

# Playford Corner Works

## Construction Artificial Lighting Emissions Plan

DCO Requirement 23 (1) & 22(2)(f)

(Applicable to Work Numbers 39 and 40)

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FOR DISCUSSION

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FOR DISCHARGE

## 1. INTRODUCTION AND SCOPE

### 1.1. Project Overview

1. East Anglia Three Limited (EATL) was awarded a Development Consent Order (DCO) by the Secretary of State, Department of Business, Energy & Industrial Strategy (DBEIS) on 7 August 2017 for the East Anglia THREE Offshore Windfarm (EA THREE). The DCO granted consent for the development of a 1200MW offshore windfarm and associated infrastructure and is live until 28 August 2022.
2. The DCO has now been subject to three non-material variations:
  - In March 2019 EATL submitted a non-material change application to DBEIS to amend the consent to increase the maximum generating capacity from 1,200MW to 1,400MW and to limit the maximum number of gravity base foundations to 100. In June 2019 DBEIS authorised the proposed change application and issued an Amendments Order.
  - In July 2020 EATL submitted a second non-material change application to DBEIS to amend the parameters of its offshore substations (reducing the number of these to one) and wind turbines (a decrease in the number of turbines and an increase in their hub height and rotor radius). On 15 April 2021 DBEIS authorised this proposed change application and issued an Amendments Order.
  - In August 2021 EATL submitted a third non-material change application to DBEIS to amend the consent to remove the maximum generating capacity of 1,400MW and to amend the parameters of its wind turbines (a decrease in the number of turbines and an increase in their hub height and rotor radius). The application is currently in the consultation phase.
3. The onshore construction works associated with EA THREE will have a capacity of 1,400MW and transmission connection of 1,320MW. The construction works will be spread across a 37km corridor between the Suffolk coast at Bawdsey and the converter station at Bramford, passing the northern side of Ipswich. As a result of the strategic approach taken, the cables will be pulled through pre-installed ducts laid during the onshore works for East Anglia ONE Offshore Windfarm (EA ONE), thereby substantially reducing the impacts of connecting to the National Grid (NG) at the same location. The infrastructure to be installed for EA THREE, therefore, comprises:
  - The landfall site with one associated transition bay location with two transition bays containing the connection between the offshore and onshore cables;
  - Two onshore electrical cables (single core);
  - Up to 62 jointing bay locations each with up to two jointing bays;
  - One onshore converter station, adjacent to the EA ONE Substation;
  - Three cables to link the converter station to the National Grid Bramford Substation;
  - Up to three onshore fibre optic cables; and
  - Landscaping and tree planting around the onshore converter station location.
4. Since the granting of the DCO, the decision has been made that the electrical connection for EA THREE will comprise a high voltage direct current (HVDC) cable rather than a high voltage alternating current cable and, therefore, the type of substation that will be required is a HVDC converter station. The substation will be referred to here as a 'converter station' and this amended terminology has been agreed with the relevant authorities on 15 October 2020. It has also been determined that only one converter station will be constructed rather than two and that the converter station will be installed in a single construction phase.

### 1.2. Purpose and Scope

5. This Construction Artificial Lighting Emissions Plan (CALEP) sets out mitigation measures to be applied to the construction activities being undertaken as part of the Playford Corner Works Stage of the EA THREE onshore construction works to reduce the potential for significant impacts from light emissions. This document has been produced to fulfil DCO Requirements 23 (1) and 22 (2) (f) which state:

**23. (1)** No stage of the connection works may commence until written details of any external lighting to be installed in connection with that stage (which includes any relevant measures identified in the artificial light emissions plan contained in the outline code of construction practice), including measures to prevent light spillage, have, after consultation with the highway authority, been submitted to and approved by the relevant planning authority; and any approved means of lighting

must be installed in accordance with the approved details and retained for the duration of the construction period for that stage.

**22.** (2) The code of construction practice must include-  
(f) artificial light emissions plan;

6. The scope of this document relates to the CALEP associated with the Playford Corner Works, as part of the onshore cable route that runs from the landfall location at Bawdsey to the Converter Station works located near Bramford, Suffolk. The works in this stage comprise Work No.s 39 and 40. (See Figure 1 Site Context Plan). CALEPs have been produced for each stage of the onshore works) and are provided under separate cover. In addition, an Operational Phase Artificial Lighting Emissions Plan (OPALEP)( EA3- OND-CNS-REP-IBR-000007) has been prepared to set out mitigation measures to be applied to the operational Converter Station (Work No. 67).
7. The Playford Corner Works will be some of the first works to be undertaken along the cable route. These works have been designated as a stage in their own right to allow the works to commence at this location prior to works commencing along the cable route as a whole (i.e. the main cable works construction phase). The access and CCS will be constructed in Summer 2022 and the jointing bay installation, cable pull through and reinstatement will be undertaken as part of the main cable works construction phase.
8. The purpose of this CALEP is to ensure that the construction activities for the Playford Corner Works comply with relevant European and UK legislation, DCO conditions, environmental commitments as set out in the Environmental Statement (ES), and environmental and construction best practice.
9. The measures contained herein will form part of the contractual agreement between EATL and its Principal Contractor and the implementation and compliance will be monitored by the Construction Management Team. These measures will only be revised with the agreement of East Suffolk Council (ESC).

## 2. ABBREVIATIONS

<b>BCT</b>	Bat Conservation Trust
<b>CALEP</b>	Construction Artificial Lighting Emissions Plan
<b>CLO</b>	Community Liaison Officer
<b>DBEIS</b>	Department of Business, Energy and Industrial Strategy
<b>DC</b>	Direct Current
<b>DCO</b>	Development Consent Order
<b>EA ONE</b>	East Anglia ONE Offshore Windfarm
<b>EA THREE</b>	East Anglia THREE Offshore Windfarm
<b>EATL</b>	East Anglia THREE Limited
<b>EnvCoW</b>	Environmental Clerk of Works
<b>EPS</b>	European Protected Species
<b>ES</b>	Environmental Statement
<b>ESC</b>	East Suffolk Council
<b>GCN</b>	Great crested newts
<b>HSE</b>	Health and Safety Executive
<b>HVDC</b>	High Voltage Direct Current
<b>ILP</b>	Institution of Lighting Professionals

<b>LED</b>	Light emitting diode
<b>MW</b>	Megawatt
<b>NG</b>	National Grid
<b>OPALEP</b>	Operational Phase Artificial Lighting Emissions Plan
<b>PRoW</b>	Public Rights of Way
<b>SCC</b>	Suffolk County Council

