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## 4 Construction

### 4.1 Executive Summary

1. Chapter 5 of the Consolidated ES (pages 124 – 150) and Chapter 1 (pages 1 -10) of the Consolidated ES Addendum provide the project description of the proposed Tyrone - Cavan Interconnector. The assessments of the construction phase impacts are in the specialist assessment chapters of the Consolidated ES and Addendum.
2. The construction period is anticipated to be up to three years from the start of the site works and will involve the construction of the proposed substation at Turleenan and 102 towers along 34 km of proposed 400 kV overhead lines.
3. The actual construction activity period at each tower site will be 15 to 29 working days with the work spread out over five stages. The overall period of time from preparatory site work (Stage 1) up to conductor stringing (Stage 4) and reinstatement of lands (Stage 5) will be approximately 6 months. This overall period at each tower site to complete all five stages depends primarily upon the number of towers in a particular line straight (i.e. an angle tower to angle tower section) as conductor stringing (Stage 4) cannot commence until all towers in a straight are erected.
4. Each tower location has a proposed temporary route for access and a proposed temporary working area around it to allow for construction.
5. Surplus material from the working areas will be disposed of at landfills as outlined in Chapter 18 of the Consolidated ES.
6. Consultation with affected landowners will be a priority to ensure that the construction phase impacts will be minimised.
7. Since the publication of the Consolidated ES Addendum, chicken sheds have been constructed on the area proposed as the access track to Tower 40. With these chicken sheds in place, it is no longer possible to use the originally proposed access route, and so two alternative access tracks are presented (referred to as AT40A and AT40B). The findings of the environmental appraisal for each assessment of these alternatives are set out within this Technical Report.
8. AT40A is inside the planning application boundaries. It will require two temporary crossings of minor watercourses and the removal of a 3 metre (m) wide section of mature vegetation. This vegetation was assessed in the Consolidated ES and would

already be affected by the proposed trimming to 2 m height that is required for safety clearance from the overhead conductor (see Chapter 5 of the Consolidated ES [Volume 2 Page 140 -142] for further details).

9. It has been determined by the assessment team that AT40B would not result in any likely significant effects and therefore there would be no change to the assessment in the Consolidated ES and Addendum. However, this option would involve machinery temporarily accessing Tower 40 outside the planning application boundaries for a small section of AT40B access route, so that it would be necessary to extend the red line boundary to a very minor degree for the associated works planning application. There is no difference in the access method proposed – other than a slight realignment of the access track around the recently constructed chicken shed. As noted within the Statement of Case, AT40B is the preferred alternative access option.
10. The Contractor will be required to work within the framework of the Outline Construction Environmental Management Plan (Appendix 9.1 of the Consolidated ES Addendum). Implementation of the mitigation measures described in that document will minimise the construction phase impacts.
11. The Outline CEMP will be a key part of the construction contract to ensure that all mitigation measures which are considered necessary to protect the environment, prior to construction, during construction and/or during operation of the Proposed Development, are fulfilled. NIE will be responsible for ensuring that the contractor manages the construction activities in accordance with the Outline CEMP including the mitigation measures that are set out within that document. The contractor will prepare a detailed CEMP which is in accordance with the Outline CEMP to ensure that construction delivers the mitigation measures set out within this Consolidated ES and Addendum, and that detailed CEMP will be agreed with the Department.

## 4.2 About the Authors

12. The description of the construction aspects of the proposed project has been undertaken by Robert Arthur, a Project Manager with ESB International, Michael Hewitt, a Transmission Project Development Engineer with SONI, Fay Lagan, an Associate Director with AECOM, and Richard Manson, a senior engineer with AECOM.

13. Mr Arthur is a chartered engineer and has worked on many overhead line projects in a variety of capacities. He holds a Master of Science degree (MSc) in Electrical Power Systems from the University of Bath, United Kingdom (2013) as well as a Diploma in Applied Electronics from the Dublin Institute of Technology Kevin Street, Dublin (2000).
14. Mr Hewitt is a trained Electrical Engineer and graduate of the University of Ulster with over 30 years' experience in the electricity industry and extensive knowledge of both distribution and transmission network design, planning, construction, commissioning and project management. He has worked on many major projects, including the Laganside development and voltage upgrade of central Belfast, and the North Down and South Armagh Network reinforcement schemes, before moving into Transmission Major Projects.
15. Mr Lagan is a chartered environmentalist with a wide ranging experience in the environmental field. He has over 15 years' experience in major environmental projects including Environmental Impact Assessment (EIA). He is a graduate of Queen's University with a Masters in Applied Environmental Sciences. His principal experience is in the EIA of projects in the UK and Ireland in the energy and highways sectors but has also worked on water sector developments and mixed used development projects.
16. Mr Mason is a senior engineer with AECOM with over 15 years' experience. He worked on the civil engineering design for the proposed Turleenan substation. He is a graduate of the University of Ulster with a Bachelor of Engineering degree in Civil Engineering and has wide ranging experience in this field.

