



Hilfield Solar Farm and Battery Storage

Construction Traffic Management Plan

on behalf of Elstree Green Limited

Prepared by Transport Planning Associates | December 2020 | Document Reference: R005





A Planning Application by

ELSTREE GREEN LIMITED

In respect of

Hilfield Solar Farm and Battery Storage

Construction Traffic Management Plan



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1 Introduction

- 1.1 This Construction Traffic Management Plan (CTMP) has been prepared by Transport Planning Associates (TPA) on behalf of Elstree Green Limited (the 'Applicant') to provide transport planning advice in relation to its proposal for a solar farm and battery storage facility (the 'Proposed Development') on land to the south and east of Elstree substation, Hertfordshire (the 'Site').
- 1.2 A Site location plan is included as **Figure 1.1**. The Site comprises three parcels. Within this CTMP, the land parcels are referred to as follows:
 - Land Parcel A Situated to the west of Hilfield Lane;
 - Land Parcel B Situated to the east of Hilfield Lane; and
 - Land Parcel C Situated to the north of Butterfly Lane.
- 1.3 The Proposed Development comprises the construction, operation, management and decommissioning of a grid connected solar farm with battery storage and associated infrastructure ("the generating station"). The generating station would have an export capacity of up to 49.9MW. The battery storage facility would be utilised to reinforce the power generation of the solar PV. Storing energy at times of low demand and releasing to the grid in periods of higher demand or when solar irradiance is lower, as well as providing balancing services to maintain National Grid stability.
- 1.4 The Site Plan is shown in **Appendix A**. The construction period will last approximately 40 weeks.
- 1.5 This CTMP provides a framework for the management of construction vehicle activity to and from the Site, to ensure that the effect of the construction phase on the local highway network is minimised. This CTMP sets out the strategy for the following;
 - Site access;
 - Construction traffic routing;
 - · Site compound and internal routing;
 - Construction vehicle dimensions, number and frequency;
 - Proposed mitigation measures; and
 - Road condition surveys.
- 1.6 It will be the responsibility of the appointed contractor to comply with all statutory regulations and guidelines in relation to construction and movement activities. The Site manager's details will be provided to the highway authority in advance of any work being carried out.

2 Site Access

2.1 This section sets out the details of the temporary construction vehicle access for each land parcel.

Construction Phase

Land Parcel A

- 2.2 Land parcel A will be accessed via an existing agricultural access on Hilfield Lane. The access arrangement for Land Parcel A is shown in **Drawing SK01** attached as **Appendix B**. This includes swept path analysis for a 16.5m articulated vehicle, which is the largest vehicle that will access the Site.
- 2.3 It is noted that a Public Right of Way (Restricted byway BUSHEY 036) routes via the identified existing agricultural access. In accordance with the Road Traffic Act 1988, motorised vehicles are permitted to use restricted byways for access/egress. The Applicant has access rights to use restricted byway BUSHEY 036. The Public Right of Way will remain open to other users throughout the construction period. Banksmen will ensure the safety of all users whenever a vehicle is present.
- 2.4 Vehicles will arrive and depart from/to the north only, to ensure that the access does not require significant widening which would affect hedgerows.

Land Parcel B

2.5 Land Parcel B will be accessed via an existing access, which serves Hilfield Farm. The access arrangement for Land Parcel B is shown on **Drawing SK02** attached as **Appendix B**. This includes swept path analysis for a 16.5m articulated vehicle, the largest vehicle that will access the Site. The existing access will be widened slightly to accommodate construction vehicle movement. Banksmen will ensure the safety of all vehicle manoeuvres at the junction.

Land Parcel C

2.6 Land parcel C will be accessed via an existing access on Butterfly lane, through Slades Farm. This access is currently used by coaches. The access arrangement for Land Parcel C is shown in **Drawing SK03-A** attached as **Appendix B**. This includes swept path analysis for a 16.5m articulated vehicle, the largest vehicle that will access the Site.

2.7 The existing access will be widened slightly to accommodate construction vehicle movements.

Banksmen will ensure the safety of all vehicle manoeuvres at the junction.

