

Onshore Cable Route Fencing and Enclosures Plan

DCO Requirement 17

Applicable to Work Numbers 5B to 20, 25 to 38, 41 to 49 and 52 to 61

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TABLE OF CONTENTS

1.	INTRODUCTION AND SCOPE	5
1.1.	Project Overview	5
1.2.	Purpose and Scope	5
2.	ABBREVIATIONS	6
3.	FENCING AND ENCLOSURES PLAN GOVERNANCE	7
4.	CONSTRUCTION DETAILS	7
4.1.	Construction Consolidation Sites (CCS)	7
4.2.	Accesses, Stone Haul Roads and Trackway	9
4.3.		
4.4.	Duct Proving	10
4.5.	Cable Pull-through	10
4.6.	Reinstatement	
5.	FENCING AND ENCLOSURE CATEGORIES	11
5.1.	Overview	11
5.2.	Construction Consolidation Sites	11
5.3.		
5.4.	5 / 1	
5.5.	Landscaping/Planting	12
5.6.	Public Rights of Way	12
5.7.	Retained Trees and Hedgerows	12
5.8.	Ecological Protection	12
6.	FENCING DETAILS	12
6.1.	Overview	12
6.2.	Metal Hoarding	
6.3.	Post and Wire	14
6.4.	Post and Rail	15
6.5.	Stock Proof	15
6.6.	Heras Fencing	15
6.7.	Signing, Lighting and Guarding	16
6.8.	Gateways	17
6.9.	Tree and Hedgerow Protection	17
6.10	D. Landscaping/Planting Protection Fencing	18
6.11	. Ecology Fencing	19
6.11	.1. Badger Gates	19
6.12	2. Maintenance	20
6.13	8. Replacement Fencing	20
7.	SUMMARY OF FENCING AND ENCLOSURE REQUIREMENTS	21
8.	DECOMMISSIONING	21



9. REFERENCES	21
APPENDIX 1 FENCING SPECIFICATIONS	22
Post and Wire	
Post and Rail	23
Stock Proof	23
Crowd Control Fencing	24
APPENDIX 2 GATEWAY SPECIFICATIONS	25
Single Gateway	25
Double Gateway	
Landscaping Gateway	

FIGURES

Figure 1 Site Context Plan Figure 6.1 Example Metal Hoarding Figure 6.2 Example of Metal Hoarding Additional Support Figure 6.3 Example Extension Panels Figure 6.4 Example Post and Wire Fencing (with newt fencing behind) Figure 6.5 Example Post and Rail Fencing Figure 6.6 Example Heras Fencing Figure 6.7 Example Chapter 8 Barrier Figure 6.8 Example Heras / Steel Hoarding Gateways Figure 6.9 Example Arm Barrier System Figure 6.10 Example Heras Fencing Tree Protection Figure 6.11 Example Deer Fencing Figure 6.12 Example Rabbit-proof Fencing Figure 6.13 Typical Badger Gate Figure 6.14 Photo of Example Badger Gate



1. INTRODUCTION AND SCOPE

1.1. Project Overview

- East Anglia Three Limited (EATL) was awarded a Development Consent Order (DCO) by the Secretary of State, Department of Business, Energy and 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 1,200MW offshore windfarm and associated infrastructure.
- 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). In September 2022 DBEIS authorised the proposed change application and issued an Amendments Order.
- 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, therefore, 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.
- 5. The EA THREE onshore works commenced development in July 2022, with works at the Converter Station, Paper Mill Lane, Playford Corner and Clappits.

1.2. Purpose and Scope

6. This plan has been produced to fulfil DCO Requirement 17 which states:

17.-(1) No stage of the connection works may commence until for that stage written details of all proposed permanent and temporary fences, walls or other means of enclosure of the connection works have been submitted to and approved by the relevant planning authority.

(2) All construction consolidation sites must remain securely fenced in accordance with the approved details at all times during construction of the relevant stage of the connection works.

(3) Any temporary fencing must be removed on completion of the relevant stage of the connection works.



(4) Any approved permanent fencing in relation to an onshore substation must be completed before that onshore substation is brought into use and maintained for the operational lifetime of the onshore substation.

- The scope of this document relates to the fencing and enclosures associated with the onshore cable route that runs from the landfall location at Bawdsey to the Converter Station works located near Bramford, Suffolk. These works comprise Work No.s 5B to 61 (See Figure 1 Site Context Plan) as defined in the EA THREE DCO. The Requirement Discharge Documents (RDDs) relating to the construction and installation of cable route infrastructure within the Clappits Works Stage (Work No.s 21 to 24), Playford Corner Works Stage (Work No.s 39 and 40), Paper Mill Lane Works Stage (Work No.s 50 and 51) and Converter Station Stage (Work No.s 62 to 69) have previously been discharged. For the sake of completeness and to provide a suite of comprehensive RDDs for use by the Principal Contractor for the cable route (NKT), the infrastructure and activities that fall within these areas and the associated management measures for these will also be addressed in this document. Nevertheless, this document seeks only to discharge this Requirement with respect to Works No.s 5B to 20, 25-38, 41-49 and 52 -61.
- 8. The information contained herein shall be adhered to by the Principal Contractor and their sub-contractors and implementation and compliance will be monitored by the Construction Management Team. These measures will only be revised with the agreement of Mid Suffolk District Council (MSDC) and East Suffolk Council (ESC).
- 9. All appointed fencing contractors will be provided with a copy of the Onshore Cable Route Archaeological Written Scheme of Investigation (WSI) (EA3-LDC-CNS-REP-IBR-000008). The WSI identifies areas where a programme of archaeological investigation (evaluation, mitigation, excavation, built heritage recording and watching brief) is required, and the measures to be taken to protect or preserve in situ or by record any significant archaeological remains that may be found. No installation of fencing or enclosures shall take place in any of the identified archaeological sensitive areas until the required mitigation works have been completed.

CCS	Consolidated Construction Site	
	Construction Design and Management Regulations 2015	
CDM		
Chapter 8	Traffic Signs Manual Chapter 8 Traffic Safety Measures and Signs for Road Works and Temporary Situations (Guidelines for (Public) Highways signing, lighting and guarding)	
CLO	Community Liaison Officer	
DBEIS	Department of Business, Energy and Industrial Strategy	
DC	Direct Current	
DCO	Development Consent Order	
EA ONE	East Anglia ONE Offshore Windfarm	
EA THREE	East Anglia THREE Offshore Windfarm	
EATL	East Anglia THREE Limited	
ECoW	Ecological Clerk of Works	
EnvCoW	Environmental Clerk of Works	
ESC	East Suffolk Council	
GPS	Global Positioning System	
HVDC	High Voltage Direct Current	
MSDC	Mid Suffolk District Council	
MW	Megawatt	
NG	National Grid	
PCCS	Primary Construction Consolidation Site	
SCCS	Secondary Construction Consolidation Site	
RTK	Real Time Kinematic	
WSI	Written Scheme of Investigation	

2. ABBREVIATIONS



3. FENCING AND ENCLOSURES PLAN GOVERNANCE

^{10.} Prior to the commencement of construction, a senior member of the construction team will be appointed by the Principal Contractor to manage the implementation of the Fencing and Enclosures Plan. Contact details of the appointed member of staff will be submitted to stakeholders for their records prior to commencement of construction.

4. CONSTRUCTION DETAILS

- The construction works will be undertaken across a 37km corridor between the Suffolk coast at Bawdsey and the Converter Station at Bramford, passing the northern side of Ipswich. The cables are to be installed through pre-installed ducts, laid during the onshore construction works for the EA ONE project. Construction has started on the cable route at three locations where Construction Consolidation Sites (CCS) will be located, at Playford, Paper Mill Lane and Clappits. This next phase of the construction works are expected to begin in Spring 2024 with an expected completion in December 2025. The construction activities within the onshore cable route will be as follows:
 - Any minor temporary modifications to the public road network.
 - Establish 3 additional CCS (approximate duration of 6 weeks for the establishment of each CCS).
 - Establish 29 accesses from the public highway. These may require Section 278 Agreement with the Local Highways Authority.
 - Establish up to circa 12.7km of stone haul road to access the jointing bay locations from the access points;
 - Install 6.4km of proprietary trackway system to reach, *inter alia*, both ends of each Horizontal Directional Drill (HDD). HDDs will be accessed by proprietary trackway system from the jointing bay hardstandings or access points to allow each HDD to be proved.
 - Establish 29 temporary jointing bay compounds (including 2 transition jointing bays) (approximate duration of 2 weeks for each compound).
 - Excavation of jointing bay pits to locate the existing ducts at each jointing bay location (approximate duration of 3 weeks for each jointing bay location);
 - Construct jointing bays (approximate duration of 3 weeks for each jointing bay).
 - Transport of cables to site, from designated port to an off-site cable storage location and on to the jointing bay locations.
 - Duct proving along the cable route.
 - Pull cables through ducts and undertake jointing (approximate duration of 3 weeks per location).
 - Backfill and reinstatement of jointing bays (approximate duration of 2 weeks).
 - Remove temporary jointing bay hardstandings / compounds and CCS Compounds, haul roads, trackmatting and access points.
 - Reinstate all disturbed land, permanent fences, replacement hedges and vegetation with suitable hedgerow species, during the first appropriate planting season.
- The layout of the above infrastructure is shown in Figure 1 Site Context Plan. The locations of the soil bunds are currently indicative and may be moved within the previously disturbed areas, following agreement with EATL, the Ecological Clerk of Works (EcoW) and the Archaeological Consultant. Similarly, the stone haul road/ trackway may also be moved laterally within a distance of +/-5m, following agreement with EATL, the ECoW and the Archaeological Consultant. Currently 12.7km of stone haul road and 6.4km of proprietary trackway are proposed, however it may be possible to reduce further the quantity of stone haul road required by using trackway where practicable. The use of trackway is less invasive (being placed directly on the topsoil) and requires fewer HGV movements. EATL commits to consulting MSDC, ESC and SCC (as applicable) with regards to any changes to the layout, should the design change significantly (e.g. changes to: highway access routes including access routes into and along the cable corridor; number of jointing bays; and anything that potentially requires archaeological assessment and mitigation).
- 13. Circa 8 teams of 5 workers will work in parallel across the cable route, installing the infrastructure at each location.
- ^{14.} Temporary modification of the existing road networks may be required, such as localized widening, socketing of street signs and temporary moving of street furniture to allow the passage of larger HGVs, as set out in the Access Management Plan (EA3-LDC-CNS-REP-IBR-000079). This will be undertaken prior to construction commencing within relevant sections of the cable corridor route.

4.1. Construction Consolidation Sites (CCS)

^{15.} The installation of the cable will require two 'Primary Construction Consolidation Sites' (PCCS) and four 'Secondary Construction Consolidation Sites' (SCCS), as set out in Table 4-1. All the proposed CCS will be within areas that were previously used for the EA ONE construction works.



Table 4-1 – Construction Consolidation Site Locations

CCS Type	Address	Dimensions (m ²)	Comments
Primary	Paper Mill Lane, Claydon, Ipswich, Suffolk IP6 0AP	3,577	Installed 2022 HGV turning area and parking 1,750m ²
Primary	Top Street, Martlesham, Suffolk IP12	3,572	HGV turning area and parking x 1,400m ²
Secondary	Bullen Lane, Bramford, Ipswich, Suffolk IP8	1,200	
Secondary	Playford Corner, Playford Mount, Ipswich, Suffolk IP6 9DS	581	Installed 2022
Secondary	Clappits, Woodbridge Road, Newbourne, Woodbridge, Suffolk IP12 4PA	1,185	Installed 2022/2023
Secondary	Landfall, Ferry Road, Woodbridge, Suffolk, IP12 3AS	1,200	Installation and use of CCS to be undertaken using Permitted Development Rights

^{16.} As shown in Table 4-1, the dimensions of the CCS will be in accordance with Part 3, Requirement 12(9) of the DCO which limits the size of the PCCS to 3,600m² and the SCCS to 1,200m².

17. The PCCSs will:

- 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.
- 18. The SCCSs will function as hubs for distribution along the cable route and will include welfare facilities with some limited storage of materials and equipment. SCCS may also include site offices.
- 19. The Paper Mill Lane PCCS will be the main administrative compound for the onshore works. Top Street PCCS and Landfall SCCS also include designated office space.
- 20. The CCS will be constructed as follows:
 - Mark out the extent of CCS with use of Global Positioning Systems (GPS) Real Time Kinematic (RTK) setting out equipment;
 - Set out and install drainage features as required. Any encountered existing field drains will be located, capped or diverted to areas where any outfall can be managed in accordance with the Surface Water and Foul Drainage Management Plan (EA3-LDC-CNS-REP-IBR-000081);
 - Erect security fencing around the perimeter of CCS;
 - Excess vegetation to be removed from soil and from site prior to soil stripping. Strip topsoil under conditions where the topsoil is within its plastic limit with regards to moisture content to minimise damage to the soils structure and texture and store in designated areas within the same field boundary, all in accordance with BS3882, British Standard Topsoil and the Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Defra, 2009). The removed vegetation will be either disposed of offsite or used on site for weed suppression in accordance with the correct licence/exemption;
 - Excavate to formation level and store any excess material. Topsoil and subsoil storage bunds will be placed in bunds locally separately, the topsoil bund being seeded, if they are to be stored for longer than 6 months. Subsoil bunds will be kept weed free;
 - Place imported stone in accordance with the CCS base structure design. Hardstandings will be installed in line with temporary works design assessments and may typically be circa 600mm thick;
 - Install prefabricated site offices, meeting room and welfare facilities, where required.



