

Gate Burton Energy Park Environmental Statement

Volume 3, Appendix 2-B: Grid Connection Construction Method Statement

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Revision 2

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APFP Regulation 5(2)(a)

Planning Act 2008

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

1. Grid Connection Construction Method Statement

1.1 Purpose

1.1.1 The purpose of this Construction Method Statement (CMS) is to provide details of how the Grid Connection Corridor is to be constructed to inform the assessment for the Environmental Statement.

1.1.2 The components described comprise:

- Grid connection cable;
- Minor modifications to Cottam Substation (Cottam SS); and
- Access points and haul route.

Grid Connection Cable

1.1.3 The electricity generated by the Scheme will be exported to the National Grid via a single 400kV circuit comprised of three buried cables from the onsite substation to Cottam Substation. The total length of the Grid Connection Corridor is approximately 7.5km. The Grid Connection Corridor will be within the Order limits.

1.1.4 The Grid Connection Corridor crosses a range of existing infrastructure such as major roads (A156), various minor roads and tracks, PRowS, existing and/or buried underground utilities (such as medium and high-pressure gas mains), a disused railway, the River Trent, field drains and main drains. A list of crossings is provided in Table 1.

Table 1 Crossings

Crossing	Approx. distance along centre line from Main Site
River Trent	2.8km
Series of unnamed drains	Various
A1500 Stow Park Road	0.8km
A156 High Road (East)	0.95km
Headstead Bank	4km
Cow Pasture Lane	5.45km
Cottam Road	5.65km
Torksey Ferry Road	6.85km
Disused Railway Line	5.1km
Flood defence to the east of the River Trent	2.3km
Flood defence to the west of the River Trent	3km

Crossing	Approx. distance along centre line from Main Site
PRoW LL Mton 66/4	2.3km
PRoW NT Cottam FP1	2.8km
PRoW NT Cottam FP3	3.8km
PRoW NT Cottam RB4	4.3km
PRoW NT South Leverton BOAT16	5.4km
PRoW NT Rampton FP5	6.4km
PRoW NT Rampton FP6	6.8km
PRoW NT South Leverton BOAT13	6.8km
PRoW NT Rampton FP20	6.9km
PRoW NT Rampton FP12	7.4km

Avoidance Areas

- 1.1.5 The start and end points of the different construction methods (being open trench and HDD) for the whole of the 7.5km route will not be confirmed until the detailed design stage. Therefore, the approach to the EIA is 1) to commit to 'Avoidance Areas' where the method will be HDD; 2) assess a 'worse case' scenario that considers both the open trench and HDD methods (see below).
- 1.1.6 Open trench will not be used within the Avoidance Areas shown in Annex A.
- 1.1.7 Avoidance areas where HDD will be used are identified within Annex A. The associated Launch and Reception pits will be located outside of avoidance areas to minimise impacts in these locations.
- 1.1.8 Note that whilst there will be no open trench or launch/exit pits in the Avoidance Areas, parts of the haul road will cross a number of Avoidance Areas. These are further discussed below and identified in Annex A.

Open Cut Trenching

- 1.1.9 For the open cut sections of the Grid Connection Corridor, a maximum 25m wide construction corridor will include a single trench within which the 400 kV connection will be installed. The trench will be up to a maximum 1.42m wide and up to maximum 2.5m depth. The cross section of a typical 400kV cable trench is shown in Annex D. The 25m construction corridor will include a running track along which vehicles and plant will be located as well as an area for temporary storage of excavated spoil.

Horizontal Directional Drilling (HDD)

- 1.1.10 The sections of the cables that will be installed via HDD will require launch and reception pits to be installed at distances typically between 200m and 500m (750m

in one or two exceptional circumstances) along the HDD section of the route. Launch and exit pits will be sited outside the avoidance areas. An illustrative example of a 25m x 20m launch pit working area and layout for a 400kV connection is included within Annex F.

