BSR Energy

Transport Statement

Worlds End Farm, Berkeley

662706

SEPTEMBER 2021

RSK

RSK GENERAL NOTES

Project No.: 662706 TS (02)

Title: Transport Statement, Worlds End Farm, Berkeley

Client: BSR Energy

Date: 17/09/2021

Office: Manchester

Status: Final Draft

Author	S Ferguson	**Technical reviewer**	I Wickett
Signature:		Signature:	
Date:	17/09/2021	Date:	17/09/2021

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TABLES

FIGURES

APPENDICES

1 INTRODUCTION

RSK has been instructed by BSR Energy to produce a Transport Statement (TS) for the proposed erection of a 49.99 MW Solar PV Array, comprising ground mounted solar PV panels, vehicular access from Worlds End Lane with internal access tracks, landscaping and associated infrastructure including security fencing, CCTV cameras, and grid connection infrastructure including inverter and substation buildings.

1.1 Site Location

The application site is a mixture of agricultural/greenfield land, located roughly 4km south west of the village of Berkeley, as illustrated in Figure 1.1. The proposed development is served off an existing access to Worlds End Lane, currently leading to several agricultural units.

Figure 1.1 Site location plan

Source: Google 2020

This report describes the effects that the construction phase of the solar farm is likely to have on traffic flows within the local area. The measures outlined within this TS will be supported by a traffic management plan (TMP) which can be conditioned as part of any planning consent and will be finalised and implemented by the contractor. A draft TMP is contained at Appendix 1.

After construction, the site will encounter low levels of traffic for regular maintenance purposes only. Therefore, there will be no long-term operational changes occurring because of the development.

1.2 Purpose and Structure of Report

The following chapters describe the work that has been undertaken as part of this study. The report is structured as follows:

- Chapter 2 describes the primary routing for construction traffic, as well as a description of, and the impacts on the existing local highway network;
- Chapter 3 discusses the possible environmental impacts of the development;
- Chapter 4 details the development proposals, and
- Chapter 5 provides our summary and conclusions.

2 BASELINE CONTEXT

2.1 Surrounding highway network

It is proposed that the site will be accessed from Worlds End Lane, located to the east of the development. The M5 is the closest motorway to the site, located roughly 5km to the east of the proposed development, and offers the primary route for construction traffic accessing the development. It is anticipated that the largest volume of traffic will be associated with the construction phase of the project, and will take the following route:

- Construction traffic will leave the M5, east of the site, at the slip road leading to the B4509 at junction 14 and join the A38 to the west.
- Traffic should continue northbound along the A38 until reaching Stone, where traffic would turn left, and journey northbound to Ham.
- Traffic would then take a left after reaching Ham and enter Clapton Road.
- Traffic should continue southbound, before reaching a T-junction that connects Clapton Road and Worlds End Lane, leading to the site access.

It is likely that the majority of construction workers will journey from either Gloucester or Bristol, located to the north and south of the site respectively. Such locations are the closest cities to the development and will offer the largest workforce for site construction.

Materials will be transported to the site via the M5, with imported materials likely to reach the site via the port at Avonmouth, before reaching the M5.

2.1.1 Worlds End Lane

Worlds End Lane is a rural, single-carriageway road, roughly 3m in width. The road passes through a mixture of greenfield/agricultural land, connecting to several agricultural buildings at its western end and Clapton Road to the east. It is likely that traffic flows, as well as pedestrian/cycle usage will be very low, due to the remote nature of the road as currently, the road leads to agricultural units only, offering limited potential for traffic flows.

2.1.2 Clapton Road

Clapton Road is a rural, single-carriageway road, roughly 4m in width with some passing places available. The road passes through a mixture of greenfield/agricultural land, as well as leading to the village of Ham to the north and connecting to the village of Hill to the south, after changing name to Hill Road. It is anticipated that traffic flows will be low due its remote nature and limited properties being served.

2.1.3 Road between Stone and Berkeley

The unnamed road that runs between the A38 at Stone and Berkeley village has similar characteristics to Clapton Road, in the form of a rural single carriageway. Some sections of this road are limited in width with other sections accommodating two-way traffic. Traffic flows are anticipated to be low, as well as non-motorised users except where it passes through built-up areas. There is a primary school close to the junction with the A38, which requires consideration in the context of construction delivery hours.

2.1.4 A38

The A38 forms part of the primary road network and is a long-distance road carrying a wide range of vehicle types, including goods vehicles. The road is a rural, single-carriageway road, roughly 10m in width and operating at a speed limit of 60mph. To the south, the road leads to Bristol, as well as connecting to the M4 and M5, offering an important connection to the wider network. The road also connects to the M5 to the north, as well as leading to Gloucester.

2.2 Existing traffic

In order to establish a baseline to consider the possible effects of construction traffic on local traffic, DfT traffic data (2009) has been examined. There are two count point locations, one south of Berkeley (manual count point 930517) and the other north of Rockhampton (manual count point 979247), roughly 3km north and 5km south of the site respectively. While neither of these points are located directly along the construction access route, the site at Berkeley is representative of the route between Stone and Ham while the site at Rockhampton is more representative of the route between Ham and Worlds End Lane.

Figure 2.1 below highlights where each count point is located, while Table 2.1 summarises these results.

Figure 2.1: Traffic count locations (DfT 2009)