4.2. Accesses, Stone Haul Roads and Trackway

- Existing accesses and farm tracks will be used where possible (with reinforcement where necessary) to access the jointing bay and HDD locations. Circa 12.7km of 5m wide stone haul road will be installed, in accordance with the permitted 18.05km (as set out in Part 3, paragraph 12(12) of the DCO). In addition, 6.4km of proprietary trackway system will be used to access, *inter alia*, the HDD proving locations. All tracks will, as far as reasonably possible, follow the track bed used for EA ONE.
- 22. There will be several HGV turning points and passing bays along the stone haul road and trackway. These are to provide HGVs with a safe location to turn round after driving onto the easement from the public highway and to reverse as short a distance as possible to the leading edge of the haul road/trackway construction. Over longer lengths of haul road/trackway further HGV turning points will be constructed allowing the HGV to drive along the haul road/trackway and reverse shorter distances.
- ^{23.} The routing of the stone haul road/ trackway will be set out using GPS RTK equipment. For trackway, the proprietary trackway matting would be installed directly on the existing topsoil. For stone haul road the construction will be as follows:
 - Set out the site tracks with the use of GPS RTK equipment;
 - Erect and maintain suitable signage and goal posts where the temporary road runs under overhead lines in accordance with HSE GS6 "Avoiding danger from overhead power lines;
 - Set out and install drainage features along the edges of the length of road to be constructed. Any impacted existing field drains will be located, capped or diverted to areas where any outfall can be managed in accordance with the Surface Water and Foul Drainage Management Plan (EA3-LDC-CNS-REP-IBR-000081;
 - Clear vegetation, strip topsoil and subsoil material for storage in separate designated stockpiles with suitable signage.
 - Topsoil storage bunds will be stored locally and seeded if they are to be stored for longer than 6 months. Subsoil bunds will be kept weed free.;
 - Excavate to formation level and store any excess material;
 - Test the existing ground conditions to ensure suitability of the temporary works design and bearing capacity for the haul road and hard standing areas;
 - Layers of stone and geotextiles/geogrid will then be placed on the cleared surface.
- 24. Based on the temporary works design and the soil bearing capacity, the 450mm thick stone haul road is likely to include one layer of non-woven geotextile and a layer of Geogrid 30/30 placed on the compacted sub-soil, with a second layer of geogrid 30/30 installed after 300mm of stone is place.
- 25. Where the stone haul road/trackway crosses over an existing watercourse, a flume will be installed temporarily to allow crossing of the watercourse and the continued flow of the watercourse beneath. When the watercourse is too wide to flume with a single board pipe, a proprietary bridge will be utilised. (See the Watercourse Crossing Method Statement (Appendix 12 of the Onshore Cable Route Code of Construction Practice (EA3-LDC-CNS-REP-IBR-000084).

4.3. Jointing Bay Compounds

- 26. 27 jointing bay compounds will be required, in addition to a compound for the 2 transition jointing bays at landfall. The jointing bay compounds will comprise hard standing to provide a working platform and to accommodate containers, drum trailer movement, parking, and welfare. The jointing bay compounds will have areas up to a maximum of 3,690m² (In accordance with Part 3 Requirement 12(11) which limits the area to 3,740m²). A typical layout is shown in Figure 2 of the Code of Construction Practice (EA3-LDC-CNS-REP-IBR-000084).
- 27. Once the location of the jointing bay compounds has been established (using GPS RTK equipment), the creation of the compound will commence with erection of security fencing, removal of topsoil layer and installation of hard standing areas. The jointing bays (25m x 5m) 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 exposed and concrete slabs constructed to provide a level working area. Drainage channels and a sump pit will be included to facilitate drainage and dewatering. Installation and jointing of the cables will then take place before the earth link boxes and fibre optic boxes are installed and the area back filled with subsoil and Cement Bound Sand, as required.
- ^{28.} Earthing link boxes will be installed within the cable system on every fourth jointing bay. All link boxes will be installed into a link box chamber that will be buried to below plough depth at a minimum of 1.2m, within the jointing bay.



^{29.} To enable the fibre optic cable pulling through the already installed ducts, a pulling chamber will be installed at every jointing bay location. All cable joints, link boxes and pulling chambers will be buried to below plough depth of 1.2m.

4.4. Duct Proving

- ^{30.} The ducts to be used for EA THREE, which were installed during the EA ONE project construction works, will require cleaning and proving to ensure that they are intact, free of debris and ready for cable installation. Cleaning and proving will be undertaken by using a foam sponge pig, driven under air pressure from jointing bay to jointing bay followed by drawing a brush and mandrill through from jointing bay to jointing bay.
- ^{31.} Each set of HDD ducts will also require proving. A larger diameter duct was installed at the HDD locations than is used along the rest of the cable route. Therefore, an excavation (2m x 3m x 1.5m) will be made at each end of each of the HDD locations at the duct diameter transition location. The transition coupler will be removed before cleaning and proving the HDD ducts as described above.
- ^{32.} The construction of the two transition jointing bays within the transition bay compound is addressed in the Landfall Method Statement (EA3-LDC-CNS-REP-IBR 000078) (Reference to jointing bays in the remainder of this document also includes transition bays). These works will use the adjacent SCCS, located off Ferry Road, Bawdsey.

4.5. Cable Pull-through

- The HVDC cable wound drums will be transported from the docks to the cable drum storage location located in Kesgrave close to Ipswich. Cable drums will then be transported directly to the jointing bay compounds. Cable lengths are dependent on the distance between the jointing bays and are typically between 750m and 1950m in length. Before cable installation commences the cable ducts and communications ducts will be given a final clean through and proved by pulling through a sponge, brush and mandrill.
- ^{34.} Installation of the cables into the ducts will begin with a cable pulling system being installed into the jointing bay. A steel bond and winching system with free spinning rollers will be installed along the bottom of the jointing bay. The cable will then be drawn off the lorry mounted cable drum using HGV hydraulic assist and cable winch & winch wire.
- Pulling calculations have confirmed that mechanical cable pushers will be required to assist the cable pull in operation on several of the longer pull locations, where cable pushers will be installed within the jointing bay. A dynamometer will ensure the maximum calculated pulling tension of the cables is not exceeded. Tension on the cable will be reduced using a biodegradable water-based lubricant, for example, "Lubtec-HD" (as used on EA ONE). Once both HVDC cables have been installed, the cable will then be jointed within the jointing bay and tested before moving onto the next pair of cables along the route. This process will be repeated for each of the twenty-eight sections.
- ^{36.} The pre-installed DTS fibre optic ducting will be proven by blowing a gauging steel ball bearing through the ducting joint bay to joint bay. The Communication fibre ducts will be proven by blowing a sponge pig through prior to installing the fibre optic cable. Fibre optic cables will then be blown through the ducted system from jointing bay to jointing bay. The blowing of fibre optic cables requires a highspeed air flow combined with a mechanical pusher.
- ^{37.} It is expected that pulling and jointing operations at each joining bay would take approximately 2.5 weeks, typically spread over a three-to-four-week period, with a typically eight-person team installing the cables and a three-person jointing team.

4.6. Reinstatement

The jointing bay compounds, CCSs, accesses and stone haul roads will be reinstated and restored with the stored topsoil and subsoil in accordance with BS3882, British Standard Topsoil and the Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Defra, 2009). Reinstatement will only take place under conditions where the topsoil is within its plastic limit with regards to moisture content to minimise damage to the soil's structure and texture. If necessary, the subsoil will be 'ripped' under friable conditions prior to placement if compaction had occurred. Topsoil may also require ripping if compacted following the removal of the trackway. Topsoil will be spread in such a way as to ensure that it does not become compacted. Pasture and arable land will be reseeded as required, fences reinstated, and suitable hedgerow species replanted during the first appropriate planting season in accordance with the Landscape Management Pan (EA3-LDC-CNS-REP-IBR-000077).



5. FENCING AND ENCLOSURE CATEGORIES

5.1. Overview

- ^{39.} This section explains the strategy behind the choice of fencing and enclosures required during construction for the different parts of the onshore cable route. The extent and type of the fencing and enclosures to be installed for the project as a whole will be in accordance with the specification for fences set out in the Specification for Highway Works, Vol. 3 (BS1722 Part 2), or equivalent and are governed by five main parameters:
 - Adjacent Land Use stock or arable the infrastructure shall be generally of post and wire, post and rail or stock proof wire mesh fencing as depicted by adjacent land use.
 - Public Interface where the works interface with roads or a Public Right of Way (PRoW) then additional controls will be required to ensure the safety of any third parties and the workforce, such as appropriate gateways or signing, lighting and guarding in line with Safety at Road Works and Street Works Code of Practice and Chapter 8 Signing Lighting and Guarding (Chapter 8) (Department of Transport, 2009).
 - Security at locations where plant, machinery and materials are being stored then the level of fencing or enclosures will be
 increased to prevent unauthorised entry. Adequate security will be provided to protect the public and staff, prevent theft from
 or damage to the works, and prevent unauthorised entry to or exit from the site. Site gates will be closed and locked when there
 is no site activity and appropriate security measures shall be implemented.
 - Environmental Constraints/Protection where environmental receptors have been identified then appropriate fencing will be installed to ensure their protection. The type of fencing will be determined by the environmental receptor and associated requirements. Fencing will also be required to protect trees and hedgerows during construction and those planted post-construction to ensure establishment where required.
 - Third Party Requirements where stakeholders stipulate specific requirements.
- 40. Fencing will be regularly inspected to ensure it is appropriately maintained.
- ^{41.} Further detail is provided on each of the fencing types proposed in Section 6 Fencing Details. On completion of the cable installation works, all areas will be reinstated and, other than that associated with landscaping/planting protection (see Section 5.5), no permanent fencing will be required.

5.2. Construction Consolidation Sites

- 42. The onshore construction works will be supported by a total of six CCS which 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 of the jointing bays. They will be of sufficient size to accommodate limited storage of materials, equipment and labour welfare facilities.
- ^{43.} The CCS will require a high level of security to protect the contents from third parties. The Primary CCS will have metal hoarding or heras fencing, depending on appropriate security risk assessments. A manual arm barrier system will be installed inside the perimeter gate of the Primary CCS to control access and egress to the compound. Secondary CCS will have Heras fencing and lockable gateways.

5.3. Stone Haul Roads and Trackway

- 44. Stone haul roads and trackway will be fenced with post and wire fencing, or as required, to prevent unauthorized access as far as reasonably practicable in accordance with the Construction Design and Management Regulations (CDM) 2015. Fencing in proximity to stone haul road/trackway will also be required to protect trees, hedgerows and ecology (see Sections 5.7 and 5.8)
- ^{45.} Where stone haul roads/trackway cross an existing farm track, the construction road will be gated. Such gates will be operated by a traffic marshal or will require construction drivers to stop their vehicle, open the gates and ensure no vehicles are using the farm track before crossing.

5.4. Jointing Bay Compounds

^{46.} Heras fencing and lockable gates of a suitable type will be installed at the jointing bay compounds, including the jointing bay (and also the landfall transition bay compound) to ensure the construction area is protected from un-authorized access. The excavated joint and transition bays will also be protected by Heras fencing, crowd control barriers and signage to protect the workforce.



47. Where the boundary interface requires a higher level of protection, for instance livestock or trees or hedgerow, then alternative protective fencing will be deployed. Signage and notices will be fixed along this boundary to inform members of the public of the works within.

5.5. Landscaping/Planting

- ^{48.} Where replanting is to take place along the cable route, post and rail, post and wire, rabbit proof fencing or tree guards will be used to protect replanted trees and shrubs. Once replanted, the reinstated area post construction will also be fenced off with stock proof fencing to prevent damage by livestock, as required.
- 49. Further details are provided in the Landscape Management Plan (EA3-LDC-CNS-REP-IBR-000002), presented under separate cover.

5.6. Public Rights of Way

^{50.} Where an existing PRoW crosses a construction access or haul road, safe passage will be maintained using crowd control fencing or post and rail fencing (depending on duration) and the demarcation of a safe route or, in some cases, the PRoW will be temporarily diverted. A PRoW Management Plan contained within the Cable Route Code of Construction Practice (EA3-LDC-CNS-REP-IBR-000010) provides further details on signage and management of the PRoW affected by the installation of the cable.

5.7. Retained Trees and Hedgerows

- 51. Trees that are to be retained and are within the vicinity of any works will be protected by Heras fencing in accordance with the British Standard 5837:2012. The fencing shall be installed at a specified distance from the tree defined by the Root Protection Area as calculated by the Arboricultural Clerk of Works. 'Crowd control fencing' will also be installed as a barrier to protect hedgerows where needed.
- ^{52.} Further details are provided in the Landscape Management Plan (EA3-LDC-CNS-REP-IBR-000077), presented under separate cover. This includes an Arboricultural Method Statement and Temporary Protective Fencing Specification.

5.8. Ecological Protection

- ^{53.} A range of fencing may be installed as part of the mitigation strategy for protected species. Full details of these mitigation requirements are presented in a project-wide Ecological Management Plan (EA3-LDC-CNS-REP-IBR-000093) presented under separate cover, however the types of fencing to be used are described within this plan in Section 6.
- 54. Newt fencing will not be required as a District Level License associated with Great Crested Newts has been obtained for the works. No reptile fencing is will be required due to the low level impacts of the works within proximity to reptile populations which can be mitigated by way of vegetation management.
- 55. A number of badger setts have been identified within the Development Order Limits, due to their presence within or in close proximity the construction works, some setts may need to be closed. In some cases, the closure of the sett will require the installation of oneway gates on sett entrances and/or badger exclusion fencing around the sett, designed in a way to avoid the likelihood of re-entry by badgers such as being able to climb the fencing. Where setts require closure prior to works this will be undertaken in the permitted timeframe prior to commencement of work.

6. FENCING DETAILS

6.1. Overview

^{56.} This section provides details on the different types of fencing and enclosures to be used during the construction works. More technical details on their application are provided in Appendix 1 Fencing Specifications and 2 Gateway Specifications.

6.2. Metal Hoarding

- ^{57.} Where the highest levels of site security and protection are required, metal hoarding will be deployed. Metal hoarding is intended for the enclosure of longer term installations such as the PCCS, where security is a higher risk. These panels are heavier than Heras fencing and require effective staying.
- 58. Steel hoarding will be 2,000mm in height and 2,100mm wide. The panels will be galvanised steel with fixed legs, fixed together with metal couplers.



^{59.} Support posts and thermo plastic support feet will be installed to anchor the fencing. Where temporary work designs detail the need for extra support/anchoring, these will be installed in the form of extra support feet, concrete support feet or sand bags.



Figure 6-1 Example Metal Hoarding



Figure 6-2 Example of Metal Hoarding Additional Support

^{60.} Where security measures deem necessary, for example, a 400mm Heras fencing extension panel or similar will be fitted to the top of the steel hoarding fence panels.





Figure 6-3 Example Extension Panels

6.3. Post and Wire

- ^{61.} This is a level of fencing that offers good demarcation properties and is easy and quick to erect. This fence type can, however, be subject to damage risk from livestock and as such is only suitable for land which does not interface with livestock or is identified as lowest risk.
- ^{62.} Strain posts will be installed at each end of the fence and at all changes of direction or gradient. Rectangular mild steel galvanised wire mesh fencing will be strained between these and supported by intermediate posts installed at regular intervals.
- ^{63.} This type of fencing and associated access gates could also be used to ensure sufficient field enclosure whilst hedgerows establish and grow as part of the post construction landscaping (refer to Landscape Management Plan (EA3-LDC-CNS-REP-IBR-000077) for more details). Further details and an illustration are provided in Appendix 1.