### 3. CONSTRUCTION DETAILS

#### 3.1. Cable Works – Overview

10. The construction works will be spread across a 37km corridor between the Suffolk coast at Bawdsey and the Converter Station at Bramford, passing the northern side of Ipswich. The cables will be pulled through pre-installed ducts laid during the onshore works for East Anglia ONE. The construction activity within each section along the onshore cable route will be as follows:
- Any minor temporary modifications to the public road network;
  - Establish the Construction Consolidation Sites (CCSs);
  - Establish accesses to, and temporary haul road to, the jointing bay locations;
  - Establish temporary jointing bay compounds;
  - Excavate jointing bay pit to locate the existing ducts at each of the compounds;
  - Construct jointing bay;
  - Transport of cables to site, pull cables through ducts and undertake jointing;
  - Topsoil replacement and seeding;
  - Remove temporary compounds (jointing bays and CCS); and
  - Reinstate all disturbed land and permanent fences and hedges.
11. Some temporary modification of the existing road networks may be required such as localised widening, temporary widening or socketing of street signs and temporary moving of street furniture in order to allow larger vehicles than normal to access the jointing bays. This will be completed prior to the start of the main construction works within relevant sections of the cable corridor route.
12. EATL will require up to seven temporary construction compounds to aid in the construction of the proposed East Anglia THREE project. These have been designated as ‘Primary Construction Consolidation Site’ (PCCS) and ‘Secondary Construction Consolidation Site’ (SCCS) depending on their uses. Two PCCS and up to five SCCS will be installed, which will all be temporary and will be removed once construction is complete.

**Table 3-1 – Construction Consolidation Site Locations**

CCS Type	ID	Address
Secondary	A	Bullen Lane, Bramford, Ipswich, Suffolk IP8
Primary	B	Paper Mill Lane, Claydon, Ipswich, Suffolk IP6 OAP
Secondary	C	Witnesham Road, Ipswich, Suffolk IP6
Secondary	D	Playford Corner, Playford Mount, Ipswich, Suffolk IP6 9DS
Primary	E	Top Street, Martlesham, Suffolk IP12
Secondary	F	Clappits, Woodbridge Road, Newbourne, Woodbridge, Suffolk IP12 4PA
Secondary	G	Park Lane, Ipswich, Suffolk IP10

13. The PCCSs will:
- Form the main point of access onto the linear construction site;
  - Provide areas for the storage of materials and equipment;

- House site administration and welfare facilities for the labour resources;
  - Form an interchange hub for deliveries of material, equipment and resources; and
  - Allow HGVs to park prior to entering the local road network during peak hours.
14. The SCCSs will act as hubs for the delivery of materials, equipment and resources along the route and will enable access to the cable route for construction. They will be of sufficient size to accommodate limited storage of materials, equipment and labour welfare facilities.
15. It is anticipated that 29 jointing bays will be required along the 37km cable route, in addition to a transition bay at the landfall. Each jointing bay will comprise a concrete box 10m long by 3m wide by 1.5m high buried so that the base is 2.5m below ground level. A jointing bay construction compound will be required adjacent to each jointing bay and will have hardstanding areas of up to 900m<sup>2</sup> within the compound which would typically measure 24m x 115m i.e. 2,760m<sup>2</sup>. (in accordance with Requirement 12(11) which stipulates that the footprint must not exceed 3,740m<sup>2</sup>). The compounds will have hardstanding and accommodate containers, drum trailer movement, parking, and welfare. A typical layout is shown in Figure 2 of the Code of Construction Practice (EA3-LDC-CNS-REP-IBR-000047).
16. Existing accesses and farm tracks will be upgraded and used where possible to access the jointing bay locations. Once these accesses reach the cable corridor, the routes to connect to the jointing bays are referred to as 'haul road'. The length of haul road for the cable route is limited by Requirement 12(12) of the DCO to 18.05km.
17. In addition, the ducts to be used for EA THREE, which were installed during the EA ONE project construction works, will require to be 'proved' to ensure that they are intact and free of debris. This will be undertaken by the use of foam pigs which will be driven under pressure from jointing bay to jointing bay. Each stretch of duct that was installed using Horizontal Direct Drilling (HDD) will, however, require duct-proving excavations at each end of the HDD, to allow the use of different size foam pigs, due to a difference in the diameter of these compared to the ducting installed using open trench techniques.

### 3.2. Playford Corner Works

18. Playford Corner Works comprise a stage of the onshore connection works and cover Work No.s 39 and 40. The infrastructure within these Work No.s comprises:
- The Playford Corner SCCS (CCS D) in Work No. 40;
  - Jointing Bay 12 in Work No. 39;
  - Two accesses with the public roads as follows:
    - Access AP-X (Work No. 40) southwards from Playford Mount, to access the Playford Corner SCCS and Jointing Bay 12; and
    - Access AP-W (Work No.39) eastwards from Holly Lane to access Jointing Bay 13 in Work No 38 (this Jointing Bay is not part of the Playford Corner Works);
  - A crossing of Church Road (CR08 and CR09); and
  - The access tracks/haul roads required to access Playford Corner SCCS, Jointing Bay 12 and also, in part, Jointing Bay 13 in Work No. 38.
19. These are shown on Figure 2.

#### 3.2.1. Accesses AP-X and AP-W, the Crossing Point, Access Tracks and Haul Roads

20. Playford Corner SCCS will be accessed from Playford Mount using Access AP-X. This access was used for the EA ONE project but was fully reinstated following the EA ONE works, so will need to be constructed again under the EA THREE DCO. From Access AP-X, a new temporary vehicular access track of 360m length and 5.5m width will be used to access the Playford Corner SCCS and also reach the edge of the cable corridor (Work No. 39), where 190m of 5.5m wide haul road will link to Jointing Bay 12 (via a crossing of Church Road). The amount of temporary haul road required to access Jointing Bay 12 will be 190m.
21. Access AP-W will be constructed from Holly Lane, along with 670m of 5.5m wide haul road to reach Jointing Bay 13. This access was not used as part of the EA ONE construction works. 210m of this haul road will be within Work No. 38 and is not part of the Playford Corner Works.



22. A crossing of Church Road (CR08 and CR09) will be required. This will be in the same location as that used for EA ONE.
23. No watercourse crossings will be required for the Playford Corner Works.
24. The construction methodologies associated with the accesses, access track and haul roads are typically as follows:
- Set out the access and track/haul road with the use of Global Positioning Systems (GPS) Real Time Kinematic (RTK) equipment;
  - Locate, divert and cap any existing field drains;
  - Set out and install drainage features the length of track to be constructed;
  - Remove vegetation, then remove and locally store topsoil material over the working width; seeding topsoil if it is to be stored for longer than 6 months;
  - Excavate to formation level and store any excess material;
  - Under-track drainage will be installed where necessary and in accordance with drainage requirements;
  - Place a geotextile onto existing subsoil to improve the bearing capacity of the sub-soil, depending on ground conditions, programme and landowner requirements; and
  - Place imported stone in accordance with the design to form the track structure.

