This was the preferred option which has become the North Wales Wind Farms Connection Project. Following detailed routeing and design the route length is now approximately 17km.

[3] North Wales Wind Farm Connections Project: Route Corridor Report (May 2013); SP Manweb http://www.nwwindfarmsconnection.co.uk/

[4] Figures are included within the 'Figures' Volume; DCO Document Ref 6.16

3.3.5 The route corridors were appraised against a series of criteria including :-

- Biodiversity and geological conservation;
- Landscape and visual amenity;
- Historic environment;
- Residential amenity;
- Flood risk;
- Forestry and woodland; and
- Cumulative effects.

3.3.6 Consultation on the route corridor options (the Stage 1 Consultation (non-statutory)) was carried out between June 2012 and February 2013. Information on the Stage 1 Consultation is included within the Consultation Report (February 2015)[5] (DCO Document Ref 5.1)

3.3.7 In summary, consultation feedback was as follows:-

- Most respondents (72%) gave the Blue corridor as the most preferred corridor. Although the Green corridor was only first preference for 13% of respondents it was second preference for 69%. The Red corridor was first preference for 28% of respondents but least preferred for 57% of respondents, suggesting that the Blue corridor was preferred over Green, which was preferred over Red.
- When additional comments were taken into account it also became apparent that the southern section of the Blue corridor was preferred over the southern section of the Green corridor, giving a preference for the Link corridors.
- The Green corridor was the second most preferred / second least preferred. If the section of the Red/Green route to the south was excluded, the number of concerns raised regarding the Green corridor fell substantially.
- By the same criteria, the Red corridor was the least preferred. If the section of the Red/Green route to the south was excluded, the number of concerns raised regarding the Red decreased but the route still remained less preferred than the Green route.

[5] North Wales Wind Farm Connections Project: Consultation Report (March 2015); SP Manweb (DCO Document Ref 5.1)

3.4 Selection of Preferred Route Corridor

3.4.1 In identifying a preferred route corridor, the determining factors in the selection of the route corridor with the least environmental effects are summarised below. These factors are a combination of qualitative and quantitative elements.

3.4.2 In summary:-

- To the south, where the Red and Green corridors split from the Blue corridor, up to the link corridor, the preference was for the Blue corridor due to landscape and visual impacts on Nantglyn and the surrounding area;
- To the north of the link corridor there was a strong preference against the Blue corridor on the grounds of its potential effects on the historic environment and residential amenity, most strongly in the vicinity of Denbigh. There was also a pinch point on the route to the north west of Denbigh where the corridor encloses the Crest Mawr SSSI and runs over the Denbigh Golf Course.
- The Blue corridor was therefore discounted to the north and the Red and Green corridors were discounted to the south, leaving the Blue/ Green and Blue/ Red link corridors as those with least environmental effects.
- The difference between the Blue/ Green and Blue/ Red corridors was less strong with fewer determining factors, however the effects on Residential Amenity at Henllan suggested that the Blue/ Red corridor has the least environmental effects.

3.4.3 Also considered were the findings of a technical review undertaken by SP Manweb and the consultation feedback (as summarised in para 3.3.7 above).

3.4.4 The technical review identified that:-

- All corridors lay below 450m height and all crossed the Elwy valley, a narrow and steep sided valley which could give technical issues for a wood pole line. In addition the Blue corridor crossed the constricted River Ystrad Valley to the south of Denbigh and lay adjacent to Denbigh quarry which may have introduced further technical challenges.
- Although all routes were considered to be technically feasible there was a slight preference against the Blue corridor to the north in the vicinity of Denbigh due to the potential issues adjacent to the quarry.

3.4.5 In conclusion:

- All of the proposed corridors were considered to be technically and environmentally feasible.
- The southern ends of the Green and Red corridors had a greater number of potential effects on Residential Amenity. The consultation feedback supported this finding and suggested a preference for the southern end of the Blue Corridor as the preferred corridor.

- The northern end of the Blue corridor had a greater number of potential effects on the environment, principally due to its effects on the Historic Environment and Residential Amenity. SP Manweb considered that the level of the effects on the Historic Environment in particular, outweighed the consultation preference for the northern end of the Blue corridor and therefore that it should not be selected as the preferred corridor. This resulted in a choice between the Blue/ Red and Blue/ Green corridors.
- For many environmental criteria and for technical considerations the northern ends of the Blue/ Red and Blue/ Green corridor were very similar in performance. However the northern end of the Blue/ Red corridor performed slightly better than the Blue/ Green corridor in terms of Biological and Residential amenity. This preference had to be balanced against the consultation feedback which gave a stronger preference against the Blue/ Red corridor.

