Briefing Note 06

Project:	**Highways England Spatial Planning Arrangement 2016-2020**	Job No:	**60572359/DN052.003**
Subject:	**Norfolk Vanguard Wind Farm - DMRB Technical Review 2**		
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Executive Summary

Following a DMRB technical review of drawing TP-PB4476-DR012 Rev D0.3 and drawing TP-PB4476-DR015 Rev D0.1 submitted alongside the Environmental Statement and supporting documents prepared by Royal Haskoning DHV (RHDHV), in support of the Norfolk Vanguard Wind Farm proposals, AECOM make the following recommendations.

Recommendations regarded as critical to the acceptability of this planning application:

A47 Substation Access A

1. A revised access layout should be proposed that would allow vehicles to enter and exit at the same time on a fully paved surface. Vehicular swept path plots should be provided in support of the revised A47 Substation Access A junction layout to demonstrate the ability of an articulated vehicle and large tipper (the Design Vehicles) to negotiate all legitimate turning movements at the junction without overrunning kerb or A47 centre lines. (para. 4.11);

2. The proposed corner radii and exit tapers at Access A should be reviewed in the context of the guidance set out in TD 42 and the grasscrete over-run area extended if necessary to provide the appropriate corner radii and tapers (para. 4.15);

A47 Substation Access D1

3. Vehicular swept path plots should be provided in support of the proposed A47 Substation Access D1 junction layout to demonstrate the ability of an articulated vehicle (the Design Vehicle) to negotiate all legitimate turning movements at the junction without overrunning kerb or centre lines. The swept paths presented should also demonstrate that an articulated vehicle entering the site is able to stand clear of the carriageway whilst an articulated vehicle is exiting the field area within the limits of the order boundary shown (para. 5.9); and

4. The proposed corner radii should be reviewed in the context of the guidance set out in TD 42 with respect to nearside tapers on the major and minor road exits from the junction (para. 5.14).

Recommendations regarded as important but not critical to the acceptability of this planning application:

A47 Substation Access A

5. A fully compliant DMRB arrangement comprising a ghost-island right-turn would represent the preferable junction arrangement at this location (para. 4.8);

6. Traffic signs and markings in accordance with TD 42, TSM and TSRGD should be demonstrated fully at the detailed design stage (para. 4.9);

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7. The potential to close off the southern access to the service road serving the dwelling known as 'The Grove' should be investigated (para. 4.13);

8. Visibility splays of 4.5m x 215m from Access A in accordance with the requirements of TD 42 should be demonstrated to be deliverable in both the horizontal and vertical plane within land in the control of either the applicant or the highway authority at the detailed design stage (para. 4.14);

A47 Substation Access D1

9. A fully compliant DMRB arrangement comprising a ghost-island right-turn would represent the preferable junction arrangement at this location (para. 5.2);

10. Traffic signs and markings in accordance with TD 42, TSM and TSRGD should demonstrated fully at the detailed design stage (para. 5.8);

11. Visibility splays from Access D1 in accordance with the requirements of TD 42 should be demonstrated to be deliverable in both the horizontal and vertical plane within land in the control of either the applicant or the highway authority at the detailed design stage (para. 5.11); and

12. The service road access should be closed and alternative provision be made to access the dwelling known as 'The Grove'. If this is not possible, AECOM recommend that appropriate corner radii are provided and swept paths and visibility splays illustrated on a further revision of Drawing TP-PB4476-DR015 Rev D0.3 to demonstrate that its legitimate use by vehicles will not be compromised by the proposed new junction (para. 5.15).

AECOM recommend that the consultation response from Highways England asserts that the recommendations listed above should be addressed.

