

East Anglia ONE  
Offshore Windfarm

# East Anglia ONE Offshore Windfarm

Fencing and Enclosures Plan  
DCO Requirement 15  
Final for Approval

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# Abbreviations

**AC** – Alternating Current

**CCS** – Consolidated Construction Site (Compound)

**CfD** – Contracts for Difference

**Chapter 8** – Guidelines for (Public) Highways signing, lighting and guarding

**DC** - Direct Current

**DCO** – Development Consent Order

**DECC** – Department for Energy and Climate Change

**EAOL** – East Anglia One Limited

**HDD** – Horizontal Directional Drill

**NRSWA** – New Road and Street Works Act 1991

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# 1. Introduction

## 1.1 Project Overview

1. East Anglia ONE Limited (EAOL), was awarded a Development Consent Order (DCO) by the Secretary of State, Department of Energy and Climate Change (DECC) on June 17th 2014 for East Anglia ONE Offshore Wind Farm. The DCO granted consent for the development of a 1200MW offshore windfarm and associated infrastructure.
2. In February 2105 EAOL secured a Contract for Difference (CfD) award to build a 714MW project and Scottish Power Renewables announced its role in leading East Anglia ONE (EA ONE) towards construction. In April 2015 EAOL submitted a non-material change application to DECC to amend the consent from direct current (DC) technology to alternating current (AC). In March 2016 DECC authorised the proposed change application and issued a Corrections and Amendments Order.
3. This plan relates to the onshore construction works associated with EA ONE, which based on the AC technology with a capacity of 714MW and transmission connection of 680MW comprises;
  - A landfall site at Bawdsey, Suffolk.
  - Up to six underground cables, approx. 37km in length.
  - Up to four cable ducts for future East Anglia Three project.
  - An onshore substation located at Bramford next to existing National Grid infrastructure.

## 1.2 Purpose and Scope

4. This Fencing and Enclosures Plan sets out the demarcation infrastructure which will be applied to the construction of the EA ONE onshore works. This plan has been produced to fulfil DCO Requirement 15 which states:

*15(1) No stage of the connection works shall be commenced 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 Work No. 39 must be completed before the relevant work is brought into use and maintained for the operational lifetime of Work No. 39.*
5. The document provides details of the fencing and demarcation to be installed as part of EA ONE onshore construction works. It includes details of the temporary fencing to be installed during the construction of the cable route and the onshore substation, and the permanent fencing to be installed at the onshore substation.
6. The information contained herein shall be adhered to by the appointed contractors and implementation and compliance will be monitored by the construction management team.
7. In the installation of any of the required fencing and enclosures, all appointed fencing contractors will be provided with a copy of the Archaeological Written Scheme of Investigation (WSI) (EA1-CON-F-IBR-010138). This 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.

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## 2. Fencing & Enclosure Categories

### 2.1 Overview

8. This section explains the different categories of fencing and enclosures required for the different parts of the onshore construction works. Drawings that illustrate the layout of the construction areas and the fencing types required are shown in Appendix 1.
9. The type of the fencing and enclosure to be installed is influenced by five main parameters:
  - Adjacent Land Use – the infrastructure shall be generally of post & wire or stock proof wire mesh fencing as required by the adjacent land use i.e. arable or livestock.
  - Public Interface – where the cable route interfaces with roads or a Public Right Of Way then additional controls will be used to ensure the safety of any third parties and the work-force; appropriate gateways or signing lighting & guarding in line with New Road and Street Works Act 1991 (NRSWA) and Traffic Signs Manual (Chapter 8).
  - 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.
  - Environmental Constraints / Protection – where environmental receptors have been identified along the cable route then some 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 successful establishment.
  - Third Party Requirements – where stakeholders stipulate specific requirements.