3.4.6 The Blue/Green link was selected as the Preferred Route Corridor. This Corridor was approximately 20km in length, and runs between Brenig / Clocaenog North and St Asaph, indicated in Figure 3.2.

3.4.7 The Stage 2 Consultation (non-statutory) was designed to gather additional information on the preferred corridor to in order to help shape the Proposed Route Alignment for the statutory stage of consultation on the Proposed Development.

3.4.8 Consultation on the preferred route corridor (the Stage 2 Consultation (non-statutory) was carried out between June 2013 and July 2013. Information on the Stage 2 Consultation is included within the Consultation Report (February 2015).

3.5 Proposed Route Alignment

3.5.1 Concerns were expressed during the Stage 2 Consultation regarding the potential environmental effects on the village of Henllan, including:

- effects on residential visual amenity,
- effects on biodiversity,
- effects on the Henllan Conservation Area; and
- the high number of people effected by routeing in proximity to Henllan.

3.5.2 Within the preferred route corridor a Proposed Route Alignment was developed (a 100m wide corridor) utilising information from on-going environmental surveys, further engineering design and collaborative multi-disciplinary walk-overs.

3.5.3 In response to the feedback to the Stage 2 Consultation, options to take the route further away from Henllan were also investigated.

3.5.4 Routeing to the east of Henllan was not feasible due to the high number of designated features including SAC and SSSI within the lower Elwy Valley, the Essential Settings of Parks and Gardens (Foxhall and Plas Heaton), and proximity to the eastern edge of the village.

3.5.5 Options to the west were investigated and refined resulting in an alternative which deviated from the original Blue Green Corridor at Eriviat Park, turning northwest and passing through pastureland in the direction of Hafod Wood, before turning north and re-joining the original Blue Green Corridor north of Berain, at Tyddyn Bartley. This option, via Hafod, was considered to be both technically and environmentally feasible.

3.5.6 The Proposed Route Alignment (the 100m wide corridor that formed the basis of the Stage 3 Consultation) was developed within the preferred route corridor (via Henllan) with an option through Hafod. Both the Henllan and the Hafod options were considered in the Preliminary Environmental Information Report[6] and were taken forward to the Stage 3 (statutory) Consultation.

3.5.7 The Proposed Route Alignment is indicated in Figure 3.2.

3.6 Final Route Alignment

3.6.1 Consultation on the proposed route alignment (the Stage 3 Statutory Consultation was carried out between March 2014 and June 2014. Information on the Stage 3 Consultation is included within the Consultation Report[7].

3.6.2 Responses to the consultation, supported both the 'Hafod' and the 'Henllan' options. Due to the larger population closer to the 'Henllan' option, the number of responses preferring either option was not considered an appropriate factor to consider. Information provided in support of each route has been considered as part of an environmental and technical review.

3.6.3 Feedback from statutory bodies, the national and regional organisations that SP Manweb is required to consult with on the Project, noted a preference for the 'Hafod' option.

3.6.4 The Preliminary Environment Information Report (Section 16) found a preference for the 'Hafod' option, concluding that:

> *"Overall it is considered that Option (a): via Hafod is preferred as although effects on the landscape and ancient and semi natural woodland (ASNW) are slightly greater for this option these are outweighed by greater effects on residential amenity and the historic environment for Option (b): via Henllan.*

3.6.5 The technical review identified that the 11kV network surrounding Henllan would be affected by the proposed 'Henllan' option, requiring substantial diversion work. In comparison the 'Hafod' option avoids the 11kV overhead line and would require less diversion work. No other technical issues were identified on either of the route options.

3.6.6 Taking into consideration consultation feedback, environmental and technical actors the 'Hafod' option was selected as the preferred option.

[6] North Wales Wind Farm Connections Project: Preliminary Environmental Information Report (March 2014); SP Manweb; http://www.nwwindfarmsconnection.co.uk/

[7] 'North Wales Wind Farms Connection Project: Consultation Report, SP Manweb, March 2015 (DCO Document Ref 5.1).