#### 4.3 Summary of Documents

17. This Technical Report summarises and incorporates by reference the content of the documents submitted in support of the planning applications for the proposed Tyrone - Cavan Interconnector in respect of construction. The relevant documents are:
  - Chapter 5 of the Consolidated ES (pages 135-150) and its appendices;
  - Appendix 9.1 of the Consolidated ES Addendum;
  - Chapter 1 of the Consolidated ES Addendum.

18. This Technical Report must therefore be read in conjunction with the Consolidated ES and its Addendum, and not as a standalone document.
19. In a general sense all EIA documentation is interrelated and, particularly with respect to the interaction of impacts, all the EIA documents would be relevant. For clarity the documents the author considers to be the key documents are summarised above. The reader should form his or her own view on what documents within the Consolidated ES and its Addendum are relevant, and key, to the topic under consideration.
20. In the interest of readability these documents are not reproduced in full in this Technical Report.

#### 4.4 Overview

21. This is a summary of information that is contained in the Consolidated ES Chapter 5 (p135- 150).

##### 4.4.1 Proposed Substation

22. The proposed Tyrone - Cavan Interconnector will connect to existing electricity infrastructure at the proposed Turleenan substation, which will provide a connection between the existing 275 kV overhead line and the proposed new 400 kV overhead line. Construction of the Turleenan substation will take up to three years, and will be undertaken in parallel with the overhead line construction activity.
23. One existing 275 kV intermediate suspension tower in the vicinity of the proposed Turleenan substation will be removed, and two new 275 kV terminal towers will be constructed to provide a connection to the proposed substation. Prior to the construction of the proposed 275 kV towers, one side of the existing 275 kV overhead line will be temporarily diverted onto temporary structures while the other will be disconnected for the duration of the works.
24. The substation installation will incorporate a control building, a 275 kV Gas Insulated Substation(GIS) building, provision for three power transformers with associated firewalls, and an open air 400 kV switchyard containing high voltage electrical equipment. The entire installation will be constructed within a securely fenced

compound, and will have a maximum height of 12.5 m to the top of the proposed GIS building, as well as proposed concrete enclosures for the transformers. The proposed ancillary works will include an access road, surrounding earthworks, land contouring, a surface water drainage system (including pond), and landscape planting.

25. During construction of the proposed substation, a temporary site entrance will be constructed to the north east of No. 152 Trew Mount Road. This provides for the existing buildings at No. 152 Trew Mount Road to be used during construction. However, this temporary arrangement will be replaced by the proposed permanent entrance following the completion of construction, and the existing dwelling will be demolished. The demolition material will be sent to landfill (as outlined in Chapter 18 of the Consolidated ES). There will be no likely significant environmental effects as a result of the demolition.
26. Vegetation planting is proposed to facilitate the integration of the substation into the existing landscape.
27. The effects of the substation on landscape character and its individual elements (such as hedges and trees) have been limited by choosing the most appropriate location and detailed on-site positioning. Mitigation of the subsequent visual effects of the completed development will be aided by the opportunities to use appropriate materials and finishes for the built elements and a combination of surrounding earthworks, to include earth mounding around the site, and suitable hedge and tree screening.
28. The drainage for the proposed substation site (hardstanding area and access road) has been designed in accordance with the Sustainable Drainage Systems (SuDS) principles and the Construction Industry Research and Information Association (CIRIA) SuDS Manual 2007.
29. A three-stage treatment to ensure water quality has been designed: treatment of stormwater using infiltration; filter drains and oil interception; and an attenuation pond. The pond will provide secure water quality by capturing the small rainfall events, settling out fine silts, and promoting plant and microbial activity to encourage adsorption and biodegradation of contaminants and nutrient removal.

#### 4.4.2 Proposed 400 kV Towers and Overhead Line

30. The construction methods and strategies are based upon the existing methods used in constructing 400 kV overhead lines in the UK and the Republic of Ireland. All design work completed, future design work, construction, and all other works of the proposed Tyrone - Cavan Interconnector will comply with current health and safety legislation.
31. Confirmatory surveys will be undertaken prior to construction, including ground investigations and ecological surveys. Prior to commencing the works consultation will take place between SONI and landowners to ensure that landowners are aware of the specific works that will take place pursuant to the proposed Tyrone - Cavan Interconnector. All landowners will be contacted prior to access being required on their lands and notice of commencement of the works will be provided to the landowner before any work begins.
32. The construction period for the proposed Tyrone - Cavan Interconnector is anticipated to be up to three years from the start of the site works. The construction of each tower in the overhead line will be undertaken in five general stages, according to the following sequence, on a rolling programme of estimated durations:
- Stage 1 – Preparatory Site Work (1 – 7 working days);
  - Stage 2 – Tower Foundations (3 – 6 working days);
  - Stage 3 – Tower Assembly and Erection (3 – 4 working days);
  - Stage 4 – Conductor/ Insulator Installation (7 working days); and,
  - Stage 5 – Reinstatement of Land (1 – 5 working days).
- See Appendix A of this Technical Report which illustrates what is involved in the five stages outlined above.
33. These stages are not necessarily consecutive due to the work required at adjoining tower bases and construction processes. For example, there is usually a period of time with no construction activity between stages 3 and 4. The duration of this period depends primarily upon the number of towers in a particular line straight that have still to be erected (i.e. an angle tower to angle tower section). Conductor stringing (Stage 4) cannot commence until all towers in a straight are erected. As noted in section 5.6.4 of the Consolidated ES, this would typically be 2 to 4 months.