### 2.2 Construction Working Width

10. Construction activities will be undertaken within a temporarily fenced strip of land, referred to as the working width. The Development Consent Order defines the “working width” to mean the construction width of the onshore cable corridor, including haul route, spoil storage and temporary drainage, during installation of cables and/or cable ducts. In accordance with the DCO, the working width shall not exceed 55m, except at the HDD locations identified in DCO Requirement 10 (6), where the working width is permitted to be increased to allow for the installation and use of the specialist equipment to undertake the HDD.
11. The default choice of fencing shall be post and rail or post and wire, visually defining the boundary of the working area. Where the boundary interface requires a higher level of protection, for instance livestock or housing developments, 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.
12. Further assessment will determine fencing solutions for roads, railways, public rights of way, private roads/tracks, waterways and other environmental situations. Where no existing fence/barrier exists to protect these, suitable fencing and gateways will be installed.
13. Appendix 1 shows an indicative drawing of the fencing requirements for construction work width demarcation and when then construction working width crosses highways.
14. Fencing for the construction working width will be the first of the fencing/enclosures to be erected and the last to be removed. It will therefore be in place for the entire duration of the works. As the first line of protection for the work taking place, regular inspections of its condition will be undertaken to ensure it is appropriately maintained.

### 2.3 Haul Road

15. The temporary haul road for the onshore construction works will accommodate large heavy goods vehicles for construction and delivery purposes, to keep the work-force supplied with materials, plant and machinery. The haul road will cross several types of existing routes such as roads, small waterways, private roads and Public Rights of Way and effective fencing and gateways will need to be in place at all these locations, to protect both the work-force and third parties at those crossing points.
16. As the haul road runs parallel to the excavated trenches, Traffic Signs Manual Chapter 8 will be enforced to protect the work-force using barriers and signage where necessary. Where the haul road crosses public highways, suitable lockable gates will be installed along with signage, on both the public highway and the haul road, to warn of the crossing.
17. The haul road will connect the construction compounds, herein referred to as Construction Consolidation Sites (CCSs) and Horizontal Directional Drill (HDD) compounds, along the route. Access points to these sites will also have suitable gateways.

### 2.4 Access Points

18. Access to onshore construction works will use designated routes leading to CCS or HDD locations. The access point design will differ between locations depending on the location on or within the cable route corridor (see further detail in the Highway Improvements and Access Management Plan (EA1-GRD-F-IEC-007945) provided under separate cover). At the construction working width boundary, lockable gates of a suitable type will be installed to ensure the construction area is protected from un-authorised vehicular access.

### 2.5 Construction Consolidation Sites

19. The onshore construction works will be supported by a total of nine Consolidate Construction Sites (CCS)s. There will be two Primary CCSs. CCS B will be a designated storage and delivery facility and also the main administrative compound for the onshore works. CCS E will be a designated storage and delivery facility with further designated office space. The remaining seven Secondary CCSs will be used mainly for the storage and deliveries from the Primary CCSs.
20. The CCSs provide the space for the installation of temporary offices, welfare, storage of machinery and materials, vehicle parking and a delivery location. The CCSs will therefore require a higher level of security to protect the contents from third parties. The Primary CCSs will have metal hoarding fencing and security gateways/barriers. Secondary CCSs will have Heras fencing and gateways.
21. Appendix 1 presents an indicative drawing of the fencing requirements at a CCS.

### 2.6 Horizontal Directional Drilling (HDD) Compounds

22. The onshore cable route traverses a number of major transport networks and natural obstacles. To enable the installation of the cables under these features, specialist trenchless techniques will be required. In all cases, this will be done using HDD. These locations are referred to as Category 1 HDD sites, of which there are eight.
23. Each of these HDD sites will contain a quantity of specialist equipment, storage and ancillary office and welfare facilities. A compound will be set up at each side of the HDD locations to where the specialist plant and materials to be delivered directly. The HDD sites shall be clearly defined by the appropriate level of fencing. As machinery and materials require operating and storing within the compound, a higher level of protection will be provided in the fencing to protect the equipment, the work-force and prevent access by third parties.

### 2.7 Work Area Demarcation

24. Work areas are defined as any part of the construction working width where active work is taking place and further protection for the work-force is required, as well as protection for third-parties. This includes the areas being excavated for cable trenches, cable joint bays, drainage etc. and will be fenced off at each end of the work area within the construction working width with appropriate fence panels. This demarcation will be moved as the works progress along the route and therefore Heras panels and gates are considered the most suitable.