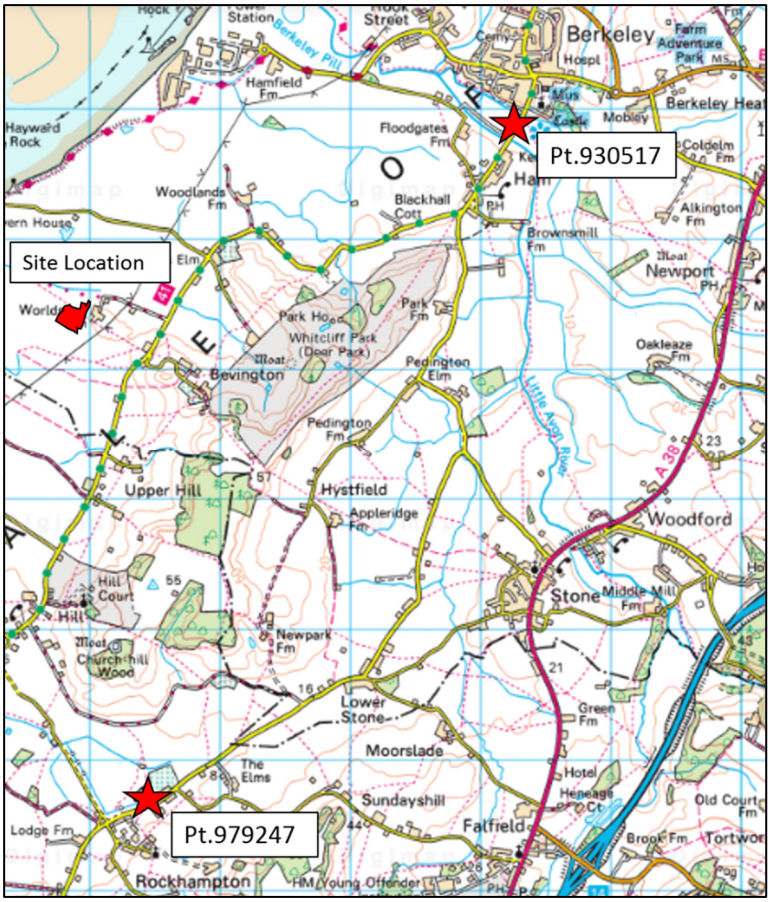

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Table 2.1: Baseline traffic flows (2009)

Location	HGV Movements	All Vehicles	% HGVs
South of Berkeley High Street, Berkeley - Pt.930517	8	993	1%
Lower Stone Road, Rockhampton - Pt.979247	18	683	3%

As the above flows are relatively low, it is likely that construction traffic will have little to no impact on the capacity of the local highway network. It is also important to recognise that HGV's make up a very small proportion of total flows, further indicating the minimal impact of construction traffic flows.

3 PROPOSED DEVELOPMENT

The proposals comprise the construction of a solar farm on land currently used for agricultural purposes off Worlds End Lane in Gloucestershire. The solar farm would have a power capacity of 49.99MW and would require the installation of approximately 98,000 modules across the site. The proposed site plan is included in Appendix 1.

The construction process is relatively simple and repetitive with off-site pre-fabrication and assembly, allowing large volumes of modules to be installed on a daily basis. This minimises the number of deliveries to site and maximises control over vehicles travelling to and from site.

3.1 Site access

The proposed site access is located off Worlds End Lane, currently used to access several agricultural units. The traffic generated as a result of the development during its operational phase will be similar to the existing volume of traffic as it will require infrequent maintenance and monitoring visits. Therefore, no permanent alterations are proposed to the site access arrangements.

As part of the proposals, the site would include a substation area located to the east of the development and served by a new separate access designated for the distributor network operator (DNO). The access would be in form of a track off Worlds End Lane and run south, adjacent to the existing farm, connecting to the proposed substation area.

During construction, the existing access will be managed to ensure that no conflicts occur between incoming and outgoing vehicles. The dominant type of material arriving at site will be the solar panel modules, which will arrive via a single transport provider and at a rate that matches the rate of installation to avoid stockpiling on site. This will result in a ‘drip feed’ of HGVs to and from the site, evenly spaced and with adequate time between deliveries to avoid two-way construction along the approach roads.

3.2 Construction traffic

Construction traffic associated with the development will comprise HGVs delivering construction materials and installation components associated with the solar array and other vehicles associated with staff and visitors.

3.3 Construction programme

It is envisaged that the construction works will take 6 months, with 22 working days per month. It is anticipated that traffic volumes will be higher during site mobilisation and access track construction across the first two months, reducing to lower levels for months 3 to 5, with site demobilisation generating the lowest volumes of traffic in month 6.

The construction process is relatively simple and repetitive with off-site pre-fabrication and assembly, allowing large volumes of modules to be installed on a daily basis. This minimises the number of deliveries to site and maximises control over vehicles travelling to and from site.

3.3.1 Mobilisation and demobilisation

The site will initially require delivery of plant, equipment, construction materials and welfare units, in preparation to build the site compound. It is envisaged that this will generate around 30 HGV movements (two-way) in the first month. Upon completion of works the site will be demobilised generating another 30 two-way vehicle movements during the last month of the programme.

3.3.2 Site access, access track and site compound

The proposals will comprise a new access off Worlds End Lane leading to a temporary site compound and internal access tracks across the solar farm to enable construction and future maintenance.

The construction compound will provide adequate space for car parking, storage of materials, welfare/offices and unloading. A hardstanding area will be constructed within the site, around the site access, to be used during the construction phase and for maintenance and monitoring activities, as illustrated in Appendix 2. In addition, access tracks would be constructed within the site to provide vehicular access for the panel installation.

The estimated access tracks total length is 4,107m. The tracks will be 4m wide and constructed to a depth of 0.45m. This equates to a volume of 7,393m^3 of required aggregate type 1. In addition, the estimated site compound area is 0.16 ha, which will also be constructed to a depth of 0.45m, equating to a volume of around 720m^3 of aggregate type 1. Therefore, the total estimated combined volume is 8,112m^3 which will be transported to the site in tipper trucks with capacity for 15m^3. This equates to a total of 541 deliveries spread out across the first two months of the programme, or around 541 two-way vehicle movements each month.

During construction, the access will be managed to ensure that no conflicts occur between incoming and outgoing vehicles.

3.3.3 DNO buildings and cabling

DNO buildings will be constructed once the construction works associated with access track and site compound are completed. This is estimated to be in the second and third months of the programme. A total of 8 HGV deliveries will be required for the transportation of concrete, plant and electrical equipment. In addition, 10 HGVs deliveries associated with the cabling will be required. Therefore, a total of 36 HGV movements (two-way) will be required for the site during this stage.

3.3.4 Panel frames and transformer inverters

Prior to the installation of the solar panels, frames and transformer inverters would need to be installed. This will take place across two months and each month will require a total of 50 HGV deliveries. This equates to 50 two-way HGV movements per month or a total of 100 HGV movements (two-way) across the two months.

3.3.5 Solar panels

The dominant type of material arriving at site will be the solar panel modules, which will arrive via a single transport provider and at a rate that matches the rate of installation to avoid stockpiling on site. This will result in a 'drip feed' of HGVs to and from the site, evenly spaced and with adequate time between deliveries to avoid two-way construction along the approach roads. The transport and installation of solar panels will require two months.