Construction Access Summary

- 2.8 The access junctions described above are considered suitable for the following reasons:
 - The accesses are currently used by large scale agricultural vehicles and are therefore considered to be suitable for use by construction vehicles;
 - There are no recorded Personal Injury Collisions (PIC's) in the vicinity of the accesses during the most recent five-year period;
 - To ensure the construction access continues to operate safely during the temporary
 construction phase, banksmen will be deployed at the Site access junctions whenever large
 construction vehicles are accessing or exiting the Site. Banksmen will not direct general traffic,
 but will indicate to heavy and large construction vehicles when it is appropriate for them to
 enter the Site. Priority will always be given to the through traffic on the adjacent highway
 network; and
 - All construction vehicles will access and egress the Site in a forward gear.
- 2.9 Temporary signage will be erected in the vicinity of accesses during the construction phase. Diagram 7301 'WORKS TRAFFIC' in the Traffic Signs Regulations and General Directions (TSRGD) will be used to indicate the access and will read 'WORKS TRAFFIC LARGE VEHICLE TURNING'. These signs will be white text and red background 1050 x 750 mm mounted in 'A' frames. The temporary signs will be in place for the duration of the construction phase.

Operational Phase

2.10 Once operational, a maintenance vehicle (likely to be a transit van) will visit the Site approximately twice a month. Maintenance vehicles will utilise the same access points as described above for the construction phase.

3 Construction Traffic Routing

3.1 The details of the construction traffic routes are set out below.

Route Overview

- 3.2 The Site is located close to the strategic highway network, being east of the M1 Motorway and A41, south of the M25 and west of the A1. The identified routes, as set out below, are considered the most appropriate route to connect the Site to the strategic road network, avoiding all weight restrictions in the local area.
- 3.3 Construction traffic will route to Land A and Land B from the M1 Motorway via the following route, and as shown in **Figure 3.1**:
 - M1 Motorway Junction 5;
 - A41 North Western Avenue;
 - Sandy Lane; and
 - Hilfield Lane.
- 3.4 Construction traffic will route to Land C from the M1 Motorway via the following route, and as shown in **Figure 3.2**:
 - M1 Motorway Junction 5;
 - A41 North Western Avenue;
 - Dagger Lane;
 - Aldenham Road; and
 - Butterfly Lane.

Route Details

Inbound Construction Traffic

- 3.5 It is anticipated that the majority of construction vehicles will route to the Site from the M1 Motorway. Construction traffic arriving from the north and the south will depart at Junction 5.
- 3.6 From Junction 5, construction traffic will head south on the A41 North Western Avenue, which is initially comprises a dual carriageway and narrows to a single carriageway two-way road to the south of the roundabout junction with the B462. Approximately 1.1km south of the B462 roundabout,

construction traffic accessing land parcel A and B will turn left onto Sandy Lane. Sandy Lane is a single carriageway two-war road approximately seven metres in width, which connects to Hilfield Lane.

- 3.7 Construction traffic will then turn right at the Sandy Lane / Hilfield Lane junction and proceed along Hilfield Lane to the Site accesses for land parcel A and B.
- 3.8 Construction traffic accessing land parcel C will continue south along the A41 North Western Avenue, before turning left onto Dagger Lane. Dagger Lane is a single carriageway two-way road that routes eastwards, primarily subject to a 60mph speed limit and with a section subject to a 30mph speed limit.
- 3.9 Dagger Lane adjoins Aldenham Road via a priority T-Junction, at which point construction traffic will turn left onto Aldenham Road and continue north for approximately 410m, before turning right at the priority T-Junction with Butterfly Lane. Butterfly Lane continues to the Site access as a single carriageway two-way road measuring approximately six metres in width and subject to a 60mph speed limit.
- 3.10 It is confirmed that the above described routes are devoid of any height or weight restrictions and are of an appropriate width and alignment for use by articulated HGV's.

Outbound Construction Traffic

3.11 All construction vehicles egressing land parcel A and B will turn left and right out of the Site respectively and continue north along Hilfield Lane and following the reverse of the above described route. All construction vehicles egressing land parcel C will turn right onto Butterfly Lane and follow the reverse of the above described route.

Route Signage

- 3.12 Appropriate signage will be provided along the construction traffic route, including at the Site accesses. All signage will be compliant with Chapter 8 of the Traffic Signs Manual where applicable and therefore the following points will be considered when locating signage:
 - The position of the sign in relation to the highway;
 - Possible distraction to drivers; and
 - The proximity to junctions and roundabouts.