25. Appendix 1 presents an indicative drawing of the fencing requirements for the demarcation of a work area.

## 2.8 Public Rights of Way

26. Where an existing Public Right of Way (PRoW) crosses the construction working width, safe access and egress will be maintained using fencing and the demarcation of a safe route or, in some cases, the PRoW will be closed and diverted. Where possible, a gap in the installed boundary fencing shall be left to maintain the crossings and minimise obstructions for users. However, in a number of cases a pedestrian gate will be required to maintain safety. In these instances the gate shall be compliant with BS5709:2006.

## 2.9 Onshore Substation

27. A permanent perimeter security fence shall be installed around the operational onshore substation. The fencing must comply with "The Electricity safety, Quality and Continuity Regulations 2002" as a minimum standard and relevant British Standards (e.g. BS 1722). The function of the perimeter security fence is to provide a deterrent and physical barrier against intruders and will be robust enough to delay entry into the substation for persons who are unauthorised. The perimeter fence around the substation will be galvanised steel mesh.
28. During construction of the substation there will be an adjacent substation temporary works area which will be set-up to accommodate temporary offices/welfare, machinery and materials storage, vehicle parking as well as being a delivery location. This requires a higher level of security to protect the contents from third parties. It will have metal hoarding fencing and gateways/barriers (consistent with the Primary CCS sites).

## 2.10 Tree Protection Fencing

29. Trees that are to be retained and are within the construction working width will be protected by temporary Heras fencing (approximately 2 metres high) in accordance with the British Standard 5837:2012. The fencing shall be installed at a specified distance from the tree, as defined by the Root Protection Area and as calculated by the Arboricultural Clerk of Works. Fencing will also be installed to protect hedgerows within the construction working width using pedestrian barriers (approx. 1.2 metres high). In addition, fencing will be installed as part of the post-construction planting to delineate boundaries and protect new woodland planting.
30. Further details are presented in the Landscape Management Plans (Substation EA1-CON-F-GBE-008554 and Cable Route EA1-CON-R-IBR-010129), provided under separate cover. However, the types of fencing to be used are included within this plan.

## 2.11 Ecological Fencing

31. A range of fencing will be installed as part of the onshore construction works as part of the mitigation strategy for protected species. Full details of these fencing requirements are presented in the Ecological Management Plan (EA1-CON-F-IBR-021237) provided under separate cover. However, the types of fencing to be used are included within this plan in Section 3.
32. Temporary reptile and newt fencing will be installed at selected locations in order to implement a capture and release programme to remove any protected species from the construction work area. The temporary fencing will be erected pre-construction in summer 2016 and will remain in place until the start of construction in that area in 2017.
33. Semi-permanent newt fencing will be installed, again as part of the capture and release programme. However this fencing will remain in place throughout the duration of construction to prevent the protected species from entering the construction working width. This fencing will be installed at the same time as the temporary fencing, pre-construction, but will remain until the completion of the works in that area.
34. A number of badger setts have been identified within the Development Order Limits, due to their presence within or in close proximity to the construction working width some setts will need to be closed. In some cases the closure of a sett will require the installation of badger exclusion fencing around the sett which is to be closed to prevent them from re-entering. This fencing will be installed as part of the pre-construction works in summer 2016 and will remain in place until construction in that area in 2017.

35. A total of 11 hedgerows were identified as part of the baseline surveys as being important for foraging and commuting bats. Of these there are six locations where a section of hedgerow will be temporarily removed during the construction works. To compensate for the temporary gap in the hedgerow, hazel hurdles or similar will be used to join the gap and will be left in place until work at the hedgerow commences.

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## 3. Temporary Fencing Details

### 3.1 Overview

36. This section provides details on the different types of temporary fencing and enclosures to be used during the construction works. More technical details on their application are provided in the Appendices 2 to 4.

### 3.1 Post & Wire

37. This fence type will be used as the 'standard' along the construction working width boundary. This is a level fencing that offers good demarcation properties and is easy and quick to erect. However it can be subject to damage from livestock and as such will not be suitable for use next to land being used for this.
38. Strain posts are installed at each end of the fence and at all changes of direction or gradient. Rectangular mild steel galvanised wire mesh fencing is strained between them and supported by intermediate posts installed at regular intervals.
39. This type of fencing, and associated access gates, will also be used where appropriate to ensure sufficient field enclosure whilst hedgerows establish and grow as part of the post construction landscaping (refer to EA1-CON-R-IBR-010129 Landscape Management Plan for more details). Further details and an illustration are provided in Appendix 2.