34. The ground conditions encountered vary along the proposed overhead line route and hence the construction techniques and machinery/equipment required will vary to accommodate this.
35. Access to the site will be between the hours Monday to Friday 07:00 – 19:00 or hours of daylight for steel erection; and on Saturday 07:00-13:00 or hours of daylight. No Sunday or night working is anticipated except for emergency works (such as pumping of excavations).
36. Site preparation works for transmission line construction will include minor civil work at the tower locations including, where appropriate:
- installation of temporary access tracks (described in Section 5.6.5.2 of the Consolidated ES);
  - levelling of tower foundation area - the towers are designed such that a difference in ground level can be accommodated from one side of the tower to the other, hence minimising the quantity of local disturbance. Where the gradient between two legs is greater than 1m, the tower will be installed with a leg extension. Depending on the particular gradient at each location, the tower may require a single leg extension, or it is possible to add an extension to any number of the four tower legs to overcome a gradient. Where the gradient is less than 1m, and the impact is moderate, consideration will be given to levelling the site foundation area (described in Section 5.6.5.1 of the Consolidated ES);
  - where towers are located on boundaries which contain hedgerows, portions of this hedgerow, cutting back of trees and other vegetation will have to be removed (described in Section 5.6.5.6 of the Consolidated ES);
  - diversion of field drains (described in Section 5.6.5.7 of the Consolidated ES);
  - delineation of on-site working area (e.g. erection of temporary fencing for safety of personnel and livestock using timber post and wire or steel mesh panels (described in Section 5.6.5.6 of the Consolidated ES); and,
  - Diversion of existing utilities, e.g. BT lines and undergrounding of lower voltage distribution lines (described in Section 5.6.5.5 of the Consolidated ES).
37. Temporary accesses capable of taking construction plant, construction materials and personnel are required for the construction of each tower, installation of the conductor

and the setting up of guarding locations. There are four forms of proposed access required for the construction:

- Access Tracks – these are temporary accesses that will be used to gain access to the working areas from the public road network;
- Access to Stringing Locations – stringing locations will be accessed by stringing equipment;
- Access to Guarding Locations – these will be accessed to construct and then remove the guarding location;
- Access to Distribution Line Crossing Locations – these will be accessed by a tracked excavator in order to underground 18 existing Distribution lines.

38. There are several types of track which could be used to facilitate access for construction and subsequent maintenance. The type of track which will be used will depend on a variety of factors including the sensitivity of the location, the type of land use and the ground conditions. The proposed arrangement for required access arrangements are detailed in the planning applications (described in Section 5.6.5.3 of the Consolidated ES).
39. Since the preparation of Chapter 5 of the Consolidated ES, the successful use of a hybrid composite material matting has become the preferred construction methodology for transmission line tower site access over ‘trackway’ panels. It is proposed that this new type of temporary access would be used instead of the aluminium “Trackway” panels. This new composite matting maintains the benefits of ground protection provided by aluminium panels. However, they are more durable, have the capability to support heavier machinery well above any maximum vehicle weights required for the construction of the proposed development, can be used on all ground conditions that will be encountered along the proposed development, and can be used on slopes. ‘Tufftrak’ and ‘Durabase’ are two brand names of this composite type matting that have been successfully employed on transmission overhead line projects throughout the UK and Ireland in the past two years. There will be no difference to the assessment as outlined in the Consolidated ES and Addendum, however, the use of composite matting will provide benefits during the construction phase over aluminium ‘trackway’ panels, as outlined above.