Management of Deliveries

- 3.13 Due to the relatively low number of vehicles associated with the construction phase at the Site, there is not anticipated to be any delay to background traffic. Background traffic will always be given priority in the vicinity of the Site access/egress.
- 3.14 The phone number of the Site Manager will be made available to all drivers of vehicles that will be accessing the Site. Drivers will be required to call ahead whilst stopped at an appropriate location.
- 3.15 The following procedure will be initiated when deliveries are made to the Site:

Procedure for Arrival to Site

- Driver to call ahead to Site:
- The banksmen are mobilised and will go to position at the Site access;
- Driver will be informed the operators are in place and it is appropriate to travel to the Site via the agreed route;
- Banksmen will have a 'walkie-talkie' and will be able to communicate with each other, the Site Manager and the HGV drivers, as necessary; and
- Banksmen will assist HGVs to manoeuvre from Hilfield Lane and Butterfly Lane into the Site access, but will not direct general traffic.
- 3.16 The following procedure will be initiated when HGVs are leaving the Site:

Procedure for Leaving the Site

- Before drivers depart the Site Manager will be notified. They will then mobilise the banksmen at the Site access;
- Drivers will be advised when the banksmen are in place and will begin to leave the Site; and
- Banksmen will guide the drivers exiting the Site access onto Hilfield Lane and Butterfly Lane, but will not direct general traffic.

Summary

- 3.17 The proposed construction traffic route is considered to provide a direct route from the strategic road network to the Site. It is of a suitable width without weight or height restrictions and is therefore considered appropriate to accommodate vehicles associated with the construction phase.
- 3.18 The use of any roads other than the designated and signposted route shall not be permitted and this shall be enforced through the agreement of this CTMP.

3.19 Appropriate mitigation measures will be provided throughout the construction phase in order to manage the arrival and departures of HGVs at the Site. This is set out further in **Chapter 6**.

4 Contractors Compound and Internal Routing

Contractors Compound

- 4.1 A contractors compound will be provided as near as possible to the access points for Land Parcels B and C. Those working within Land Parcel A will use the compound at Land Parcel B.
- 4.2 Approximately 60 to 70 construction workers are anticipated to be required on Site on an average day. This may increase slightly during peak construction. The location where staff will travel from is unknown at this stage as it will depend on the appointed contractor. However, it is envisaged that the majority of non-local workforce will stay at local accommodation and be transported to the Site by minibuses to minimise the impact on the strategic and local highway network. Notwithstanding this, appropriate car parking provision for construction workers and visitors will be provided within the contractor compounds.
- 4.3 No parking by contractors, visitors or delivery vehicles will be permitted on the local highway network or the Site access road at any time during the construction phase, and visitors will be advised of the parking arrangements in advance of travelling to the Site. The Site Manager will monitor that parking is taking place in the designated area on a regular basis.
- 4.4 No diversion of pedestrian routes, parking suspensions or closure of lanes are required.
- 4.5 An underground cable will be installed to connect each Parcel of Land. This will need to cross Aldernham Road and Hilfield Road. Prior to these works being undertaken, all appropriate licences will be obtained, and traffic management agreed with HCC.

Internal Access Road

- 4.6 The Proposed Development will include internal access roads throughout the Site allowing for the movement of construction and maintenance vehicles.
- 4.7 It is proposed that the internal access roads will be completed during the initial stages of construction so that temporary haul routes are not necessary.
- 4.8 Wheel washing facilities will be provided at the end of the access roads, ahead of the egress onto Hilfield Lane and Butterfly Lane, to ensure no mud is taken onto the local highway network. If necessary, a road sweeper will be deployed.

5 Construction Vehicle Trip Generation

Construction Phase

- 5.1 It is anticipated that the construction phase will last for approximately 40 weeks. Construction activities and deliveries will be carried out Monday to Friday 08:00-18:00 and between 08:00 and 13:30 on Saturdays. No construction activities or deliveries will occur on Sunday or Public Holidays. As there are a number of schools in the area, deliveries will be coordinated to avoid drop of and pick up times, between 07:30-09:00 and 15:00-18.00. As such, all deliveries will be made between 09:00-15:00.
- 5.2 The construction period will include the use of HGVs to bring the equipment onto the Site and this will be strictly managed to ensure that vehicle movement is controlled and kept to a minimum. It should be noted that, unlike wind farms, the construction of a solar farm and battery storage facility does not require equipment to be delivered by abnormal loads (i.e. vehicles over 16.5m in length).
- 5.3 Deliveries to the Site shall be reported to the Site Manager and will be made by the smallest possible vehicles for that particular item of plant or material, to ensure that vehicles can manoeuvre safely.

Solar Farm

- 5.4 The components which are required to construct the solar farm will arrive by HGV (maximum size of 16.5m in length).
- 5.5 The Applicant has advised that 430 deliveries will be required for the solar modules and mounting structures. The largest vehicle to deliver this equipment will be a 16.5m articulated vehicle.
- It is anticipated that the proposed solar farm will have a total of 16 inverter/transformer stations. It is assumed that these would be transported individually due to their weight and as such it is anticipated that this would equate to a total of 16 deliveries.
- 5.7 It is also anticipated that the internal equipment housed within the substation container and the external equipment located within the substation compound would be delivered on four 10m rigid lorries and/or 16.5m articulated lorries.
- It is likely that the material required for the internal access tracks will arrive by 10m rigid vehicles and it is anticipated that 215 deliveries will be required.