- 1.1.11 Activities within the working areas are listed in the sections below. The majority of the HDD operation will be undertaken within normal working hours, however 24/7 working hours may be required in the event that poor ground conditions are encountered.
- 1.1.12 On completion of the directional drilling, the launch and reception pits will then become jointing pits for installation of the cable.
- 1.1.13 The maximum depth of drilling will be under the River Trent and would be up to a maximum of 25m beneath the bottom of the river bed.
- 1.1.14 The crossing of the River Trent will be HDD with a pit on the western side of the Environment Agency Flood Defences (on the western side of the River Trent) and another on the eastern side of the river, east of the existing flood defence. These will be located >16m from the toe of the existing flood defences. No construction works would occur within the Avoidance Area shown in Annex A.

Worse Case Scenario

- 1.1.15 The ES assesses the worse case scenario. This scenario will vary depending on the discipline. Each discipline defines the worse case scenario for their respective chapter and assesses it. The worse case scenario includes consideration of the maximum potential effects associated with both the HDD and open trench construction options.
- 1.1.16 For example, the worse case footprint (or maximum area of disturbance) will comprise:
 - 25m width construction corridor;
 - 1.42m wide trench; and
 - Forty 25m x 20m launch and reception pit working areas.

Cottam and West Burton Cable Connection - Cumulative Assessment

- 1.1.17 The Low Carbon 400kV connection may be joined for part of the route by two further 400 kV connections associated with the connections to Cottam and West Burton solar projects, subject to these projects being approved. Consolidation of the three projects' 400 kV connections into a 'shared corridor' reduces the overall area of disturbance and provides opportunity for reducing overall construction effects by combining activities.
- 1.1.18 Annex C shows the locations where the Cottam and West Burton 400 kV connections join and leave the shared corridor.

- 1.1.19 Within the Cumulative Assessment section of each technical discipline Chapter (**ES Volume 1: Chapters 6 to 15 [EN010131/APP/3.1]**), an assessment is provided of the installation of all three connections in Area 2 and 3 (refer Annex C) of the shared corridor and two connections in Area 5 (refer Annex C).
- 1.1.20 For the purposes of assessment, launch and reception working areas (the same number as the single Low Carbon connection) are assumed within the grid connection corridor. Each working area would be up to a maximum larger area of 60m x 40m. Within the working area would be individual pits for each connection. Each pit would be a maximum of 5m length x 5m width x 3m depth.
- 1.1.21 The cumulative assessment is based on:
- A construction working area widened from a maximum 25m to a maximum 100m distance;
 - Within the avoidance areas, installation will be via HDD;
 - Outwith the avoidance areas, the installation technique is subject to design development therefore a worse case open trench scenario is assessed; and
 - For the worse case scenario, up to a maximum of three separate trenches, are assumed within Area 2 and 3 (refer Annex C) and two separate trenches in Area 5 (refer Annex C). Each trench would be up to a maximum 1.42m width and 2.5m depth.

Minor modifications to Cottam Substation

- 1.1.22 The Grid Connection Corridor will connect the Solar and Energy Storage Park to Cottam SS. Minor modifications will be made within the footprint of the existing substation to facilitate the connection. No extension to Cottam SS is required.

Access Points and Haul Route

- 1.1.23 During the construction phase up to eleven access points will be utilised to facilitate access/egress to all land contained within the Grid Connection Corridor. The access points are shown in Annex B and include:
- A1500 Stow Park Road (North);
 - A1500 Stow Park Road (South);
 - A156 High Road (East);
 - A156 High Road (West);
 - A156 High Road (West, southern option);
 - Headstead Bank (West);
 - Headstead Bank (East);
 - Cottam Road (North, Cow Pasture Lane);
 - Cottam Road (North);

- Cottam Road (South); and
- Torksey Ferry Road (North).

1.1.24 A temporary access track will be constructed throughout the Grid Connection Corridor to enable vehicles to access the launch / reception pits and open cut trenches.

1.1.25 The majority of the access track will be constructed using a hard core MOT type 1 base and either crushed stone or tarmac. Where possible aluminium trackway will be used as an alternative to minimise ground disturbance.

1.1.26 The access track alignment is subject to detailed design. Its location within the Grid Corridor will depend on the location of the launch and exit pits and open cut trench sections.