The proposals will require around 97,920 solar panels. Assuming each HGV has capacity to transport 400 solar panels, a total of 245 HGVs deliveries will be required, spread across two months. This equates to 164 HGV two-way movements in each month or a total of 490 HGV two-way movements across three months. However, given the limitations of the road network local to the site, it may be necessary to use smaller vehicles to deliver panels, potentially doubling the number to 327 two-way movements per month.

3.3.6 Fuel deliveries

Fuel deliveries will take place with one tanker travelling to the site every month for the duration of the programme. This equates to 2 vehicle movements (two-way) each month.

3.3.7 Staff and visitors

The number of staff and visitors will change throughout the programme with more staff being required during the peak of the construction. It is estimated that around 10 workers will be required on site during the mobilisation/demobilisation stages which will generate a total of 20 two-way vehicle movements per day, travelling cars or vans. The remainder of the programme is anticipated to require 20 workers which equates to 40 two-way vehicle movements per day.

3.4 HGV construction traffic volume

Overall, it is anticipated that the programme will generate a maximum of 561 HGV vehicle movements during the second month of the programme. This equates to an average of 26 daily movements in that month. The peak of the construction traffic will take place over the first three months of the programme and will result in an average of 511 vehicle movements (two-way) per month or 24 movements per day.

A summary of the anticipated HGV movements associated with the construction programme is shown in Table 3.1 below. Based on the construction hours of the site, avoiding school start and finish times, this will equate to around 1-2 HGVs per hour in each direction, applying the assumption that smaller vehicles are used for solar panel delivery.

Table 3.1: Anticipated HGV movements (two-way) for the programme

Activity	Programme month						Total
	1	2	3	4	5	6	
Site mobilisation	30						30
Access tracks & site compound	433	541	109				1,083
Substation and cabling		18	18				36
Frames and inverters			50	50			100
Solar panels			327	327	327		981
Site demobilisation						30	30
Fuel deliveries	2	2	2	2	2	2	12
Total per month	465	561	506	379	329	32	2,272
Daily average	22	26	23	18	15	2	

After construction, the site will encounter low levels of traffic, equivalent to around one van per week, for regular maintenance purposes only. Therefore, there will be no long-term operational changes occurring as a result of the development.

3.5 Traffic management

Traffic management measures will be required during the construction period to manage the traffic between the A38 and the site as these rural roads are restricted in width along some sections. There are a number of locations where passing opportunities exist, which are likely to cater for a proportion of conflicts between oncoming vehicles, noting the low traffic flows and very low frequency of construction traffic. These are identified on the plan at Appendix 3, illustrating where it is possible for a car to pass an HGV. This drawing also highlights potential locations within the assumed adopted highway (i.e. between field boundaries) where additional passing bays could be accommodated with only minor works necessary.

Some critical sections along the route may require the implementation of measures, which could include the use of temporary traffic signals, stop and go boards or traffic marshals along the road to control vehicle movements.

There is potential to use more restrictive controls during peak periods of construction, such as during site mobilisation when the volume of traffic may be compressed into a two week period. At other times, the daily volume of HGVs may be considered sufficiently low that the risk of causing disruption is negligible.

The TMP in the Appendix 4 will provide more detail on the potential measures, which will be discussed between the contractor and highway authority in advance of construction commencing.

4 ENVIRONMENTAL ASSESSMENT

4.1 Methodology

To assess the likely effect of construction traffic on the local area the *Guidelines for the Environmental Assessment of Roads Traffic (GEART, 1993)* is considered. As described in Section 2, traffic count data from the DfT has been utilised as baseline data.

Information provided by the applicant indicates the predicted traffic generated for the construction phase based on workers and HGV movements. This data has been compared to the DfT data to calculate a percentage change in traffic during the anticipated 16-week construction phase where workers and HGV movements are predicted to peak.

4.2 Construction Impacts

4.2.1 Traffic Flows

The rural nature of the road network surrounding the site is factored into the construction traffic impacts; as such a specific HGV route has been developed. It is possible to assess the likely impact of construction traffic along this route by comparing the baseline traffic data with the construction traffic data.

These figures have been calculated to give a daily flow. The results of these calculations are as follows;

- Average number of worker movements over 6 months = 40 p/d two-way
- Average number of HGV movements for 16 weeks = 28 p/d two-way

The projected increase in traffic flow along the proposed HGV route from the site is summarised in Table 3.1.

Table 4.1: Percentage Increase in Traffic Flow

Location	Total HGV Movements	Total All Vehicles	HGV % change	All Vehs. % Change
Between Stone and Ham	32 (+24)	1057 (+64)	+300%	+6.4%
Between Ham and Worlds End Lane	42 (+24)	747 (+64)	+133 %	+9.3%

GEART recognises that the day to day variation of traffic on a road is frequently plus or minus 10 per cent. It should therefore be assumed that a projected change in traffic of less than 10 per cent creates no detrimental environmental impact. A 30 per cent change in traffic flow (or HGV flow) represents a reasonable threshold for assessing traffic flow impacts on link roads.

The percentage increase in traffic exceeds the 30% threshold for HGVs at both data points, meaning further assessment is required.

4.2.2 Potential environmental effects

The IEA guidelines examine the potential environmental effects of road traffic on the following:

- Severance;
- Driver stress and delay;
- Pedestrian delay and amenity;
- Fear and intimidation; and
- Road safety

However, only 'pedestrian amenity' and 'fear and intimidation' are considered to affected by the HGV component. The magnitude of effect for each of these potential impacts is outlined in the tables below.

Table 4.2: Magnitude of impact - Pedestrian amenity

Magnitude	Description
Major	Change in total traffic or HGV flows over 200%
Moderate	Change in total traffic or HGV flows of 100-200%
Minor	Change in total traffic or HGV flows of 50-100%
Negligible	Change in total traffic or HGV less than 50%

Table 4.3: Magnitude of impact - Fear and intimidation

Magnitude	Description
Major	AAWT hourly flow (all vehs) >1,800 or AAWT flow (HGVs) >3,000
Moderate	AAWT hourly flow (all vehs) 1,200 to 1,800 or AAWT flow (HGVs) 2,000 to 3,000
Minor	AAWT hourly flow (all vehs) 600 to 1,200 or AAWT flow (HGVs) 1,000 to 2,000
Negligible	AAWT hourly flow (all vehs) < 600 or AAWT flow (HGVs) < 1,000

Based on the values in Table 3.2 and 3.3, the predicted impact on pedestrian amenity is classed as moderate to major, and fear and intimidation is classed as negligible.