1. Introduction

1.1. AECOM, on behalf of Highways England, have undertaken a technical review of drawing TP-PB4476-DR012 Rev D0.3 and drawing TP-PB4476-DR015 Rev D0.1 submitted alongside the Environmental Statement (ES) and supporting documents prepared by Royal Haskoning DHV (RHDHV), in support of the Norfolk Vanguard Wind Farm proposals to the west of Dereham. The drawings illustrate the layouts proposed for a direct access to the southeast of the A47 (Access A) to serve the proposed Norfolk Vanguard substation at Necton and a direct access to the northwest of the A47 (Access D1) to serve National Grid Overhead Line Modification Works (NG OHLMW). The drawings have been reviewed alongside the supporting text contained in document 8.10, the 'Outline Access Management Plan', submitted as an appendix to ES Chapter 24 'Transport & Traffic'.

1.2. AECOM have previously reviewed the Environmental Impact Assessment Traffic & Transport Method Statement (TTMS), Preliminary Environmental Information Report (PEIR) and Norfolk Vanguard Substation – A47 Substation Access Review Technical Note (the SATN) and priority junction layout proposed at the A47 Substation Access B (drawing no. TD-PB4476-DR014 Rev D0.3), each produced by RHDHV, and have also undertaken a junction assessment review. The results of the previous reviews are reported in AECOM BN01 (March 2017), BN02 (December 2017), BN03 (May 2018), BN04 (January 2019) and BN05 (January 2019).

1.3. This Briefing Note (BN06) will review the layouts proposed at the A47 Access A and Access D1 priority junctions with a view to determining whether or not the proposed layouts are compliant with the requirements of the Design Manual for Roads and Bridges (DMRB).

1.4. For ease of reference, AECOM's main comments and recommendations are presented in bold and underlined text throughout the note. Recommendations regarded as critical to the acceptability of this layout are coloured **red.** Recommendations regarded as important but not critical to the acceptability in principle of this planning application are highlighted in **amber.**

2. Background

2.1. The Norfolk Vanguard Wind Farm itself will be located off the Norfolk Coast. However, electricity generated will access the National Grid at a substation adjacent to the A47 Trunk Road at Necton, to the west of Dereham. As part of the Norfolk Vanguard project, an extension to the existing substation will be required as well as construction of a new onshore substation (at the Necton site) for the Norfolk Vanguard Wind Farm. The substation will be accessed by vehicular traffic via the A47.

2.2. Highways England is the highway authority with respect to the SRN, comprising of the A47 at this location. Highways England's primary interest will be the impact of traffic generated by the site on the safe and free flow of traffic using the A47.

2.3. AECOM previously recommended in BN03 with respect to both Access A and Access D1 that Highways England required scale plans of the proposed junction layouts (with dimensions and visibility splays shown) before agreeing to the proposals in principle. Any agreement would also be subject to acceptance by NCC and a Stage 1 Road Safety Audit.

2.4. Specifically, this DMRB review considers the proposed layouts presented by RHDHV in drawing TP-PB4476-DR012 Rev D0.3 and TP-PB4476-DR015 Rev D0.1 with respect to the proposed A47 Access A and Access D1 concept drawings respectively.

2.5. The location of the proposed accesses relative to each other and to existing junctions and accesses on the A47, is illustrated on Drawing PB4476-003-00X-002, an extract from which is reproduced as Figure 1 below.