### **3.2.2. Secondary Construction Consolidation Site (Work No. 40)**

25. The Playford Corner SCCS will be a hub for the delivery of materials, equipment and resources. The dimensions of the Playford Corner SCCS will be 60m long by 20m wide covering a surface area of 1,200m<sup>2</sup>, in accordance with Requirement 12(9)(a) of the DCO which limits the size of each SCCS to 1,200m<sup>2</sup>. The Playford Corner SCCS will also be within the area previously used for the EA ONE SCCS in this location.
26. The construction of the SCCSs involves stripping of topsoil, importing and laying stone for the compound base and installing cabins and welfare facilities. Construction of the Playford Corner SCCS will take approximately 3 weeks and the methodology will be as follows:
- The extent of SCCS will be marked out with the use of GPS RTK equipment;
  - Any existing field drains will be located, diverted and capped;
  - Drainage features will be set out and installed as required;
  - Security fencing will be erected around the perimeter of the SCCS;
  - Once vegetation has been removed, topsoil material over the SCCS area will be removed and locally stored and seeded if it is to be stored for longer than 6 months;
  - Any excess material will be excavated to formation level and stored; and
  - Imported stone will be placed in accordance with the design of the SCCS base structure.
27. The SCCS will be constructed first, with the jointing bay and cable pull through occurring at a later date (anticipated in 2024). It is intended that the SCCS will provide an early onsite presence for the onshore cable construction works and will be used as a base for mitigation and survey works being undertaken as well as for the construction team to visit site during the later stages of the planning and design process. It may also be used for stakeholder and other site meetings.
28. The Playford Corner SCCS will remain in situ for the duration of the onshore cable works, prior to being restored as described in Section 3.2.5.

### **3.2.3. Jointing Bay 12 (Work No. 39)**

29. The jointing bay will be located within Work No. 39, 90m to the east of Church Road (Grid Ref 621869, 248384).
30. Once the location of the jointing bay compound has been established (using GPS RTK equipment), creation of the compound will commence with erection of temporary security fencing, removal of topsoil layer and installation of hardstanding areas.
31. The jointing bay will then be excavated to a depth of up to 2.5m with adequate slope batter or shoring on all sides of the excavation to prevent the soil from collapse. The existing ducts will be uncovered and concrete slabs constructed to provide a level working area.

Two sump pits will be included to facilitate drainage and dewatering and water will be treated, where necessary, before being discharged. Installation and jointing of the cables will then take place, along with installation of earthing link boxes and fibre optic cable chambers, before area is back filled with subsoil.

32. The creation of the jointing bay compound and excavation of the jointing bay will each take a week.

### 3.2.4. Cable Installation

33. The electrical transmission cables will be delivered to the Playford Corner SCCS where they will be transferred to the jointing bay compound when needed. The cable drums will comprise abnormal loads and their delivery will be managed as set out in the Traffic Management Plan (EA3-LDC-CNS-REP-IBR-000039). Two cable lengths of approximately 1260m will be required to pull through between each pair of jointing bays. The cable ducts will be proved before the cable is pulled through. Once the cables are received at the jointing bay compound, they will be temporarily stored on the hardstanding area prior to installation in the pre-installed ducts.
34. Installation of the cables into the ducts between Jointing Bay 12 and Jointing Bay 13 (not part of the Playford Corner Works) will begin with a cable pulling system being installed into the bay. A steel bond and winching system with free spinning rollers will be installed along the bottom of the bay. Hydraulic jacks will raise the cable drum off the ground and a winch will be used to pull in cable using a pulling rope. A dynamometer will ensure the maximum pulling tension is not exceeded. Tension on the cable will be reduced using a biodegradable water-based lubricant. This process will be repeated for the second cable being installed in the duct. The cables will then be jointed once 2 cable sections (4 cables) have been installed.
35. It is expected that pulling and jointing operations would take approximately 2.5 weeks, typically spread over a three to four week period, with approximately five workers for each jointing bay. These works will then be repeated to install the cables between Jointing Bays 11 and 12.

### 3.2.5. Reinstatement

36. Following installation and jointing of the cables, the jointing bay, compound, accesses and haul roads will be reinstated with the stored topsoil and subsoil following trenching. If necessary, the subsoil will be 'ripped' prior to placement if compaction had occurred. Topsoil will be spread in such a way as to ensure that it does not become compacted. The topsoil will then be cultivated and reseeded (if required) and suitable hedgerow species replanted during the first appropriate planting season, in accordance with the Landscape Management Plan (EA3-LDC-CNS-REP-IBR-000042). Temporary fencing around any new planting would be removed once reinstatement was established.
37. The Playford Corner SCCS will remain in situ for the duration of the cable works and will then be removed and reinstated.

## 3.3. Lighting During Construction

### 3.3.1. Overview

38. The majority of the construction activities will be conducted during daylight hours and will not require artificial lighting, unless daylight conditions are not sufficient for specific works to ensure safe working. It is anticipated that there would be some limited activities requiring work on a 24 hour basis, these works will require the use of artificial temporary lighting to ensure safe working. Artificial lighting will also be needed particularly during the winter months when daylight hours are shorter than the specified working hours.
39. The activities which may require temporary external artificial lighting at night are:
- Continuous works, such as concrete pouring or testing and commissioning;
  - Security purposes at the CCS and jointing bay;
  - Delivery of abnormal loads;
  - Potential emergency works; and
  - Equipment such as stockpiles and emplacement areas, which will be carefully sited to ensure no light spillage.
40. The locations where activities that might require temporary construction lighting are described below and shown on Figure 1:

- Works at the jointing bay will only generally be undertaken during normal working hours. The jointing bay location will only, therefore, require artificial lighting during times where natural light is not sufficient to carry out the works. There may, however, be a requirement for artificial lighting on emergency works and also for security reasons for a short period (circa 3 weeks) following pull-through of the cable and prior to back-fill and reinstatement of the excavation.
- At Secondary CCS sites, security will be 24 hour with limited lighting specific to compound offices and parking area. This will be programme dependant.

41. Lighting from these sources has the potential to have the following impacts:

- Intrusive lighting impacting nearby residents causing disturbance and annoyance, particularly with regard to sleep patterns;
- Impact on ecological sensitive receptors from light spill;
- Impact on visual amenity due to the illumination of the night sky; and
- Lighting on surrounding roads distracting passing motorists.

### 3.3.2. Types and Positioning Requirements

42. Lighting should be sufficient to enable people to work, use facilities and move from place to place safely and without experiencing eye-strain. Table 3-2, which has been adapted from Health and Safety and Executive (HSE) document Health and Safety Guidance 38 (HSG38) 'Lighting at Work' (1997), details the recommended minimum lighting levels for different types of work activity and location. It makes recommendations for average illuminance for the work area as a whole and for minimum measured illuminance at any position within it.

**Table 3-2 Recommendations for Minimum Lighting Levels (adapted from HSE document HSG38 (Lighting at Work)).**

Activity	Typical locations/ types of work	Average illuminance measured (lux) 1x	Minimum illuminance measured (lux) 1x
<b>Movement of people, machines and vehicles</b>	Accesses, haul roads and vehicle compound/parking areas.	20	5
<b>Background work including movement of people, machines and vehicles in hazardous areas; rough work not requiring perception of detail</b>	Construction site clearance, excavation and soil work.	50	20
<b>Task based lighting and work requiring limited perception of detail</b>	Where specific work tasks are required to focus on a particular point or feature.	100	50

43. The artificial lighting required at the CCS and jointing bay location and anywhere else if required in exceptional circumstances will comply with the minimum requirements for safe work operations, the guidance and standards (Section 6) and mitigation measures avoiding or minimising the impacts on sensitive visual and ecological receptors.

