Longfield Solar Farm

Environmental Statement [PINS Ref: EN010118]

Appendix 13B: Framework Construction Traffic Management Plan

Document Reference: EN010118/APP/6.2(B)

Revision Number: 5.0

January 2023

Longfield Solar Energy Farm Ltd

APFP Regulation 5(2)(a)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

Quality information

Prepared by	Checked by	Verified by	Approved by
[redacted]			
Weronika Rybinska	Chris Burlton	Nick Anderson	Mark Watson
Graduate Consultant	Principal Consultant	Regional Director	Associate Director

Prepared for:

Longfield Solar Energy Farm Ltd

Prepared by:

AECOM Limited
Saxon House
27 Duke Street
Chelmsford CM1 1HT
United Kingdom

T: +44 (0)1245 771200
aecom.com

© AECOM Limited. All Rights Reserved.

This document has been prepared by AECOM Limited ("AECOM") for sole use of our client (the "Client") in accordance with generally accepted consultancy principles, the budget for fees and the terms of reference agreed between AECOM and the Client. Any information provided by third parties and referred to herein has not been checked or verified by AECOM, unless otherwise expressly stated in the document. No third party may rely upon this document without the prior and express written agreement of AECO

Table of Contents

1. Introduction 1
1.1 Context 1
1.2 Document Purpose and Scope 1
1.3 Objectives 1
1.4 Report Structure 2
2. Existing Conditions 3
2.1 Site Location 3
2.2 Surrounding Area 3
2.3 Site Accessibility 4
3. Future Highway Network 6
3.1 Future Network Changes 6
3.2 Committed Developments/ Schemes 6
3.3 Boreham Interchange and the Radial Distributor Road (RDR) 6
3.4 Chelmsford North East Bypass (CNEB) (Phase 1) 7
3.5 A12 Chelmsford to A120 Widening Scheme 8
3.6 Timescales 8
4. Policy and Best Practice 10
4.1 National Policy 10
4.2 Local Planning Policy 11
5. Construction Movements 12
5.1 Introduction 12
5.2 Construction Programme 12
5.3 Construction Vehicle Movements 12
5.4 Construction Vehicle Distribution 17
5.5 Vehicle Types, Plant Requirements and Abnormal Loads 18
6. Site Access, Layout and Routing 21
6.1 Introduction 21
6.2 Scheme Elements 22
6.3 Solar Farm Site 23
6.4 Bulls Lodge Substation Site 26
6.5 Grid Connection Route 27
7. Management and Mitigation 30
7.1 Introduction 30
7.2 Highway Network 30
7.3 Pedestrian and Cycle Routes 32
7.4 Management Measures and Controls 33
7.5 Staff Vehicle Measures and Controls 37
7.6 Management Structure 40
7.7 Monitoring and Review 40
8. Compliance and Enforcement 42
8.1 Introduction 42
8.2 Best Practice 42
8.3 Contractual Conditions 42
8.4 Information Packs and Communications 42
8.5 Enforcement 42
8.6 Delivery of Highway Works 43
9. Conclusion 44

Figures

Figure 1: Site Location 3
Figure 2: Forecast Average Daily HGVs (Vehicles) during the Construction Period 13
Figure 3: Forecast Average Daily LGVs (Vehicles) during the Construction Period 15
Figure 4: Forecast Total Average Daily Vehicles during the Construction Period 16
Figure 5: Proposed Order limits Access Arrangements (Construction Phase) 21

Tables

Table 1: Committed Developments/ Scheme Summary 8
Table 2: Anticipated Construction Programme and Activities 12
Table 3: Forecast HGV Trip Attraction – Peak Construction Phase 13
Table 4: Solar Farm Site - Anticipated Construction Workforce (Peak Activity) 14
Table 5: Forecast LGV Trip Attraction – Peak Construction Phase 15
Table 6: Forecast Worst-Case Vehicular Trip Attraction – Peak Construction Phase 16
Table 7: Regional Vehicle Trip Distribution – Incoming Trips to Chelmsford MSOA 005 18
Table 8: Scheme Elements 22
Table 9: Desirable Minimum SSDs based on Design Speed 25
Table 10: SSDs on Waltham Road and Boreham Road (DMRB) 25
Table 11: Working Hours assessed in the Transport Assessment 38

1. Introduction

1.1 Context

AECOM has been appointed by Longfield Solar Energy Farm Ltd ('the Applicant') to prepare a Framework Construction Traffic Management Plan (CTMP) in support of the proposed Longfield Solar Farm ('the Scheme'), located approximately 1km to the west of the village of Terling and 7km to the northwest of Chelmsford in Essex.

The Order limits are approximately 453ha in size and located within the administrative areas of Braintree District Council (BDC) and Chelmsford City Council (CCC). The Order limits comprise existing agricultural land which is separated by several areas of woodland, as well as parts of the existing highway network.

The Scheme comprises the construction, operation (maintenance), and decommissioning of a solar photovoltaic (PV) array electricity generating facility and electrical storage facility with a total capacity exceeding 50 megawatts (MW) and export connection to the National Grid, including extension of the existing Bulls Lodge Substation. The site boundary Order limits includes the proposed Solar Farm Site, the Grid Connection Route and Bulls Lodge Substation Site.

The electricity generated by the Scheme will be exported to the National Grid via the Grid Connection Route, via a connection between the Longfield Substation and the Bulls Lodge Substation Extension. This connection will also facilitate the import of electricity to be stored within the Battery Energy Storage System (BESS).

1.2 Document Purpose and Scope

The purpose of this Framework CTMP is to focus on the management of construction traffic within the vicinity of the Order limits along the local highway network during the construction period of the works, in order to limit any potential disruptions and implications on the wider transport network, as well as for the existing road users.

This Framework CTMP sets out the proposals to manage construction traffic and staff vehicles during the construction of the Scheme. It identifies the management of freight traffic i.e. Heavy Goods Vehicles (HGVs), as well as staff vehicles.

This Framework CTMP has been informed by extensive consultation with Essex County Council (ECC) Highways as the local highway authority and National Highways (formerly Highways England) as the highway authority for the Strategic Road Network (SRN) and further details of the discussions and meetings held, as well as meeting minutes etc. are provided as part of the Transport Assessment (TA).

It should be noted that as this is a framework document, certain details remain to be developed as the Scheme progresses into detailed design. The full details of all measures may not be available until after consent for the Scheme has been granted. A Detailed CTMP will be required to be produced by the contractor prior to commencement of construction of the Scheme. An additional detailed CTMP will be produced related to the National Grid works proposed at the Bulls Lodge Substation in order to support the proposed works at the Bulls Lodge Substation.

1.3 Objectives

The objectives of this Framework CTMP are to set a framework for the measures that would be developed in the full CTMP to:

- Minimise the volume of HGV and staff vehicles associated with the construction phase as far as reasonably practicable;
- Maximise the safe and efficient movement of materials and staff required during the construction phase as far as reasonably practicable;
- Minimise the restrictions imposed and ensure efficient management to the local PRoW within the Order limits boundary during the construction phase;
- Minimise the impacts both for the local community and visitors to the area using the road network as far as reasonably practicable; and

- Set out the measures to be adhered to by those travelling to and from the Order limits to reduce the impact of the construction of the Scheme.

1.4 Report Structure

Following this introduction, this Framework CTMP is structured as follows:

- **Section 2** provides details of the Order limit's location, surrounding area and the existing highway network;
- **Section 3** provides details of future baseline conditions during the construction phase;
- **Section 4** covers relevant planning policy and best practice for the construction phase of the Scheme;
- **Section 5** summarises the HGV and staff vehicle movements which are expected to be generated by the Scheme across the construction period, including during the peak phase;
- **Section 6** provides details of the proposed site access for the Solar Farm Site and the Bulls Lodge Substation Site access, including details of layouts, visibility splays and swept paths, as well as routing arrangements and internal site layout considerations including access tracks, compounds and parking;
- **Section 7** summarises the proposed measures to manage the highway network and pedestrian and cycle routes during the construction phase, as well as measures directed at HGVs and staff members, as well as for the management, monitoring and review of the CTMP;
- **Section 8** deals with compliance and enforcement of the CTMP; and
- **Section 9** provides the conclusion to the CTMP.

2. Existing Conditions

2.1 Site Location

The Scheme is located within the administrative areas of Chelmsford and Braintree, in the county of Essex. The Order limits occupy circa. 453 ha of existing agricultural land to the east of Waltham Road, to the north of Boreham, Chelmsford. The Order limits consist of agricultural fields mainly under arable production, with some small parcels of pasture, interspersed with trees, hedgerows, small areas of woodland and farm access tracks. Bulls Lodge Substation and the extension to it (which forms part of the Scheme) are located within the southernmost extent of the Order limits, as well as parts of the existing highway network which will be utilised by vehicles travelling to/ from the Scheme.

A site location plan is included in **Figure 1** below, as well as within **Appendix A**.

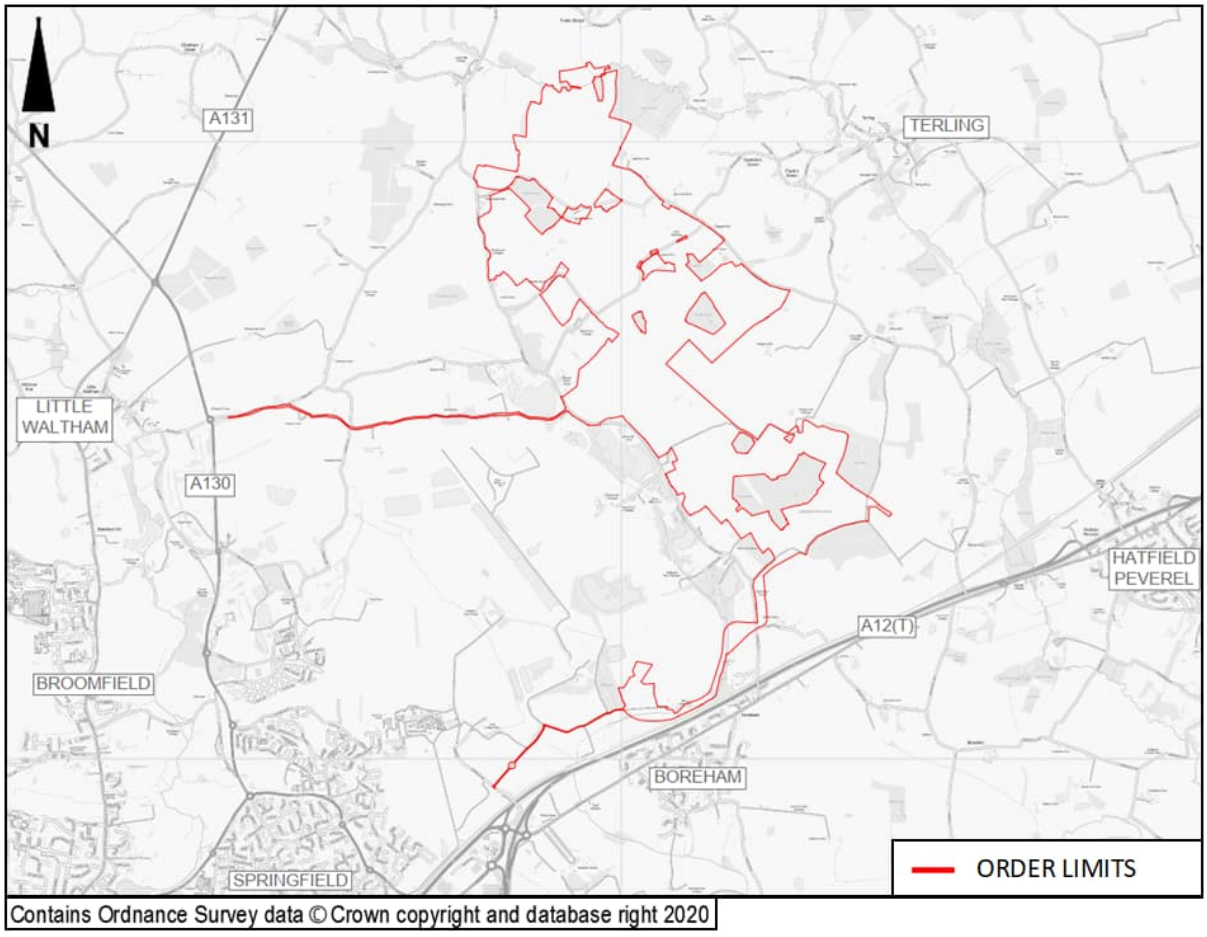


Figure 1: Site Location

2.2 Surrounding Area

The landscape features immediately surrounding the Order limits comprise a number of villages, including Fuller Street which is located approximately 300m to the north, as well as Gamble's Green and Terling located 500m and 1.1km to the east, Boreham located 500m to the southwest and Hatfield Peverel which is located 1.5km to the southeast. Chelmsford is located approximately 5.7km to the southwest of the site.

Boreham Road and Waltham Road run north to south along the western edge of the Solar Farm Site, with the A12(T) carriageway situated approximately 800m beyond the southern edge of the Order limits. Waltham Road runs north/ south along the western boundary of the Solar Farm Site and becomes Boreham Road to the north of the junction with Cranham Road. The A12(T) and B1137 lie to the south and southwest of the Order limits, in addition to the Great Eastern Main Line (GEML) railway (which locally connects Chelmsford and Witham).

Across the remainder of the surrounding area, Terling Road, Terling Hall Road and Boreham Road are the main (albeit rural) north to south transport routes. Noakes Lane and Noakes Farm Road provide east to west access and pass through the Order limits. Braintree Road forms the main part of the road network to the north, extending between Terling and Fuller Street.

There is an extensive network of Public Rights of Way (PRoW) both within the Order limits and across the surrounding area. Further details of these are set out within the TA (**Section 4**) and the Outline Public Rights of Way Management Plan (PRoW MP) presented in Appendix 13C [APP-095].

2.3 Site Accessibility

2.3.1 Strategic Highway Network

The A12(T) is a dual carriageway road which forms part of the SRN and is managed by National Highways. The A12(T) can be accessed via the B1137 Main Road, Boreham at the Boreham Interchange, and/ or the B1137 The Street, Hatfield Peverel at Junctions 20A and 20B (the Hatfield Peverel Interchange).

The A130 Essex Regiment Way (ERW) is a dual carriageway road which links Little Waltham, north of Chelmsford, to the A131 in the north heading towards Braintree. The A130 is classified by ECC as a Priority 1 Road (PR1) and provides access to Wheelers Hill, which joins with Leighs Road, Drakes Lane and Cranham Road to the east which provide access to both Boreham Road and Waltham Road. In the south the route links with the A1016 near Belstead Hall and with the A12(T) at the Boreham Interchange (Junction 19).

In addition to the above, the Boreham Interchange improvements and the Radial Distributor Road (RDR) including the new roundabout with the private road to / from Bulls Lodge Substation are currently under construction and are expected to be complete (and therefore operational) both prior to and during the future assessment scenario (2025). Further details are provided within **Section 3**.

A plan showing the surrounding highway network, including the indicative alignment of the RDR, is held within **Appendix B**.

2.3.2 Local Highway Network

B1137 Main Road

The B1137 Main Road is classified as a Priority 2 Road (PR2) and is a single carriageway road with footways along the majority of its length and street lighting provision within the villages of Boreham and Hatfield Peverel. The existing speed restrictions applicable on the B1137 vary along its route, comprising the National Speed Limit (60mph) between the Boreham Interchange and the village of Boreham, 40mph within Boreham itself, a section of National Speed Limit (60mph) to the east of Boreham, a section of 50mph speed restriction to the west of Hatfield Peverel and 30mph within Hatfield Peverel itself.

Waltham Road and Boreham Road

Waltham Road and Boreham Road are rural single carriageway roads (both classified as PR2s) and together connect Boreham in the south with Great Leighs in the north and serve a mixture of localised residential, leisure, agricultural, commercial and industrial land uses. These roads are subject to the National Speed Limit (60mph) and do not contain pedestrian footways or street lighting provision which is in keeping with their rural character. The Solar Farm Site borders Waltham Road and Boreham Road at various locations.

Cranham Road and Wheelers Hill

Waltham Road forms a priority junction with Cranham Road approximately 2.8km to the north of the B1137 Main Road. Cranham Road is a rural single carriageway road which provides a connection to the A130 ERW to the west via Wheelers Hill. Cranham Road and Wheelers Hill are both classified as PR2s, are subject to the National Speed Limit (60mph) and do not contain any pedestrian footways or street lighting provision.

Braintree Road

Braintree Road runs to the north of the Order limits and is a rural single carriageway road which is accessed via Boreham Road at its western extent and serves the villages of Fuller Street and Terling. Braintree Road is rural in character, subject to the National Speed Limit (60mph) and does not contain any pedestrian footways or street lighting provision.

Terling Hall Road

Terling Hall Road runs along the eastern boundary of the Solar Farm Site and is accessed via the B1137 Main Road to the south, where there is a 12' 6" height restriction as the route passes underneath the railway line. Terling Hall Road is a narrow rural single carriageway road which principally serves agricultural properties.

Generals Lane, Private Road and Bulls Lodge Substation

Generals Lane is a rural single carriageway road (classified as a local road) which is accessed via the Boreham Interchange and passes over the A12(T) eastbound on-slip as well as the railway line. The road is subject to the National Speed Limit (60mph) and does not contain any pedestrian footways or street lighting provision. Generals Lane provides access to a private road (subject to a 30mph speed limit) which subsequently runs east and provides access to the existing Bulls Lodge Substation. It is understood that the private road was previously upgraded to accommodate the works which were carried out when the substation was originally constructed.

It should be noted that Generals Lane will be demolished as part of the current ongoing works at the Boreham Interchange and further details are provided within **Section 3**.

A plan showing the surrounding highway network is held within **Appendix B**.

2.3.3 Protected Lanes

The Chelmsford Local Plan 2013-2036 identifies a number of Protected Lanes and byways which are located near to the Order limits and have historic and landscape value. The Council intends to protect these lanes and byways by preserving, as far as possible, the trees and hedgerows, banks, ditches and verges which contribute to their character, and by resisting development proposals which have an adverse environmental impact upon them (such as a material increase in traffic) in line with Strategic Policy S3 (Conserving and Enhancing the Historic Environment) and Policy DM13 (Non-Designated Heritage Assets).

The following local routes have protected status as set out within the Chelmsford Local Plan 2013-2036, shown on the Adopted Policies Map for Chelmsford North (Map 1):

- Boreham Road to the north of the junction with Cranham Road;
- Braintree Road between the junctions with Boreham Road (west) and Fairstead Hall Road (east) including a short section which passes through the northern extents of the Solar Farm Site;
- Terling Hall Road to the east of the Solar Farm Site; and
- The following local roads which run through the centre of the Solar Farm Site:
  - Noakes Lane which runs between the junctions with Boreham Road (west) and Terling Hall Road (east) and provides access to Noakes House, Hankins Farm and Little Weathers; and
  - Birds Farm Lane which runs between the junctions with Boreham Road (west) and Noakes Lane (east) and provides access to Bird's Farm Cottage.

A plan showing the Protected Lanes located near the site is held within **Appendix C**.

2.3.4 Other Transport Modes

Details relating to the accessibility of the Order limits via public transport, cycling and on foot are provided within the TA (Sections 4.3 and 4.4). It should be noted that the majority of construction workers will be expected to travel to and from the Order limits by vehicle due to the remote location of the Scheme and lack of easy access to the public transport.

3. Future Highway Network

3.1 Future Network Changes

During the construction phase, the construction vehicles will be able to utilise the RDR to travel between the A12(T) and the A130 ERW via the Boreham Interchange. This route will bypass the A130 Colchester Road and A130 WHL, providing a more direct route between the site and the SRN.

The agreed routing arrangements are not expected to change during the implementation of the A12 Chelmsford to A120 Widening Scheme or the various improvements due to be carried out at the Boreham Interchange, as it is understood that there will be no daytime road closures during these works. Should there be any temporary overnight road closures, then vehicle movements will be re-timed as necessary to avoid having to use alternative routes to travel to/ from the Order limits.

3.2 Committed Developments/ Schemes

The cumulative schemes for consideration have been agreed in consultation with ECC and National Highways.

The following highway improvement schemes are due to be completed ahead of the construction phase and are therefore considered to form part of the future baseline (2025) situation:

- Boreham Interchange Improvements;
- RDR; and
- Phase 1 of the Chelmsford North East Bypass (CNEB).

The following highway improvement schemes are expected to be completed after or during the construction phase and are therefore considered to represent a cumulative scheme:

- A12 Chelmsford to A120 Widening Scheme;
- CNEB Phase 2; and
- Outer Radial Distributor Road (RDR2).

Furthermore, there are a number of committed developments (with planning permission) within the area which have been considered as cumulative schemes including the Chelmsford Garden Community and a development on land to the north of Cranham Road.

A summary of the highway improvement schemes which are expected to be incorporated as part of the future baseline situation is set out below.

3.3 Boreham Interchange and the Radial Distributor Road (RDR)

The highway network during the construction phase will be different from current, having incorporated several changes as a result of ongoing highway schemes including the Boreham Interchange improvements, the RDR and the removal of the Generals Lane overbridge. The Boreham Interchange improvements and delivery of the RDR will allow development traffic to bypass parts of the A130 including White Hart Lane and improve the links to the Order limits from the strategic network. The following improvements are planned to be delivered by spring/ May 2023 and are therefore expected to be in place prior to the construction phase for the Scheme:

- Completion of the RDR from A130 ERW to Boreham Interchange including a new bridge over the railway line and A12(T) northbound on-slip (currently under construction);
- Construction of a new fully signalised Generals Lane roundabout, which includes for a new arm for the RDR;
- The provision of a cut-through lane on the Generals Farm roundabout from the A12(T) southbound on-slip for traffic travelling towards Chelmsford and the A130/ A131;
- Partially signalising the Drovers Way roundabout, with signals on the A12(T) northbound off-slip;
- Improvements to the footway/ cycleway that runs on the south side of the interchange which forms the route to Chelmsford; and

- Provision of an improved route along the north side of the interchange to allow residents of Boreham to walk and cycle to the new station.

The existing access arrangements for Bulls Lodge Substation are due to change as a result of the above:

- The Generals Lane connection with the Boreham Interchange and A12(T) overbridge will be demolished as part of the works at the Boreham Interchange; and
- The RDR will be completed, including the connection with the Boreham Interchange as well as the new roundabout with the private road to / from Bulls Lodge Substation.

The plan showing the surrounding highway network within **Appendix B** includes the indicative alignment of the RDR which is currently under construction.

3.4 Chelmsford North East Bypass (CNEB) (Phase 1)

The CNEB will provide an 8km bypass between the A12(T) and the current A131, providing a strategic link between Chelmsford, Braintree, London Stansted Airport and the east and south east of England. The first phase (Phase 1) will consist of a single carriageway link between the current Beaulieu Housing Development and a new roundabout on the existing A131 at Chatham Green, as well as widening the existing A131 between Chatham Green and Deres Bridge to dual carriageway. A subsequent phase (Phase 2) is planned to dual the A131 between the Beaulieu Housing Development and the roundabout at Chatham Green. A plan showing the indicative proposals is shown in Section 7 of the TA.

The future CNEB will ultimately extend through the Chelmsford Garden Community, whilst tying in with National Highways' proposed improvements to the Junction 19 (Boreham Interchange) of the A12(T) which will be delivered as part of the A12 Chelmsford to A120 Widening Scheme.

The construction of the CNEB is set to start in early 2023 with Phase 1 planned to open in late 2024. It should be noted that the bypass will not provide a direct connection with Cranham Road, as an overbridge will be provided at this location. However, the delivery of the RDR will allow development traffic to bypass parts of the A130 including White Hart Lane, improving links to the Order limits from the SRN.

As set out above, the CNEB (Phase 1) will change the alignment of Cranham Road to accommodate the bypass and the provision of a combined Cranham Road/ Drakes Lanes overbridge. The new structure will be constructed offline to keep Cranham Road open for as long as possible. However, Cranham Road may need to be temporarily closed to permit the tie-in of this existing route with the new approaches to the overbridge (this cannot be confirmed at this stage however). Therefore, depending on the nature/ duration/ programme of the above closure (if required), an alternative route may need to be temporarily followed by construction vehicles travelling to/ from the Solar Farm Site which will be agreed with ECC Highways. Alternatively, it may be possible to reschedule HGVs to avoid any periods where there may be a closure. Further details will be provided as part of the Detailed CTMP for the Solar Farm Site once further details are known.

3.5 At this stage, it is expected that should a temporary diversion route be required, then this would be via the B1137 Main Road and Waltham Road as discussed with ECC Highways. There will be a maximum of 50 daily HGVs (100 two-way movements) associated with the Solar Farm Site. This would represent a 1.2% increase in daily traffic levels along the B1137 Main Road (see Table 22 for 2025 baseline flows) and a 1.2% increase in daily traffic levels along Waltham Road north of Main Road (see Table 22 for 2025 baseline flows). In the instance that these HGVs are temporarily diverted via the B1137 Main Road and Waltham Road due to a closure on Cranham Road further consultation will be held with the Highway Authority in conjunction with any traffic management proposals required in association with the delivery of the CNEB when the Detailed CTMP for the Solar Farm Site is prepared. The need to

manage HGV construction traffic for Waltham Road, including the section of Waltham Road to the south of the proposed site access, will be considered once further details are known with specific regard to ECC's casualty reduction scheme in this area. Traffic measures along this section of Waltham Road, such as if road widening is required by the council, would be delivered within the existing Scheme parameters.A12 Chelmsford to A120 Widening Scheme

The proposed A12 Chelmsford to A120 Widening Scheme comprises National Highways' plans to widen the section of the A12(T) between Chelmsford (Junction 19, Boreham Interchange) and the interchange with the A120 (Junction 25). The preferred route of the A12(T) widening in the vicinity of the site is predominantly on-line (i.e. upgrading of existing carriageway) and comprises improvements to Junction 19 (Boreham Interchange) and the replacement of the existing Junction 20A and Junction 20B with a new Junction 21 to the east of Hatfield Peverel. The project is anticipated to commence construction in 2025, with completion estimated for 2027. The proposed A12 Chelmsford to A120 Widening Scheme will be supported by a CTMP. Detailed CTMPs will also be prepared in due course for the Solar Farm Site and Bulls Lodge Substation which will include further details of the A12 Chelmsford to A120 Widening Scheme where relevant.

3.6 Timescales

A summary of the anticipated timeframes for the main committed developments/ schemes is set out within **Table 1** below.

Additional information related cumulative and additional schemes is set out within Section 7.3 of the TA.

Table 1: Committed Developments/ Scheme Summary

Committed Development/ Scheme	Anticipated Date of Completion
Boreham Interchange Improvements	Spring 2023
RDR	May 2023
CNEB (Phase 1)	Late 2024
Beaulieu Station	2025/ 2026
A12 Chelmsford to A120 Widening Scheme	2027
RDR2	2036
CNEB (Phase 2)	Post-2036
Chelmsford Garden Community	2044

The main construction phase for the Scheme is expected to commence during the first quarter of 2024 and to be completed during the first quarter of 2026. The above highway improvements schemes and committed developments have therefore been considered as follows as part of this TA:

- The RDR and associated Boreham Interchange improvements (which are currently under construction) are due to be complete prior to the construction phase of the Scheme. As such, the proposed HGV routing strategy utilises the Boreham Interchange and RDR where appropriate.

- The CNEB (Phase 1) will be under construction during the early part of the proposed construction period and is due to be complete towards the end of the proposed construction period. Vehicles travelling to/ from the Solar Farm Site will utilise the Cranham Road/ Drakes Lanes overbridge once this has been completed.

- Beaulieu railway station, RDR2 and the A12 Chelmsford to A120 Widening Scheme will be under construction and therefore not in place to support the construction phase of the Scheme. Nonetheless, these committed schemes will be in place to support the operational and decommissioning phases of the Scheme.

- The CNEB (Phase 2) and Chelmsford Garden Community are not expected to affect the proposed construction phase and will be completed during the operational phase of the project. The assessment of the construction phase therefore excludes these committed schemes/ developments.

- The timeframes for the development on land to the north of Cranham Road are currently unknown. Nonetheless, the forecast operational trips (see **Section 8 of the TA**) have been included on the network to provide a robust assessment of cumulative traffic movements during the construction phase. In terms of the proposed carriageway widening improvements on Wheelers Hill and Cranham Road, it is assumed that these would be implemented as part of Longfield Solar Farm (see **Section 8 TA**).

4. Policy and Best Practice

4.1 National Policy

4.1.1 National Policy Statement for Energy (NPS EN-1)

The NPS for Energy (EN-1) was published in 2011 and provides the basis for decisions regarding nationally significant energy infrastructure. Section 5.13 outlines the planning policy for traffic and transport, including guidance on undertaking relevant parts of the EIA.

- The NPS EN-1 is currently under review and an updated draft was published for consultation in September 2021. Paragraph 5.14.8 states that the Secretary of State (SoS) should only consider preventing or refusing development on highways grounds if there would be an unacceptable impact on highway safety, or residual cumulative impacts on the road network would be severe.

4.1.2 National Policy Statement for Renewable Energy Infrastructure (NPS EN-3)

The NPS for Renewable Energy Infrastructure (EN-3) was published in 2011 and sets out the policies relating to electricity generation from renewable sources of energy, for consideration in conjunction with NPS EN-1. It should however be noted that solar farms are not explicitly included within the document.

The NPS EN-3 is currently under review and an updated draft was published for consultation in September 2021, with the inclusion of solar photovoltaic generation impacts within Section 2.54. The most relevant paragraphs are set out as follows:

- Paragraph 2.54.3 discusses the importance of assessing various potential routes to the site for the delivery of materials and components during the construction period;
- Paragraph 2.54.4 considers the suitability of access roads for vehicles transporting components and the need to identify potential modifications where necessary; and
- Paragraph 2.54.9 states that consistent with EN-1, the SoS should be satisfied, taking into account the views of the relevant local highway authorities, that any abnormal loads can be safely transported whilst minimising inconvenience to other road users and that the environmental effects of this and other construction traffic, after mitigation, are acceptable.

4.1.3 National Planning Policy Framework (NPPF, 2021)

The NPPF promotes the use of sustainable transport throughout the UK, safe road design and the efficient and sustainable delivery of goods and supplies. The NPPF sets out the long-term strategy for sustainable development. The most relevant paragraphs in the context of transport are set out below:

- Paragraph 111 states that development should only be prevented or refused on highways grounds where there would be an unacceptable impact on highway safety or the residual cumulative impacts of development on the road network are severe; and
- Paragraph 112 states that applications for development should give priority first to pedestrian and cycle movements and then, as far as possible, to facilitating access to high quality public transport Fleet Operator Recognition Scheme (FORS, 2020).

FORS is a voluntary accreditation scheme that promotes best practice for commercial vehicle operators. The aim is to improve fleet efficiency, improve safety, save money and reduce road congestion. FORS will be promoted as best practice for the construction vehicles accessing the site.

4.1.4 Construction Logistics and Cycle Safety (CLOCS, 2019) – Managing Work Related Road Risk

The CLOCS guidance draws upon evolving best practice, standards, policies and codes of practice, providing a standard which planning authorities, developers and contractors can implement and providing a coherent set of guidelines which can be adhered to, with the primary goals of achieving:

- Zero collisions between construction vehicles and the community
- Improved air quality and reduced emissions

- Fewer vehicle journeys
- Reduced reputational risk.

4.2 Local Planning Policy

The following identifies various local planning policy documents before picking out the key policies which are considered to be relevant to the construction phase of the scheme.

Essex County Council Essex Transport Strategy: The Local Transport Plan for Essex (June 2011) includes the following policy relevant to this chapter:

- Policy 6 Freight Movement states the Council will manage the efficient movement of freight within the county by working with operators to ensure that heavy goods vehicles use identified routes and that other freight traffic uses the most appropriate routes.

Essex County Council Development Management Policies (February 2011) includes the following relevant policies:

- Policy DM1 General Policy, which sets out that the Highway Authority will protect the highway network for the safe and efficient movement of people and goods by all modes of travel;
- Policy DM19 HGV Movement, which sets out that the Highway Authority will protect the safety and efficiency of the highway network by ensuring that any proposals which generate significant numbers of heavy goods vehicle movements are located in close proximity to the main road network; and
- Policy DM20 Construction Management, which states that the Highway Authority will protect the safety and efficiency of the highway network. This will include ensuring that any temporary construction accesses are agreed with the Highway Authority prior to commencement of development.

Chelmsford City Council Chelmsford Local Plan 2013-2036 (adopted May 2020) includes the following relevant policy:

- Policy DM19 Renewable and Low Carbon Energy, which identifies that proposals should not have a detrimental impact on highway safety.

Braintree District Council's Local Plan Review (2005) is one of the documents that makes up the development plan for the Braintree District. The Council is in the process of preparing a new Local Plan, which will eventually supersede the Local Plan Review in its entirety. As part of the 'saved' policies within the document, Chapter 5 (Transport) includes policies on pedestrian networks, cycleways, public transport and generators of demand.

Braintree District Council Local Development Framework Core Strategy (adopted September 2011) includes Policy CS7 Promoting Accessibility for All, which states the following:

- The Council will work with partners to improve accessibility, reduce congestion and reduce the impact of development upon climate change;
- Traffic and car parking will be carefully managed to encourage sustainable travel; and
- The promotion of community-based initiatives such as car pools, car sharing and voluntary mini- bus services will be encouraged.

Braintree District Council Publication Draft Local Plan (June 2017) includes the following relevant policies:

- Policy LPP44 Sustainable Transport;
- Policy LPP 45 Parking Provision; and
- Policy LPP 46 Protected Lanes.

5. Construction Movements

5.1 Introduction

This section provides a summary of the forecast HGV and staff vehicle movements that are estimated to be attracted during the construction phase of the Scheme, based on the proposed construction programme.

5.2 Construction Programme

The peak construction year is anticipated to be 2025; this assumes the main construction phase commences during the first quarter of 2024 and will be completed during the first quarter of 2026**.** A summary of the key construction activities across the programme is set out below in **Table 2**.

Table 2: Anticipated Construction Programme and Activities

Construction Activity	Period							
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
Site access and enabling works								
Earthwork/Tracks								
Drainage								
Construction Compounds								
Buildings								
Fence								
CCTV								
PV Substructure								
PV Panels								
Solar Stations								
AC Trenching & Cabling								
DC Trenching & Cabling								
SS								
BESS								
400kV Cable Route								
Bulls Lodge Substation Extension*								
Landscaping								

*The anticipated timeframes for the Bulls Lodge Substation Extension are subject to change and the TA and CTMP have therefore assessed a worst-case by combining the peak of these works with those for the Solar Farm Site (see Section 5.3 below)

5.3 Construction Vehicle Movements

5.3.1 HGVs

Based on the proposed construction programme and phasing, there is expected to be a maximum of 75 HGVs per day across the Order limits for the peak of construction (period of one month). However, the following has been assessed;

- A maximum of 50 HGVs associated with the Solar Farm Site (travelling to/ from the proposed access on Waltham Road via Cranham Road, Wheelers Hill and A130 Essex Regiment Way); and
- A maximum of 46 HGVs associated with the extension to Bulls Lodge Substation (travelling to/ from the substation via the A12(T), RDR and private road).

A summary of the average number of daily HGVs (vehicles) across the construction programme is identified below in **Figure 2**.

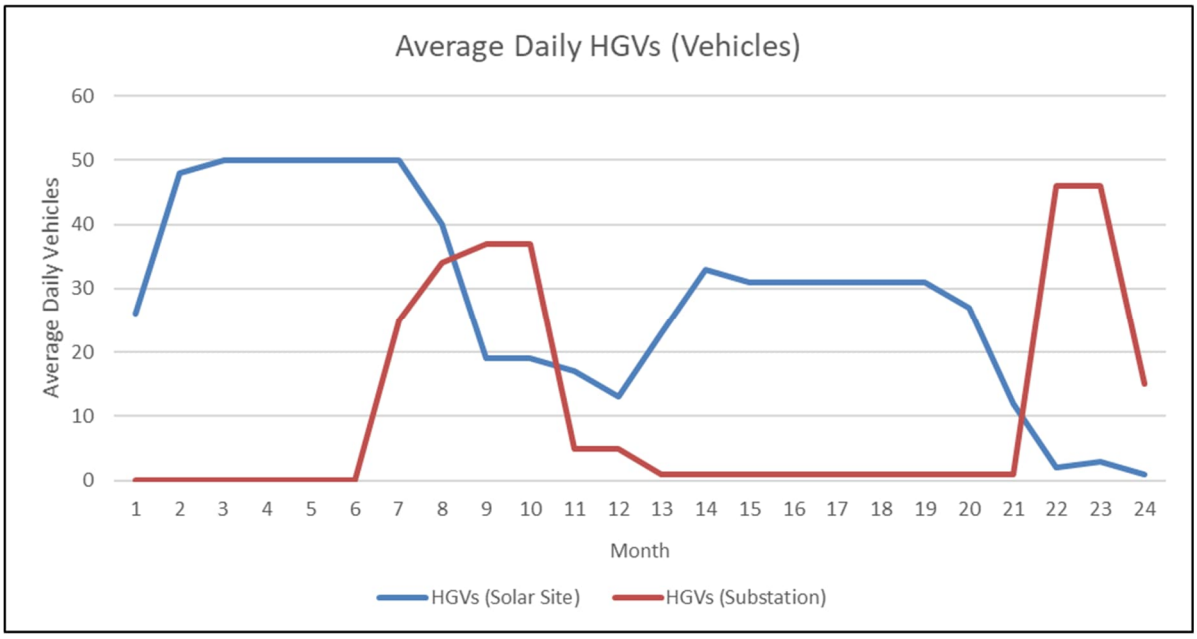


Figure 2: Forecast Average Daily HGVs (Vehicles) during the Construction Period

As set out below in **Table 2,** in order to provide a worst-case assessment within the TA and to allow for some contingency in the phasing, the individual peaks for the Solar Farm Site and Bulls Lodge Substation Site have been combined resulting in a maximum of 96 HGVs per day. As above, 50 HGVs would travel to/ from the main site access on Waltham Road via the local highway network (following the agreed routing strategy), with the remainder (46 HGVs) travelling to/ from the substation via the A12(T), RDR and the private road. In reality, the 'peak' number of daily movements is expected to be lower than that assessed, as the individual peaks for the Solar Farm Site and Bulls Lodge Substation are not expected to overlap.

A summary of the total anticipated daily number of HGVs is set out below in **Table 3**, which is based on an eight-hour delivery window, with movements split equally across the hours (HGVs leaving the site within one hour of making a delivery).

Table 3: Forecast HGV Trip Attraction – Peak Construction Phase

Time	Solar Farm Site (Peak)			Bulls Lodge Substation (Peak)			Combined Peaks (Worst-Case)		
	Arr	Dep	Total	Arr	Dep	Total	Arr	Dep	Total
06:00-07:00	0	0	0	0	0	0	0	0	0
07:00-08:00	0	0	0	0	0	0	0	0	0
08:00-09:00	0	0	0	0	0	0	0	0	0
09:00-10:00	7	0	7	7	0	7	14	0	14
10:00-11:00	7	7	14	6	7	13	13	14	27
11:00-12:00	7	7	14	7	6	13	14	13	27
12:00-13:00	8	7	15	6	7	13	14	14	28
13:00-14:00	7	8	15	7	6	13	14	14	28
14:00-15:00	7	7	14	6	7	13	13	14	27
15:00-16:00	7	7	14	7	6	13	14	13	27
16:00-17:00	0	7	7	0	7	7	0	14	14
17:00-18:00	0	0	0	0	0	0	0	0	0
18:00-19:00	0	0	0	0	0	0	0	0	0
19:00-20:00	0	0	0	0	0	0	0	0	0
Total	**50**	**50**	**100**	**46**	**46**	**92**	**96**	**96**	**192**

5.3.2 Staff Vehicles

The construction phase peak period is anticipated to take place during the 2025 summer period, when up to 533 construction workers (associated with both the Solar Farm Site and Bulls Lodge Substation Site) are expected to travel to/ from the Order limits per day. The following has been assessed;

- A maximum of 500 construction workers for the Solar Farm Site per day for a period of up to two months, with 45% likely to be sourced locally and 55% likely to be non-local; and
- A maximum of 33 construction workers for the Bulls Lodge Substation Site per day for a period of up to 18 months, with all staff to be sourced locally and to travel directly to/ from the Bulls Lodge Substation Site. There will also be up to 22 LGVs per day in addition to the above construction worker trips.

It should be noted that the majority of construction workers and HGV movements will be associated with the Solar Farm Site which therefore forms the focus of this chapter. Separate details relating to Bulls Lodge Substation have been provided where appropriate. **Table 4** below provides a summary of the peak daily construction workforce for the Solar Farm Site in terms of the anticipated split between local and non-local staff and anticipated shift patterns.

Table 4: Solar Farm Site - Anticipated Construction Workforce (Peak Activity)

Type	Working Hours	Local	Non-Local	Total
Civil works/ structures	Summer 12-hour shift (07:00-19:00) Winter 10-hour shift (08:00-18:00)	126	161	287 (58%)
Welfare & compound, panels, electrical works, CCTV, internal substations, site management and general site staff	Early 8-hour shift (08:00-16:00)	44	57	101 (20%)
	Late 8-hour shift (09:00-17:00)	44	57	101 (20%)
Other	Ad hoc (staggered)	11	0	11 (2%)
Total		**225**	**275**	**500**
Proportion		**45%**	**55%**	**100%**

For Bulls Lodge Substation, all construction workers are expected to be sourced locally and there is expected to be a maximum of 26 construction worker vehicles per day. This allows for limited car sharing amongst the 33 construction workers equivalent to 1.2 occupants per vehicle i.e. given there will be fewer staff and therefore fewer opportunities to car share than for the Solar Farm Site. The shuttle service will not be used to transfer workers to/ from Bulls Lodge Substation as construction workers will be expected to travel directly to/ from the substation rather than via the Solar Farm Site.

As set out within Section 4 of the TA, there is limited potential to travel to/ from the Order limits on foot or by public transport. It is therefore anticipated that the majority of local construction workers would travel by car, whereas non-local staff would stay within local accommodation and then be transferred to/ from the Order limits by shuttle service. The anticipated travel patterns of construction workers for the Solar Farm Site are as follows, following discussions with ECC Highways:

- Local staff: 95% to travel by car (average car occupancy of 1.5 per vehicle);
- Local staff: 5% to travel by other modes e.g. by bus or bicycle (or in the instance that the Chelmer Valley Park & Ride is utilised, by rail, P&R bus and private shuttle service); and
- Non-local staff: 100% to travel to/ from local accommodation by shuttle service (to be provided as part of the scheme).

It should be noted that car sharing will be encouraged for local construction workers and based on AECOM's experience of previous DCO applications where a large construction workforce has been employed, an average car occupancy of 1.5 persons per vehicle is considered to be realistic for the purposes of calculating the forecast vehicle trip attraction for Solar Farm Site. The Applicant will implement measures (to be secured as part of this

Framework CTMP) to seek to maximise the numbers of staff that car share with colleagues to reduce the number of vehicles travelling to/ from the Order limits each day, including a Car Share Scheme to match potential sharers and help staff identify any colleagues who could potentially be collected along their route to/ from site. The aspiration is to achieve a higher average occupancy level than 1.5 persons per vehicle (for the Solar Farm Site) to further reduce the impact of the Scheme on the local network and the SRN.

A summary of the average number of daily LGVs (vehicles) across the construction programme is identified below in **Figure 3**.

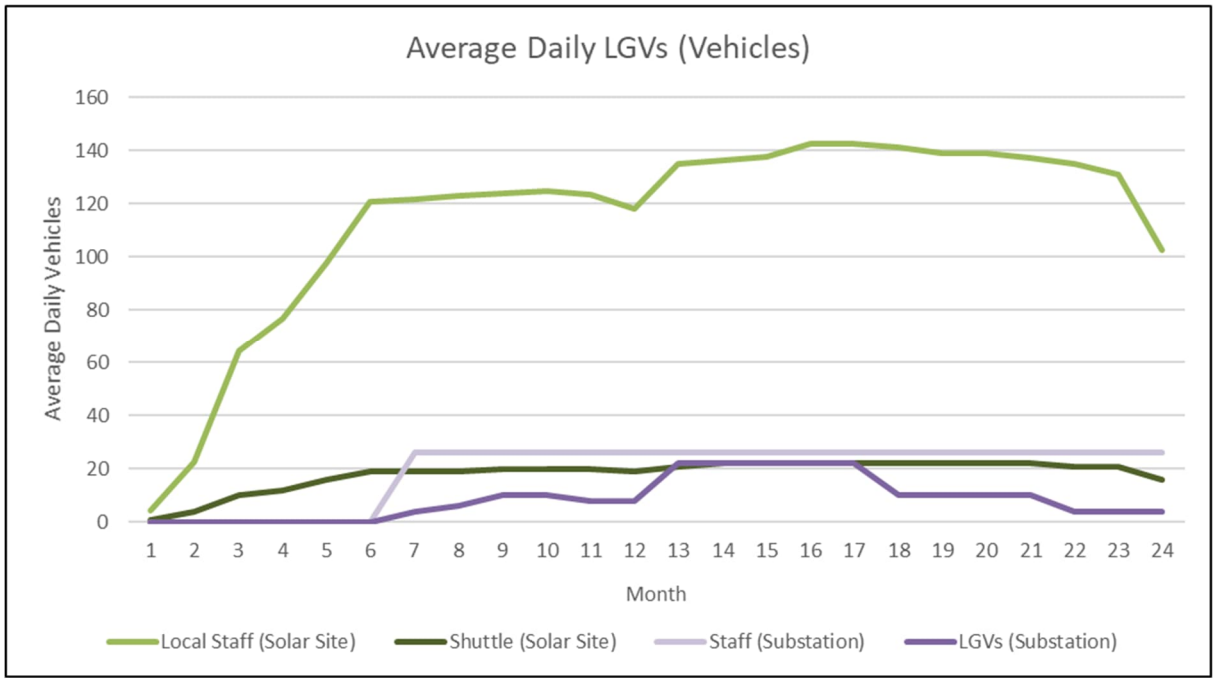


Figure 3: Forecast Average Daily LGVs (Vehicles) during the Construction Period

It is assumed that construction workers would arrive to the Order limits within the hour prior to starting a shift and depart from the Order limits within the hour after completing a shift. In terms of the small number of other staff travelling at various times, it is assumed that they would arrive between 09:00-12:00 and depart between 14:00-17:00. For the purposes of the highway impact assessment within the TA, the winter profile (as opposed to the summer profile) has been adopted to provide a worst-case assessment in terms of travel patterns, resulting in the development peak hours being more closely aligned with the network peak hours due to the compressed working hours (10-hour shift) for civil works/ structures staff. These working hours have been adopted for both the Solar Farm Site and Bulls Lodge Substation.

The total anticipated daily number of LGV movements (including those travelling to/ from Bulls Lodge Substation) during the peak construction phase is summarised below in **Table 5**.

Table 5: Forecast LGV Trip Attraction – Peak Construction Phase

Time	Solar Farm Site						Bulls Lodge Substation						Combined Peaks (Worst-Case)		
	Cars			Shuttle Buses			Cars			LGVs					
	Arr	Dep	Total	Arr	Dep	Total	Arr	Dep	Total	Arr	Dep	Total	Arr	Dep	Total
06:00-07:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
07:00-08:00	108	0	108	9	9	18	20	0	20	0	0	0	137	9	146
08:00-09:00	28	0	28	2	2	4	6	0	6	0	0	0	36	2	38
09:00-10:00	3	0	3	0	0	0	0	0	0	3	0	3	6	0	6
10:00-11:00	2	0	2	0	0	0	0	0	0	3	3	6	5	3	8
11:00-12:00	2	0	2	0	0	0	0	0	0	3	3	6	5	3	8
12:00-13:00	0	0	0	0	0	0	0	0	0	3	3	6	3	3	6
13:00-14:00	0	0	0	0	0	0	0	0	0	4	3	7	4	3	7

Time	Solar Farm Site						Bulls Lodge Substation						Combined Peaks (Worst-Case)		
	Cars			Shuttle Buses			Cars			LGVs					
	Arr	Dep	Total	Arr	Dep	Total	Arr	Dep	Total	Arr	Dep	Total	Arr	Dep	Total
14:00-15:00	0	2	2	0	0	0	0	0	0	3	4	7	3	6	9
15:00-16:00	0	2	2	0	0	0	0	0	0	3	3	6	3	5	8
16:00-17:00	0	31	31	2	2	4	0	6	6	0	3	3	2	42	44
17:00-18:00	0	28	28	2	2	4	0	5	5	0	0	0	2	35	37
18:00-19:00	0	80	80	7	7	14	0	15	15	0	0	0	7	102	109
19:00-20:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	**143**	**143**	**286**	**22**	**22**	**44**	**26**	**26**	**52**	**22**	**22**	**44**	**213**	**213**	**426**

5.3.3 Total

A summary of the average number of total vehicles across the construction programme is identified below in **Figure 4**, inclusive of HGVs, local staff vehicles, shuttle services (non-local staff) and LGVs.

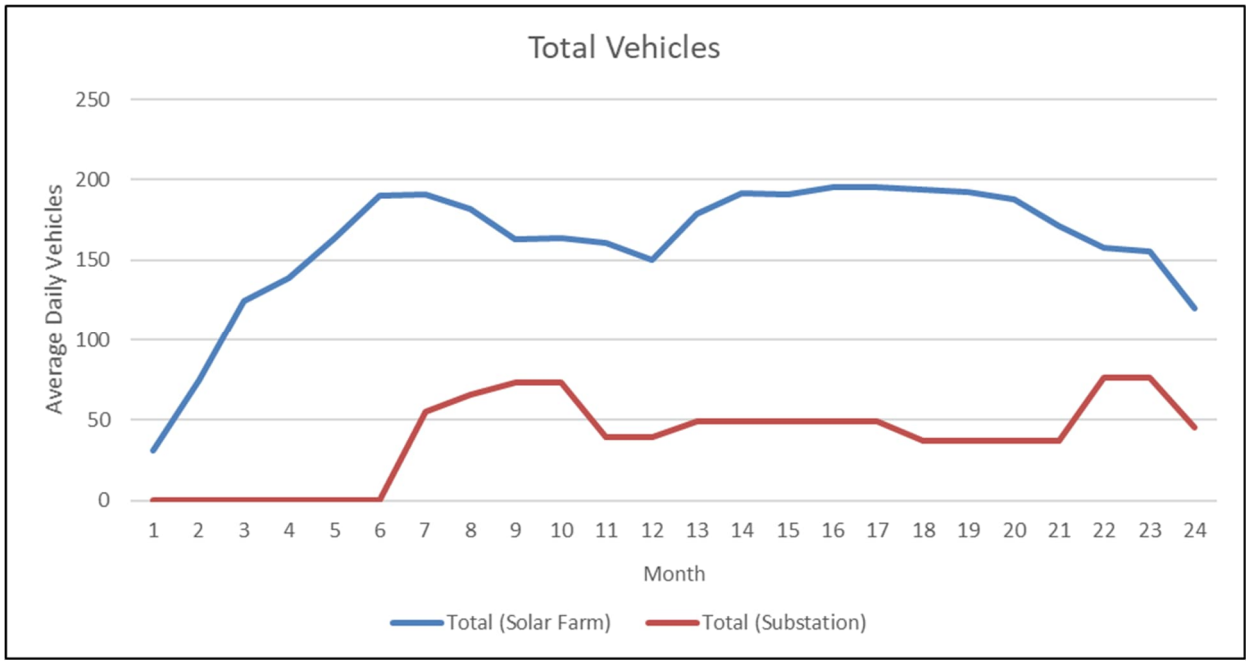


Figure 4: Forecast Total Average Daily Vehicles during the Construction Period

For the purposes of the TA, a worst-case assessment of the individual combined peak periods in terms of HGV, LGV and staff vehicle trips has been carried out for robustness, which equates to 309 daily vehicles (combining individual peaks of 96 HGVs in **Table 3** and 213 LGVs in **Table 5**) and 618 daily two-way movements. This has been represented below in **Table 6** for completeness.