Figure 6-4 Example Post and Wire Fencing (with newt fencing behind)



6.4. Post and Rail

- ^{64.} This fence type will be deployed around the construction working areas where post and wire is not deemed sufficiently robust. It involves vertical posts being knocked into the ground using a mechanical or manual fence knocker at regular spacing. Three horizontal rails are attached between each pair of posts.
- ^{65.} This type of fencing and associated access gates could also be used to ensure sufficient field enclosure whilst hedgerows establish and grow as part of the post construction landscaping (refer to Landscape Management Plan (EA3-LDC-CNS-REP-IBR-000077) for more details). Further details and an illustration are provided in Appendix 1.



66

67. Figure 6-5 Example Post and Rail Fencing

6.5. Stock Proof

- ^{68.} Where a construction working area interfaces with farmland that contains larger livestock, stock proof fencing will be installed to ensure they are effectively contained through-out the period of the works.
- ^{69.} The installation is as per the Post and Wire fencing, however, an increased specification will be required subject to the type of livestock e.g. installation of additional barbed wire protection. Further details and an illustration are provided in Appendix 1.

6.6. Heras Fencing

- 70. Heras fencing offers is easy to erect and dismantle and will be used where construction works are taking place in areas which require additional security to prevent unauthorised access, such as the Secondary CCSs and jointing bay compounds. In addition, all open excavations will be cordoned off with Heras fencing panels.
- 71. Heras fence panels will be anti-climb specification (2,000mm high by 3,000-3,500mm wide). Panels will be held in situ with the use of thermo plastic support feet and fixed with the use of two couple clips per panel. Where extra support / anchoring is required extra support feet, concrete support feet or sand bags will be used.





Figure 6-6 Example Heras Fencing

6.7. Signing, Lighting and Guarding

- 72. Signing, lighting and guarding in accordance with Traffic Signs Manual Chapter 8 will be installed at all working construction areas, as required, to warn and protect the work-force from the dangers present.
- 73. The following are compliant with the NRSWA ('New Roads and Street Works Act 1991) and the Safety at Street Works and Road Works A Code of Practice 2013:
 - Signing adequate warning and instruction signs to warn road users approaching from any direction of ongoing works, locations for this include highways improvements locations
 - Lighting warning lights will be deployed depending on the speed limit in force on a particular piece of highway (mandatory for 40mph and above) and traffic signals will be used for lane closures. Should night working be permitted at any time then this will comply with the External Lighting Emissions Plan (EA3-LDC-CNS-REP-IBR-000085)
 - Guarding in the vicinity of public roads, the work-force will be protected, as necessary, by Chapter 8 barriers with lead-in cones. All open excavations will be cordoned off with Heras fencing panels.



Figure 6-7 Example Chapter 8 Barrier

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6.8. Gateways

74.

Gates will match the fence installation type. Single gateways will comprise steel or wooden posts and be 3,600mm wide by 1,000mm high and double gateways will comprise steel or wooden posts and steel gates and be 6,000m wide by 1,000mm high. Where these will be located close to a public highway, gates will be set back as far as possible to allow vehicles to leave the carriageway safely, a minimum of 20m from the highway will be observed. Further details and an illustration are provided in Appendix 2 and 3.





Figure 6-8 Example Heras / Steel Hoarding Gateways

75. At the two PCCSs, a manual arm barrier system will be installed inside the perimeter gates to control access and egress to the compound. The barrier will be controlled by a security gate-person who will be housed in a temporary gatehouse.



Figure 6-9 Example Arm Barrier System

6.9. Tree and Hedgerow Protection

- 76. Heras fencing will be installed in accordance with the British Standard 5837:2012 along the Root Protection Area of trees where there is a direct interface between the feature and the construction working area to protect against potential root disturbance. Protective fencing to BS 5837:2012 is braced to protect from failure from impacts. Reflective signage will be fitted to the barrier as required.
- 77. Fencing will also be installed to protected hedgerows as required, the protective fencing is to be 'crowd control fencing', 1.1m high. Further details and illustrations are provided in Appendix 1.





Figure 6-10 Example Heras Fencing Tree Protection

78. The Landscape Management Plan (EA3-LDC-CNS-REP-IBR-000077) provides further details on how tree and hedge protection is to be deployed.

6.10. Landscaping/Planting Protection Fencing

- 79. Post installation protective fencing will also be installed where required around areas of new planting. Where required this may include standard stock proof timber post and rail fencing and/or timber post and wire fencing will be used to complete boundaries and protect new hedging and woodland. Fencing will be installed prior to hedge planting unless plants are alternatively suitably protected whilst fencing is installed, for example with guards.
- Additional deer control fencing and/or rabbit proof mesh fencing will also be installed around any blocks of new woodland planting. The deer specification will protect against all species up to and including Red Deer. Gates in the deer control fencing will be padlocked to prevent unauthorized access and to minimise the potential for the gate to be left open. See Landscape Management Plan (EA3-LDC-CNS-REP-IBR-000077) for further details.



Figure 6.-11 Example Deer Fencing





Figure 6-12 Example Rabbit-proof Fencing

6.11. Ecology Fencing

Ecology fencing, specific to species, will be required to exclude identified protected species from entering the construction working areas and installation will be as advised by the Ecological Clerk of Works (EcoW). The specification of the fencing is dependent on species and purpose of the fencing, the following types of ecological fencing may be required, further details are provided in the Ecological Management Plan (EA3-LDC-CNS-REP-IBR-000093), provided under separate cover. The need for ecology fencing will be identified by the EcoW. Ecology fencing will be inspected by the EcoW, following installation and on a bi-weekly basis during spring and summer and a monthly basis during the autumn and winter.

6.11.1. Badger Gates

^{82.} During the closure of badger setts, one-way badger gates will be installed to prevent the badgers from re-entering the sett. as shown in Figure 6.13 and Figure 6.14.

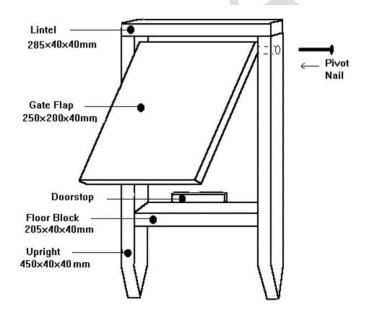


Figure 6.13 Typical Badger Gate





Figure 6.14 Photo of Example Badger Gate

6.12. Maintenance

All fencing will be regularly inspected by the Site Management Team and contractors. Where defects or damage is found, repairs will be undertaken within 24hrs, with Chapter 8 Signing, Lighting and Guarding will be used to prevent unauthorised access prior to any full repairs.

Ecology fencing, if required, will be inspected by the EcoW, following installation and on a bi-weekly basis during spring and summer and a monthly basis during the autumn and winter.

6.13. Replacement Fencing

^{84.} Landowners fencing that has to be removed as part of the construction works will be replaced on a like-for-like basis. Although existing fencing will be retained / repaired as much as possible, some circumstances will necessitate partial or complete removal.



85



7. SUMMARY OF FENCING AND ENCLOSURE REQUIREMENTS

The following table shows a summary of proposed fencing and enclosures to be installed during the onshore construction works. Illustrative drawings are presented in Appendices 1 to 2.

Table 7-1 Summary of Fencing and Enclosure Requirements

Category	Fencing and Gateway Types
Primary CCS	Heras fencing or metal hoarding with double gateways; Manual arm barrier; Chapter 8 Signing, Lighting and Guarding
Secondary CCS	Heras fencing with double gateways; Chapter 8 Signing, Lighting and Guarding.
Stone Haul Roads and Trackway	Post and wire fencing or as required by the CDM Regulations Gating of farm tracks
Jointing Bay Compounds	Heras fencing with double gateways; Crowd control fencing Chapter 8 Signing, Lighting and Guarding
Landscaping/Planting	Stock proof timber post and rail fencing and/or timber post and wire fencing Deer control fencing and rabbit proof mesh fencing
Public Rights of Way	Crowd control fencing Post and rail (where required for a longer duration)
Trees and Hedgerows Protection	Heras fencing Crowd control fencing
Ecological Protection	Badger gates

8. DECOMMISSIONING

- ^{86.} On completion of the onshore construction works, all fencing will be removed with the exception of any landscaping protection fencing, where required. All boundaries will be reinstated to match existing/previous boundary treatments. All reinstatement will be in agreement with affected landowners. Temporary fencing will be removed as soon as practicable.
- 87. General disposal parameters for the fences/enclosures once removed comprise:
 - Re-use by local landowners;
 - Re-use/Recycle via local recycling centres;
 - Off Hire / Return to applicable depots to be re-used in future; or
 - Disposal remove to applicable disposal site in line with current legislative requirements.

9. **REFERENCES**

Department for Transport, 2009, Traffic Signs Manual, Chapter 8 Traffic Safety Measures and Signs for Road Works and Temporary Situations, Part 1: Design, London, TSO (<u>https://www.gov.uk/government/publications/traffic-signs-manual</u>)



APPENDIX 1 FENCING SPECIFICATIONS

Post and Wire

Strain posts will be knocked into the ground with the use of a mechanical or manual fence knocker to a depth of 750mm. Where circumstances do not allow posts to be knocked into the ground, then post holes shall be excavated to a depth of 800mm x 300mm x 300mm. The excavations will be backfilled with the use of compacted as dug material.

Support posts will be knocked into the ground a depth of 450mm. Where it is impracticable to knock the posts in, an excavation to a depth of 500mm will be undertaken and filled with compacted as dug material.

Intermediate posts will be knocked into the ground a depth of 325mm. Where it is impracticable to knock the posts in an excavation to a depth of 450mm will be undertaken the installation will be filled with compacted as dug material.

Dimensions:

- Terminal/Strain Posts round, 125mm x 2,320mm long
- Intermediate Post round, 80mm x 1,870mm long, installed at maximum 3,500mm intervals
- Strain Supports installed where there is a change of direction or 150m maximum spacing
- Rectangular Mild Steel Galvanised Hinge Joint Wire Mesh Fencing.

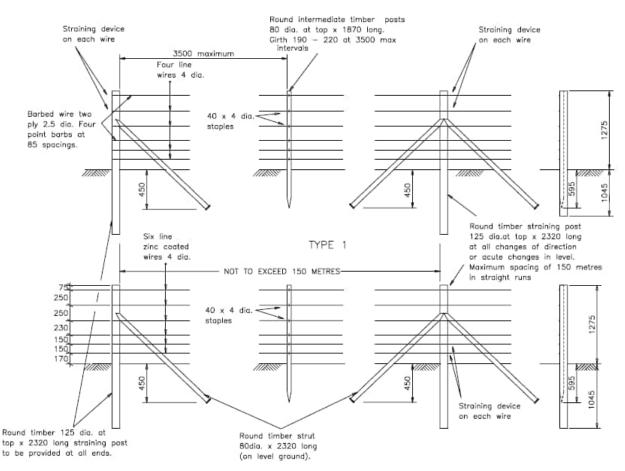


Figure A Post and Wire Fencing



Post and Rail

Posts will be knocked into the ground with the use of a mechanical or manual fence knocker to a depth of 600mm. Where circumstances do not allow posts to be knocked into the ground, then post holes shall be excavated to a depth of 600mm x 300mm x 300mm. The excavations will be backfilled with the use of compacted as dug material or ST2 concrete depending on ground conditions.

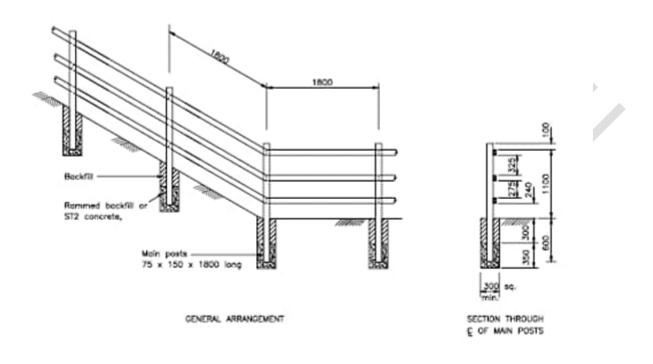


Figure B Indicative Post and Rail Fencing Construction

Stock Proof

Strain posts will be knocked into the ground with the use of a mechanical or manual fence knocker to a depth of 750mm. Where circumstances do not allow posts to be knocked into the ground, then post holes shall be excavated to a depth of 800mm x 300mm x 300mm. The excavations will be backfilled with the use of compacted as dug material or, depending on ground conditions, 225mm of concrete placed in the bottom of the installation and the remainder will be filled with compacted as dug material.

Support posts will be knocked into the ground to a depth of 450mm. Where it is impracticable to knock the posts in, an excavation to a depth of 500mm will be undertaken with 225mm of concrete placed in the bottom of the installation and the remainder will be filled with compacted as dug material.

Intermediate posts will be knocked into the ground to a depth of 325mm. Where it is impracticable to knock the posts in, an excavation to a depth of 450mm will be undertaken. The installation will be filled with compacted as dug material.

Dimensions:

- Terminal/Strain Posts round, 125mm x 2,320mm long
- Intermediate Posts round, 80mm x 1,870mm long, installed at maximum 3,500mm intervals
- Strain Supports installed where there is a change of direction or 150m maximum spacing
- Rectangular Mild Steel Galvanised Hinge Joint Wire Mesh Fencing

2 x Strands of 2 Ply mild steel Barbed Wire – evenly tensioned shall be installed along the top of the fencing. Where there is interface with the general public plain wire shall be used in lieu of barbed wire.



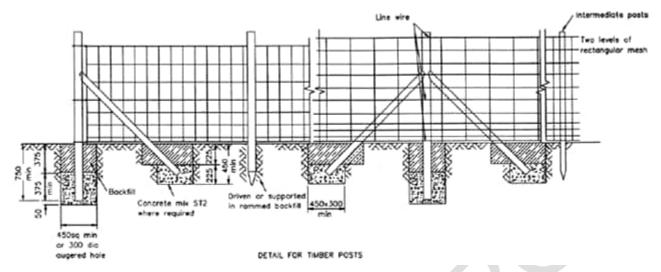


Figure C Stock Proof Fencing

Crowd Control Fencing



Figure D Crowd Control Fencing



APPENDIX 2 GATEWAY SPECIFICATIONS

Single Gateway

Typical arrangements for single gateways will be steel gates with steel or wooden posts, unless otherwise requested by landowners. The gateway shall be 3,600mm wide by 1,000mm high.