However, based on the two data points, current HGV flows are very low, making the relative rise in HGV flows seem overly high. Furthermore, it is likely that there will be low pedestrian user numbers, making the environmental effect of construction traffic on existing highway users insignificant, especially coupled with the temporary nature of the construction flows.

4.3 Mitigation

4.3.1 Construction

Although there is no discernible effect on the strategic network as a result of the construction stage, a construction traffic management plan (TMP) will be developed to ensure that HGV's only use appropriate routes to access the site.

In addition to traffic management measures, where there are likely to be impacts to non-motorised users, such as public rights of way crossing access routes, additional signage will be erected to raise awareness for both users and drivers of vehicles. Signage will be erected at the start and end of each road being used by construction traffic to highlight the use by HGVs.

4.3.2 Operation

The operational stage of the project will not lead to any significant increase in traffic compared to existing levels.

5 SUMMARY AND CONCLUSIONS

RSK has been instructed by BSR Energy to produce a Transport Statement for the proposed construction of a 49.99 MW solar farm in Gloucestershire.

This assessment provides a summary of the likely increase in traffic flows during the construction and operational periods of the solar farm. Utilising existing traffic data and construction traffic data, it is considered this development will have a negligible effect on the local road network.

A number of traffic management measures are available to mitigate the impact of construction traffic during the relatively short 6 month period, which will be adequately secured through a Traffic Management Plan.

The existing strategic road network has sufficient capacity to overcome any concerns raised over temporary increases in HGV and non-HGV construction traffic movements generated during the construction period.

On the above basis, the proposed development is acceptable from a transport perspective.

APPENDIX 1 SITE PLAN

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28/07/2021 11:40:52
File References:

File Name:
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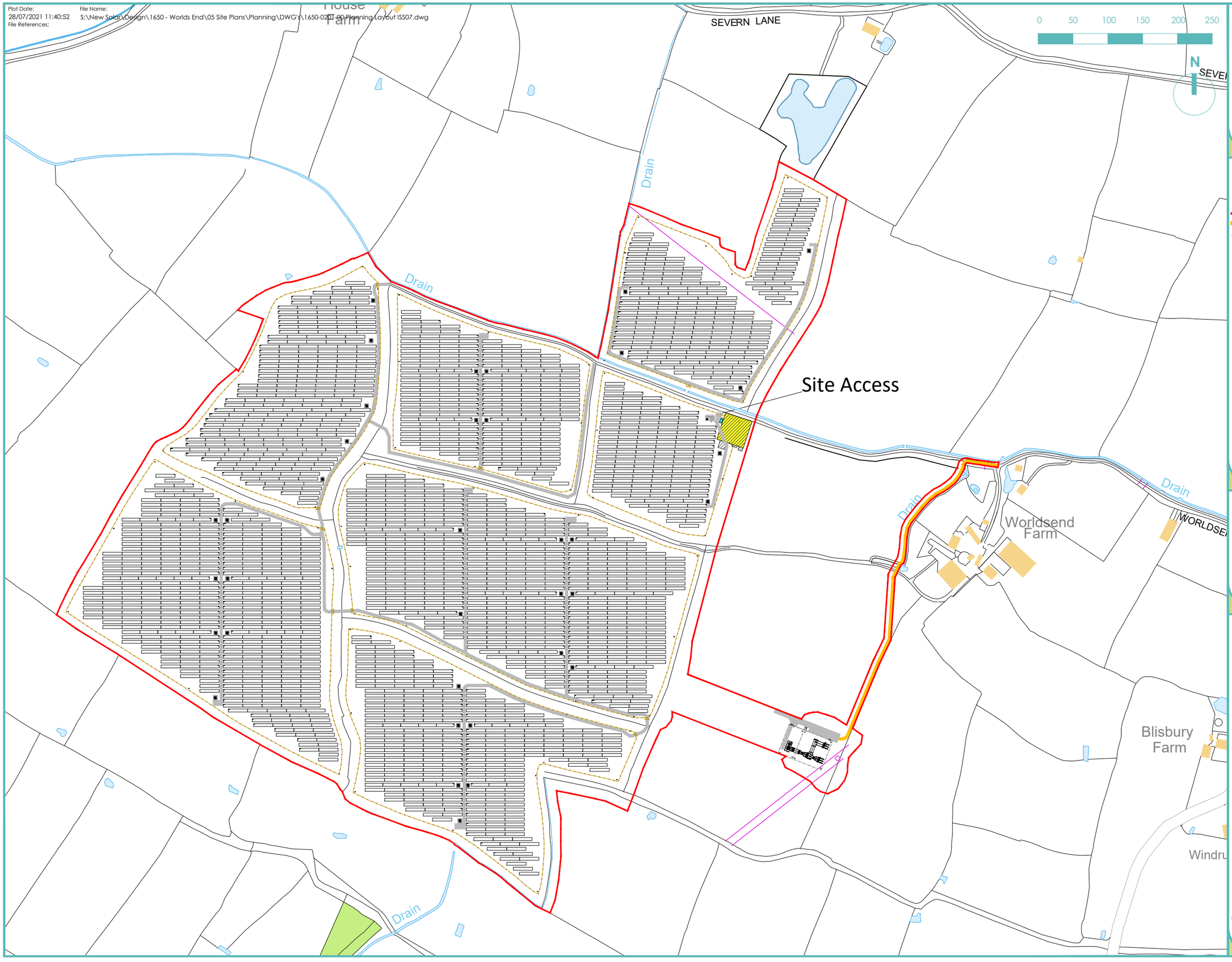

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Key:

- Site Boundary (160.62 Acres)
- DNO Access Track
- Fence
- Solar Arrays
- Private Switch
- CCTV Camera
- Spares/Welfare Containers
- Transformer Stations
- Transformer Access Tracks
- String Inverters
- Temporary Construction Compound