Table 6: Forecast Worst-Case Vehicular Trip Attraction – Peak Construction Phase

Time	Solar Farm Site			Bulls Lodge Substation			Total		
	Arr	Dep	Total	Arr	Dep	Total	Arr	Dep	Total
06:00-07:00	0	0	0	0	0	0	0	0	0
07:00-08:00	117	9	126	20	0	20	137	9	146
08:00-09:00	30	2	32	6	0	6	36	2	38
09:00-10:00	10	0	10	10	0	10	20	0	20
10:00-11:00	9	7	16	9	10	19	18	17	35
11:00-12:00	9	7	16	10	9	19	19	16	35

Time	Solar Farm Site			Bulls Lodge Substation			Total		
	Arr	Dep	Total	Arr	Dep	Total	Arr	Dep	Total
12:00-13:00	8	7	15	9	10	19	17	17	34
13:00-14:00	7	8	15	11	9	20	18	17	35
14:00-15:00	7	9	16	9	11	20	16	20	36
15:00-16:00	7	9	16	10	9	19	17	18	35
16:00-17:00	2	40	42	0	16	16	2	56	58
17:00-18:00	2	30	32	0	5	5	2	35	37
18:00-19:00	7	87	94	0	15	15	7	102	109
19:00-20:00	0	0	0	0	0	0	0	0	0
Total	**215**	**215**	**430**	**94**	**94**	**188**	**309**	**309**	**618**

The above indicates that for the Solar Farm Site, there is expected to be a maximum of 126 two-way vehicle trips during the AM development peak hour (07:00-08:00) and 94 two-way vehicle trips during the PM development peak hour (18:00-19:00). A lower number of additional trips is expected during the traditional network weekday peak hours of 08:00-09:00 and 17:00-18:00, representing 32 two-way vehicle trips during each of these periods. Further details of the proposed trip attraction calculations are contained within **Appendix P**. These construction vehicles will access the Order limits via the proposed site access on Waltham Road.

In terms of Bulls Lodge Substation, there is expected to be a maximum of 20 two-way vehicle trips for any given hour of the day. These construction vehicles will access the Order limits via the A12(T), Boreham Interchange, RDR and the private road to the east of the new roundabout. There is not expected to be a requirement for any off-site road modifications as a result of these works (other than to provide the eastern and western access points) as the private road was upgraded when the original substation was constructed and is currently suitable for larger vehicles which currently infrequently access the substation.

5.4 Construction Vehicle Distribution

The proposed construction vehicle trip distribution for the Solar Farm Site has been informed by journey to work patterns from the 2011 Census database for residents travelling to Chelmsford MSOA 005 as a destination i.e. to their place of work. The *'WU03EW - Location of usual residence and place of work by method of travel to work'* dataset has been used to determine the distribution of incoming residents driving by car or van. The following points of origin have been reviewed to derive a regional vehicle trip distribution:

- At MSOA level for Chelmsford (all 21 MSOAs) and Braintree (all 18 MSOAs) to distribute local trips to Chelmsford MSOA 005, representing 56.2% of all vehicle trips.
- At local authority level for all remaining areas where at least four residents travelled to Chelmsford MSOA 005 as a car/ van driver, representing 41.2% of all vehicle trips.
- Areas where three or fewer residents travelled to Chelmsford MSOA 005 as a car/ van driver were excluded, representing just 2.6% of all vehicle trips.

The regional trip distribution has therefore been based on points of origin where at least four residents travelled to Chelmsford MSOA 005 as a car/ van driver (representing 97.4% of all vehicle trips), which includes all MSOAs in Chelmsford and Braintree, as well as many areas in the southeast. These trips have then been assigned to the following entry/ exit points to the study area, to inform the anticipated trip distribution of construction vehicle trips:

- A12(T) to the north
- A12(T) to the south
- A130 to the south (for local trips not using the A12(T))
- A130 to the north (via the A131)

The following regional trip distribution (**Table 7**) has been identified for construction vehicles travelling to/ from the Solar Farm Site. It should be noted that adjustments have been made below depending on the type of trip i.e. construction worker, shuttle bus and HGV.

Table 7: Regional Vehicle Trip Distribution – Incoming Trips to Chelmsford MSOA 005

Route	# Residents	Distribution
A12(T) North	632	14.8%
A12(T) South	1,600	37.5%
A130 North	795	18.6%
A130 South	1,241	29.1%
Total	**4,267**	**100%**

Following the above, the construction vehicle trips for the Solar Farm Site have been routed onto the local highway network as follows:

- Construction worker vehicles have been distributed to/ from the Solar Farm Site based on the most logical route to/ from the identified network entry/ exit point i.e. the shortest or quickest journey based on Google Routeplanner. Whilst a limited number of construction worker vehicles (up to 16 cars/ vans per day) would travel to/ from Bulls Lodge Substation instead of the Solar Farm Site, all construction worker trips have been distributed to/ from the Solar Farm Site (i.e. the proposed access on Waltham Road) to provide a robust assessment of the local highway network.
- The distribution shown in **Table 7** has been revised for shuttle buses, on the basis that these vehicles would travel to/ from local worker accommodation and would not therefore be expected to utilise the A12(T). The locations for local worker accommodation have yet to be determined, and it has therefore been assumed that shuttle buses would travel via the A130 and A131 towards Braintree to the north (30%), the A130 towards Chelmsford to the south (40%), or alternatively via the B1137 Main Road towards Boreham (20%) or Hatfield Peverel (10%) to the east.
- The distribution shown in **Table 7** has been revised for HGVs travelling to/ from the Solar Farm Site, on the basis that these would be strategic trips (e.g. originating from ports such as Felixstowe or Southampton) and would therefore be expected to utilise the A12(T) to the south (50%), the A12(T) to the north (25%) or the A130 and A131 to the north (25%). These vehicles would then follow the agreed routing strategy via Wheelers Hill, Cranham Road and Waltham Road. In terms of HGVs travelling to/ from Bulls Lodge Substation, it has been assumed that 50% would travel to/ from the A12(T) to the north and 50% would travel to/ from the A12(T) to the south, subsequently utilising the Boreham Interchange, RDR and the private road to/ from the substation.

The proposed routing arrangements are not expected to change during the implementation of the A12 Chelmsford to A120 Widening Scheme or the various improvements due to be carried out at the Boreham Interchange, as it is understood that there will be no daytime road closures during these works. Should there be any temporary overnight road closures, then vehicle movements will be re-timed as necessary to avoid having to use alternative routes to travel to/ from the Order limits. Further details on management and mitigations will be provided within the Detailed CTMP if additional management and mitigations are required.

In terms of construction trips to/ from Bulls Lodge Substation, the following has been assumed:

- All construction workers would travel directly to/ from the substation via the A12(T), the Boreham Interchange and the RDR; and
- 50% construction vehicles (comprising HGVs, LGVs and staff) would travel to/ from the A12(T) to the north and the remaining 50% would travel to/ from the A12(T) to the south, utilising the Boreham Interchange, RDR and the private road to/ from the substation.

Further details, including traffic flow diagrams showing the distribution of construction vehicles across the highway network are contained within the TA.

5.5 Vehicle Types, Plant Requirements and Abnormal Loads

It is expected that the majority of construction vehicles accessing the Order limits will fall into the ‘normal’ size category (i.e. transit vans and HGVs). It is anticipated that the following vehicle types will serve the Scheme during the construction phase:

- Cars;
- Small vans;
- 10m rigid vehicles;
- Box vans;
- 8-wheeler rigid lorries;
- Concrete mixers; and
- Flatbed low loaders.

The plant requirements for the construction works are listed below, including number of each plant types, size/ weight and duration:

- Piling Rigs: 12 needed throughout the construction programme;
- Mini Excavator (8t or smaller): Nine needed throughout the construction programme;
- Excavator (8t- 30t): Up to six needed throughout the construction programme;
- Mobile Crane: These will be on visiting basis and will drive into the Order limits, required to lift Inverter Stations, transformers and other electrical equipment at the substations and along the Grid Connection Route;
- Crane (50t) for Grid Connection Route;
- Transformers, pre-assembled battery arrays, structural steel work: Needed throughout the construction programme;
- Crawler Dozer: Up to three needed throughout the construction programme;
- Telehandler: Four needed throughout the construction programme;
- Mobile Platforms/Cherry Pickers: 15 needed throughout the construction programme; and
- Drilling equipment (HDD): One needed during Grid Connection Route construction.

The above is expected to be sourced locally and will be delivered to Order limits either individually driven (larger units) and/or by plant haulage.

All cranes required in support of construction will be classified as normal loads. The largest mobile crane is expected to be 14.5m in length and 2.85m in width. Vehicle swept paths have been carried out for a mobile crane of similar (albeit slightly larger) dimensions for the proposed site access on Waltham Road for the Solar Farm Site. Vehicle swept paths have also been carried out for a maximum legal articulated vehicle (16.5m in length) for the proposed western and eastern access for Bulls Lodge Substation, as well as the proposed site access on Waltham Road. The swept paths (**Appendix F** and **Appendix G**) demonstrate that all vehicles including mobile cranes will be able to access the Order limits without overrunning any kerb lines. All mobile cranes will be required to follow the agreed HGV routing strategy when travelling to/ from the Order limits.

At this stage, there is expected to be three abnormal loads associated with Longfield substation and two abnormal loads associated with Bulls Lodge Substation. The abnormal load deliveries will be associated with substation components such as the transformers, as well as the cable drums associated with the Grid Connection Route. A specialised haulage service will be employed to allow these components to be transported with the necessary escort, permits and traffic management, with the contractor consulting the relevant highways authorities to ensure the correct permits are obtained. The police will also be given advanced notification under the Road Vehicle Authorisation of Special Types Order 2003.

An Abnormal Load Route Survey has been prepared to review the suitability of two potential delivery routes for accommodating Abnormal Indivisible Loads (AILs) when travelling to the Solar Farm Site. The two assessed routes comprise 1) the agreed HGV routing strategy via the A12(T), RDR, A130, Wheelers Hill and Cranham Road, and 2) an alternative route via the existing section of the A130 to the north of Springfield instead of the RDR. The assessment has been based on a candidate transformer and a girder frame trailer to provide a worst-case assessment. The abnormal load assessment demonstrates that both routes are expected to be able to accommodate AILs subject to a number of recommendations e.g. vegetation clearance, relocating street furniture and providing a load bearing surface. The proposed recommendations can all be carried out within the limits of

road adoption i.e. are not reliant on third party land. Further details of the assessment methodology and findings are contained within the Abnormal Load Route Survey which is held in **Appendix M**.

As per the agreed HGV routing strategy, the route via the RDR is the preferred route in terms of the routing of abnormal loads. It is understood that the new bridge over the railway line and A12(T) northbound on-slip has been designed to accommodate a single locomotive pulling a STGO Category 3 load (maximum gross weight of 150 tonnes, maximum basic axle load of 16.5 tonnes, gross weight of the vehicle train not exceeding 196 tonnes). Therefore, this bridge is expected to be able to accommodate the abnormal load associated with the transformer on the basis that this will be no larger than a STGO Category 3 vehicle.

As set out within **Section 7**, carriageway widening will be carried out along Wheelers Hill, Cranham Road and Waltham Road to accommodate HGVs travelling to/ from the Solar Farm Site. No carriageway widening is expected to be required on the private road to/ from Bulls Lodge Substation to accommodate HGVs travelling to/ from the substation as the existing carriageway conditions are deemed to be appropriate (the private road was previously upgraded to accommodate the works which were carried out when the substation was originally constructed). The 6m wide construction track within the Solar Farm Site is also expected to accommodate all trips associated with the construction phase of the Scheme. Further details related to the abnormal loads will be included within the Detailed CTMP reports for the Solar Farm Site and the Bulls Lodge Substation Site.

6. Site Access, Layout and Routing

6.1 Introduction

During the construction phase the Scheme will be served by a proposed Solar Farm Site access on Waltham Road and the Bulls Lodge Substation extension will be served by two proposed accesses on the private road. The proposed access locations for the Scheme are illustrated in **Figure 5** below (as well as **Appendix D**) and further details are provided below. It should be noted, the existing access to the Bulls Lodge Substation will continue to be operational during the construction phase of the Scheme.

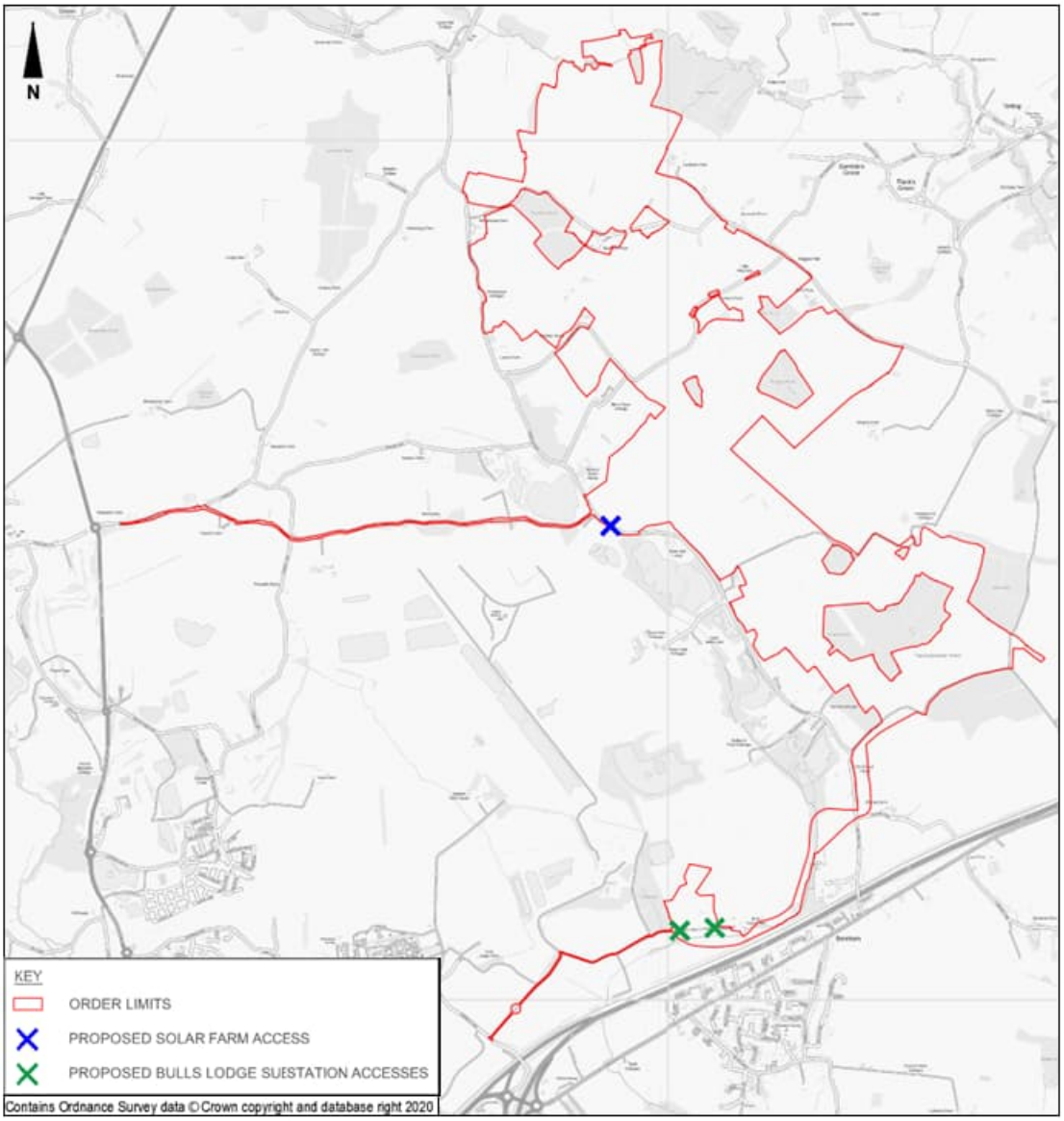


Figure 5: Proposed Order limits Access Arrangements (Construction Phase)

The proposed access for the Solar Farm Site and the proposed western access for Bulls Lodge Substation will both be utilised during the operational phase. However, the proposed eastern access for Bulls Lodge Substation will be removed towards the end of construction as this will not be required during the operational phase.

It should be noted that the existing Bulls Lodge Substation site access on the private road (situated between the proposed eastern and western accesses) will be retained throughout construction, operation and decommissioning, but will not be utilised by the Scheme itself.

The proposed site layout for the construction phase is shown within **Appendix H**. This shows the proposed access arrangements and internal construction routes, as well as construction compound locations for the Solar Farm Site and the Bulls Lodge Substation Site.

6.2 Scheme Elements

A summary of the Scheme elements which are considered to be relevant to this Framework CTMP are set out below in **Table 8**.

Table 8: Scheme Elements

Element of Scheme	Parameter Type	Design Principle
Access to Work No. 1	Location	Access tracks described in Work No. 6 will link the main site entrance in Work No. 9 to the Solar PV Array Works Areas which form Work No. 1. All access to the Solar PV Array Works Areas during construction, operation and decommissioning will be via this route.
Access to Work No. 2	Location	Access tracks in Work No. 6 will link the main site entrance in Work No. 9 to the BESS Compound which forms Work No. 2A and 2B. All access during construction, operation and decommissioning will be via this route.
Access to Work No. 3	Location	Access tracks in Work No. 6 will link the main site entrance in Work No. 9 to the Longfield Substation which forms Work No. 3. All access during construction, operation and decommissioning will be via this route.
Access to Work No. 4	Location	Access tracks described in Work No. 6 will link the Main Site Entrance in Work No. 9 to the Grid Connection Route east of Waltham Road which forms Work No. 4. Access to the Grid Connection Route east of Waltham Road during construction, operation and decommissioning will be via this route.
Access to Work No. 4	Location	The private road described in Work No. 5 will provide access to the Grid Connection Route west of Waltham Road which forms Work No. 4. Access to the Grid Connection Route west of Waltham Road during construction, operation and decommissioning will be via this route.
Access to Work No. 4	Design	No permanent access tracks will be constructed as part of the Grid Connection Route.
Grid Connection Route	Implementation	The working area for cable installation will not exceed a total width of 20m (excluding temporary construction and storage compounds).
Access to Work No. 5	Location	The private road in Work No. 9 will provide access to the Bulls Lodge Substation Extension which forms Work No. 5. All access during operation will be via this route.
Permissive paths, Public Rights of Way, cycle routes	Design	The existing surface of the existing public rights of way that pass through the Order limits will be preserved and will be regularly maintained during construction and operation to ensure accessibility.
Site Access	Location	For all traffic relating to construction, operation and decommissioning activities on the Solar Farm Site (Work Nos. 1, 2, 3, 6, 7A, 8 and 10) a single, new main site entrance at approximate NGR TL 74668 12760 will be used as marked as Work No. 9 on the Works Plan.
Site Access	Location	Sections of the Grid Connection Route to the east of the northernmost crossing of Boreham Brook (part of Work No. 4) will be accessed via the main site entrance, partly via a managed crossing of Waltham Road.
Site Access	Location	Sections of the Grid Connection Route west of the northernmost crossing of Boreham Brook (part of Work No. 4) will be accessed via the private road off Generals Lane.

Element of Scheme	Parameter Type	Design Principle
Site Access	Location	The Bulls Lodge Substation Extension (Work No. 5A, 5B and 7B) will be accessed via the private road off Generals Lane.
Site Access	*Design*	The new main site entrance at approximate NGR TL 74668 12760 within the area marked as Work No. 9 on the Works Plan will be surfaced with tarmacadam.
Site Access	*Design*	The new main site entrance will link to the network of internal access tracks in Work No. 6.
Site Access	*Design*	A visibility splay of 2.4m x 125m at the main site entrance will be maintained clear of vegetation and obstructions throughout construction, operation and decommissioning of the Scheme.
Site Access	*Design*	Widening of Cranham Road to accommodate access to the Scheme during construction and operation will require extension of up to 1.55m of the highway in the vicinity of an existing culvert of Boreham Brook, within the existing highway boundary.

6.3 Solar Farm Site

6.3.1 Proposed Solar Farm Site Access

The proposed access for the Solar Farm Site is situated on the eastern side of Waltham Road, approximately 125m to the south of the Waltham Road/ Cranham Road junction. This location has been agreed with ECC Highways and offers the following benefits:

- The proposed access will provide direct access from Waltham Road into the Solar Farm Site without crossing any third-party land;
- The access will be located on a section of carriageway where the required visibility splays and Sight Stopping Distances (SSDs) will be achievable in each direction following vegetation clearance within the Order limits (see below);
- The Waltham Road carriageway near the proposed site access has recently been resurfaced (in May 2021) which should alleviate any road safety concerns relating to the historic collision record on this part of the network (see the TA for further details);
- The section of Waltham Road carriageway near the proposed Solar Farm Site access has recently been resurfaced (in May 2021) which should help to alleviate any road safety concerns relating to the historic collision record on this part of the network;
- The access will minimise the distance covered by construction HGVs on Waltham Road, given the agreed routing strategy where HGVs will travel via Wheelers Hill and Cranham Road to the west;
- Waltham Road is approximately 6.0m in width to the north of the proposed Solar Farm Site access which will limit the extent of any carriageway widening to accommodate HGVs on this part of the network (see **Section 7**); and
- All vehicles approaching the Solar Farm Site access from either the A12(T) to the south or the A130 to the west will avoid Boreham Road which has protected status.

6.3.2 Vehicle Routing

As agreed with ECC Highways, construction HGVs will travel to/ from the Solar Farm Site via the SRN (including the RDR if travelling to/ from the A12(T)), Wheelers Hill, Cranham Road and Waltham Road, to avoid passing along any Protected Lanes or through the villages of Boreham or Hatfield Peverel to the south. Local off-site highway improvements (e.g. verge clearance, hedge cutting and/ or carriageway widening) will be carried out along Wheelers Hill, Cranham Road and Waltham Road at the required locations to provide the desired 6.0m carriageway width for HGVs along this route where possible (further details are set out within **Section 7**). In terms of the wider network, construction vehicles will access Wheelers Hill from the south via the A12(T) at the Boreham Interchange

and then the RDR, or via the A120 and A131 to the north. A vehicle routing plan showing the agreed routing strategy for HGVs is held in **Appendix E**.

The above routing strategy reflects the most suitable routes available and has been specified by ECC from the outset of the project, due to the following limitations/ restrictions associated with alternative local routes which run to the north and east of the Order limits:

- Terling Hall Road (to/ from the east) is categorised as a local road and is a narrow rural single carriageway road which has a 12'6" height restriction as the route passes underneath the railway line, a short distance to the north of the A12(T). This road also has protected status.
- Braintree Road (to/ from the north) is categorised as a local road and is a rural single carriageway road which serves the villages of Fuller Street and Terling, which narrows to below 4m in width to the east of the junction with Boreham Road. This road also has protected status.

Construction staff will be advised to take the most direct route to the site using 'higher' order roads, such as A and B classified roads i.e. the SRN and PR1/ PR2 routes. It is envisaged that workers would use the routes set out above to access Waltham Road from the north, or the B1137 Main Road to access Waltham Road from the south if travelling via the A12(T).

As set out in **Section 3**, the alignment of Cranham Road will change to accommodate the CNEB (Phase 1) and the provision of a combined Cranham Road/ Drakes Lanes overbridge. The new structure will be constructed offline to keep Cranham Road open for as long as possible. However, Cranham Road may need to be temporarily closed to permit the tie-in of this existing route with the new approaches to the overbridge. Therefore, depending on the nature/ duration/ programme of the above closure (if required), an alternative route may need to be temporarily followed by construction vehicles travelling to/ from the Solar Farm Site which will be agreed with ECC Highways. Alternatively, it may be possible to reschedule HGVs to avoid any periods where there may be a closure. Further details will be provided as part of the Detailed CTMP for the Solar Farm Site following further consultation with the Highway Authority once further details are known. The need to manage HGV construction traffic for Waltham Road, including the section of Waltham Road to the south of the proposed site access, will be considered once further details are known with specific regard to ECC's casualty reduction scheme in this area. Traffic measures along this section of Waltham Road, such as if road widening is required by the council, would be delivered within the existing Scheme parameters.

6.3.3 Access Layout

The proposed layout of the access to the Solar Farm Site is shown within **Appendix F**. During the construction phase, this will provide access to a north-south construction route within the Solar Farm Site which will allow construction vehicles to access all areas of the site. The north-south route supports the proposals to provide a single point of access and will minimise the usage of other parts of the local highway network, including the Protected Lanes of Boreham Road to the west and Braintree Road to the north.

As shown by the proposed layout of the access, the site access road will include laybys on either side to accommodate HGVs waiting to enter or exit the Solar Farm Site should this be required (to prevent stacking of vehicles). The site access road has been designed to accommodate two-way movements as shown by the vehicle swept paths (**Appendix G**). There is expected to be up to 7-8 HGVs arriving to or departing from the Solar Farm Site per hour, which equates to one HGV arriving or departing approximately every eight minutes. The proposed layout of the Solar Farm Site access and site access road is considered to be appropriate for accommodating this level of activity. A Stage 1 Road Safety Audit (RSA) will be carried out on the preliminary design of the proposed site access post-submission.

The proposed site access road will be surfaced with tarmac over a 20m distance from the junction with Waltham Road, to minimise the transfer of material onto the public highway as a result of construction vehicles.

6.3.4 Visibility Splays

The required application of design standards are set out within ECC's Development Management Policies document (dated February 2011) which states the following under Policy DM7 *'visibility splays and stopping sight distances (SSD) for all roads, with the exception of internal estate roads which carry or are intended to carry HGVs and/ or passenger transport vehicles at a level of less than 5% of the overall traffic flow, must comply with standards contained within DMRB unless otherwise agreed with the Highway Authority'*.

DMRB CD 109 (Highway Link Design) identifies desirable minimum SSDs based on the design speed of the carriageway. These values are adopted within DMRB CD 123 (Geometric design of at-grade priority and signal-controlled junctions) in order to determine the visibility requirements (the 'y' distance) at priority junctions, measured along the edge of the major road carriageway from the centreline of the minor arm at the junction. These requirements are shown in **Table 9** below.

Table 9: Desirable Minimum SSDs based on Design Speed

Design Speed (kph)	SSD ('Y' Distance)
50	70m
60	90m
70	120m
85	160m
100	215m
120	295m

The minimum distance from which the visibility splays are measured at simple priority junctions is at a 2.4m setback (the 'x' distance) from the give-way line.

The 'Desirable Minimum' SSDs in the DMRB are based on a driver perception/ reaction time of two seconds and a deceleration rate of 0.25g (2.45 m/s^2). The 'Absolute Minimum' (one step below Desirable Minimum) SSD values use the same reaction time and a deceleration rate of 0.375g (3.68 m/s^2).

The 85th percentile speed of traffic represents the appropriate speed measurement for an existing major road when determining visibility splay requirements. The above parameters have been adopted to calculate the desirable minimum and absolute minimum visibility requirements for Waltham Road based on the highest recorded 85th percentile speeds in October 2019 as identified within the TA. The results are shown below in **Table 10**.

Table 10: SSDs on Waltham Road and Boreham Road (DMRB)

Direction	85th Percentile Speed (Highest Recorded)	DMRB Requirement (SSD/ 'Y' Distance)	
		Desirable Minimum	Absolute Minimum
Northbound	71.9 kph	122m	95m
Southbound	72.9 kph	125m	97m

In view of the above, and the requirements set out in DMRB CD 123 and DMRB CD 109, the following desirable minimum visibility splays have been identified:

- Junction visibility splays of 2.4m x 125m for vehicles turning from the site access to the mainline carriageway; and
- Forward visibility splays/ SSDs of 125m for vehicles travelling towards the site access on the immediate junction approaches of the mainline carriageway.

The above visibility/ SSD requirements have been agreed with ECC Highways as identified by the correspondence contained within the TA.

A drawing showing the required areas to be kept clear to achieve the above visibility splays and SSDs is held within **Appendix F**. This demonstrates that these can all be achieved through the clearance of vegetation etc. within the highway boundary and the Order limits. As above, a Stage 1 Road Safety Audit (RSA) will be carried out on the preliminary design of the proposed site access post-submission.

6.3.5 Vehicle Swept Paths

As set out above, the agreed routing strategy for HGVs is via Wheelers Hill, Cranham Road and Waltham Road, to prevent these larger vehicles from passing through Hatfield Peverel or Boreham to the south of the Solar Farm Site. As such, all HGVs will turn left into the proposed site access from Waltham Road to the north, and then right

out of the access to return back to Waltham Road to the north. A drawing showing vehicle swept paths for a maximum legal articulated vehicle and a mobile crane is held in **Appendix F**.

The vehicle swept paths demonstrate that construction vehicles will be able to turn in/ out of the proposed site access without overrunning any kerb lines. It should be noted that banksmen will be in place to control HGV movements at the access to ensure these movements are carried out safely. An appropriate level of visibility will be achievable to/ from the access as set out above. A small section of the Waltham Road carriageway will be widened to 6.0m to the north of the proposed Solar Farm Site access to support the movements of HGVs and further details are provided in **Section 7**.

6.3.6 Construction Compounds

As shown by the proposed Solar Farm Site layout (held in **Appendix I**), one main construction compound will be located near to the proposed Solar Farm Site access and approximately ten smaller secondary compounds will be situated across the Solar Farm Site at strategic locations, served by the primary and secondary access routes. The compounds will be converted to solar PV or landscaping at the end of their use.

The main construction compound will be located 580m from the proposed Solar Farm Site access, adjacent to the primary access road which will run from the proposed access and eastwards through the Solar Farm Site. The main compound will be approximately 150m x 150m in size and will contain offices, mobile welfare units, canteens, storage and waste skips, an 11kV power supply, parking areas and space for storage, a wheel washing facility, a bunded area for refuelling and the storage of liquids, as well as unloading and turning areas. A plan showing the proposed layout of the main construction compound is held in **Appendix I**.

The smaller secondary construction compounds will be situated across the Solar Farm Site at strategic locations. The secondary compounds will be up to 50m x 50m in size and will contain material storage areas, mobile welfare units, offices, diesel generators, rock fill placed on a suitable formation and temporary matting (if required), fencing to secure the compound, parking areas and turning areas. A plan showing the proposed layout of a secondary construction compound is held in **Appendix I**.

6.3.7 Access Tracks

It is proposed to utilise the existing hard-surfaced tracks that run throughout the Solar Farm Site where possible as the primary construction route (upgrading existing access tracks through widening or resurfacing where these are required along the route), and to construct additional secondary access tracks where connectivity is required. The access tracks from the proposed site access to the main construction compound, as well as the access tracks to Longfield substation and Bulls Lodge Substation, will be 6.0m in width. Passing places (20m in length) will be installed at strategic locations in order to allow the safe passage of construction vehicles. The internal tracks will enable free-flowing movement within the site whilst removing construction traffic from local roads.

6.3.8 Car and Cycle Parking

During the construction phase of the works, a total of 150 parking spaces will be provided within the main construction compound for construction workers which is designed to meet peak parking demand. A total of 50 cycle parking spaces will also be provided. Construction workers will then be transported within the Order limits via mini-bus, or similar.

6.4 Bulls Lodge Substation Site

6.4.1 Access Locations

During the construction phase, two new accesses will be provided to facilitate the extension of the Bulls Lodge Substation as follows:

- A western access will be located on the northern side of the private road circa. 180m to the west of the existing substation access. This will be utilised by HGVs to carry out the necessary works to extend Bulls Lodge Substation; and,
- An eastern access will be located on the northern side of the private road circa. 30m to the east of the existing substation access. This will provide access to the construction compound for the substation and will primarily be utilised by construction workers. This access will also be utilised by HGVs when deliveries are made.

The existing operational access for Bulls Lodge Substation will be retained but will not be utilised by vehicles associated with the Scheme. A plan showing the proposed vehicle access arrangements for Bulls Lodge Substation is held within **Appendix G**.

6.4.2 Vehicle Routing

The Bulls Lodge Substation will be accessed via the Boreham Interchange and the RDR which will form a new roundabout with the existing private road that serves the substation to the east. The RDR is currently under construction and is expected to be completed in May 2023 i.e. prior to the construction phase. Therefore, construction and operational phase vehicles will utilise the RDR and existing private road to travel to/ from Bulls Lodge Substation throughout the programme. The proposed HGV routing strategy to/ from Bulls Lodge Substation are identified on the plan held in **Appendix E**.

6.4.3 Access Layouts

The proposed layouts of the western and eastern accesses are shown within **Appendix G** which show that the construction access roads will be located to the west and north of the Bulls Lodge Substation extension. The access tracks will be 6m wide to accommodate two-way HGVs including the required load bearing capacity, load overhang and turning provisions as shown by the vehicle swept paths (covered further below). Based on information received from National Grid, the western and eastern accesses are expected to serve up to 46 HGVs and 48 LGVs per day in total during the peak construction period.

6.4.4 Visibility Splays

The section of private road which serves Bulls Lodge Substation was upgraded when the original substation was constructed, is subject to a 30mph speed limit and only serves the substation and a limited number of buildings and agricultural fields to the east. Therefore, this part of the network is suitable for HGVs whilst being limited to a few local/ repeat users and is therefore lightly trafficked. Visibility splays of 2.4m x 90m will be provided at the western and eastern accesses commensurate with the desirable minimum requirement for a 30mph speed limit. The drawings held within **Appendix G** shows the areas to be kept clear to achieve these visibility splays to in each direction.

6.4.5 Vehicle Swept Paths

All vehicles will turn left into the proposed substation accesses from the private road to the west and then right out of the site access to return back to the west. Drawings showing vehicle swept paths for a maximum legal articulated vehicle are held in **Appendix G**. The vehicle swept paths demonstrate that construction vehicles will be able to turn in/ out of the proposed substation accesses without overrunning any kerb lines. It should be noted that banksmen will be in place to control HGV movements at the accesses to ensure these movements are carried out safely. An appropriate level of visibility will be achievable to/ from each access as set out above.

6.4.6 Construction Compounds

A construction compound will be located immediately to the north of the Bulls Lodge Substation Site and accessed via the proposed eastern access. The compound will contain offices, a welfare and car parking area, space for storage, a wheel washing facility, an area for refuelling and storage of liquids, as well as unloading and turning areas. A plan showing the proposed location and indicative layout of the Bulls Lodge Substation construction compound is held within **Appendix G**.

6.4.7 Car Parking

A total of 50 parking spaces will be provided for construction workers within the construction compound at the Bulls Lodge Substation Site. The car park will be located within the construction compound accessed via the proposed eastern access.

6.5 Grid Connection Route

6.5.1 Location

The proposed Grid Connection Route from the Longfield Substation to the point of connection at Bulls Lodge Substation is expected to be formed of a single 400 kV cable circuit. The proposed Grid Connection Route and the associated working corridor runs southwest from the Solar Farm Site, where it runs south along the eastern side

of Waltham Road, before crossing both Waltham Road and Boreham Brook. The Grid Connection Route then runs further south before running west adjacent to the private road serving Bulls Lodge Substation, before crossing the private road to reach the substation in the vicinity of the proposed western access. A plan showing the Grid Connection Route is held in **Appendix J**.

6.5.2 Vehicle Access

The construction area for the Grid Connection Route will be accessed from two locations. The proposed works to the west of Boreham Brook will be accessed via the private road which serves Bulls Lodge Substation. The cable route works to the east of Waltham Road will be accessed from within the Solar Farm Site. There will be a single crossing point of Waltham Road to allow vehicles to access the section of Grid Connection Route to the west of Waltham Road up to the central crossing of Boreham Brook. Construction vehicles will not be permitted to travel along Waltham Road for the purposes of accessing the Grid Connection Route, they will cross directly over Waltham Road between the works areas east and west of the site. These routing arrangements are illustrated by the plan held in **Appendix E**. Temporary access tracks will be provided along each section of the Grid Connection Route, as well as to provide access to any works areas as required.

6.5.3 Construction Vehicle Crossing Point on Waltham Road

A construction vehicle crossing point will be required on Waltham Road (circa. 600m to the north of the junction with B1137 Main Road) as part of the works to construct the proposed Grid Connection Route. The vehicle crossing point will be used to access the section of Grid Connection Route between the western side of Boreham Brook (as it will not be possible to access this section via the route from Bulls Lodge Substation to the west). The following arrangements are proposed to be implemented to safely manage the crossing point on Waltham Road:

- The construction access points will be located opposite each other on Waltham Road (both gated out-of-hours to prevent general access);
- All construction vehicles will access the western section via the eastern section, which will in turn be accessed from within the Solar Farm Site i.e. the crossing will accommodate straight-ahead vehicle movements only, with no vehicles turning to/ from Waltham Road;
- The construction access tracks will have a minimum width of 6m to accommodate two-way HGV movements movement along the construction access route;
- Forward visibility splays of at least 125m will be provided to the vehicle crossing point and associated Temporary Traffic Management (TTM) for traffic approaching the crossing point on the two Waltham Road approaches;
- Temporary traffic signals will be implemented at each arm of the crossing (this includes one on each side of the crossing on Waltham Road and one on each side of the crossing on the construction route i.e. four traffic signals in total); and
- The temporary traffic signals will be demand-based (i.e. on-call system for the two minor construction access arms, to ensure Waltham Road traffic is only impacted when construction vehicles need to cross Waltham Road).

The Grid Connection Route will require temporary traffic management on Waltham Road for a period of up to 30 weeks in order to allow this to be installed across Waltham Road and to allow construction vehicles to safely cross Waltham Road to access the section of the cable route to the west. Following discussions with ECC Highways, it is proposed to implement temporary traffic signals on Waltham Road which will only hold up mainline traffic when a construction vehicle needs to cross Waltham Road. There are expected to be up to 30 such vehicle crossing movements per day (equivalent to 3-4 crossing movements per hour) which will only hold up traffic momentarily (when construction vehicles cross Waltham Road). Waltham Road will remain free-flowing, with mainline traffic having priority under a green traffic signal, other than when construction vehicles need to cross Waltham Road. Therefore, the temporary traffic signals are not expected to have a material impact on journey times or driver delay along Waltham Road.

In terms of the installation of the Grid Connection Route itself across Waltham Road, it is envisaged that this will be dealt with through a lane closure(s) rather than a whole road closure. The exact methodology for implementing the temporary traffic management will be determined by the contractor once appointed and designed to minimise any potential effects as far as possible. In the event that during detailed design it is identified that a whole road closure is required to accommodate trenching techniques, then alternative techniques such as Horizontal

Directional Drilling (HDD) will be implemented at this location instead (therefore avoiding any road closure). Further details will be provided within the detailed CTMPs once further details are known in due course.

A Stage 1 Road Safety Audit (RSA) will be carried out on the preliminary design of the proposed crossing point post-submission.

6.5.4 Construction Compounds

The construction compounds for the Grid Connection Route will be contained within the overall working corridor and then decommissioned when no longer required.

6.5.5 Plant Requirements

The construction of the Grid Connection Route will require the use of 50 tonne cranes along the route (these are not expected to constitute abnormal loads, as previously mentioned, and will be accommodated by the proposed access tracks).

7. Management and Mitigation

7.1 Introduction

This section of the Framework CTMP outlines the construction traffic management measures that will be implemented in support of the Scheme, to avoid any adverse impacts on the surrounding networks during the construction phase.

7.2 Highway Network

7.2.1 Proposed Carriageway Widening

Following discussions with ECC Highways, it was agreed that carriageway widening improvements should be implemented along the local highway network where necessary along the agreed route to accommodate construction vehicles travelling to/ from the Solar Farm Site. This includes widening the carriageway to 6.0m where possible and providing a minimum width of 5.5m where 6.0m is not possible i.e. due to constraints such as third-party land ownership and existing buildings (although there is only one instance of this – see below). A detailed review has therefore been carried out for Wheelers Hill, Cranham Road and Waltham Road, representing the section of the local highway network between the A130 ERW and the proposed Solar Farm Site access on Waltham Road, to determine the areas where widening may be required.

A detailed schedule and series of drawings are held within **Appendix K** identifying the extent and locations of potential carriageway widening that may be required to achieve a minimum carriageway width of 6.0m along the agreed extents of the local highway network. This has been informed by OS mapping, highway boundary information and a site visit to identify the areas where the widening should take place e.g. to determine which side of the carriageway would be most appropriate for the widening. These drawings indicate the following:

- Where the carriageway currently falls below 6.0m in width (based on the OS mapping), it will be possible to widen the carriageway to 6.0m within the highway boundary along the entire route (18 individual sections), except for a single pinch point at the western extent of the study area (adjacent to Kingswood, approximately 150m east of the A130/ Wheelers Hill roundabout)) due to existing buildings on both sides of the carriageway;
- For the above pinch point, as agreed with ECC, it will be possible to widen the carriageway to 5.5m within the highway boundary which is considered to be appropriate for the following reasons:
  - The carriageway will only fall below 6.0m (but no less than 5.5m) for a short distance (pinch point) of circa. 40m, with good forward visibility in each direction at this location;
  - A carriageway width of 5.5m is sufficient for two large vehicles to pass based on Manual for Streets guidance;
  - The existing carriageway exceeds 6.0m in width both to the east and west of the pinch point, allowing two large vehicles to easily pass; and
  - An existing access provides an additional opportunity for two large vehicles to pass to the west of the pinch point, if required.

It should be noted that following a visual inspection, the anticipated extents of the proposed carriageway widening are considered to represent a worst-case scenario as 8 out of the 18 sections appear to be wider in reality than indicated by the OS mapping. Further details are set out within the schedule held in **Appendix K**.

In view of the above, a topographical survey should be carried out at the detailed design stage to determine the true extents of widening at the eight identified locations in order to avoid any unnecessary works i.e. should less widening be required to achieve 6.0m width or in the instance that the carriageway is already 6.0m in width.

The proposed extent of carriageway widening to be delivered in support of the Scheme has been agreed with ECC Highways, as shown by the meeting minutes held in the TA. A Stage 1 Road Safety Audit (RSA) will be carried out on the preliminary design of the proposed carriageway widening post-submission. The carriageway widening will be secured by the DCO and further details of the works to provide this widening will be provided in the relevant Detailed CTMP.

7.2.2 Noakes Lane Crossing Points

The proposed construction route within the Solar Farm Site will cross Noakes Lane at two locations to allow construction vehicles to access all parts of the Solar Farm Site. Following discussions with ECC Highways, it was agreed that visibility splays of 90m should be provided in both directions at these crossing points, through the clearance of vegetation (hedgerows) within the Solar Farm Site. A drawing showing the locations of these crossing points and the areas to be kept clear to achieve visibility splays of 2.4m x 90m is held within **Appendix L**. It should be noted that the crossing points will be gated with supporting measures (e.g. banksmen and signage) to safely control construction vehicles as they cross Noakes Lane to access different parts of the Solar Farm Site. Priority will be provided to vehicles on Noakes Lane, with construction vehicles being held until the carriageway is clear in both directions. A Stage 1 Road Safety Audit (RSA) will be carried out on the preliminary design of the proposed Noakes Lane crossing points post-submission.

7.2.3 Temporary Traffic Management on Waltham Road

The Grid Connection Route will require temporary traffic management on Waltham Road for a period of up to 30 weeks in order to allow this to be installed across Waltham Road and to allow construction vehicles to safely cross Waltham Road to access the section of the cable route to the west. Following discussions with ECC Highways, it is proposed to implement temporary traffic signals on Waltham Road which will only hold up mainline traffic when a construction vehicle needs to cross Waltham Road. There are expected to be up to 30 such vehicle crossing movements per day (equivalent to 3-4 crossing movements per hour) which will only hold up traffic momentarily (when construction vehicles cross Waltham Road). Waltham Road will remain free-flowing, with mainline traffic having priority under a green traffic signal, other than when construction vehicles need to cross Waltham Road. Therefore, the temporary traffic signals are not expected to have a material impact on journey times or driver delay along Waltham Road. In terms of the installation of the Grid Connection Route itself across Waltham Road, it is envisaged that this will be dealt with through a lane closure(s) rather than a whole road closure. The exact methodology for implementing the temporary traffic management will be determined by the contractor once appointed and designed to minimise any potential effects as far as possible. Further details will be provided within the detailed CTMPs once further details are known in due course.

The construction area for the Grid Connection Route will be accessed from two locations. The works to the west of Boreham Brook will be accessed via the private road which serves Bulls Lodge Substation. The works to the east of Waltham Road will be accessed from the Solar Farm Site. There will be a single crossing point of Waltham Road to allow vehicles to access the section of Grid Connection Route to the west of Waltham Road up to the central crossing of Boreham Brook. Construction vehicles will not be permitted to travel along Waltham Road for the purposes of accessing the Grid Connection Route, they will cross directly over Waltham Road between the works areas east and west of the site.

7.2.4 Waltham Road/Cranham Road Junction

It is recommended that the vegetation within the central island of the Waltham Road/ Cranham Road junction (within the highway boundary) is cut-back/ maintained by ECC Highways throughout the construction phase to maximise visibility at this junction. This will benefit both existing vehicles using this junction as well as those associated with the Scheme, including HGVs following the agreed routing strategy. This will be secured as part of the DCO and further details will be included in the Detailed CTMP.

7.2.5 Private Road to/from Bulls Lodge Substation

The private road to/ from Bulls Lodge Substation is currently utilised by Hanson's quarry and the waste facility, National Grid for the existing substation and road users associated with the limited buildings/ agricultural fields at the eastern end. Furthermore, the private road may also be utilised by construction traffic associated with the A12 Chelmsford to A120 Widening Scheme and the CNEB (Phase 1) during part of the construction phase. As such, this Framework CTMP includes measures further below to manage construction traffic to/ from Bulls Lodge Substation, to minimise the cumulative impacts of construction traffic associated with the Scheme and other road users. A separate CTMP will be prepared for the A12 Chelmsford to A120 Widening Scheme.

7.3 Pedestrian and Cycle Routes

7.3.1 Summary

Access to all existing PRoW will be retained during the construction phase, with no PRoW closures and a limited number of temporary PRoW diversions around the Grid Connection Route works area when this is installed as well as a couple of temporary PRoW diversions within the Solar Farm Site. The below provides details of how existing PRoW will be managed during the construction phase (running progressively from north to south) which is supported by the Outline PRoW MP presented in Appendix 13C [APP-095]. This also identifies the minimum legal PRoW widths (based on information supplied by ECC) which will be retained throughout the construction phase.

7.3.2 Construction Route Crossing Points

The proposed construction routes will cross existing PRoW within the Solar Farm Site at a number of locations. These locations are listed below and include the main (primary) construction route which will be utilised throughout the construction programme and secondary routes which will be utilised less frequently to access certain parcels when required:

- PRoW 113_33 – 1 x primary crossing point and 1 x secondary crossing point;
- PRoW 221_53 – 1 x secondary crossing point;
- PRoW 113_25 – 1 x primary crossing point;
- PRoW 113_30 – 1 x primary crossing point and 2 x secondary crossing points;
- PRoW 213_4 – 1 x primary crossing point along diverted section;
- PRoW 213_5 – 1 x primary crossing point;
- PRoW 113_32 – 2 x primary crossing points and 1 x secondary crossing point along diverted section; and
- PRoW 213_18 – 1 x secondary crossing point.

Each diversion will be clearly marked out, along with appropriate signage at either end of the diversion. The diversion routes will be agreed with the relevant local authority prior to construction.

The existing PRoW and proposed crossing points will be carefully managed to ensure that all users are able to safely pass through these areas.

7.3.3 Physical Separation from Construction Route

The proposed construction route will be physically separated from existing PRoW, to maximise the safety of pedestrians and cyclists within the Order limits. The following existing PRoW will run alongside, but will be physically separated from, the proposed construction route:

- PRoW 113_25 – to be physically separated from the primary construction route for a length of circa. 110m;
- PRoW 213_4 – to be temporarily diverted throughout construction and physically separated from the primary construction route for a length of circa. 575m (circa. 75m additional length); and
- PRoW 113_32 – to be temporarily diverted throughout construction and physically separated from the primary construction route for a length of circa. 450m (no additional length).

Each diversion will be clearly marked out, along with appropriate signage at either end of the diversion. The diversion routes will be agreed with the relevant local authority prior to construction. The existing PRoW will be reinstated during the operational phase, albeit public access will be retained throughout as a result of the PRoW diversions.

As above, a sufficient corridor will be provided to accommodate and retain the minimum legal PRoW widths (specified by ECC) will be maintained for all PRoW throughout the construction phase. The above locations including details of minimum legal PRoW widths are presented within the Outline PRoW MP presented in Appendix 13C [APP-095].

7.3.4 Grid Connection Route

The proposed Grid Connection Route will cross three existing PRoW and it is therefore proposed to temporarily (and locally) divert these PRoW around each works area, for a short period, (circa. 2-3 weeks each), when the cables are installed:

- PRoW 213_19 – temporary PRoW diversion around the works area during cable installation (circa. 20m additional length);
- PRoW 213_20 – temporary PRoW diversion around the works area during cable installation (circa. 30m additional length); and
- PRoW 213_21 – temporary PRoW diversion around the works area during cable installation (circa. 45m additional length).

The construction works will be very localised at the above locations and the temporary PRoW diversions will therefore only displace the existing PRoW around the works area before re-joining the existing PRoW. This is illustrated within the Streets, Access and Rights of Way (SARoW) plans (60640215-1013-AROW-003, 60640215-1013-AROW-004 and 60640215-1013-AROW-007 to 60640215-1013-AROW-009) which indicate that temporary diversions would increase the length of each PRoW by circa. 20-45m, allowing a 5m buffer from the edge of the works area.

Each minor diversion will be clearly marked out, along with appropriate signage at either end of the diversion. The diversion routes will be agreed with the relevant local authority prior to construction.

The existing PRoW will be reinstated once the Grid Connection Route has been installed at each location, albeit public access will be retained throughout as a result of the localised PRoW diversions. Further details of the above temporary PRoW diversions are presented within the Outline PRoW MP presented in Appendix 13C [APP-095].

7.3.5 Bulls Lodge Substation Access

An existing bridleway (PRoW 213_48) runs along the existing private road to/ from Bulls Lodge Substation for a distance of circa. 550m. In addition, an existing bridleway (PRoW 213_23) crosses the existing private road to/ from Bulls Lodge Substation approximately 200m to the northeast of the junction with the RDR.

The private road currently accommodates agricultural vehicles as well as maintenance vehicles for the existing Bulls Lodge substation. During the development and network peak hours, there is expected to be a maximum of 20 additional two-way vehicle movements on the private road to/ from Bulls Lodge substation, via the Boreham Interchange and the A12(T) as a result of the Scheme during the construction phase. This equates to a maximum of one additional vehicle movement every three minutes. The private road will be utilised by construction vehicles associated with the extension of the existing Bulls Lodge substation, with a maximum of 46 HGVs per day and 48 LGVs/ cars per day (during peak construction phase).

In order to safely manage access along the private road, safety measures such as signage and banksmen will be provided at either end of the 550m section to both manage and increase awareness of construction vehicles and PRoW users when required. This has been agreed as the preferred approach with ECC Highways, rather than seeking to temporarily divert or close the PRoW. It should be noted that no physical modifications are expected to be necessary to accommodate construction vehicles on the private road (other than to accommodate the eastern and western access points for the extension of the existing Bulls Lodge Substation) as it is currently used by vehicles of a similar size and type.