- 5.9 Front end JCBs would also be required to transport equipment around the Site, and to distribute the graded stone required for the access road as necessary. It is anticipated that five JCBs will be required and that these will be transported to the Site by a 16.5m low loader.
- 5.10 In addition, there will be a number of deliveries bringing sand, gravel and cables to the Site.
- 5.11 **Table 5.1** sets out a summary of the HGV movements that could be associated with the construction phase of the solar farm.

Table 5.1 Heavy Goods Vehicle Movements – Construction Period

Activity	Type of Vehicle	Total Number of Deliveries
Solar Modules & Mounting Structures	Max 16.5 Articulated	430 (860 two-way movements)
Inverters/Transformers	10m Rigid	16 (32 two-way movements)
Substation	10m Rigid and 16.5m Articulated	4 (8 two-way movements)
Internal Access Tracks	10m Rigid	215 (430 two-way movements)
General	Front End JCB by low loader	5 (10 two-way movements if driven to Site)
Other (sand, gravel, waste etc)	Max 16.5 Articulated	315 (630 two-way movements)
Total		985 deliveries (average of 5 deliveries per day or 10 two way movements per day)*
10% Buffer		1084 deliveries (average of 5.5 deliveries per day or 11 two way movements per day)*

^{*} Deliveries taking place over a 40 week period (200 working days, excluding Saturdays to be robust)

- As set out in **Table 5.1** it is anticipated 985 deliveries (1,970 two-way movements) could be made by HGVs during the construction of the solar farm, at an average of around five deliveries, or 10 two-way movements, per day. If a 10% buffer is applied to represent a worst case, the number of deliveries will be an average of five to six per day.
- 5.13 In addition to the HGV movements identified in **Table 5.1**, there will also be a small number of construction movements associated with smaller vehicles such as for waste management and the

transportation of construction workers and sub-contractors. It is likely that that there could be up to five LGV movements per day. This includes minibuses transporting construction workers.

5.14 As stated, construction traffic will be coordinated to avoid school drop-off and pick-up periods. Due to the Site operational hours (08:00-18:00), construction worker travel will occur outside of the peak hours.

Battery Storage

5.15 Components which are required to construct the battery storage facility will arrive by HGV (maximum size of 16.5m length). In summary, it is proposed that the following HGV movements could be associated with the construction of the battery storage facility, as set out in **Table 5.2**.

<u>Table 5.2 Heavy Goods Vehicle Movements – Construction Phase</u>

Activity	Type of Vehicle	Total number of Deliveries	
Battery Modules (up to 49.9 MW)	Max 16.5m Articulated	50 (100 two-way movements)	
General Deliveries (cables, fencing etc.)	16.5m Articulated or 10m Rigid	75 (150 two-way movements)	
Contractor's Compound	16.5m Articulated	6 (12 two-way movements)	
Total		131 deliveries (average of less than one delivery per day or up to two two-way movements)	
* Deliveries taking place over a 40 week period (200 working days, excluding Saturdays to be robust)			

Deliveries taking place over a 40 week period (200 working days, excluding Saturdays to be robust)

As set out in **Table 5.2** it is anticipated that a maximum of 131 deliveries (262 two-way movements) could be made by HGV's during the construction of the battery storage facility, at an average of less than one delivery, or up to two two-way movements, per day.

Operational and Decommissioning Phases

- 5.17 Once operational, maintenance vehicles will utilise the same access points. It is likely that a maintenance vehicle (likely to be a transit van) will visit the Site approximately twice a month.
- 5.18 Space will be available within the Site on the access road for such a vehicle to turn around to ensure that reversing will not occur onto the highway.

5.19 The traffic management elements of the decommissioning phase will be addressed in the decommissioning plan.

Summary

- 5.20 It is expected that there will be approximately seven to five HGVs accessing the Site each day during the construction phase. There will also be construction workers arriving at the Site in the morning and departing in the evening, although the numbers involved are forecast to be relatively low and will occur outside of peak hours.
- 5.21 The level of traffic forecast during the temporary construction phase is therefore low and it is concluded that it will not have a material impact on the safety or operation of the local highway network.