40. As such, the two types of access track that will be employed during the construction of the proposed development are stone access tracks (as described in section 5.6.5.3 of the Consolidated ES) and composite material matting described above.
41. The first stage in the construction of the overhead line, after preparatory works, is to construct a foundation for each tower. The foundations consist of four separate concrete pads of chimney or pyramid type. However, depending on particular geological conditions, there may be the requirement to use (i) mini-piled, (ii) auger or (iii) rock foundations. The minimum and maximum tower foundation footprint is detailed for each tower in Appendix 5C, Volume 3 of the Consolidated ES. The working area for construction of a tower is 1,225m<sup>2</sup> (described in Section 5.6.6.1 of the Consolidated ES).
42. Construction of each foundation takes up to 6 days. Tower erection can commence within 21 days after foundation installation, when the concrete will have cured sufficiently.
43. The steel for the remainder of the tower is delivered to the site by lorry and various sections of the tower, depending on weight and method of construction of the tower, are pre-assembled on the ground beside the tower. The tower will be built using a derrick pole. See illustration 5.2 in the Chapter 5 of the Consolidated ES for an example of tower erection using a derrick pole. A derrick pole is a metal support pole that holds a section of tower in place while it is attached to sections of tower already erected. Each tower section/panel is also held in place by the use of stays.
44. Steelwork for each tower will be delivered directly to site from the Carn depot, adjacent to the M12 Carn roundabout. With the steelwork on site, the tower is then part-assembled at ground level into box sections of approximately 10m high, adjacent to the tower foundation. The steelwork will be assembled and erected, using the derrick pole method described above, by a team of approximately eight operatives over a 3-4 day period.
45. As outlined in Chapter 1 of the Consolidated ES Addendum, it was determined that Tower 102 required a small change in design. The boundary between the SONI and EirGrid section of the proposed Interconnector is just south of tower 102. When the line straight alignments from 97-102 and 102-105 were finalised, Tower 102 should have changed from a 30 degree type to a 60 degree type angle tower. As the final alignment

of straight 102-105 was a part of a separate section of the development and a separate planning process this did not occur, however it was identified during a design review carried out in advance of the CES addendum being lodged in 2015.

46. The design change slightly increased the foundations of the Tower but did not affect the above ground works. The foundations are still within the maximum stated areas of up to 20 x 20 m listed within Appendix 5C, Volume 3 of the Consolidated ES. The change in tower type will increase the amount of spoil and concrete due to the increase in footing size required. The traffic impacts in these peak periods will remain the same and there will be no change to the assessment as presented in the Consolidated ES.
47. The proposed overhead line will be strung using full-tension stringing which ensures that the conductor is sufficiently tensioned during installation. The stringing operation is undertaken between angle towers in a straight line between the two towers. There are three key aspects of stringing:
  - Stringing Locations – where the stringing machinery is located;
  - Guarding Locations – the protection of road and river crossings; and,
  - Stringing Procedure – how the overhead line is actually strung.
48. Once all works are complete, the access route and the construction areas around the tower are restored to their original condition. This work will be carried out by a specialised agricultural contractor and is carried out in consultation with each landowner.
49. The normal maintenance of the proposed overhead line will generally involve inspections by helicopters (annual) and ground inspections (bi-annual). The annual Helipatrol process involves the helicopter flying parallel to the overhead line route at approximately the same height as the 400 kV towers at a speed of 30 kilometres per hour. A line inspector accompanies the pilot on the patrol and observes the condition of the line and any potential conflicts, e.g. vegetation growing too close to the overhead line. In advance of any Helipatrol commencing, landowners that require advance notification are contacted to inform them of the date and approximate time of the Helipatrol traversing over their lands. Specific landowner contact is supplemented with a publicity campaign to inform the general public. Where landowners request no Helipatrols along their lands a foot patrol is carried out annually in place of the Helipatrol.

50. Ground Inspection access will be undertaken using suitable off road vehicles for routine inspections once every two years. These vehicles will use existing accesses. In bad ground conditions or if the landowner has specific requirements, e.g. crops growing in field where line is located, access can be completed by foot patrol method.
51. The construction of the proposed substation and the towers will generate approximately 103,797m<sup>3</sup> of surplus material (e.g. excavated soil), which will be disposed of offsite. It is proposed that the excavated material will be sent to landfills as identified in Chapter 18 of the Consolidated ES.
52. The Tyrone - Cavan Interconnector will become a permanent part of the strategically important electrical transmission grid infrastructure network. Following construction, its ongoing operation will be facilitated by routine maintenance, refurbishment and replacement of redundant equipment to ensure a permanent transmission infrastructure. Accordingly, SONI and NIE have no plans for the decommissioning of the overhead line, towers or substation.
53. The lifespan of the Tyrone - Cavan Interconnector is anticipated to be extended beyond its 50 - 80 year design life, depending on its condition and refurbishments and depending on the transmission network requirements.
54. In the unlikely event that its useful life has expired and it is to be removed, the majority of the material of the overhead line, towers and substation will be taken for recycling. Similar access will be required as for the construction phase as outlined in the Consolidated ES.
55. The effects of decommissioning would be temporary and of a similar scale to or less than the construction phase, as described and assessed in the Consolidated ES. Similar mitigation measures as described for the construction stage in the Consolidated ES should be again implemented to ensure the minimisation or elimination of any environmental impacts.
56. The construction and operational phase for the substation, towers, overhead line and associated works has been included in the Outline Construction Environmental Management Plan (Appendix 9.1 of Consolidated ES Addendum). Topic-specific

construction impacts are addressed in other Technical Reports and in the Consolidated ES and its Addendum.