7.4 Management Measures and Controls

7.4.1 HGV Measures and Controls

The following measures will be implemented to manage HGV deliveries to the Order limits on the surrounding highway network (relating both the Solar Farm Site and the Bulls Lodge Substation Site):

- Road condition surveys;
- Delivery management system;
- Traffic management and monitoring;
- Suitable (and agreed) HGV routes;

- HGV timing restrictions;
- Banksmen and site management;
- Communications strategy;
- Appropriate site access arrangements;
- Necessary escort, permits and traffic management for abnormal loads;
- Avoiding any Protected Lanes; and
- Interactions with pedestrians and cyclists.

7.4.2 Road Condition Surveys

A road condition survey will be carried out on Wheelers Hill, Cranham Road and Waltham Road (limited to the 125m section between Cranham Road and the proposed site access) pre-construction, during construction and post-construction, to identify any defects that arise to highways assets/ verges during the construction phase of the Scheme for re-instatement.

In addition, a separate road condition survey will be carried out for the route between the A12(T) and the Order limits, including on the RDR in the instance that this is not adopted, to identify any defects that arise to highways assets/ verges as a result of abnormal loads for re-instatement. As above, this survey would be carried out both before and after any abnormal loads travel on the network.

7.4.3 Delivery Management System

A Delivery Management System (DMS) will be implemented to control bookings of HGV deliveries from the start of the construction period. This will be used to regulate the arrival times of HGVs via timed delivery slots, as well as to monitor compliance of HGV routing (instructing as all HGV drivers to avoid Waltham Road to the south of the proposed access for the Solar Farm Site and Boreham Road to the north of Cranham Road). In addition, adequate space will be made available along the proposed access road to ensure no queuing back onto the surrounding road network occurs.

7.4.4 Traffic Management and Monitoring

A Traffic Management and Monitoring System (TMMS) will be developed to provide details of the technologies and other means employed to monitor HGVs to/ from the Solar Farm Site and Bulls Lodge Substation Site e.g. Global Positioning System (GPS) and Automatic Number Plate Recognition (ANPR). This will enable the Applicant to monitor the following:

- Compliance with the HGV routes;
- Compliance with the number of HGV limits in terms of number of deliveries arriving and departing at any one time and over the course of the day; and
- Compliance with the timing restrictions.

In addition, the TMMS will also record all LGVs which enter and exit the Order limits, to allow all vehicles to be monitored. In the instance that a complaint has been made in relation to inappropriate routes being used, then this will be cross-referenced with the TMMS to allow appropriate actions to then be taken.

The precise form of TMMS would be determined following the appointment of a contractor and will include a summary of the contractual requirements which those visiting the Order limits will have to adhere to, along with the measures to be taken for non-compliance.

7.4.5 HGV Routes

HGVs will be required to comply with the agreed routing strategy (see **Appendix E**) in accordance with the DMS and TMMS, including the avoidance of Protected Lanes and the B1137 Main Road which passes through Boreham and Hatfield Peverel. Where applicable, the RDR should be utilised to access the proposed site access on Waltham Road (via Wheelers Hill and Cranham Road), as well as the Bulls Lodge Substation via the Boreham Interchange.

In the case of exceptional circumstances where the proposed routing to the Order limits is compromised due to an incident or road closure for example, then it is considered acceptable for HGVs to be redirected via an alternative route or to deliver outside of the established scheduling if required.

7.4.6 HGV Timing Restrictions

To reduce the potential impact of HGV deliveries, the arrival and departure times will be managed to minimise the number of HGVs travelling to the Order limits during the network peak hours for the local highway network; identified within the TA as 08:00-09:00 and 17:00-18:00. For example, HGVs could be delayed in the afternoon to avoid being released from the Order limits during the PM network peak hour.

The timing restrictions, considered likely to be implemented at this stage are:

- Avoiding arrivals or departures on a weekday between 08:00-09:00 and 17:00-18:00;
- No arrivals or departures on a Saturday before 08:00 or after 13:00; and
- No arrivals or departures on Sundays or public holidays.

The restrictions imposed on deliveries by HGVs will be set out within the DMS and TMMS.

7.4.7 Banksmen and Site Management

Suitably qualified banksmen will be positioned at the proposed site access for the Solar Farm Site on Waltham Road, at the proposed site accesses for Bulls Lodge Substation Site, the Waltham Road construction vehicle crossing point and at internal crossing points when required, to allow vehicle arrivals and departures, as well as internal vehicle movements to be safely controlled during the construction period. This includes the two crossing points on Noakes Lane, and PRoW crossing points within the Order limits. Visibility will be maximised between construction vehicles and other users at the crossing points (through hedgerow clearance for example), and advanced signage will be provided to warn users of the potential presence of construction vehicles. Manned controls will be provided at each crossing point (including marshals/ banksmen and gates), with a default priority that construction traffic will give-way to other users.

7.4.8 Communications Strategy

A Communications Strategy will be developed by the Applicant to ensure that the measures contained within this Framework CTMP are communicated to the workforce. This would include an information pack setting outing the contractual requirements which will be provided to the contractors. Furthermore, regular meetings will be held with contractors to discuss HGV management and to address any issues associated with travel to / from the Order limits, as well as to relay information including any restrictions and requirements which should be followed.

7.4.9 Site Access Arrangements

The Solar Farm Site and Bulls Lodge Substation Site access layouts have been designed to accommodate HGVs as shown by the vehicle swept paths held in **Appendices F** and **G**. A hardstanding surface will be provided at the proposed accesses to ensure the weight of the HGVs can be accommodated. In addition, wheel washing facilities will be provided within the main construction compound for the Solar Farm Site and within the construction compound for the Bulls Lodge Substation Site to prevent mud from being trafficked onto the highway. A north-south construction route will be provided through the Solar Farm Site, to allow vehicles to access all areas of the Solar Farm Site via the single point of access on Waltham Road.

Vegetation clearance will be carried out at the proposed site access on Waltham Road (visibility splays of 125m), the two crossing points on Noakes Lane (visibility splays of 90m) and the proposed Bulls Lodge Substation access from the private road (visibility splays of 90m) in order to achieve appropriate levels of visibility at these locations as agreed with ECC Highways.

7.4.10 Abnormal Loads

At this stage, there are expected to be three abnormal loads associated with Longfield substation and two abnormal loads associated with Bulls Lodge Substation. The abnormal load deliveries will be associated with substation components such as the transformers, as well as the cable drums associated with the Grid Connection Route. A specialised haulage service will be employed to allow these components to be transported with the necessary escort, permits and traffic management, with the contractor consulting the relevant highways authorities to ensure the correct permits are obtained. The police will also be given advanced notification under the Road Vehicle Authorisation of Special Types Order 2003.

An Abnormal Load Route Survey has been prepared to review the suitability of two potential delivery routes for accommodating AILs to the Solar Farm Site. The two assessed routes comprise 1) the agreed HGV routing strategy

via the A12(T), RDR, A130, Wheelers Hill and Cranham Road, and 2) an alternative route via the existing section of the A130 to the north of Springfield instead of the RDR. The assessment has been based on a candidate transformer and a girder frame trailer to provide a worst-case assessment. The abnormal load assessment demonstrates that both routes are expected to be able to accommodate AILs subject to a number of recommendations e.g. vegetation clearance, relocating street furniture and providing a load bearing surface. The proposed recommendations can all be carried out within the limits of road adoption i.e. are not reliant on third party land. Further details of the assessment methodology and findings are contained within the Abnormal Load Route Survey which is held in **Appendix M**.

As per the agreed HGV routing strategy, the route via the RDR is the preferred route in terms of the routing of abnormal loads. It is understood that the new bridge over the railway line and A12(T) northbound on-slip has been designed to accommodate a single locomotive pulling a STGO Category 3 load (maximum gross weight of 150 tonnes, maximum basic axle load of 16.5 tonnes, gross weight of the vehicle train not exceeding 196 tonnes). Therefore, this bridge is expected to be able to accommodate the abnormal load associated with the transformer on the basis that this will be no larger than a STGO Category 3 vehicle.

As set out within **Section 7.2.1**, carriageway widening will be carried out along Wheelers Hill, Cranham Road and Waltham Road to accommodate HGVs travelling to/ from the Solar Farm Site. No carriageway widening is expected to be required on the private road to/ from Bulls Lodge Substation to accommodate HGVs travelling to/ from the substation as the existing carriageway conditions are deemed to be appropriate (the private road was previously upgraded to accommodate the works which were carried out when the substation was originally constructed). The 6m wide construction track within the Solar Farm Site is expected to accommodate all trips associated with the construction phase of the Scheme. Further details related to the abnormal loads will be included within the Detailed CTMPs for the Solar Farm Site and the Bulls Lodge Substation Site.

7.4.11 Protected Lanes

Construction vehicles will avoid the use of Protected Lanes with the exception of 'one-off' emergency access if required. Should it be necessary, access for emergency vehicles will also be achievable via several alternative existing access points (e.g. should the proposed site access for the Solar Farm Site become blocked or unavailable). This includes existing access points on Waltham Road, Boreham Road to the west of the Solar Farm Site and Terling Hall Road to the east. For Bulls Lodge Substation, should there be any issues with one of the proposed access points then it will be possible to utilise the alternative access point to gain access.

The contactor will discourage the construction workers from using Protected Lanes when travelling to/ from the site. A figure clearly identifying the locations of the Protected Lanes and how these relate to the site is held within **Appendix C**.

7.4.12 Pedestrians and Cyclists

Further to the above, the following measures have been included as embedded mitigation within the ES and will be delivered to minimise the traffic impacts of the Scheme on pedestrians and cyclists during the construction and decommissioning phases. The measures will be secured through the DCO, primarily by the Framework CTMP and Outline PRoW MP (presented in Appendix 13C [APP-095]), as well as via the Outline Construction Environmental Plan or the Decommissioning Strategy for the decommissioning phase. The measures include:

- Maintaining access to/ along PRoW during the construction phase, including minimum legal widths for PRoW users;
- Providing temporary PRoW diversion routes where necessary e.g. when the Grid Connection Route is installed, to avoid any PRoW closures. Each diversion will be clearly marked out, along with appropriate signage at either end of the diversion. The diversion routes will be agreed with the relevant local authority prior to construction;
- Providing sufficient protection/ separation between existing PRoW and the proposed construction route where necessary;
- Managing areas where the internal construction route crosses any existing PRoW (where these are unable to be diverted), by maximising visibility between construction vehicles and other users (pedestrians and cyclists), implementing traffic management e.g. advanced signage to advise other users of the works, as well as manned controls at each crossing point (marshals / banksmen), with a default priority that construction traffic will give-way to other users. This includes several PRoW crossing points (see the Outline PRoW MP presented in Appendix 13C [APP-095]);

- Providing sufficient cycle parking spaces within the Order limits to encourage construction staff to travel by bicycle where viable (50 cycle parking spaces to be provided); and
- Developing a communications strategy including regular meetings with contractors to review and address any issues associated with walking or cycling to / from the Order limits, as well as to relay information including any restrictions and requirements which should be followed.

It should be noted that all pedestrian and cycle routes will be maintained and remain unobstructed at all times when in use, to ensure the continued safe passage of the public including when using the PRoW through the Order limits and at crossing points. Further details are set out within the Outline PRoW MP presented in Appendix 13C [APP-095].

7.5 Staff Vehicle Measures and Controls

Staff movements will be managed through the implementation of the following measures:

- Limited car parking;
- Car sharing;
- Staff routing;
- Staff arrival and departure times;
- Parking strategy;
- Shuttle service; and
- Chelmer Valley Park & Ride (if necessary).

7.5.1 Limited Car Parking

The proposed car park for the Solar Farm Site will be situated within the main construction compound accessed via the proposed site access on Waltham Road. The capacity of the car park is set to be limited to 150 vehicles, to accommodate the expected parking demand of construction staff within the Solar Farm Site during the peak period, with additional parking available for shuttle buses. The proposed layout of the main construction compound is shown in **Appendix I**.

A total of 50 parking spaces will be provided within the construction compound for the Bulls Lodge Substation for construction workers. The proposed layout of the construction compound for Bulls Lodge Substation is shown in **Appendix G**.

7.5.2 Car Sharing

To reduce the potential impact of vehicles associated with the local staff during the construction period, the Applicant will implement measures to encourage car sharing to reduce the number of vehicles travelling to/ from the Order limits each day. The benefits of car sharing will be promoted to encourage multi-occupancy vehicle use, such as reduced fuel costs and ease of parking with guaranteed spaces for those car sharing within the compounds. A Car Share Scheme will be implemented to match potential sharers and to help staff identify any colleagues who could potentially be collected along their route to/ from the Order limits. It should be noted that parking will be limited to 150 spaces at the Solar Farm Site and 50 spaces for the Bulls Lodge Substation Site, to encourage staff to travel together.

For the Solar Farm Site, a minimum occupancy rate of 1.5 persons per vehicle for local staff (an assumption adopted within the TA) is expected; however, the aspiration is to achieve a higher average occupancy level to further reduce the impact of the development on the local network and the SRN.

For Bulls Lodge Substation, all staff are expected to be sourced locally and there is expected to be a maximum of 26 construction worker vehicles per day. This allows for limited car sharing amongst the 33 construction workers equivalent to 1.2 occupants per vehicle i.e. given there will be fewer staff and therefore fewer opportunities to car share than for the Solar Farm Site.

7.5.3 Staff Routing

To minimise additional vehicle trips on local roads, construction staff will be directed to take the most direct route to the Order limits by using the SRN where appropriate e.g. the A12(T) and the RDR.

7.5.4 Staff Arrival and Departure Times

The construction working hours on the Solar Farm Site will run from 07:00 to 19:00 Monday to Saturday, generally in a single 12 hour shift. Construction working hours on the Bulls Lodge Substation Extension will run from 07:00 to 19:00 Monday to Saturday with the exception of overhead line works at Bulls Lodge Substation Extension which will run from 07:00 to 19:00 Monday to Sunday.

Construction working hours will be planned carefully with the aim that they do not need to start later than 08:00 or finish earlier than 18:00, to avoid workers commuting to the Site during the road network peak hours.

The Transport Assessment has considered a worse scenario of a possible shorter winter time working day between 08:00 to 18:00, to provide a robust assessment of potential impacts should worker movements coincide with the peak hours on the existing road network for example.

The working hours of staff assessed in the TA to provide a robust assessment are set out below in **Table 11**. The timing of HGV arrivals and departures, with any restrictions on movements, is presented in Section 7.4.6.

Table 11: Working Hours assessed in the Transport Assessment

Type	Working Hours
Civil works/ structures	Summer 12-hour shift (07:00-19:00) Winter 10-hour shift (08:00-18:00)
Welfare & compound, panels, electrical works, CCTV, internal substations, site management and general site staff	Early 8-hour shift (08:00-16:00)
	Late 8-hour shift (09:00-17:00)
Other	Ad hoc (staggered)

The network peak hours for the local highway network are 08:00-09:00 and 17:00-18:00 (see the TA for further details). Construction workers will be expected to arrive in the hour before the start of their shift and to depart in the hour after the end of their shift. Based on the above, only circa. 20% of staff would be expected to travel at these times (those working 09:00-17:00), with the vast majority avoiding the network peak hours. The proposed working hours are therefore designed to minimise additional trips at the busiest times in terms of trips on the surrounding highway network.

In the instance that any on-site works are conducted outside of the above working hours, then these will comply with the restrictions stated in the Outline Construction Environmental Management Plan (OCEMP) and any other restrictions agreed with the relevant planning/ highway authorities.

7.5.5 Shuttle Service

Non-Local Staff

As identified in **Section 5**, circa. 55% of staff are likely to be sourced locally whereas the remainder of staff (45%) would likely travel from further afield and stay within local worker accommodation during the week. The locations for local worker accommodation have yet to be determined, and it has therefore been assumed that shuttle services would travel via the A130 and A131 towards Braintree to the north (30%), the A130 towards Chelmsford to the south (40%), or alternatively via the B1137 Main Road towards Boreham (20%) or Hatfield Peverel (10%) to the east.

The following assumptions have been adopted for the shuttle service which will be provided for non-local staff travelling to/ from the Solar Farm Site:

- The shuttle services will travel between the Solar Farm Site and local worker accommodation to transfer all non-local staff to and from the Solar Farm Site each day;
- The shuttle services will depart from the Solar Farm Site to pick-up construction workers from local worker accommodation and return to the Solar Farm Site within the hour prior to the start of a shift;
- The shuttle services will depart from the Solar Farm Site to drop-off construction workers back at their local worker accommodation within the hour after the completion of a shift (before returning back to the Solar Farm Site);

- The shuttle services will each be expected to have an average occupancy of 25 people when transferring construction workers;
- A shuttle service round-trip (e.g. from the Solar Farm Site to local worker accommodation in Chelmsford or Braintree for example, and then back to the Solar Farm Site) is expected to take around 30-45 minutes on average (it has been assumed that a shuttle service would both depart and return during the same hour); and
- A total of six shuttle buses will be available to cater for peak demand.

The above is designed to minimise vehicle trips on the surrounding highway network as far as possible.

Internal Movements

A shuttle service or minibus will be used to transport staff around the Solar Farm Site by making use of the internal routes to travel between the main compound and the secondary compounds. This will minimise trips within the Solar Farm Site and will also avoid trips on the surrounding highway network, given that the proposed site access on Waltham Road will allow all areas of the Solar Farm Site to be accessed.

7.5.6 Park & Ride

A meeting was held with ECC on 5 August 2021 to understand the potential viability of using the currently underutilised Chelmer Valley Park & Ride (CVPR) site for construction worker parking during the peak construction period of the Scheme.

The key purpose of the meeting was to, subject to viability, understand the number of spaces which could be made available, the potential arrangements for worker shuttle services and the mechanism for securing these arrangements.

The following key points were discussed/ confirmed during the meeting:

- ECC confirmed that it would be possible to utilise 200 spaces at the CVPR if required during the construction and decommissioning phase. There is an overall capacity of circa. 1,000 spaces at CVPR which was only around 50% utilised prior to COVID-19 pandemic/ restrictions;
- The spaces could be utilised at a cost of £3.60 per space per day, and a discount would potentially be available for utilising a certain number of spaces (e.g. 50+ spaces) for a certain period (e.g. one month);
- The arrangements could be flexible by utilising a greater number of spaces during the peak construction period and fewer spaces during quieter periods;
- ECC has their own fleet of minibuses and could provide a service to transport workers between the CVPR and the Solar Farm Site if required. Alternatively, a private shuttle service could be operated by the Applicant which would be easier to control in terms of service frequency and flexibility;
- The proposed working hours at the Scheme during the construction phase align with the opening hours of the CVPR (open from 06:30 until 20:00 during the week). It is understood that the CVPR opening hours could be extended to support the Scheme if required;
- The use of the CVPR would offer a sustainable travel option for construction workers arriving to Chelmsford by rail, who could then use an existing P&R service to travel to/ from the CVPR and then the Order limits via private shuttle;
- The use of the CVPR would reduce construction worker vehicle trips on local roads and is easily accessible with good connections to the SRN; and
- The use of parking at the CVPR would reduce the number of parking spaces required on the Solar Farm Site for construction workers, albeit a certain number of spaces would nonetheless need to be provided for operational reasons.

As identified within **Table 4**, a total of 143 construction worker vehicles are expected to travel to/ from the Solar Farm Site during the peak construction phase. There is therefore the potential to reduce construction worker vehicle trips by around 70% on the local highway network in the instance that 100 spaces are utilised within the P&R. This would have particular benefits at the B1137 Main Road/ Waltham Road junction and along Wheelers Hill, Cranham Road and Waltham Road. The Scheme (construction phase) would only be expected to result in an additional five

vehicular trips passing through the B1137 Main Road / Waltham Road junction during each of the network peak hours, with this mitigation in place.

In view of the above, the CVPR site will be utilised for construction worker parking (with a supporting shuttle service to/ from the Solar Farm Site) during the peak construction (and decommissioning) periods of the Scheme, to reduce construction vehicle worker trips on the surrounding network including at the B1137 Main Road/ Waltham Road junction. The assessment carried out within the TA has nonetheless been based on all trips travelling to/ from the Order limits during the peak construction phase as a worst-case i.e. not using the CVPR site.

7.6 Management Structure

The overall management and implementation of the CTMP will be the responsibility of the Applicant. A Transport Co-ordinator will be appointed by the Applicant to implement, manage and develop the CTMP.

The Transport Co-ordinator will:

- Implement and monitor the CTMP to identify successful measures and areas for improvement;
- Promote the CTMP to all staff and contractors travelling to and from the Order limits to ensure compliance with its contents;
- Liaise as appropriate with local transport and traffic groups, local planning authorities, local highway authorities and National Highways;
- Monitor data relating to HGV routes, timing of HGV arrivals and departures and compliance with the DMS/ TMMS;
- Manage the Car Share Scheme;
- Manage the shuttle service between local worker accommodation and the Solar Farm Site (as well as to/ from the CVPR); and
- Discuss any issues with relevant parties and identify any amendments to the CTMP (including measures) to ensure compliance is maintained.

7.7 Monitoring and Review

7.7.1 HGVs

The CTMP will be monitored and revised to ensure that contractors are complying with the document. This process will be led by the Transport Co-ordinator.

The Transport Co-ordinator will monitor data relating to HGV routes, timing of HGV arrivals and departures and compliance with the DMS/ TMMS. The results of the data monitoring will be reported to identify any issues which need to be resolved and any additional measures which should be implemented to these from arising again. The reports will be shared with the Applicant, local authority and the highway authorities i.e. ECC Highways and National Highways.

7.7.2 Staff Vehicles

A Car Share Scheme will be implemented and managed by the Transport Co-ordinator, to match potential sharers and to help staff identify any colleagues who could potentially be collected along their route to/ from the Solar Farm Site. The car share database will also be available to staff that have signed up, to allow them to identify their own potential matches. Car sharing staff will be allocated spaces within the main construction compound so that they are guaranteed a parking space upon arrival.

Construction staff vehicles will be monitored when entering and exiting the Solar Farm Site access on Waltham Road to determine whether the majority of staff are travelling via Wheelers Hill and Cranham Road and Waltham Road to the north, or alternatively via B1137 Main Road and Waltham Road to the south. This monitoring will determine whether any additional measures (such as utilising additional parking within the CVPR) should be explored to minimise staff trips on the local highway network to the south.

Construction staff will be directed to available parking bays upon arrival to assist them to park in a timely manner. Given the working patterns identified, it is expected that the car parks for the Solar Farm Site and Bulls Lodge Substation Site will be managed between 06:30-09:00 in the summer and between 07:30-09:00 in the winter, when

the majority of staff are expected to arrive. Appropriate signage will be provided to clearly identify the entry and exit points to the car parks. It should be noted that the usage of the car parks will be monitored and that the potential to utilise additional parking within the CVPR will be explored during peak construction if required.

7.7.3 Additional Monitoring

The following monitoring will also be carried out during the construction phase of the Scheme, and secured as part of this Framework CTMP:

- The collision record of Waltham Road will be monitored within the vicinity of the Solar Farm Site access including a 250m stretch to the southeast of the access and the 125m section to the northwest of the access up to the junction with Cranham Road;
- Construction vehicles (HGVs) will be monitored to ensure HGV drivers are adhering to the agreed routing strategy (see **Appendix E**), with all HGVs to turn left in and right out of the proposed site access on Waltham Road;
- Road safety will be monitored within the Order limits including at the PRoW crossing points, temporary PRoW diversion points, and at the Noakes Lane crossing points; and
- The TTM on Waltham Road will be monitored when this is required for the installation of the Grid Connection Route.

8. Compliance and Enforcement

8.1 Introduction

This section of the Framework CTMP provides a summary of the mechanisms that will be implemented to maximise compliance with the CTMP.

8.2 Best Practice

The Applicant will use internal management procedures to maximise compliance and its enforcement with the requirements of the Framework CTMP, including:

- Contractor kick-off meetings: contractors will be reminded of the Applicant's standards and expectations as set out in contract documentation.
- Site induction: drivers will be briefed on the aims and objectives of the CTMP, including the booking system, designated routes and expected driver behaviour. A copy of the CTMP will be provided to each contractor to provide details of how the site will be managed as well as the rules and regulations.
- Reporting: incidences of non-compliance will be investigated within the CTMP. Reports from each incident will be raised and shared with the relevant contractor. The CTMP will be updated where necessary to resolve any ongoing issues.

8.3 Contractual Conditions

Each contractor will be provided with a contract setting out their contractual requirements in terms of compliance with the Framework CTMP upon appointment. A copy of the CTMP will be provided along with details of the agreed routing strategy for HGVs to ensure that this route is followed.

8.4 Information Packs and Communications

Information packs will be provided to all contractors once they have been confirmed. The information pack will form part of the agreement between the Applicant and the designated contractors. The information pack will include details of the following:

- Code of Good Practice;
- Details of the Transport Co-ordinator;
- Delivery routing restrictions;
- Worker routing;
- Emergency procedures;
- Non-compliance guidance; and
- Complaint procedures.

8.5 Enforcement

The Applicant will take all reasonable steps to avoid any breach of the Framework CTMP through the implementation of the management measures. However, should any breaches occur, then enforcement procedures will be followed:

- The Transport Co-ordinator will notify the Applicant of any breaches of the Framework CTMP arrangements as and when they occur.
- The Applicant will issue a warning letter to the relevant contractor outlining what action would be taken in the event of any further non-compliance (in general terms).
- The Applicant will report the details of the response to the Transport Co-ordinator as part of the monitoring report. The monitoring report will be made available to the relevant local planning authorities and relevant highway authorities at their request to ensure compliance and to demonstrate that action is being taken where necessary.

Further detail on the sanctions which could be applied will be included within the detailed CTMPs for the Solar Farm Site and the Bulls Lodge Substation Site.

8.6 Delivery of Highway Works

The parties agree the principle of entering into a highways agreement with Essex County Council, as the local highway authority, to establish a framework pursuant to which the undertaker and ECC will manage the approval of details of street works authorised by the Order, and supervision, inspection, sign off and maintenance of those works.

9. Conclusion

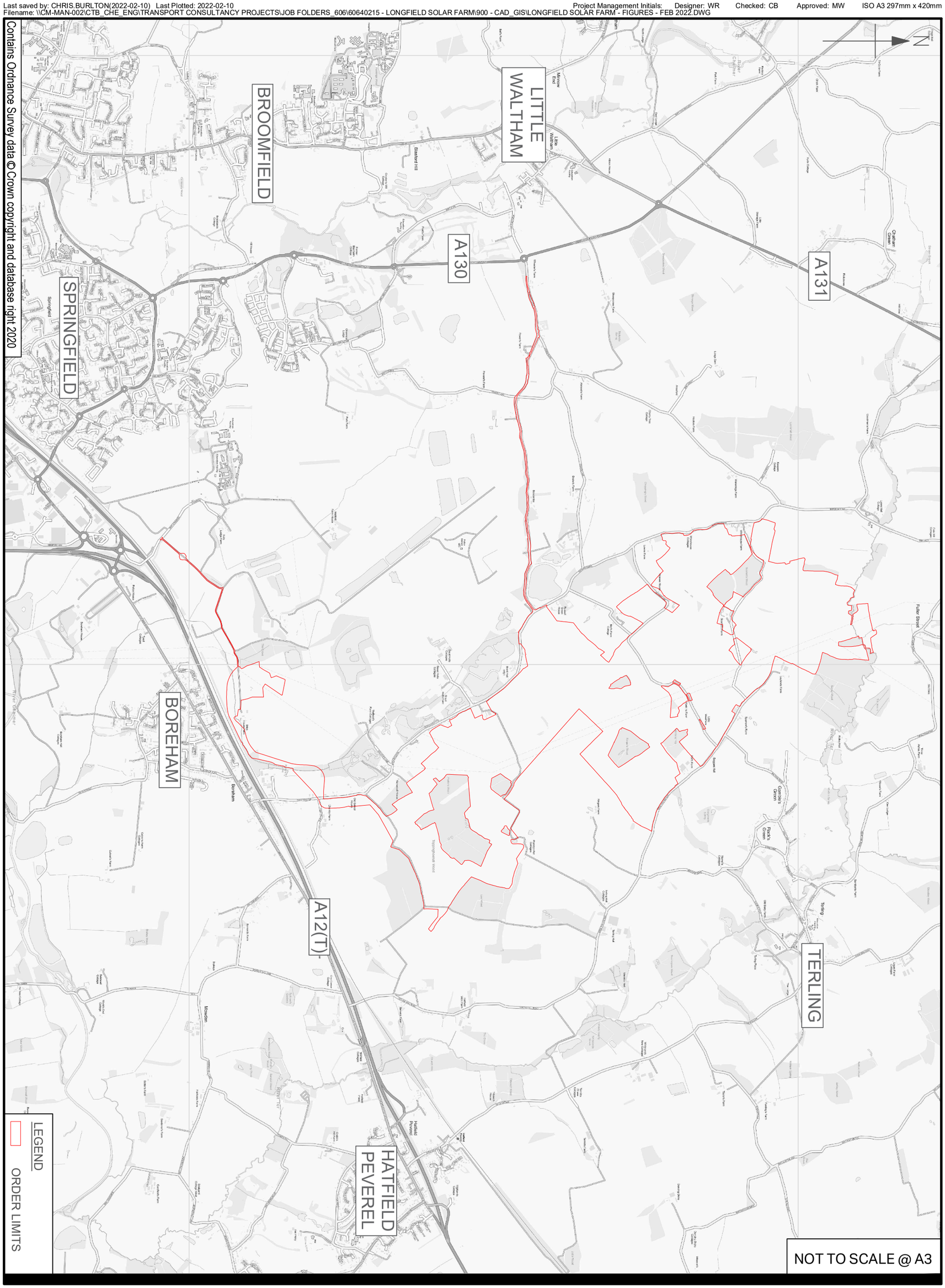
The purpose of this Framework CTMP is to focus on the management of construction traffic along the local highway network within the vicinity of the Order limits during the construction period of the works, in order to limit any potential disruptions and implications on the wider transport network as well as for the existing road users.

This Framework CTMP sets out the proposals to manage construction traffic and staff vehicles during the construction of the Scheme. It identifies the management of freight traffic i.e. Heavy Goods Vehicles (HGVs), as well as staff vehicles.

It should be noted that as this is a framework document, certain details will remain to be developed as the Scheme progresses into detailed design. The full details of all measures may not be available until after consent for the Scheme has been granted and will be provided within the full CTMPs for the Solar Farm Site and the Bulls Lodge Substation Site as necessary.

Appendix A – Site Location Plan

Last saved by: CHRIS.BURLTON(2022-02-10) Last Plotted: 2022-02-10
Filename: \\CM-MAN-002\CTB_CHE_ENG\TRANSPORT CONSULTANCY PROJECTS\JOB FOLDERS_606\60640215 - LONGFIELD SOLAR FARM\900 - CAD_GIS\LONGFIELD SOLAR FARM - FIGURES - FEB 2022.DWG
Project Management Initials: Designer: WR Checked: CB Approved: MW ISO A3 297mm x 420mm



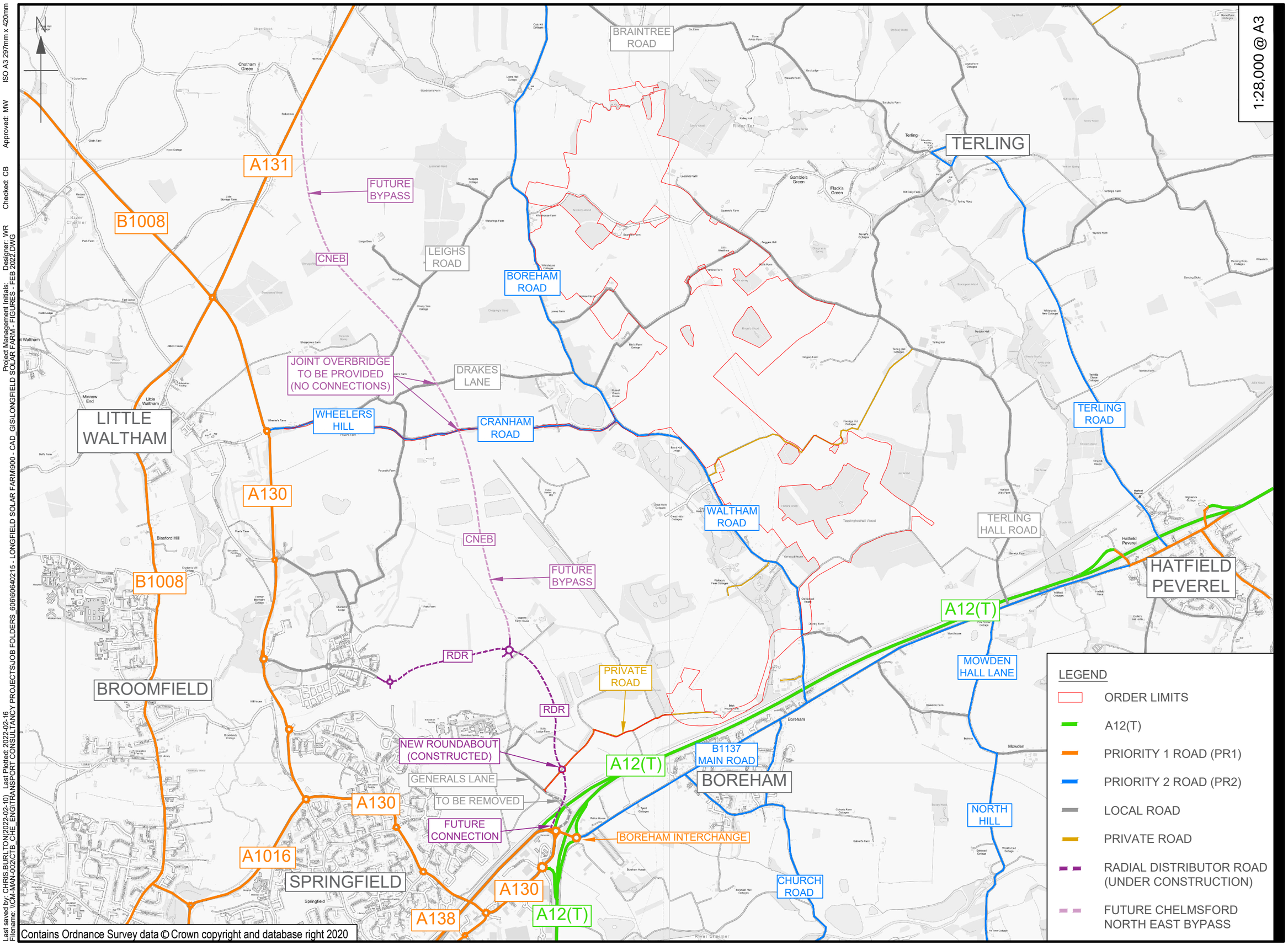
Longfield Solar Farm
Site Location Plan
APFP Regulation: 5(2)(a)
Project No.: 60640215 Date: February 2022 PINS Ref: EN010118

Note: Drawing is not to scale as this is designed to show information on a single sheet for ease of reference

AECOM

60640215-1013-TRA-001

Appendix B – Surrounding Highway Network



Contains Ordnance Survey data © Crown copyright and database right 2020

1:28,000 @ A3

Note: Drawing scale is designed to show information on a single sheet for ease of reference

AECOM

60640215-1013-TRA-002

Longfield Solar Farm
Environmental Statement - Surrounding Highway Network (Including Future Improvements)
APFP Regulation: 5(2)(a)
Project No.: 60640215 Date: February 2022 PINS Ref: EN010118
Figure 13-1

Project Management Initials: Designer: WR Checked: CB Approved: MW ISO A3 297mm x 420mm

Last saved by: CHRIS.BURLTON(2022-02-10) Last Plotted: 2022-02-16
Filename: \\CM-MAN-002\CTB_CHE_ENG\TRANSPORT CONSULTANCY PROJECTS\JOB FOLDERS_60616\60640215 - LONGFIELD SOLAR FARM\900 - CAD_GIS\LONGFIELD SOLAR FARM - FIGURES - FEB 2022.DWG

Appendix C – Protected Lanes

Last saved by: CHRIS.BURLTON(2022-02-10) Last Plotted: 2022-02-10
Filename: \\CM-MAN-002\CTB_CHE_ENG\TRANSPORT CONSULTANCY PROJECTS\JOB FOLDERS_606\60640215 - LONGFIELD SOLAR FARM\900 - CAD_GIS\LONGFIELD SOLAR FARM - FIGURES - FEB 2022.DWG
Project Management Initials: Designer: WR Checked: CB Approved: MW ISO A3 297mm x 420mm

Contains Ordnance Survey data © Crown copyright and database right 2020

N

BOREHAM ROAD

BOREHAM ROAD

NOAKES LANE

BIRDS FARM LANE

NOAKES FARM ROAD

BRAINTREE ROAD

TERLING HALL ROAD

LEGEND

ORDER LIMITS

PROTECTED LANE

NOT TO SCALE @ A3

Longfield Solar Farm
Protected Lanes
APFP Regulation: 5(2)(a)
Project No.: 60640215 Date: February 2022 PINS Ref: EN010118

Note: Drawing is not to scale as this is designed to show information on a single sheet for ease of reference

AECOM

60640215-1013-TRA-003

Appendix D – Proposed Site Access Locations

Last saved by: CHRIS.BURLTON(2022-02-10) Last Plotted: 2022-02-10
Filename: \\CM-MAN-002\CTB_CHE_ENG\TRANSPORT CONSULTANCY PROJECTS\JOB FOLDERS_606\60640215 - LONGFIELD SOLAR FARM\900 - CAD_GIS\LONGFIELD SOLAR FARM - FIGURES - FEB 2022.DWG
Project Management Initials: Designer: WR Checked: CB Approved: MW ISO A3 297mm x 420mm

Contains Ordnance Survey data © Crown copyright and database right 2020

LEGEND

ORDER LIMITS

INDICATIVE SOLAR FARM SITE ACCESS

INDICATIVE BULLS LODGE SUBSTATION ACCESSES

NOT TO SCALE @ A3

Longfield Solar Farm
Proposed Site Access Locations (Construction Phase)
APFP Regulation: 5(2)(a)
Project No.: 60640215 Date: February 2022 PINS Ref: EN010118

Note: Drawing is not to scale as this is designed to show information on a single sheet for ease of reference

AECOM

60640215-1013-TRA-006

Appendix E – HGV Routing Plan

Last saved by: CHRIS.BURLTON(2022-02-10) Last Plotted: 2022-02-16
Filename: \\CM-MAN-002\CTB_CHE_ENG\TRANSPORT CONSULTANCY PROJECTS\JOB FOLDERS_606\60640215 - LONGFIELD SOLAR FARM\900 - CAD_GIS\LONGFIELD SOLAR FARM - FIGURES - FEB 2022.DWG
Project Management Initials: Designer: WR Checked: CB Approved: MW ISO A3 297mm x 420mm

Contains Ordnance Survey data © Crown copyright and database right 2020

N

A130
A131
WHEELERS HILL
JOINT OVERBRIDGE TO BE PROVIDED (NO CONNECTIONS)
CNEB
FUTURE BYPASS
RDR
CRANHAM ROAD
A12(T)
WALTHAM ROAD
PRIVATE ROAD
CABLE ROUTE ACCESS (WEST)
BOREHAM BROOK
CABLE ROUTE ACCESS (EAST)
WALTHAM ROAD CROSSING POINT

LEGEND
- ORDER LIMITS
- INDICATIVE SOLAR FARM SITE ACCESS
- INDICATIVE BULLS LODGE SUBSTATION ACCESSES
- INDICATIVE HGV ROUTING
- INDICATIVE CABLE ROUTE ACCESS
- FUTURE CHELMSFORD NORTH EAST BYPASS

1:27,500 @ A3

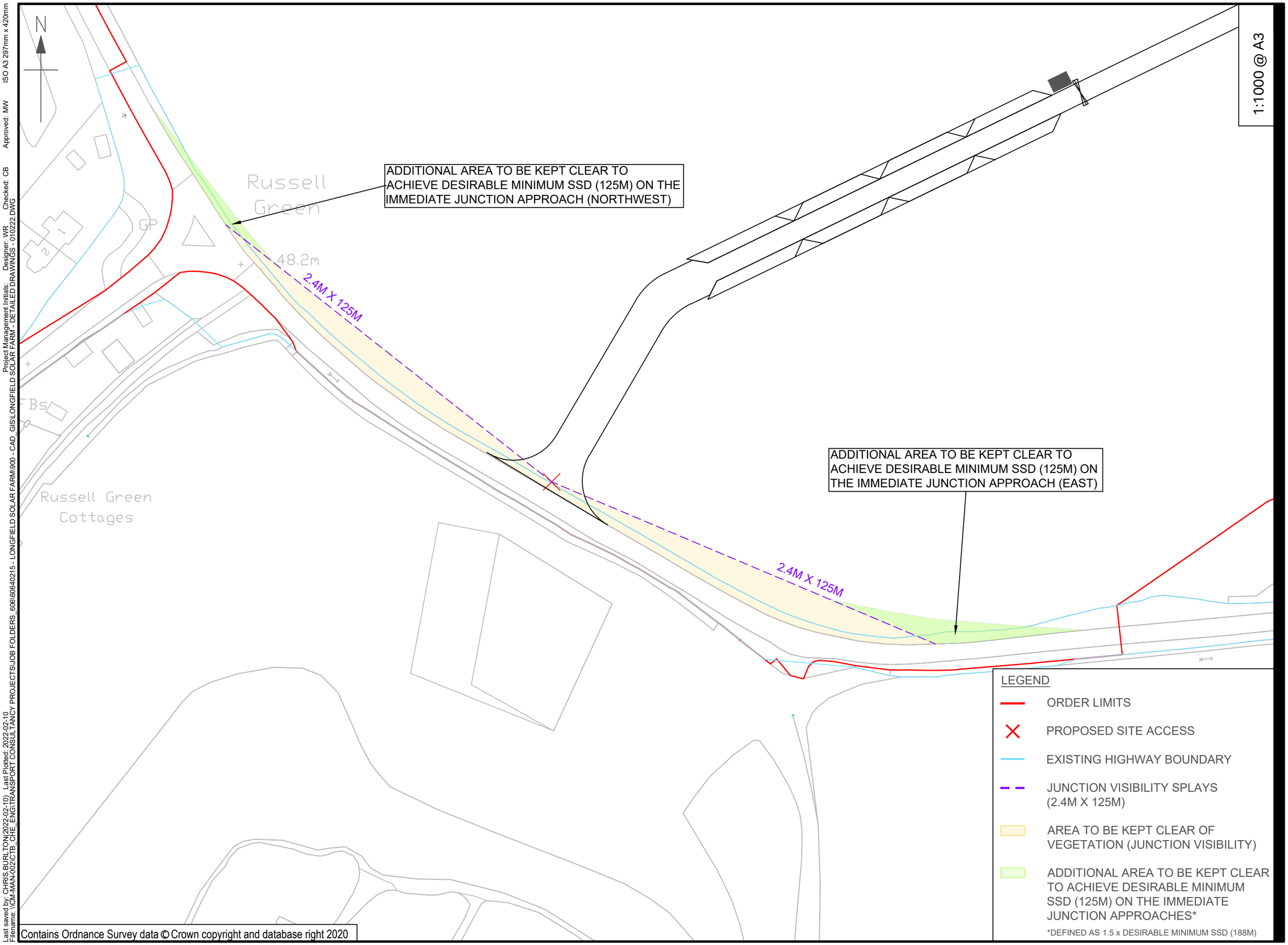
Longfield Solar Farm
Environmental Statement - Agreed Routing Strategy (HGVs)
APFP Regulation: 5(2)(a)
Project No.: 60640215 Date: February 2022 PINS Ref: EN010118
Figure 13-3

Note: Drawing scale is designed to show information on a single sheet for ease of reference

AECOM

60640215-1013-TRA-007

Appendix F1 – Proposed Site Access Layout, Visibility Splays and Swept Paths



Contains Ordnance Survey data © Crown copyright and database right 2020

Last saved by: CHRIS.BURLTON(2022-02-10) Last Plotted: 2022-02-10
Filename: \\CM-MAN-002\CTB_CHE_ENG\TRANSPORT CONSULTANCY PROJECTS\JOB FOLDERS_60616\60640215 - LONGFIELD SOLAR FARM\900 - CAD_GIS\LONGFIELD SOLAR FARM - DETAILED DRAWINGS - 010222.DWG

Project Management Initials: Designer: WR Checked: CB Approved: MW ISO A3 297mm x 420mm

1:1000 @ A3

AECOM

60640215-1013-TRA-050

Note: Drawing scale is designed to show all PRoW on a single sheet for ease of reference

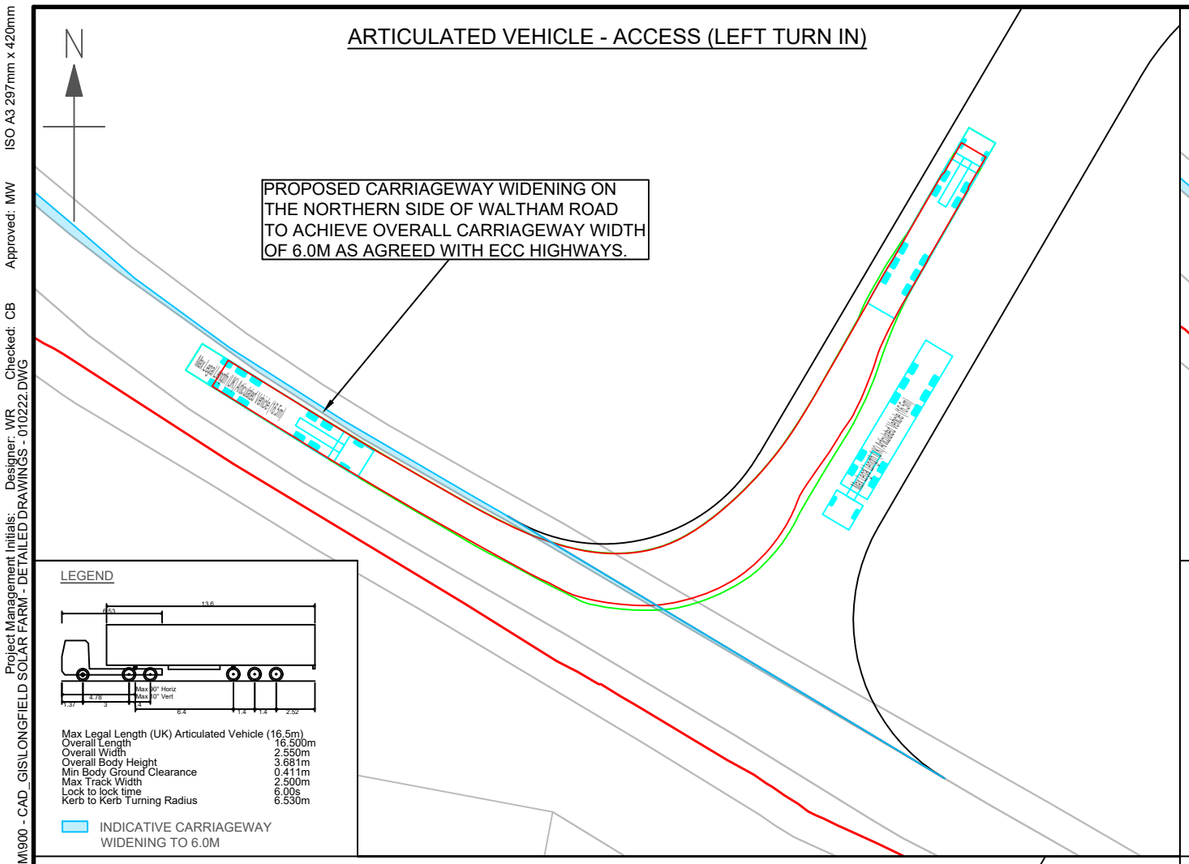
Longfield Solar Farm
Proposed Site Access and Visibility Splays
APFP Regulation: 5(2)(a)
Project No.: 60640215 Date: February 2022

PINS Ref: EN010118

Appendix F2 – Access Swept Paths

Project Management Initials: Designer: WR Checked: CB Approved: MW ISO A3 297mm x 420mm
Last saved by: CHRIS.BURLTON(2022-02-10) Last Plotted: 2022-02-10
Filename: \\CM-MAN-002\CTB_CHE_ENG\TRANSPORT CONSULTANCY PROJECTS\JOB FOLDERS_606\606840215 - LONGFIELD SOLAR FARM\900 - CAD_GIS\LONGFIELD SOLAR FARM - DETAILED DRAWINGS - 010222.DWG

ARTICULATED VEHICLE - ACCESS (LEFT TURN IN)



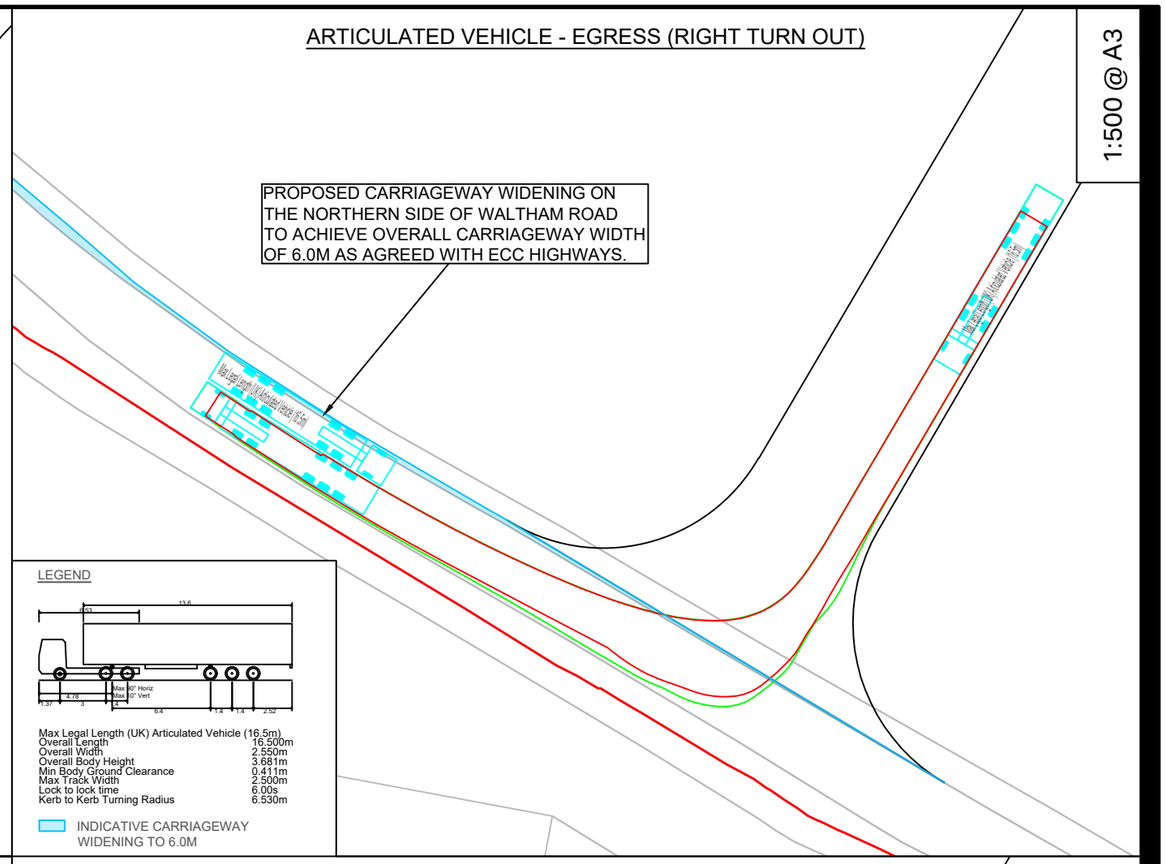
LEGEND

Max Legal Length (UK) Articulated Vehicle (16.5m)

Overall Length	16.500m
Overall Width	2.550m
Overall Body Height	3.681m
Min Body Ground Clearance	0.411m
Max Track Width	2.500m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	6.530m