### 3.2 Post & Rail

40. This fence type will be deployed along the construction working width boundary where Post & Wire is not deemed suitable. It involves vertical posts being knocked into the ground using mechanical or manual fence knocker at regular spacing and then three horizontal rails are attached.
41. This type of fencing, and associated access gates, will also be used where appropriate to ensure sufficient field enclosure whilst hedgerows establish and grow as part of the post construction landscaping (refer to Landscape Management Plans for more details; Substation EA1-CON-F-GBE-008554 and Cable Route EA1-CON-R-IBR-010129). Further details and an illustration are provided in Appendix 2.

### 3.3 Stock Proof

42. Where the construction working width boundary 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. The installation is as per the Post & 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 2.
43. Provision shall also be made for protection of new woodland planting blocks, established as part of the onshore substation landscaping, from the deer population, see Appendix 4 for further details .

### 3.4 Heras Panels

44. Where construction works are taking place in areas which require additional security to prevent unauthorised access, then Heras fencing will be deployed. Locations include the Secondary CCS compounds. It offers an appropriate level of security and is easy to erect and dismantle.
45. Heras fence panels will be anti-climb specification (2000mmhigh by 3000-35000 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 3.1 Example Heras Fencing

### 3.5 Metal Hoarding

46. Where the highest levels of site security and protection are required, metal hoarding will be deployed. These panels are heavier than Heras fencing and require more effective support stays as they are intended for longer term installations, including the Primary CCS sites and the HDD compounds, where security is a higher risk.
47. Steel hoarding will be 2000mm in height and 2100mm wide. The panels will be galvanised steel with fixed legs, fixed together with metal couplers.



Figure 3.2 Example Metal Hoarding

48. Support posts and thermo plastic support feet will be installed to anchor the fencing. Where temporary work designs detail the need for extra support or anchoring, this will be provided by the addition of extra support feet, concrete support feet or sand bags.



Figure 3.3 Example of Metal Hoarding Additional Support

49. Where security measures deem it necessary a 400mm Heras fencing extension panel will be fitted to the top of the steel hoarding fence panels.



Figure 3.4 Example Extension Panel

### 3.6 Works Barriers

50. Signing, Lighting and Guarding will be installed at all areas where there is a direct interface between construction and the general public using public highways. It will be used at trench and excavation areas within the construction working width to warn and protect the work-force from the dangers present.
51. 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 road crossings and 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 Construction Artificial Lighting Emissions Plan (EA1-CON-F-GBE-005848)
  - Guarding – the work-force will be protected in by Chapter 8 barriers with lead-in cones; all open excavations will be cordoned off with Heras Fencing Panels.



Figure 3.5 Example Chapter 8 Barriers

### 3.7 Access / Crossings

52. Gates will be installed where there is an interface between the construction works and third-party land or at land owner boundaries where land owners stipulate the installation of a gateway. These will be deployed at construction working width boundaries, road crossings and anywhere where there is a requirement to gain access/egress to and from the construction area from the outside and maintain security to protect the work-force and the public. The different types of gateways to be installed are detailed below and all gates will be fitted with warning and information signs.

#### 3.7.1 Single Gateway

53. Single gateways will be installed where private tracks and bridleways cross the cable working width. Typical arrangement for a single gateway will be steel gates will steel posts, 3600mm wide by 1000mm high. Further details and an illustration are provided in Appendix 3.

#### 3.7.2 Double Gateways

54. Double Gates will be installed where the haul road interfaces with public and private roads and an increased width of the road/track is required to provide safe vehicular access. Typical arrangements for a double gateway will be steel gates and posts 6000mm wide by 1000mm high. Further details and an illustration are provided in Appendix 3.

#### 3.7.3 Public Right of Way Gates

55. Where the construction working width interacts with existing Public Rights of Way, a gateway shall be installed. Public footpaths that are not to be temporarily diverted will have gates installed at the construction working width boundary and Heras fencing along the path across the work area.