1.1.27 The access track will be designed to avoid drainage ditches and watercourses based on the surface water flood map for the region. Where watercourses cannot be avoided, both a temporary culvert and an open span bridge crossing will be considered, with the type of crossing selected being determined based on site specific factors and in consultation with the relevant authority. For the purposes of assessment, culverted crossings are assumed so that the worst-case scenario is assessed.

1.1.28 Environment Agency Flood Defences will be avoided, with a minimum 16m standoff between the base of the flood defence and the access track.

1.2 Equipment

1.2.1 Equipment to install the cable comprises:

HDD

Launch Pits:

- 44ft articulated lorry for delivery / pick up of the directional drill rig;
- Three 44ft articulated lorries for delivery of cable;
- Up to 5 three-axle rigid 30ft flatbeds for delivering temporary trackway;
- One telehandler anticipated to be delivered on 44ft articulated lorry;
- One excavator (anticipated to be delivered and picked up with the telehandler);
- Two 6m³ concrete lorries for delivering the concrete to create the joint bays;
- Two Vans (4x 2 m);
- Beavertail Lorry & 1000 Gallon Tank 13m x 2.5m Rod boxes;
- JT8020 - HDD Rig 9m Long 2.6m Wide (20t);
- John Deere 7280R Tractor and tanker Dimensions - 12.3m x 2.5m;

- Vehicle with 2 x 1000 Gallon Mixing Tanks 9m x 2.5m; and
- Mud Mixing Tank Unit 7.6m x 2.5m.

Reception Pits:

- One excavator (anticipated to be delivered and picked up with the telehandler; and
- Two 6m³ concrete lorries for delivering the concrete to create the joint bays.
- Three 44ft articulated lorries for delivery of cable;
- Up to 5 three-axle rigid 30ft flatbed for delivering temporary trackway;
- One telehandler anticipated to be delivered on 44ft articulated lorry;
- Three excavators (anticipated to be delivered and picked up with the telehandler);
- Two 6m³ concrete lorries for delivering the concrete to create the joint bays; and
- One flatbed lorry for the delivery of sand.

1.3 Construction

Construction Activities

1.3.1 Construction activities will include:

- The establishment of mobilisation areas and running tracks;
- Temporary construction compounds;
- Stripping of topsoil in sections;
- Trenching in sections;
- Appropriate storage and capping of soil;
- Appropriate construction drainage with pumping where necessary;
- Sectionalised approach of duct installation;
- Excavation and installation of jointing pits;
- Cable joint installation;
- Cable pulling;
- Implementation of crossing methodologies for watercourses, infrastructure (including roads and rail), and sensitive habitats (e.g. HDD, cable bridging);
- Testing and commissioning; and
- Site reinstatement and habitat creation.

Spoil

- 1.3.2 During construction of the Grid Connection Corridor, spoil will be stored temporarily within designated areas adjacent to the cable route and within the construction compounds. The spoil will be utilised to backfill the launch and exit pits, reinstate the temporary construction compounds and any temporary access roads. Any excess spoil will be removed from the Order Limits and will be transported off site as required.
- 1.3.3 It is estimated that a maximum of 3,024 tonnes of spoil would be removed from the grid connection corridor. However, it is highly unlikely that this amount will be reached and is therefore a worse case scenario.

Construction Compound

- 1.3.4 There will be two main construction compounds within the Grid Connection Corridor. The locations of the construction compounds are shown in Annex B.
- 1.3.5 In addition, at each of the grid connection corridor access locations, there will be temporary construction lay-down areas up to 50m x 50m which would be used to support both the Low Carbon and the Cottam and West Burton installations. The laydown area footprint will be determined by the applicant and will take into consideration topography, drainage and heritage and environmental constraints.
- 1.3.6 The lay-down areas will allow construction vehicles to turn off the public highway and park safely. Activities at the lay-down areas will include receipt of deliveries, unloading, provision of welfare and storage of plant and construction materials. The areas will include portacabins, welfare and power generators and will be secured using heras fencing and security cameras. Upon completion of construction, the laydown areas will be removed and the land reinstated.