57. The Construction Environmental Management Plan (CEMP) will be a key part of the construction contract to ensure that all mitigation measures which are considered necessary to protect the environment, prior to construction, during construction and/or during operation of the proposed Tyrone - Cavan Interconnector, are fulfilled. NIE Networks will be responsible for ensuring that the contractor manages the construction activities in accordance with the Outline CEMP including the mitigation measures that are set out within that document.
58. The contractor will prepare a CEMP for agreement by the Department which is in accordance with the Outline CEMP to ensure that the mitigation measures as set out in the EIA documents are fully implemented within the framework that has been established.

#### 4.5 Response to Third Party and Statutory Consultee Submissions

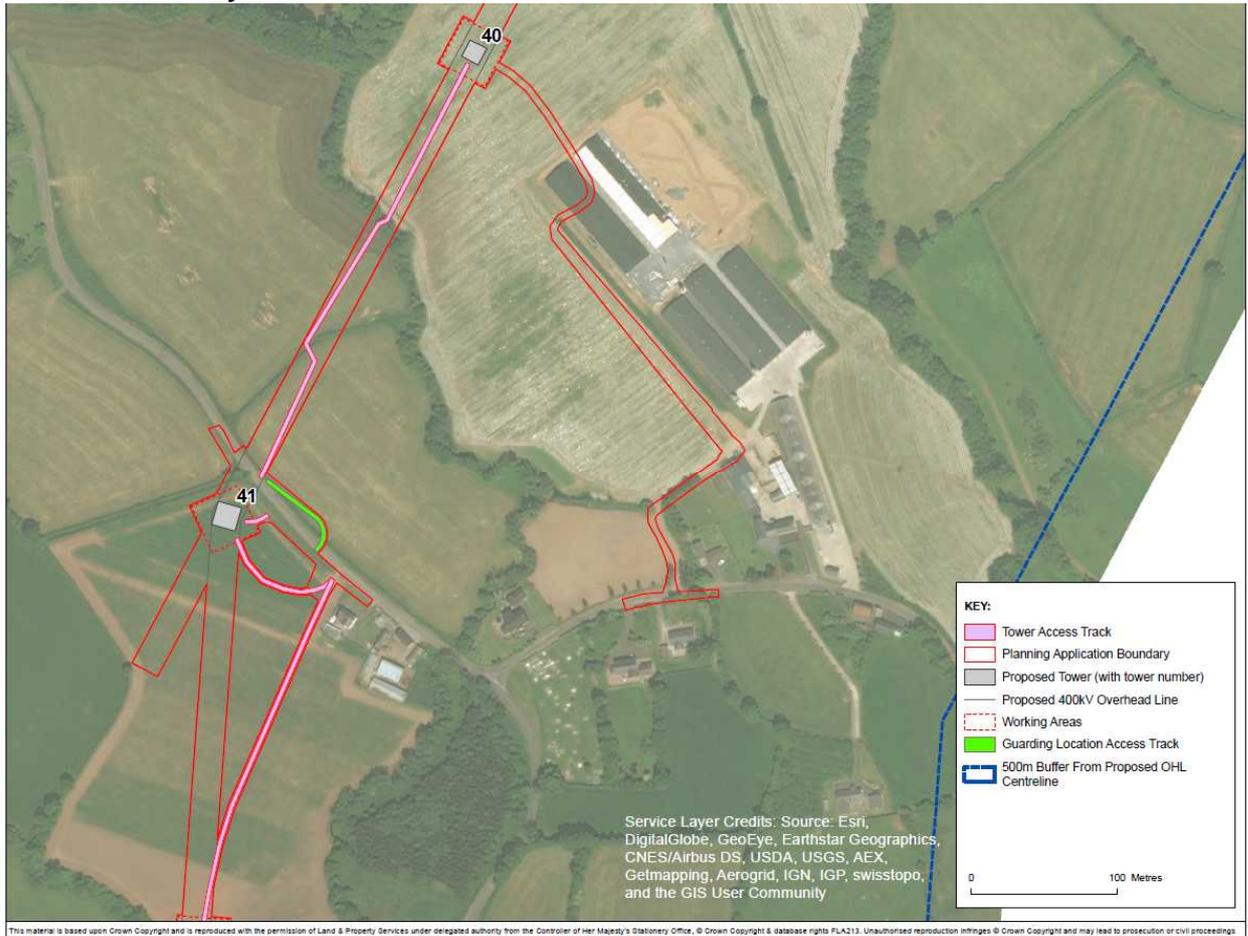
59. Between 2009 and 2012, there were approximately 6,000 third party submissions made in relation to the proposed Tyrone - Cavan Interconnector. These were reviewed and taken into account in the writing of the Consolidated ES. Following the publication of that document in 2013 and between May 2013 to May 2015, 2,957 third party submissions were made. Where comments have been made about the construction phase impacts, these matters have been addressed in the individual specialist Technical Reports (e.g. objections relating to ecology impacts resulting from the construction phase are addressed in Technical Report 8 – Ecology). All submissions that were taken into account in the writing of the Consolidated ES Addendum.
60. Between June 2015 and November 2016, there have been 594 third party submissions. Again, submissions relating to construction impacts are dealt with in relevant specialist Technical Reports. However, as the submissions did not raise any specific issues with regard to the construction methodology proposed there are no specific submissions from this period that we have responded to within this Technical Report.