3.6.7 In response to consultation feedback a number of areas were looked at in greater detail. These included:-

- Tir Mostyn Ridge

  Consultation responses raised the potential for the route to skyline along this ridge.

  In response to these concerns the effects of moving the route alignment below the ridge were considered. This alternative would reduce effects on more distant receptors, but due to the topographical nature of the ridge, would increase effects on receptors closer to the ridge and result in skylining. As such, it was decided that locating the route alignment higher on the ridge line would minimise effects on those closest to the route and those most likely to experience significant effects.

- Tan-yr-Allt

  Consultation feedback and the review of the initial indicative pole positions identified the close proximity of the poles to this property.

  The proposed route alignment would take advantage of a localised hollow in the landscape to the front of the receptor thus minimising the height of the route alignment in views from the receptor. However, it would be in close proximity to the receptor and prominent in their view. As such, the Final Route Alignment in this location is now at a greater distance from this property and less prominent.

- Pandy Wood

  The Final Route Alignment in this location has been routed within the 100m wide Proposed Route Alignment but to the north east of the centreline. This reduces potential effects on a number of non-designated heritage assets.

  A small derelict/unoccupied farmstead lies within the wooded area at Pandy and the proposed route alignment was located in very close proximity to this potential receptor. In response to potential effects, the Final Route Alignment has been move northeast and away from this potential receptor.

- Hafod Farm Approach

  Concerns were raised regarding the potential for the route to skyline at this location, however, adjusting the alignment would bring the route closer to residential properties and could result in more significant effects on receptors. Therefore the route has not been amended in this location.

- Berain Farm

  Concerns were raised about the proximity to the listed buildings and locally valued setting at Berain. By routeing to the rear of the property and utilising existing trees for screening and backclothing of the overhead line, the effects from the Final Route Alignment would be reduced. A slight alteration to the route in this location has aimed to reduce the potential impact on trees in this location and therefore increase the opportunity for utilising the existing trees for screening and backclothing.

- Elwy Valley and Cefn Meiriadog

  Concerns were raised about potential skylining in these locations. The alignment through these areas seeks to minimise potential effects on the Historic Landscape area (Elwy valley), the SAC, SSSI, RIGS, areas of ASNW. Adjustments to the alignment would likely result in more effects on these designated areas and therefore the route has not been amended in this location.

- Cable Route from the Terminal Pole

  Although still within the 100m wide Proposed Route Alignment the cable route is now located in the field to the east of the existing track. Locating the cable route within the existing track would have necessitated the removal of sections of mature hedgerows and would have had the potential to impact on a number of mature trees and their roots.

3.6.8 Further detailed engineering and environmental reviews of the proposed route alignment resulted in the development of the Order Limits and the Limits of Deviation which have been evaluated as part of the EIA process. Figure 3.3 illustrates the 100m Proposed Route Alignment, the Order Limits and the location of the areas identified above

3.7 Design

Undergrounding

3.7.1 National Policy Statement EN-5 accepts overhead lines are not incompatible with licence operators' obligations to preserve the environment and that for the most part, adverse landscape and visual impacts can be mitigated. SP Manweb considers the wood pole design facilitates compliance with this obligation in that it result in lower impacts on the environment and enables more sensitive routeing through the landscape. EN-5 notes, however, that where there are serious concerns about the potential adverse landscape and visual impacts of a proposed overhead line, the decision maker will have to balance these against other factors including the need for the proposed infrastructure, the availability and cost of alternative routes, technical difficulties and likely costs of undergrounding, as well as the benefits and any impacts of undergrounding along any of the identified sections.

3.7.2 With the above in mind, SP Manweb has evaluated the Proposed Development against the approach set out in EN-5, referring to the assessment in Chapter 7 'Landscape and Visual' of this ES (DCO Document Ref 6.7). In its assessment, SP Manweb also had regard comments received in response to consultation.

3.7.3 SP Manweb's evaluation is set out in the 'Appraisal of the North Wales Wind Farms Connection Project Against National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) In Relation to Undergrounding' (Appendix 1 to the Planning Statement) (DCO Document Ref 7.5)).