Rev:	Revision History:	Date:	By:
01	Initial Issue	15/11/19	AK
02	OS Map added	17/12/19	MB
03	DNO Substation & Access added	13/01/20	MB
04	Spare/Welfare containers and access gates added DNO access route amended	08/10/20	MB
05	Re-design for string inverters HV Compound added	24/02/21	MB
06	Development area revised	20/04/21	JA
07	Temporary construction compound added	27/07/21	JA

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Project:
Worlds End Farm Solar Park

Location:
Worlds End Clapton,
Berkeley, GL139RA

Title:
Planning Layout

Scale: 1:5000 @A3

Issue Notes:
Construction compound added

BSR Energy

Drawn By: JA	Issue Date: 27/07/21
Checked By: MB	Checked Date: 27/07/21
Approved By: CH	Approved Date: 29/07/21

Drawing Number:
1650-0201-00

Drawing Status: For Approval	Issue: 07

APPENDIX 2 SITE COMPOUND PLAN

Plot Date:
29/07/2021 10:41:35
File References:

File Name:
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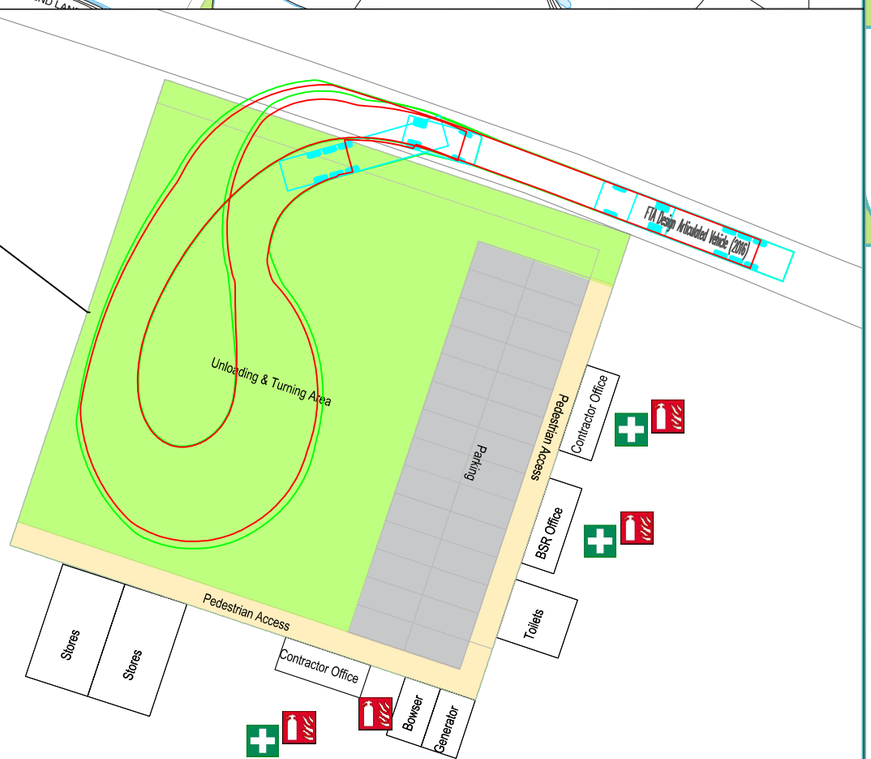
0 50 100 150 200 250

Severn House Farm
SEVERN LANE
Drain
Woodlands Farm
Willis Elm Farm
New Elm Cottage
Site Access
Worldsend Farm
WORLDSEND LANE
yhouse



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Key:

- Temporary Construction Compound
- First Aid Point
- Fire Extinguisher

Rev:	Revision History:	Date:	By:
01	Initial Issue	27/07/21	JA

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Project:
Worlds End Farm Solar Park

Location:
Worlds End Clapton, Berkeley, GL139RA

Title:
Access & Construction Compound

Scale: 1:500 & N.T.S @A3

Issue Notes:
Initial Issue

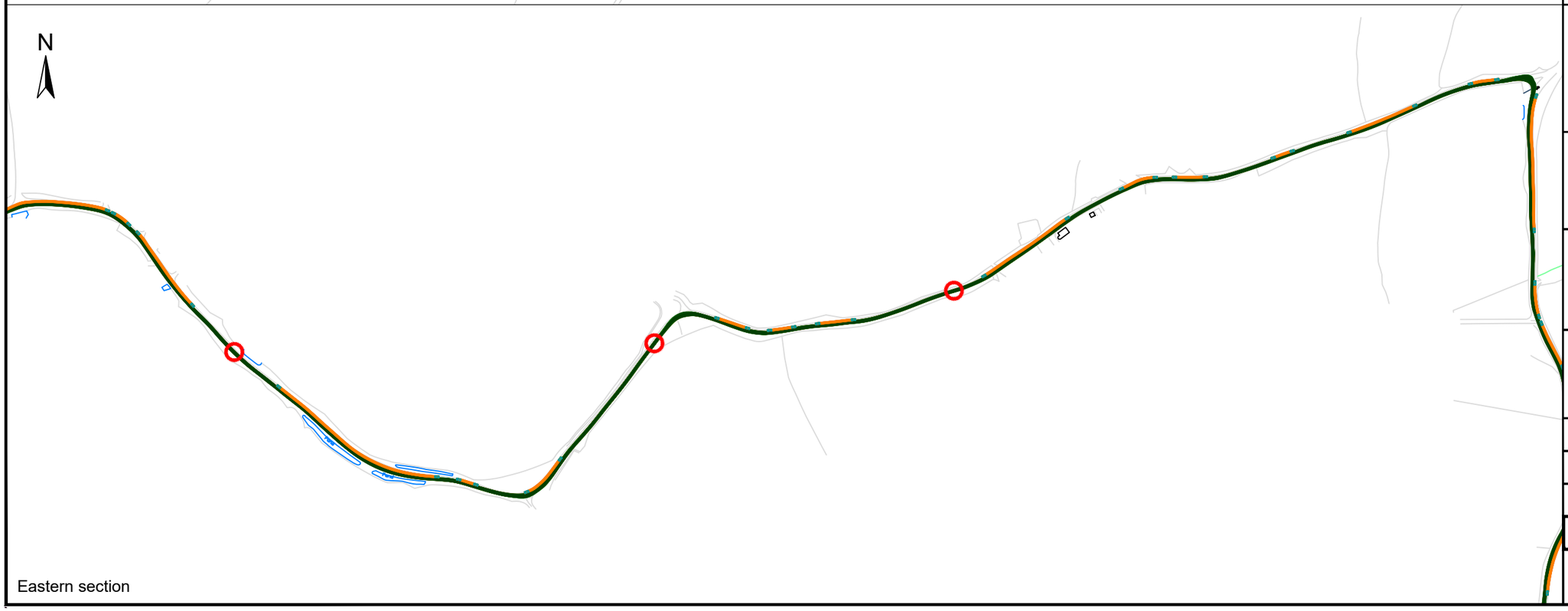
Drawn By:	Issue Date:
JA	27/07/21
Checked By:	Checked Date:
MB	27/07/21
Approved By:	Approved Date:
CH	29/07/21