### 3.3.3. Hours of Lighting

44. The need for artificial lighting will be dependent on seasonality and will be switched on 30 minutes before sunset<sup>1</sup> (which will change through the winter) to the end of the shift. It will also be switched on at the start of the shift to up to 30 minutes after sunrise. Again, this is dependent on seasonality and will change through the winter months and with daylight savings adjustments. Temporary

<sup>1</sup> As determined by the Met Office with respect to Ipswich  
<https://www.metoffice.gov.uk/weather/forecast/u12b4ht3f#?date=2021-05-24>

construction lighting will be also provided during working hours only at times where natural light is not sufficient to carry out specific works to ensure safe working conditions.

45. Working hours will comply with DCO Requirement 25, which states:

#### Construction hours

*25.—(1) Construction work for the connection works must only take place between 0700 hours and 1900 hours Monday to Saturday, with no activity on Sundays or bank holidays, except as specified in paragraph (2).*

*(2) Outside the hours specified in paragraph (1), construction work may be undertaken for essential and non-intrusive activities including but not limited to:*

*(a) continuous periods of operation that are required as assessed in the environmental statement, such as concrete pouring;*

*(b) fitting out works associated with the onshore substation(s) comprised within Work No. 67;*

*(c) delivery to the connection works of abnormal loads that may cause congestion on the local road network;*

*(d) connection works carried out on the foreshore;*

*(e) daily start up or shut down;*

*(f) electrical installation; and*

*(g) non-destructive testing.*

*(3) All construction work undertaken in accordance with paragraph (2)(a) to (d) must be agreed with the relevant planning authority in writing in advance, and must be carried out within the agreed time.*

46. Further information is provided in Section 5.5 of the Code of Construction Practice (EA3-LDC-CNS-REP-IBR-000047).

47. There may be a requirement for artificial lighting on emergency works, which in any case will need to comply with the minimum requirements for safe work operations, the guidance and standards (Section 6) and mitigation measures avoiding or minimising the impacts on sensitive visual and ecological receptors.

48. At the Secondary CCS site security will be 24 hour with limited lighting specific to compound offices and parking area and will be required when the compound is in operation.

## 4. CONSTRUCTION ARTIFICIAL LIGHTING EMISSIONS PLAN GOVERNANCE

49. Prior to the commencement of construction, an Environmental Clerk of Works (EnvCoW) will be appointed by the Principal Contractor to manage *inter alia* the implementation of the CALEP. Contact details for the EnvCoW will be submitted to stakeholders for their records prior to commencement of construction.

## 5. LOCAL COMMUNITY LIAISON

50. EATL is committed to providing clear communication to local residents and will manage public relations with local residents and businesses. Proactive community liaison will be maintained, keeping local residents informed of the type and timing of the works involved. As outlined in the Code of Construction Practice (EA3-LDC-CNS-REP-IBR-000047), a combination of communication mechanisms such as posters, notices, exhibitions, letters, newsletters, website updates and parish council meetings will be employed to keep local residents and businesses informed.

51. A designated EA THREE Community Liaison Officer (CLO) will manage and respond to any public concerns, queries or complaints in a professional and diligent manner as set out in the Community Liaison and Public Relations Procedure contained within the Code of Construction Practice (EA3-LDC-CNS-REP-IBR-000047). The Complaints Procedure will be publicised and complaints will be directed to the EATL Community Liaison Officer. All enquiries will be logged, investigated and rectifying actions taken when deemed appropriate. Enquiries will be dealt with in an expedient and courteous manner. Details of complaints will be reported to ESC and SCC within 48 hours.

52. Parish Councils, District Councillors and County Councillors, including Ward Members and Portfolio Holders, in the area and the local liaison group will be contacted (in writing) in advance of the proposed works and ahead of key milestones in order to advise them of

the ongoing works. The information provided will include a timetable of works, a schedule of working hours, the extent of the works, and a contact name, address and telephone number in case of complaint or query.

## 6. GUIDELINES AND STANDARDS

53. This CALEP has been developed in accordance with the following guidance and standards:

- Institution of Lighting Professionals (ILP), 2020, Guidance Note for the Reduction of Obtrusive Light, (ILP, 2020).
- British Standard BS EN 12464-2:2014 Light and lighting. Lighting of work places. Outdoor work places;
- British Standard BS 5489-1:2020 Code of practice for the design of road lighting. lighting of roads and public amenity areas;
- Health and Safety and Executive (HSE), Health and Safety Guidance 38 (HSG38) 'Lighting at Work' (HSE, 1997)
- Bat Conservation Trust (BCT), ILP (2018), Guidance Note 08/18 Bats and artificial lighting in the UK, Bats and the Built Environment series, (BCT, ILP, 2018); and
- BCT Interim Guidance: artificial lighting and wildlife (BCT, 2014).

## 7. POTENTIALLY SENSITIVE RECEPTORS

### 7.1. Introduction

54. Potentially sensitive receptors that could be affected by temporary external artificial lighting during construction works include visual and ecological receptors.

### 7.2. Visual receptors

55. There are very few potentially sensitive visual receptors in close proximity to the onshore cable route construction works. These include occupiers of residential properties, users of the outdoors and agricultural workers. A review to identify potentially sensitive receptors that could be affected by external artificial lighting in the vicinity of the Playford Corner Works has been undertaken. This considered all buildings within 100m of the CCS and jointing bay location and concluded that no residential buildings are present within this distance. At the identified distances, light intrusion/nuisance and, spill light are not considered to be significant. Light control measures with respect to visual receptors will therefore relate to limitation of light of bright luminaries in the field of view and also sky glow.

56. Public Rights of Way are located 34m to the southwest, 153m to the northeast. However, no issues were recorded during the use of the site for the EA ONE construction works.

57. There are no landscape designations in the vicinity of the Playford Corner Works site.

### 7.3. Ecological Receptors

58. Light spill and intrusive lighting from night-time works could potentially disturb ecologically sensitive receptors which includes nocturnal species. The key ecologically sensitive receptors from the construction artificial lighting emissions are considered to comprise badgers, bats, otters, great crested newts and birds (breeding and non-breeding birds), however there are no otters, great crested newts or notable bat species recorded in the vicinity of the Playford Corner Works.

#### 7.3.1. Badger

59. Badgers and their setts are protected from damage and disturbance under the Badger Protection Act (1992). Pre-construction badger surveys have been carried out in 2016, with the results updated through monitoring surveys throughout EA ONE construction and during pre-construction surveys undertaken in 2020 and 2021. A few active badger setts are located within habitat close to the cable corridor section associated with the works. These are currently located outside of the DCO corridor.

60. As badger setts locations are sensitive information, they are not shown in Appendix 1, however these are located within the woodlands and hedgerows near to the cable corridor and as such these habitats are particularly sensitive to light spillage.