Posts will be installed 825mm below the surface level and will be set in concrete.

All gates will be fitted with warning and information signs.

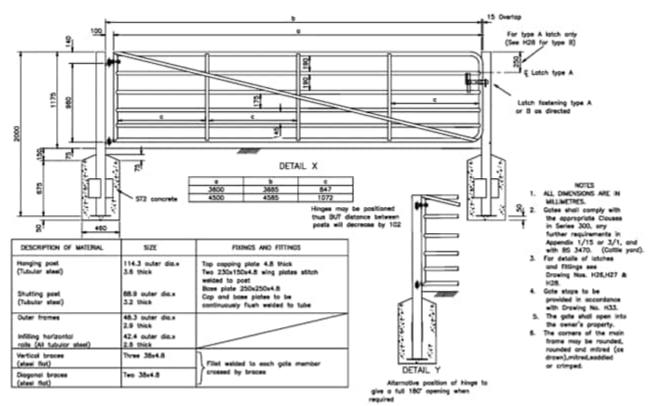


Figure E Single Gateway

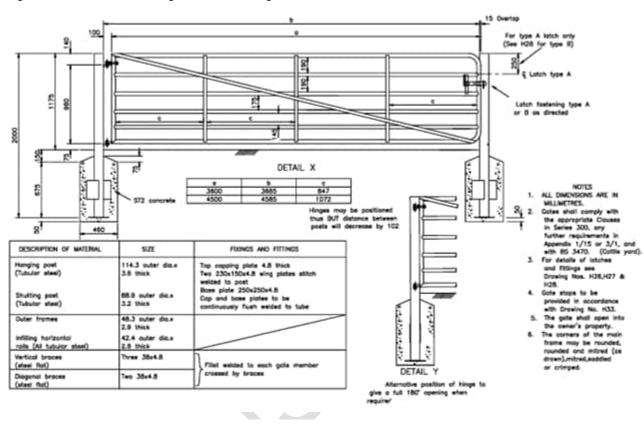


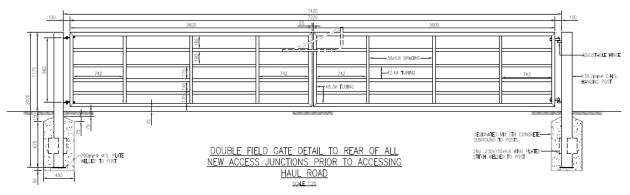
Double Gateway

Typical arrangements for double gateways will be steel gates with steel or wooden posts, unless otherwise requested by landowners. The gateway shall be 6,000mm wide by 1,000mm high.

Posts will be installed 825mm below the surface level and will be set in concrete.

All gates will be fitted with warning and information signs.



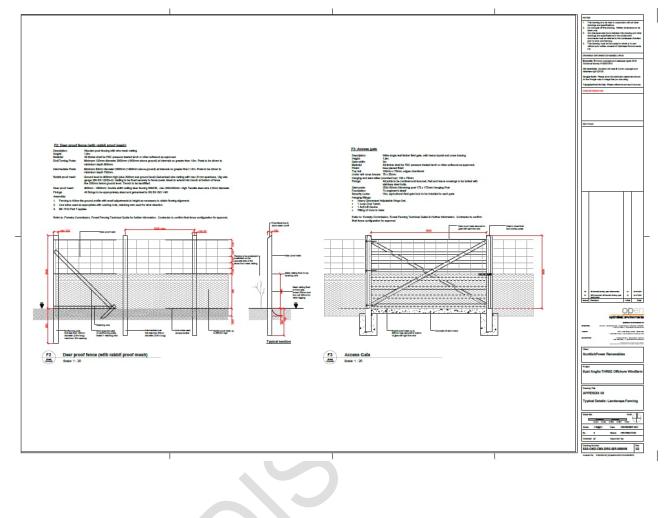


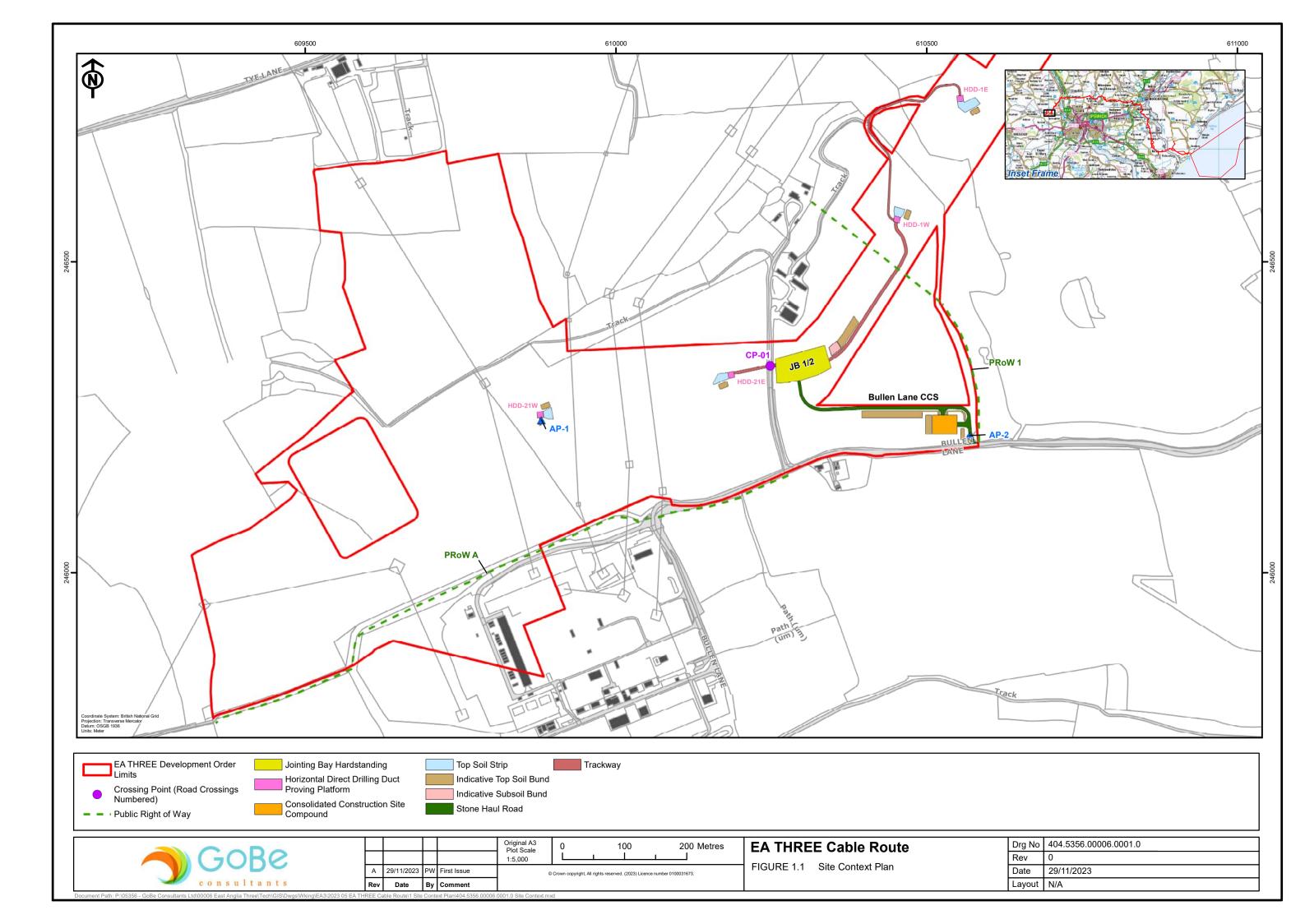


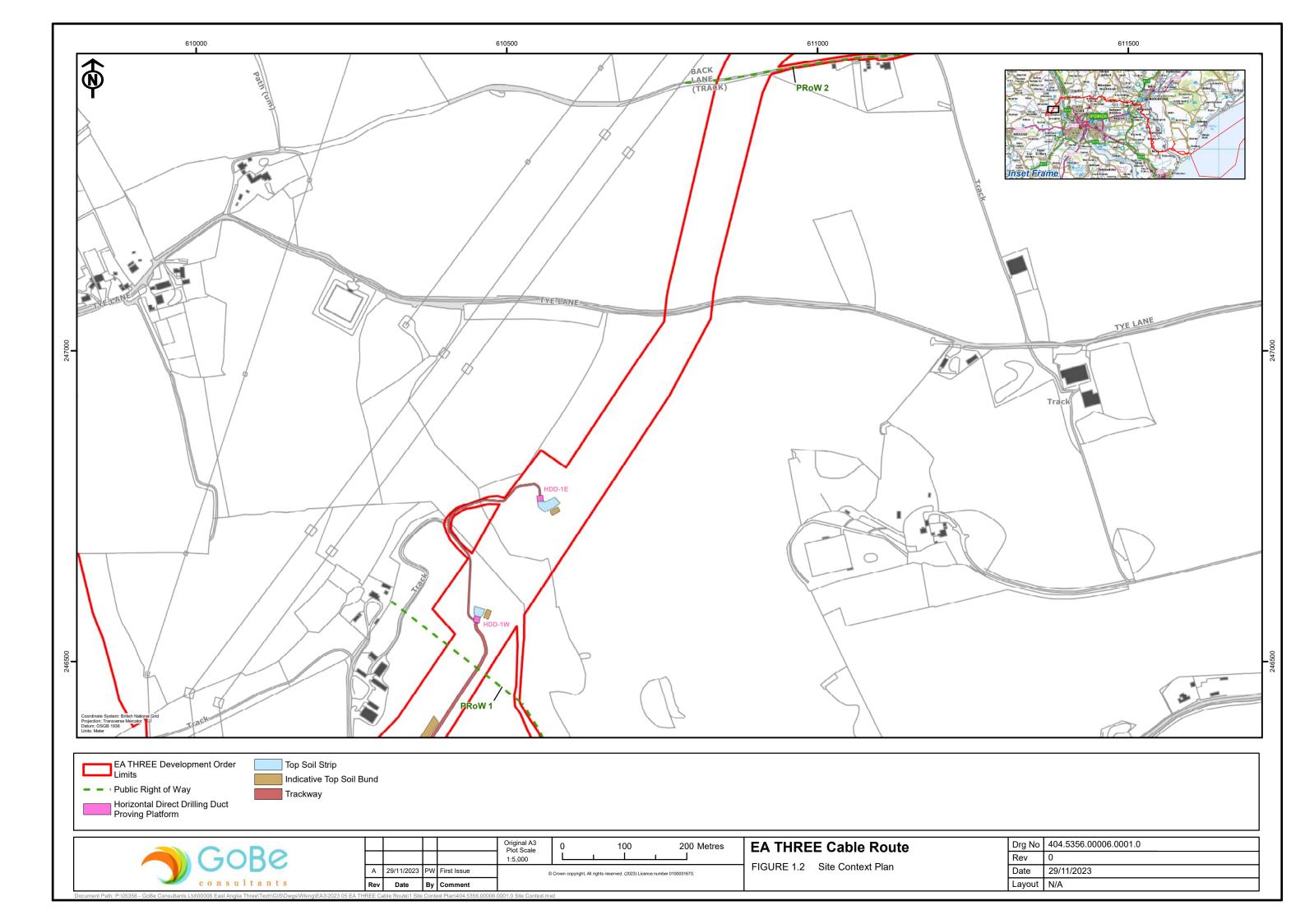
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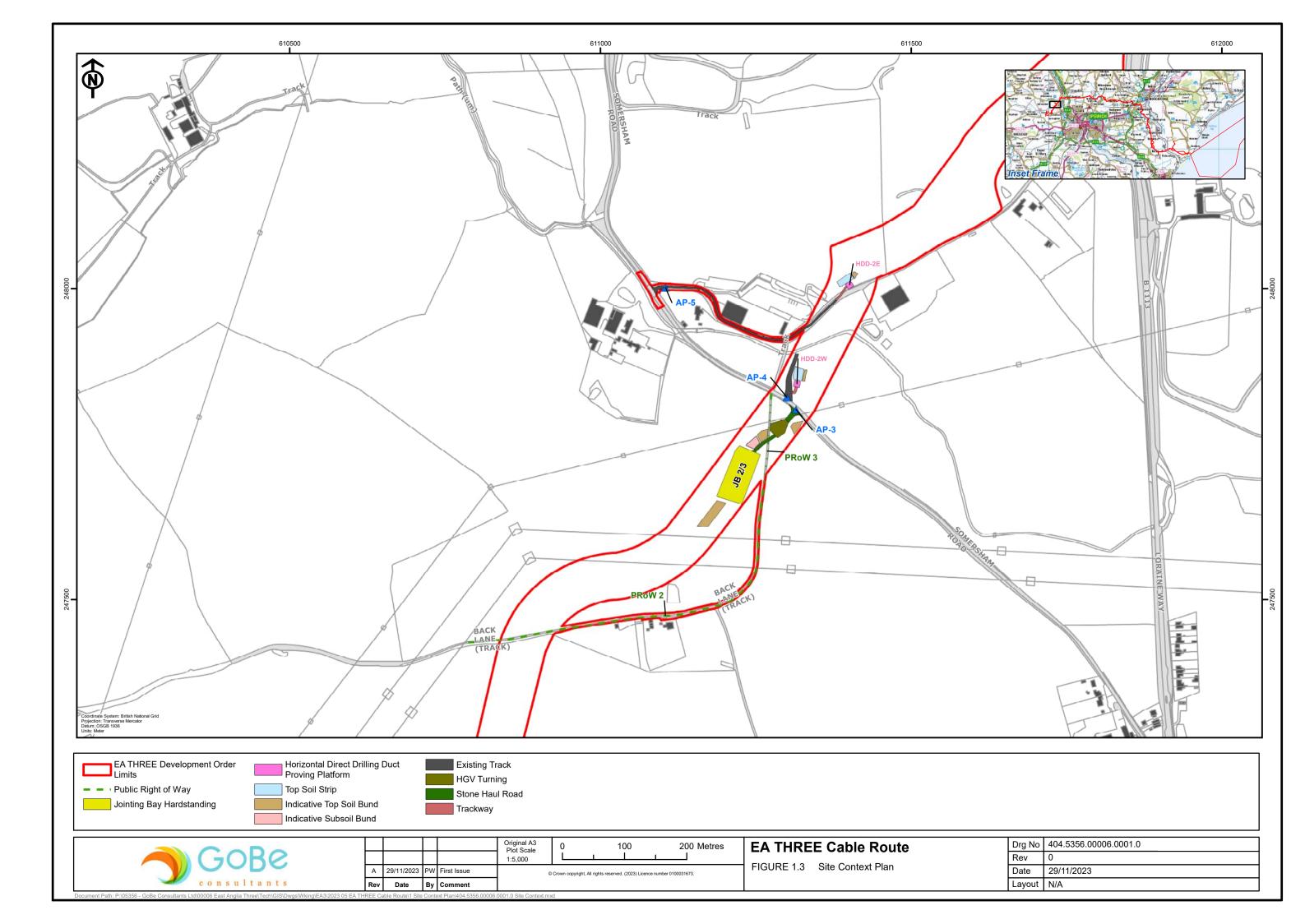