Drawing Number:
1650-0201-20

Drawing Status: For Approval
Issue: 01

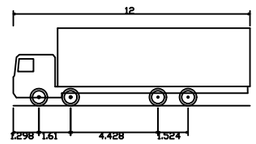
APPENDIX 3 SWEPT PATH ANALYSIS

Western section



Eastern section

Vehicle Profile



Rigid Truck	
Overall Length	12.000m
Overall Width	2.500m
Overall Body Height	3.928m
Min Body Ground Clearance	0.412m
Track Width	2.471m
Lock to lock time	6.00s
Kerb to Kerb Turning Radius	11.900m

Rigid vehicle

Car (where space allows)

Potential passing bays

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
—	—	—	—	—	—

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Client

BSR Energy

Project Title

Worlds End Farm

Berkeley

Drawing Title

Swept path analysis
and passing provision
Clapton Road

Drawn	Date	Checked	Date	Approved	Date
MQ	AUG21	—	—	—	—

Scale	Orig Size	Dimensions
1:5000	A3	METRES

Project No.	Drawing File
662706	

Drawing No.	Rev.
662706-10-01	—

Scale

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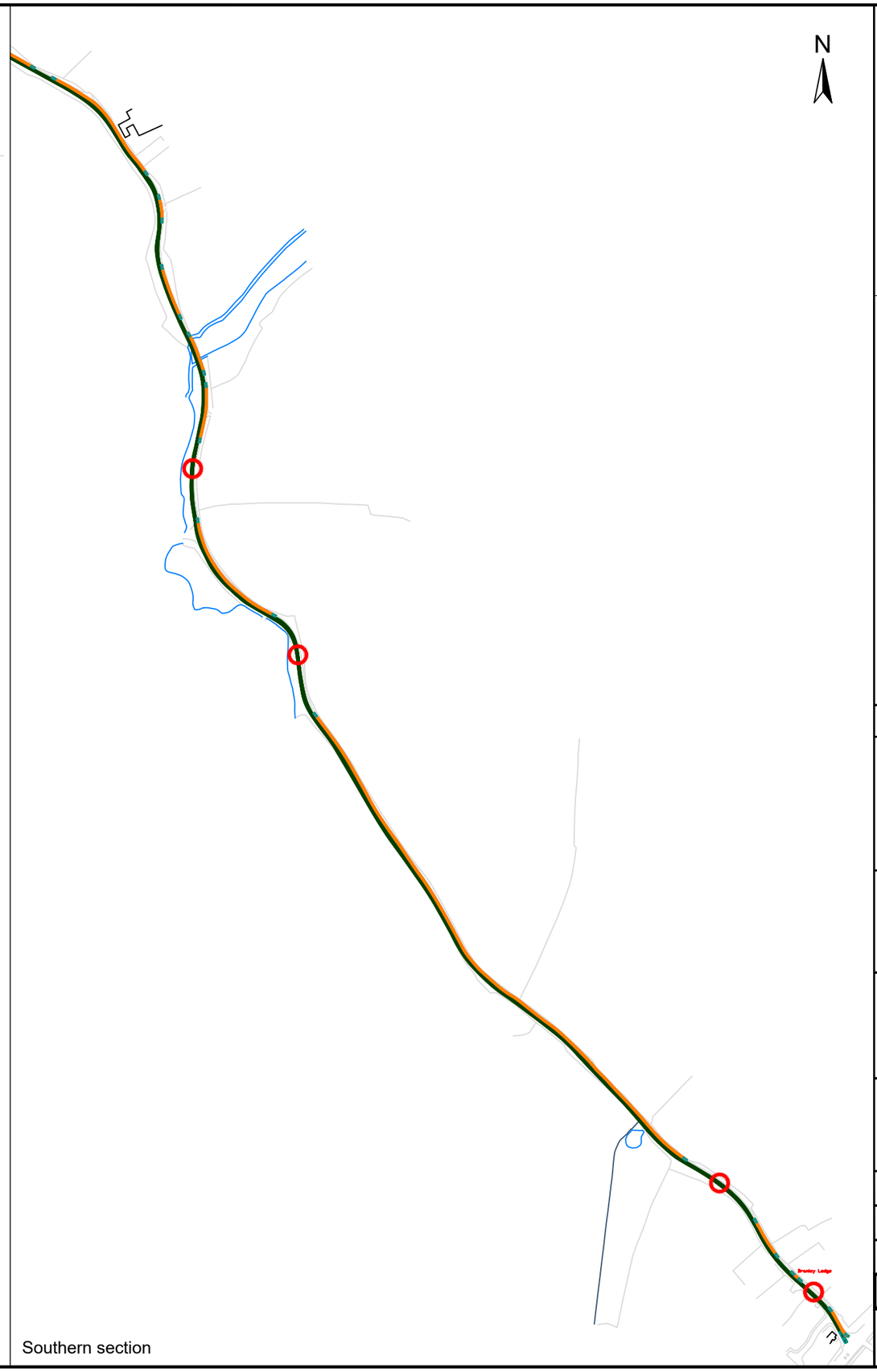
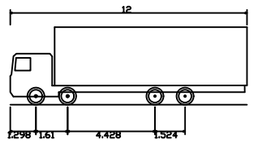
Northern section



Southern section

Vehicle Profile



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Rigid vehicle

Car (where space allows)

Potential passing bays

Rev.	Date	Amendment	Drawn	Chkd.	Appd.
—	—	—	—	—	—

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Client

BSR Energy

Project Title

Worlds End Farm

Berkeley

Drawing Title

Swept path analysis
and passing provision
Road from Stone to Ham

Drawn	Date	Checked	Date	Approved	Date
MQ	AUG21	—	—	—	—

Scale	Orig Size	Dimensions
1:5000	A3	METRES

Project No.	Drawing File
662706	

Drawing No.	Rev.
662706-10-02	—

Scale

0 50 100 200 300

APPENDIX 4 TRAFFIC MANAGEMENT PLAN

Traffic Management Plan

Worlds End Farm, Berkeley

Our reference: 662706-TMP-Rev02

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RSK has been instructed by BSR Energy to prepare a Traffic Management Plan (TMP), to support the proposals for the construction of a 49.99 MW solar farm at Worlds End Lane, Berkeley, Gloucester.