Construction Programme

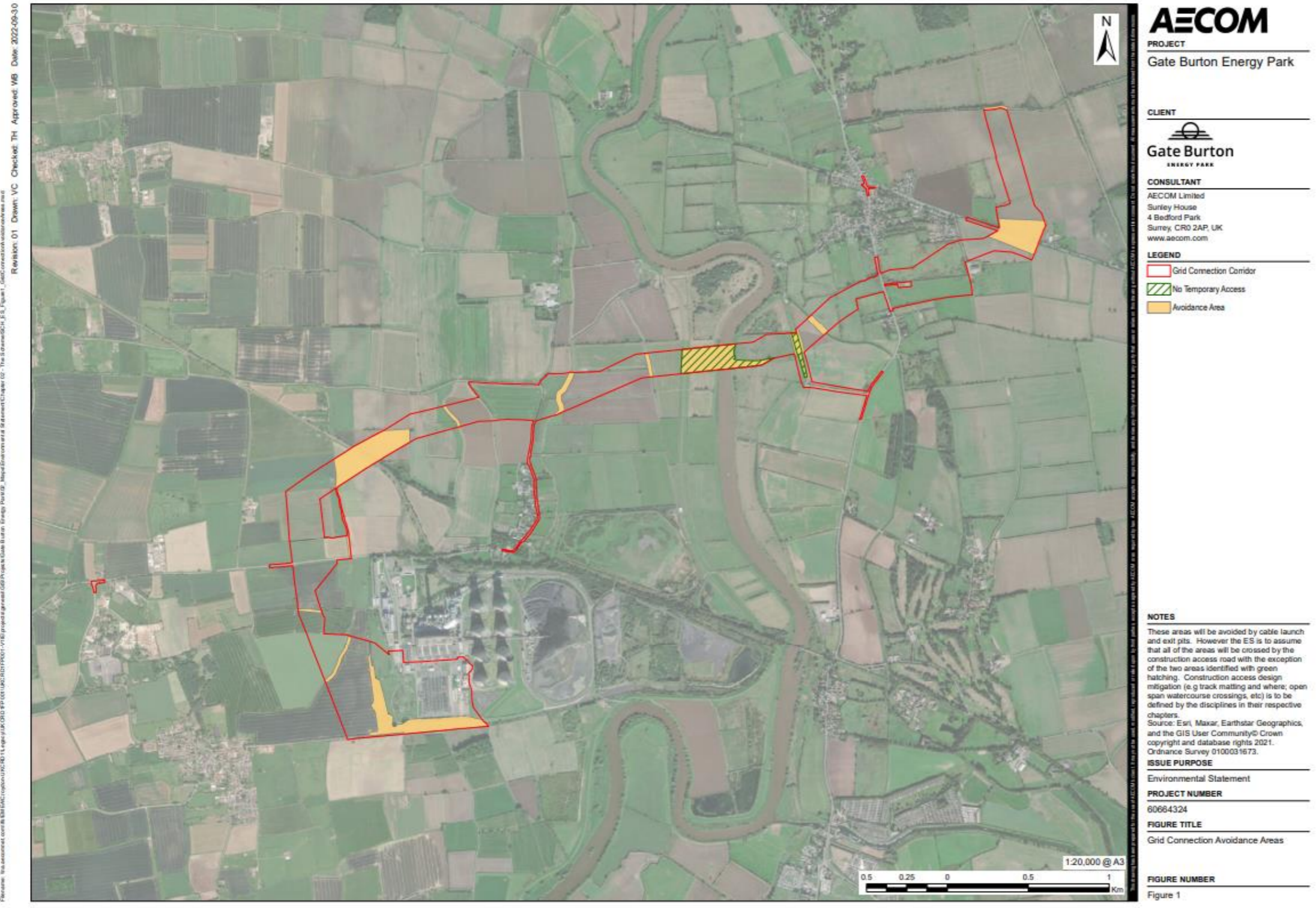
- 1.3.7 It is anticipated that the construction of the Low Carbon 400kV Grid Connection will be undertaken over a 24 - 36 month period with each discipline in the ES considering the worse case duration. Cable installation will follow behind excavation or HDD with the cables being installed into the ducts. There will be overlap of up to six weeks between sections as individual joint bays become available and completed bays are backfilled and reinstated.
- 1.3.8 For the purposes of the cumulative assessment, the Cottam and West Burton connections are assumed to be installed in up to three separate construction mobilisations (with each mobilisation including installation of ducts and pulling of cables) for each connection over a maximum 5 year period.