#### 4.6 Further Environmental Information for the Purposes of the Inquiry

61. Since the publication of the Consolidated ES and its Addendum, the following environmental information has become available, and is presented to the inquiry for the purposes of the inquiry. Accordingly, and by virtue of Regulation 23(6) of the Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2015 the requirements of paragraphs (4) and (5) of the said Regulation 23 do not apply.
62. Since the publication of the Consolidated ES Addendum, a number of chicken sheds have been constructed on the area proposed as the access track to Tower 40. With these chicken sheds in place, it would not be possible to use the access route originally identified and so two alternative access tracks are presented.
63. These are shown in Plates 4.1 and 4.2 of this Technical Report. Option AT40A does not require any amendment to the planning application boundary as Tower 40 could be accessed from the south-west within the planning application boundary. This option would use a currently proposed access point from the Tullysaran Road and would travel to Tower 40 crossing two minor watercourses with a temporary crossing structure such as temporary composite material matting described above in paragraph 56. This option would also require the removal of a 3 m wide section of mature vegetation at the watercourse crossing to facilitate the access track.
64. Option AT40B will require a minimal amendment to the access track so it is routed around the recently constructed chicken sheds. This option would require the planning application boundary to be amended to accommodate a small section of access track extending beyond the current planning application boundary (Plate 4.2 illustrates the amended section of track). This area would be over the same field as the previous access track and would be over improved grassland. There would be no requirement for stoning along this section of access track.
65. As noted within the Statement of Case, the applicant proposes that AT40B be the response to this approval, which represents a de minimis alteration to the planning application boundary. AT40A would not require a change to the planning application boundary and it remains as a possible option that is available to the applicant.
66. Both Option AT40A and AT40B have been assessed by the environmental team and a summary of their assessment is set out within Tables 4.1 and 4.2 of this Technical

Report. The assessments in the tables below have been prepared by the relevant environmental specialists for the project.