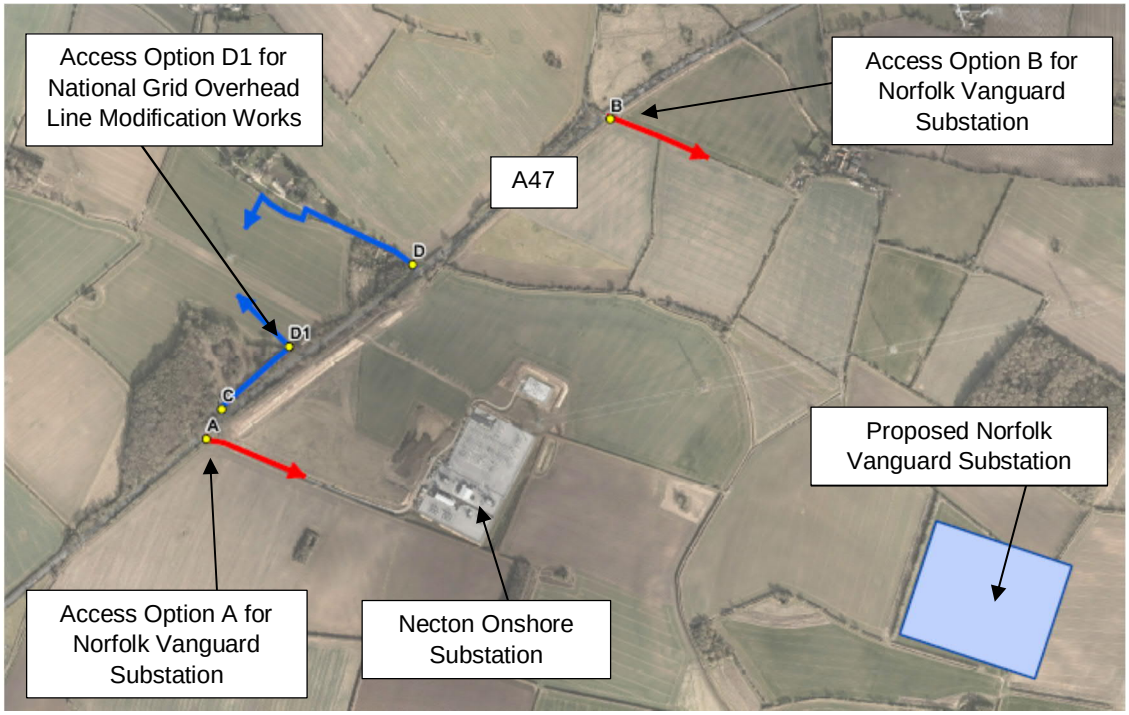

Figure 1. Location of Access A and D1 on the A47 at Necton

3. DMRB Technical Review

3.1. This BN06 represents a technical review of drawing TP-PB4476-DR012 Rev D0.3 '*A47 Substation Access A Concept Drawing (Left turn in / Left Turn Out)*' and drawing TP-PB4476-DR015 Rev D0.1 *'A47 Substation National Grid OHLMW Access D1 Concept Drawing (Temporary)'*, each understood to be dated October 2018. The review does not constitute a detailed design check of all aspects of the proposals, but is intended to identify aspects of the design which are potential 'show stoppers' and/or aspects which if revised could have an impact upon the predicted junction operation. A site visit has not been undertaken.

3.2. This section provides a technical review of the proposed layout with reference to the Design Manual for Roads and Bridges (DMRB) guidance set out in:

- TD 42/95 – Geometric Design of Major/Minor Priority Junctions (DMRB Volume 6 Section 2 Part 6, January 1995); and
- TD 41/95 Vehicular Access to All-Purpose Trunk Roads' (DMRB Volume 6 Section 2 Part 7, March 1995.

3.3. Reference is also made to TD 9/93 (Highway Link Design) where applicable.

3.4. No evidence has been submitted to demonstrate whether the proposed layouts have been subject to a Stage 1 Road Safety Audit (RSA). This review does not constitute a Road Safety Audit.

3.5. AECOM has not appointed a Principal Designer or considered the associated aspects that would apply within this role. It is recommended that should this scheme proceed a Principal Designer is appointed by the client in accordance with current CDM Regulations.

4. A47 Substation Access A Junction

Introduction

4.1. Access A is an existing priority junction with the A47 (illustrated by Figure 2 below), currently serving the existing Necton Electricity Substation (NES) and adjacent farm land. Access A currently comprises a simple T-junction with adjacent 'grasscrete' over-run areas originally provided to accommodate access by 'abnormal loads' during construction of the NES. At present the access is currently shared by local farmers accessing agricultural land south of the A47 and by operational traffic associated with the NES. The A47 is a two-way single carriageway road subject to the derestricted National Speed Limit of 60mph in the vicinity of the junction. Table 4.1 of the SATN shows that, between them, accesses A and B are anticipated to be used by up to an additional 278 vehicles per day during the Substation works, which are anticipated to last for up to six years (Table 24.12 of ES Chapter 24).