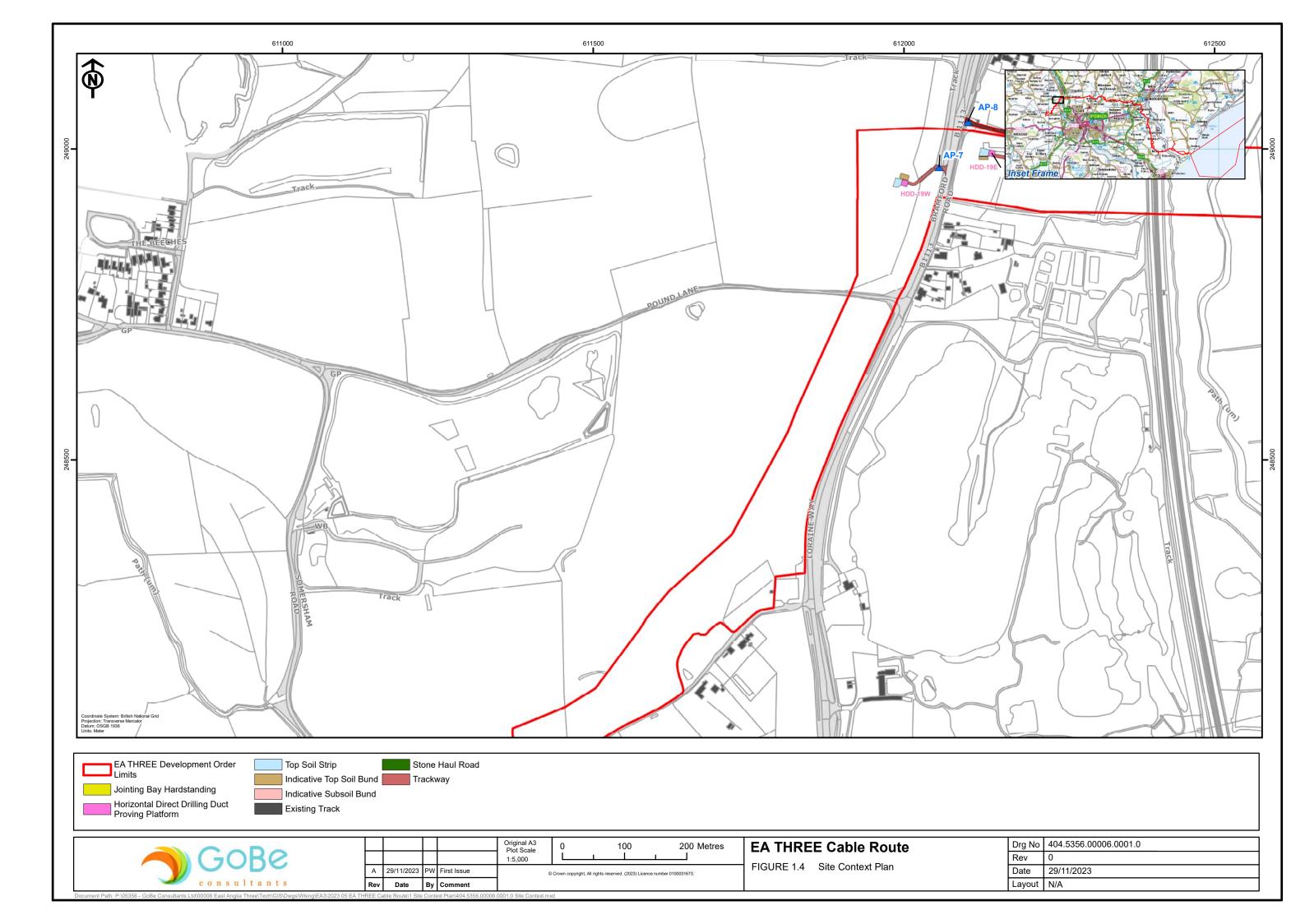
Landscaping Gateway

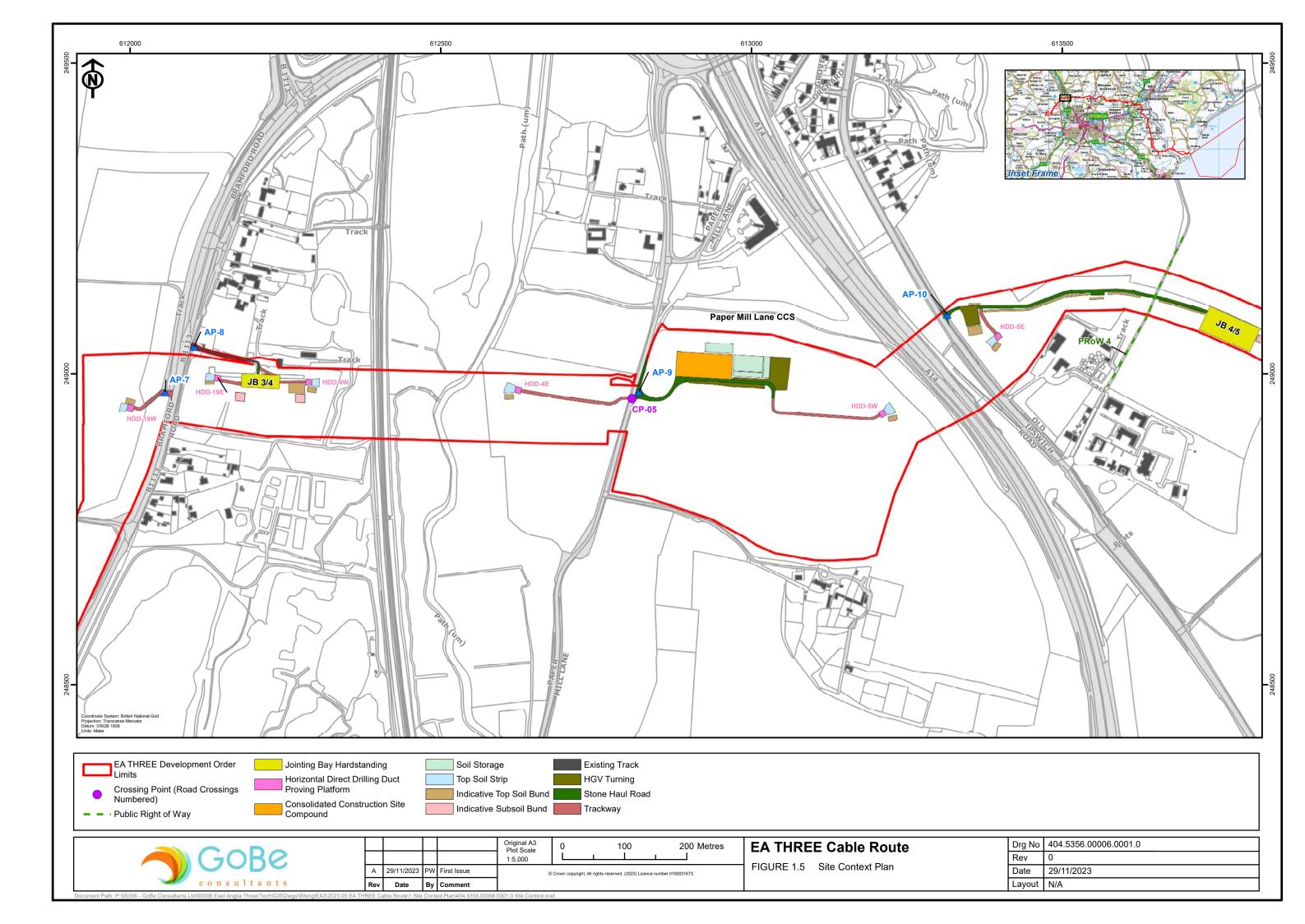


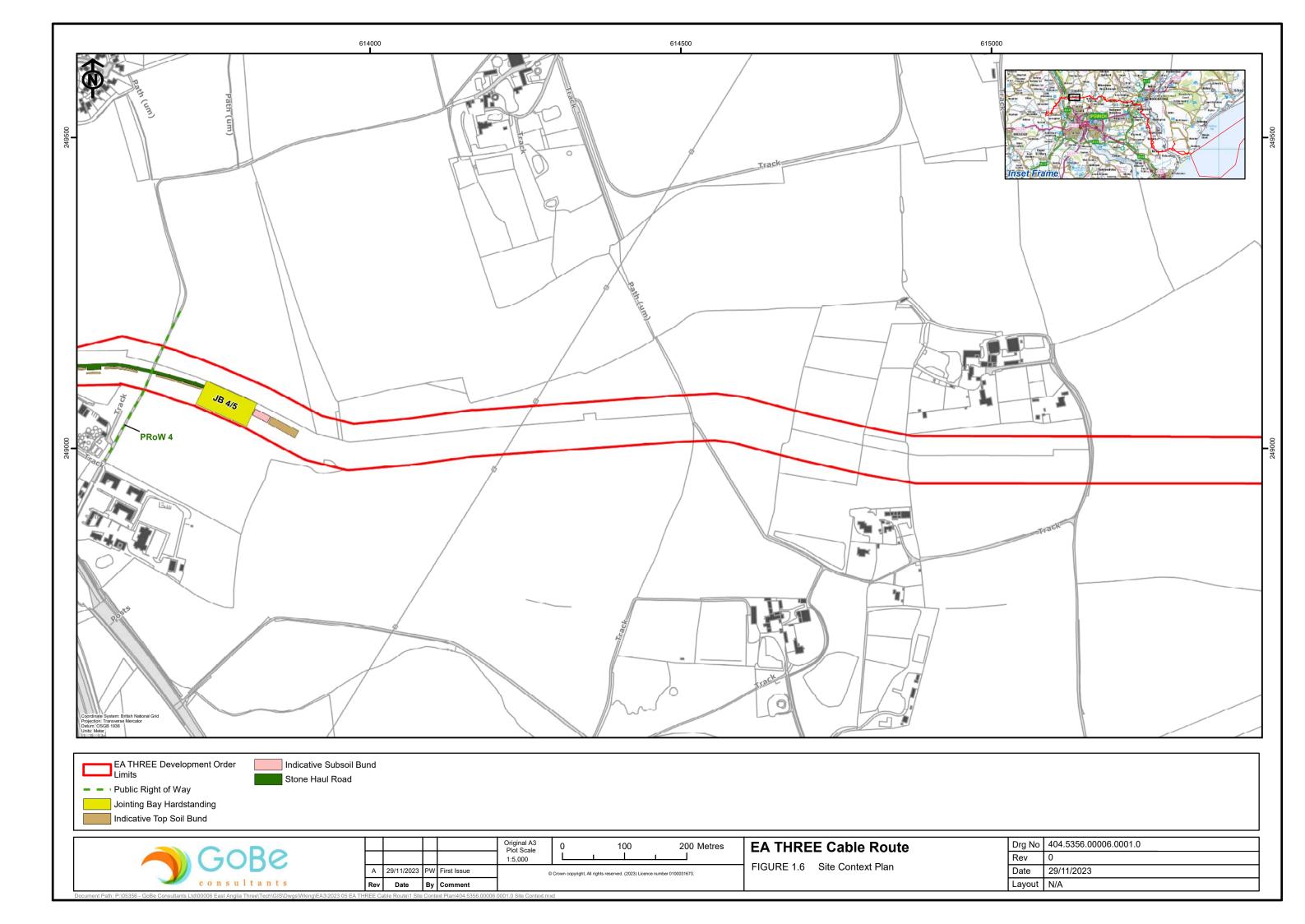