INDICATIVE CARRIAGEWAY WIDENING TO 6.0M

ARTICULATED VEHICLE - EGRESS (RIGHT TURN OUT)



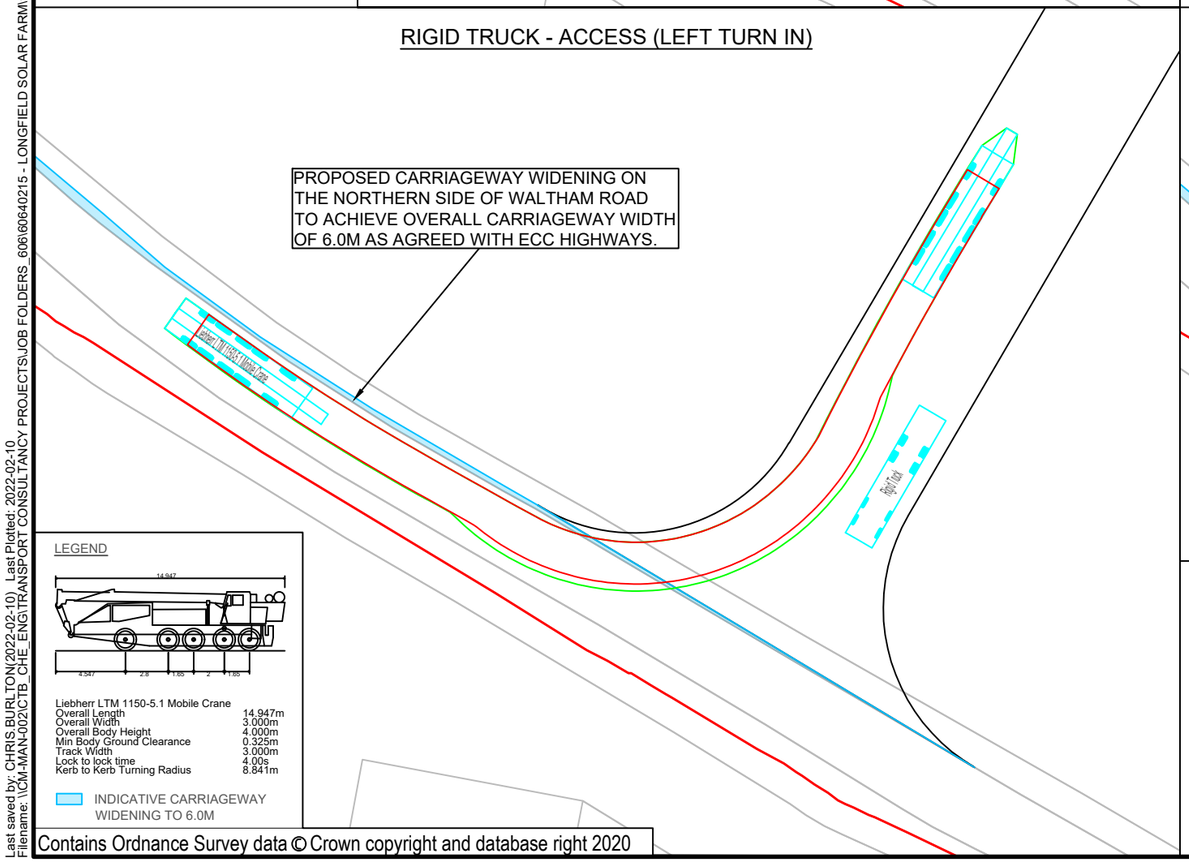
LEGEND

Max Legal Length (UK) Articulated Vehicle (16.5m)

Overall Length	16.500m
Overall Width	2.550m
Overall Body Height	3.681m
Min Body Ground Clearance	0.411m
Max Track Width	2.500m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	6.530m

INDICATIVE CARRIAGEWAY WIDENING TO 6.0M

RIGID TRUCK - ACCESS (LEFT TURN IN)



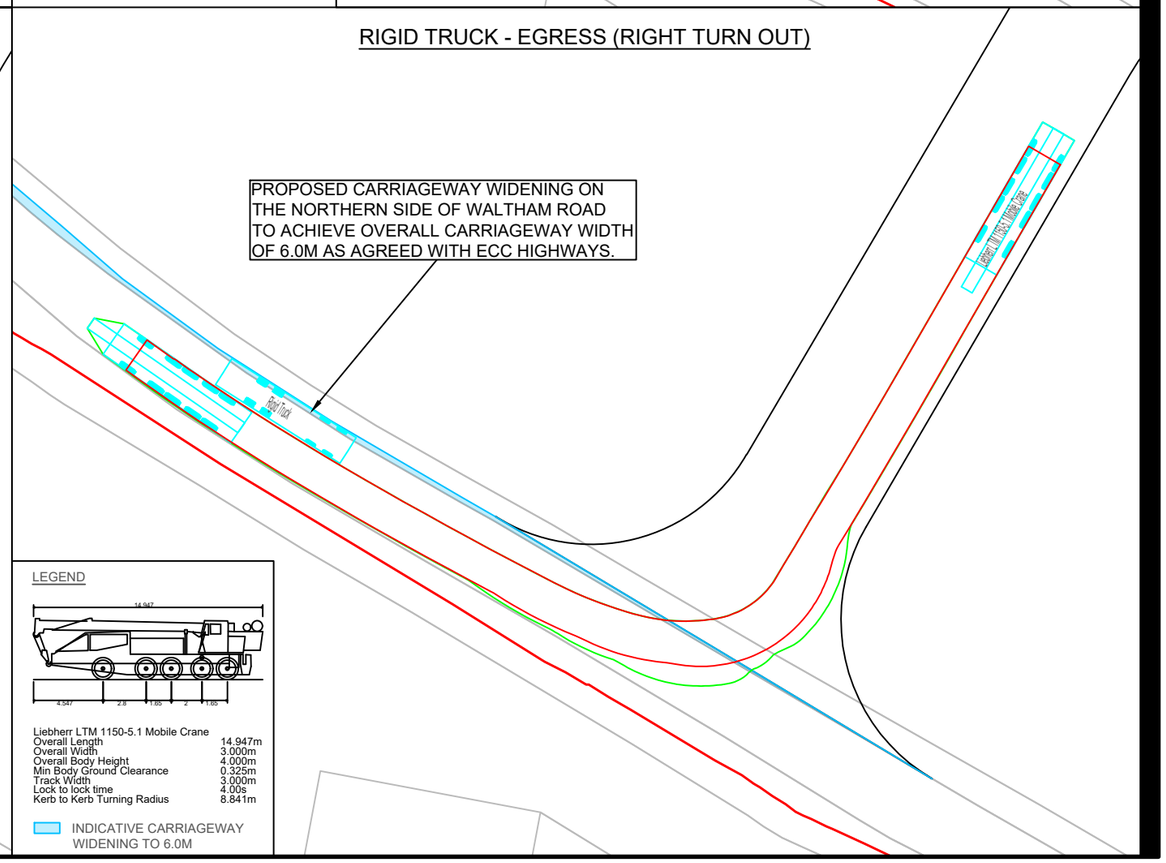
LEGEND

Liebherr LTM 1150-5.1 Mobile Crane

Overall Length	14.947m
Overall Width	3.000m
Overall Body Height	4.000m
Min Body Ground Clearance	0.325m
Track Width	3.000m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	8.841m

INDICATIVE CARRIAGEWAY WIDENING TO 6.0M

RIGID TRUCK - EGRESS (RIGHT TURN OUT)



LEGEND

Liebherr LTM 1150-5.1 Mobile Crane

Overall Length	14.947m
Overall Width	3.000m
Overall Body Height	4.000m
Min Body Ground Clearance	0.325m
Track Width	3.000m
Lock to lock time	4.00s
Kerb to Kerb Turning Radius	8.841m

INDICATIVE CARRIAGEWAY WIDENING TO 6.0M

Contains Ordnance Survey data © Crown copyright and database right 2020

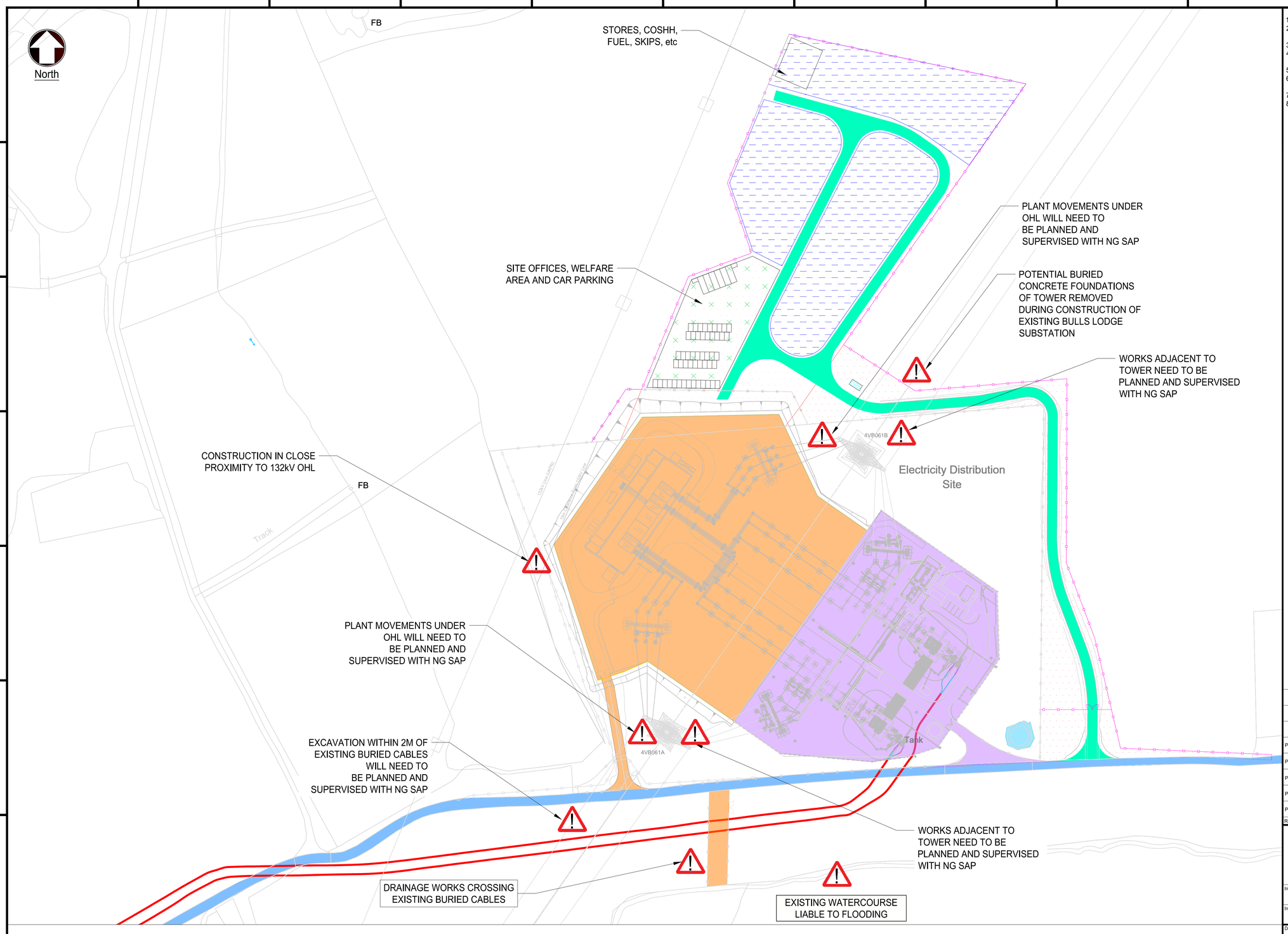
1:500 @ A3

AECOM

60640215-1013-TRA-055

Longfield Solar Farm
Proposed Site Access - Vehicle Swept Paths
APFP Regulation: 5(2)(a)
Project No.: 60640215 Date: February 2022 PINS Ref: EN010118

Appendix G1 – Bulls Lodge Substation Extension CDM Layout



GENERAL ARRANGEMENT - PLAN

SCALE @ A1: 1:1000

1:1000 0 50m 100m

1. Do not scale from this drawing.
2. Information on this drawing is based on Ordinate Survey data dated back to 20/10/21 from emapsite.
3. All dimensions are in metres unless otherwise stated.
4. This drawing is to be read in conjunction with all relevant documents and drawings.
5. No unauthorised disclosure, storage or copying.
6. All spatial coordinates relate to the Ordnance Survey, British National Grid (OSGB36).
7. All levels are in metres and relate to AOD (Ordnance Survey, Newlyn).
8. Indicative CDM layout. Contractor to confirm temporary construction areas layout at detail design stage.

Key to Symbols:

- Existing NG substation
- Existing NG retention pond
- Public road
- Construction compound area
- New NG substation Extension and Access Road
- Access road - Temporary
- Site compound - parking and welfare
- Security compound
- Storage and laydown areas (incl. soil storage)
- Under ground HV cables
- Temporary fence

SHE BOX (CONTAINING SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION)

IN ADDITION TO THE HAZARDS AND RISKS NORMALLY ASSOCIATED WITH CONSTRUCTING, MAINTAINING AND DEMOLISHING THE STRUCTURES ON THIS DRAWING, THE FOLLOWING SIGNIFICANT RISK INFORMATION SHOULD BE TAKEN INTO ACCOUNT WHEN PLANNING AND CARRYING OUT CONSTRUCTION, MAINTENANCE AND DEMOLITION WORK.

CONSTRUCTION

- EXCAVATIONS MUST BE COMPLETED IN ACCORDANCE WITH HSG47.
- ANY UNDERGROUND SERVICES AND HAZARDS LOCATED DURING SUBSEQUENT CIVIL WORKS IN THE AREA SHOWN ON THIS DRAWING ARE TO BE ACCURATELY RECORDED.
- LOCATION OF NEW BURIED 400kV CABLES FROM LONGFIELD SOLAR TO BE CONFIRMED. INTERFACE TO BE CONSIDERED BY CONTRACTOR.

MAINTENANCE (INCLUDING CLEANING)

1. NO UNUSUAL RISKS OR HAZARDS.

DEMOLITION

1. NO UNUSUAL RISKS OR HAZARDS.

ALL WORKS SHALL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT.

SHESQ BOX

BELOW GROUND SERVICES INDICATED ARE TAKEN FORM THE REFERENCED DRAWINGS ONLY AND ARE TO BE CONFIRMED BY TRIAL PITTING AS A MINIMUM. ALL EXCAVATIONS AND REMOVALS ARE TO BE UNDERTAKEN IN STRICT ACCORDANCE WITH NATIONAL GRID SITE RULES AND PERMITS TO WORK AND ARE TO FOLLOW HSG47. RISK OF LAND CONTAMINATION IS ALSO PRESENT. REFERENCE SHOULD BE MADE TO THE RELEVANT RISK REGISTERS.

Rev	Description	Cre'd	Chk'd	App'd	Date
P05	Issued for DCO	JK	CB	CB	17/12/21
P04	Updated as per NG and Design Assurance comments	PP	ST	CB	24/11/21
P03	Updated as per NG and Design Assurance comments	JK	ST	CB	19/11/21
P02	Draft issue	JK	ST	CB	06/10/21
P01	Preliminary Issue	JK	CB	CB	09/09/21

nationalgrid

Investment No:	Project No:	Site:
100504	201083	Bulls Lodge

Investment Name: Longfield Solar Farm Connection

Document Title: Bulls Lodge Substation Extension CDM Layout

Created by:	Date:	Checked by:	Date:	Approved by:	Date:
J. Kensall	07/09/21	C. Bilsland	07/09/21	C. Bilsland	07/09/21

Development Eng:	Document Type:	Scale:	Format:	Sheet(s):	Rev:
S. Stoyanov	DWG	AS SHOWN	A1	1	P05

National Grid Document Number: PDD-100504-LAY-108

DCO Figure Number: TBC

FEED Document Number: 422215-MMD-00-XX-DR-C-0104

© Mott Macdonald
This document is issued for the party which commissioned it and for specific purposes connected with the captioned project only. It should not be relied upon by any other party or used for any other purpose.
We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties.
© Crown copyright and database rights 2021 Ordnance Survey 0100031673

Appendix G2.1 – Bulls Lodge Substation Extension West Access Road Visibility Splay

North

ACCESS ROAD:
DESIGN SPEED =
60KPH / 30 MPH STOPPING
SIGHT DISTANCE = 90m
(DESIRABLE MINIMUM)

VERGE OFFSET 1m FROM
VISIBILITY SPLAY FOR
MAINTENANCE PURPOSE

4VB061A

15.0m

2.4m

1:400 0 20m 40m

Notes:

1. Do not scale from this drawing
2. Information on this drawing is based on Ordinate Survey data dated back to 20/10/21 from emapsite.
3. All dimensions are in metres unless otherwise stated
4. This drawing is to be read in conjunction with all relevant documents and drawings
5. No unauthorised disclosure, storage or copying
6. All spatial coordinates relate to the Ordnance Survey, British National Grid (OSGB36)
7. All levels are in meters and relate to AOD (Ordnance Survey, Newlyn

Key to Symbols:

Visibility Splay

Rev	Description	Cre'd	Chk'd	App'd	Date
P03	Issued for DCO	JK	CB	CB	17/12/21
P02	Updated as per NG and Design Assurance comments	JK	ST	CB	19/11/21
P01	Preliminary Issue	JK	CB	CB	06/10/21

nationalgrid

Investment No:	Project No:	Site:
100504	201083	Bulls Lodge

Investment Name: Longfield Solar Farm Connection

Document Title:
Bulls Lodge Substation Extension
West Access Road
Visibility Splay

Created by:	Date:	Checked by:	Date:	Approved by:	Date:
J Kensall	06/10/21	C Bilsland	06/10/21	C Bilsland	06/10/21

Development Eng:	Document Type:	Scale:	Format:	Sheet(s):	Rev:
S. Stoyanov	DWG	AS SHOWN	A1	1	P03

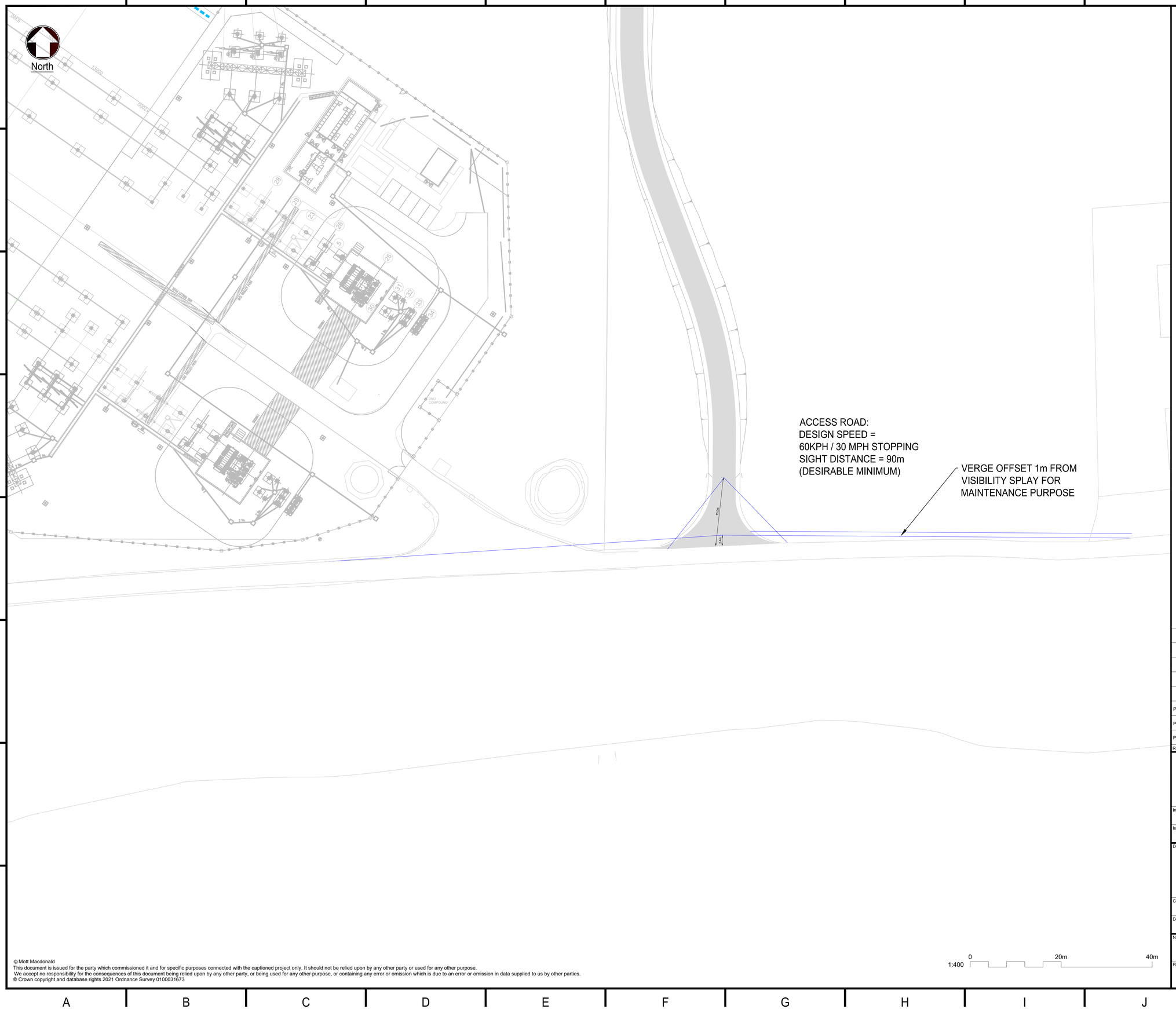
National Grid Document Number: PDD-100504-LAY-110

DCO Figure Number: TBC

FEED Document Number: 422215-MMD-00-XX-DR-C-0106

© Mott Macdonald
This document is issued for the party which commissioned it and for specific purposes connected with the captioned project only. It should not be relied upon by any other party or used for any other purpose.
We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties.
© Crown copyright and database rights 2021 Ordnance Survey 0100031673

Appendix G2.2 - Bulls Lodge Substation Extension Visibility Splays East Access Road



Notes:

1. Do not scale from this drawing
2. Information on this drawing is based on Ordinate Survey data dated back to 20/10/21 from emapsite.
3. All dimensions are in metres unless otherwise stated
4. This drawing is to be read in conjunction with all relevant documents and drawings
5. No unauthorised disclosure, storage or copying
6. All spatial coordinates relate to the Ordnance Survey, British National Grid (OSGB36)
7. All levels are in meters and relate to AOD (Ordnance Survey, Newlyn)
8. Layout of existing boundary fence line indicative only.

Key to Symbols:

Visibility Splay

Rev	Description	Cre'd	Chk'd	App'd	Date
P03	Issued for DCO	JK	CB	CB	17/12/21
P02	Updated as per NG and Design Assurance comments	JK	ST	CB	19/11/21
P01	Preliminary Issue	PP	CB	CB	06/10/2021

nationalgrid

Investment No:	Project No:	Site:
100504	201083	Bulls Lodge

Investment Name: Longfield Solar Farm Connection

Document Title:

Bulls Lodge Substation Extension
Visibility Splays
East Access Road

Created by:	Date:	Checked by:	Date:	Approved by:	Date:
P Petkov	06/10/2021	C Bilsland	06/10/2021	C Bilsland	06/10/2021

Development Eng:	Document Type:	Scale:	Format:	Sheet(s):	Rev:
P Petkov	DWG	1:400	A1	1	P03

National Grid Document Number: PDD-100504-LAY-111

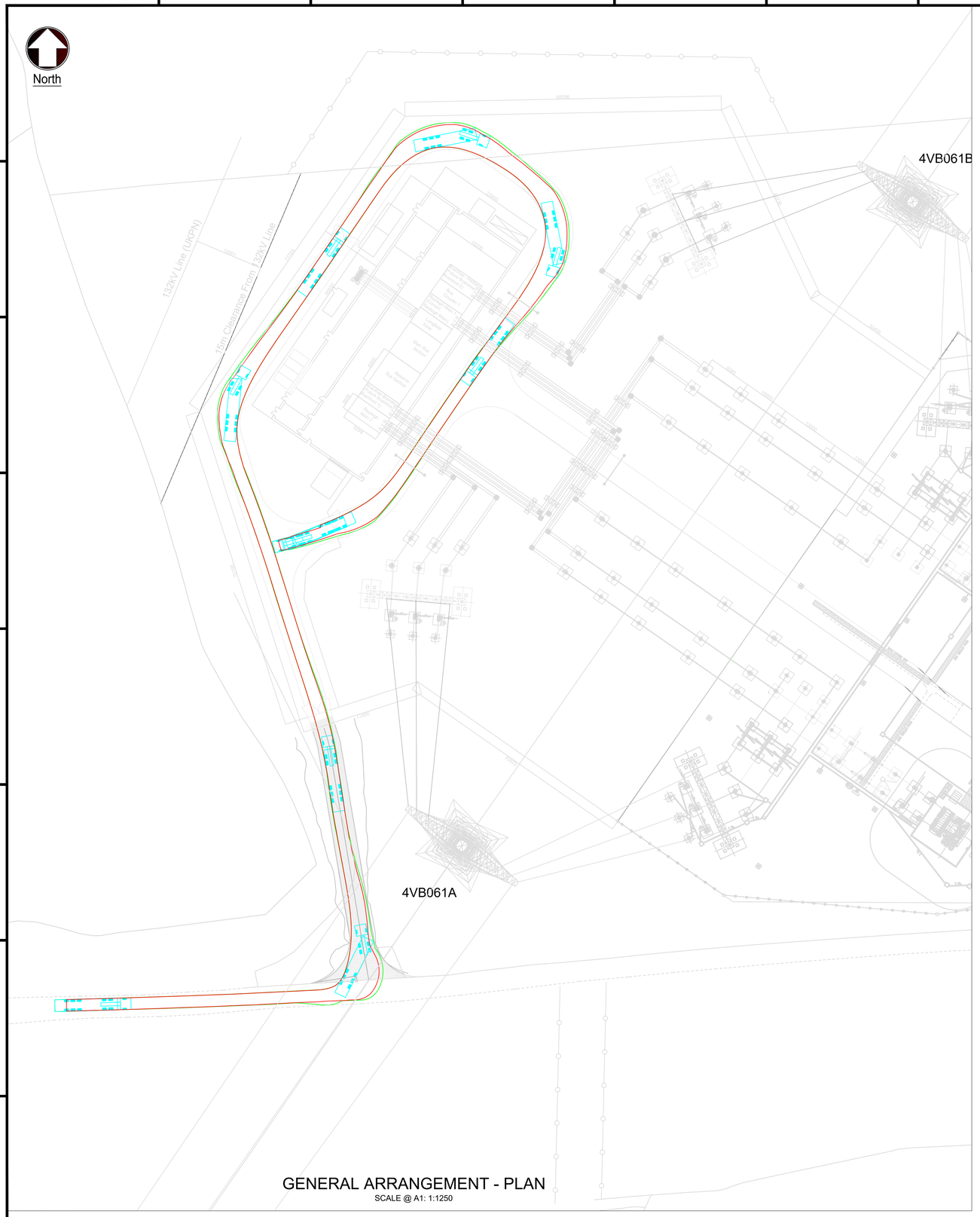
DCO Figure Number: TBC

FEED Document Number: 422215-MMD-00-XX-DR-C-0107

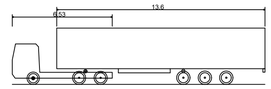
1:400 0 20m 40m

© Mott Macdonald
This document is issued for the party which commissioned it and for specific purposes connected with the captioned project only. It should not be relied upon by any other party or used for any other purpose.
We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties.
© Crown copyright and database rights 2021 Ordnance Survey 0100031673

G3.1 – Bulls Lodge Substation Extension Swept Path Analysis 16.5m Articulated Vehicle



GENERAL ARRANGEMENT - PLAN
SCALE @ A1: 1:1250



Max Legal Length (UK) Articulated Vehicle (16.5m)	
Overall Length	16.500m
Overall Width	2.550m
Overall Body Height	3.681m
Min Body Ground Clearance	0.411m
Max Track Width	2.500m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	6.530m

VEHICLE DETAILS
N.T.S

1:1250 0 50m 125m

1. Do not scale from this drawing
2. Information on this drawing is based on Ordinate Survey data dated back to 20/10/21 from emapsite.
3. All dimensions are in metres unless otherwise stated
4. This drawing is to be read in conjunction with all relevant documents and drawings
5. No unauthorised disclosure, storage or copying
6. All spatial coordinates relate to the Ordnance Survey, British National Grid (OSGB36)
7. All levels are in meters and relate to AOD (Ordnance Survey, Newlyn)

Swept Path Legend:

- Path of vehicle axles / wheels
- Extent of vehicle body (cab / trailer)

Rev	Description	Cre'd	Chk'd	App'd	Date
P04	Environmental Statement " APFP Regulation: 5(2)(a) "	JK	CB	CB	02/02/22
P03	Issued for DCO	JK	CB	CB	17/12/21
P02	Issued for Comment	JK	ST	CB	18/11/21
P01	Preliminary Issue	JB	CB	CB	03/09/21

nationalgrid

Investment No:	Project No:	Site:
100504	201083	Bulls Lodge

Investment Name: Longfield Solar Farm Connection

Document Title:
Bulls Lodge Substation Extension
Swept Path Analysis
16.5m Articulated Vehicle

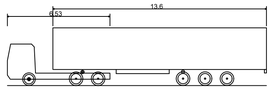
Created by:	Date:	Checked by:	Date:	Approved by:	Date:
J. Bell	03/09/21	C Bilsland	03/09/21	C Bilsland	03/09/21

Development Eng:	Document Type:	Scale:	Format:	Sheet(s):	Rev:
S Stoyanov	DWG	AS SHOWN	A1	1	P04

National Grid Document Number: PDD-100504-LAY-109
Figure Number: Figure 2-38
FEED Document Number: 422215-MMD-00-XX-DR-C-0105
PINS Ref: EN010118

© Mott Macdonald
This document is issued for the party which commissioned it and for specific purposes connected with the captioned project only. It should not be relied upon by any other party or used for any other purpose.
We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties.
© Crown copyright and database rights 2021 Ordnance Survey 0100031673

G3.2 – Bulls Lodge Substation Extension Temporary Access Swept Path Analysis 16.5m Articulated Vehicle



Max Legal Length (UK) Articulated Vehicle (16.5m)

Overall Length	16.500m
Overall Width	2.550m
Overall Body Height	3.681m
Min Body Ground Clearance	0.411m
Max Track Width	2.500m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	6.530m

VEHICLE DETAILS
N.T.S

1:400 0 20m 40m

Notes:

1. Do not scale from this drawing
2. Information on this drawing is based on Ordinate Survey data dated back to 20/10/21 from emapsite.
3. All dimensions are in metres unless otherwise stated
4. This drawing is to be read in conjunction with all relevant documents and drawings
5. No unauthorised disclosure, storage or copying
6. All spatial coordinates relate to the Ordnance Survey, British National Grid (OSGB36)
7. All levels are in meters and relate to AOD (Ordnance Survey, Newlyn)

Swept Path Legend:

- Path of vehicle axles / wheels
- Extent of vehicle body (cab / trailer)

Rev	Description	Cre'd	Chk'd	App'd	Date
P01	Issued for DCO	PP	CB	CB	17/12/21

nationalgrid

Investment No:	Project No:	Site:
100504	201083	Bulls Lodge

Investment Name: Longfield Solar Farm Connection

Document Title:
Bulls Lodge Substation Extension
Temporary Access Swept Path Analysis
16.5m Articulated Vehicle

Created by:	Date:	Checked by:	Date:	Aproved by:	Date:
P Petkov	06/10/2021	C Bilsland	06/10/2021	C Bilsland	06/10/2021

Development Eng:	Document Type:	Scale:	Format:	Sheet(s):	Rev:
P Petkov	DWG	1:400	A1	1	P02

National Grid Document Number: PDD-100504-LAY-117

DCO Figure Number: TBC

FEED Document Number: 422215-MMD-00-XX-DR-C-0111

© Mott Macdonald
This document is issued for the party which commissioned it and for specific purposes connected with the captioned project only. It should not be relied upon by any other party or used for any other purpose.
We accept no responsibility for the consequences of this document being relied upon by any other party, or being used for any other purpose, or containing any error or omission which is due to an error or omission in data supplied to us by other parties.
© Crown copyright and database rights 2021 Ordnance Survey 0100031673

Appendix H – Operation Layout Overview

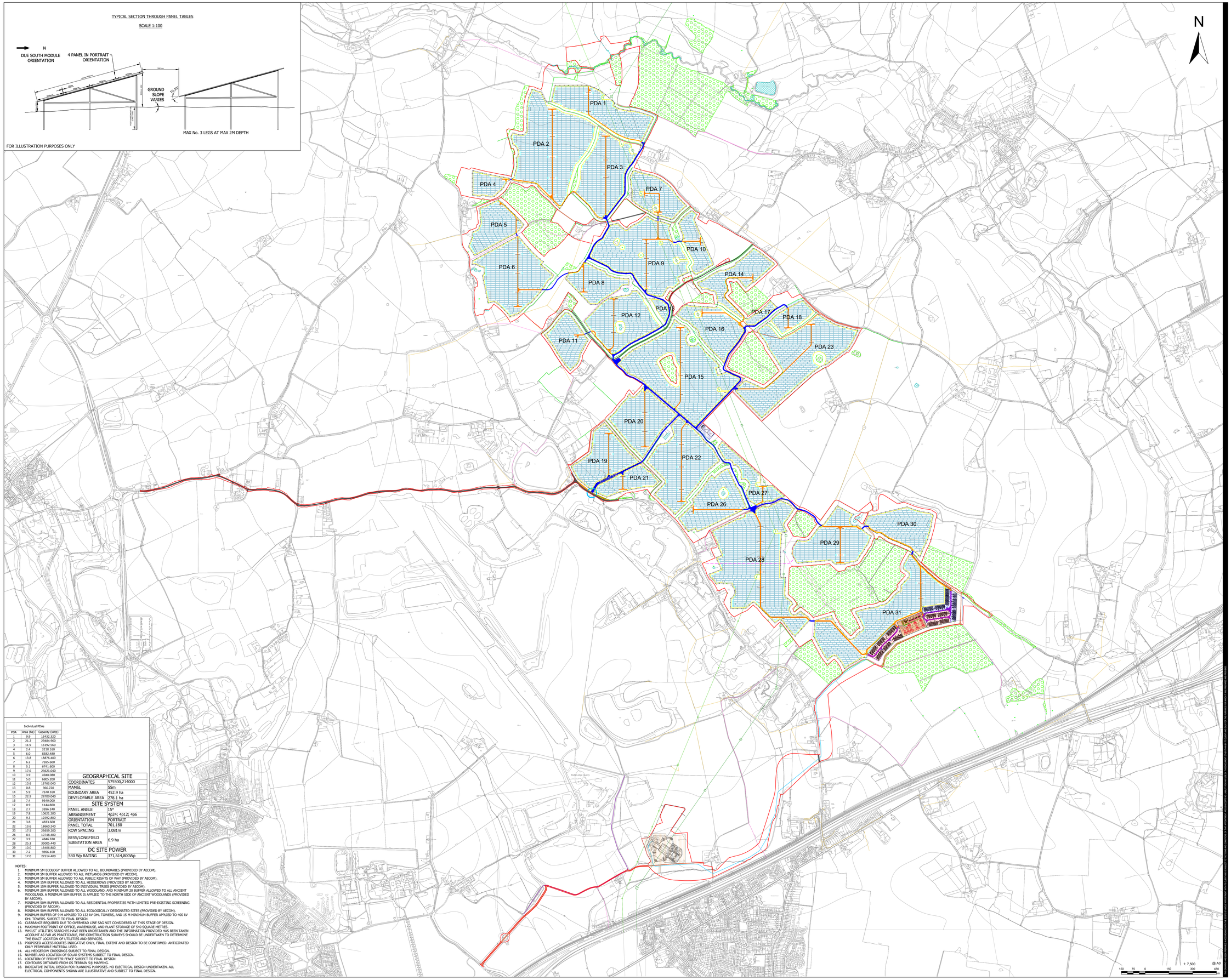
Revision: M Drawn:EL Checked:MB Approved:AB Date: 2022-01-20

Filename: N:\Projects\4\4077 Longfield Solar\GI1-Working\GI1_01-Drawings\4077_LGF_DR_PRE_0001M.dwg

TYPICAL SECTION THROUGH PANEL TABLES

SCALE 1:100

FOR ILLUSTRATION PURPOSES ONLY



Individual PDAs		
PDA	Area (ha)	Capacity (kWp)
1	9.9	13432.320
2	21.2	29484.960
3	11.9	16192.560
4	2.4	3218.160
5	6.0	8382.480
6	13.8	18876.480
7	6.2	7695.600
8	5.1	6741.600
9	17.6	23621.040
10	3.9	4948.080
11	5.0	6805.200
12	10.6	13763.040
13	0.8	966.720
14	5.9	7670.160
15	22.9	28709.040
16	7.4	9540.000
17	0.9	1144.800
18	2.7	3396.240
19	7.8	10621.200
20	9.3	12592.800
21	3.8	4833.600
22	13.6	18660.240
23	17.5	23659.200
26	8.5	10748.400
27	3.9	4846.320
28	25.3	35005.440
29	10.0	13406.880
30	7.2	9896.160
31	17.0	22514.400

GEOGRAPHICAL SITE	
COORDINATES	575500,214000
MAMSL	55m
BOUNDARY AREA	452.9 ha
DEVELOPABLE AREA	278.1 ha
SITE SYSTEM	
PANEL ANGLE	15°
ARRANGEMENT	4p24; 4p12; 4p6
ORIENTATION	PORTRAIT
PANEL TOTAL	701,160
ROW SPACING	3.081m
BESS/LONGFIELD SUBSTATION AREA	6.9 ha
DC SITE POWER	
530 Wp RATING	371,614,800Wp

NOTES:

1. MINIMUM 5M ECOLOGY BUFFER ALLOWED TO ALL BOUNDARIES (PROVIDED BY AECOM).
2. MINIMUM 5M BUFFER ALLOWED TO ALL WETLANDS (PROVIDED BY AECOM).
3. MINIMUM 5M BUFFER ALLOWED TO ALL PUBLIC RIGHTS OF WAY (PROVIDED BY AECOM).
4. MINIMUM 15M BUFFER ALLOWED TO ALL HEDGEROWS (PROVIDED BY AECOM).
5. MINIMUM 15M BUFFER ALLOWED TO INDIVIDUAL TREES (PROVIDED BY AECOM).
6. MINIMUM 20M BUFFER ALLOWED TO ALL WOODLAND, AND MINIMUM 20 BUFFER ALLOWED TO ALL ANCIENT WOODLAND. A MINIMUM 50M BUFFER IS APPLIED TO THE NORTH SIDE OF ANCIENT WOODLANDS (PROVIDED BY AECOM).
7. MINIMUM 50M BUFFER ALLOWED TO ALL RESIDENTIAL PROPERTIES WITH LIMITED PRE-EXISTING SCREENING (PROVIDED BY AECOM).
8. MINIMUM 50M BUFFER ALLOWED TO ALL ECOLOGICALLY DESIGNATED SITES (PROVIDED BY AECOM).
9. MINIMUM BUFFER OF 9 M APPLIED TO 132 kV OHL TOWERS, AND 15 M MINIMUM BUFFER APPLIED TO 400 kV OHL TOWERS. SUBJECT TO FINAL DESIGN.
10. CLEARANCE REQUIRED DUE TO OVERHEAD LINE SAG NOT CONSIDERED AT THIS STAGE OF DESIGN.
11. MAXIMUM FOOTPRINT OF OFFICE, WAREHOUSE, AND PLANT STORAGE OF 540 SQUARE METRES.
12. WHILST UTILITIES SEARCHES HAVE BEEN UNDERTAKEN AND THE INFORMATION PROVIDED HAS BEEN TAKEN ACCOUNT AS FAR AS PRACTICABLE, PRE-CONSTRUCTION SURVEYS SHOULD BE UNDERTAKEN TO DETERMINE THE EXACT LOCATION OF UTILITIES AND SERVICES.
13. PROPOSED ACCESS ROUTES INDICATIVE ONLY, FINAL EXTENT AND DESIGN TO BE CONFIRMED. ANTICIPATED ONLY PERMEABLE MATERIAL USED.
14. ALL HEDGEROW CROSSINGS SUBJECT TO FINAL DESIGN.
15. NUMBER AND LOCATION OF SOLAR SYSTEMS SUBJECT TO FINAL DESIGN.
16. LOCATION OF PERIMETER FENCE SUBJECT TO FINAL DESIGN.
17. CONTOURS OBTAINED FROM OS TERRAIN 5® MAPPING.
18. INDICATIVE INITIAL DESIGN FOR PLANNING PURPOSES. NO ELECTRICAL DESIGN UNDERTAKEN. ALL ELECTRICAL COMPONENTS SHOWN ARE ILLUSTRATIVE AND SUBJECT TO FINAL DESIGN.

AECOM

PROJECT

LONGFIELD
SOLAR FARM

CLIENT

Longfield Solar Farm

CONSULTANT

Arcus Consultancy Services
1C Swinegate Court East
3 Swinegate
York, YO1 8AJ
T: +44 1904 715 470
www.arcusconsulting.co.uk

LEGEND

- Order Limits
- Potential Developable Area (PDA)
- Deer Fencing
- Palisade Fencing
- Acoustic Fencing
- 4p24 PV Panel
- 4p12 PV Panel
- 4p6 PV Panel
- Balance of Solar System Locations
- Longfield Substation
- Office, Warehouse and Plant Storage Area
- BESS Phase 1
- BESS Phase 2
- BESS Rendezvous Area
- Primary Access Track
- Secondary Access Track
- Existing Private Access Track
- Existing Public Highway
- Site Entrance
- Overhead Electricity Line (11kV)
- Overhead Electricity Line (11kV) Diversion
- Overhead Electricity Line (132kV)
- Overhead Electricity Line (400 kV)
- 400kV Cable Route
- 5m Contour
- Area of Wetland
- Individual Tree
- Hedgerow
- Area of Woodland
- Bridleway
- Public Footpath
- Proposed Cycle Track
- Security Kiosk
- Site Access Layby
- BESS Internal Tracks
- Gate
- CCTV
- BESS Water Tank
- Attenuation Pond
- Drainage Pipe Network
- Bull's Lodge Extension Area

ARCUS
An ERM Group Company

NOTES

This drawing is to be read in conjunction with all other relevant documentation.

All dimensions, changes, levels, and coordinates are in metres unless defined otherwise.

This drawing is to be read in conjunction with the project health & safety file for any identified potential risks.

The drawing is the copyright of Arcus and cannot be reproduced in any form without the express consent of the company. Written and scaled dimensions to be checked on site, and any discrepancies should be reported to Arcus prior to work commencing on Site.

Reproduced from Ordnance Survey digital map data © Crown copyright 2021. All rights reserved. License number 100048606.

ISSUE PURPOSE

Environmental Statement

PINS REFERENCE NUMBER

EN010118

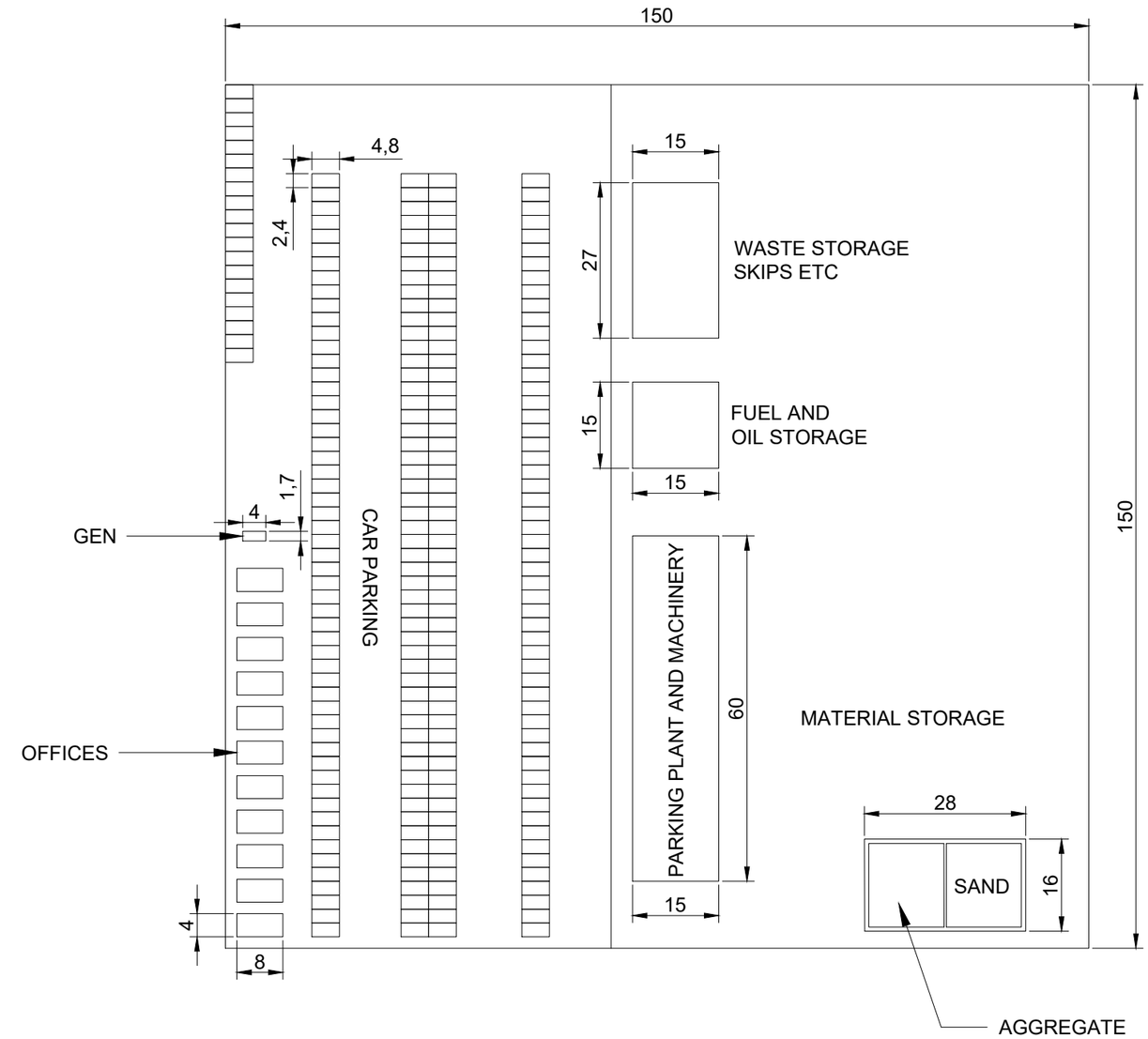
FIGURE TITLE

Operational Layout Overview

FIGURE NUMBER

Figure 2-5

Appendix I1 – Main Construction Compound



FOR ILLUSTRATION PURPOSES ONLY

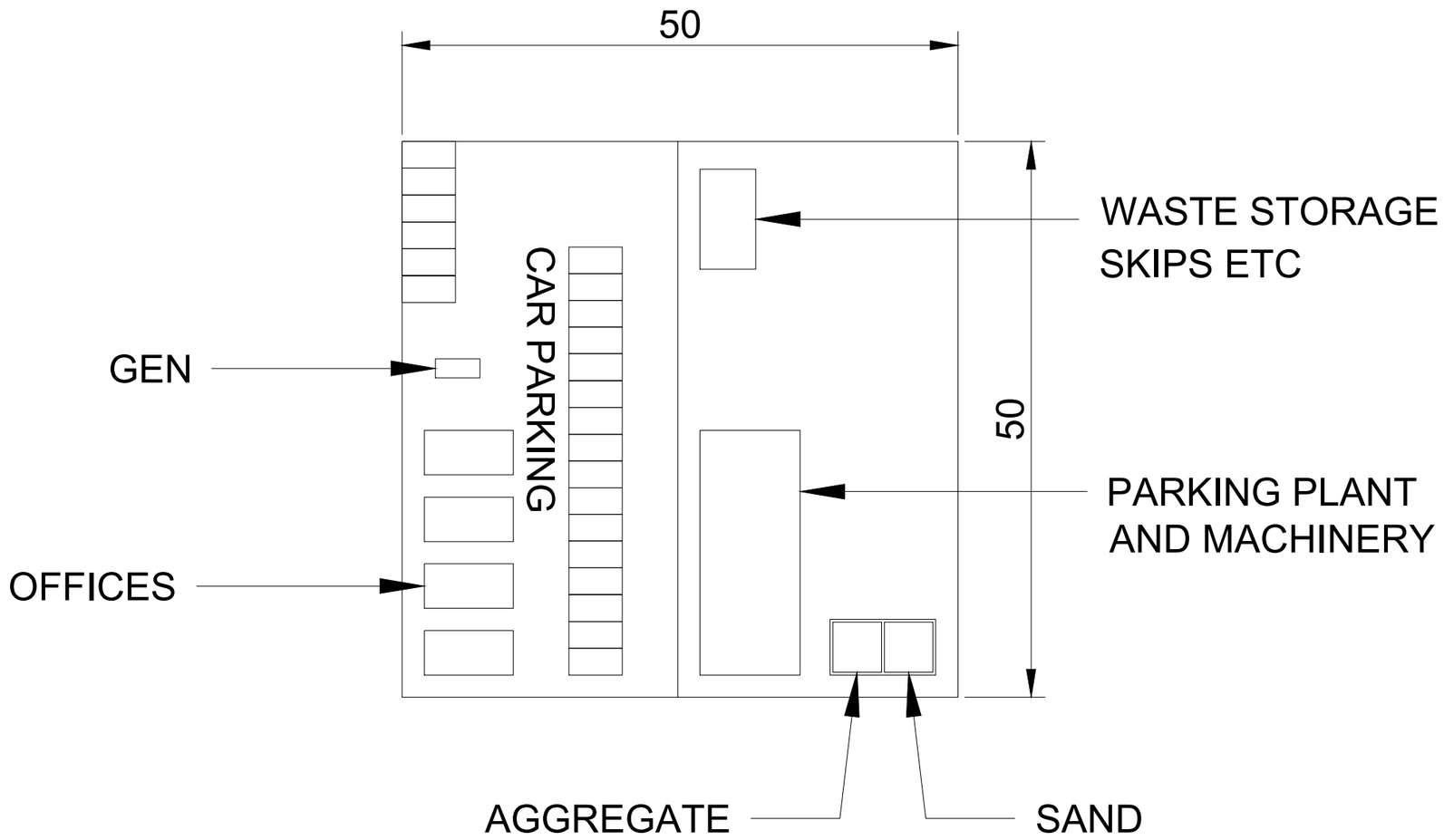
Plot Date : 16 June 2021 10:05:52
File Name N:\PROJECTS\4077 LONGFIELD SOLAR\01-WORKING\01_01-DRAWINGS\4077_LGF_DR_PLAN_0002-0015

Project Title: Longfield Solar Farm	Drawing Title: MAIN CONSTRUCTION COMPOUND	Purpose of issue: ENVIRONMENTAL STATEMENT	THIS DOCUMENT HAS BEEN PREPARED IN ACCORDANCE WITH THE SCOPE OF ARCUS' APPOINTMENT WITH ITS CLIENT AND IS SUBJECT TO THE TERMS OF THAT APPOINTMENT. ARCUS ACCEPTS NO LIABILITY FOR ANY USE OF THIS DOCUMENT OTHER THAN BY ITS CLIENT AND ONLY FOR THE PURPOSES FOR WHICH IT WAS PREPARED AND PROVIDED
Client: EDF renewables		Designed: — / Drawn: SR / Checked: EL / Approved: —	Drawing Number: 4077_LGF_DR_P_0015 / Rev: -
		Arcus Internal Project No.: 4077	
		Scale @ A3: 1:1	Date: 15.06.2021