Figure 2. Existing access for Necton Onshore Substation (Access A)

4.2. Existing accesses serving an unmade service road to the north of the A47 and providing access to a single dwelling known as 'The Grove' are located approximately 27m southwest and 72m northeast of the existing Access A priority junction.

4.3. This section considers the proposed Access A layout illustrated on the RHDHV drawing TP-PB4476-DR012 Rev D0.3, which appears to retain the existing simple T-junction arrangement with the A47 with no geometric changes to the existing physical layout. RHDHV propose a left-in / left-out access arrangement at Access A for the duration of the OHLM works, enforced by the implementation of an Access Management Strategy.

4.4. Additionally, AECOM have cognisance to the RHDHV tracking drawings TP-PB4476-DR017 Rev D0.1 and TP-PB4476-DR018 Rev D0.1 each dated August 2018.

4.5. This technical review does not consider the question as to whether the proposed layout is sufficient to accommodate the predicted increases in traffic flows at the A47 Substation Access A junction attributed to the Norfolk Vanguard Wind Farm project, but confines itself to the question of whether the layout proposed meets the requirements of the DMRB.

General Principles

4.6. Geometric measurements referenced within this technical note have been obtained from an electronic copy of drawing TP-PB4476-DR012 Rev D0.3, which was provided to AECOM by

RHDHV on 3 January 2019. Additionally, AECOM have cognisance to the RHDHV tracking drawings TP-PB4476-DR017 Rev D0.1 and TP-PB4476-DR018 Rev D0.1 which were also provided to AECOM in electronic format by RHDHV on 3 January 2019.

4.7. It should be noted that the information presented on drawing no. TP-PB4476-DR012 Rev D0.3 is in two-dimensional form only and therefore a review of the vertical aspects of the proposal has not been undertaken. The vertical aspects could have implications in terms of alignment in both vertical and horizontal planes and also the perceived visibility available and should be provided in due course.

4.8. The proposed access illustrated by drawing no. TP-PB4476-DR012 Rev D0.3 appears to retain the existing priority T-junction with the A47 in situ. Whilst the RHDHV assertion that vehicular right-turn movements will be removed and controlled by an Access Management Strategy is noted, **AECOM consider that, in principle, a fully compliant DMRB arrangement comprising a ghost-island right-turn would represent the preferable junction arrangement at this location**. Any subsequent proposals for a DMRB compliant ghost-island right-turn arrangement would need to consider the implications for the access to 'The Grove' located almost opposite (see paragraph 4.13 below).

4.9. TD 42 (para. 7.78) identifies that guidance for the appropriate use of traffic signs and road markings at priority junctions is contained in the Traffic Signs Manual (TSM). Additionally the Traffic Signs Regulations and General Directions (TSRGD) should be consulted. Indicative signing and lining illustrated on drawing no. TP-PB4476-DR012 Rev D0.3 appears to be broadly consistent with the guidance set out in TD42, TSM and TSRGD. **AECOM recommend that traffic signs and markings in accordance with TD 42, TSM and TSRGD are demonstrated fully at the detailed design stage.**

4.10. The current access to the development area is an existing service road, circa 4.0m in width, which forms a simple priority T-junction with the A47 and provides access to the existing NES and adjacent agricultural land. Existing kerb radii are circa 6m on the entry to the service road from the A47 and 10m on the exit from the service road to the A47. The existing provision of 'grasscrete' over-run areas adjacent to the service road potentially delivers an effective entry radius of 12m and exit radius of 14.5m for the existing service road should drivers choose to make use of these areas.