Glossary

Cable Circuit	An electrical conductor necessary to transmit electricity between two points within the Scheme and may include one more auxiliary cables for the purpose of gathering monitoring data, earthing cables, cables for auxiliary supply, optical fibre and other types of communication cables, cables connecting to direct current boxes.
Cable route	The trench and working width for the cable circuits within the Grid Connection Corridor. It will include cable circuits as well as the temporary access track, laydown, topsoil storage and excavated material during construction. The cables that run within the cable route would connect to the substations within the Sites.
Jointing Pit	Underground structures constructed at regular intervals along the Grid Connection Cables to join sections of cable and facilitate installation of the cables into buried ducts. Located within the Grid Connection Corridor.

Annexes

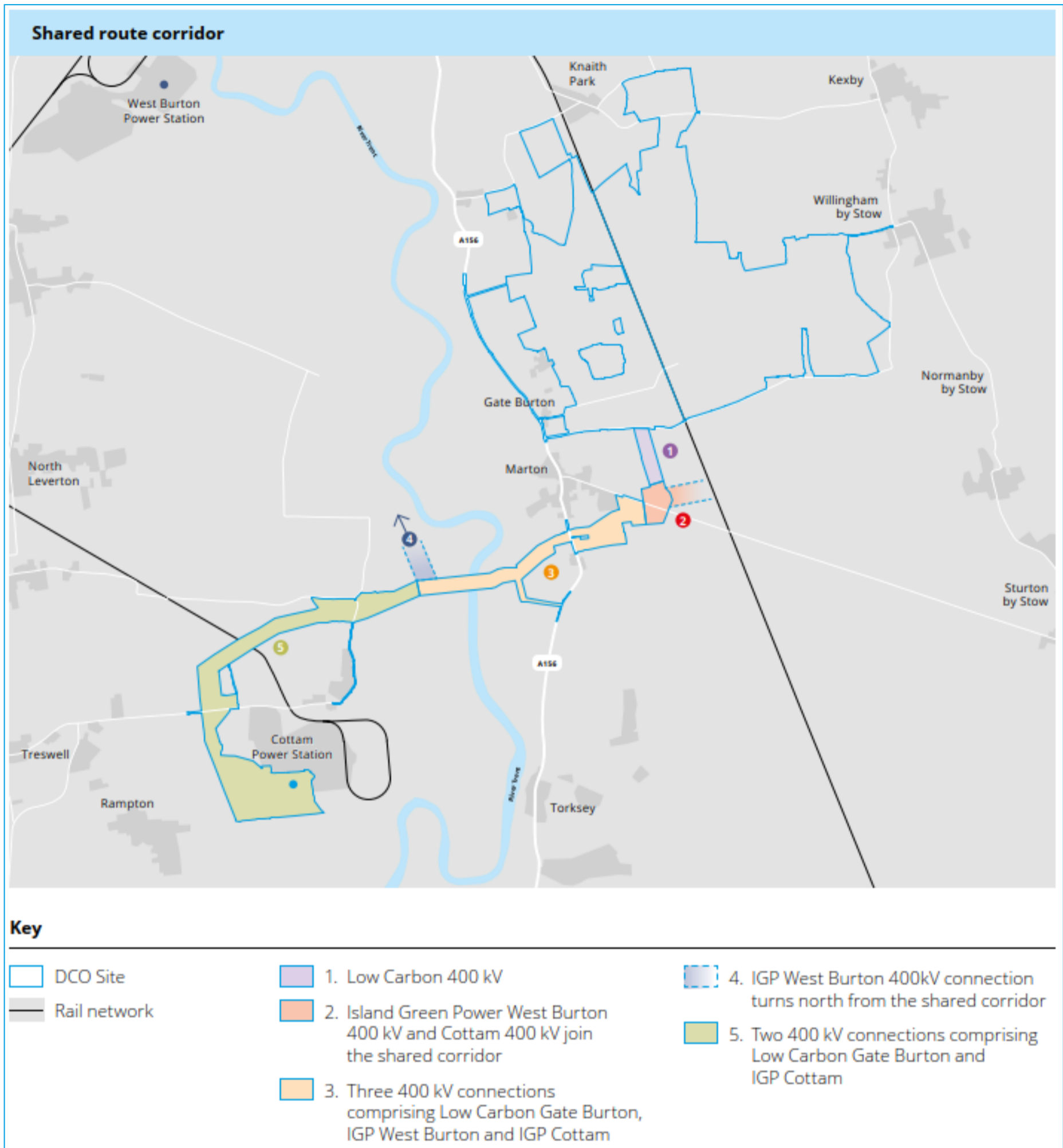
Annex A - Avoidance Areas



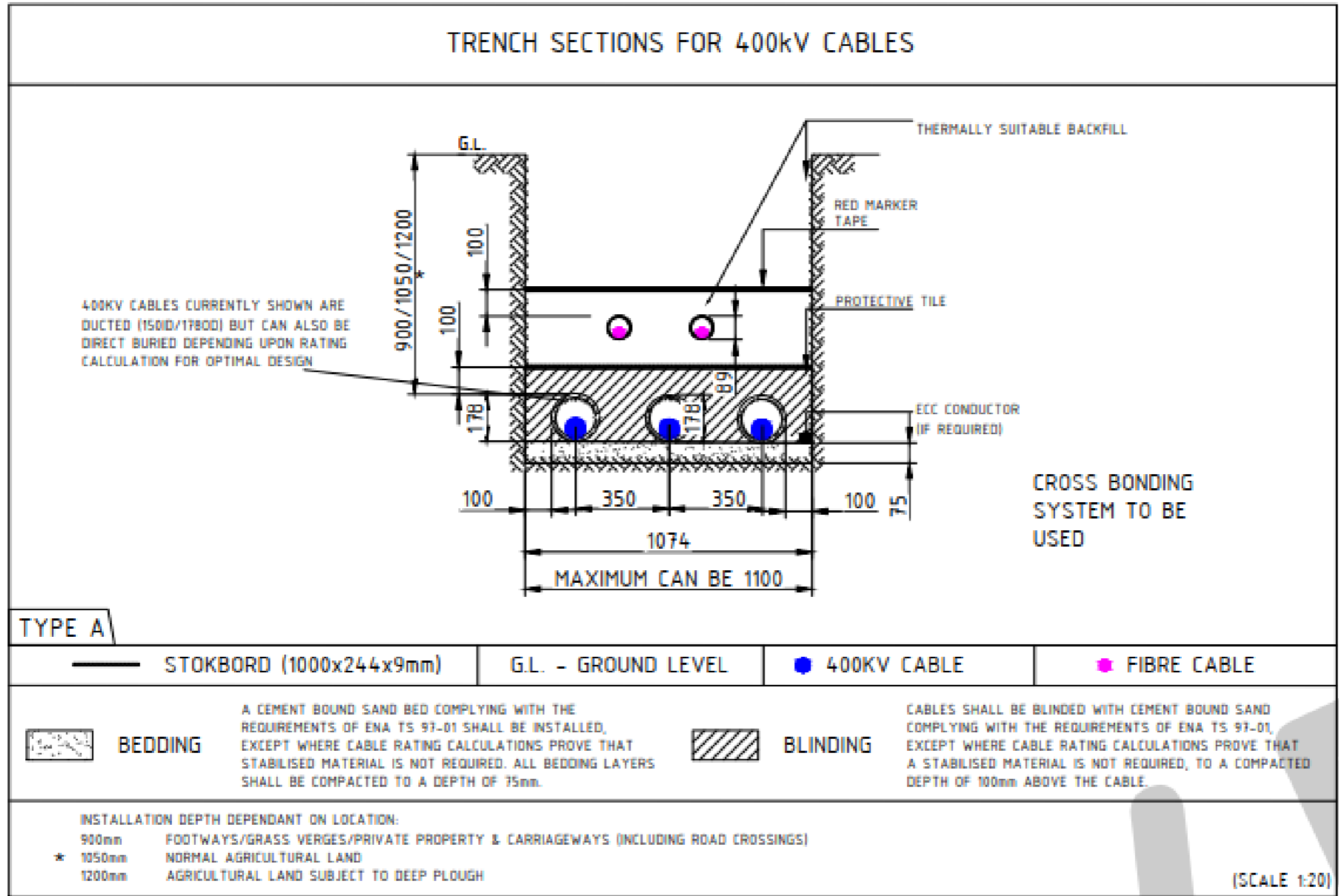
Annex B - Grid Connection Access and Construction Compounds Locations