**7.3.2. Birds**

61. Birds may be sensitive to lighting due to illumination of nests and hunting habitats. All wild birds, their nests and eggs are protected under the Wildlife and Countryside Act 1981 (as amended). Bird species listed on Schedule 1 of the Act are afforded further protection making it an offence to intentionally or recklessly disturb any such bird when it is building its nest or while it is in or near a nest containing dependant young, and / or disturb the dependant young of any such bird. No Schedule 1 birds have been recorded in the vicinity of Playford Corner Works.

**8. LIGHTING SCHEME**

**8.1. Objectives**

62. The objectives and performance outcomes for this CALEP are detailed below in Table 8-1.

*Table 8-1: Objectives and performance outcomes*

Objectives	Performance Outcomes
<ul style="list-style-type: none"> <li>To ensure temporary lighting installations are positioned so as to avoid light spill directly towards roads, residences and other potential viewing locations or ecological receptors.</li> <li>To ensure the potential impacts from light emissions on haul roads for mobile equipment are reduced so far as practicable.</li> <li>To utilise existing vegetation screens to minimise the impact of any light spill in the direction of roads, residences and other viewing locations or ecological receptors.</li> <li>To use directional lighting to reduce light spill and minimise light emissions from night-time construction works to retain dark night skies.</li> <li>To ensure procedures are in place to record and effectively respond to any complaint in respect to lighting.</li> <li>To record and report the effectiveness of lighting emission controls.]</li> <li>To utilize appropriate mitigation measures to reduce glare.</li> </ul>	<ul style="list-style-type: none"> <li>Minimum levels of lighting are used which provide sufficient lighting to ensure that safety is not compromised.</li> <li>External lighting complies with relevant UK legislation, environmental commitments as set out in the ES and environmental and construction best practice.</li> <li>The safety of external traffic on nearby roads is not affected by light sources on site.</li> <li>Impacts from light emissions from the works on nearby sensitive visual receptors is avoided or minimised where avoidance is not possible.</li> <li>Impacts from light emissions from the works on ecological receptors are avoided or minimised, where avoidance is not possible.</li> <li>Complaints are responded to quickly and effectively.</li> <li>The effectiveness of lighting emission controls is reported.</li> </ul>

**8.2. Mitigation**

63. The onshore construction works have been carefully designed to minimise impacts on the environment. Using the ducts already installed during the EA ONE project will minimise the need for additional constructions works and associated artificial lighting. A number of mitigation measures will be adopted as part of the project design to avoid or minimise potential impacts from artificial lighting, relating to construction, on the sensitive receptors. Non-reflective surfaces and barriers and screens will be used as required to minimise light nuisance.

64. Site lighting will be positioned and directed to minimise nuisance to public rights of way users and residents, to minimise distractions to drivers on adjoining public highways and to minimise sky glow, so far as reasonably practicable. At the CCS, external lighting will be limited to internal access roads and walkways and security lighting. Task related flood lighting during low light levels during normal working hours and also emergency works may be required at the jointing bays . Lighting will be selected and positioned in accordance with guidance and standards provided in Section 6.

65. Light spill will be reduced by directing the light to where it is needed and away from the identified potentially sensitive receptors, where possible. The design of the luminaire and accessories such as hoods, cowls, louvres will be used achieve this. Where possible asymmetric optics will be used such that the front glazing is kept at or near parallel to the surface being lit. In addition, where possible glare will be minimised by ensuring that the main beam angle directed towards any potential observer is no greater than 70°, in accordance with ILP guidance (ILP, 2021). Higher mounting heights allow lower main beam angles, which can assist in reducing glare.



66. So far as is practicable, all power to temporary lighting will be taken from mains supplies rather than from portable generators. Where portable generators are used, industry best practice will be followed to minimise noise and pollution from such generators.

67. All lighting relating to the onshore construction works are temporary and will be removed as soon as possible on completion of the relevant element of works.

### 8.2.1. Mitigation Specific to Ecology

68. Additional mitigation specific to ecology, in accordance with the Bat Conservation Trust (2018) guidelines will be included as follows:

- LED luminaires will be used where possible;
- Metal halide, fluorescent sources will not be used;
- Column heights will be carefully considered to minimise light spill;
- Narrow spectrum light sources will be used to lower the range of species affected by lighting;
- Light sources that emit minimal ultra-violet light will be selected;
- Lights will peak in wavelength higher than 550nm;
- White and blue wavelengths of the light spectrum will be avoided to reduce insect attraction and where white light sources are required in order to manage the blue short-wave length content, they will be of a warm / neutral colour temperature, ideally <2700Kelvin;
- Only luminaires with an upward light ratio of 0% and with good optical control will be used; and
- External security lighting will be set on motion-sensors with short (1 minute) timers.

69. Directional beams and non-reflective surfaces will be used to ensure light spill and nuisance does not encroach onto adjacent areas including:

- Woodland and water edge, so as not to disturb emerging or foraging bats, badgers or other nocturnal species (birds, hedgehogs). Flood lighting will be directed away from any potential roost identified and 30m disturbance zone around badger setts.
- Other high value foraging habitats and potential flight paths, such as connecting hedgerows and standalone trees.

70. Pre-construction surveys for protected species and Schedule 1 birds will be undertaken in the vicinity of the Playford Corner Works. Survey works have an expiry of approximately 18-24 months and, therefore, if works are to take place 18-24 months after the most recent surveys, a re-survey will be undertaken in order to confirm that the status of the habitats has not changed and to ensure that mitigation is based on up to date survey data.

71. External lighting at night will be avoided as far as feasible, particularly during the months of higher bat activity (August – October). When lighting at night is required, it will comply with the Bat Conservation Trust (2018) recommendations on external lighting (as set out above) as agreed with Natural England, as required. This will be designed to avoid light spill to both:

- Woodland and water edge, so as not to disturb emerging or foraging bats, badgers or other nocturnal species. . Flood lighting will be directed away from any potential roost identified and 30m disturbance zone around badger setts.
- Other high value foraging habitats and potential flight paths, such as connecting hedgerows and standalone trees.

72. Should any Schedule 1 or other species of bird be found to be nesting within the vicinity of the Playford Corner Works, an exclusion zone will be implemented specific to that species in accordance with the Ecological Mitigation Plan.

73. Periods of 24-hour lighting will be minimised where possible during construction.

## 9. MONITORING AND REPORTING

### 9.1. Monitoring

74. Regular inspections of lighting mitigation measures will be undertaken by the Principal Contractor's construction management team, the EnvCoW and ecological specialists where required, to ensure effective implementation and report any non-compliances. If non-conformity with any control and mitigation measures is identified, it will be recorded and appropriate remedial action will be implemented.