4.11. Vehicular swept paths for an 'articulated vehicle' and 'large tipper' are provided in drawing TP-PB4476-DR017 Rev D0.1 and TP-PB4476-DR018 Rev D0.1 respectively. Whilst AECOM note that the swept paths of each of the design vehicles appear to be broadly accommodated within the existing junction layout (including over-run areas), some overrunning of A47 centre lines on the left-turn exit manoeuvre is shown and the swept paths overlap on the access road beyond the immediate junction, raising the risk of conflicts occurring where insufficient width is provided for two vehicles to access and egress the development area simultaneously. Potentially a scenario could occur where a vehicle waiting to egress the access blocks the path of a large vehicle wishing to enter the site, forcing that vehicle to stop on the A47 until the junction access area is cleared and potentially increasing the risk of collisions occurring. **AECOM recommend that a revised access layout is proposed that would allow vehicles to enter and exit at the same time on a fully paved surface. Vehicular swept path plots should be provided in support of the revised A47 Substation Access A junction layout to demonstrate the ability of an articulated vehicle and large tipper (the Design Vehicles) to negotiate all legitimate turning movements at the junction without overrunning kerb or A47 centre lines.**

A47 Substation Access A – Simple Priority Junction

4.12. The proposed access illustrated by drawing no. TP-PB4476-DR012 Rev D0.3 appears to retain the existing priority T-junction with the A47 in situ. The existing accesses on the northern side of the A47 serving the dwelling known as 'The Grove' also appear to be retained and effectively form a left-right stagger of 27m and right-left stagger of 72m with Access A respectively.

4.13. AECOM note that the existing stagger distance of 27m to the southern access serving The Grove falls short of the mandatory minimum stagger distance for a simple left-right stagger as set out in TD 42 (para. 7.65). Whilst acknowledging that the stagger represents an existing situation and vehicular use of the southern access for The Grove is likely to be negligible, **AECOM recommend that the potential to close off the southern access to the service road serving the dwelling known as 'The Grove' should be investigated**.

4.14. Drawing TP-PB4476-DR012 Rev D0.3 illustrates the extent of land required to be clear to provide visibility splays of 4.5m x 215m in each direction from the centre line on the minor road. AECOM are satisfied that a Desirable Minimum Stopping Sight Distance (DMSSD) of 215m is appropriate in this location and is consistent, in principle, with the requirements of TD 9 (Table 3) with respect to forward visibility for the major road right-turn (notwithstanding the proposed Access Management Strategy left-in / left-out operation) and TD 42 (Table 7/1) with respect to 'y' distance from the Minor Road. AECOM are also satisfied that an 'x' distance of 4.5m is appropriate and consistent with the acceptable relaxation in difficult circumstances set out by TD 42 (para. 7.8) for lightly trafficked simple junctions. AECOM note the presence of a significant number of mature trees in the hedgerow on the south side of the A47 on both sides of the access point and that these trees also serve the function of screening 'The Grove' from views of the substation. It is unclear from the drawing provided how much of the hedgerow and how many of the trees would have to be removed in order to achieve the visibility splays shown. Notwithstanding this, AECOM are satisfied that a DMSSD visibility splay of 4.5m x 215m is likely to be achievable in both directions from the minor road, in the horizontal plane, subject to the clearance of vegetation from the identified area. Para 3.1 of the OAMP acknowledges the presence of a crest curve located approximately 200m north east of the access point. **AECOM recommend that visibility splays of 4.5m x 215m from Access A in accordance with the requirements of TD 42 are demonstrated to be deliverable in both the horizontal and vertical plane within land in the control of either the applicant or the highway authority at the detailed design stage.**

4.15. Drawing TP-PB4476-DR012 Rev D0.3 illustrates entry/exit corner radii of 6m and 10m respectively on the minor road at Access A whilst the existing provision of 'grasscrete' over-run areas adjacent to the service road delivers effective entry/exit corner radii of 12m and 14.5m respectively. AECOM consider that the proposed corner radii fall short of the provision recommended by TD 42 (para. 7.17) which advises that *"Where provision is to be made for large goods vehicles, the recommended circular corner radius is:- b. 15m at rural simple junctions, with tapers of 1:10 over a distance of 25m"*. The standard requires an exit taper into both the major and minor road arms, however an approach taper from the major road is not required. The layout illustrated on drawing TP-PB4476-DR012 Rev D0.3, does not provide for an exit taper into the minor arm or into the major road. AECOM consider that this is likely to be contributory in the over running of centre lines on the A47 shown on the swept paths referred to above. **AECOM recommend that the proposed corner radii and exit tapers at Access A are reviewed in the context of the guidance set out in TD 42 (para. 7.17) and the paved area extended if necessary to provide the appropriate corner radii and tapers.**

4.16. AECOM consider that the existing and proposed Access A priority junction does not currently constitute a DMRB compliant junction. However, AECOM consider that a DMRB compliant junction is likely to be deliverable at this location, in principle, subject to resolution of the recommendations set out in this BN06.