6 Proposed Mitigation measures

- 6.1 The appointed contractor will introduce measures to minimise the impact resulting from construction activities. It will be the responsibility of the Project Manager and Site Manager to oversee the implementation of the mitigation measures.
- 6.1 Proposed mitigation measures include:
 - signs to direct construction vehicles associated with the development will be installed along the agreed construction traffic route. Delivery drivers, contractors and visitors will be provided with a route plan in advance of delivering to Site to ensure that vehicles follow the identified route;
 - (ii) advisory signs informing contractors and visitors that parking is not permitted on-street in the vicinity of the Site or on the Site access road;
 - (iii) all signage on the designated route will be inspected twice daily by the Site Manager (once in the morning and once at lunchtime), to ensure they are kept in a well maintained condition and located in safe and appropriate locations;
 - (iv) a compound area for contractors will be set up on-Site in the vicinity of each access, including appropriate parking spaces. Contractors and visitors will be advised that parking facilities will be provided on-Site in advance of visiting the Site and that they should not park on-street;
 - (v) a wheel wash facility will be provided ahead of exiting the Site allowing vehicles to be hosed down so that no construction vehicles will take mud or debris onto the local highway network;
 - (vi) a road sweeper will be provided for surrounding local roads along the designated route to alleviate any residual debris generated during the construction phase, as required;
 - (vii) the Site will be secured at all times with Heras fencing;
 - (viii) a requirement for engines to be switched off on-Site when not in use;
 - (ix) spraying of areas with water supplied as and when conditions dictate to prevent the spread of dust;
 - (x) vehicles carrying waste material off-Site to be sheeted;
 - (xi) banksmen will be provided at the Site access to indicate to construction traffic when it is safe for them to enter and exit the Site;

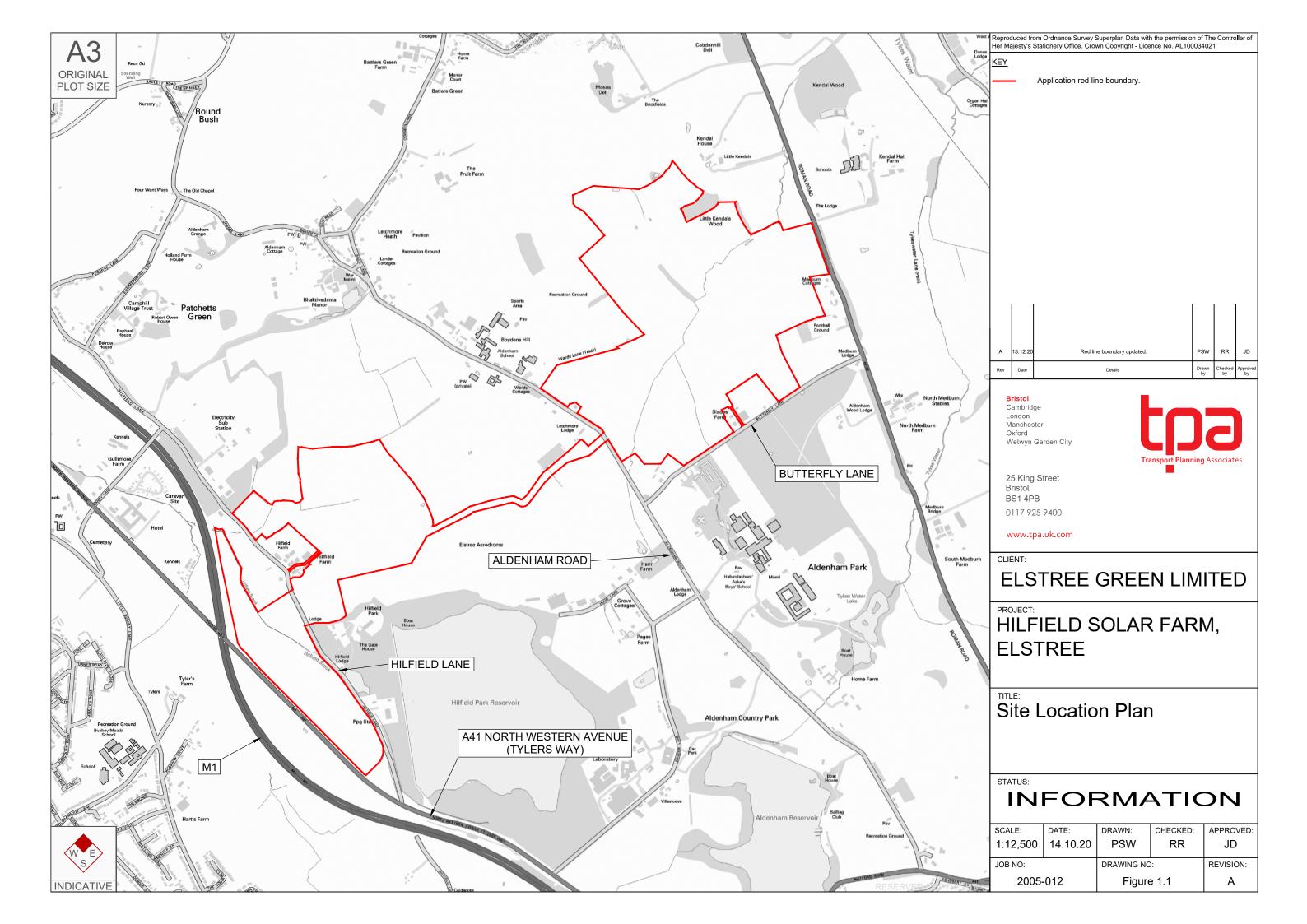
- (xii) all residents in the vicinity of the Site along the designated route will be provided with contact details of the Site Manager, which will also be provided on a Site-board at the Site accesses; and
- (xiii) Agreement to a Highways Condition Survey.