56. All pedestrian gates shall comply with BS5709:2006 and will be a minimum of 1000mm wide (1525mm for bridleways) and installed to open away from the construction working width. At these locations a minimum of two sections (3600mm) of post and rail fencing will be installed either side of the gateway. Further details and an illustration are provided in Appendix 3.

### 3.8 Compound Gateways

57. Gates at CCS compounds and HDD compounds will match the fence installation type. Where these are located close to Public Highways, gates will be set back as far as possible to allow vehicles to leave the carriageway safely, a minimum of 2 metres from the highway will be observed.



Figure 3.6 Example Steel Hoarding / Heras Gateways

58. At the Primary CCS compounds a manual arm barrier system will be installed inside the perimeter gate 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.

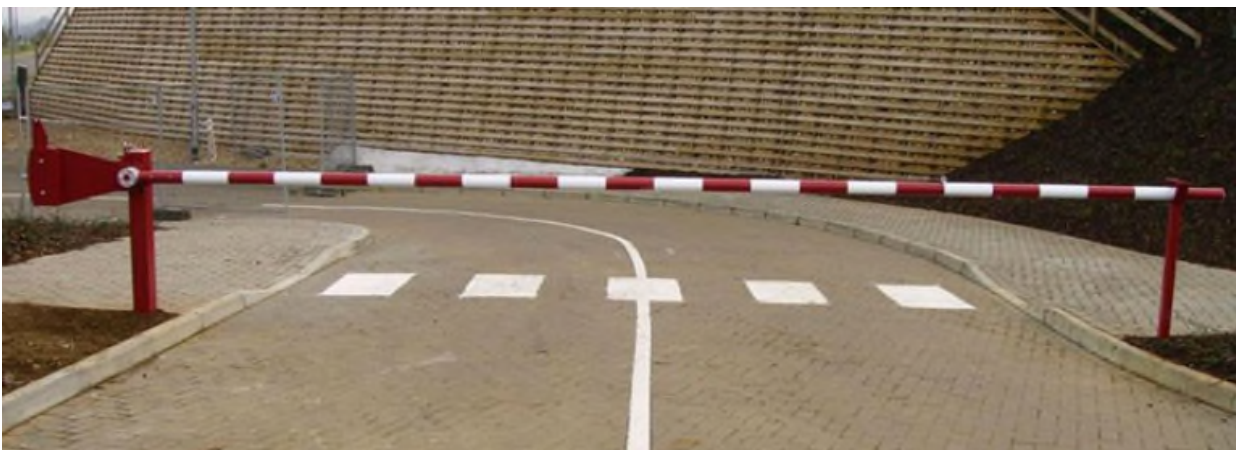


Figure 3.7 Example Arm Barrier System

### 3.9 Tree Protection

59. 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 width to protect against potential root damage. Where these areas interface with traffic, the public or the construction site, then a reflective barrier and signage will be fitted to the barrier. Drawing EA1-GRD-DG-OPEN-008038 presented in Appendix 2 further details how tree and hedge protection is to be deployed.
60. Fencing will also be installed to protect hedgerows within the construction working width. This protective fencing is to be of the 'crowd control barrier' design which is approximately 1100mm high. Further details and illustrations are provided in Appendix 2. And Figure 3.8 shows an example of heras fencing tree protection.



Figure 3.8 Example Tree Protection Fencing

### 3.10 Landscape Protection Fencing

61. Post construction protective fencing will also be installed where required around areas of new woodland planting. 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 areas. Fencing is to be installed prior to hedge planting.
62. Additional deer control fencing or rabbit proof mesh fencing will also be installed around blocks of new woodland planting. The fencing specification will protect against all deer species up to and including Red Deer, see Appendix 4 for further details.

### 3.11 Ecology Fencing

63. Ecology fencing will be required to exclude identified protected species from entering the construction working width. The specification of the fencing will depend on species and purpose of the fencing. The sections below provide information on the types of ecological fencing to be installed. Further details are presented in the EA1-CON-F-IBR-021237 Ecological Management Plan, provided under separate cover.