5. A47 Substation NG OHLMW Access D1 Junction

Introduction

5.1. The proposed Access D1 is located on the northern verge of the A47 approximately 300m northeast of the existing NES access (Access A). It is currently an existing field access (illustrated by Figure 3 below), providing immediate access to the field in which the electricity pylon is located, and connecting with the northern section of the unmade service road serving the dwelling known as 'The Grove'. The A47 is a two-way single carriageway road subject to the derestricted National Speed Limit of 60mph in the vicinity of the proposed junction. Table 5.1 of the SATN shows that this access is anticipated to be used by up to 24 vehicles per day during the NG OHLMW works, which are anticipated to last for two one-week periods (footnote to Table 4.1 of the SATN).

Figure 3. Existing field access (Access D1)

5.2. RHDHV assert that a fully DMRB compliant ghost island right-turn access to the Electricity Pylon field at Access D1 would be disproportionate to the vehicular demand and construction programme proposed. RHDHV accordingly propose the implementation of an Access Management Strategy to remove right-turn manoeuvres from the A47 by enforcing left-in / left-out movements by construction traffic whereby all OHLM traffic would approach Access D1 from the south and exit to the north. Whilst the RHDHV assertion that vehicular right-turn movements will be removed and controlled by an Access Management Strategy is noted, **AECOM consider that, in principle, a fully compliant DMRB arrangement comprising a ghost-island right-turn would represent the preferable junction arrangement at this location**. However, AECOM accept that the disruption involved in providing a ghost island right turn layout would be disproportionate to the proposed use of the access by construction traffic

5.3. This section considers the proposed Access D1 layout illustrated on the RHDHV drawing TP-PB4476-DR015 Rev D0.1, comprising a simple priority T-junction with the A47 located approximately 300m northeast of Access A. The proposed junction with the A47 consists of a minor arm of 7.5m width, serving a gated field access and also providing access to the service road for The Grove, with entry/exit kerb radii with the A47 of circa 14m and 13m respectively. RHDHV also propose a temporary 30mph speed reduction on the A47 for the duration of the OHLM works, over a distance of circa 430m straddling the proposed Access D1 junction.

5.4. Additionally, AECOM have cognisance to the RHDHV tracking drawings TP-PB4476-DR023 Rev D0.1 and TP-PB4476-DR024 Rev D0.1 each dated August 2018.

5.5. This technical review does not consider the question as to whether the proposed mitigation is sufficient to accommodate the predicted increases in traffic flows at the A47 Access D1 junction attributed to the Norfolk Vanguard Wind Farm project, but confines itself to the question of whether the layout proposed meets the requirements of the DMRB.

General Principles

5.6. Geometric measurements referenced within this technical note have been obtained from an electronic copy of drawing no. TP-PB4476-DR015 Rev D0.3, which was provided to AECOM by RHDHV on 3 January 2019. Additionally, AECOM have cognisance to the RHDHV tracking drawings TP-PB4476-DR023 Rev D0.1 and TP-PB4476-DR024 Rev D0.1 which were also provided to AECOM in electronic format by RHDHV on 3 January 2019.

5.7. It should be noted that the information presented on drawing no. TP-PB4476-DR015 Rev D0.3 is in two-dimensional form only and therefore a review of the vertical aspects of the proposal has not been undertaken. The vertical aspects could have implications in terms of alignment in both vertical and horizontal planes and also the perceived visibility available and should be provided in due course.