Overhead Lines

3.7.4 Overhead lines can be built on steel towers (pylons) or wood poles. However the farmland through which the majority of the line would be built was considered to be more suitable for wood poles than steel towers. Wood poles are preferred where technically feasible as they are less visually intrusive, less likely to be visible on the skyline and are more flexible for detailed routeing, providing a better fit with the landscape. The initial assessments of the Proposed Route Alignment suggested it might be necessary to introduce steel towers to overcome technical issues in a small number of locations. More detailed line route work has shown however that this would not be necessary and the entirety of the overhead line would be constructed using wood poles.

3.7.5 The wood pole overhead line design proposed for the 132kV circuit is of double wood pole (OHL-132-03) design. These double wood poles have a maximum angle of line deviation of 35 degrees and are particularly suited to wind farm connections, which tend to be on higher ground and are subject to more adverse weather conditions.

3.7.6 The 132 kV Overhead Line would comprise conductors supported by double wood poles. The wood poles are generally no larger than 470mm in diameter, and would range between 11m and 16.6m in length. Taking into account that the nominal depth of the poles is 2.5m and the steel bracings and insulators add typically 2.3m to the length, the net result is that the actual conductor height above ground (at pole positions) is about 0.2m less than the pole length referred to. The average span between poles is 79m.

3.7.7 The poles carry 3-phase conductors (cables) in a single circuit network with an underslung earth wire, which incorporates a fibre optic cable for protection signalling and communication purposes. The four conductors are supported on a steel structure which sits on top of the double wood pole and are made of aluminium with the phase conductors having an overall diameter of 24mm and the earth/fibre optic wire being 14mm in diameter.

3.7.8 The double wood pole is illustrated in Chapter 2 'Description of Proposed Development' (Figure 2.3).

3.7.9 Studies have been undertaken to identify whether a lighter single wood pole design would be suitable. Chapter 2 of the Design and Construction Report (DCO Document Ref 7.1) sets out the need for the double wood pole design.

3.7.10 Earthed construction is required to control rise of earth potential (ROEP). At the proposed Clocaenog Forest collector substation measurements show that the resistivity[8] of the ground is extremely high and therefore an earthed overhead line is required to control the ROEP.

[8] Soil resistivity is a measure of how much the soil resists the flow of electricity. It is a critical factor in design of systems that rely on passing current through the Earth's surface. An understanding of the soil resistivity and how it varies with depth in the soil is necessary to design the grounding system in an electrical substation.

3.7.11 An earthed design, such as the double wood pole proposed, is required for the Proposed Development. The single wood pole design does not carry an earth and therefore cannot be used for the Proposed Development.

3.7.12 Underground cables may sometimes be appropriate to overcome technical issues or in areas of highest visual sensitivity. EN-5 states however, that the decision maker will only refuse consent for overhead line proposals in favour of underground alternatives if "the benefits... (of an underground line) …clearly outweigh any extra economic, social and environmental impacts, and the technical difficulties are surmountable."

3.7.13 Consultation feedback has made reference to the use of underground cables as a means of reducing visual effects, particularly where the overhead line is likely to skyline and be visible in the wider landscape. These benefits are likely to be outweighed by the effects of underground cables on for example, habitats, ground cover and unknown archaeology. The environmental assessment takes into account these sensitive locations and viewpoints have been selected to assess such effects. The nature of the landscape and the chosen technology (double wooden poles) is such that there are unlikely to be large scale major adverse effects from this overhead line. Whilst the overhead line would be visible in the skyline at some locations, it would not be both prominent in views and large in scale.

3.7.14 On the basis of environmental impacts assessment, it is considered that an overhead line, rather than an underground cable, would be appropriate for the Project. SP Manweb has carried out a thorough review of the Proposed Development in light of comments received in response to consultation but concluded that no new information has come to light that would change the assessments present in the Strategic Options Report (DCO Document Ref 7.3). In response to the suggestions, SP Manweb considered a number of options for undergrounding in the context of NPS (EN-5) but concluded that no new information was provided that would require the line to be placed underground. Further information is provided in the Planning Statement (DCO Document Ref 7.4).

3.7.15 The Wider Scheme includes a section of underground cable taking the connection from the St Asaph substation to the terminal point of the Proposed Development located in a field to the south of Trebanog, Groesffordd Marli (which is south of Glascoed Road, B5381),. Information on the reasons for this section of cable, its routeing and construction are included within Appendix 1.2 of this ES (DCO Document Ref 6.17). The potential effects of the cable are considered within the Stage 1 and Stage 2 assessment of combined and cumulative effects within the individual technical chapters of this ES.