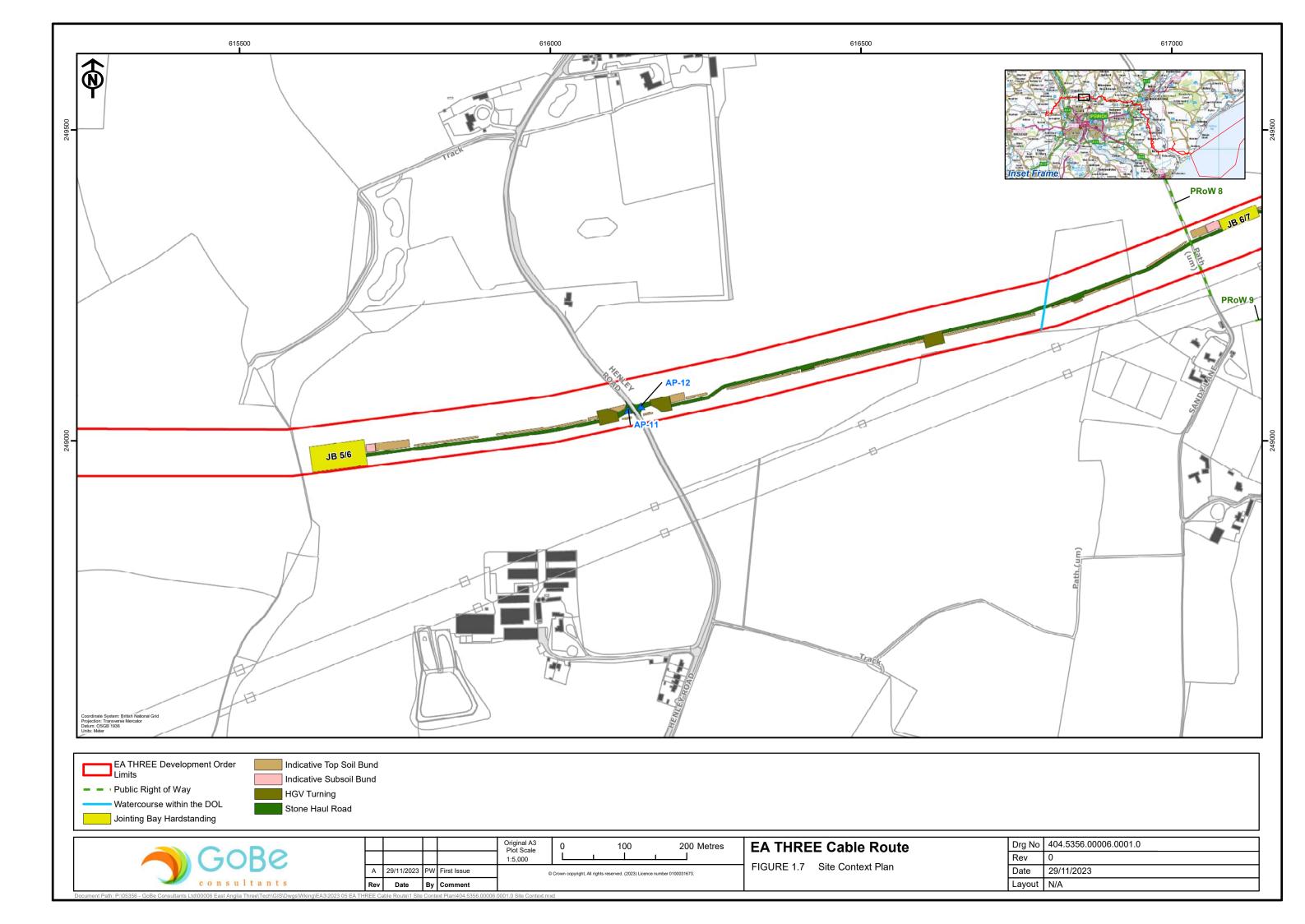


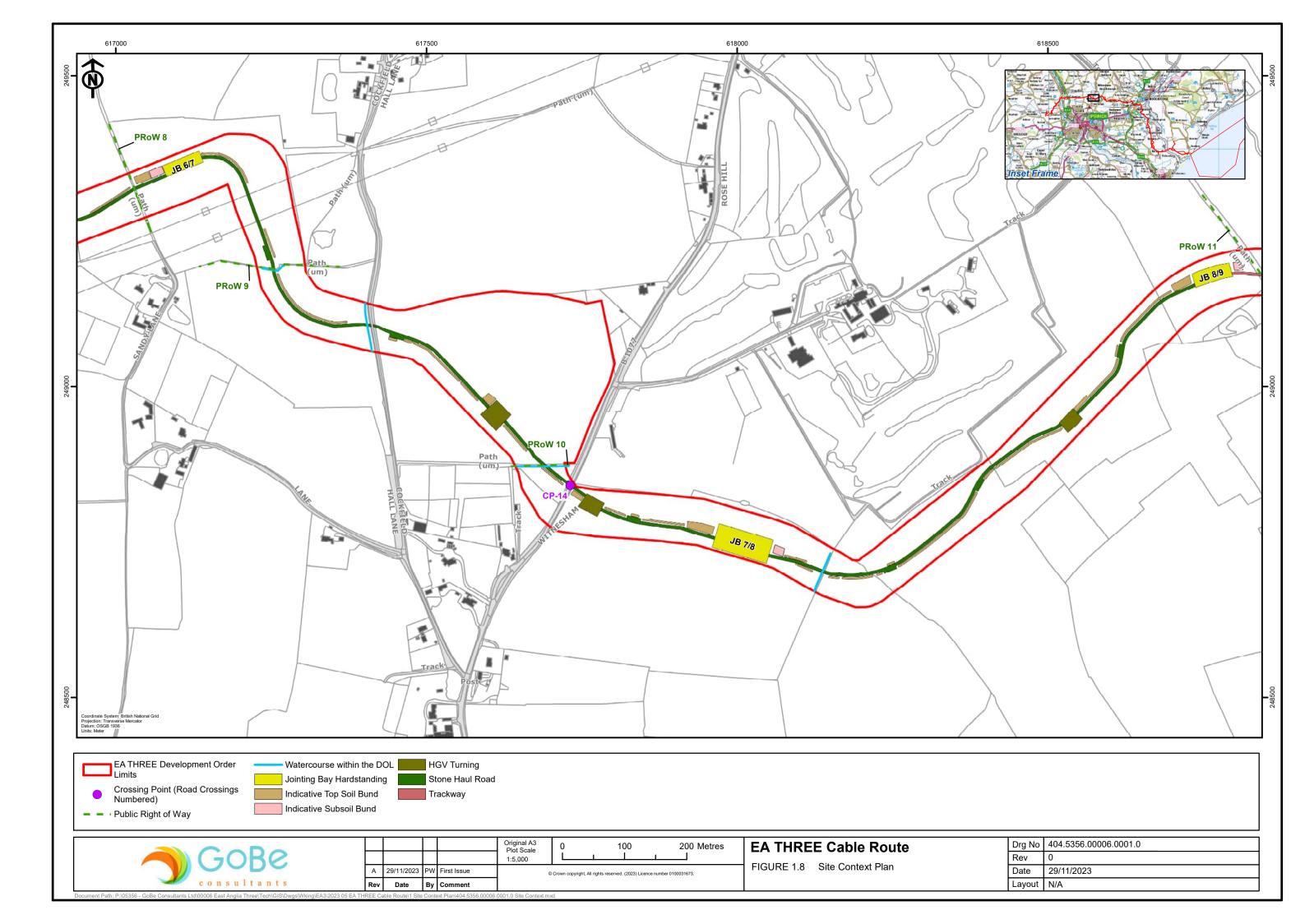


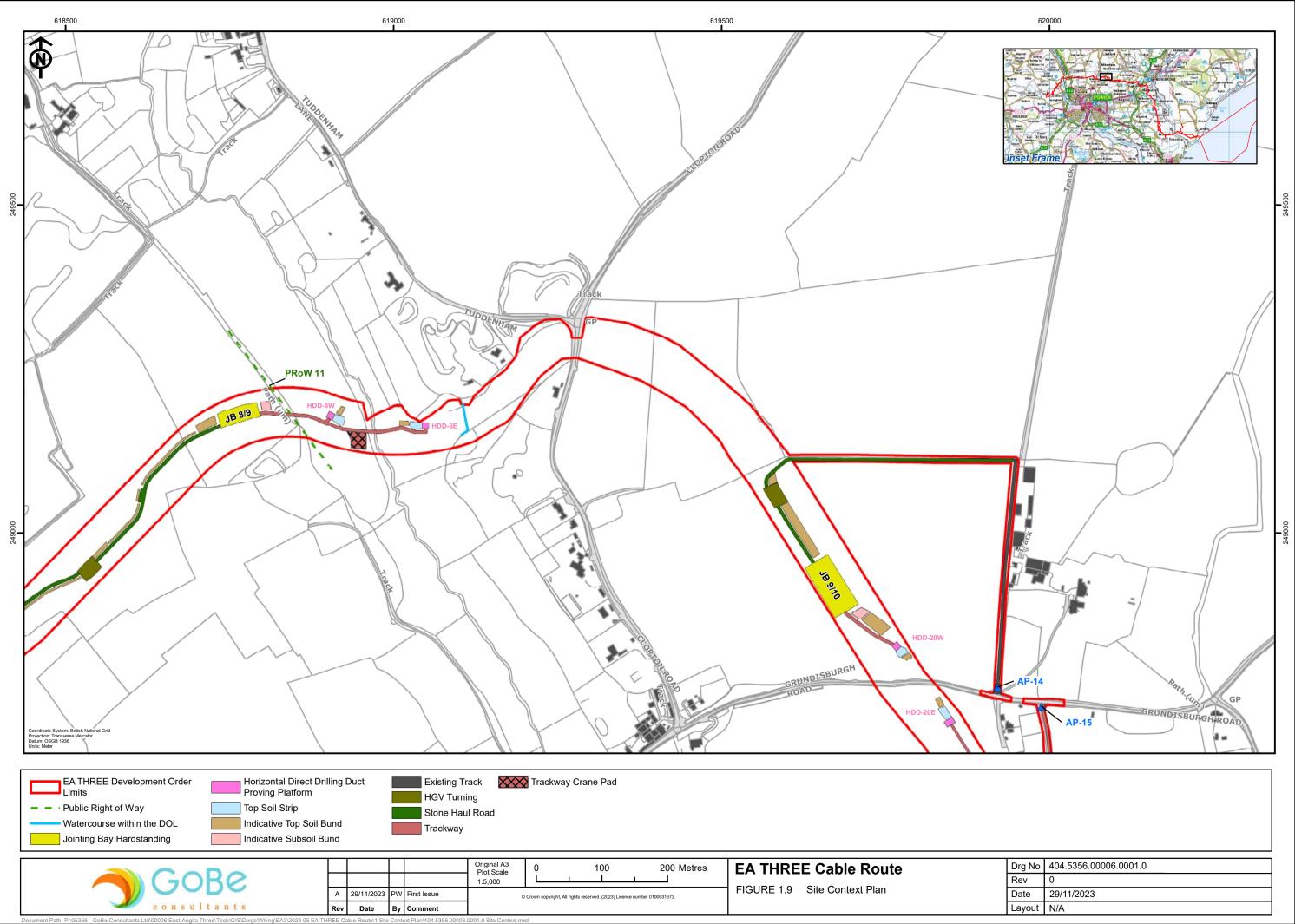






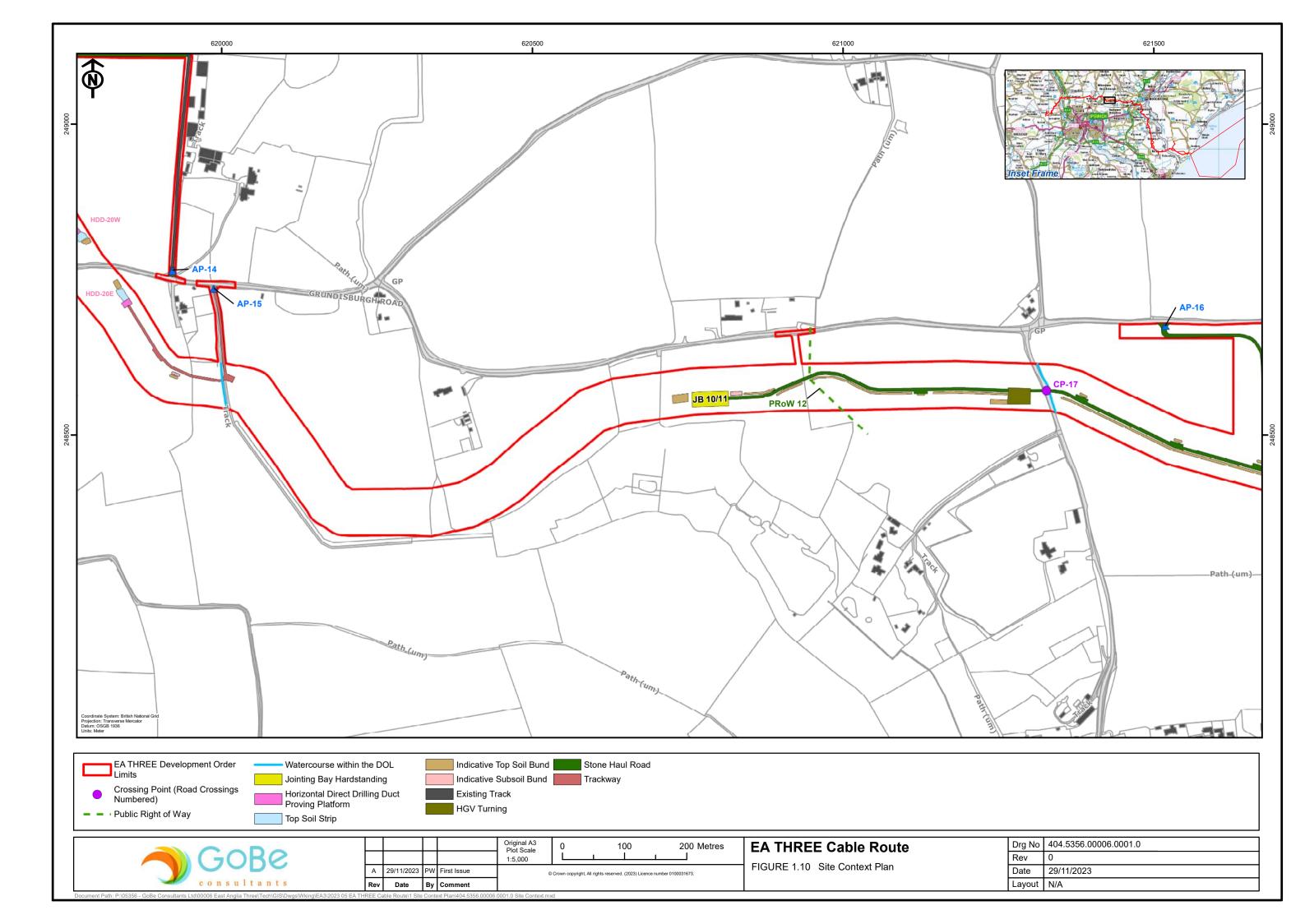