Arcus Consultancy Services
1C Swinegate Court East, 3 Swinegate
York, YO1 8AJ

Tel: +44 (0) 1904 715 470
Fax:
www.arcusconsulting.co.uk

Appendix I2 – Secondary Construction Compound



FOR ILLUSTRATION PURPOSES ONLY

Plot Date : 17 June 2021 10:27:35
File Name N:\PROJECTS\4077 LONGFIELD SOLAR\01-WORKING\01_01-DRAWINGS\4077_LGF_DR_PLAN_0002-0016

Project Title: Longfield Solar Farm	Drawing Title: SECONDARY CONSTRUCTION COMPOUND	Purpose of issue: ENVIRONMENTAL STATEMENT	
Client: EDF renewables		Designed:	Drawn: SR
		Checked: EL	Approved:
		Arcus Internal Project No.: 4077	Date: 16.06.2021
		Scale @ A3: 2:1	

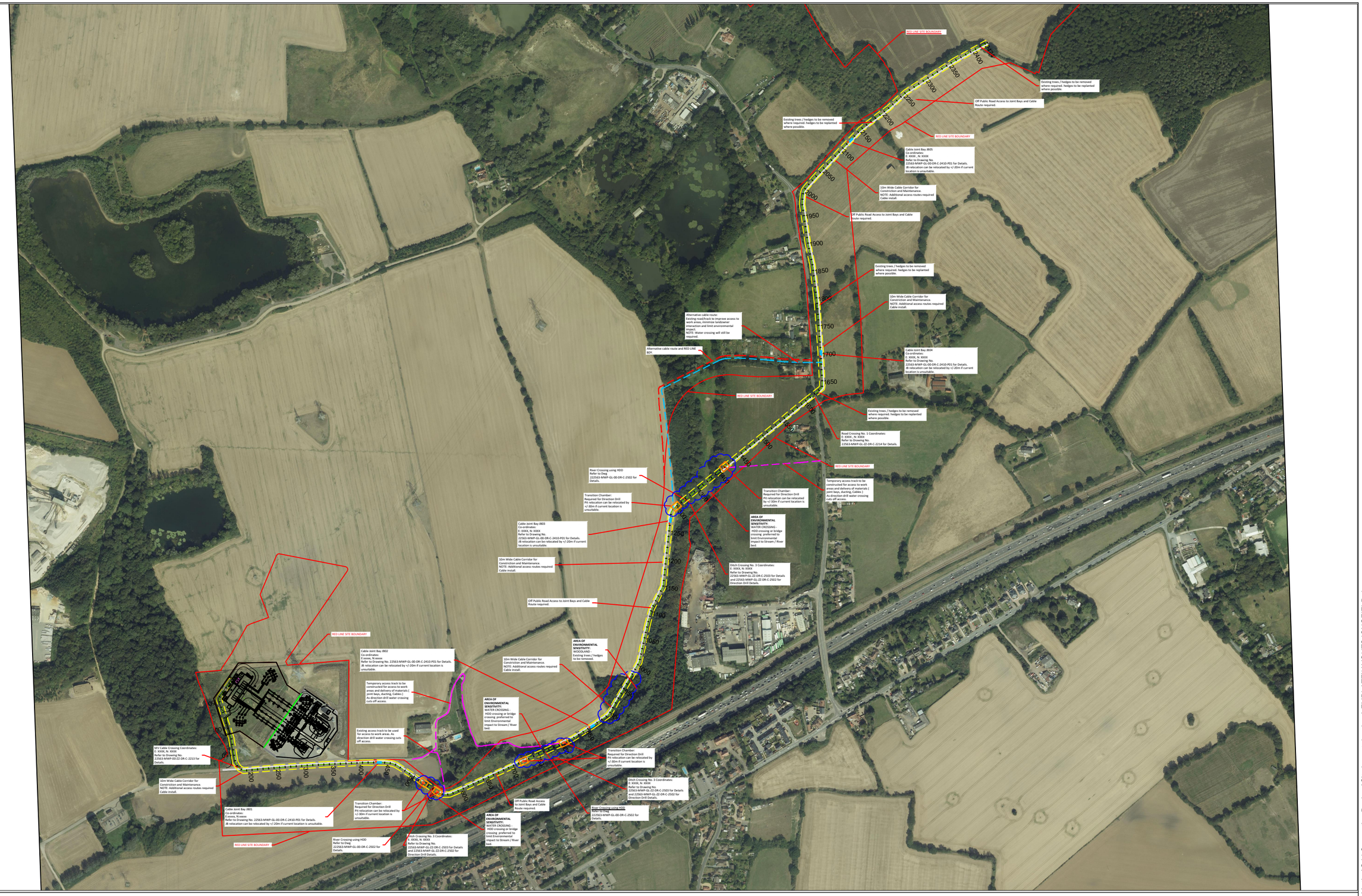
THIS DOCUMENT HAS BEEN PREPARED IN ACCORDANCE WITH THE SCOPE OF ARCUS' APPOINTMENT WITH ITS CLIENT AND IS SUBJECT TO THE TERMS OF THAT APPOINTMENT. ARCUS ACCEPTS NO LIABILITY FOR ANY USE OF THIS DOCUMENT OTHER THAN BY ITS CLIENT AND ONLY FOR THE PURPOSES FOR WHICH IT WAS PREPARED AND PROVIDED

Drawing Number	Rev
4077_LGF_DR_P_0016	-

Arcus Consultancy Services
1C Swinegate Court East, 3 Swinegate
York, YO1 8AJ

Tel: +44 (0) 1904 715 470
Fax:
www.arcusconsulting.co.uk

Appendix J1 – Grid Connection Route (Layout Plan)



Malachy Walsh and Partners

Engineering and Environmental Consultants

Cork | Tralee | London | Limerick

The Elm Suite,
Loughmore Centre,
Raheen Business Park,
Limerick, V94 RP26

Tel : +353 (0) 61 480164
fax. : +353 (0) 61 441125
E-mail : limerick@mwp.ie
Web : www.mwp.ie

I.S. EN ISO 9001

REV	DATE	DESCRIPTION	BY	APP
P05	29/ 10 / 21	ISSUED FOR INFORMATION	JMcC	CM
P04	18/ 10 / 21	ISSUED FOR INFORMATION	JMcC	CM
P03	12 / 10 / 21	ISSUED FOR INFORMATION	JMcC	CM
P02	12 / 10 / 21	ISSUED FOR INFORMATION	JMcC	CM

CLIENT:

PROJECT: LONGFIELD SOLAR FARM
400KV GRID CONNECTION

TITLE: LAYOUT PLAN

DRAWN:	CHECKED:	APPROVED:
JMcC	CM	JL
DATE: OCT. '21	SCALE @ A3: 1 : 2500	
PROJECT NUMBER: 21736		DRAWING STATUS:

DRAWING NUMBER: 22563-MWP-04-GL-DR-C-2110 REV: P05

N:\projects\22563 LongField\Drawings\Active\Grid Connection Designs\Site Layout drawings\EMPLATE\LAYOUTS !ONGFIELD.dwg

Appendix K1 – Proposed Carriageway Widening (Schedule)

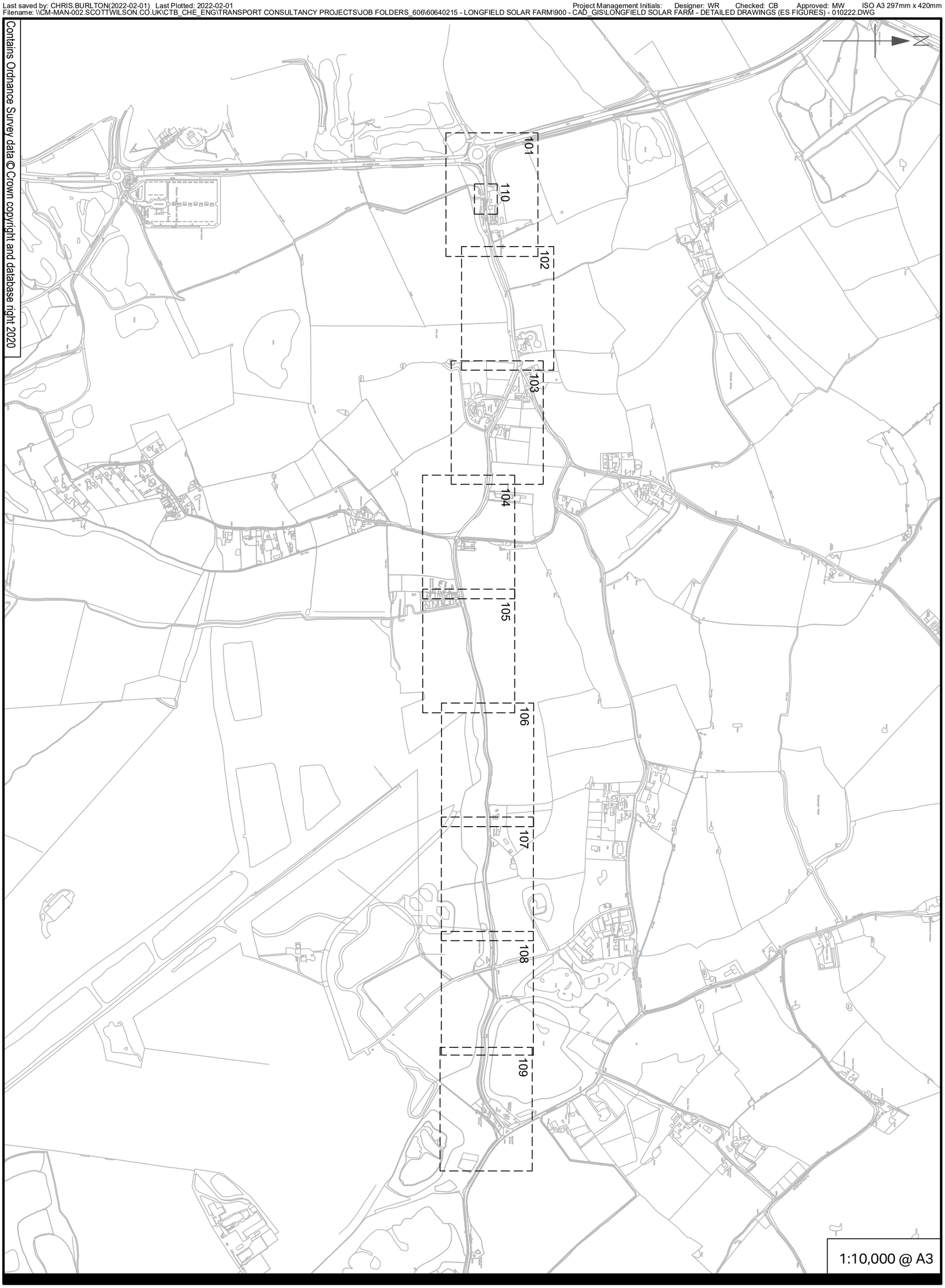
Schedule of Proposed Works (Wheelers Hill, Cranham Road and Waltham Road)

Section	Plan(s)	Road	Location	Proposed Widening (based on OS Mapping)							Review (Site Visit)
				Northern Side		Southern Side		Total Approx. Area (sqm)	Existing Kerb/ Verge	Total Width	
				Length	Max Widening	Length	Max Widening				
1	101 & 110	Wheelers Hill	Kingswood	-	-	9.7m	0.22m	1 sqm	kerb	5.5m	OS mapping appears to be representative
2	101	Wheelers Hill	East of Kingswood	90m	1.2m	35m	0.5m	60 sqm	verge (both sides)	6.0m	Carriageway appears to be wider, at least 5.5m
3	102	Wheelers Hill	West of Shuttleworth Hall	20m	0.25m	-	-	2 sqm	verge	6.0m	OS mapping appears to be representative
4	102	Wheelers Hill	Shuttleworth Hall	-	-	10m	0.1m	1 sqm	verge	6.0m	OS mapping appears to be representative
5	103	Wheelers Hill	Shouderstick Haul	240m	1.2m	80m	0.5m	175 sqm	some kerb (northern), verge (southern)	6.0m	OS mapping appears to be representative
6	104	Wheelers Hill	West of Domsey Lane	10m	0.1m	-	-	1 sqm	verge	6.0m	OS mapping appears to be representative
7	104	Cranham Road	East of Domsey Lane	-	-	135m	0.95m	60 sqm	verge	6.0m	Carriageway appears to be wider, at least 5.5m
8	105	Cranham Road	East of Caravan Park	90m	0.8m	-	-	50 sqm	verge	6.0m	Carriageway appears to be wider, at least 5.5m
9	105	Cranham Road	East of Caravan Park	150m	0.9m	-	-	72 sqm	verge	6.0m	Carriageway appears to be wider, at least 5.5m
10	106	Cranham Road	West of Combe	20m	0.3m	-	-	3 sqm	verge	6.0m	OS mapping appears to be representative
11	106	Cranham Road	West of Combe	55m	0.6m	-	-	17 sqm	verge	6.0m	OS mapping appears to be representative
12	106 & 107	Cranham Road	Combe and Boscombe	170m	1.8m	300m	1.75m	480 sqm	verge (both sides)	6.0m	Carriageway appears to be significantly wider, at least 5.5m
13	107	Cranham Road	East of Boscombe	35m	0.55m	-	-	10 sqm	verge	6.0m	OS mapping appears to be representative
14	108	Cranham Road	West of War Memorial	-	-	70m	0.4m	23 sqm	verge	6.0m	OS mapping appears to be representative
15	108	Cranham Road	East of War Memorial	-	-	75m	1.0m	39 sqm	verge	6.0m	Carriageway appears to be wider, at least 5.5m
16	108	Cranham Road	East of War Memorial	120m	1.0m	-	-	63 sqm	verge	6.0m	Carriageway appears to be wider, at least 5.5m
17	109	Cranham Road	West of Waltham Road	230m	1.55m	-	-	168 sqm	kerb (majority)	6.0m	Carriageway appears to be wider, at least 5.5m
18	109	Waltham Road	South of Cranham Road	120m	0.8m	-	-	48 sqm	verge	6.0m	OS mapping appears to be representative

Appendix K2 – Carriageway Widening

Last saved by: CHRIS.BURLTON(2022-02-01) Last Plotted: 2022-02-01 Project Management Initials: Designer: WR Checked: CB Approved: MW ISO A3 297mm x 420mm
Filename: \\CM-MAN-002.SCOTTWILSON.CO.UK\CTB_CHE_ENG\TRANSPORT CONSULTANCY PROJECTS\JOB FOLDERS_606\60640215 - LONGFIELD SOLAR FARM\900 - CAD_GIS\LONGFIELD SOLAR FARM - DETAILED DRAWINGS (ES FIGURES) - 010222.DWG

Contains Ordnance Survey data © Crown copyright and database right 2020



Longfield Solar Farm
Environmental Statement - Estimated Extent of Carriageway Widening - Key Plan
APFP Regulation: 5(2)(a)
Project No.: 60640215 Date: February 2022 PINS Ref: EN010118
Figure 13-5

Note: Drawing scale is designed to show the areas covered by remainder of the sheets

AECOM

60640215-1013-TRA-100

Last saved by: CHRIS.BURLTON(2022-02-02) Last Plotted: 2022-02-02 Project Management Initials: Designer: WR Checked: CB Approved: MW ISO A3 297mm x 420mm
Filename: \\CM-MAN-002.SCOTTWILSON.CO.UK\CTB_CHE_ENG\TRANSPORT CONSULTANCY PROJECTS\JOB FOLDERS_606\60640215 - LONGFIELD SOLAR FARM\900 - CAD_GIS\LONGFIELD SOLAR FARM - DETAILED DRAWINGS (ES FIGURES) - 010222.DWG

Contains Ordnance Survey data © Crown copyright and database right 2020

N

Track

Kingswood

WHEELERS HILL

+ 60.7m

Wheelers Farm

Kozi-Holm

(Telecommunication) Mast

WIDENING WITHIN HIGHWAY BOUNDARY ON SOUTHERN SIDE OF WHEELERS HILL (UP TO 0.25M ADDITIONAL WIDTH OVER CIRCA. 10M IN LENGTH, TO ACHIEVE 5.5M TOTAL WIDTH)

WIDENING WITHIN HIGHWAY BOUNDARY ON SOUTHERN SIDE OF WHEELERS HILL (UP TO 0.5M ADDITIONAL WIDTH OVER CIRCA. 35M IN LENGTH, TO ACHIEVE 6.0M TOTAL WIDTH)

WIDENING WITHIN HIGHWAY BOUNDARY ON NORTHERN SIDE OF WHEELERS HILL (UP TO 1.2M ADDITIONAL WIDTH OVER CIRCA. 90M IN LENGTH, TO ACHIEVE 6.0M TOTAL WIDTH)

CUTLINE: 60640215-1013-TRA-101

CUTLINE: 60640215-1013-TRA-102

LEGEND

EXISTING CARRIAGEWAY

HIGHWAY BOUNDARY

INDICATIVE CARRIAGEWAY WIDENING

1:1000 @ A3

Longfield Solar Farm
Environmental Statement - Estimated Extent of Carriageway Widening - Sheet 1 of 9
APFP Regulation: 5(2)(a)
Project No.: 60640215 Date: February 2022 PINS Ref: EN010118
Figure 13-5

AECOM

60640215-1013-TRA-101

Last saved by: CHRIS.BURLTON(2022-02-02) Last Plotted: 2022-02-02 Project Management Initials: Designer: WR Checked: CB Approved: MW ISO A3 297mm x 420mm
Filename: \\CM-MAN-002.SCOTTWILSON.CO.UK\CTB_CHE_ENG\TRANSPORT CONSULTANCY PROJECTS\JOB FOLDERS_606\60640215 - LONGFIELD SOLAR FARM\900 - CAD_GIS\LONGFIELD SOLAR FARM - DETAILED DRAWINGS (ES FIGURES) - 010222.DWG

Contains Ordnance Survey data © Crown copyright and database right 2020

N

CUTLINE: 60640215-1013-TRA-101

CUTLINE: 60640215-1013-TRA-102

WIDENING WITHIN HIGHWAY BOUNDARY ON THE NORTHERN SIDE OF WHEELERS HILL (UP TO 0.25M ADDITIONAL WIDTH, OVER CIRCA. 20M IN LENGTH)

WIDENING WITHIN HIGHWAY BOUNDARY ON THE SOUTHERN SIDE OF WHEELERS HILL (UP TO 0.1M ADDITIONAL WIDTH, OVER CIRCA. 10M IN LENGTH)

63.8m

64.7m

Path (um)

LB

Shuttleworth Hall

CUTLINE: 60640215-1013-TRA-102

CUTLINE: 60640215-1013-TRA-103

LEGEND

EXISTING CARRIAGEWAY

HIGHWAY BOUNDARY

INDICATIVE CARRIAGEWAY WIDENING

1:1000 @ A3

Longfield Solar Farm
Environmental Statement - Estimated Extent of Carriageway Widening - Sheet 2 of 9
APFP Regulation: 5(2)(a)
Project No.: 60640215 Date: February 2022 PINS Ref: EN010118
Figure 13-5

AECOM

60640215-1013-TRA-102

Last saved by: CHRIS.BURLTON(2022-02-02) Last Plotted: 2022-02-02 Project Management Initials: Designer: WR Checked: CB Approved: MW ISO A3 297mm x 420mm
Filename: \\CM-MAN-002.SCOTTWILSON.CO.UK\CTB_CHE_ENG\TRANSPORT CONSULTANCY PROJECTS\JOB FOLDERS_606\60640215 - LONGFIELD SOLAR FARM\900 - CAD_GIS\LONGFIELD SOLAR FARM - DETAILED DRAWINGS (ES FIGURES) - 010222.DWG

Contains Ordnance Survey data © Crown copyright and database right 2020

N

CUTLINE: 60640215-1013-TRA-102

CUTLINE: 60640215-1013-TRA-103

WIDENING WITHIN HIGHWAY BOUNDARY ON SOUTHERN SIDE OF WHEELERS HILL (UP TO 0.5M ADDITIONAL WIDTH, OVER CIRCA. 80M IN LENGTH)

WIDENING WITHIN HIGHWAY BOUNDARY ON NORTHERN SIDE OF WHEELERS HILL (UP TO 1.2M ADDITIONAL WIDTH, OVER CIRCA. 240M IN LENGTH)

64.7m

Hobbits

Shoulderstick Haul

Pond

LEIGHS RUN

Track

FB Pond

Pond

Power's Farm

Pond

LEGEND

EXISTING CARRIAGEWAY

HIGHWAY BOUNDARY

INDICATIVE CARRIAGEWAY WIDENING

CUTLINE: 60640215-1013-TRA-103

CUTLINE: 60640215-1013-TRA-104

1:1000 @ A3

Longfield Solar Farm
Environmental Statement - Estimated Extent of Carriageway Widening - Sheet 3 of 9
APFP Regulation: 5(2)(a)
Project No.: 60640215 Date: February 2022 PINS Ref: EN010118
Figure 13-5

AECOM

60640215-1013-TRA-103

Last saved by: CHRIS.BURLTON[2022-02-02] Last Plotted: 2022-02-02
Filename: \\GM-MAN-002.SCOTTWILSON.CO.UK\CTB_CHE_ENG\TRANSPORT CONSULTANCY PROJECTS\JOB FOLDERS_60\60640215 - LONGFIELD SOLAR FARM\900 - CAD_GIS\LONGFIELD SOLAR FARM - DETAILED DRAWINGS (ES FIGURES) - 010222.DWG
Project Management Initials: Designer: WR Checked: CB Approved: MW ISO A3 297mm x 420mm

N

CUTLINE: 60640215-1013-TRA-104

CUTLINE: 60640215-1013-TRA-103

Silver Ash

Poste House Cottage

Little Acc

Rafiki Cottage

63.6m

WIDENING WITHIN HIGHWAY BOUNDARY ON THE NORTHERN SIDE OF WHEELERS HILL (UP TO 0.1M ADDITIONAL WIDTH, OVER CIRCA. 10M IN LENGTH)

WIDENING WITHIN HIGHWAY BOUNDARY ON THE SOUTHERN SIDE OF CRANHAM ROAD (UP TO 0.95M ADDITIONAL WIDTH, OVER CIRCA. 135M IN LENGTH)

CUTLINE: 60640215-1013-TRA-105

CUTLINE: 60640215-1013-TRA-104

LEGEND

- EXISTING CARRIAGEWAY
- HIGHWAY BOUNDARY
- INDICATIVE CARRIAGEWAY WIDENING

Contains Ordnance Survey data © Crown copyright and database right 2020

1:1000 @ A3

AECOM

60640215-1013-TRA-104

Longfield Solar Farm
Environmental Statement - Estimated Extent of Carriageway Widening - Sheet 4 of 9
APFP Regulation: 5(2)(a)
Project No.: 60640215 Date: February 2022 PINS Ref: EN010118
Figure 13-5

Last saved by: CHRIS.BURLTON(2022-02-02) Last Plotted: 2022-02-02 Project Management Initials: Designer: WR Checked: CB Approved: MW ISO A3 297mm x 420mm
Filename: \\CM-MAN-002.SCOTTWILSON.CO.UK\CTB_CHE_ENG\TRANSPORT CONSULTANCY PROJECTS\JOB FOLDERS_606\60640215 - LONGFIELD SOLAR FARM\900 - CAD_GIS\LONGFIELD SOLAR FARM - DETAILED DRAWINGS (ES FIGURES) - 010222.DWG

Contains Ordnance Survey data © Crown copyright and database right 2020

N

CUTLINE: 60640215-1013-TRA-104

CUTLINE: 60640215-1013-TRA-105

WIDENING WITHIN HIGHWAY BOUNDARY ON NORTHERN SIDE OF CRANHAM ROAD (UP TO 0.8M ADDITIONAL WIDTH, OVER CIRCA. 90M IN LENGTH)

WIDENING WITHIN HIGHWAY BOUNDARY ON NORTHERN SIDE OF CRANHAM ROAD (UP TO 0.9M ADDITIONAL WIDTH, OVER CIRCA. 150M IN LENGTH)

CUTLINE: 60640215-1013-TRA-105

CUTLINE: 60640215-1013-TRA-106

LEGEND

- EXISTING CARRIAGEWAY
- HIGHWAY BOUNDARY
- INDICATIVE CARRIAGEWAY WIDENING

1:1000 @ A3

Longfield Solar Farm
Environmental Statement - Estimated Extent of Carriageway Widening - Sheet 5 of 9
APFP Regulation: 5(2)(a)
Project No.: 60640215 Date: February 2022 PINS Ref: EN010118
Figure 13-5

AECOM

60640215-1013-TRA-105

Last saved by: CHRIS.BURLTON(2022-02-02) Last Plotted: 2022-02-02 Project Management Initials: Designer: WR Checked: CB Approved: MW ISO A3 297mm x 420mm
Filename: \\CM-MAN-002.SCOTTWILSON.CO.UK\CTB_CHE_ENG\TRANSPORT CONSULTANCY PROJECTS\JOB FOLDERS_606\60640215 - LONGFIELD SOLAR FARM\900 - CAD_GIS\LONGFIELD SOLAR FARM - DETAILED DRAWINGS (ES FIGURES) - 010222.DWG

Contains Ordnance Survey data © Crown copyright and database right 2020

N

CUTLINE: 60640215-1013-TRA-105

CUTLINE: 60640215-1013-TRA-106

WIDENING WITHIN HIGHWAY BOUNDARY ON NORTHERN SIDE OF CRANHAM ROAD (UP TO 0.3M ADDITIONAL WIDTH, OVER CIRCA. 20M IN LENGTH)

WIDENING WITHIN HIGHWAY BOUNDARY ON NORTHERN SIDE OF CRANHAM ROAD (UP TO 0.6M ADDITIONAL WIDTH, OVER CIRCA. 55M IN LENGTH)

WIDENING WITHIN HIGHWAY BOUNDARY ON NORTHERN SIDE OF CRANHAM ROAD (UP TO 1.8M ADDITIONAL WIDTH, CIRCA. 170M IN LENGTH)

WIDENING WITHIN HIGHWAY BOUNDARY ON SOUTHERN SIDE OF CRANHAM ROAD (UP TO 1.75M ADDITIONAL WIDTH, OVER CIRCA. 300M IN LENGTH)

LEGEND

EXISTING CARRIAGEWAY

HIGHWAY BOUNDARY

INDICATIVE CARRIAGEWAY WIDENING

Combe

CUTLINE: 60640215-1013-TRA-106

CUTLINE: 60640215-1013-TRA-107

1:1000 @ A3

Longfield Solar Farm
Environmental Statement - Estimated Extent of Carriageway Widening - Sheet 6 of 9
APFP Regulation: 5(2)(a)
Project No.: 60640215 Date: February 2022 PINS Ref: EN010118
Figure 13-5

AECOM

60640215-1013-TRA-106

Last saved by: CHRIS.BURLTON(2022-02-02) Last Plotted: 2022-02-02 Project Management Initials: Designer: WR Checked: CB Approved: MW ISO A3 297mm x 420mm
Filename: \\CM-MAN-002.SCOTTWILSON.CO.UK\CTB_CHE_ENG\TRANSPORT CONSULTANCY PROJECTS\JOB FOLDERS_606\60640215 - LONGFIELD SOLAR FARM\900 - CAD_GIS\LONGFIELD SOLAR FARM - DETAILED DRAWINGS (ES FIGURES) - 010222.DWG

Contains Ordnance Survey data © Crown copyright and database right 2020

N

CUTLINE: 60640215-1013-TRA-106

CUTLINE: 60640215-1013-TRA-107

Boscombe

Pond

Ponds

WIDENING WITHIN HIGHWAY BOUNDARY ON NORTHERN SIDE OF CRANHAM ROAD (UP TO 0.55M ADDITIONAL WIDTH, OVER CIRCA. 35M IN LENGTH)

LEGEND

EXISTING CARRIAGEWAY

HIGHWAY BOUNDARY

INDICATIVE CARRIAGEWAY WIDENING

CUTLINE: 60640215-1013-TRA-107

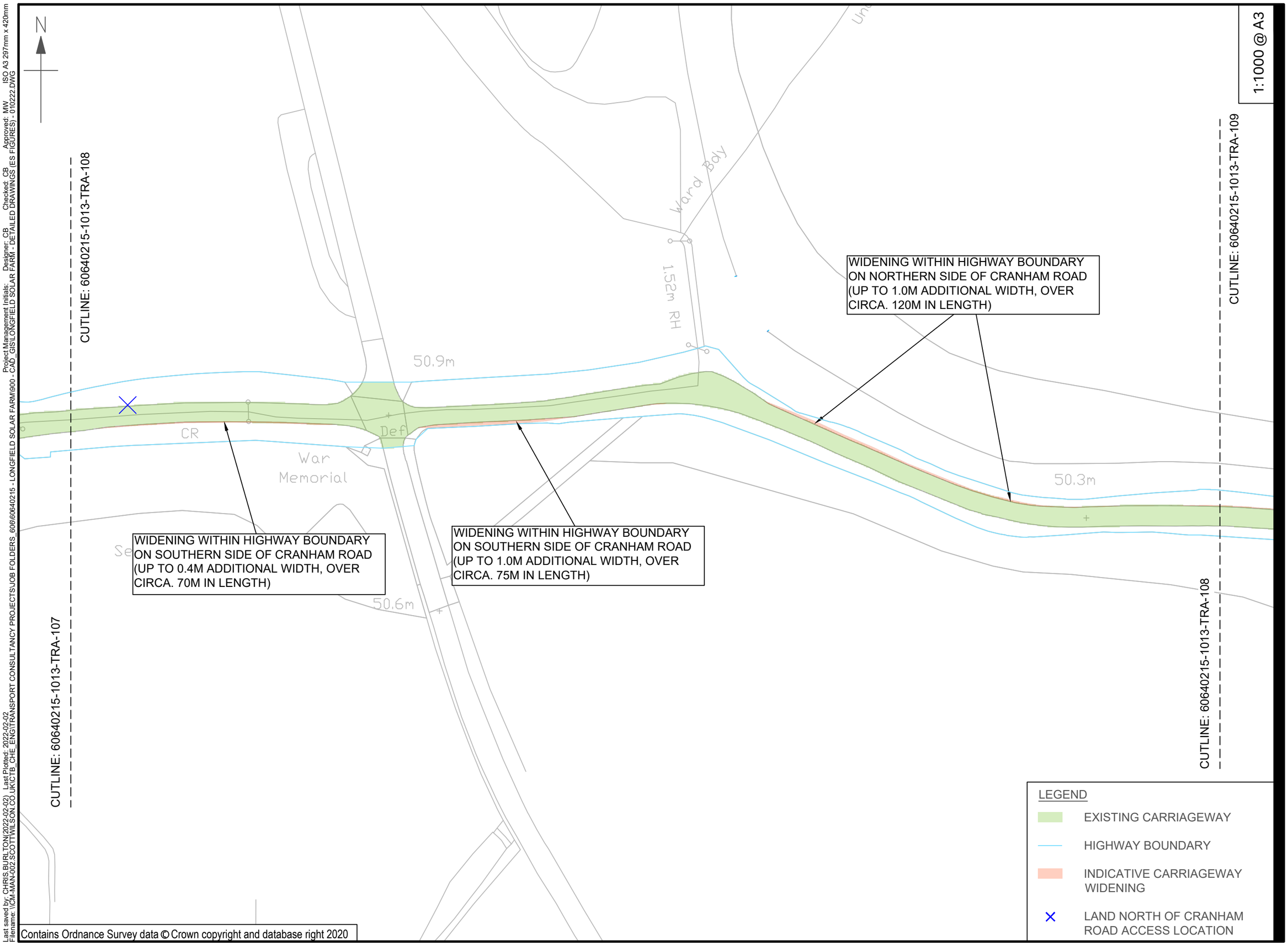
CUTLINE: 60640215-1013-TRA-108

1:1000 @ A3

Longfield Solar Farm
Environmental Statement - Estimated Extent of Carriageway Widening - Sheet 7 of 9
APFP Regulation: 5(2)(a)
Project No.: 60640215 Date: February 2022 PINS Ref: EN010118
Figure 13-5

AECOM

60640215-1013-TRA-107



1:1000 @ A3

ISO A3 297mm x 420mm

Project Management Initials: Designer: CB Checked: CB Approved: MW
Last saved by: CHRIS.BURLTON(2022-02-02) Last Plotted: 2022-02-02
Filename: \\CM-MAN-002.SCOTTWILSON.CO.UK\CTB_CHE_ENG\TRANSPORT CONSULTANCY PROJECTS\JOB FOLDERS_60\60640215 - LONGFIELD SOLAR FARM\900 - CAD_GIS\LONGFIELD SOLAR FARM - DETAILED DRAWINGS (ES FIGURES) - 010222.DWG

Contains Ordnance Survey data © Crown copyright and database right 2020

AECOM

60640215-1013-TRA-108

Longfield Solar Farm
Environmental Statement - Estimated Extent of Carriageway Widening - Sheet 8 of 9
APFP Regulation: 5(2)(a)
Project No.: 60640215 Date: February 2022 PINS Ref: EN010118
Figure 13-5

Last saved by: CHRIS.BURLTON(2022-02-02) Last Plotted: 2022-02-02
Filename: \\CM-MAN-002.SCOTTWILSON.CO.UK\CTB_CHE_ENG\TRANSPORT CONSULTANCY PROJECTS\JOB FOLDERS_606\60640215 - LONGFIELD SOLAR FARM\900 - CAD_GIS\LONGFIELD SOLAR FARM - DETAILED DRAWINGS (ES FIGURES) - 010222.DWG
Project Management Initials: Designer: CB Checked: CB Approved: MW ISO A3 297mm x 420mm

Contains Ordnance Survey data © Crown copyright and database right 2020

CUTLINE: 60640215-1013-TRA-108

CUTLINE: 60640215-1013-TRA-109

N

WIDENING WITHIN HIGHWAY BOUNDARY ON NORTHERN SIDE OF CRANHAM ROAD (UP TO 1.55M ADDITIONAL WIDTH, OVER CIRCA. 230M IN LENGTH)

WIDENING WITHIN HIGHWAY BOUNDARY AND REDLINE BOUNDARY ON NORTHERN SIDE OF WALTHAM ROAD (UP TO 0.8M ADDITIONAL WIDTH, OVER CIRCA. 120M IN LENGTH)

Coldstream Cottages

47.5m

Russell Green Cottages

FBs

GP

Russell Gre

48.

LEGEND

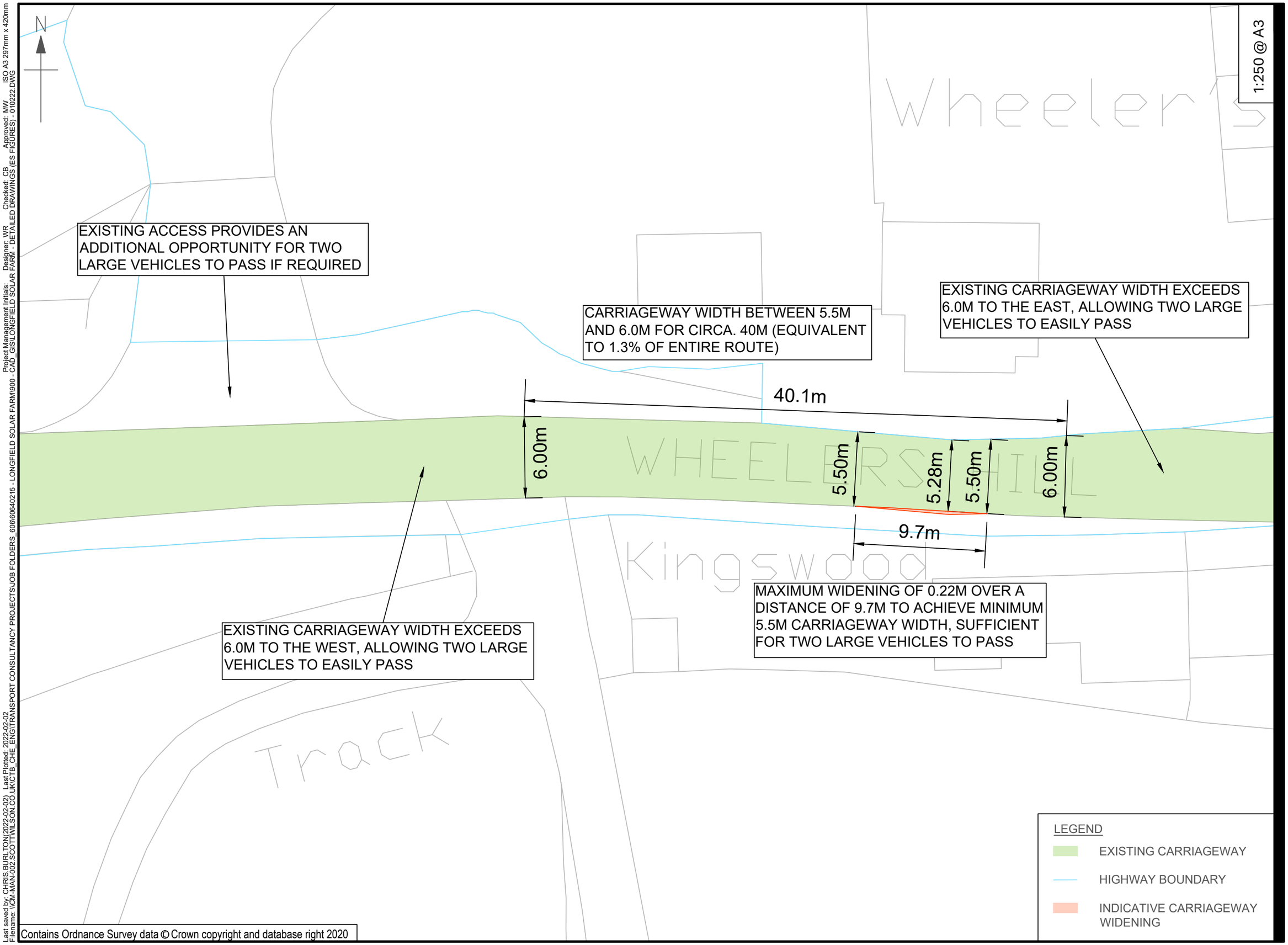
- INDICATIVE SOLAR FARM SITE ACCESS
- EXISTING CARRIAGEWAY
- HIGHWAY BOUNDARY
- INDICATIVE CARRIAGEWAY WIDENING

1:1000 @ A3

Longfield Solar Farm
Environmental Statement - Estimated Extent of Carriageway Widening - Sheet 9 of 9
APFP Regulation: 5(2)(a)
Project No.: 60640215 Date: February 2022 PINS Ref: EN010118
Figure 13-5

AECOM

60640215-1013-TRA-109



1:250 @ A3

AECOM

60640215-1013-TRA-110

Longfield Solar Farm
Environmental Statement - Estimated Extent of Carriageway Widening - Wheelers Hill Pinchpoint
APFP Regulation: 5(2)(a)
Project No.: 60640215 Date: February 2022 PINS Ref: EN010118
Figure 13-5

Contains Ordnance Survey data © Crown copyright and database right 2020

Last saved by: CHRIS.BURLTON(2022-02-02) Last Plotted: 2022-02-02
Filename: \\CM-MAN-002.SCOTTWILSON.CO.UK\CTB_CHE_ENG\TRANSPORT CONSULTANCY PROJECTS\JOB FOLDERS_60\60640215 - LONGFIELD SOLAR FARM\900 - CAD_GIS\LONGFIELD SOLAR FARM - DETAILED DRAWINGS (ES FIGURES) - 010222.DWG
Project Management Initials: Designer: WR Checked: CB Approved: MW ISO A3 297mm x 420mm

Appendix L – Noakes Lane Crossing Points

N

Noake's Farm

Drain

Def

Pond

Pond

HEAKES LANE

es House

tage

WITHIN ORDER LIMITS

CR

Co Const, CP & ED Bdy

Pond

55.2m

57.3m

OUTSIDE ORDER LIMITS

WITHIN ORDER LIMITS

Path (um)

Pond

The Headlands

Pond

56.1m

Bird's Farm Cottage

Pond

Pond

Und Track

LEGEND

- ORDER LIMITS
- INDICATIVE PRIMARY ACCESS TRACK
- INDICATIVE SECONDARY ACCESS TRACK
- INDICATIVE FENCING
- JUNCTION VISIBILITY SPLAYS (2.4M X 90M)
- AREA TO BE KEPT CLEAR OF VEGETATION

Contains Ordnance Survey data © Crown copyright and database right 2020

1:2000 @ A3

AECOM

60640215-1013-TRA-054

Longfield Solar Farm
Proposed Construction Route Crossing Points on Noakes Lane
APFP Regulation: 5(2)(a)
Project No.: 60640215 Date: February 2022 PINS Ref: EN010118

Project Management Initials: Designer: CB Checked: WR Approved: MW ISO A3 297mm x 420mm
Last saved by: CHRIS.BURLTON(2022-02-10) Last Plotted: 2022-02-10
Filename: \\CM-MAN-002\CTB_CHE_ENG\TRANSPORT CONSULTANCY PROJECTS\JOB FOLDERS_606\60640215 - LONGFIELD SOLAR FARM\900 - CAD_GIS\LONGFIELD SOLAR FARM - DETAILED DRAWINGS - 010222.DWG

Appendix M – Abnormal Load Route Survey

Pell Frischmann

Longfield Solar Farm

Abnormal Load Route Survey

November 2022

106657

This report is to be regarded as confidential to our Client and is intended for their use only and may not be assigned except in accordance with the contract. Consequently, and in accordance with current practice, any liability to any third party in respect of the whole or any part of its contents is hereby expressly excluded, except to the extent that the report has been assigned in accordance with the contract. Before the report or any part of it is reproduced or referred to in any document, circular or statement and before its contents or the contents of any part of it are disclosed orally to any third party, our written approval as to the form and context of such a publication or disclosure must be obtained.

Report Ref.	**Document1**					
File Path	**Document1**					
Rev	**Suit**	**Description**	**Date**	**Originator**	**Checker**	**Approver**
01		Draft	16/09/2022	Gordon Buchan	Timothy Lockett	Gordon Buchan
02		Issue	02/11/2022	Gordon Buchan	Timothy Lockett	Gordon Buchan

Ref. reference. Rev revision. Suit suitability.

Prepared for

Longfield Solar Farm Limited

Alexander House, 1 Mandarin Road
Rainton Bridge Business Park
Houghton Le Spring
Sunderland
DH4 5RA

Prepared by

Pell Frischmann

93 George Street
Edinburgh
EH2 3ES

Pell Frischmann

Contents

1 Introduction 1
2 Site Description & Locations 2
2.1 Proposed Development 2
2.2 AIL Vehicles 2
3 Access Route Review 4
3.1 Access Options 4
3.2 Routes Description 5
3.3 Swept Path Assessment Results and Summary 15
3.4 Land Ownership 16
3.5 Weight Review 16
3.6 Summary Issues 16
4 Summary 17
4.1 Summary of Access Review 17

Figures

Figure 1 Site Location 2
Figure 2 Example Transformer Load Transporter 3
Figure 3 Access Options 4

Tables

Table 1 Route Constraints: Route Option 1 5
Table 2 Route Constraints: Route Option 2 12
Table 3: ESDAL Consultees 16

Appendices

Appendix A Points of Interest
Appendix B Swept Path Assessment Drawings

1 Introduction

Pell Frischmann (PF) has been commissioned by Longfield Solar Farm Limited (LSFL) to undertake a survey of the delivery route for Abnormal Indivisible Loads (AIL) associated with the construction and development of Longfield Solar Farm, located to the northeast of Chelmsford, Essex.

The Route Survey Report (RSR) has been prepared to help inform LSFL on the likely issues associated with the development of the site with regards to on-site transport and access for AIL traffic. The report identifies the key issues associated with AIL deliveries from the A12 to site and notes that remedial works, either in the form of physical works or as traffic management interventions, will be required to accommodate the predicted loads.

The detailed assessment and subsequent designs of any remedial works are beyond the agreed scope of works between PF and LSFL at this point in time.

It is the responsibility of the equipment supplier to ensure that the entirety of the proposed access route is suitable and meets with their satisfaction. The equipment supplier will be responsible for ensuring that the finalised proposals meet with the appropriate levels of health and safety consideration for all road users and has been made in accordance with the relevant legislation at the time of delivery.

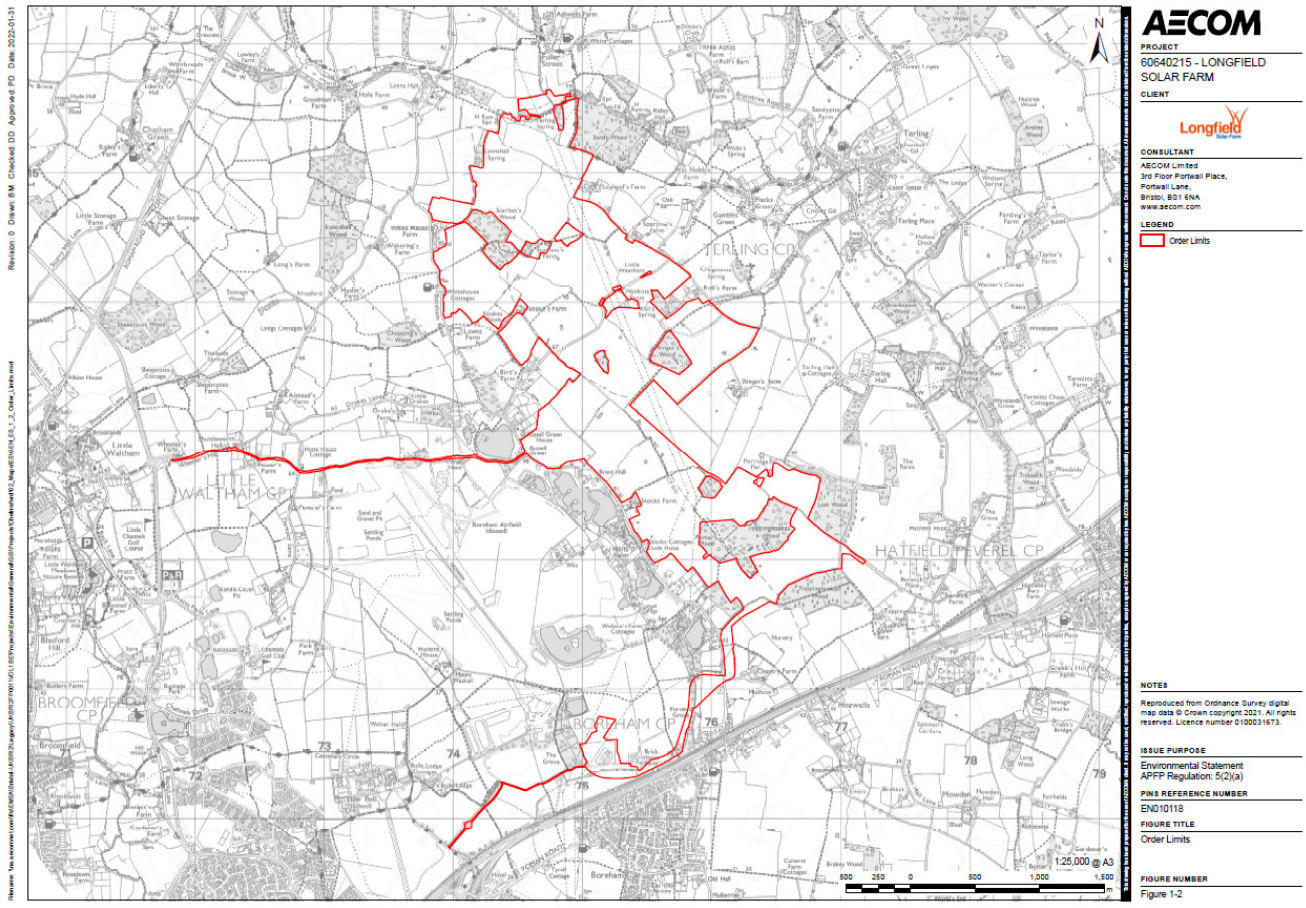
2 Site Description & Locations

2.1 Proposed Development

The proposed development site is a large solar energy farm co-located with battery storage on farmland north east of Chelmsford and north of the A12 between Boreham and Hatfield Peverel, Essex.

The site is illustrated in Figure 1.

Figure 1 Site Location



The transport and access arrangements for the site have been considered in detail in the Transport and Access Chapter for the Environmental Impact Assessment.

Construction access to the site has been reviewed and would be from the west via Wheeler's Hill and Channels Drive from A130. These two roads connect to the A130 which provides access to the south to the A12 at Chelmsford or to the A120 at Braintree.

To allow the proposed solar farm to connect to the national electrical grid, new transformers will be required. These transformers will be located within the site and due to their size and weight are classified as Abnormal Indivisible Loads (AIL).

2.2 AIL Vehicles

Details of the proposed transformer loads and transporters were provided by Longfield Solar Farm Limited. The proposed transformers are transported with some of the cooling oil removed and replaced by nitrogen to lower the weight.

The proposed components have yet to be selected through a commercial tendering process. A candidate transformer has therefore been used to provide a worst case assessment.

The candidate transformers are 165 MVA with a maximum transport weight of 155 tonnes. The loads would be a maximum of 9m in length by 3.5m in width by 4m in height. These represent a worst case load and are likely to reduce in scale when the site is constructed.

To transport loads such as these, two trailer options are available;

- A modular flat deck trailer that is either self-propelled or towed; or
- A girder frame trailer, where the load sits in frame carried between two bolsters bogies.

The longest, heaviest and widest transport solution is the girder frame trailer and this has been used in the following assessment, based upon details provided by the client from a similar load.

The proposed transformer vehicle would have eight axle bogies to support the girder frame at either end. AN example trailer is illustrated in Figure 2.

Figure 2 Example Transformer Load Transporter



The combined weight of the trailer when loaded is 251 tonnes, with an axle loading of 15.6 tonnes (125.5 tonnes per bogie bolster).

Various road improvements would be required to enable access. These enhancements are noted in the following sections, however no detailed design options have been undertaken as yet. These would generally be progressed once the client has selected their final preferences for equipment.

The access options have only considered access to the site boundary. Access within the site has not been considered.