Plate 4.1 AT40A layout

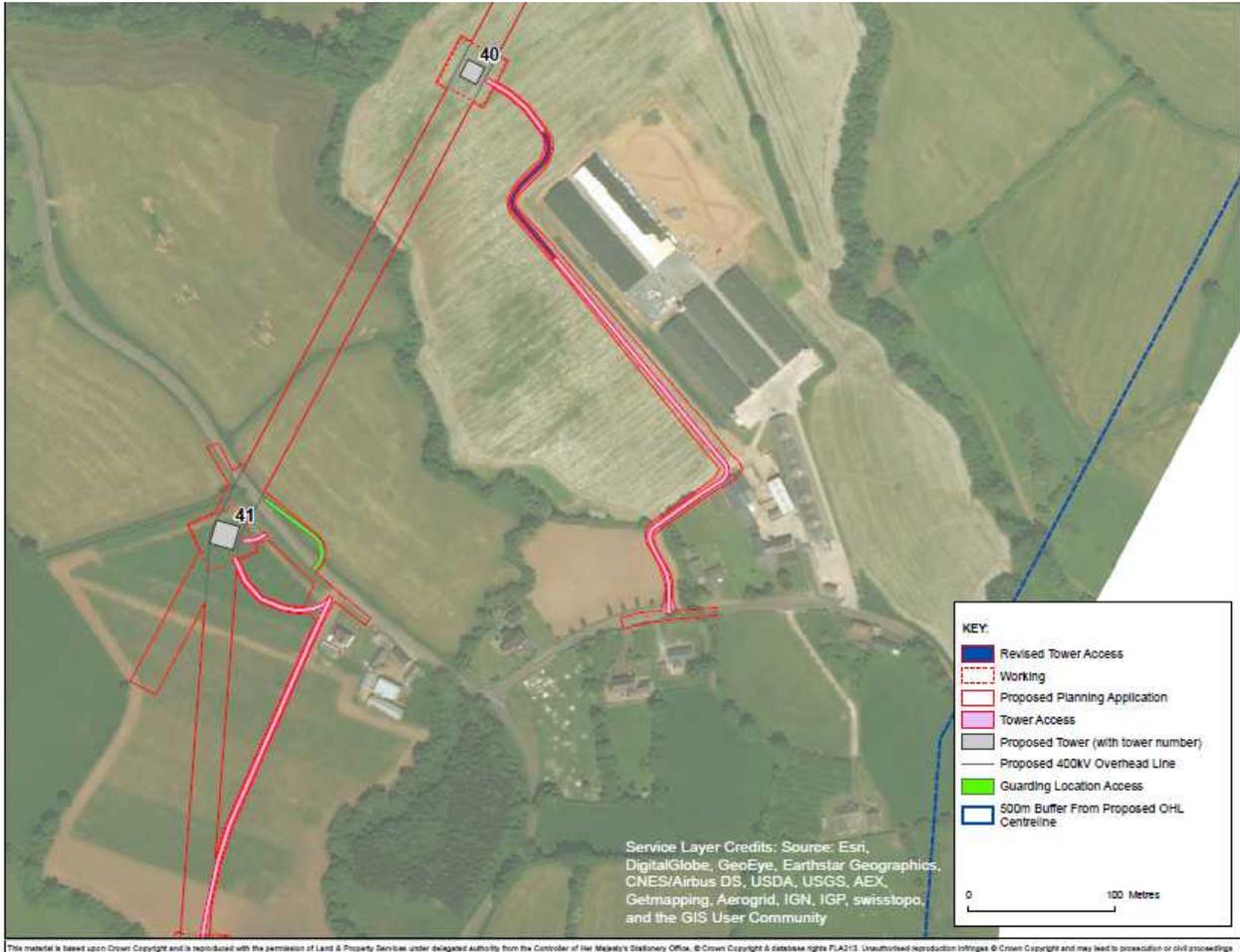


The alternative access track is shown running from Tower 40 in a south-westerly direction towards the guarding location access track. This plate is indicative and for illustrative purposes only.

Table 4.1 Appraisal of AT40A

| Environmental Review Topic                         | AT40A Comment   |
|--|---|
| <b>EMF</b>   | No change in the assessment presented in the Consolidated ES and Addendum.  |
| <b>Water Environment</b>                           | The proposed AT40A changes would require crossing a field drain (sheugh) and a minor watercourse/tributary of the Ballymartrim Water, which is a designated salmonid river despite its Poor WFD status. Mitigation measures, as presented in the Consolidated ES, would be required to ensure no likely significant effects.  |
| <b>Soils, Geology and Groundwater</b>              | New proposed access track would require mitigation measures, as presented in the Consolidated ES to ensure no likely significant effects.   |
| <b>Ecology</b>                                     | <p>Tower 40 is located in an area of arable land, whilst the proposed access track would cross an area of improved grassland. A tributary of the Ballymartrim Water, a running water body, lies between the two fields, with a species poor hedgerow with trees. Potential impacts on the Ballymartrim River as a Salmonid River are assessed in the Consolidated ES, Chapter 8 Water Environment and Chapter 10 Ecology. <i>“The majority of watercourses are small unnamed streams or drains that are tributaries of the larger River Blackwater, Ballymartrim Water and River Rhone. All of these surface waters are included on the Protected Areas Register as a result of their fisheries interests and ecological status”</i>. Mitigation measures, in particular those presented in the Consolidated ES, would be required to ensure no likely significant effects.</p> <p>Downstream of the proposed water crossing and north of Tower 40, a linear parcel of deciduous woodland is present. This woodland has mature sessile oak trees, along with other tree species such as Scots Pine, beech, holly, hazel and hawthorn. The woodland floor is dominated by bramble, but pockets of typical woodland flora are found.</p> <p>The proposed crossing of the watercourse would require the removal of mature trees. While these trees are identified for trimming in the Consolidated ES, their removal will be a slight adverse impact. The trees would be replaced with similar trees as mitigation because of the safety clearance issues. A species rich hedgerow will be planted at this location as replacement planting. Mitigation measures, in particular those presented in the Consolidated ES, would be required to ensure no likely significant effects.</p> |
| <b>Noise</b>                                       | No change.  |
| <b>Cultural Heritage</b>                           | No change.  |
| <b>Landscape and Visual</b>                        | The track itself will not result in any significant change in the assessment. However, the rerouting of AT40A will involve the removal of vegetation along the watercourse banks, including mature trees.   |
| <b>Community Amenity and Land Use</b>              | Parcel 056 has uses such as livestock (pigs and poultry) and other uses. Parcel 058 is grassland (cattle or sheep). Mitigation measures as presented in the Consolidated ES, would be required to ensure no likely significant effects.   |
| <b>Socio-Economics</b>                             | No change.  |
| <b>Telecommunications and Aviation Assets</b>      | No change.  |
| <b>Flood Risk Assessment</b>                       | The temporary crossing of the watercourses will be designed to ensure sufficient clearance so that there is no change in the flood conditions.  |
| <b>Transport</b>                                   | No change.  |
| <b>Air Quality</b>                                 | No change.  |
| <b>Cumulative and Interrelationship of Impacts</b> | There is the potential for interactions in terms of water environment, ecology and landscape but no significant change in the assessment.   |
| <b>Transboundary Impacts</b>                       | No change.  |

Plate 4.2: AT40B Layout



This plate is indicative and for illustrative purposes only.