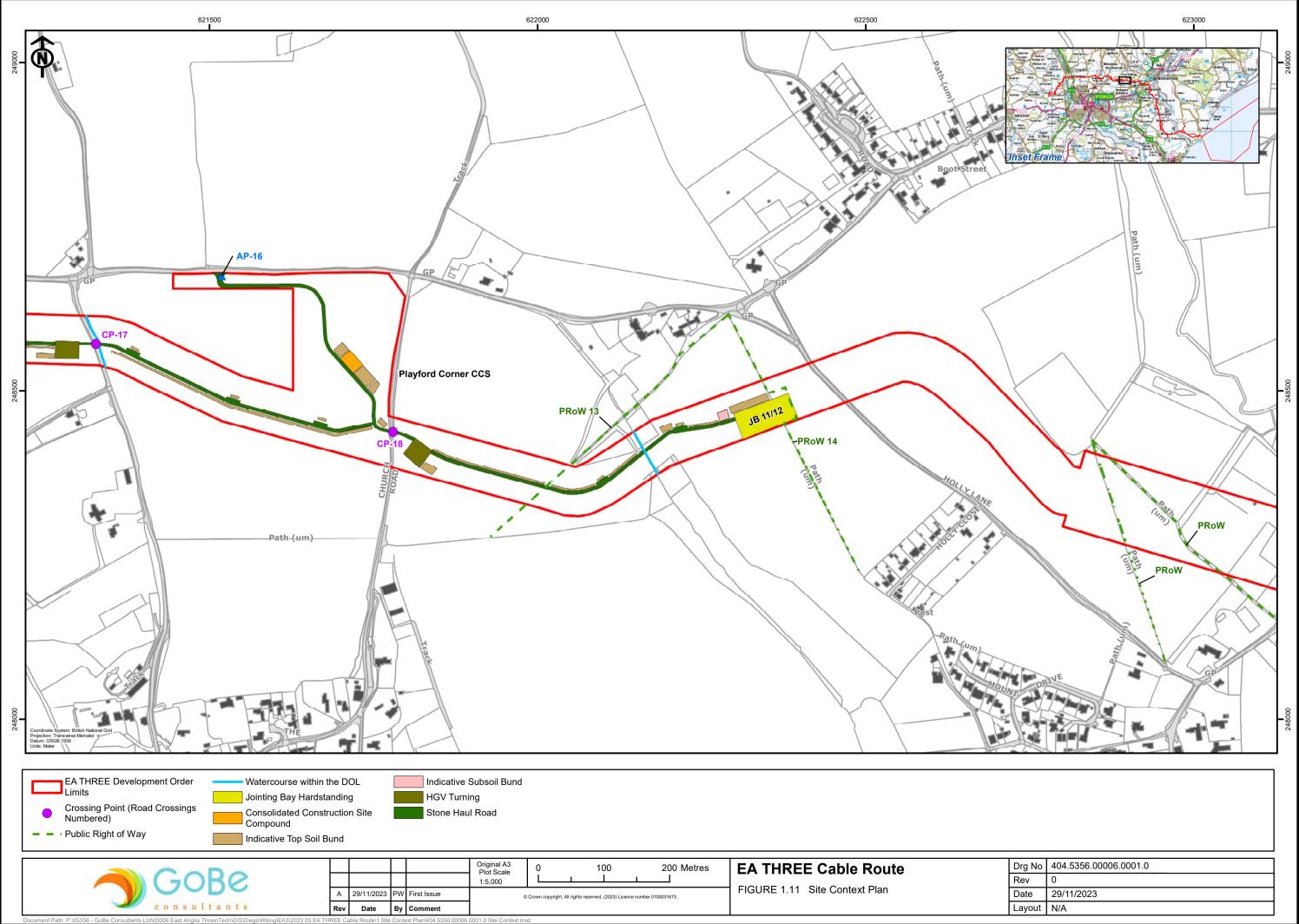




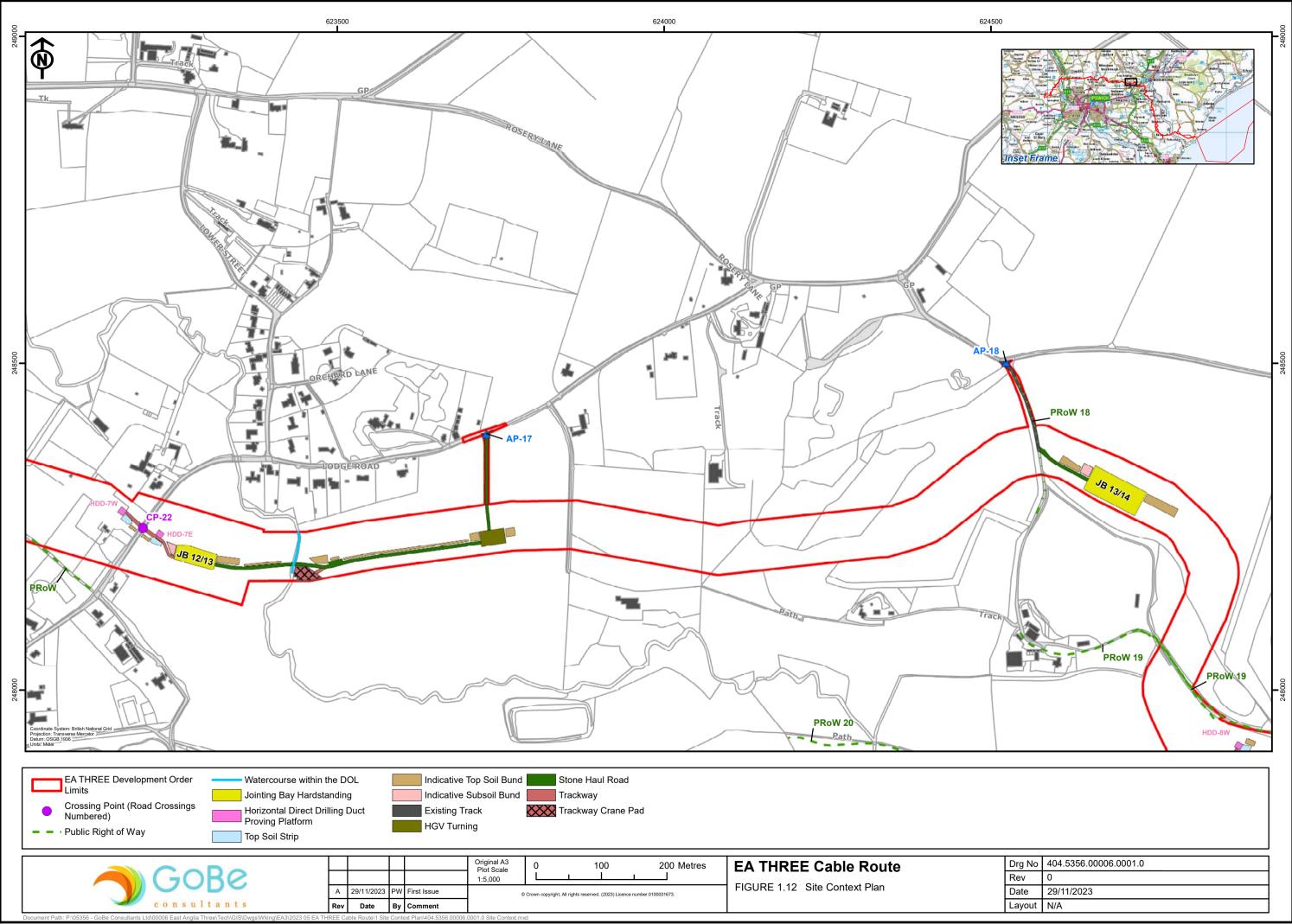


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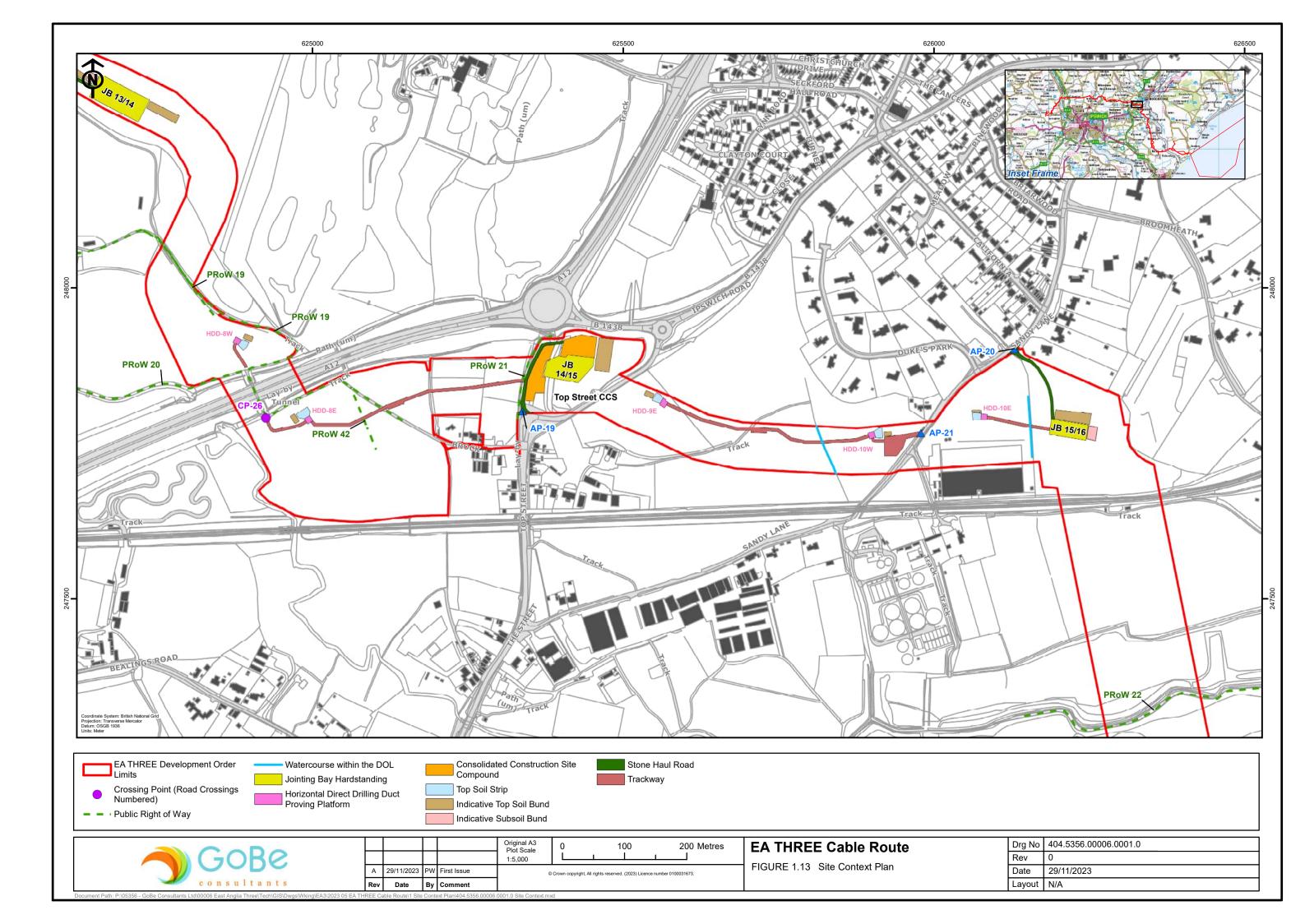