75. The frequency and the location inspections will be determined by the EnvCoW and will be included in the Project Environmental Management Plan (included within the Code of Construction Practice (EA3-LDC-CNS-REP-IBR-000047) and the Construction Environmental Management Plan (prepared by contractors).
76. Any complaint regarding lighting of the construction works will be directed to the EnvCoW who will in turn notify ESC. The EnvCoW will investigate the complaint and provide a response to the complainant and ESC within 48 hours. Investigation will include checking that luminaires remain directional and suitable for the application. If the complaint is justified a solution will be found to prevent reoccurrence, such as use of hoardings or other barriers to contain light spill. This may include investigation of alternatives, such as the use of lower wattage lighting, or re-direction of lighting or re-positioning shielding.
77. Should any Schedule 1 or other species of bird be found to be nesting within the vicinity of the proposed construction works, an exclusion zone will be implemented specific to that species in accordance with the Ecological Mitigation Plan.

## 9.2. Reporting

78. The effectiveness of lighting controls will be reported in the Site Inspection and Audit Reports. Inspections will be undertaken by the ecological specialists, where required and will be reported to the EnvCoW.

## 10. REFERENCES

BCT, 2014, *Interim Guidance: artificial lighting and wildlife*, [https://cdn.bats.org.uk/pdf/BCT\\_Interim\\_Guidance\\_Artificial\\_Lighting\\_June\\_2014.pdf?mtime=20181101151319&focal=none](https://cdn.bats.org.uk/pdf/BCT_Interim_Guidance_Artificial_Lighting_June_2014.pdf?mtime=20181101151319&focal=none).

BCT, ILP, 2018, *Guidance Note 08/18 Bats and artificial lighting in the UK, Bats and the Built Environment series*, London, <https://cdn.bats.org.uk/pdf/Resources/ilp-guidance-note-8-bats-and-artificial-lighting-compressed.pdf?mtime=20181113114229>;

British Standard BS EN 12464-2:2014 Light and lighting. Lighting of work places. Outdoor work places;

British Standard BS 5489-1:2020 Code of practice for the design of road lighting. lighting of roads and public amenity areas;

HSE, 1997 *Health and Safety Guidance 38 (HSG38) 'Lighting at Work'*, Second Edition, <https://www.hse.gov.uk/pubns/priced/hsg38.pdf>

ILP, 2021, *Guidance Note 01/21, Guidance Note for the Reduction of Obtrusive Light*, London, <https://theilp.org.uk/publication/guidance-note-1-for-the-reduction-of-obtrusive-light-2021>.



## **APPENDIX 1 TECHNICAL DRAWINGS AND LUMINARIES SPECIFICATIONS**

FOR DISCHARGE

CUBE Next 4x300W	Technical Data
Minimum dimensions (L x W x H)	1230 x 1160 x 2405 mm
Maximum dimensions (L x W x H)	1790 x 1735 x 8400 mm
Dry weight	1285 kg
Lifting system	Hydraulic
Mast rotation	340°
Max. lamps power	4 x 300 W
Lamps type	LED
Max. total lumen	153000 Lm
Max. illuminated area	4200 m <sup>2</sup>
Battery running time	56 h @ 33% dimming 22 h @ 80% dimming 17 h @ 100% dimming
Battery recharging time	12 h
Inlet plug (A/V/Hz)	32/220/50 – 32/240/60
Avg. sound pressure	0
Wind speed resistance	110 km/h



Picture shown may not reflect actual configuration.

## V20 light tower

The **V20 light tower** is a brand-new mobile light tower equipped with 4x320W high efficiency LED lamp floodlights. More than 140 hours of running time and one of the lowest sound pressure level in the industry: only 58 dB(A) at 7 meters.

## GTL01 digital controller

The V20 is equipped with a **GTL01 digital controller** specifically studied to manage every function of the light tower for the best ease of use.

## Generac LED lamps

4 x 320W high efficiency LED floodlights designed by Generac Mobile®.

## Low voltage LED

The floodlights are powered with **low voltage** 48 Volts. No more high voltages on external cables. Safety as a must!

## Top accessibility

3 doors for a wider access. 2 compass-top doors with «wing» shape provide a complete access to the engine for a safe and convenient maintenance. 1 back door allows the access to the digital control panel.

## RLS – Rapid Locking Stabilizers

The special shape of the **adjustable stabilizers** allows the operator to level the V20 light tower in few seconds.

## The lowest noise level!

Innovation means also **decreasing the noise level!** The V20 light tower emits only 58 dB(A) @ 7 meters.

## Long running time

Thanks to the V20's fuel saving features such as the small engine and the LED lamps, this model can **run up to 143 hours** without refueling.

## Double power

You can connect a V20 to another V20 and run two lighting towers with only one engine.



*Picture shown may not reflect actual configuration.*

V20 Y2	Technical Data
Minimum dimensions (L x W x H)	2250 x 1400 x 2436 mm
Maximum dimensions (L x W x H)	2640 x 1900 x 8500 mm
Dry weight	1030 kg
Lifting system	Hydraulic
Mast rotation	340°
Lamps power	4 x 320 W
Lamps type	LED
Total lumen	188160 Lm
Illuminated area	4500 m <sup>2</sup>
Engine	Yanmar 2TNV-70
Engine cooling	Liquid
Cylinders (q.ty)	2
Engine speed (50/60 Hz)	1500 / 1800 rpm
Liquid containment (110%)	√
Alternator (kVA/V/Hz)	5/220/50 – 5/240/60
Outlet socket (kVA/V/Hz)	2/220/50 – 2/240/60
Inlet plug (A/V/Hz)	16/220/50 – 16/240/60
Avg. sound pressure	58 dB(A) @ 7m
Wind speed resistance	110 km/h
Tank capacity	100 l
Running time	143 h



Picture shown may not reflect actual configuration.

# HOFTRONIC™

## DATASHEET



### LED FLOODLIGHT 200 WATT 160LM/W IP65 4000K 5 YEARS WARRANTY

## Specifications

448476

SKU

Input power	220-240V AC	Dimensions	458.5 x 371 x 57 mm
Watts	200 Watt	Operating temperature	-20°C ~ 40°C
Equivalent watts	3600 Watt	Switching cycles	20.000 cycles
Luminous flux	32000 Lumen	Life span	30.000 hours
Light color	Neutral white	Certification	CE, RoHS
Color temperature	4000K	Warranty	5 years
Color rendering index (CRI)	70Ra	Suitable for	Indoor and outdoor
Beam angle	120°	Color	Black
Powerfactor	> 0.95	Frequency	50/60Hz
Energy label	A++	EAN	7439628448476
IP-rate	IP65		
Material	Aluminium		
Dimmable	No		



# SMC TL-90 LED Mobile Lighting Tower



Compact and easy to transport, the **SMC TL-90 LED** lighting tower has powerful 240W LED lamps, giving a strong and even light stream with instant on/of light and a lamp life of 50,000 hours and saves up to **50% fuel savings**. The machine is fully retractable for transport and storage. The lighting towers can be equipped with autostart/stop which allows the user to minimise fuel consumption by a further **30%**, yet maximise efficiency. It also features a mains changeover switch to effectively run a unit from a mains power or alternatively link 3 machines together using only one engine. They are suitable for a wide range of applications.