3 Access Route Review

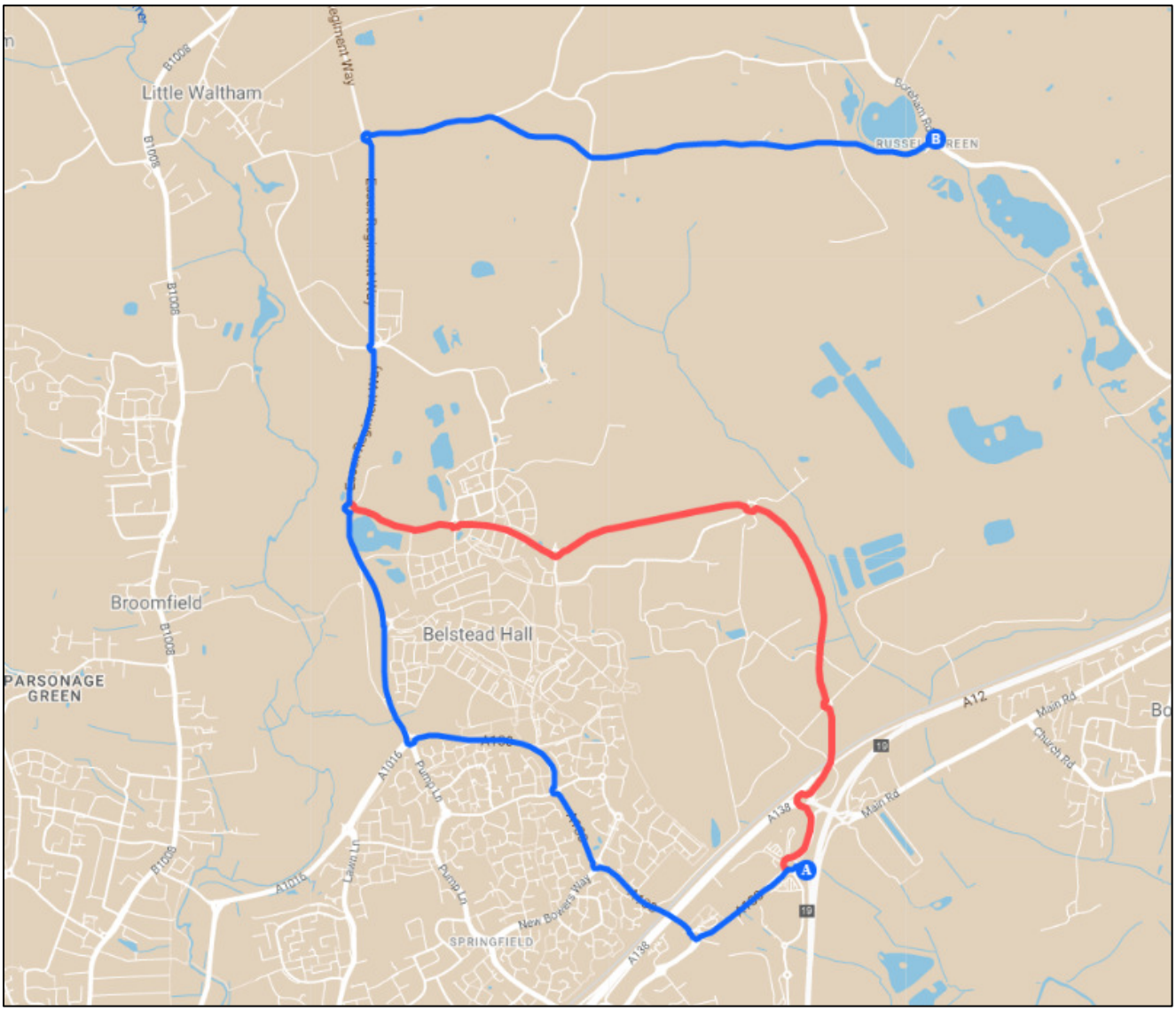
3.1 Access Options

Two access options from the A12 have been considered. These are:

- Option 1 (Blue) from Boreham Interchange to site via the A130; and
- Option 2 (Red) from Boreham Interchange to site via Beaulieu Parkway. Option 2 uses a yet to be completed bridge link over the A12 into the new Beaulieu Estate. This option would be considered should the new access route be completed in time for transformer delivery. It shares the final section of Option 1 of the A130 and Wheeler's Hill to access the site.

Both access options have been reviewed on site to assess their feasibility for use. The two options are illustrated in Figure 3.

Figure 3 Access Options



A site visit to review both access options was undertaken by Pell Frischmann in September 2022. The access review considered various access route options to each site, with access coming from the A12 corridor. No wider access back from the A12 was considered at this point in time as the Port of Entry (PoE) for the loads has not yet been determined.

The site visit was undertaken using an HD video camera and a GPS tracker to ensure that all Points of Interest (POI) were carefully noted.

3.2 Routes Description

The following locations were identified from the site review and are detailed in Table 1 for Route Option 1 and Table 2 for Route Option 2. Plans illustrating the location of the constraints and a detailed list of POI are provided in Appendix A.

Table 1 Eirlys Route Constraints - Option 1

POI	Key Constraint	Details
1	**A12 Boreham Interchange** 	Loads would depart the A12 at Boreham Interchange. For Route Option 1, loads would take the second exit at the roundabout. A swept path assessment has been undertaken and is presented in Appendix B. Loads will require access to all lanes on the approach, circulating and exit from the junction. No physical mitigation works are required to accommodate the proposed loads.
2	**A130 / Colchester Road Junction** 	Loads will take the third exit at the roundabout and will proceed northbound on the A130. A swept path assessment has been undertaken and is presented in Appendix B. Loads will require access to all lanes on the approach, circulating and exit from the junction. No physical mitigation works are required to accommodate the proposed loads.
3	**A130 Road & Rail Bridge** 	Loads will proceed over the combined road and railway bridge. The load running height will need to be increased to improve clearances over the vertical alignment of the road. Following the bridge, the loads will be returned to their normal running height.

POI	Key Constraint	Details
4	**A130 / The Avenue Junction** 	Loads will proceed ahead on the A130, passing through the junction. A swept path assessment has been undertaken and is presented in Appendix B. Loads will over-run the central divide at the junction where a load bearing surface will need to be laid. Two bollards, one lighting column and one road sign will need to be removed. Loads will oversail the southern verge where pedestrian should be held back during deliveries. Low overhead utilities were noted at this location and clearance to these should be confirmed once the selected haulier has been appointed. A 5m clear head height is required.
5	**A130 / New Bowers Way Roundabout** 	Loads will proceed ahead at the roundabout, taking the second exit. To reduce the need for intrusive works, loads will undertake a contraflow transit of the junction under police control. A swept path assessment has been undertaken and is presented in Appendix B. Loads will oversail the central island of the junction and the northern verge of the exit lane. No physical mitigation is required.
6	**A130 Tree Canopy** 	The tree canopy along the A130 will need to be trimmed to provide a clear 5m head height. Trimming works can be subject to ecological constraints and it is recommended that early engagement with Essex County Council is undertaken prior to deliveries commencing.
7	**A130 / New Nabbotts Way Roundabout** 	Loads will proceed ahead at the roundabout, taking the second exit. To reduce the need for intrusive works, loads will undertake a contraflow transit of the junction under police control. A swept path assessment has been undertaken and is presented in Appendix B. Loads will oversail the central island of the junction where one chevron and one road sign should be relocated.

POI	Key Constraint	Details
8	**A130 / Centenary Way Junction** 	Loads will continue ahead on the A130 at the junction. The central reserve does not appear on OS plans and as such, no swept path drawing has been prepared. Loads will over-run the central island where a load bearing surface will be required. Two bollards will need to be removed. The tree canopy at this location will need to be trimmed to provide a clear 5m head height. Trimming works can be subject to ecological constraints and it is recommended that early engagement with Essex County Council is undertaken prior to deliveries commencing.
9	**A130 / Beaulieu Construction Access** 	Loads will continue ahead on the A130 at the junction. The cones in the centre of the road should be removed prior to loads moving.
10	**A130 / A1016 Roundabout** 	Loads will turn right at the junction, taking the third exit. To reduce the need for intrusive works, loads will undertake a contraflow transit of the junction under police control. A swept path assessment has been undertaken and is presented in Appendix B. No physical mitigation works are required to accommodate the proposed loads.
11	**A130 / Regiment Gate Roundabout** 	Loads will continue ahead on the A130 at the junction, taking the first exit. The current junction does not appear on OS plans. To review access, an aerial photograph has been used. The subsequent swept path assessment has been undertaken and is presented in Appendix B. No physical mitigation works are required to accommodate the proposed loads. A review of this junction once the appropriate OS data is available is recommended, once the haulier has confirmed the actual vehicle to be used for deliveries.

POI	Key Constraint	Details
12	**A130 / Channels Drive Roundabout** 	Loads will continue ahead on the A130 at the junction, taking the first exit. The current junction does not appear on OS plans. To review access, an aerial photograph has been used. The subsequent swept path assessment has been undertaken and is presented in Appendix B. Loads will oversail the western edge of the central island. No physical mitigation works are required to accommodate the proposed loads. A review of this junction once the appropriate OS data is available is recommended, once the haulier has confirmed the actual vehicle to be used for deliveries.
13	**A130 Overhead Utilities and Tree Canopy** 	The tree canopy along the A130 will need to be trimmed to provide a clear 5m head height. Trimming works can be subject to ecological constraints and it is recommended that early engagement with Essex County Council is undertaken prior to deliveries commencing. Low overhead utilities were noted at this location and clearance to these should be confirmed once the selected haulier has been appointed. A 5m clear head height is required.
14	**A130 / Chelmer P&R Roundabout** 	Loads will proceed ahead at the roundabout, taking the second exit. A swept path assessment has been undertaken and is presented in Appendix B. Loads will oversail the central island of the junction where one chevron sign shod be relocated.
15	**A130 Overhead Utilities** 	Low overhead utilities were noted at this location and clearance to these should be confirmed once the selected haulier has been appointed. A 5m clear head height is required.

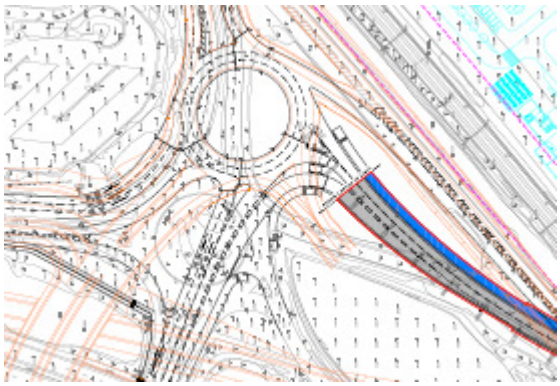
POI	Key Constraint	Details
16	**A130 / Wheeler's Hill Roundabout** 	Loads will turn right at the junction, taking the third exit. To reduce the need for intrusive works, loads will undertake a contraflow transit of the junction under police control. A swept path assessment has been undertaken and is presented in Appendix B. To accommodate the loads, vegetation on the inside of the junction should be cut back. Trimming works can be subject to ecological constraints and it is recommended that early engagement with Essex County Council is undertaken prior to deliveries commencing.
17	**Wheeler's Hill** 	A continuous swept path assessment of Wheeler's Hill has been undertaken and is presented in Appendix B. The load remains within the roadway area identified by Aecom as part of their wider road review for the Solar Farm and the load can be accommodated within the current or proposed road widening sections of the road. Low overhead utilities were noted at this location and clearance to these should be confirmed once the selected haulier has been appointed. A 5m clear head height is required.
18	**Wheeler's Hill Overhead Utilities** 	Low overhead utilities were noted at this location and clearance to these should be confirmed once the selected haulier has been appointed. A 5m clear head height is required.
19	**Wheeler's Hill Tree Canopy** 	The tree canopy along Wheeler's Hill will need to be trimmed to provide a clear 5m head height. Trimming works can be subject to ecological constraints and it is recommended that early engagement with Essex County Council is undertaken prior to deliveries commencing. Low overhead utilities were noted at this location and clearance to these should be confirmed once the selected haulier has been appointed. A 5m clear head height is required.

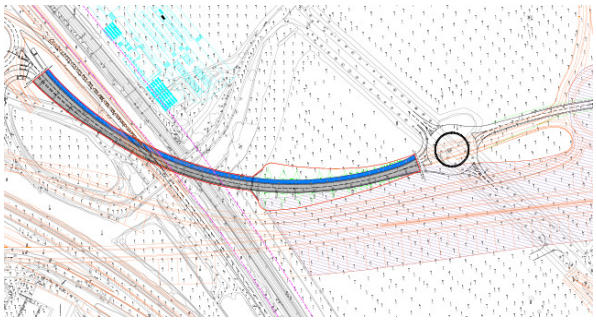
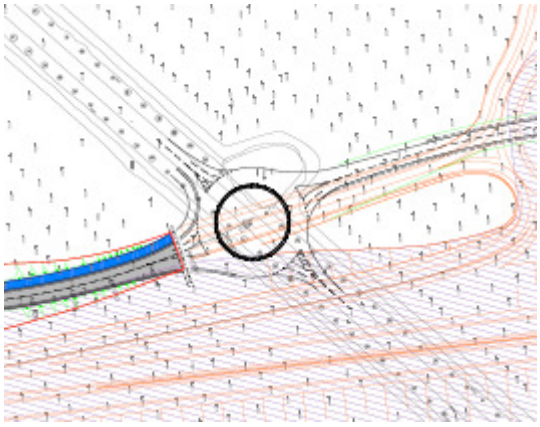
POI	Key Constraint	Details
20	**Wheeler's Hill Tree Canopy 2** 	The tree canopy along Wheeler's Hill will need to be trimmed to provide a clear 5m head height. Trimming works can be subject to ecological constraints and it is recommended that early engagement with Essex County Council is undertaken prior to deliveries commencing.
21	**Wheeler's Hill Vegetation** 	The tree canopy and verge vegetation along Wheeler's Hill will need to be trimmed to provide a clear 5m head height and to improve edge clearances over the adopted road verge. Trimming works can be subject to ecological constraints and it is recommended that early engagement with Essex County Council is undertaken prior to deliveries commencing.
22	**Wheeler's Hill Overhead Utilities** 	Low overhead utilities were noted at this location and clearance to these should be confirmed once the selected haulier has been appointed. A 5m clear head height is required.
23	**Cranham Road Tree Canopy** 	A continuous swept path assessment of Cranham Road has been undertaken and is presented in Appendix B. The load remains within the roadway area identified by Aecom as part of their wider road review for the Solar Farm and the load can be accommodated within the current or proposed road widening sections of the road. The tree canopy and verge vegetation along the road will need to be trimmed to provide a clear 5m head height and to improve edge clearances over the adopted road verge. Trimming works can be subject to ecological constraints and it is recommended that early engagement with Essex County Council is undertaken prior to deliveries commencing.

POI	Key Constraint	Details
24	**Cranham Road Tree Canopy** 	The tree canopy and verge vegetation along Cranham Road will need to be trimmed to provide a clear 5m head height and to improve edge clearances over the adopted road verge. Trimming works can be subject to ecological constraints and it is recommended that early engagement with Essex County Council is undertaken prior to deliveries commencing.
25	**Cranham Road Overhead Utilities** 	Low overhead utilities were noted at this location for two sets of overhead utilities and clearance to these should be confirmed once the selected haulier has been appointed. A 5m clear head height is required.
26	**Cranham Road Overhead Utilities** 	Low overhead utilities were noted at this location and clearance to these should be confirmed once the selected haulier has been appointed. A 5m clear head height is required.
27	**Cranham Road Overhead Utilities** 	Low overhead utilities were noted at this location and clearance to these should be confirmed once the selected haulier has been appointed. A 5m clear head height is required.

POI	Key Constraint	Details
28	**Craham Road to the West of the Site** 	Low overhead utilities were noted at this location and clearance to these should be confirmed once the selected haulier has been appointed. A 5m clear head height is required.
29	**AIL Site Access Junction** 	An AIL access is proposed opposite Cranham Road. A swept path assessment has been undertaken and is presented in Appendix B. Loads will over-run the junction splitter island where a load bearing surface is required. One telephone pole, one direction sign and one road sign should be removed. Loads will travel into the site and will then proceed to the substation site via private access tracks.

Table 2 Route Option 2

POI	Key Constraint	Details
1	**Boreham Interchange** 	Loads would depart the A12 at Boreham Interchange and would take the fourth exit onto the A130 eastbound. A swept path assessment has been undertaken and is presented in Appendix B. Loads will require access to all lanes on the approach, circulating and exit from the junction. No physical mitigation works are required to accommodate the proposed loads.
30	**New Roundabout leading to Beaulieu Parkway** 	Loads will take the third exit at the upgraded junction. An indicative alignment has been indicated on the swept path drawings in Appendix B. No physical mitigation works are required to accommodate the proposed loads, although this should be confirmed once the junction works and connecting bridge are completed in full.

POI	Key Constraint	Details
31	**Beaulieu Parkway Bridge**  	Loads will cross the A138 and railway via a new bridge, currently under construction.
32	**Beaulieu Parkway South Roundabout** 	Loads will proceed ahead at the roundabout, taking the second exit. A swept path assessment has been undertaken and is presented in Appendix B. The assessment has been based upon drawings of the proposed road network and should be repeated once the road is complete to ensure that al mitigation has been confirmed. Loads will oversail the central island of the junction where one chevron sign should be relocated. Loads will also oversail the western verge of the entry arm, although no physical works are required.
33	**Beaulieu Parkway Signalised Junction** 	Loads will pass through the traffic signalised junction, proceed northbound. A swept path assessment has been undertaken and is presented in Appendix B. This indicates that the southern central island will be over-run, requiring the removal of the traffic signal and bollard.

POI	Key Constraint	Details
34	**Beaulieu Parkway / Remembrance Way Roundabout** 	Loads will proceed ahead at the roundabout, taking the third exit. A swept path assessment has been undertaken and is presented in Appendix B. Loads will also oversail the southern verge of the entry arm, where one road sign should be relocated. They will then oversail the central island of the junction, however no physical mitigation works are required.
35	**Beaulieu Parkway / Commonwealth Link Roundabout** 	Loads will proceed ahead through the junction, taking the second exit. To reduce the need for intrusive works, loads will undertake a contraflow transit of the junction under police control. A swept path assessment has been undertaken and is presented in Appendix B. One chevron sign on the northern verge of the central island should be relocated.
36	**Beaulieu Parkway / Albatross Way Roundabout** 	Loads will proceed ahead at the roundabout, taking the second exit. A swept path assessment has been undertaken and is presented in Appendix B. Loads will also oversail and over-run the southern verge of the entry arm, where a load bearing surface should be provided and underground utilities protected. The southern pedestrian call post and signal in advance of the junction should also be removed to improve clearances in advance of the junction. Loads will then oversail the central island of the junction, where one chevron sign should be relocated.
37	**Channels Drive / Lakeview Crescent Junction** 	Loads will proceed ahead through the junction. To reduce the need for intrusive works, loads will undertake a contraflow transit of the junction under police control. A swept path assessment has been undertaken and is presented in Appendix B. One lighting column and one road sign in the northern verge should be relocated. One bollard in the central island of the junction should be removed.

POI	Key Constraint	Details
38	**Channels Drive Gradient** 	Loads will need to proceed at caution on the down gradient at this location.
12	**A130 / Channels Drive Roundabout** 	Loads will turn right at the junction, taking the second exit. To reduce the need for intrusive works, loads will undertake a contraflow transit of the junction under police control. A swept path assessment has been undertaken and is presented in Appendix B. No physical works are required ta the junction.

3.3 Swept Path Assessment Results and Summary

The detailed swept path drawings for the locations assessed are provided in Appendix B and illustrate tracking undertaken for the worst-case loads.

The colours illustrated on the swept paths are:

- Grey / Black – OS / Topographical Base Mapping;
- Green – Vehicle body outline (body swept path);
- Red – Tracked pathway of the wheels (wheel swept path); and
- Purple – The over-sail tracked path of the load where it encroaches out with the trailer (load swept path).

Where mitigation works are required, the extents of over-run and over-sail areas are illustrated on the swept path drawings.

Please note that where assessments have been undertaken using Ordnance Survey (OS) base mapping, there can be errors in the data source. The available OS mapping does not identify the road edge through some sections. An indicative road edge has been provided for illustration only and should be confirmed through a test run or the completion of a topographical survey at these locations.

There are sections of this route where there is no available OS data. In these areas, aerial photography has been used. Reassessment of these areas should be undertaken once more accurate data becomes available.

Where provided by the client, topographical data has been utilised. Please note that PF cannot accept liability for errors on the data source, be that OS base mapping or client supplied data.

3.4 Land Ownership

The limits of road adoption can vary depending upon the location of the site and the history of the highway agency. The adopted area is generally defined as land contained within a defined boundary where the road agency holds the maintenance rights for the land from the original landowner. In urban areas, this is usually defined as the area from the edge of the footway across the road to the opposing footway back edge.

In rural areas the area of adoption can be open to greater interpretation as defined boundaries may not be readily visible. In these locations, the general rule is that the area of adoption is between established fence / hedge lines or a maximum 2m from the road edge. This can vary between areas and location.

3.5 Weight Review

A weight review has been undertaken via the ESDAL (Electronic Service Delivery for Abnormal Loads) contacts database using the National Highways website www.esdal.com.

All of the relevant ESDAL contacts are noted in Table 3, and all have been contacted to ascertain if there are any relevant constraints that should be noted.

Table 3: ESDAL Consultees

Organisation	Email Address
Essex County Council	[redacted]
Network Rail	AbLoadsESDAL[redacted]
Historic Rail Estate	[redacted]

3.6 Summary Issues

It is strongly suggested that following a review of the RSR, Longfield Solar Farm Limited should undertake the following prior to the delivery of the first abnormal loads, to ensure load and road user safety:

- Review the two access options and develop a preferred option with the road authorities;
- Review the construction progress of the new access bridge and junctions on Option 2;
- A revised review of axle loading on structures along the entire access route with the various road agencies is undertaken immediately prior to the loads being transported in case of last minute changes to structures;
- A review of clear heights with utility providers and the transport agencies along the route to ensure that there is sufficient space to allow for loads plus sufficient flashover protection (to electrical installations);
- That any verge vegetation and tree canopies which may foul loads is trimmed prior to loads moving;
- That a review of potential roadworks and or closures is undertaken once the delivery schedule is established in draft form;
- That a test run is completed to confirm the route and review any vertical clearance issues; and
- That a condition survey is undertaken to ascertain the extents of road defects prior to loads commencing to protect from spurious damage claims.

4 Summary

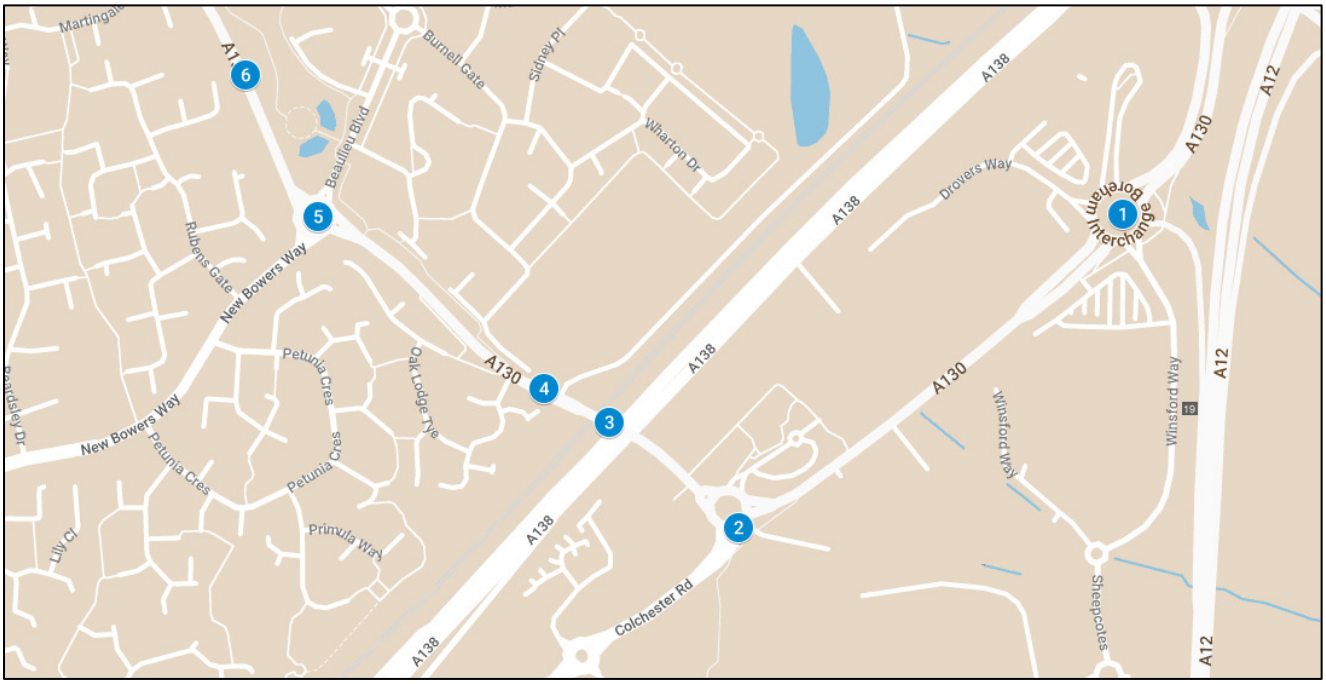
4.1 Summary of Access Review

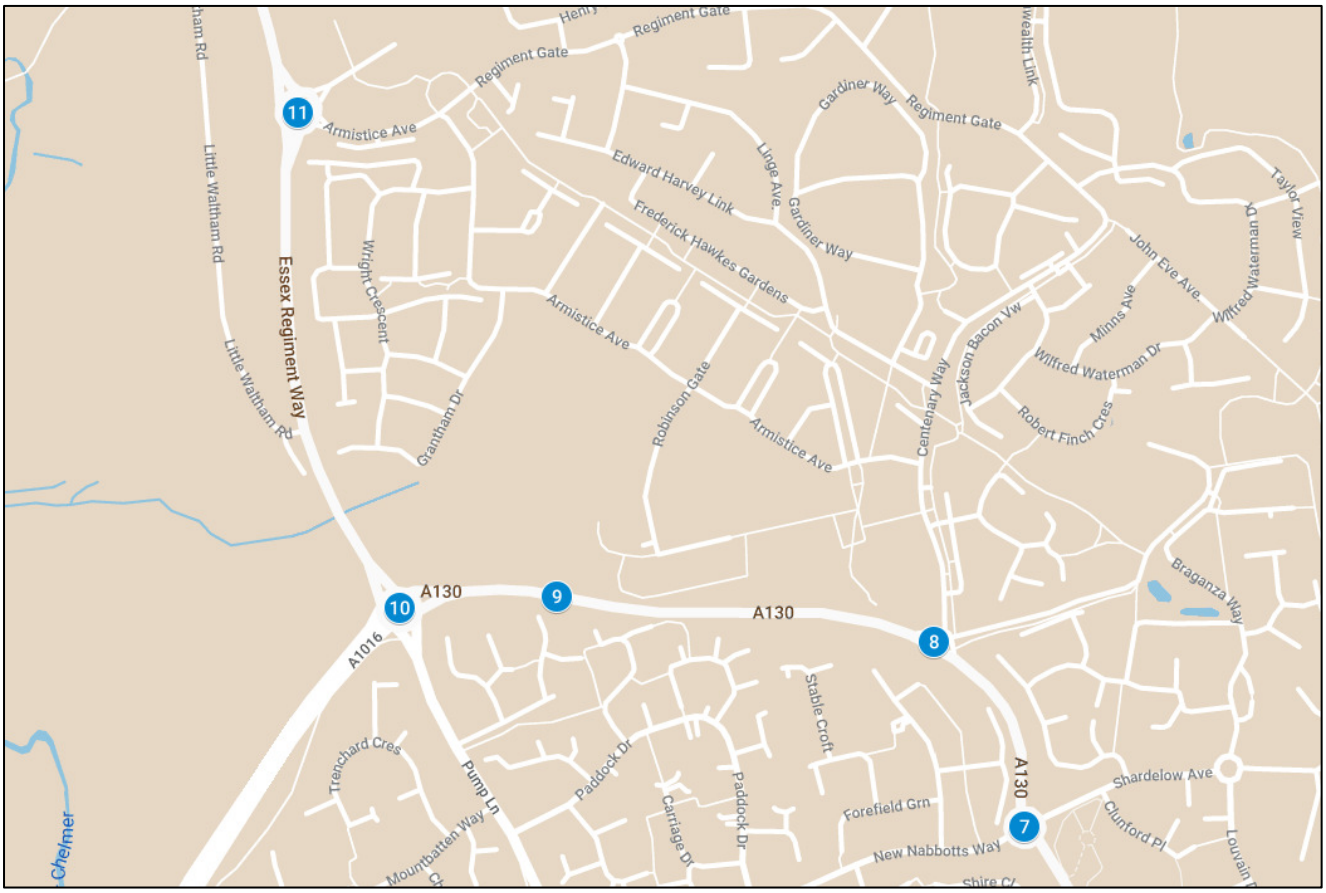
PF has been commissioned by Longfield Solar Farm Limited to prepare a Route Survey Report to examine the issues associated with the transport of transformer components to the development site from the A12.

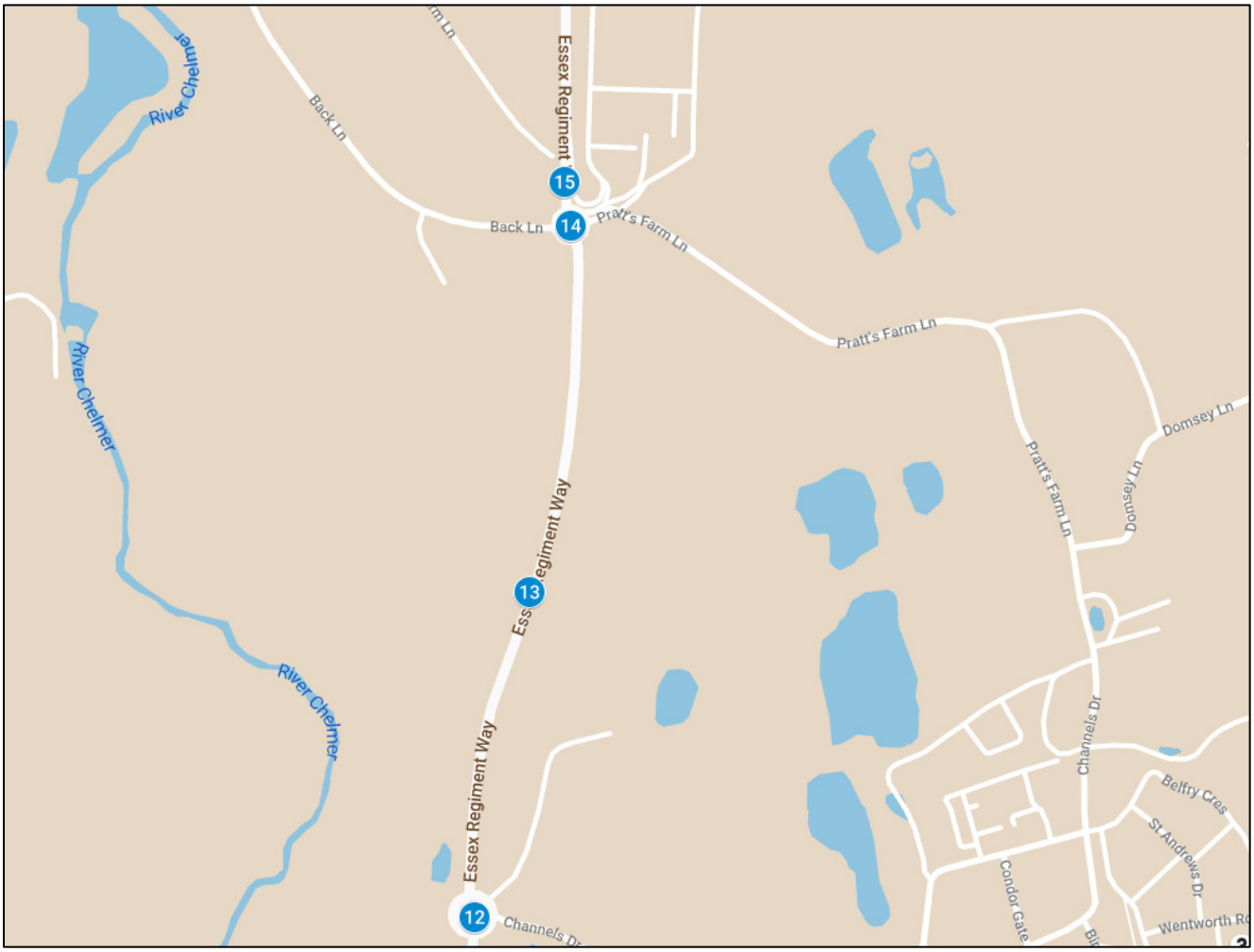
This report identifies the key points and issues associated with the proposed route and outlines the issues that will need to be considered for successful delivery of components.

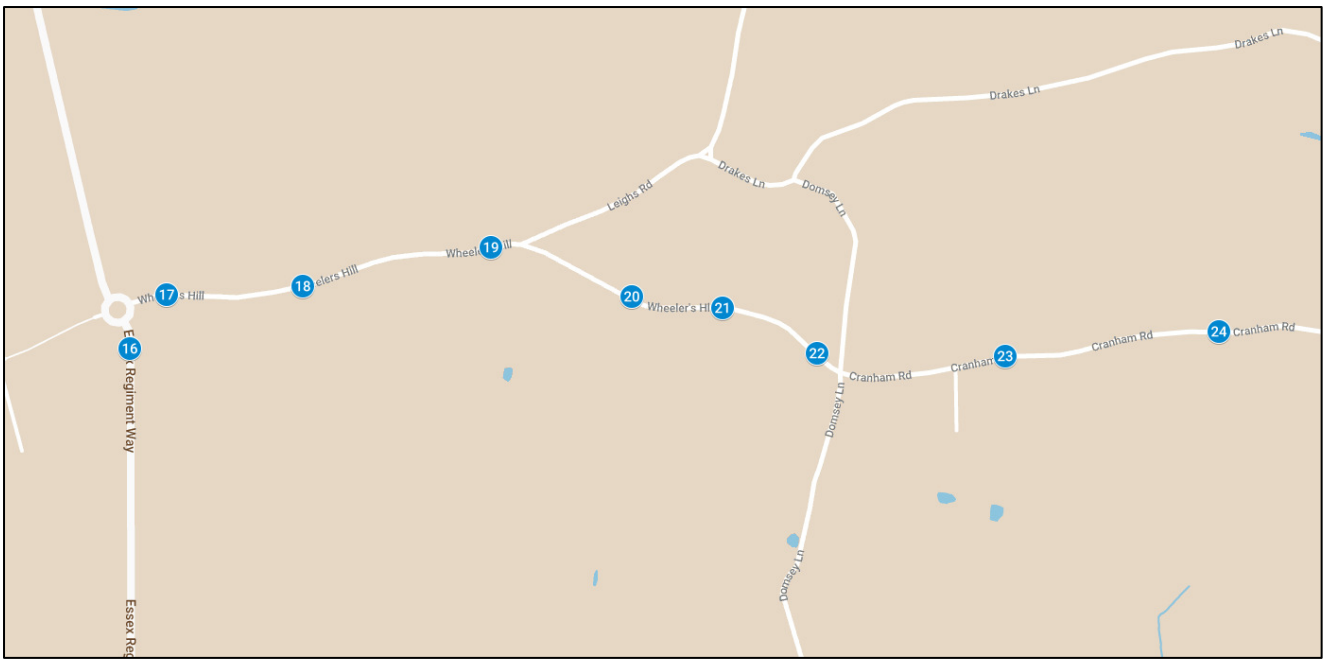
The report is presented for consideration to Longfield Solar Farm Limited. Various road modifications, structural reviews and interventions are required to successfully access the site. If these are undertaken, access to the proposed solar farm site is considered feasible.

Appendix A Points of Interest

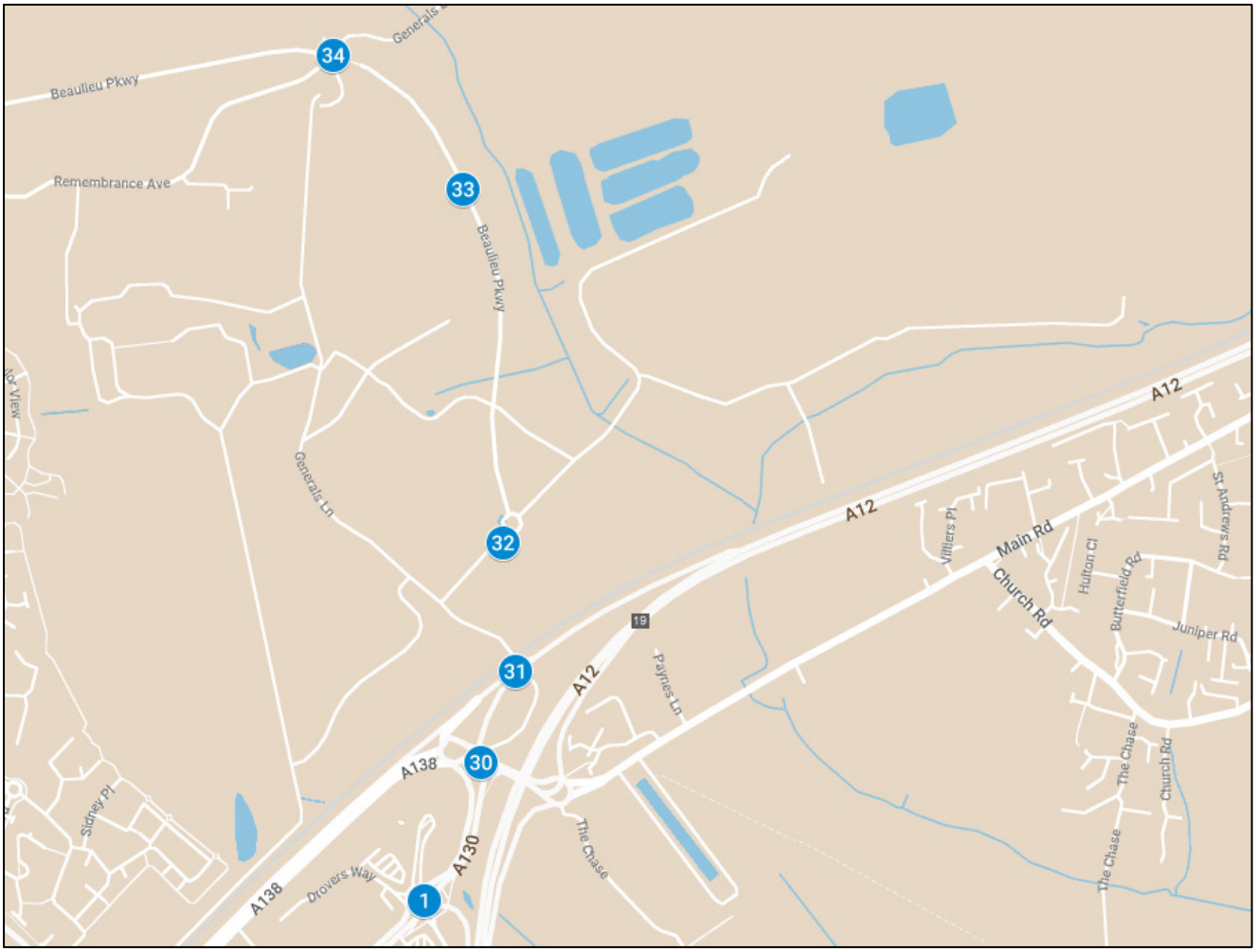

A1
Martingale
Burnell Gate
Sidney Pl
Beaufieu Blvd
Wharton Dr
A138
Drovers Way
A130
A12
Boreham Interchange
Rubens Gate
New Bowers Way
Petunia Cres
Oak Lodge Tve
A130
A138
Winsford Way
19
Beardsley Dr
Lily Cl
Primula Way
Colchester Rd
Sheepcotes
1
2
3
4
5
6


Regiment Gate
Armistice Ave
Gardiner Way
Edward Harvey Link
Linge Ave
Frederick Hawkes Gardens
Wealth Link
Taylor View
John Eve Ave
Wilfred Waterman Dr
Minns Ave
Jackson Bacon Vw
Centenary Way
Robert Finch Cres
Little Waltham Rd
Essex Regiment Way
Wright Crescent
Grantham Dr
Robinson Gate
Armistice Ave
A130
A1016
Braganza Way
Stable Croft
Trenchard Cres
Pump Ln
Paddock Dr
Carriage Dr
Forefield Grn
New Nabbotts Way
Shardelow Ave
Clunford Pl
Mountbatten Way
Chelmer
7
8
9
10
11


River Chelmer
Back Ln
Essex Regiment Way
15
Back Ln
14
Pratt's Farm Ln
Pratt's Farm Ln
Domsey Ln
Pratt's Farm Ln
Domsey Ln
River Chelmer
River Chelmer
13
Essex Regiment Way
Channels Dr
Belfry Cres
St Andrews Dr
Condor Gate
Wentworth Rd
12
Channels Dr


Drakes Ln
Drakes Ln
Drakes Ln
Leighs Rd
Domsey Ln
19
17
18
20
21
16
22
Cranham Rd
23
Cranham Rd
24
Cranham Rd
Domsey Ln
Domsey Ln
Essex Regiment Way

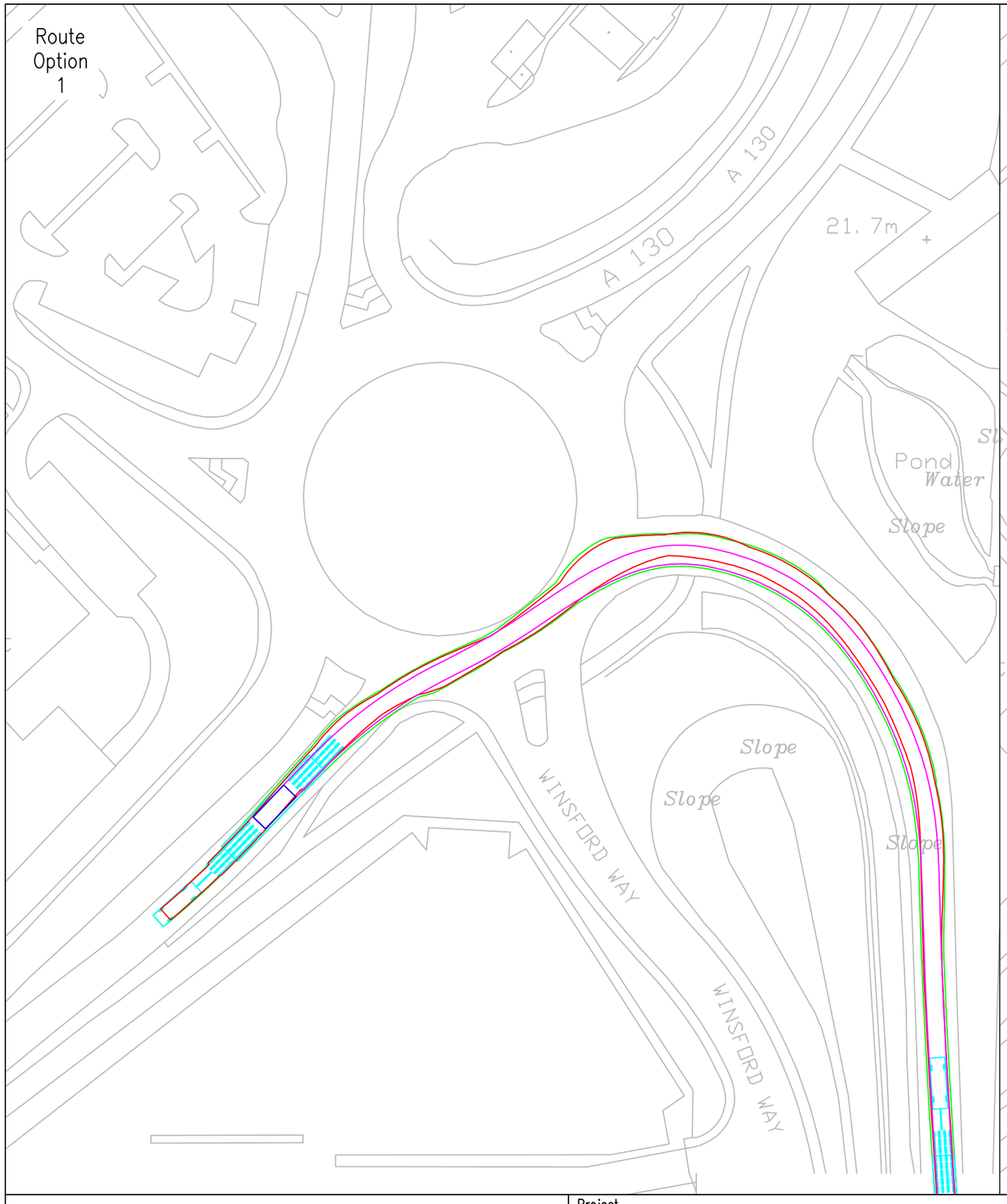

Cranham Rd
Cranham
Cranham Rd
Boreham Rd
25
27
26
28
29


Beaulieu Pkwy
Remembrance Ave
Beaulieu Pkwy
Generals Ln
A12
A12
Main Rd
Church Rd
Villiers Pl
Hulton Cl
Butterfield Rd
St Andrews Rd
Juniper Rd
Paynes Ln
A12
A138
A130
A138
Drovers Way
Sidney Pl
The Chase
The Chase
The Chase
Church Rd
19
34
33
32
31
30
1

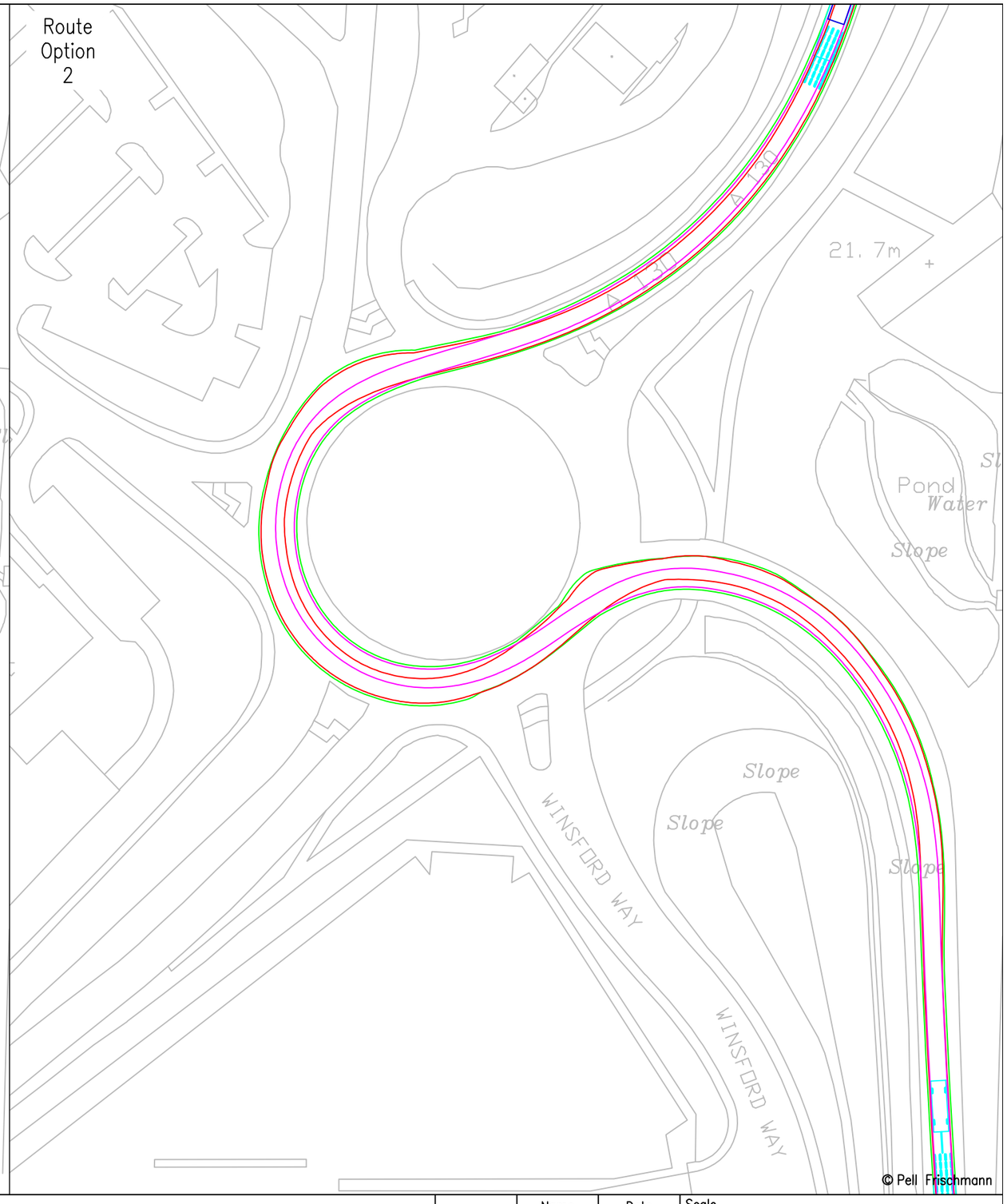

Essex Regiment Way
Channels Dr
Belfry Cres
St Andrews Dr
Condor Gate
Wentworth Rd
Bridie Cl
Fairway Dr
Jigger Gdns
Brassie Wood
Niblick Grn
Beaulieu Pkwy
Remembrance Ave
Centenary Wy
Walter Whybro Cres
Henry Shuttlewood Dr
Regiment Gate
Little Waltham Rd
Commonwealth
12
38
37
36
35

Appendix B Swept Path Assessment Drawings

Route Option 1



Route Option 2



© Pell Frischmann

Pell Frischmann
93 GEORGE STREET, EDINBURGH, EH2 3ES
Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: Longfield Solar Farm Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Longfield Solar Farm

Drawing Title: 165 MVA Transformer

SPA Location: Boreham Interchange

NO MITIGATION REQUIRED

	Name	Date
Drawn	GB	02/11/2022
Designed	TL	17/09/2022
Checked	GB	20/09/2022
Point of Interest		1

Scale: 1:1000 @ A3

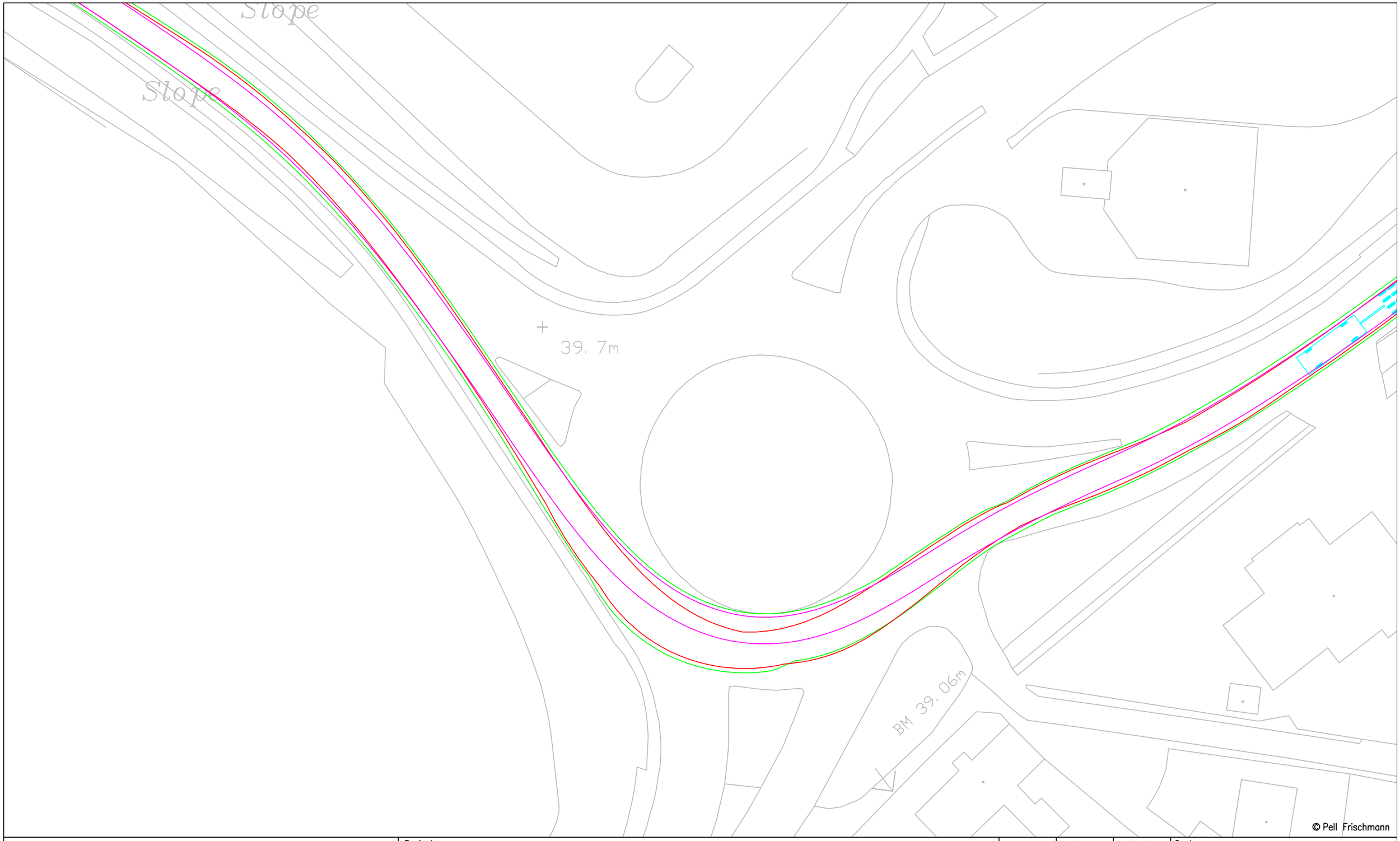
File No.: 220917 Longfield Tracking.dwg

Drawing Status: Draft

Drawing No.: SK01

Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: –



© Pell Frischmann

Pell Frischmann
93 GEORGE STREET, EDINBURGH. EH2 3ES
Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: Longfield Solar Farm Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Longfield Solar Farm