The application site is a mixture of agricultural/greenfield land, located roughly 4km south west of the village of Berkeley. The proposed development is served off an existing access to Worlds End Lane, currently leading to several agricultural units.

Purpose of the TMP

The construction process of the solar farm will require the movement of large equipment and materials to the site as well as staff movements. This TMP outlines the management of these movements and the interaction with the surrounding road network during the stages of the process.

The objectives of this TMP shall be to:

- Ensure safe vehicular and pedestrian access and egress at all times;
- Minimise the impact of traffic by identifying clear controls on routes for large goods vehicles, vehicle types, vehicle quantities and hours of site operations and delivery times;

Responsibilities

It is the responsibility of the Project Manager to ensure this plan is communicated to the Principal Contractor. The Principal Contractor must follow this plan and ensure that they communicate this to their own employees and contractors. Any deviation from this plan by the Principal Contractor must be justified by risk assessment and communicated to the Project Manager.

Frequency and duration of vehicle movements

Construction Traffic

It is envisaged that the construction phase would require up to 26 HGVs a day, with roughly 20 workers on site at its peak. The construction period is expected to be around 6 months with a peak during the first three months with a maximum flow of around 1 to 2 HGVs per hour in each direction.

Vehicle movements associated with construction workers are assumed to occur between 6.00am – 7.00am and in the three hours up to the end of the working day plus one hour after (4.00pm – 8.00pm), from Monday to Friday. Traffic associated with workers has therefore been distributed equally across these time periods. On rare occasions some works will be completed outside of the normal working hours, which means that some workers may leave later in the evenings. However, this would involve a small workforce and only occur for short periods. HGV deliveries will be scheduled between 7.00am and 6.00pm with restrictions around school drop and pick up times during term time.

Operational Traffic

The operational stage of the project will only require occasional maintenance visits and therefore not lead to any significant increase in traffic compared to existing levels, and it is not necessary to monitor the impact.

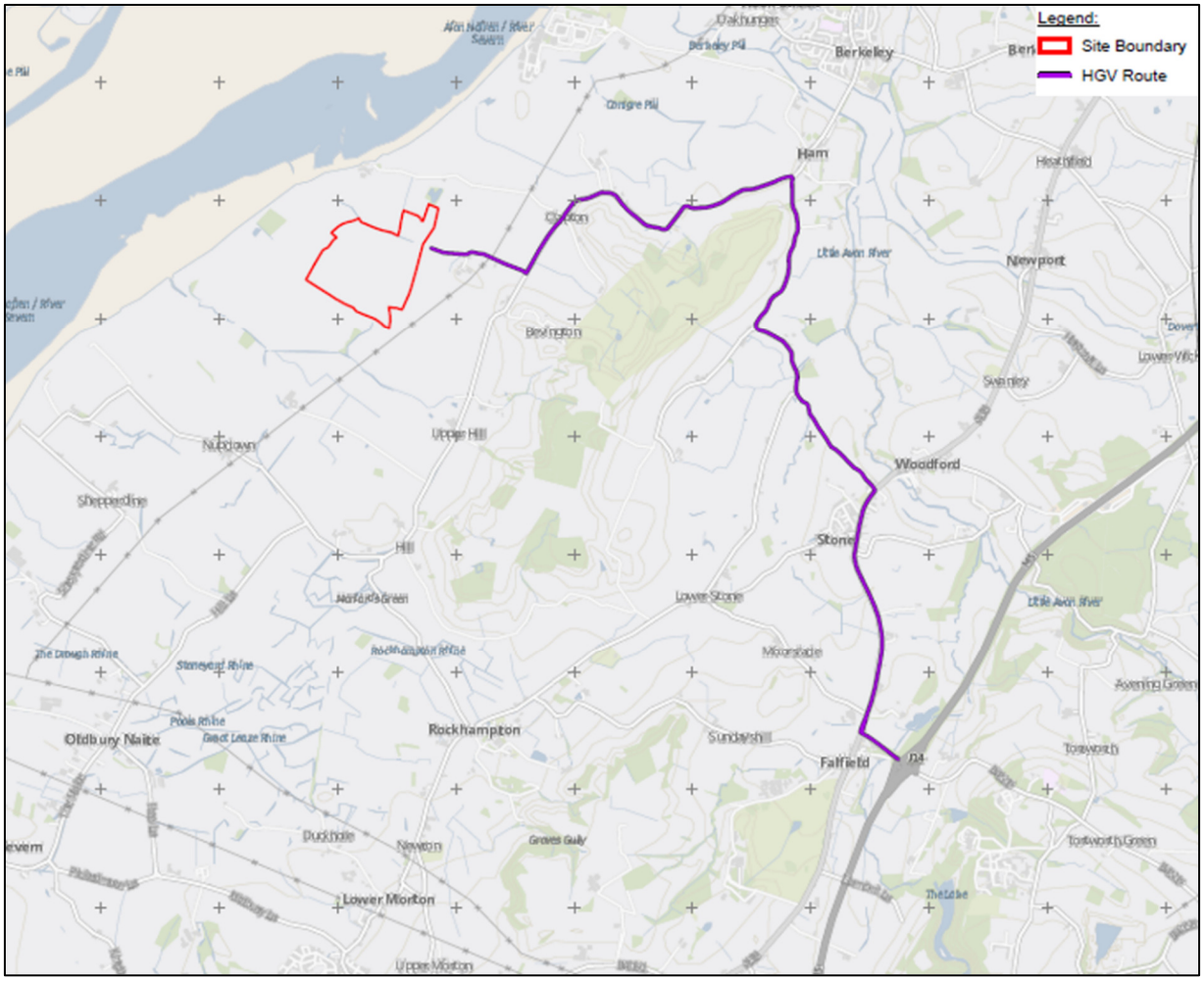
Traffic route assessment

It is anticipated that construction traffic will use the main strategic roads close to the site, with a route appraisal undertaken in order to avoid passing through the nearby village of Berkeley.