Annex C - Low Carbon and Cottam and West Burton Schematic

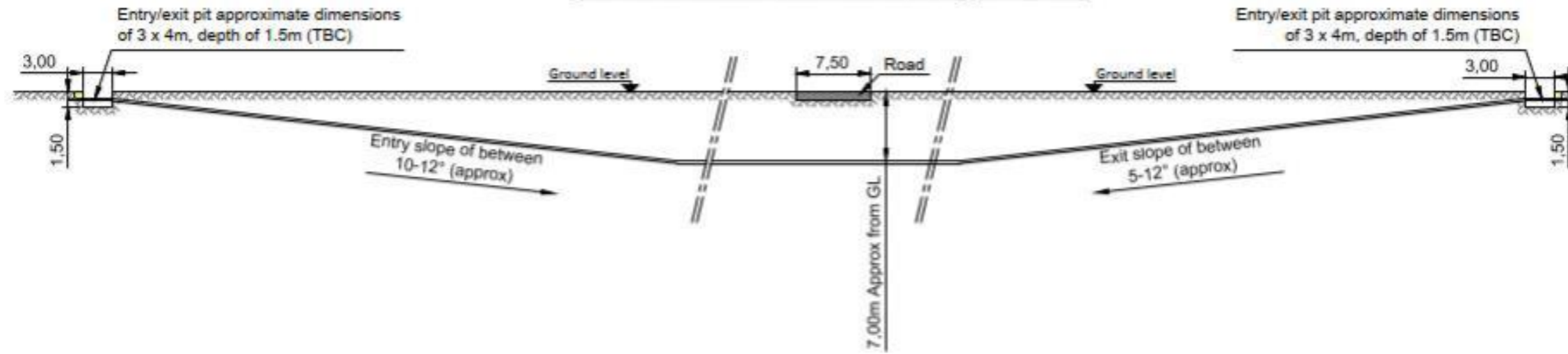


Annex D- Open Cut Trench Cross-Sections

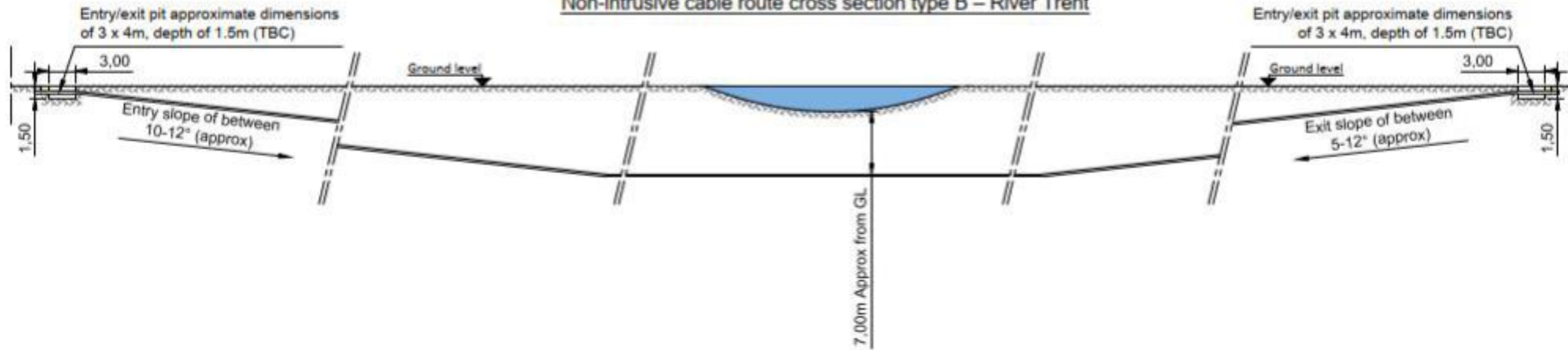


Annex E- HDD Cross Sections

Non-intrusive cable route cross section type A - Road