The lighting tower functions in all climatic conditions and with a comprehensive and protected monitoring system. Safety features include mast deployment alarm and a safety system which ensures the mast descends automatically when the handbrake is released, preventing collisions with overhead obstacles.



**Fuel saving up to £2,000 per year\*\***

## Features:

- **Fuel saving of £160 per month\***
- **Instant light**, no restricted time
- **Super silent operation** – reduced noise pollution at just 60dB(A) at 7m
- **Hydraulically operated mast** can be fully extended to 9m height in only 12 seconds
- **Compact and robust design** with the ability to load ten units together for ease of transportation
- **Fork lit pockets and single lit eye** for easy transportation
- **360° rotating head lamp** with telescopic mast for quick and easy operation
- **5 x 240W LED lamps** fitted with high output optics for high intensity light
- **Bio-degradable oil** in hydraulic system
- **Engine fluids fully bunded** to protect the environment from spills
- **Fuel efficient** giving 133 hours of uninterrupted operation
- **Mains changeover switch** to run unit from mains power
- **Link up to 3 machines** together using only one engine
- **EC whole vehicle type approved trailer**
- **50,000 hours LED lamp life**
- Galvanised canopy

## Safety Features:

- Mast deployment alarm & safety system

## Optional Extras:

- 110 Volt power outlet
- 4 wind down prop stands
- Auto-run timer module
- Eco Sensor dusk to dawn timer

\* Compared to standard tower lights

\*\*As of September 2014

Specifications are subject to change without prior notice

## SPECIFICATION

ENGINE TYPE	Kubota D905-BG 3cyl Water Cooled 7.4kW @ 1500rpm diesel
HYDRAULIC SYSTEM	Bio-degradable Oil
FUEL TANK CAPACITY	130 Litres
FUEL CONSUMPTION	0.97 l/hr (Lamps only)
RUNNING TIME	133 Hours
LAMP SPECIFICATION	5 x 240W LED
AVERAGE SOUND PRESSURE LEVEL @ 7 METRES	60dB(A)
ALTERNATOR	Mecc Alte LT3 110 4 Pole, 230V, 50Hz
CONTINUOUS POWER / STANDBY POWER	5.0kW / 5.5kW**
POWER OUTLET SOCKETS	1 x 16 AMP outlet 1 x 16 AMP inlet
MAST MAXIMUM HEIGHT	8740mm
MAST RAISE / LOWER TIME	12 / 18 secs
WIND SPEED	Suitable for operation in wind speeds up to 100km/h
STABILISERS	4 with rear wind down legs
BUNDING	Fully banded to 120% for all fluids
ROAD LIGHTS AND REFLECTORS	Standard
DIMENSIONS FOR TRANSPORT (LxWxH)	2565mm x 1320mm x 2100mm
DIMENSIONS FULLY DEPLOYED(LxWxH)	2870mm x 2639mm x 8740mm
WEIGHT FULLY FUELLED / UNFUELLED	1050kg / 933kg

\*\* Allows 1 unit to power up to 3 units

### Optional Specifications:

#### Petrochemical Specification:

- Spark arrestor
- Chalwyn valve

#### Offshore specification:

- Spark arrestor
- Chalwyn valve
- Fuel water trap
- Ani-static fan belt
- Braided fuel lines
- Battery isolator switch
- Fuel isolator shut of valve

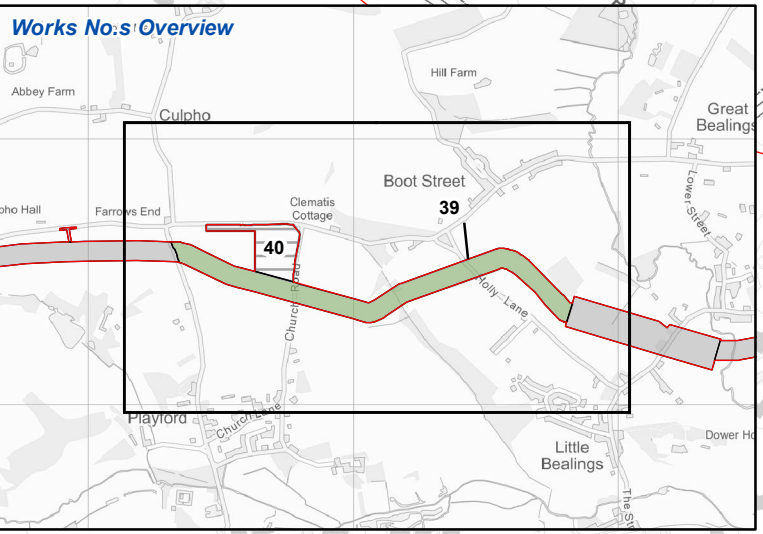
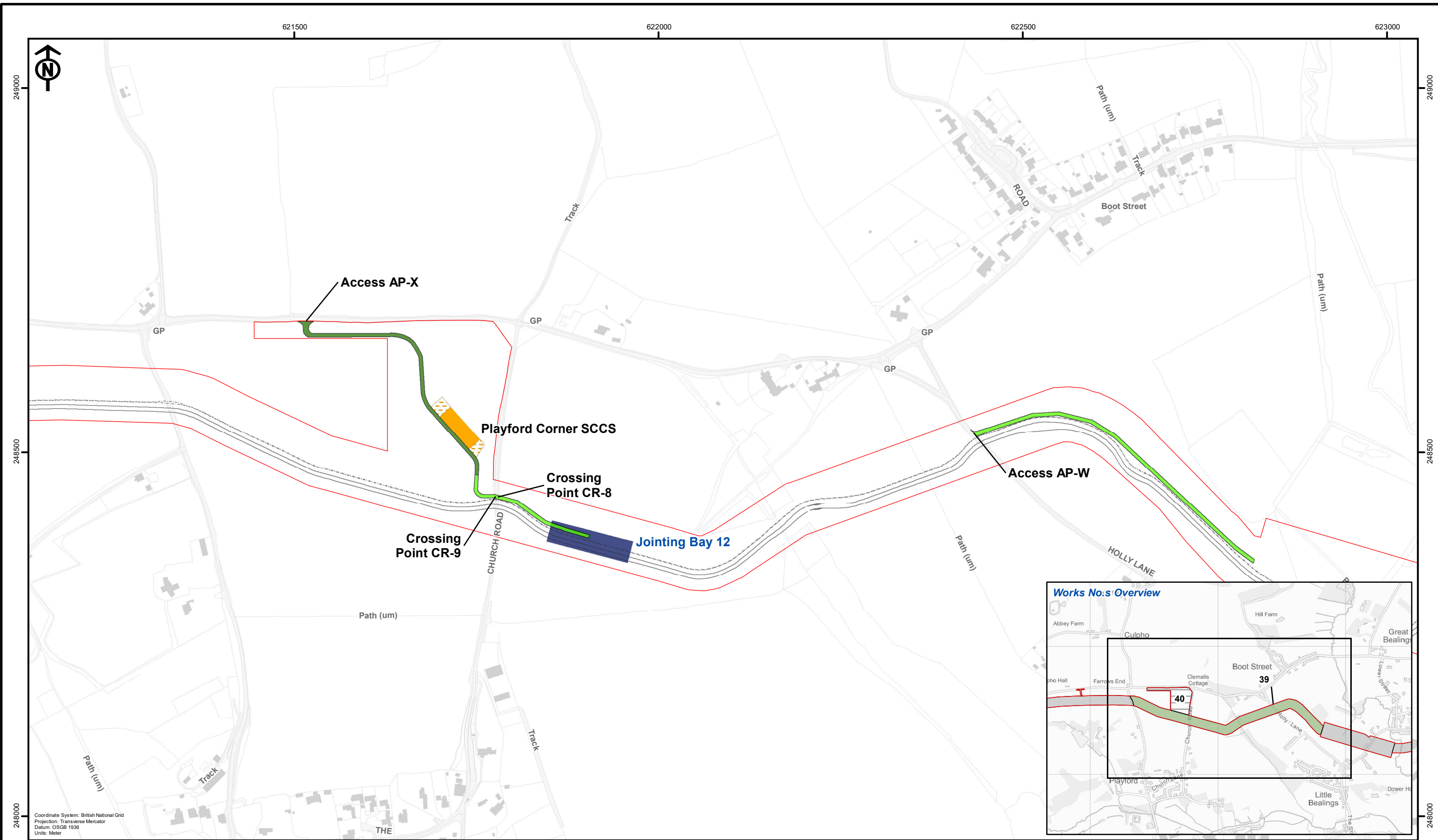