It is anticipated that construction traffic will leave the M5, east of the site, at the slip road leading to the B4509 at junction 14 and join the A38 to the west. Traffic should continue northbound along the A38 until reaching Stone, where traffic would turn left, and journey northbound to Ham. Traffic would then take a left after reaching Ham and enter Clapton Road. Traffic should continue southbound, before reaching a T-junction that connects Clapton Road and Worlds End Lane, leading to the site access.

The below plan details the primary route construction traffic should take, as described above, in order to reach the site.

Figure 1 Construction traffic route plan



Traffic Management measures

The traffic routing for HGVs will require all arrivals and departures to use the same route between the A38 and Worlds End Lane which includes narrow sections of road. Swept path analysis has shown that a 12m rigid vehicle can navigate the route with multiple and frequent opportunities for oncoming cars to pass in the opposite direction. There are also additional opportunities to introduce passing bays along sections where passing is not available for a reasonable distance.

During peak periods of construction traffic, it may be necessary to implement traffic management measures to control vehicle movements in order to avoid two-way conflicts. This can take a number of forms, including the following:

- Control of timing of deliveries with suppliers
- Holding vehicles at a specific location
- Temporary traffic signals
- Stop / Go boards
- Traffic marshals
- Short duration (15 minutes) road closures

These measures can be adopted to suit the appropriate circumstances and traffic volumes. The available options will be discussed with the highway authority and any implementation agreed before commencement of construction in line with standard streetworks processes.

Peak traffic proposals

During peak construction traffic periods, anticipated to be during site mobilisation and potentially extending through to access road construction, HGVs travelling along the A38 towards the site will pull into the existing layby located 600m south of the turning in Stone where they will call the site operatives to find out when they are permitted to enter the site. This will reduce the number of potential vehicle conflicts around the pinch points along the rural route to the site and allow a convoy of vehicles to approach the site, if the frequency of vehicles is high. Site operatives will be positioned at the junction between Worlds End Lane and Clapton Road and at the eastern end of Clapton Road to assist construction traffic with stop/go boards. A similar arrangement will be implemented for vehicles leaving the site, holding them within the site until the road is clear, again allowing a convoy of vehicles to travel along Worlds End Lane and Clapton Road.

Pre- / Post Construction Condition Surveys

Pre-construction and post construction condition surveys of minor roads used on the approach to the construction site will be carried out under a section 59 agreement with Gloucestershire County Council. This will include a provision for any ongoing maintenance and repair to the highway required as a result of the increased usage during construction.

Section 59 Agreements will be in place before the relevant road is used by HGV construction traffic. Remediation required on these roads as a direct result of HGV construction traffic will be underwritten by BSR Energy and its contractors once construction works are complete. The extent of the survey will cover the length of the construction traffic routing from Stone.

Signage

The Principal Contractor will be responsible for the implementation, management and control of measures for traffic management and control throughout the extent and duration of the works. For these works, this is expected to comprise traffic signs, barriers, and such other measures necessary.

All temporary traffic signs will be provided in accordance with the Traffic Signs Regulations and General Directions 2016 in locations agreed with and by the relevant Authority.

Non-motorised users

Where there are likely to be impacts to non-motorised users, such as public rights of way crossing access routes, additional signage will be erected to raise awareness for both users and drivers of vehicles. Signage will also be erected at the start and end of each road being used by construction traffic to highlight the use by HGVs.

Maintenance of the Highway

The public highway in the vicinity of access points will be cleaned regularly using road sweepers, when required. These will complement the provision of on-site wheel washing facilities, where appropriate. The extent and frequency of road sweeping will be reviewed regularly and agreed with Gloucestershire County Council to ensure highways are kept clear of mud.

Pre construction and post construction condition surveys, under a section 59 agreement, and any required ongoing associated maintenance, will be carried out as discussed earlier.

Construction Compound and Parking

Construction Compound

A temporary site compound will be constructed to provide site facilities for the workforce and allow construction materials to be stored safely and securely near the works.

The compound will be used for the whole duration of the construction period and will provide a base from which the construction activities will be managed. The site compound will include:

- Office space;
- Laydown areas;
- Car Parking for construction workers;
- Parking and unloading areas for HGVs;
- Waste storage facilities; and
- Welfare facilities.

Construction traffic shall utilise the construction traffic access route, described in the section ‘Traffic route assessment’ in figure 1.

Car Parking

Sufficient parking on-site will be provided by the Principal Contractor for associated personnel. Parking facilities will be restricted to the temporary compound. Parking on the road verges will be strictly prohibited. The Principal Contractor will be required to monitor and take necessary action to prevent site vehicles parking outside of the agreed parking positions.

Monitoring and review of the TMP

The TMP will be reviewed and updated by the Principal Contractor on a regular basis. The Principal Contractor will manage public relations with local residents around the site that may be affected by noise or other amenity aspects caused by the construction works associated with the project. This will necessitate the appointment of a Transport Coordinator from within the Principal Contractor's staff to liaise with all stakeholders to ensure that the TMP will be compatible and effectively managed alongside local authority policies.

The Transport Coordinator will be responsible for the day-to-day management of the TMP and will be the first point of contact for site issues. They will also respond to any questions or queries about the development and instigate such responses and, if deemed necessary, such mitigation measures as may be necessary to resolve traffic issues connected with the construction work.

The Transport Coordinator will monitor and review the effectiveness of the TMP and prepare regular updates to the planning authority and the Highway authority if requested. The Transport Coordinator shall be responsible for informing and updating the supply chain and local community and residents to raise awareness and present the Principal Contractors commitment to using safe and efficient construction vehicle practices. This commitment will be communicated to all parts of the supply chain involved in the development and to all third parties who may be affected by the transport provisions for the decommissioning site works.