Drawing Title: 165 MVA Transformer

SPA Location: A130 / Colchester Road Roundabout

NO MITIGATION REQUIRED

	Name	Date
Drawn	GB	02/11/2022
Designed	TL	17/09/2022
Checked	GB	20/09/2022
Point of Interest		2

Scale: 1:500 @ A3

File No.: 220917 Longfield Tracking.dwg

Drawing Status: Draft

Drawing No.: SK02

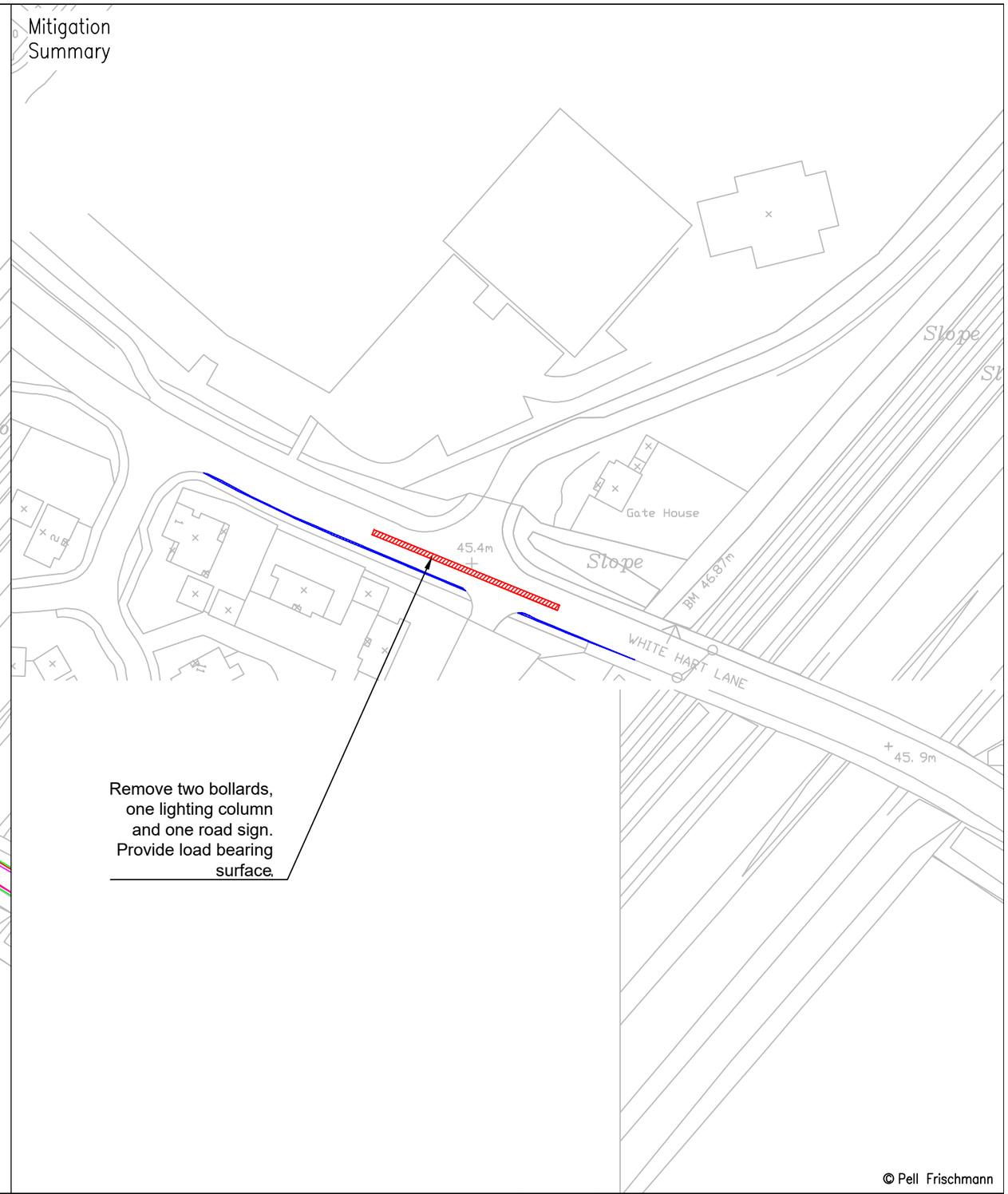
Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: –

Swept Path



Mitigation Summary



© Pell Frischmann

Pell Frischmann
93 GEORGE STREET, EDINBURGH, EH2 3ES
Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: Longfield Solar Farm Limited

Key: Wheel SPA; Body SPA; Load SPA; Indicative; Over-run; Over-sail

Project: Longfield Solar Farm

Drawing Title: 165 MVA Transformer

SPA Location: A130 / The Avenue Junction

	Name	Date
Drawn	GB	02/11/2022
Designed	TL	17/09/2022
Checked	GB	20/09/2022
Point of Interest		4

Scale: 1:1000 @ A3

File No.: 220917 Longfield Tracking.dwg

Drawing Status: Draft

Drawing No.: SK03

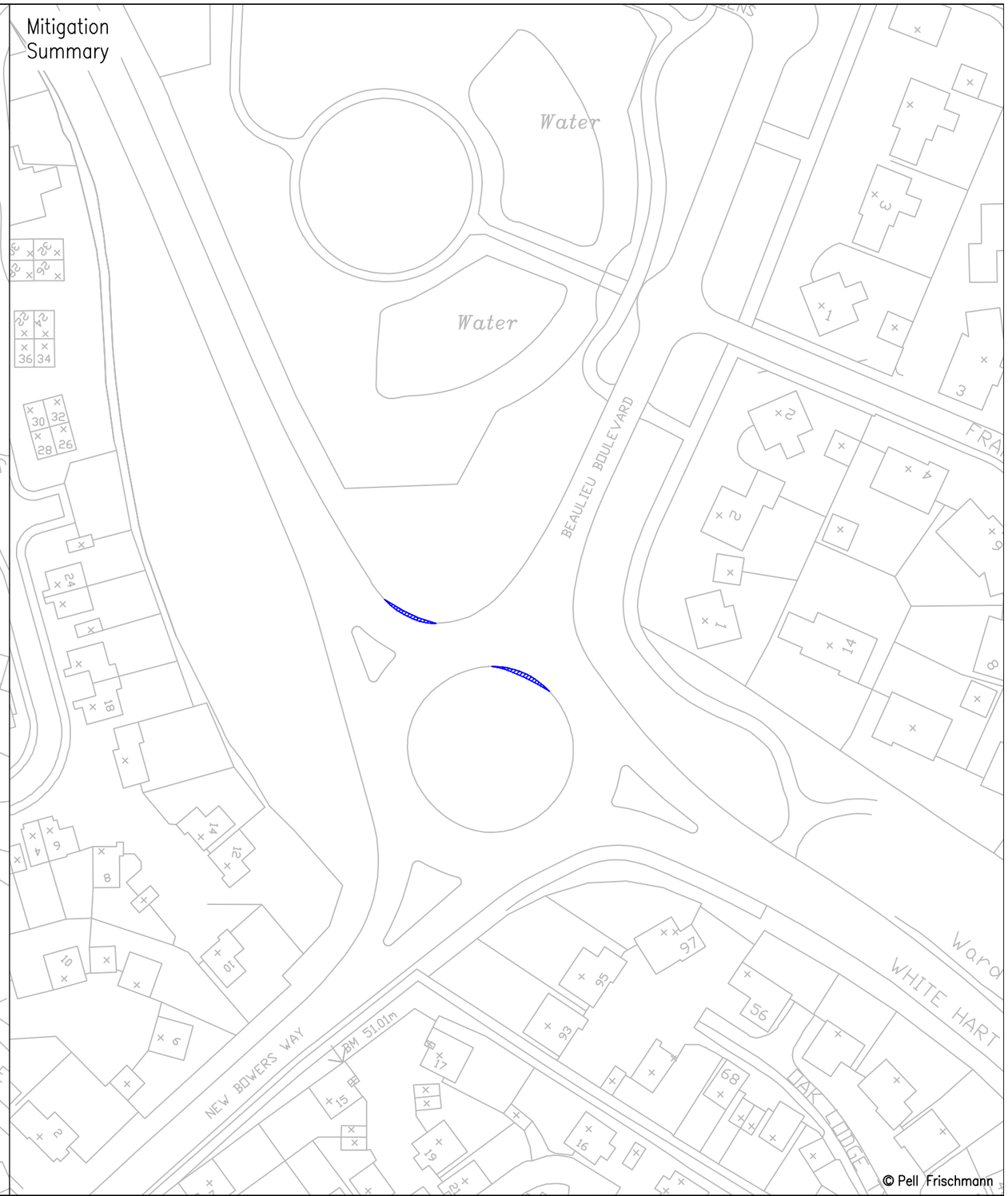
Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: –

Swept Path



Mitigation Summary



© Pell Frischmann

Pell Frischmann
93 GEORGE STREET, EDINBURGH, EH2 3ES
Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: Longfield Solar Farm Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Longfield Solar Farm

Drawing Title: 165 MVA Transformer

SPA Location: A130 / New Bowers Way Roundabout

	Name	Date
Drawn	GB	02/11/2022
Designed	TL	17/09/2022
Checked	GB	20/09/2022
Point of Interest		5

Scale: 1:1000 @ A3

File No.: 220917 Longfield Tracking.dwg

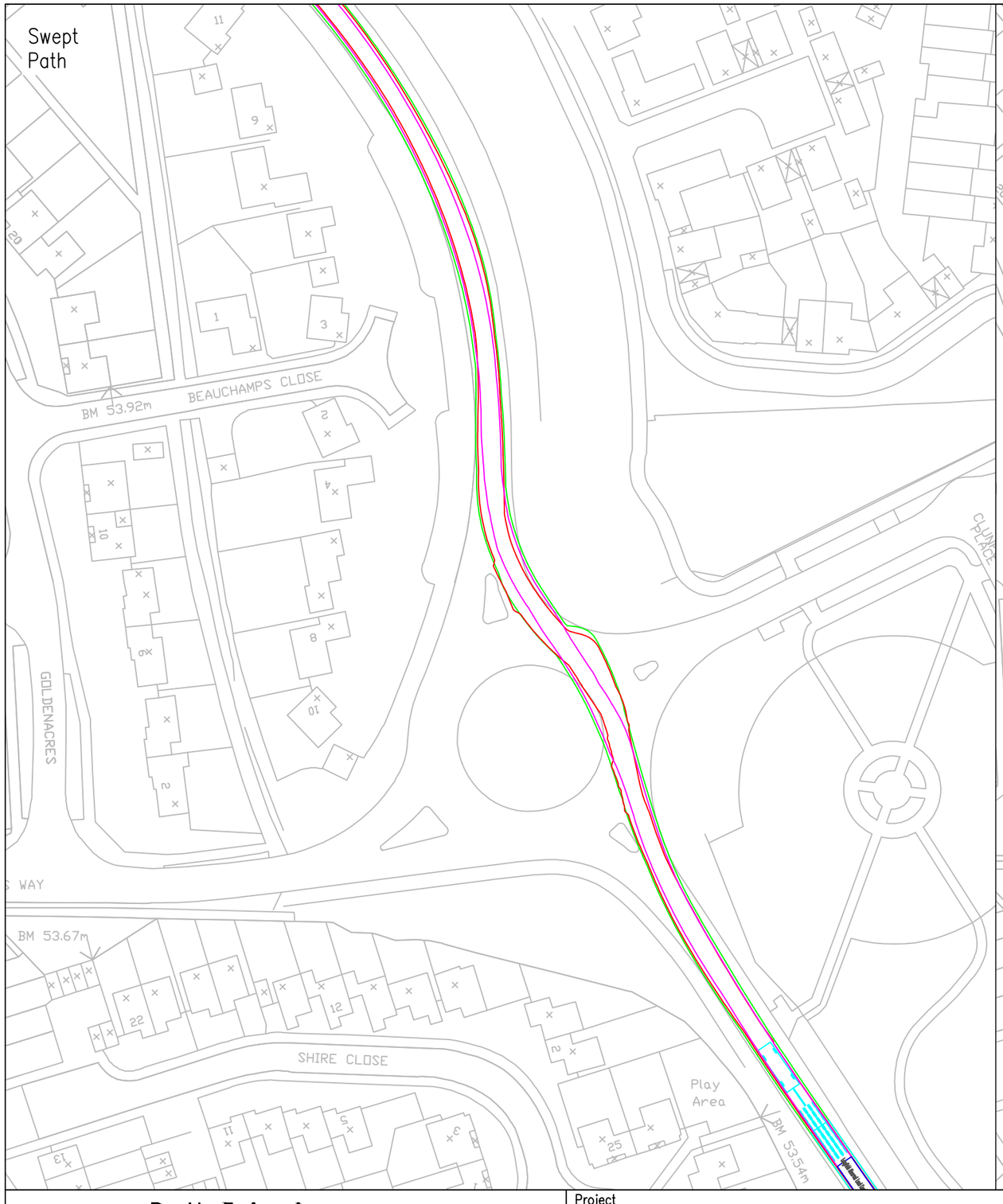
Drawing Status: Draft

Drawing No.: SK04

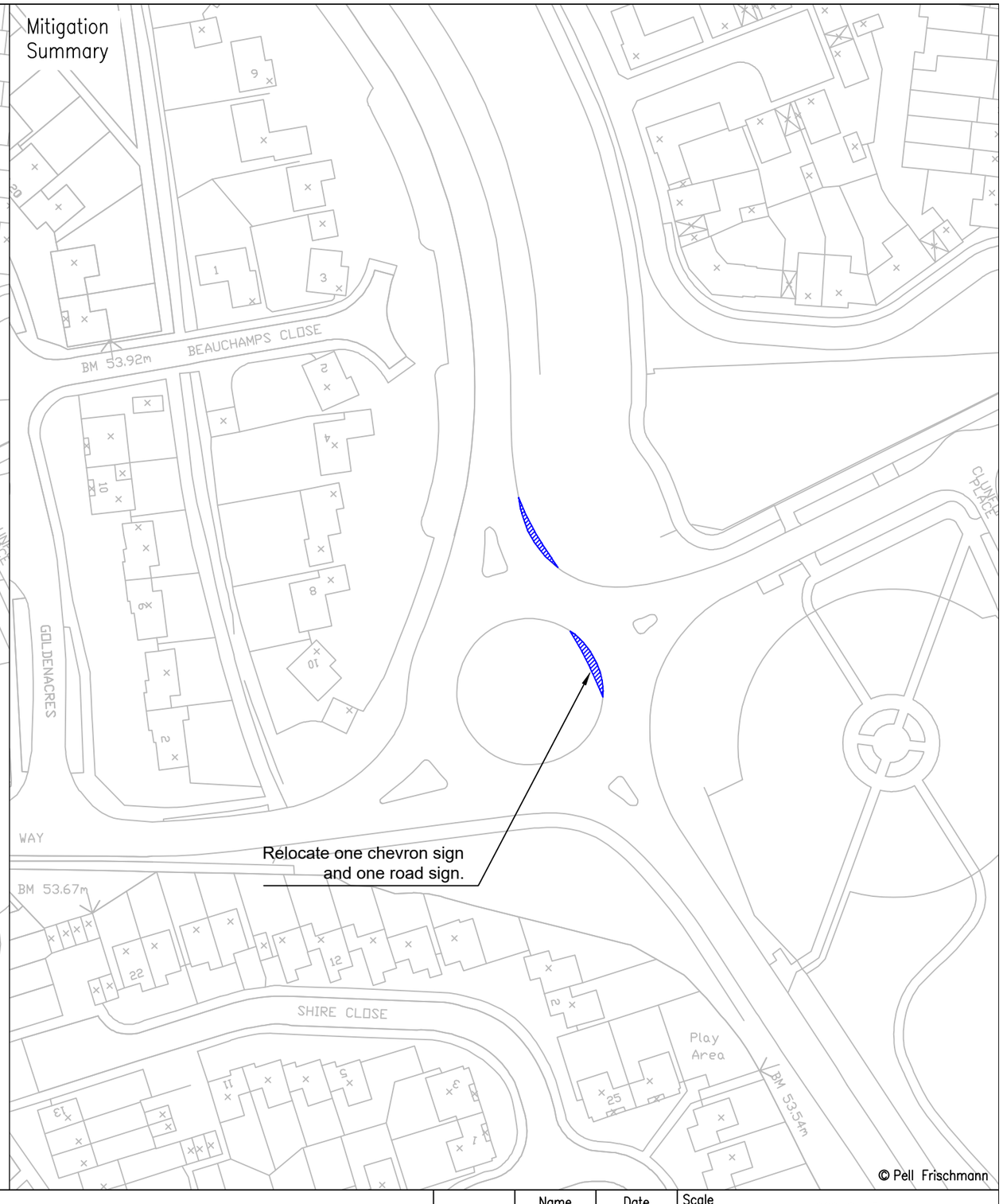
Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: –

Swept Path



Mitigation Summary



© Pell Frischmann

Pell Frischmann
93 GEORGE STREET, EDINBURGH, EH2 3ES
Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: Longfield Solar Farm Limited

Key: Wheel SPA; Body SPA; Load SPA; Indicative; Over-run; Over-sail

Project: Longfield Solar Farm

Drawing Title: 165 MVA Transformer

SPA Location: A130 / New Nabbotts Way Roundabout

	Name	Date
Drawn	GB	02/11/2022
Designed	TL	17/09/2022
Checked	GB	20/09/2022
Point of Interest		7

Scale: 1:1000 @ A3

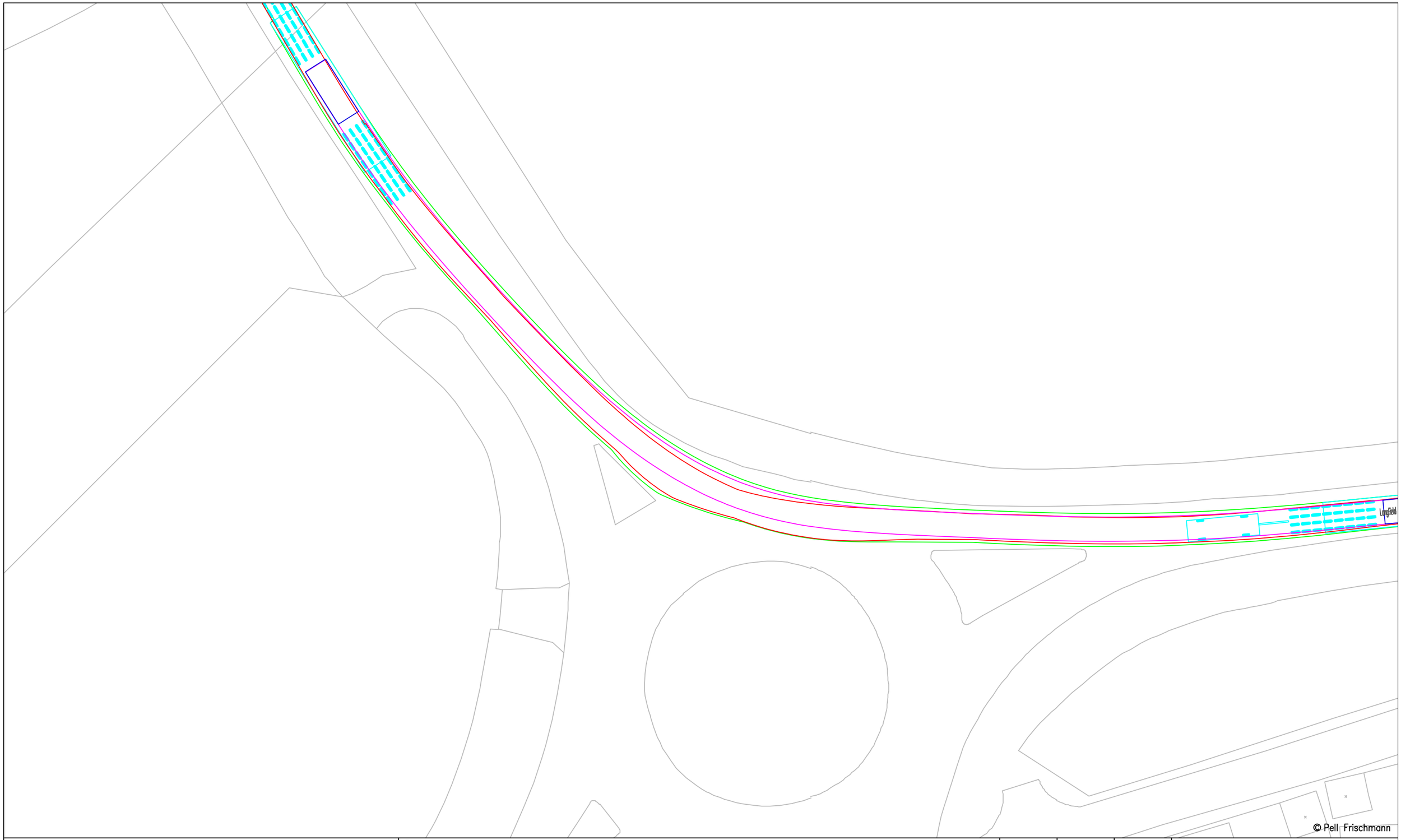
File No.: 220917 Longfield Tracking.dwg

Drawing Status: Draft

Drawing No.: SK05

Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: –



Pell Frischmann
93 GEORGE STREET, EDINBURGH. EH2 3ES
Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: Longfield Solar Farm Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Longfield Solar Farm

Drawing Title: 165 MVA Transformer

SPA Location: A130 / A1016 Roundabout

NO MITIGATION REQUIRED

	Name	Date
Drawn	GB	02/11/2022
Designed	TL	17/09/2022
Checked	GB	20/09/2022
Point of Interest		10

Scale: 1:500 @ A3

File No.: 220917 Longfield Tracking.dwg

Drawing Status: Draft

Drawing No.: SK06

Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: –



Pell Frischmann
93 GEORGE STREET, EDINBURGH. EH2 3ES
Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: Longfield Solar Farm Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Longfield Solar Farm

Drawing Title: 165 MVA Transformer

SPA Location: A130 / Regiment Gate Roundabout

NO MITIGATION REQUIRED

	Name	Date
Drawn	GB	02/11/2022
Designed	TL	17/09/2022
Checked	GB	20/09/2022
Point of Interest		11

Scale: 1:500 @ A3

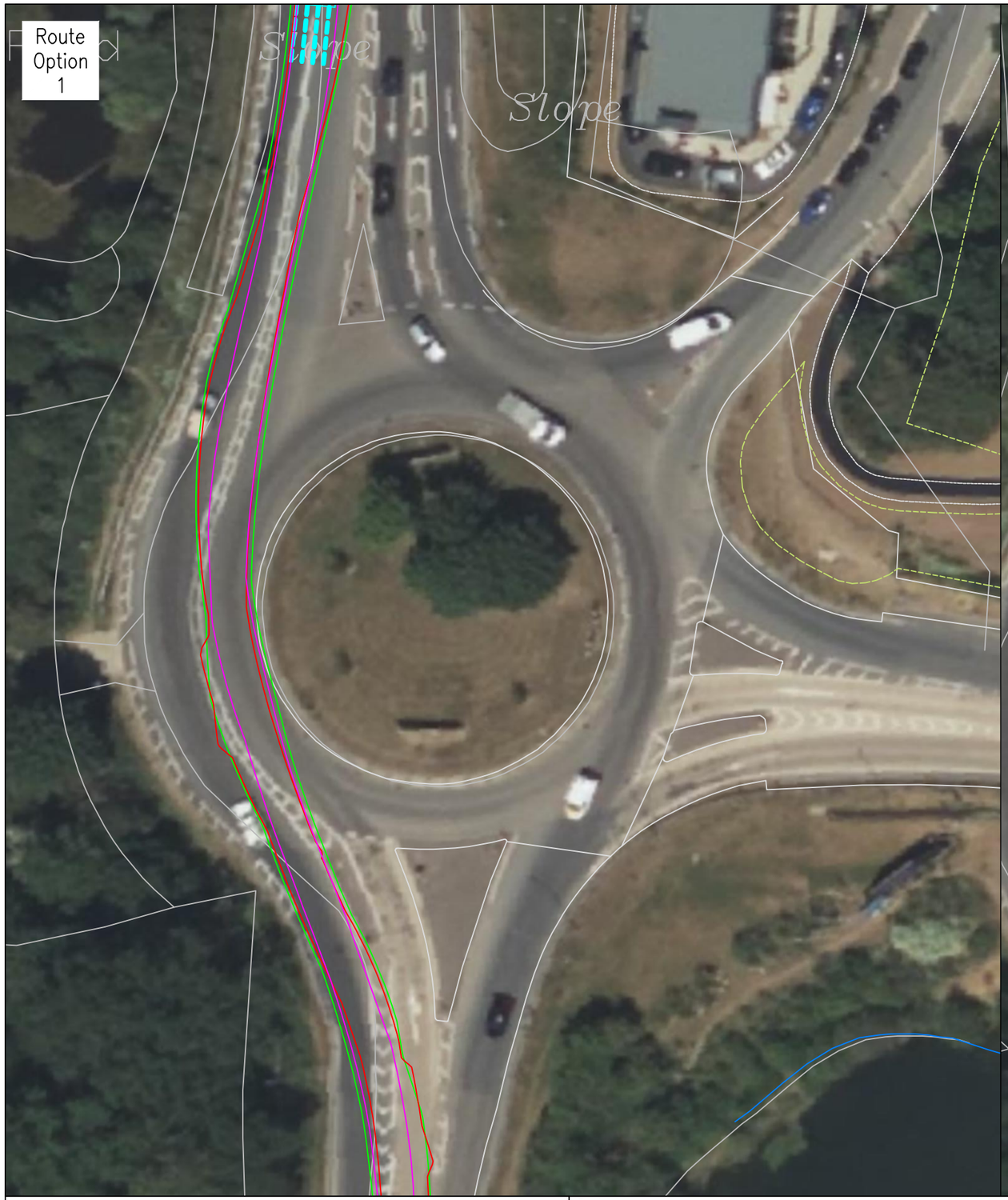
File No.: 220917 Longfield Tracking.dwg

Drawing Status: Draft

Drawing No.: SK07

Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: –





Pell Frischmann
93 GEORGE STREET, EDINBURGH, EH2 3ES
Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: Longfield Solar Farm Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Longfield Solar Farm

Drawing Title: 165 MVA Transformer

SPA Location: A130 / Channels Drive Roundabout

	Name	Date
Drawn	GB	02/11/2022
Designed	TL	17/09/2022
Checked	GB	20/09/2022
Point of Interest		12

Scale: 1:500 @ A3

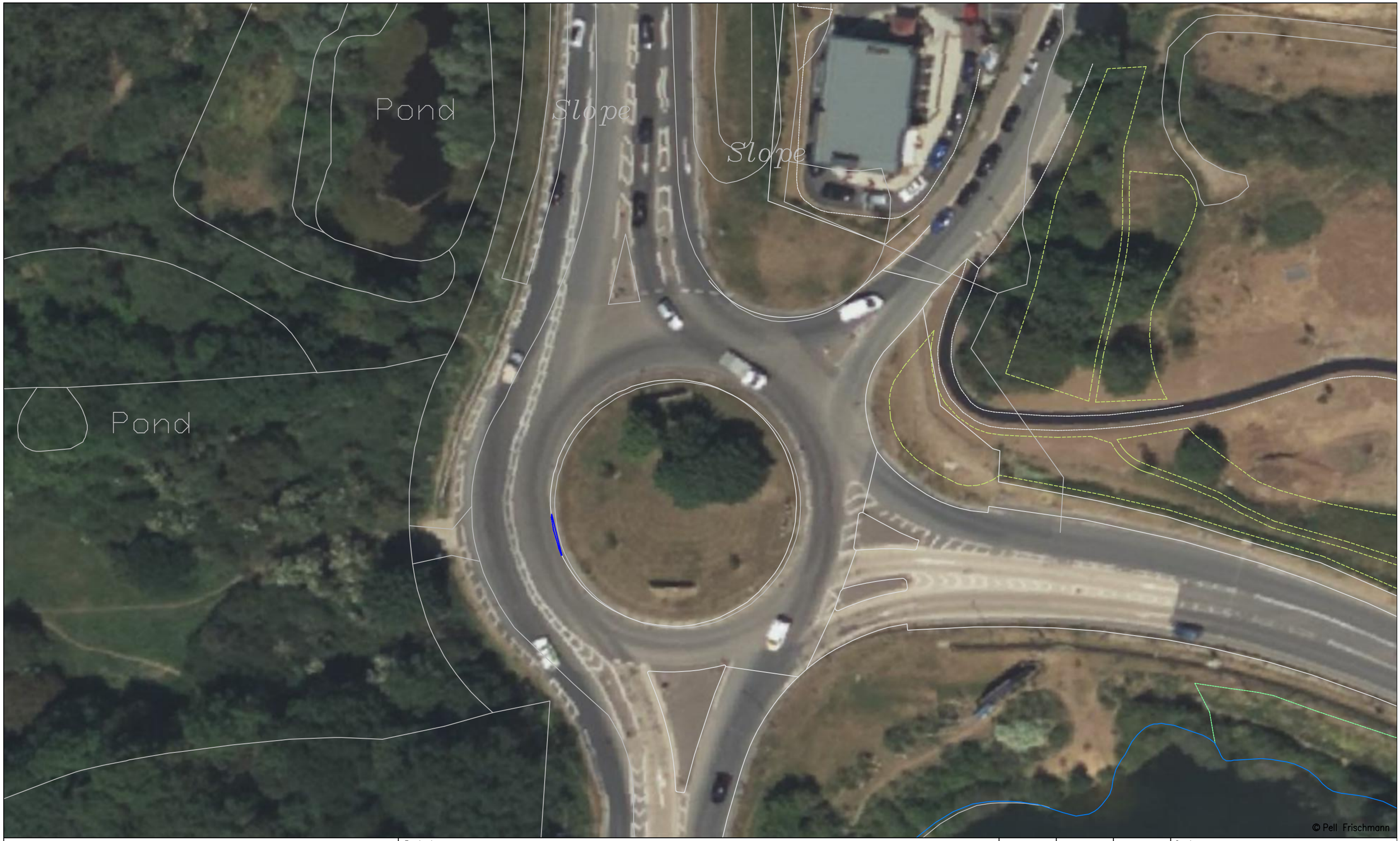
File No.: 220917 Longfield Tracking.dwg

Drawing Status: Draft

Drawing No.: SK08

Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: –



Pell Frischmann
93 GEORGE STREET, EDINBURGH, EH2 3ES
Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: Longfield Solar Farm Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Longfield Solar Farm

Drawing Title: 165 MVA Transformer

SPA Location: A130 / Channels Drive Roundabout

	Name	Date
Drawn	GB	02/11/2022
Designed	TL	17/09/2022
Checked	GB	20/09/2022
Point of Interest		12

Scale: 1:500 @ A3

File No.: 220917 Longfield Tracking.dwg

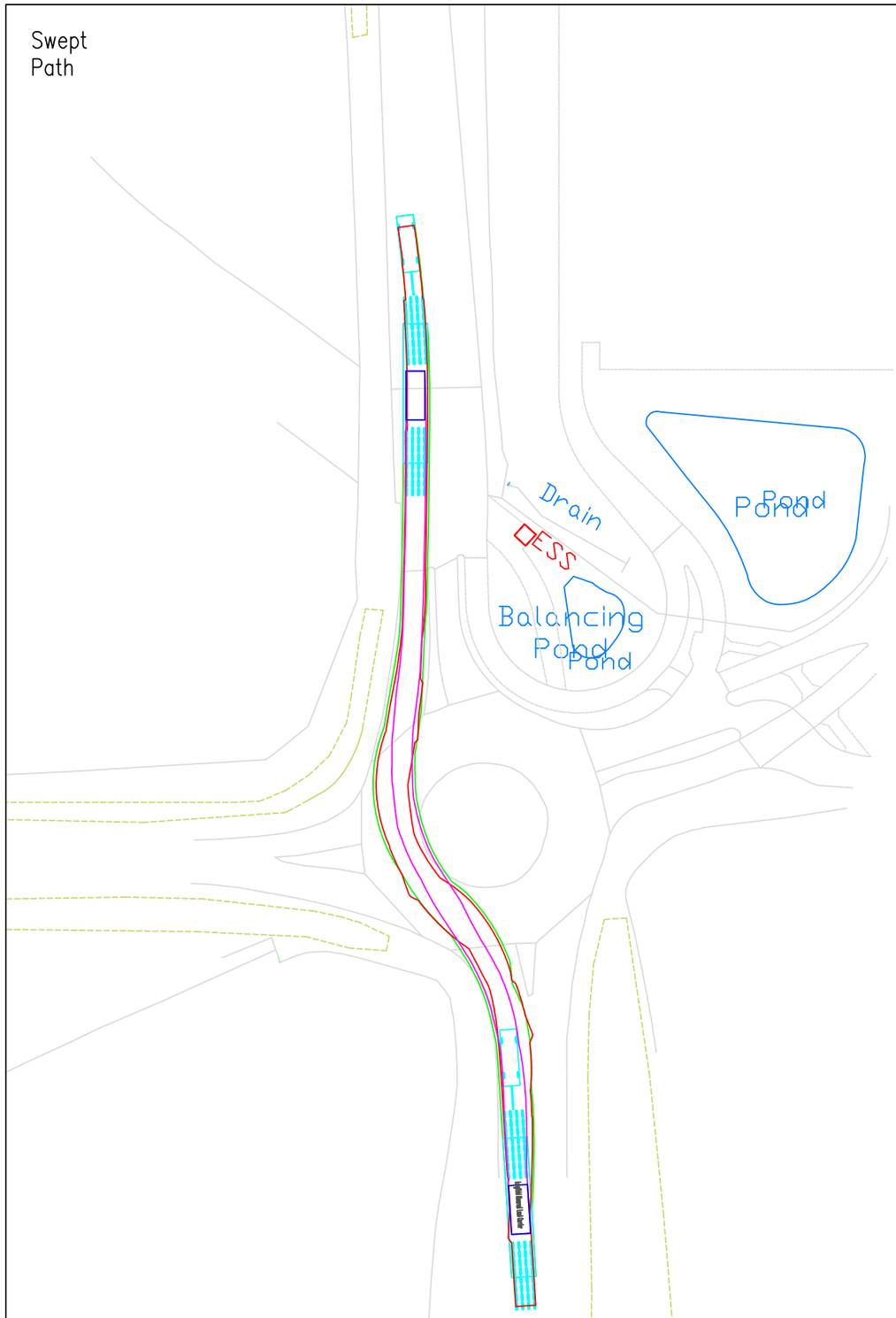
Drawing Status: Draft

Drawing No.: SK08A

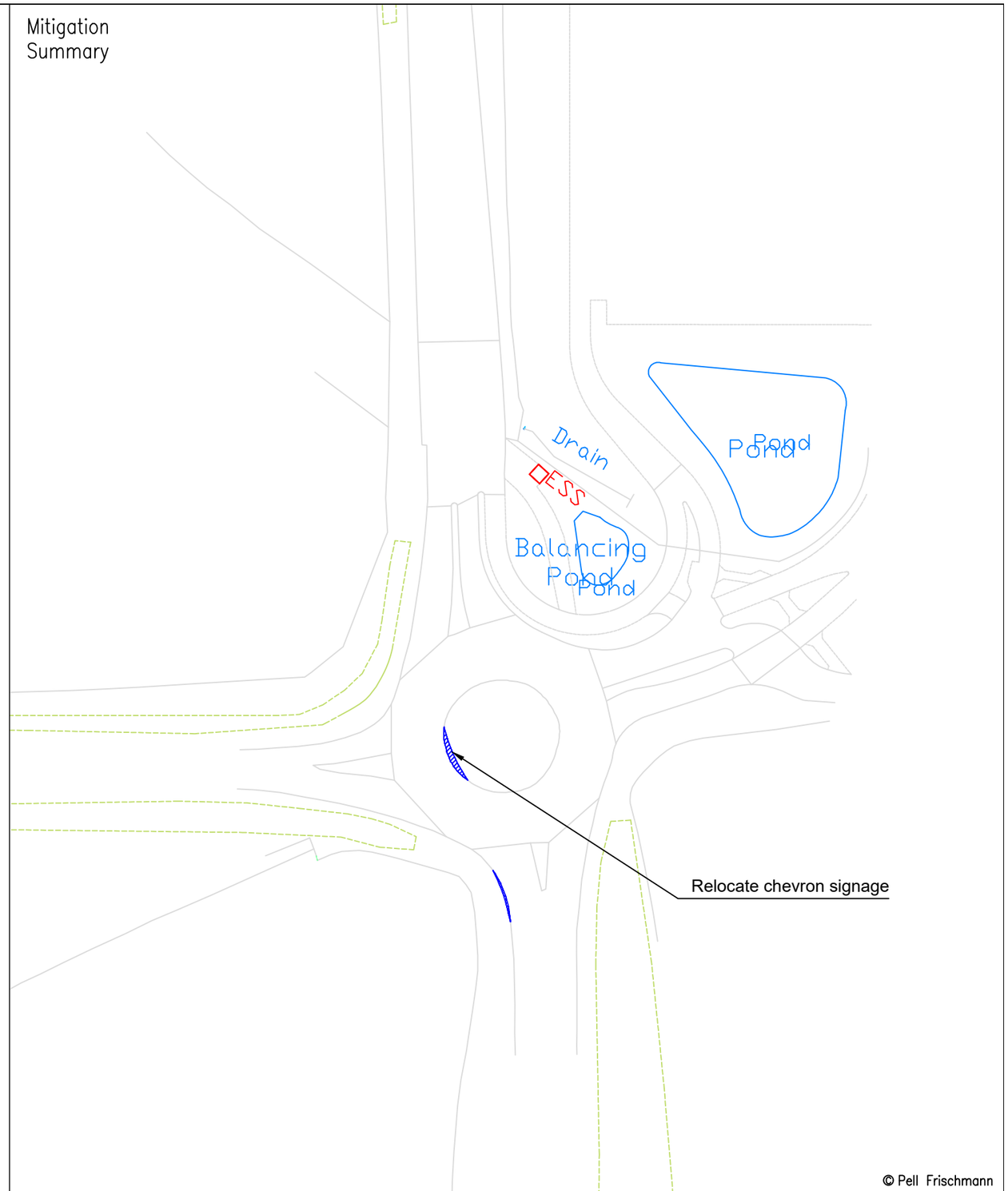
Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: –

Swept
Path



Mitigation
Summary



© Pell Frischmann

Pell Frischmann
93 GEORGE STREET, EDINBURGH, EH2 3ES
Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: Longfield Solar Farm Limited

Key: Wheel SPA; Body SPA; Load SPA; Indicative; Over-run; Over-sail

Project: Longfield Solar Farm

Drawing Title: 165 MVA Transformer

SPA Location: A130 / Chelmer P&R Junction

	Name	Date
Drawn	GB	02/11/2022
Designed	TL	17/09/2022
Checked	GB	20/09/2022
Point of Interest		14

Scale: 1:1000 @ A3

File No.: 220917 Longfield Tracking.dwg

Drawing Status: Draft

Drawing No.: SK09

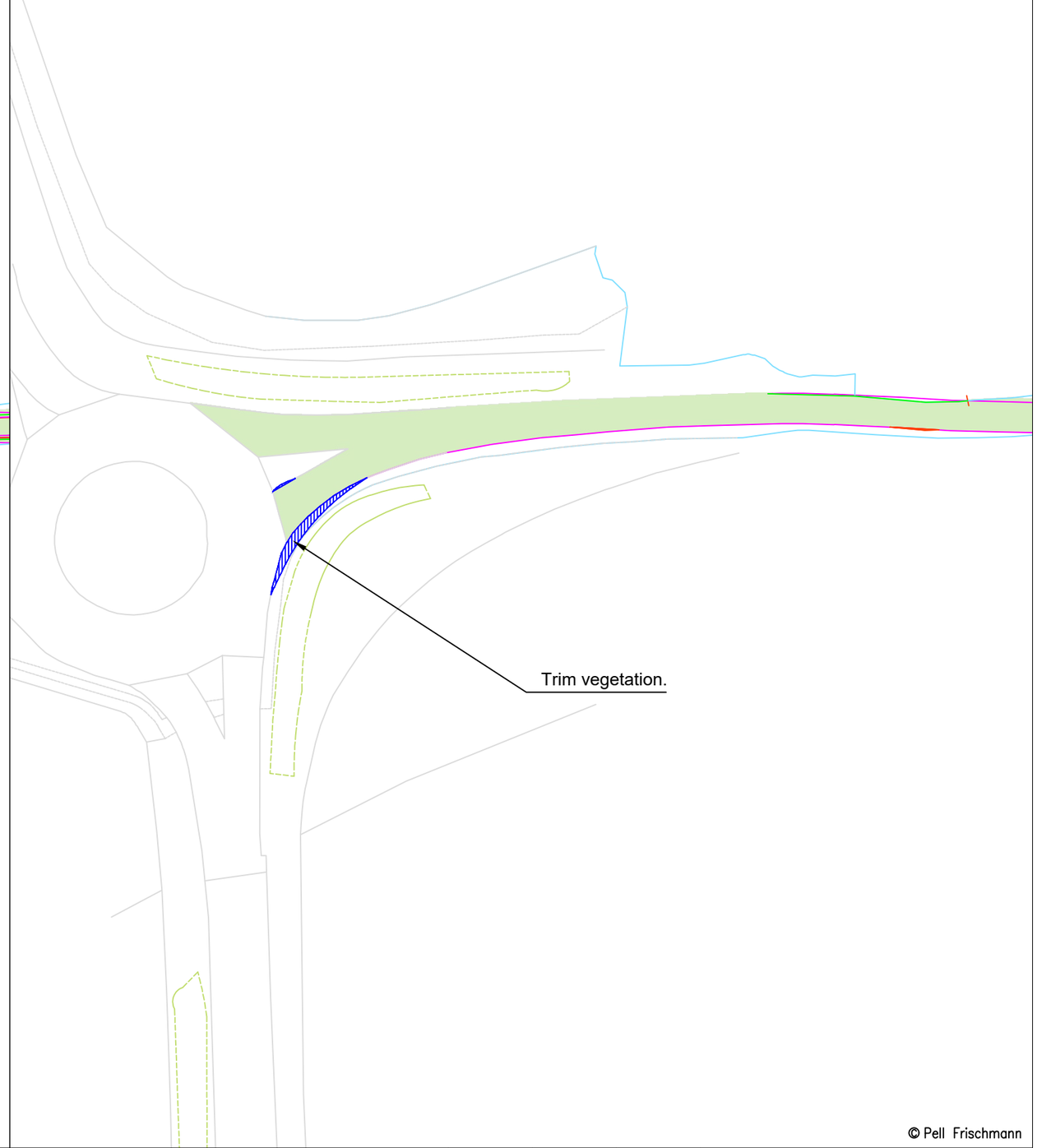
Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: –

Swept
Path



Mitigation
Summary



© Pell Frischmann

Pell Frischmann
93 GEORGE STREET, EDINBURGH, EH2 3ES
Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: Longfield Solar Farm Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Longfield Solar Farm

Drawing Title: 165 MVA Transformer

SPA Location: A130 / Wheeler's Hill Roundabout

	Name	Date
Drawn	GB	02/11/2022
Designed	TL	17/09/2022
Checked	GB	20/09/2022
Point of Interest		16

Scale: 1:1000 @ A3

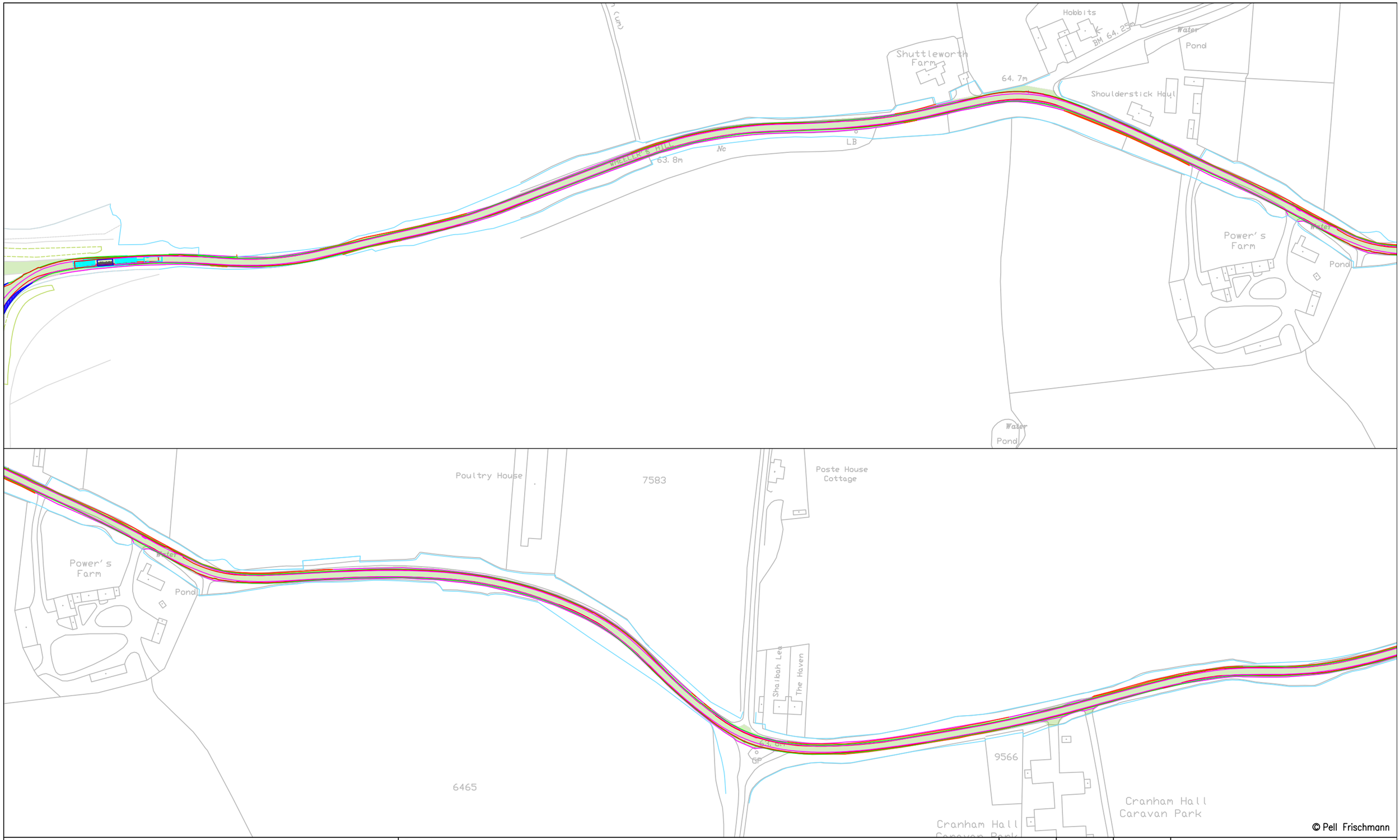
File No.: 220917 Longfield Tracking.dwg

Drawing Status: Draft

Drawing No.: SK10

Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: –



© Pell Frischmann

Pell Frischmann
93 GEORGE STREET, EDINBURGH, EH2 3ES
Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: Longfield Solar Farm Limited

Key: Wheel SPA; Body SPA; Load SPA; Indicative; Over-run; Over-sail

Project: Longfield Solar Farm

Drawing Title: 165 MVA Transformer

SPA Location: Wheeler's Hill / Cranham Road

	Name	Date
Drawn	GB	02/11/2022
Designed	TL	17/09/2022
Checked	GB	20/09/2022
Point of Interest		17-22

Scale: 1:2_1 @ A3

File No.: 220917 Longfield Tracking.dwg

Drawing Status: Draft

Drawing No.: SK11

Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: _



Pell Frischmann
93 GEORGE STREET, EDINBURGH, EH2 3ES
Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: Longfield Solar Farm Limited

Key: Wheel SPA; Body SPA; Load SPA; Indicative; Over-run; Over-sail

Project: Longfield Solar Farm

Drawing Title: 165 MVA Transformer

SPA Location: Cranham Road

	Name	Date
Drawn	GB	02/11/2022
Designed	TL	17/09/2022
Checked	GB	20/09/2022
Point of Interest		23-29

Scale: 1:2_1 @ A3

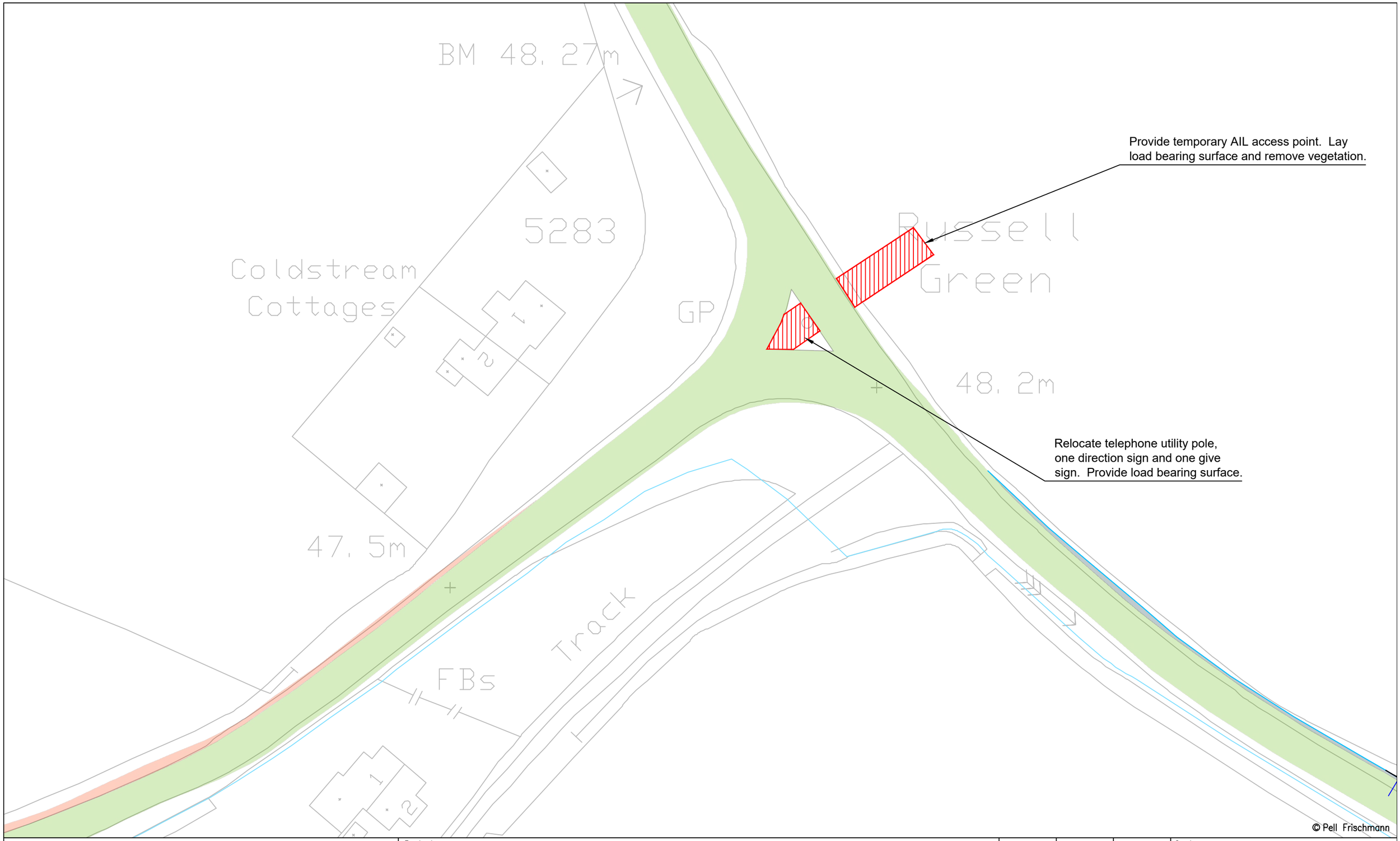
File No.: 220917 Longfield Tracking.dwg

Drawing Status: Draft

Drawing No.: SK12

Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: –



Pell Frischmann
93 GEORGE STREET, EDINBURGH, EH2 3ES
Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: Longfield Solar Farm Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Longfield Solar Farm