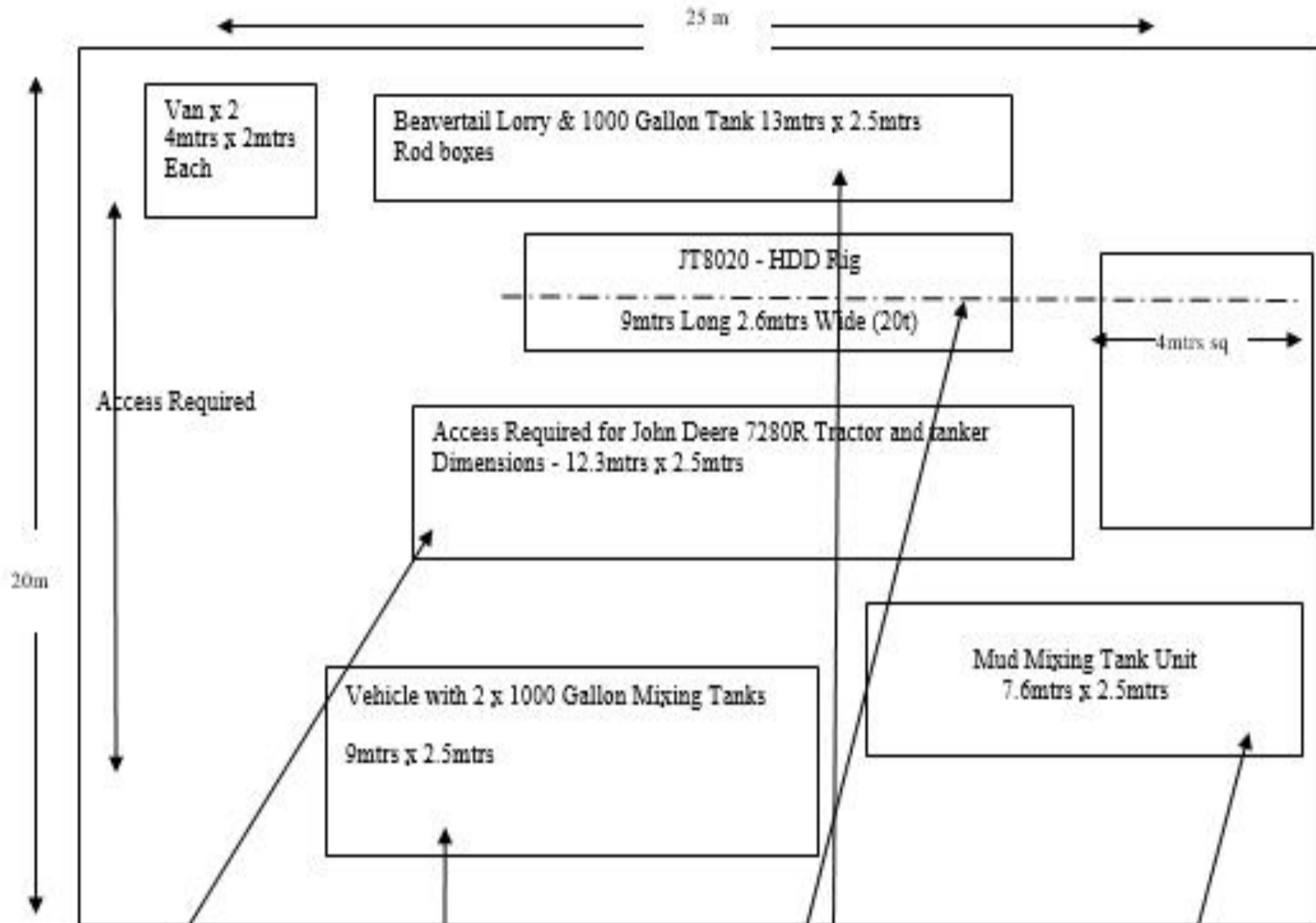


Non-intrusive cable route cross section type B - River Trent



Annex F - Illustrative 25m x 20m HDD Launch Pit Layout for a 400kV connection

DRILL SITE LAYOUT SKETCH



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