3.8 Mitigation Through Design

3.8.1 Mitigation has been considered as an integral part of the overall design strategy of the overhead line, not just 'add-on' measures to ameliorate significant environmental effects. SP Manweb has attempted to adopt a positive and pro-active approach whereby mitigation is assessed and considered at all stages of a project (environmental constraints, initial and ongoing design, predicted construction method and predicted operation method).

3.8.2 SP Manweb has a limited choice when designing new 132kV overhead lines and is restricted by operational and technical requirements. The design strategy developed by SP Manweb is therefore focussed on identifying and refining route options which would minimise adverse environmental and socio-economic impacts.

3.8.3 SP Manweb is aware of the impact of the Proposed Development on the landscape and local communities. The multiple stages of consultation have sought to define the most appropriate route whilst balancing SP Manweb's statutory duties and requirements.

3.8.4 SP Manweb is able to demonstrate that the principles of good design have been applied to the project through the application of its design strategy, approach to routeing of overhead lines and undergrounding. It is also considered that the use of a double wood pole design, instead of a steel tower design provides a more appropriate design for this landscape.

3.8.5 Over the project development cycle as described, the final design of the overhead line has, systematically being optimised in response to increasing knowledge of the site and potential environmental effects. This process of evolution of the design has seen the Final Route Alignment evolve in response to matters raised by consultees, as recorded in the Consultation Report (March 2015), and the studies being undertaken for the environmental assessment.

3.8.6 The hierarchical approach towards mitigation (prevent, reduce, offset) has first sought to avoid any significant effects through the overall design of the overhead line and disposition of its elements, and, subsequently would be mitigated (on-site) through careful micro-siting of the overhead line infrastructure.

3.8.7 In addition, SP Manweb has sought to reduce any identified effects, or where this has not been possible, to offset the effect. This has been achieved by measures to minimise effects at source (i.e. altering and refining the proposed routeing), abatement (i.e. by removing the site infrastructure away from sensitive species and habitats through micro-siting) and through the use of appropriate construction methods.

3.8.8 The Proposed Development has therefore been developed through the iterative process of environmental assessment to minimise environmental effects as far as possible within the technical constraints of a project of this nature. Mitigation has been undertaken at three levels:

- Avoidance of potential effects;
- Reduction of potential effects; and
- Offset.

3.8.9 The key elements of the mitigation for this route design applied at each level are set out below. Further details of the 'embedded' mitigation for each discipline are set out within the individual topic chapters.

Avoidance

3.8.10 The process of selection of the route is the most important and effective source of mitigation for the overhead line. By employing appropriate routeing strategies it has been possible to avoid a number of potential effects. This has been achieved through arriving at a proposed route alignment which responds to the specific environmental constraints of the area, and which seeks to avoid specific locations that are deemed particularly sensitive to development of this type such as proximity to watercourses, archaeological features, areas of ecological sensitivity and specific landscape features.

3.8.11 Programming of construction operations would be employed in order to avoid potential effects where seasonal constraints dictate.

3.8.12 Demarcation of working/exclusion areas and adoption of appropriate working practices would be developed and employed to avoid specific effects where appropriate.

Reduction

3.8.13 The likely effects of the Proposed Development have been reduced through the technical design of the 132kV overhead line itself.

3.8.14 Development of the 132kV wood pole line has allowed the overhead line to be carried on this structure rather than the more typical steel lattice towers.

3.8.15 The routeing, in addition to seeking to avoid specific constraints, has also been developed to provide reduction mitigation where avoidance has not been possible. Typically this has been adopted to:

- Minimise the need to remove areas of established broadleaved woodland and minimise effects on commercial forestry; and
- To optimise the opportunities for backclothing as far as possible to further reduce the perceptibility of the route.

3.8.16 Opportunities to reduce potential effects have also been identified through the undergrounding of some of the existing SP Manweb low voltage infrastructure in the vicinity of the proposals.

Further Design Mitigation Following Statutory Consultation

3.8.17 The Proposed Route Alignment presented at the Consultation and in the PEIR was approximately 100m wide with temporary access tracks identified. Following consultation and on-going design refinement, the Order Limits have been narrowed to between 40 – 60m for the majority of the route (excluding access works) in the DCO application.

3.8.18 SP Manweb considers that the approach to design mitigation described above has ensured that the Proposed Development is suitable and appropriate for connecting the Wind Farms.