5.8. TD 42 (para. 7.78) identifies that guidance for the appropriate use of traffic signs and road markings at priority junctions is contained in the Traffic Signs Manual (TSM). Additionally the Traffic Signs Regulations and General Directions (TSRGD) should be consulted. Indicative signing and lining illustrated on drawing no. TP-PB4476-DR015 Rev D0.3 appears to be broadly consistent with the guidance set out in TD42, TSM and TSRGD. **AECOM recommend that traffic signs and markings in accordance with TD 42, TSM and TSRGD are demonstrated fully at the detailed design stage.**

5.9. Vehicular swept paths for an 'articulated vehicle' and 'large tipper' are provided in drawing TP-PB4476-DR023 Rev D0.1 and TP-PB4476-DR024 Rev D0.1 respectively. Whilst AECOM note that the swept paths of each of the design vehicles appear to be broadly accommodated within the proposed junction layout, some overrunning of centre lines on the articulated vehicle swept paths is shown. AECOM are satisfied in principle that two design vehicles making the left-in / left-out manoeuvre will be able to access/egress the minor arm of the junction simultaneously, however the potential for conflicts between articulated vehicles entering the access from the south and general traffic on the southbound A47 should be reviewed. **AECOM recommend that vehicular swept path plots are provided in support of the proposed A47 Substation Access D1 junction layout to demonstrate the ability of an articulated vehicle (the Design Vehicle) to negotiate all legitimate turning movements at the junction without overrunning kerb or centre lines.** In addition AECOM note that the 'order limits' indicated on the drawing present a challenging alignment within the field area, potentially requiring vehicles to utilise both sides of the access to complete this turn. **The swept paths presented should also demonstrate that an articulated vehicle entering the site is able to stand clear of the carriageway whilst an articulated vehicle is exiting the field area within the limits of the order boundary shown.**

A47 Substation NG OHLMW Access D1 – Simple Priority Junction

5.10. Drawing TP-PB4476-DR015 Rev D0.3 illustrates the extent of land required to provide visibility splays of 4.5m x 90m in each direction from the centre line on the minor road, commensurate with the temporary 30mph speed restriction proposed for the A47. AECOM are satisfied that an 'x' distance of 4.5m is appropriate in this location and is consistent with the acceptable relaxation in difficult circumstances set out in TD 42 (para.7.8) for lightly trafficked simple junctions. AECOM

note that the proposed 'y' distance is dependent upon the successful implementation of a Traffic Regulation Order (TRO) introducing a 30mph speed restriction on a circa 430m stretch of the A47.

5.11. AECOM also note that the illustrated kerb realignment and visibility splays are likely to require the removal of a significant length of mature trees and hedgerow vegetation adjacent to the highway. It is unclear whether the land required is currently within the control of the applicant and/or whether the required permissions have been obtained for removal of the hedgerow and trees. Given the level of use anticipated for this access point, should the removal of all the vegetation within the visibility splays shown not be feasible, consideration could be given to reducing the 'x' distance to 2.4m as a permitted relaxation at lightly used accesses, as set out at TD41/95 para 2.21. In any case, **AECOM recommend that visibility splays from Access D1 in accordance with the requirements of TD 42 are demonstrated to be deliverable in both the horizontal and vertical plane within land in the control of either the applicant or the highway authority at the detailed design stage.**

5.12. AECOM consider that, based on the prevailing derestricted 60mph speed restriction on the A47, a Desirable Minimum Stopping Sight Distance (DMSSD) of 215m is appropriate in this location and consistent with the requirements of TD 9 (Table 3) with respect to forward visibility for the major road right-turn (notwithstanding the proposed Access Management Strategy left-in / left-out operation) and TD 42 (Table 7/1) with respect to 'y' distance from the Minor Road. Whilst not illustrated on drawing TP-PB4476-DR015 Rev D0.3, AECOM understand that, although a DMSSD visibility splay of 215m is likely to be achievable, in principle, in both directions from the minor access in the horizontal plane subject to the clearance of vegetation, vertical visibility is understood to be compromised on the approach to the junction from both directions due to the presence of a crest curve on the A47 carriageway at this location, with the apex of the curve located some 200m northeast of the existing substation access (access A). Accordingly, RHDHV assert that Access D1 would require a speed restriction on the A47 to achieve DMRB compliant forward visibility.