**Table 4.2 Appraisal of AT40B**

| <b>Environmental Review Topic</b>                  | <b>AT40B Comments</b>   |
|--|---|
| <b>EMF</b>   | No change in the assessment presented in the Consolidated ES and Addendum.  |
| <b>Water Environment</b>                           | The changes in the access track do not bring the proposed access track any closer to the tributary of the Ballymartrim Water. No change.  |
| <b>Soils, Geology and Groundwater</b>              | No change.  |
| <b>Ecology</b>                                     | No change.  |
| <b>Noise</b>                                       | The access track would remain in proximity to a number of poultry sheds. However Given the temporary nature of the impacts from passing construction vehicles and the nature of the receptor, there will be no likely significant effect. Noise impacts on access tracks are outlined in the Consolidated ES, Noise, Chapter 11, Paragraph 102 – 104. |
| <b>Cultural Heritage</b>                           | No change.  |
| <b>Landscape and Visual</b>                        | No change.  |
| <b>Community Amenity and Land Use</b>              | Parcel 056 has uses such as livestock (pigs and poultry) and other uses. As the proposed change is very minor, there is no change in the assessment.  |
| <b>Socio-Economics</b>                             | No change.  |
| <b>Telecommunications and Aviation Assets</b>      | No change.  |
| <b>Flood Risk Assessment</b>                       | Tower 40 is not identified in the flood risk assessment as being in the Q100 floodplain and so there is no change.  |
| <b>Transport</b>                                   | No change.  |
| <b>Air Quality</b>                                 | No change.  |
| <b>Cumulative and Interrelationship of Impacts</b> | No change.  |
| <b>Transboundary Impacts</b>                       | No change.  |

## 4.7 Summary and Conclusions

67. This is a summary of information that is contained in the Consolidated ES Chapter 5 (p135 – p150). The Consolidated ES has identified the potential for impacts on the environment and proposes mitigation measures to mitigate these impacts. In summary the construction phase of the proposed project :
- Involves close consultation and liaison with relevant landowners and stakeholders;
  - Is carried out across a very long linear site for the proposed towers and overhead line and, therefore, will have limited impact simultaneously along the whole site length. The proposed substation is a discrete site located away from residential and other sensitive receptors;
  - Is low density in terms of traffic generation given the phased nature of work over an extended period of time; and,
  - Is continually monitored with respect to potential impacts which have been identified in the Consolidated ES and other applications documentation, and in accordance with all commitments, which will be implemented, listed within in the CEMP.
68. The Outline CEMP will be a key part of the construction contract to ensure that all mitigation measures which are considered necessary to protect the environment, prior to construction, during construction and/or during operation of the Proposed Development, are fulfilled. NIE Networks will be responsible for ensuring that the contractor manages the construction activities in accordance with the Outline CEMP including the mitigation measures that are set out within that document. The contractor will prepare a detailed CEMP which is in accordance with the Outline CEMP to ensure that construction delivers the mitigation measures set out within this Environmental Statement, and that detailed CEMP will be agreed with the Department.

## Appendix A - Overhead Line Construction Illustration

# Construction

(For illustrative purposes only)

It should be noted that the construction methodology outlined below is indicative only and is based on EirGrid's and ESB Networks' experience of similar transmission line projects. Where there are site specific issues, for example poor ground conditions or unique planning conditions, then alternative methodologies are likely to be required.

In all cases, EirGrid will work with landowners to agree access routes and to minimise disruption.

Individual tower sites will be separated by an average of 350m and access to the sites will be required for short periods during each phase of construction.

### 1 Setting Out/Access Routes

Site preparation works including minor civil works.

Access routes agreed with landowner.

Tower foundations pegged out.

### 2 Tower Foundations

Temporary fencing.

Local levelling and clearing of vegetation where required.

### 3 Typical Tower Foundations

Foundations backfilled using excavated material compacted in layers.

4 Individual footings for each tower.

Ground level.

Typical duration of foundation works = 1 week per tower.

Inset labels: Shear block, Tower Stub, Steel reinforcement, Concrete foundation block.

### 4 Tower Erection

Tower sections assembled on ground and lifted into position.

Towers can be erected using a derrick pole and winch. The derrick consists of an aluminium or steel pole held in position using guy ropes anchored to the ground. A mobile crane may also be used.

Ground level.

Typical duration of tower erection = 1 week per tower.

### 5 Stringing

Light Pilot Lines carried by hand onto stringing wheels.

Intermediate Tower.

Angle Tower.

Temporary guard poles and netting erected over roadway for duration of Stringing operation.

Typical duration = 1 week per straight.

### 6 Re-Instatement & Completion

Grounds re-instated to original condition around base of towers.