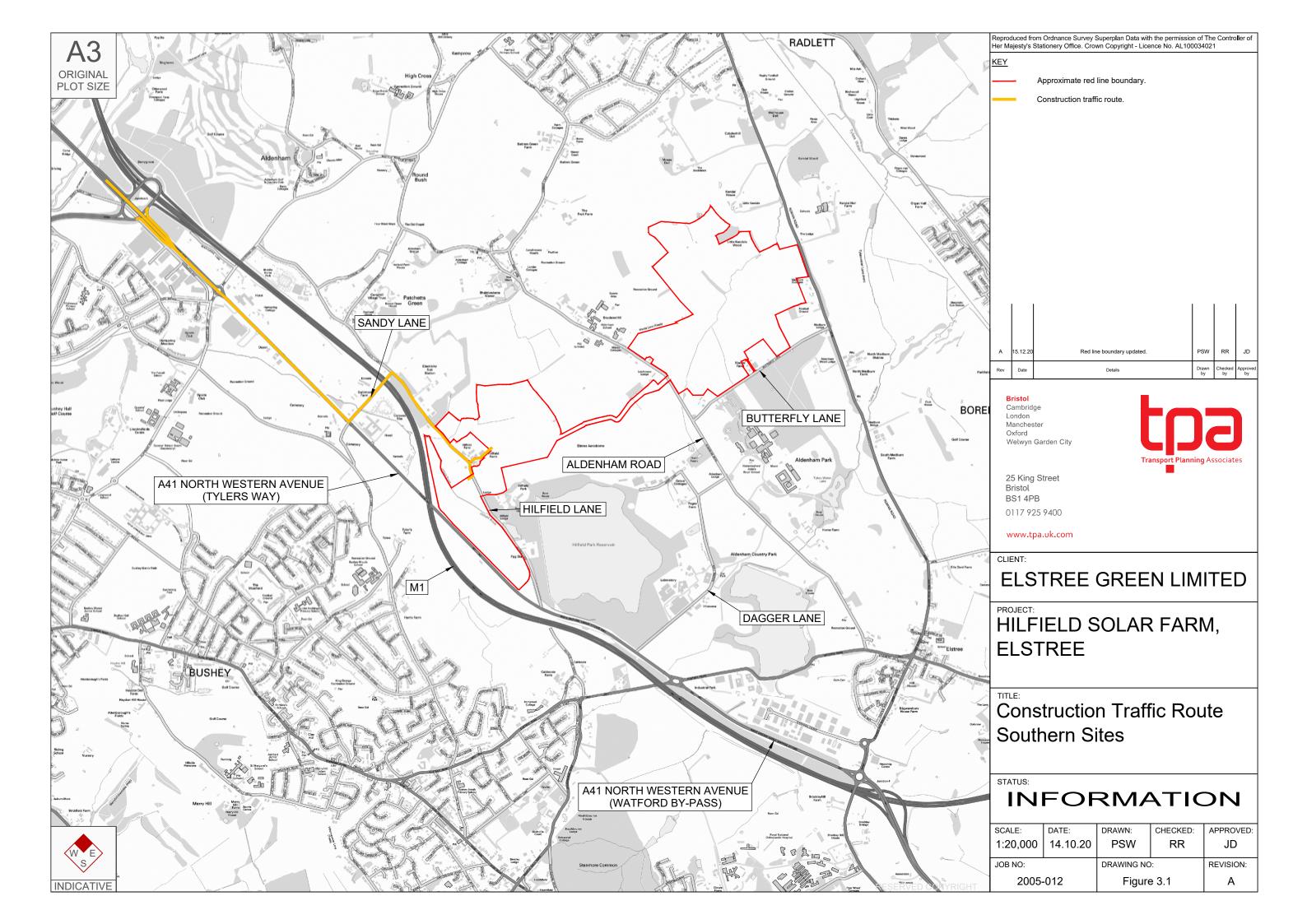
7 Road Condition Surveys

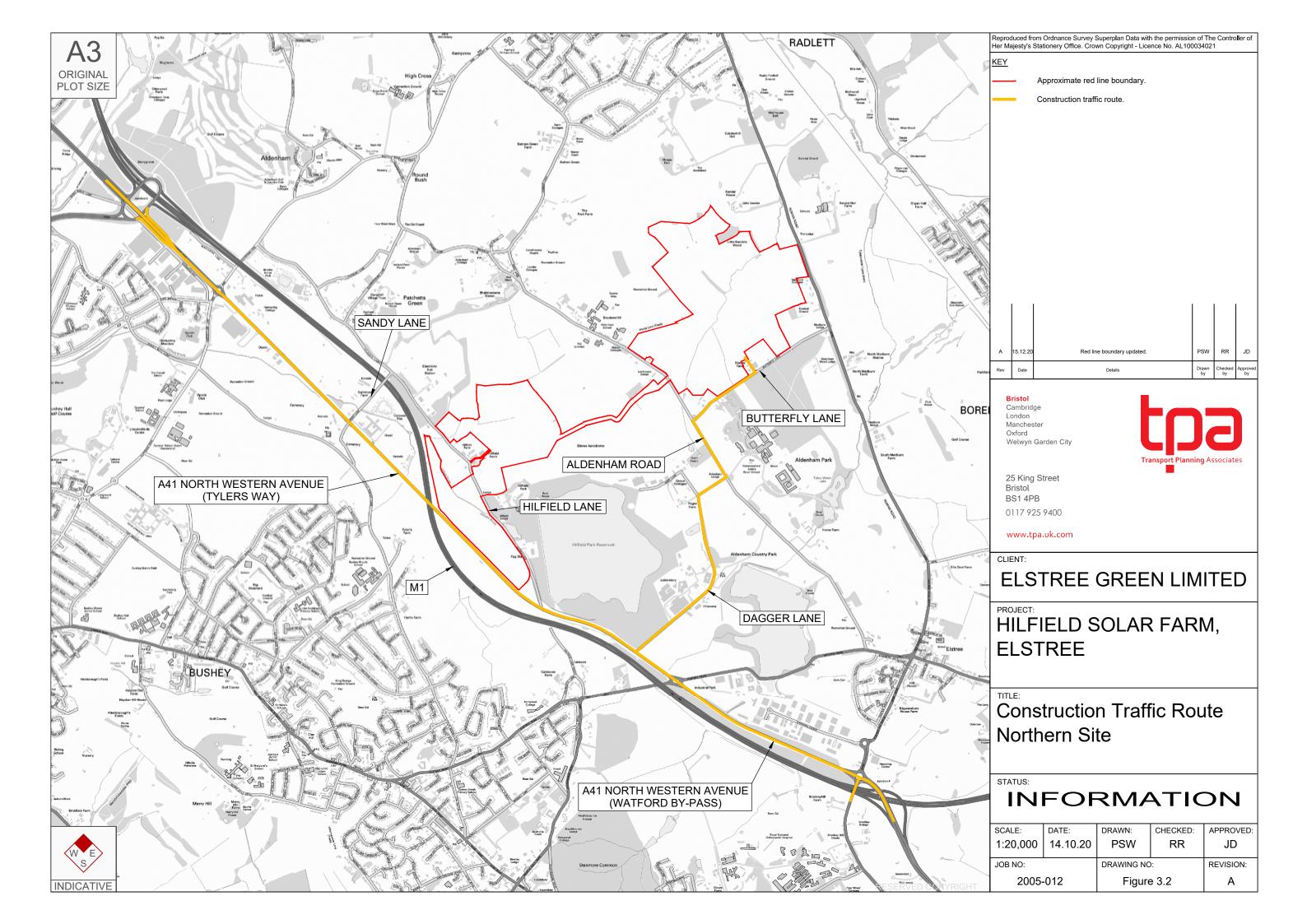
- 7.1 A pre-commencement walk-over condition survey on the local highway network will be carried out and agreed with highway officers at HCC, in order to assess the baseline condition of the adopted highway.
- 7.2 The extent of the survey will be agreed with highway officers and is anticipated to include the section of carriageway in the vicinity of the construction accesses only. The wider road network is already used regularly by agricultural vehicles and HGV's and as such any damage caused would not be able to be attributed solely to construction activity at this Site. The survey will incorporate a photographic record as appropriate.
- 7.3 A post-construction condition survey would then be conducted across the same extent of adopted highway in order to identify and agree with HCC any remedial works reasonably attributable to construction activities. Any identified highways defects resulting from construction activities will be corrected to the satisfaction of HCC.