5.13. AECOM assume that the proposed Access D1 junction represents a permanent infrastructure provision on the A47 which will remain in situ upon completion of the NG OHLM works. A 90m visibility splay as proposed does not represent a DMRB compliant junction in perpetuity, once the temporary speed restriction on the A47 is lifted and the speed limit reverts to 60mph at this location. However, AECOM accept that the resulting provision will be, in principle, no worse than currently exists at this location and should in principle be satisfactory, provided that the regular, permanent use of this access point reverts to its pre-construction level once the NG OHLM works are complete and no attempt is made to use the resulting improved access for any other purpose.

5.14. Drawing TP-PB4476-DR015 Rev D0.3 illustrates entry/exit corner radii of circa 14m and 13m respectively on the minor road, with an exit taper over a distance of 23.5m at a ratio of approximately 1:9 to the major road kerb. AECOM consider that the proposed corner radii fall short of the provision recommended by TD 42 (para. 7.17) which advises that *"Where provision is to be made for large goods vehicles, the recommended circular corner radius is:- b. 15m at rural simple junctions, with tapers of 1:10 over a distance of 25m"*. TD 41 requires similar provision with no further relaxations permitted. The standard requires an exit taper into both the major and minor road arms, however an approach taper from the major road is not required. The layout illustrated on Drawing TP-PB4476-DR015 Rev D0.3, does not provide an exit taper into the minor arm and the exit taper illustrated into the major road is of insufficient length and too narrow an angle. This may be a contributory factor for the over running of centre lines shown on the swept paths referred to above. **AECOM recommend that the proposed corner radii are reviewed in the context of the guidance set out in TD 42 (para. 7.17) with respect to nearside tapers on the major and minor road exits from the junction.**

5.15. AECOM note that the existing unmade service road giving access the dwelling known as 'The Grove' served by proposed Access D1 is shown as remaining open on Drawing TP-PB4476-DR015 Rev D0.3. Whilst it is evident that this access point is little used and alternative access points are available further south on the A47, AECOM regard it as undesirable to retain an access point within the overall footprint of the new junction. AECOM also note that the proposed entry/exit radii on the service road minor arm at circa 2m fall short of the minimum corner radii recommended by TD 42 (para. 7.17) of 10m in rural areas where no provision is made for large goods vehicles. Dependent on the level of use anticipated, an alternative layout such as that shown at Layout 8 of TD 41/05 could be considered. **AECOM recommend that the service road access should be closed and alternative provision be made to access the dwelling known as 'The Grove'. If this is not possible, AECOM recommend that appropriate corner radii are provided and swept paths and visibility splays illustrated on a further revision of Drawing TP-PB4476-DR015 Rev D0.3 to demonstrate that its legitimate use by vehicles will not be compromised by the proposed new junction.**

5.16. AECOM consider that the proposed Access D1 priority junction does not currently constitute a DMRB compliant junction. However, AECOM consider that a DMRB compliant junction encompassed within a reduced A47 speed limit is likely to be deliverable at this location, in principle, subject to resolution of the recommendations set out in this BN06.

6. Conclusion

6.1. This Briefing Note (BN06) has been prepared by AECOM, on behalf of Highways England, to provide a DMRB technical review of the mitigation proposed at the A47 Substation Access A and Access D1 junctions, illustrated by drawing TP-PB4476-DR012 Rev D0.3 and TP-PB4476-DR015 Rev D0.3 submitted by RHDHV in support of the Norfolk Vanguard Wind Farm proposal.

6.2. This review has identified several issues relating to DMRB compliance. AECOMs recommendations regarding these concerns are highlighted by the use of bold underlined text throughout this document. Recommendations regarded as critical to the acceptability of this layout are coloured **red.** Recommendations regarded as important but not critical to the acceptability of this planning application in principle are highlighted in **amber.**

6.3. AECOM recommend that the consultation response from Highways England asserts that the recommendations listed above should be addressed.