Drawing Title: 165 MVA Transformer

SPA Location: Cranham Road: AIL Access Junction

	Name	Date
Drawn	GB	02/11/2022
Designed	TL	17/09/2022
Checked	GB	20/09/2022
Point of Interest		29

Scale: 1:500 @ A3

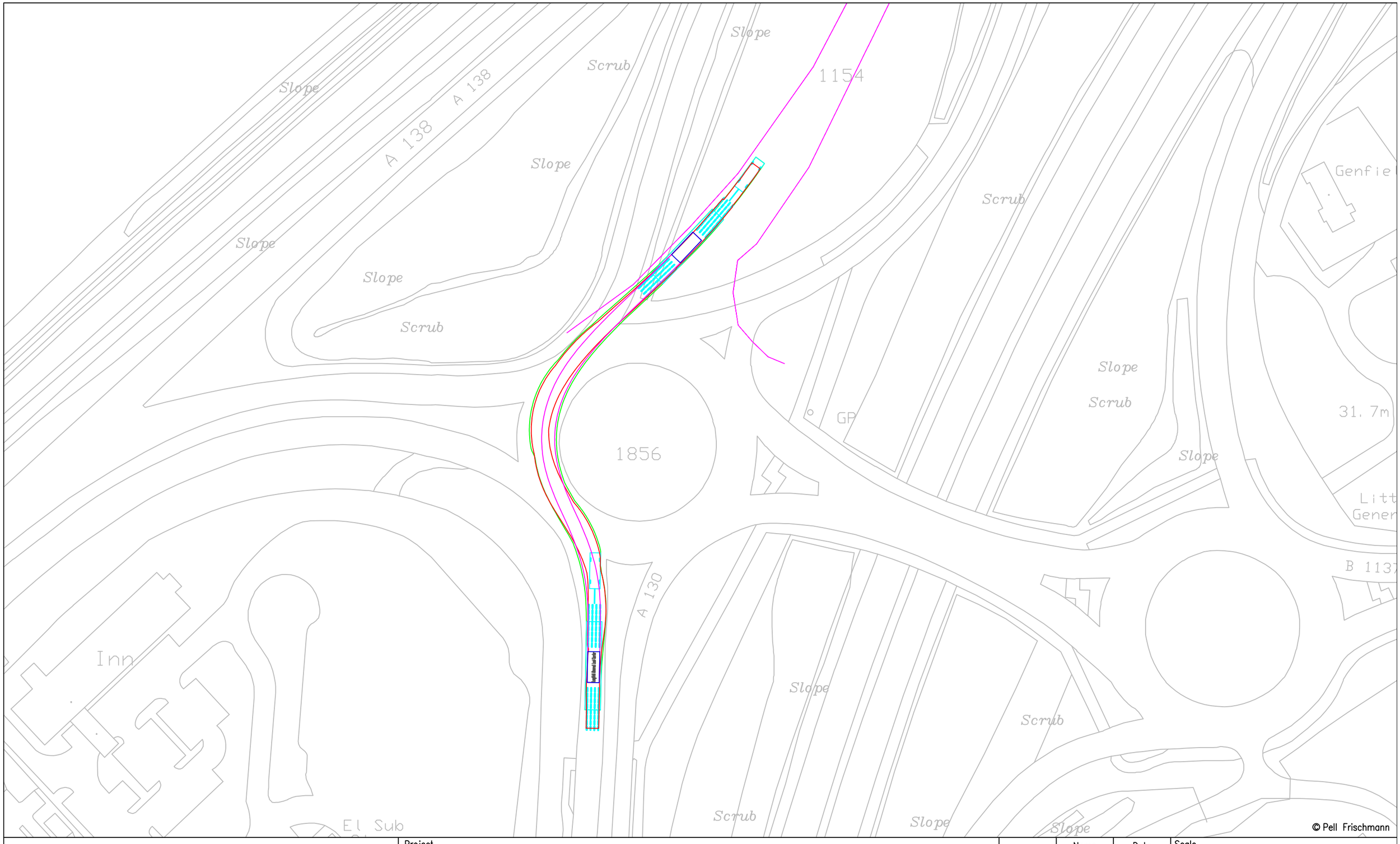
File No.: 220917 Longfield Tracking.dwg

Drawing Status: Draft

Drawing No.: SK13

Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: –



Pell Frischmann
93 GEORGE STREET, EDINBURGH. EH2 3ES
Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: Longfield Solar Farm Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Longfield Solar Farm

Drawing Title: 165 MVA Transformer

SPA Location: A130 / A138 Roundabout

NO MITIGATION REQUIRED

	Name	Date
Drawn	GB	02/11/2022
Designed	TL	17/09/2022
Checked	GB	20/09/2022
Point of Interest		30

Scale: 1:1000 @ A3

File No.: 220917 Longfield Tracking.dwg

Drawing Status: Draft

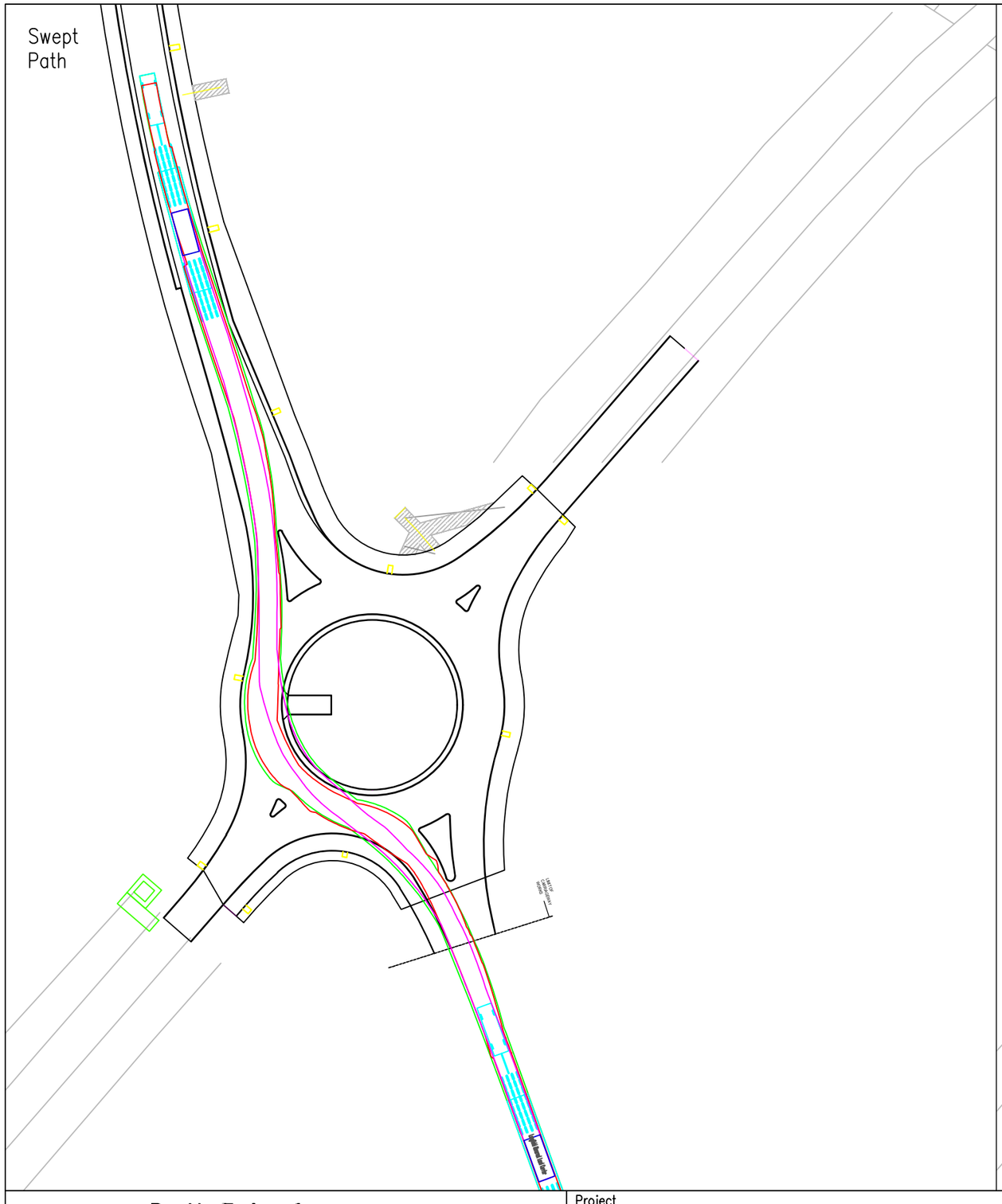
Drawing No.: SK14

Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

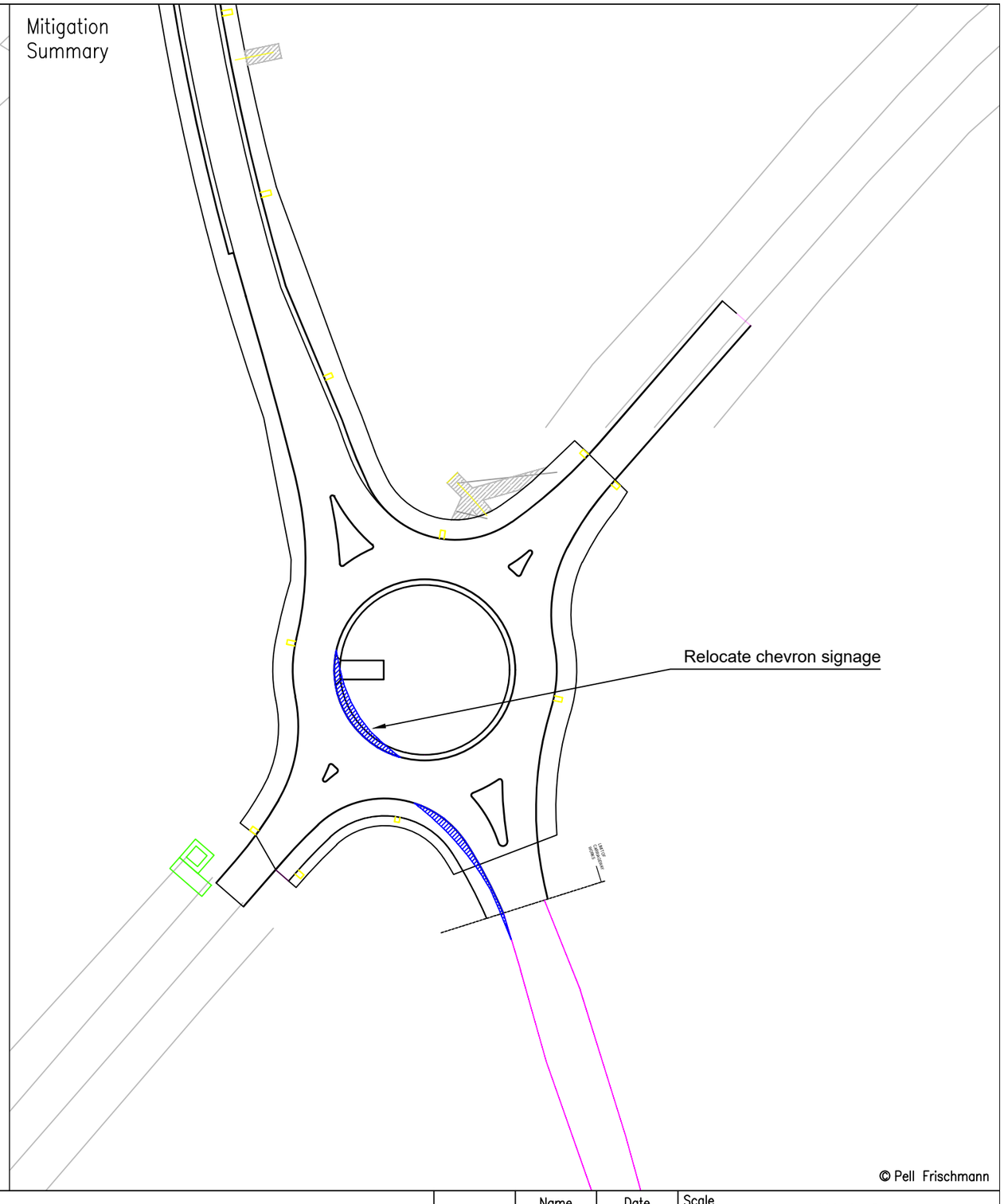
Revision: –

© Pell Frischmann

Swept Path



Mitigation Summary



© Pell Frischmann

Pell Frischmann
93 GEORGE STREET, EDINBURGH, EH2 3ES
Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: Longfield Solar Farm Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Longfield Solar Farm

Drawing Title: 165 MVA Transformer

SPA Location: Beaulieu Parkway Roundabout (South)

	Name	Date
Drawn	GB	02/11/2022
Designed	TL	17/09/2022
Checked	GB	20/09/2022
Point of Interest		32

Scale: 1:1000 @ A3

File No.: 220917 Longfield Tracking.dwg

Drawing Status: Draft

Drawing No.: SK15

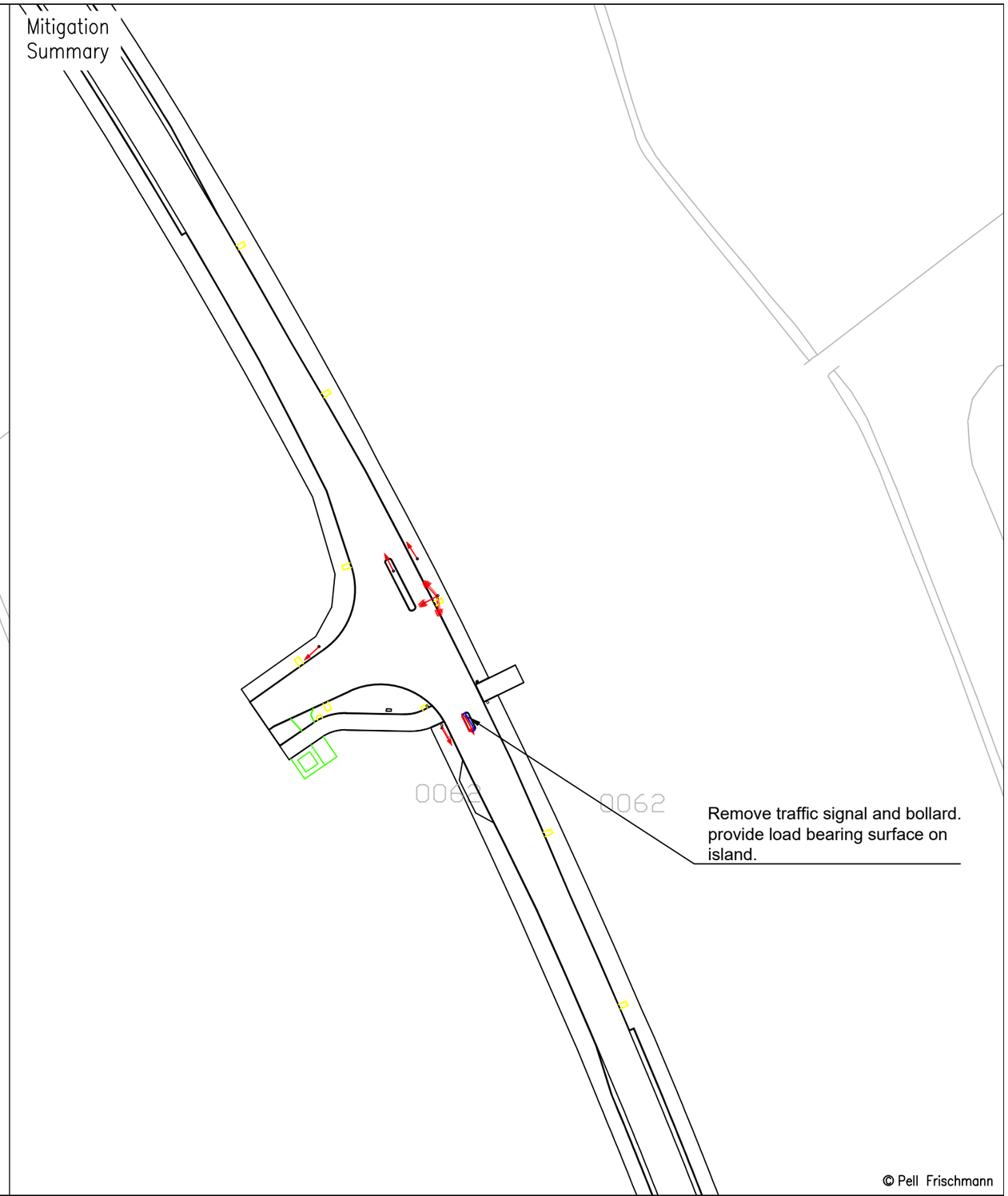
Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: –

Swept Path



Mitigation Summary



© Pell Frischmann

Pell Frischmann
93 GEORGE STREET, EDINBURGH, EH2 3ES
Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: Longfield Solar Farm Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Longfield Solar Farm

Drawing Title: 165 MVA Transformer

SPA Location: Beaulieu Parkway Signalised Junction

	Name	Date
Drawn	GB	02/11/2022
Designed	TL	17/09/2022
Checked	GB	20/09/2022
Point of Interest		33

Scale: 1:1000 @ A3

File No.: 220917 Longfield Tracking.dwg

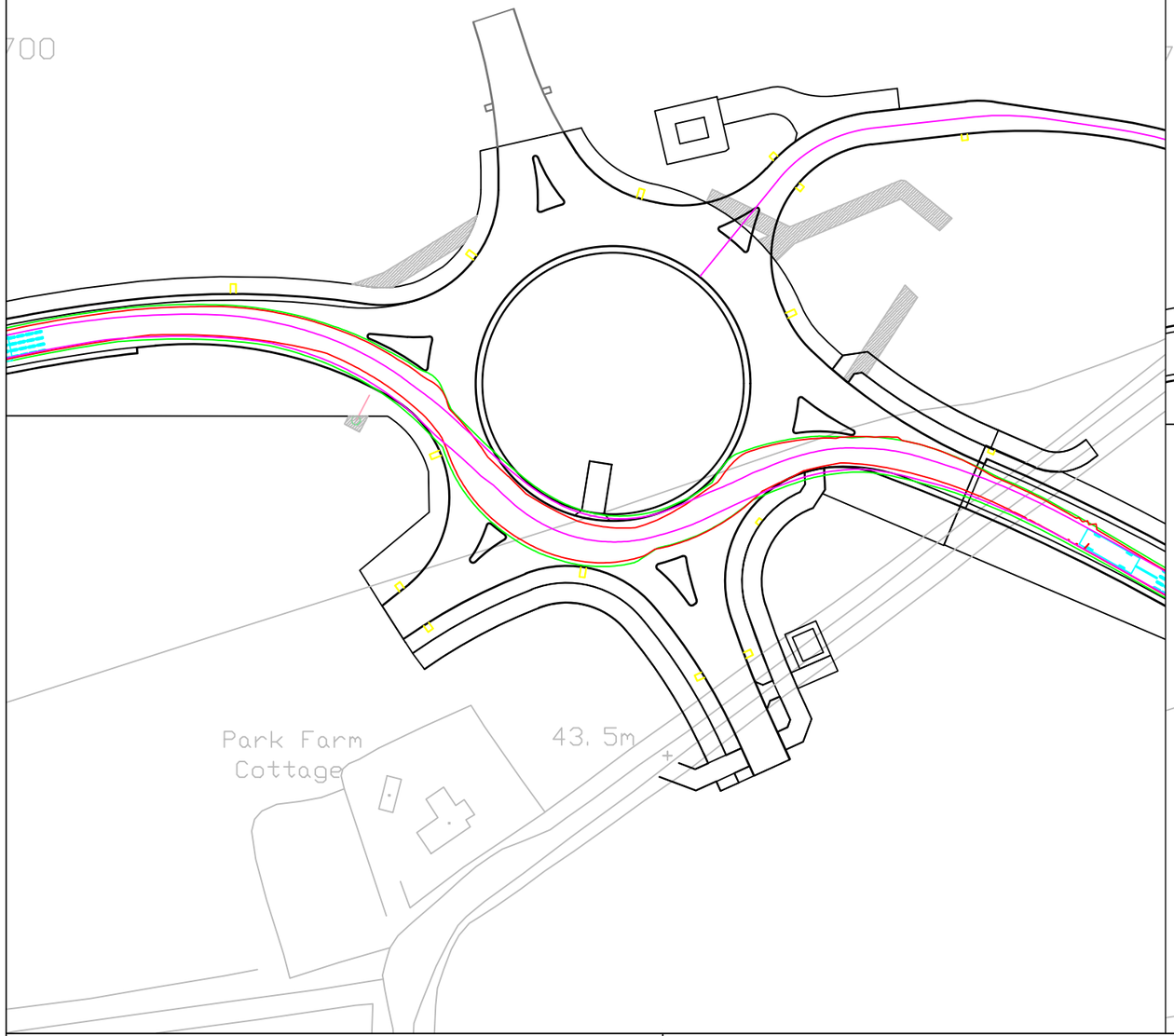
Drawing Status: Draft

Drawing No.: SK16

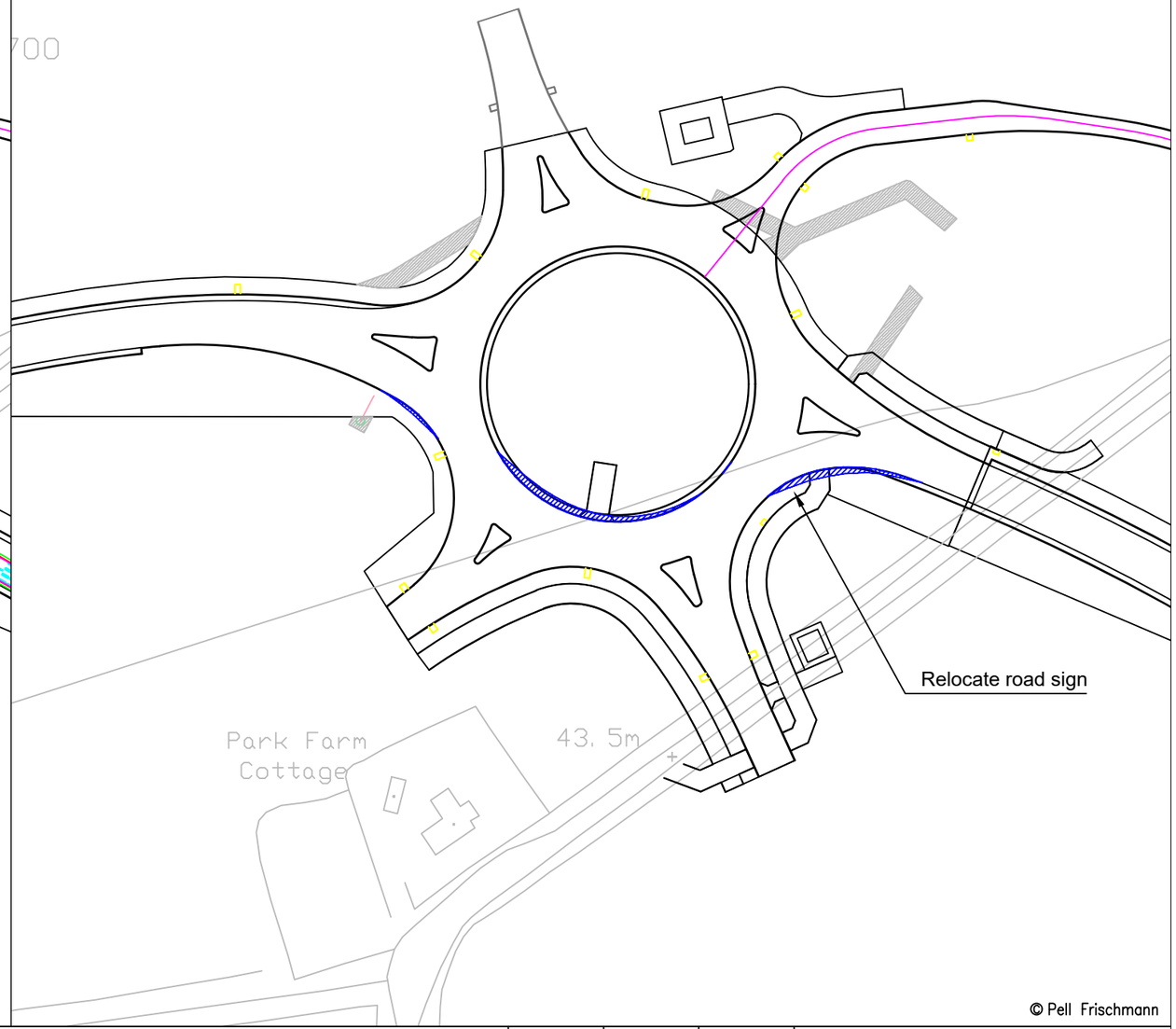
Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: –

Swept
Path



Mitigation
Summary



© Pell Frischmann

Pell Frischmann
93 GEORGE STREET, EDINBURGH. EH2 3ES
Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: Longfield Solar Farm Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Longfield Solar Farm

Drawing Title: 165 MVA Transformer

SPA Location: Beaulieu Parkway / Remembrance Avenue Roundabout

	Name	Date
Drawn	GB	02/11/2022
Designed	TL	17/09/2022
Checked	GB	20/09/2022
Point of Interest		34

Scale: 1:1000 @ A3

File No.: 220917 Longfield Tracking.dwg

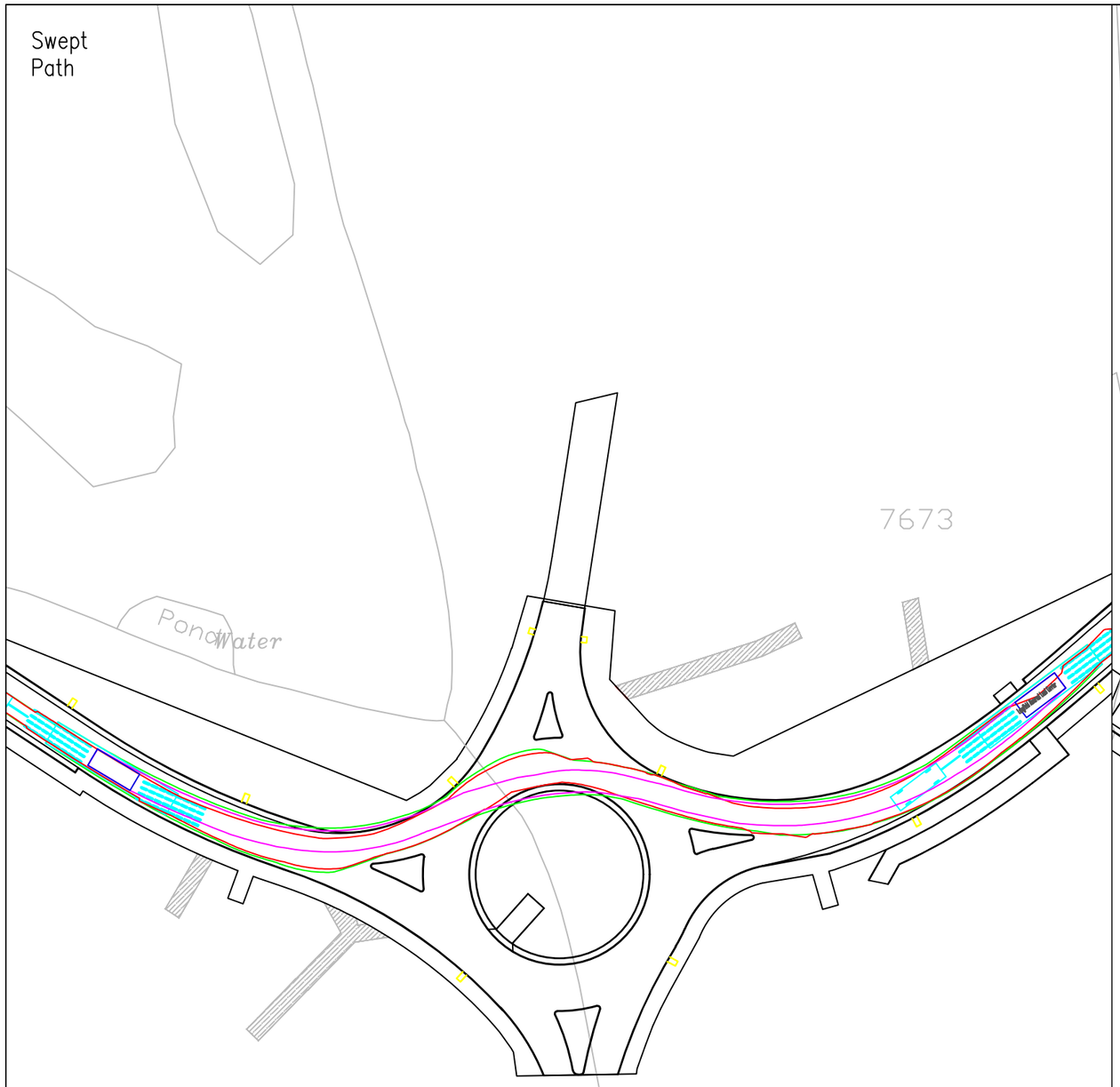
Drawing Status: Draft

Drawing No.: SK17

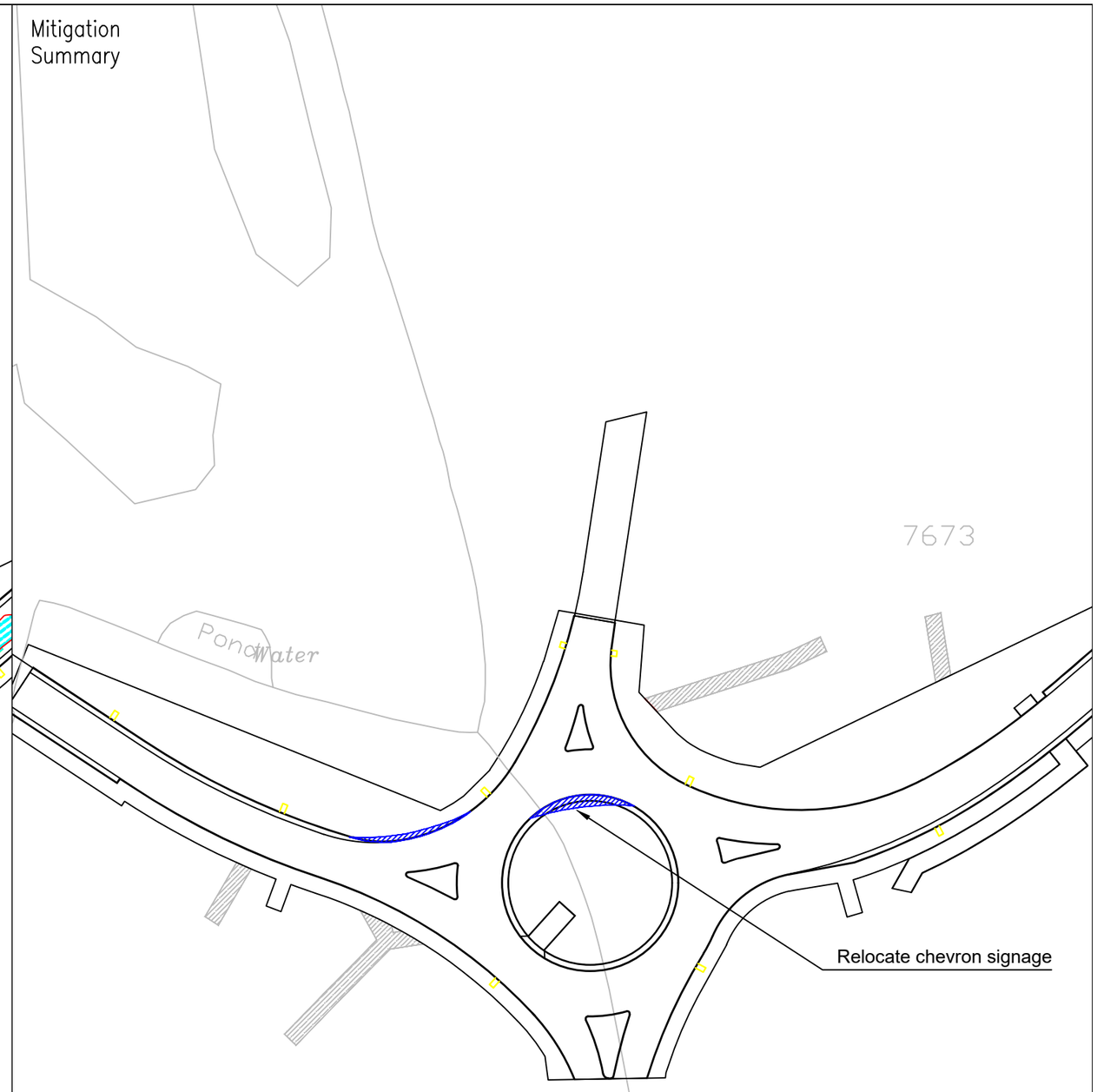
Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: –

Swept
Path



Mitigation
Summary



© Pell Frischmann

Pell Frischmann
93 GEORGE STREET, EDINBURGH, EH2 3ES
Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: Longfield Solar Farm Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Longfield Solar Farm

Drawing Title: 165 MVA Transformer

SPA Location: Beaulieu Parkway / Commonwealth Link Roundabout

	Name	Date
Drawn	GB	02/11/2022
Designed	TL	17/09/2022
Checked	GB	20/09/2022
Point of Interest		35

Scale: 1:1000 @ A3

File No.: 220917 Longfield Tracking.dwg

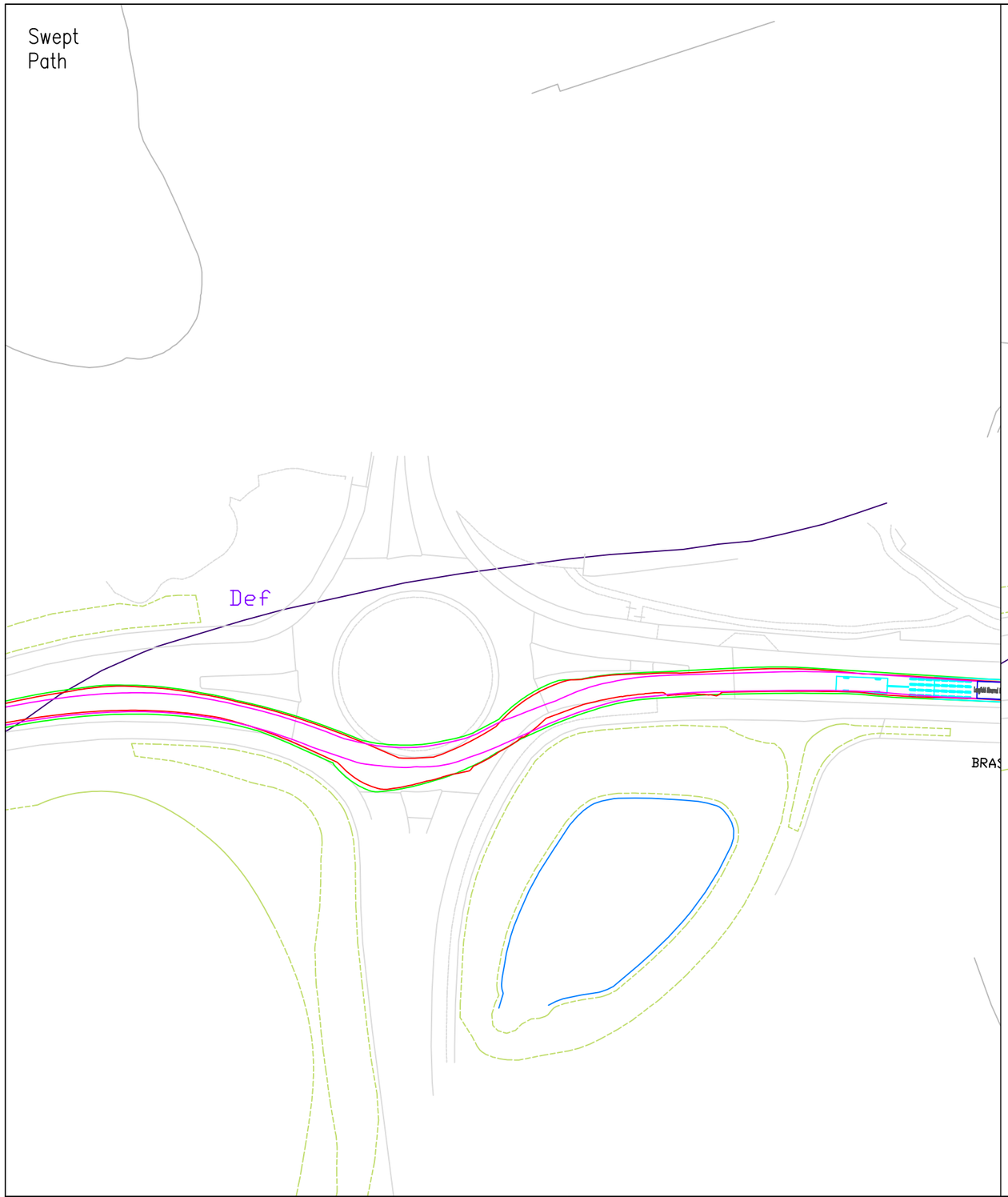
Drawing Status: Draft

Drawing No.: SK18

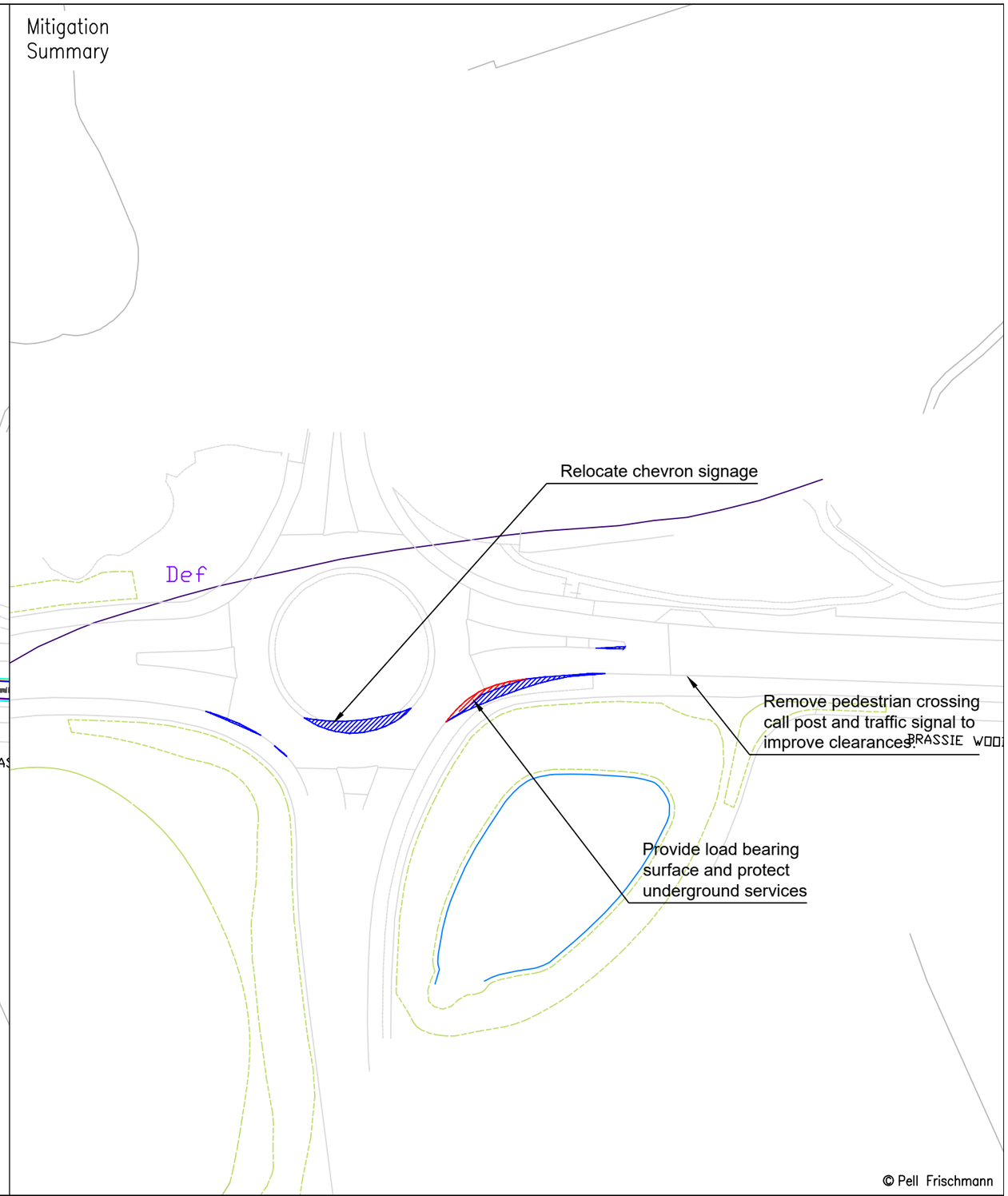
Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: –

Swept Path



Mitigation Summary



© Pell Frischmann

Pell Frischmann
93 GEORGE STREET, EDINBURGH, EH2 3ES
Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: Longfield Solar Farm Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Longfield Solar Farm

Drawing Title: 165 MVA Transformer

SPA Location: Beaulieu Parkway / Albratross Way Roundabout

	Name	Date
Drawn	GB	02/11/2022
Designed	TL	17/09/2022
Checked	GB	20/09/2022
Point of Interest		36

Scale: 1:1000 @ A3

File No.: 220917 Longfield Tracking.dwg

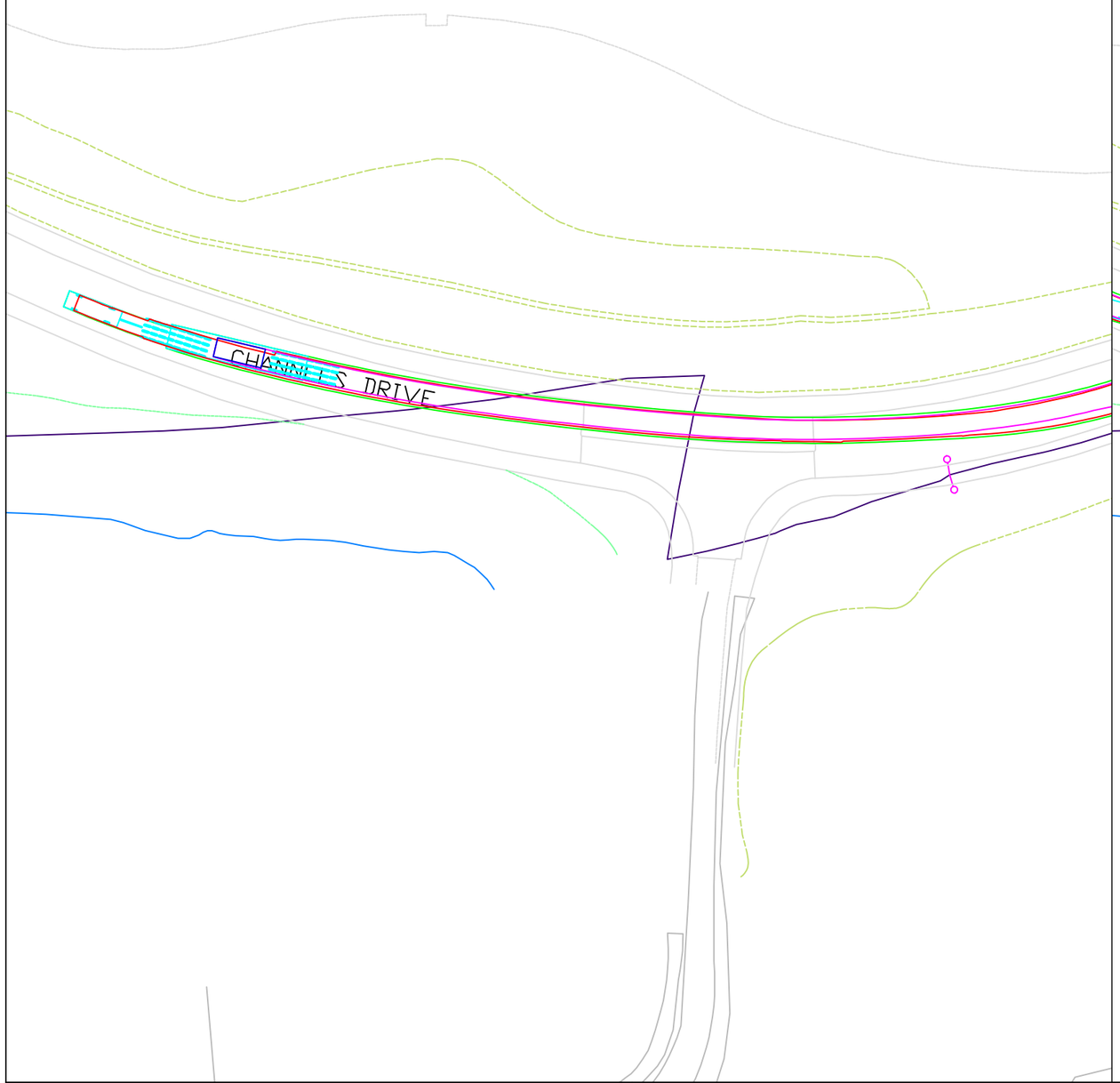
Drawing Status: Draft

Drawing No.: SK19

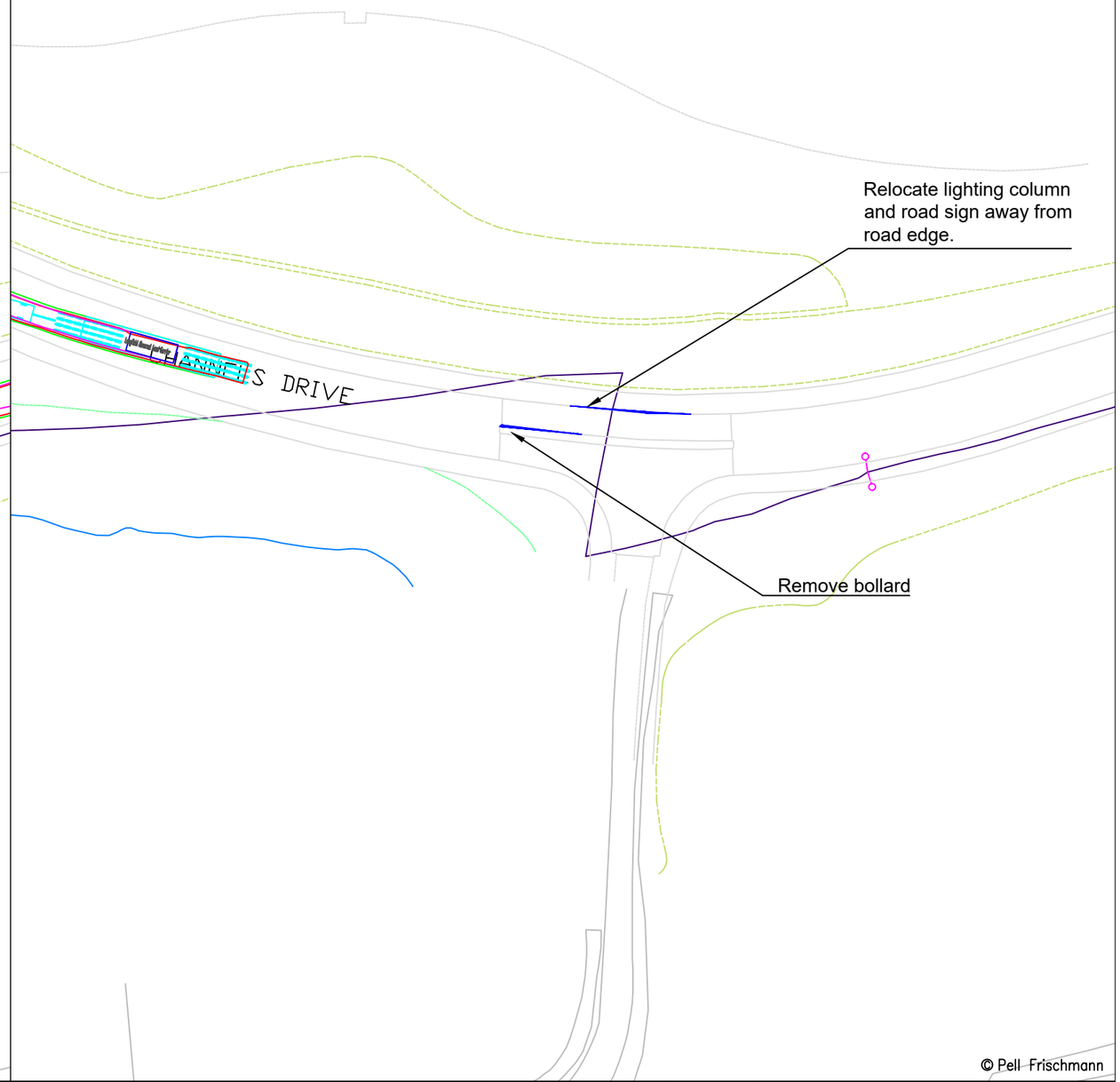
Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: –

Swept
Path



Mitigation
Summary



© Pell Frischmann

Pell Frischmann
93 GEORGE STREET, EDINBURGH, EH2 3ES
Tel: +44 (0)131 240 1270
Email: pfedinburgh@pellfrischmann.com
www.pellfrischmann.com

Client: Longfield Solar Farm Limited

Key: Wheel SPA | Body SPA | Load SPA | Indicative | Over-run | Over-sail

Project: Longfield Solar Farm

Drawing Title: 165 MVA Transformer

SPA Location: Beaulieu Parkway / Lakeview Crescent Junction

	Name	Date
Drawn	GB	02/11/2022
Designed	TL	17/09/2022
Checked	GB	20/09/2022
Point of Interest		37

Scale: 1:1000 @ A3

File No.: 220917 Longfield Tracking.dwg

Drawing Status: Draft

Drawing No.: SK20

Notes:
1. All mitigation is subject to confirmation through a test run.
2. This is not a construction drawing and is intended for illustration purposes only.

Revision: –