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EA THREE DCO Corridor	Access Track	<b>Works No.s</b> 39 40
Secondary Construction Consolidation Site	Haul Road	
Jointing Bay Compound	EA THREE Existing Cable Ducts	
Top Soil	EA ONE Existing Cable Ducts	



Rev	Date	By	Comment
B	05/04/2022	PW	Second Issue
A	31/03/2022	JRS	First Issue

Original A3 Plot Scale 1:5,000

0 100 200 Metres

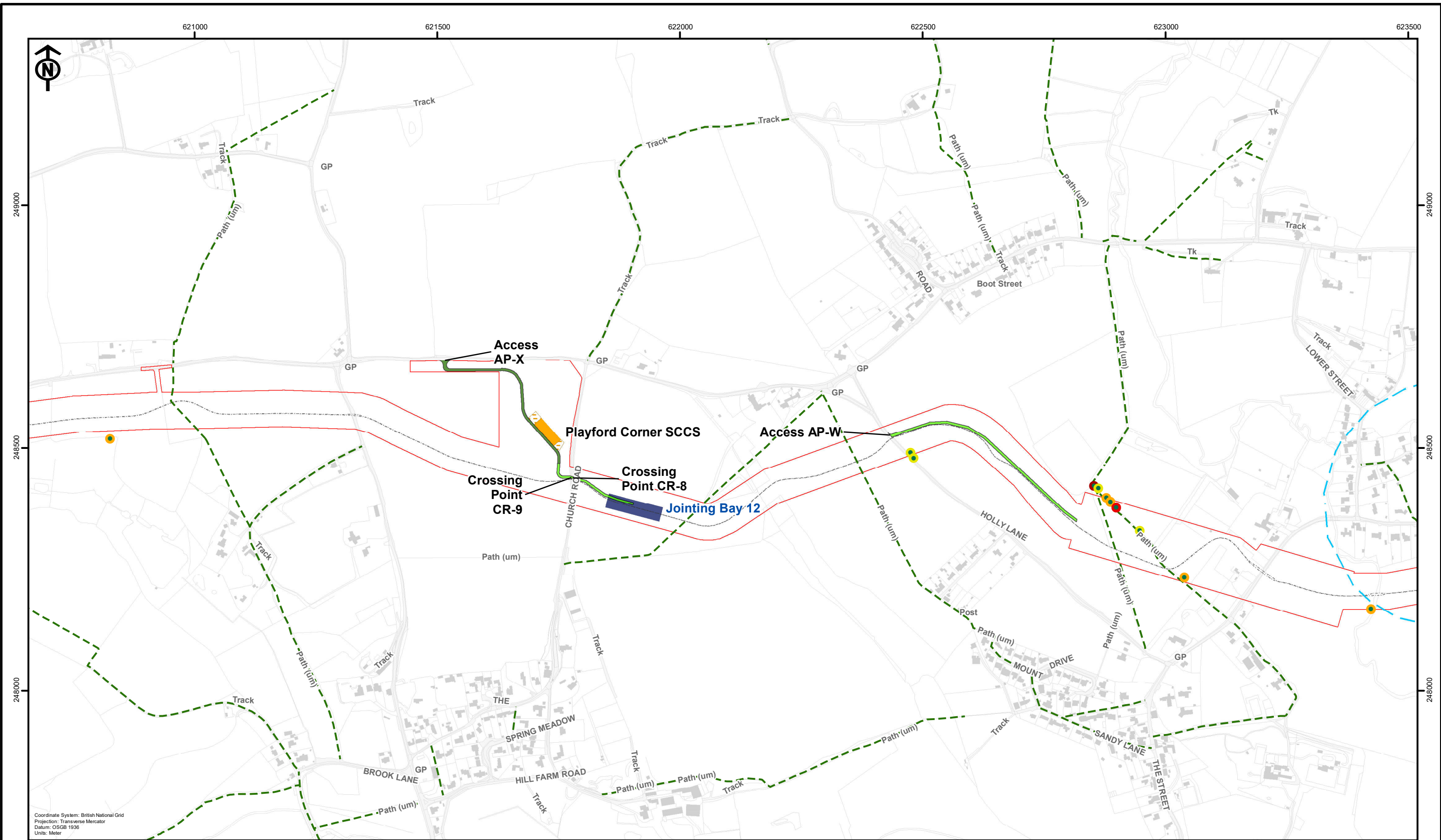
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**Playford Corner Works Stage**

Figure 1: Site Context Plan

Drg No	05356.00006.12.0021.1 Site Context Plan
Rev	2
Date	05/04/2022
Layout	N/A





- EA THREE DCO Corridor
- Secondary Construction Consolidation Site
- Jointing Bay Compound
- Access Track
- Haul Road
- Top Soil
- EA THREE Existing Cable Ducts
- Public Right of Way within 100m
- Confirmed Bat Roost
- High Bat Potential Tree
- Moderate Bat Potential Tree
- Low Bat Potential Tree
- Positive GCN Pond 250m Buffer



Rev	Date	By	Comment
B	05/04/2022	PW	Second Issue
A	11/01/2022	PW	First Issue

Original A3 Plot Scale 1:7,500

0 150 300 Metres

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NOT TO BE USED FOR NAVIGATION.

**Playford Corner Works Stage**  
Figure 2: Potentially Sensitive Receptors to Construction Lighting

Drg No	05356.00006.12.0062.1 Sensitive Receptors
Rev	2
Date	05/04/2022
Layout	N/A