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Figures

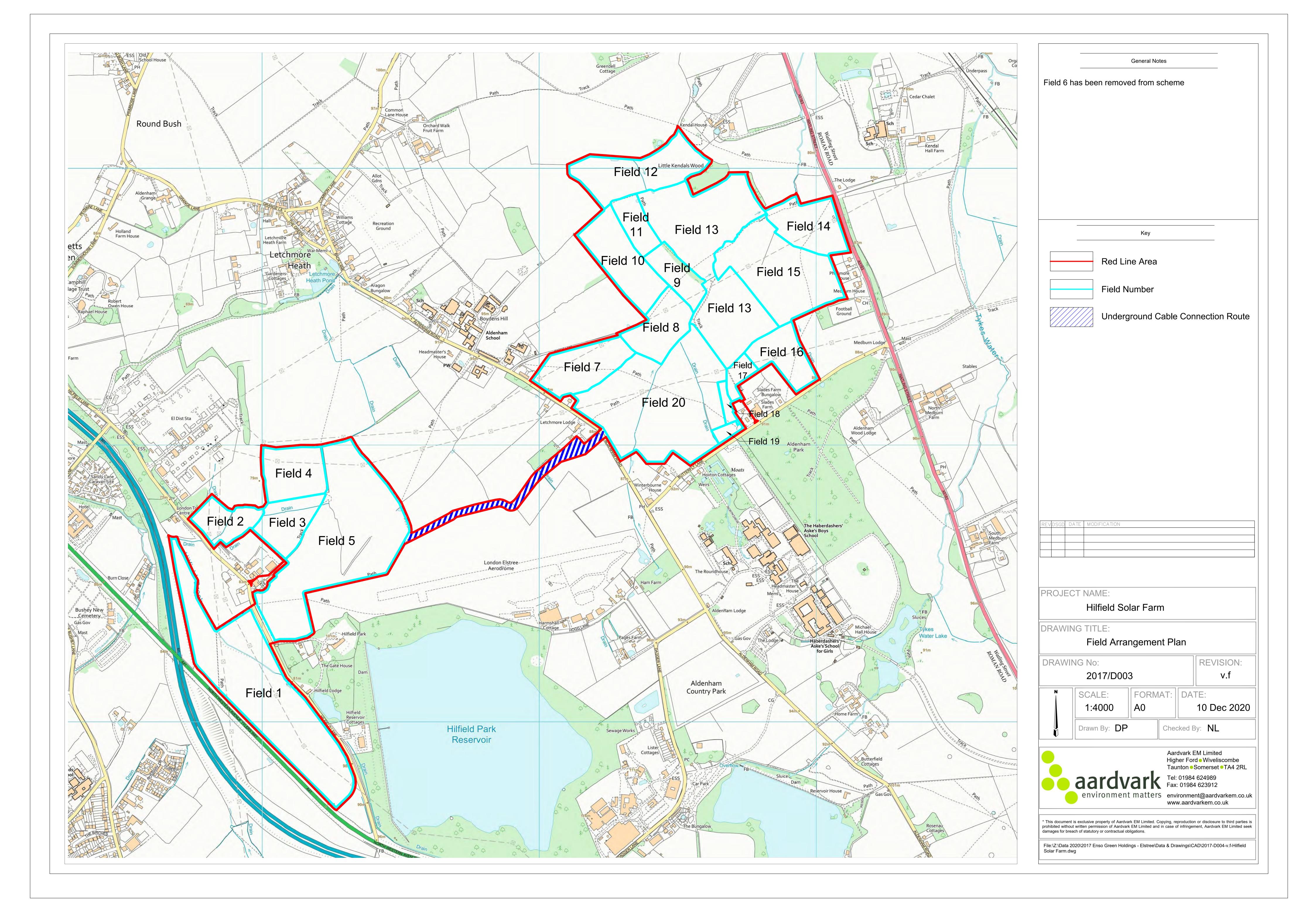






Elstree Green Limited Hilfield Solar Farm

APPENDIX A





Elstree Green Limited Hilfield Solar Farm

APPENDIX B