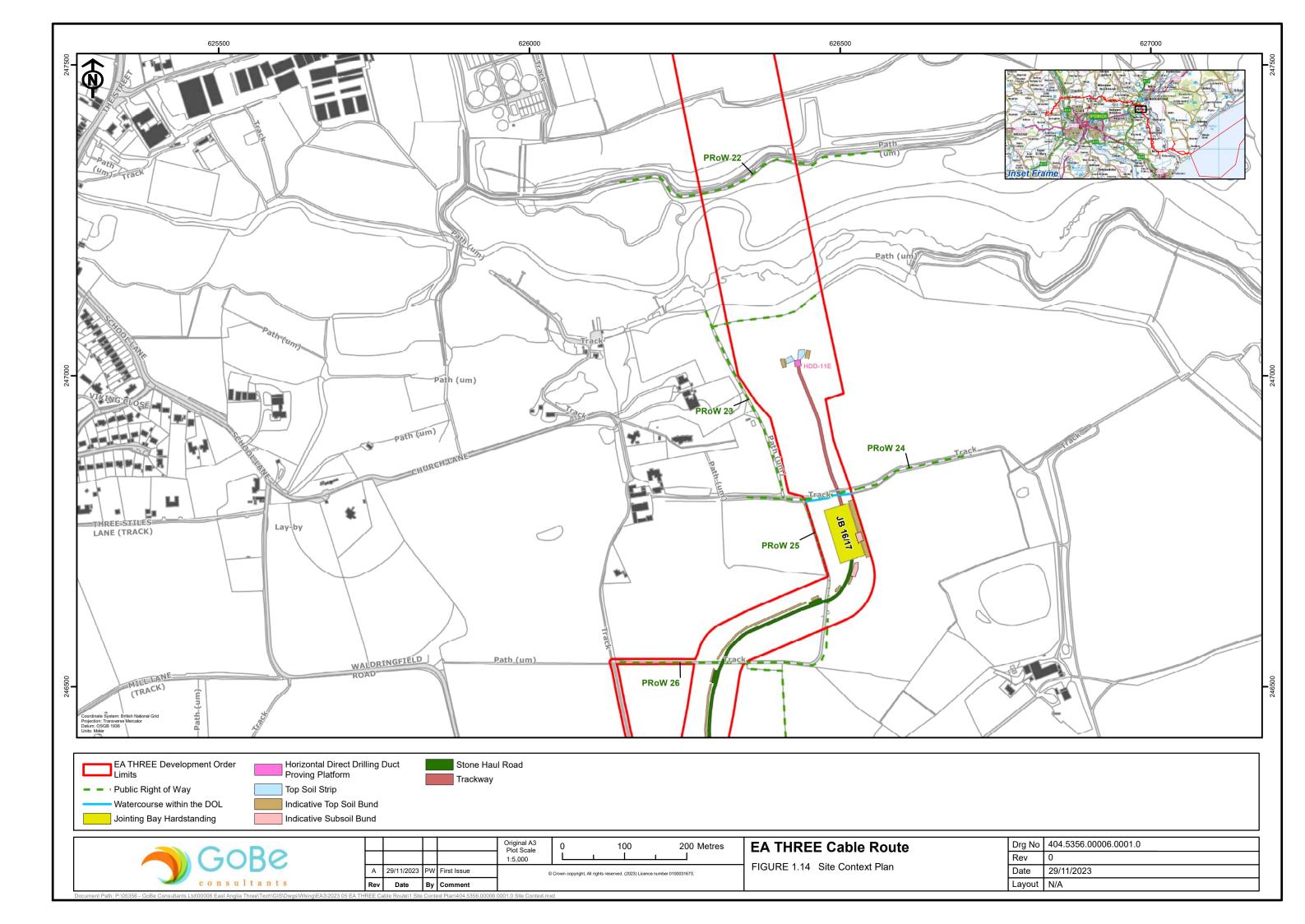


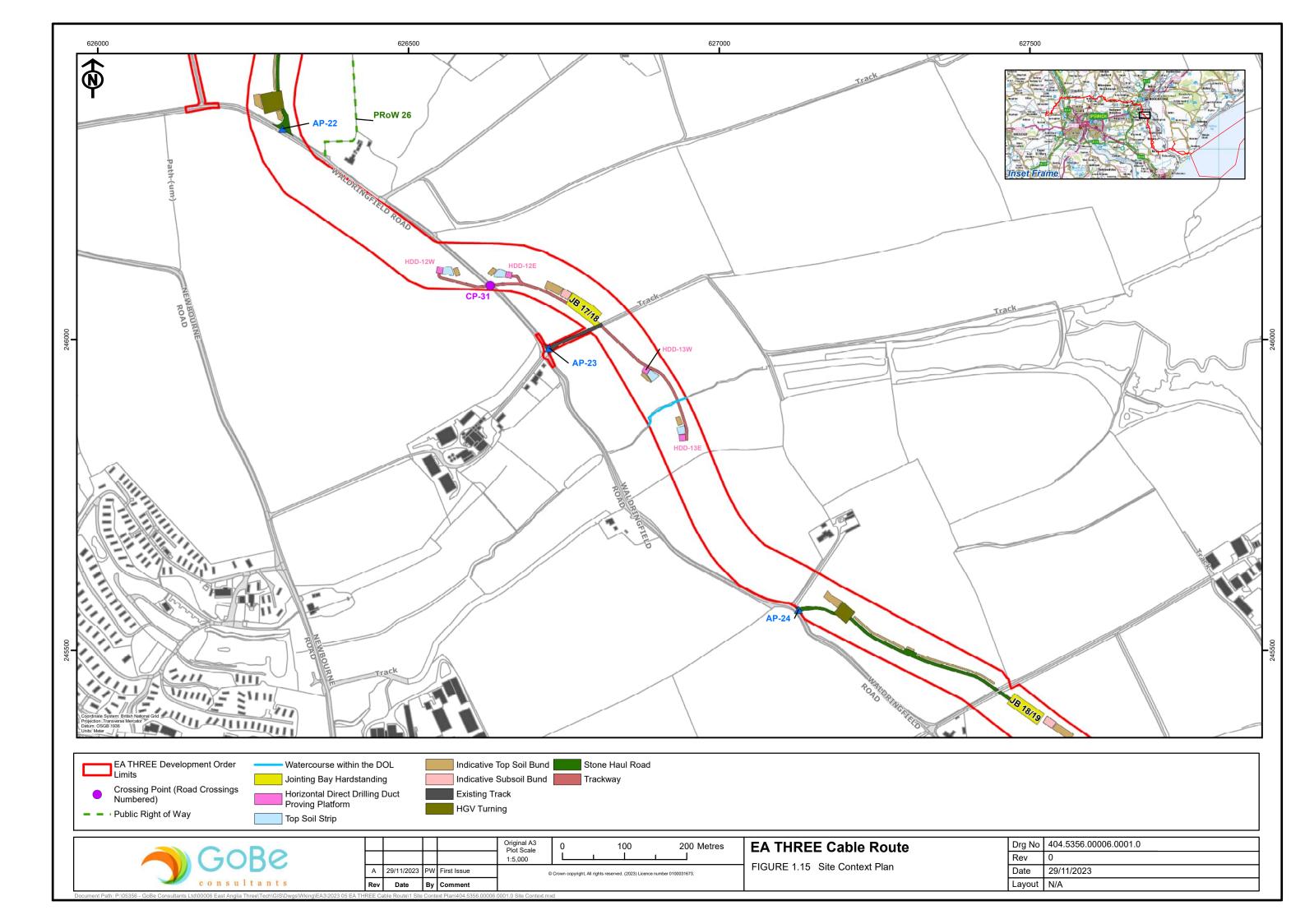
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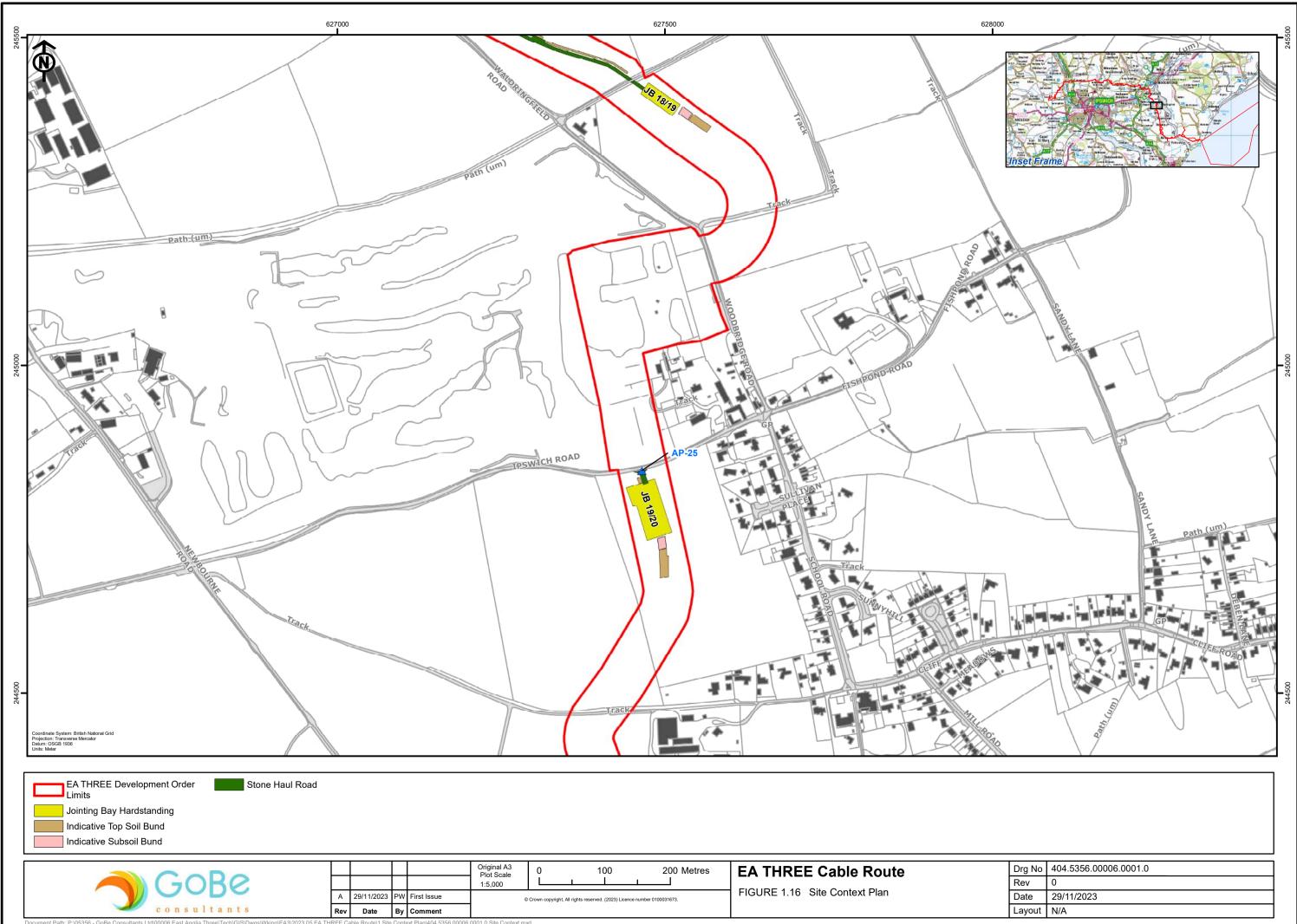


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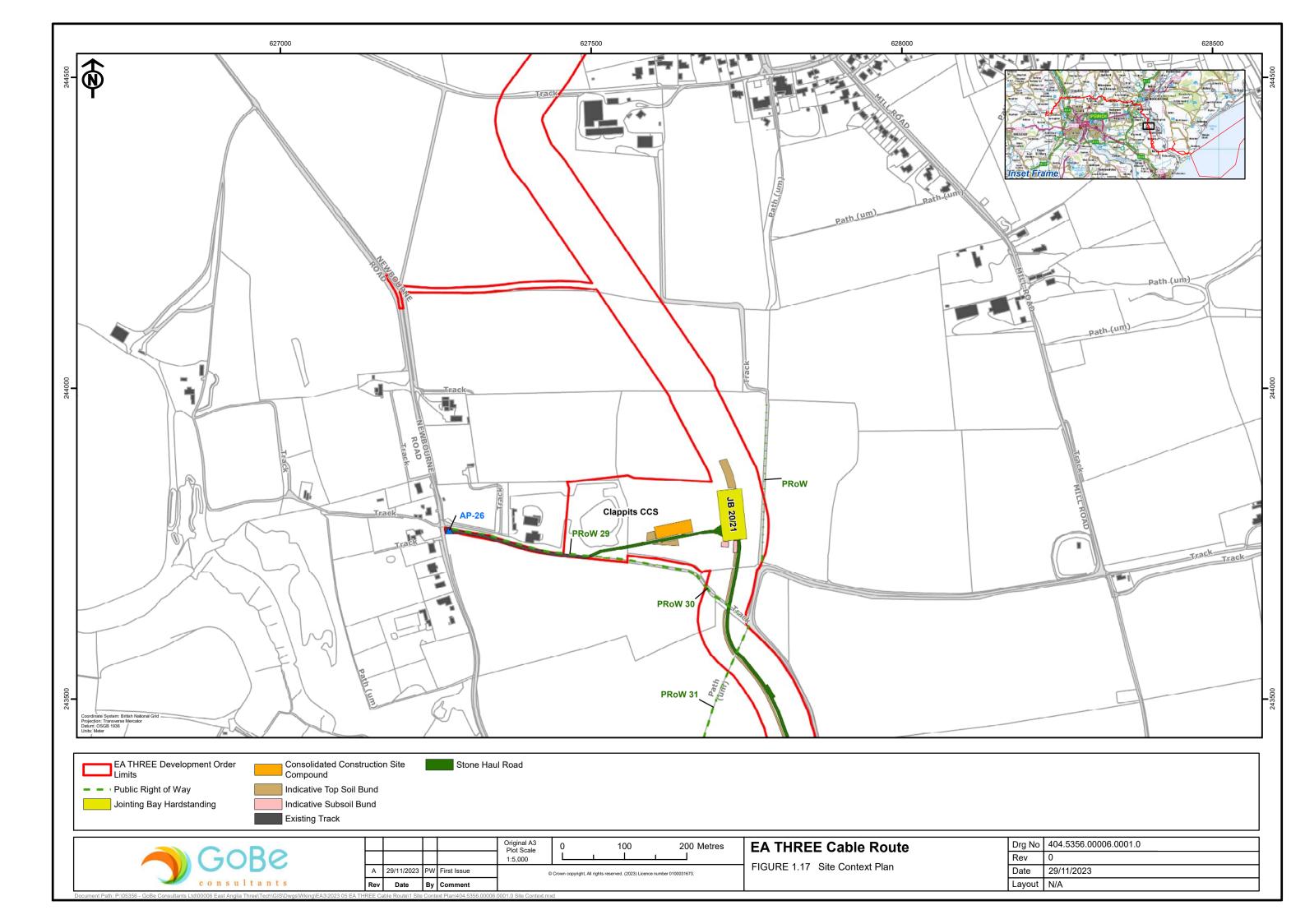


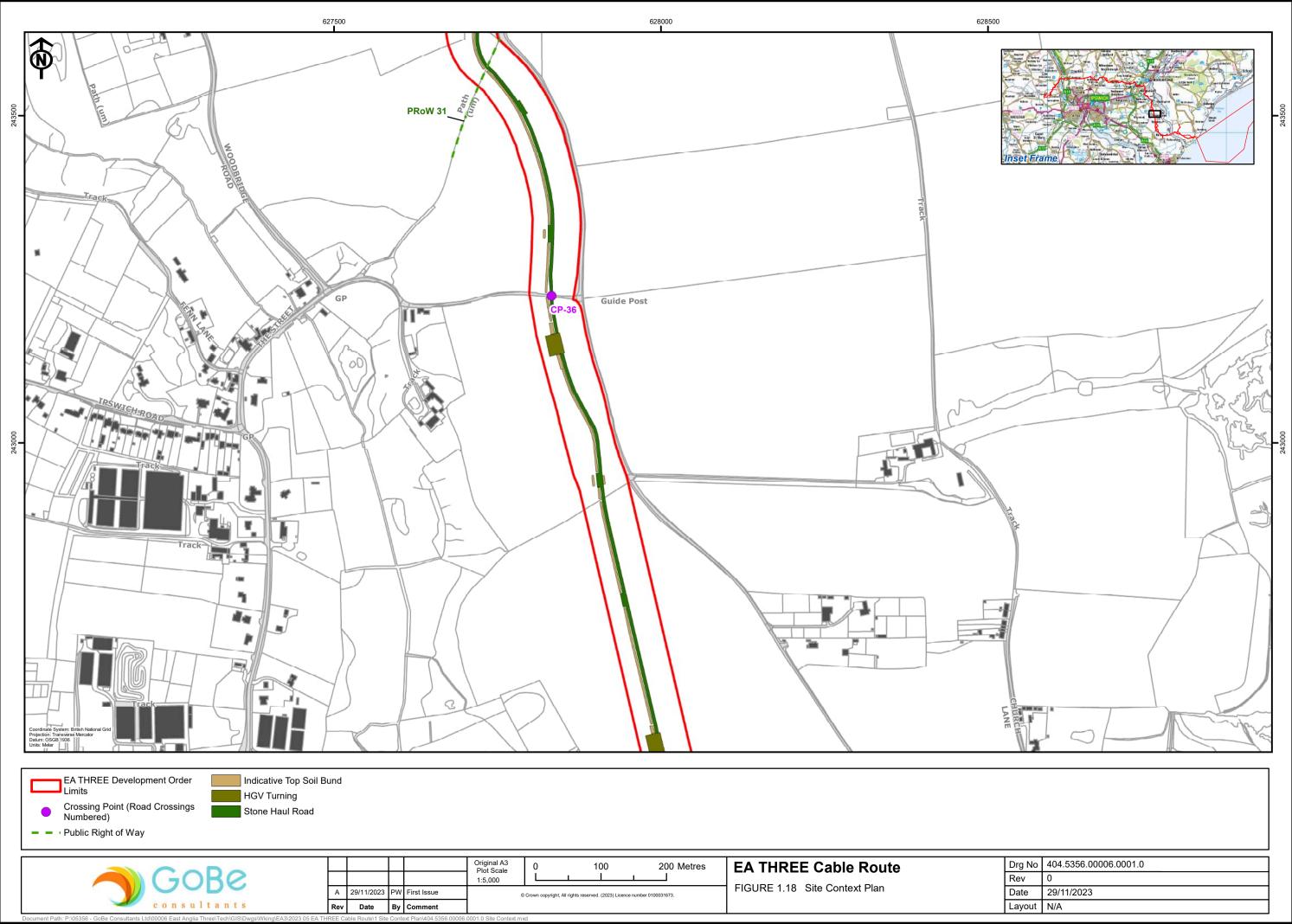






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