#### 3.11.1 Temporary Reptile and Newt Fencing

64. Basic construction will consist of wood stakes / posts planted every 1500mm to a height of 500mm with an impermeable plastic membrane fixed to the posts. The plastic membrane layer needs to be partly buried to secure it against wind and burrowing. An indicative illustration is provided in Appendix 2.
65. Installation will involve digging a trench 200mm deep by 150mm wide to install the membrane into. Following trench digging, 50x50x900mm timber stakes will be installed along the edge of the trench. Stakes will be knocked in using a sledge hammer to a depth of 300mm at 1500mm centres along the fence line.



66. The membrane will be 1000 gauge 250 micron polythene or woven polypropylene. This material will be rolled out and attached to the stakes by hand. A roll/fold will be placed in the top of the membrane before being attached to the stake. This roll will form an overhang which cannot be climbed by the reptiles/newts. The bottom of the membrane is then installed into the trench, including a minimum of 100mm under-lap. A minimum of 3 clout nails are to be used to attach the membrane to each stake. The trench will then be backfilled by hand or mini-excavator and the backfill compacted by foot.
67. Wherever possible a fence plough will be used to install the membrane directly into the ground to avoid the need for open trenches and backfilling. The stakes will be installed as described above.
68. This fencing will be subject to regular inspection and maintenance to ensure it remains effective.



Figure 3.9 Example Temporary Reptile/Newt Exclusion Fencing

### 3.11.2 Semi-permanent Newt Fencing

69. Where the newt fencing is to remain in place during construction a more robust type of fencing is being installed in the form of Herpetosure fencing, which comprises of 3000mm x 900mm x 3.5mm beige recycled polypropylene panels. The Herpetosure fencing is designed to be reusable and recyclable, and offers a high level of impact resistance.
70. To install, a tractor with sub-soiler / trencher or pedestrian trencher will be used to pull a slit / trench into the ground to a depth of 300mm. Where this is not possible, either a mini excavator will be used to create the trench or the trench will be dug by hand. Herpetosure panels will be placed into the trench, over lapped and riveted together with 3 rivets.

### 3.11.3 Badger Exclusion Fencing

71. During the closure of badger setts, badger exclusion fencing will be installed where required to prevent the badgers from re-entering the sett. The fencing will comprise of badger netting installed between strainer posts which will be partially buried to prevent burrowing.
72. The specification for the fencing consists of:
- 75mm intermediate posts, 1800mm long at 3500mm centres
  - 150mm strainer posts, 2400mm long
  - HT17/194/8 Badger Netting with 2 strands of 2.5mm HT Line Wire (top and bottom), buried 300mm deep with a 300mm underlap
73. Timber strainer posts will be knocked in at the start of the fence line, the end of the line and significant changes in direction in the area surrounding the sett. These posts will be driven in using the post knocker to a depth maximum depth 1000mm. Once the strainers have been installed, intermediates posts will be installed between the strainer posts.

74. A 300mm x 300mm trench will be excavated using a mini-excavator along the fence line. Badger netting and line wires will then be attached to the post and strained using wire strainers. Badger netting will be placed into the ground to create 300mm vertical with 300mm horizontal return. Once the wire is installed the trench will be backfilled and compacted.

### 3.12 Maintenance

75. All temporary fencing will be regularly inspected by Construction Management Team and contractors. Where defects or damage is found, repairs will be undertaken within 24hrs. Where there is a requirement for temporary Chapter 8 Signing, Lighting & Guarding will be used to prevent unauthorised access.

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## 4. Permanent Fencing Details

### 4.1 Substation Fencing

76. A perimeter security fence shall be installed around the operational substation compound. The fencing must comply with “The Electricity safety, Quality and Continuity Regulations 2002” as a minimum standard and relevant British Standards (e.g. BS 1722).
77. The perimeter fence around the substation compound will consist of a 2.4m high fence, which is the minimum fence height required for safety and security purposes. The perimeter fencing system will be a mesh fence configuration Hi SEC Super 6 or a similar solution. This solution provides a close mesh that is almost impossible to climb and very difficult to cut through with anything but power tools. The Hi Sec security system uses welded mesh to repel would be intruders. The galvanised steel mesh comprises of welded mesh with 6mm diameter wires in 2400mm high by 2525mm wide panels with 60mm x 60mm posts in a concrete anti-dig sill 600mm deep. Further details are provided in Appendix 4.

### 4.2 Replacement Fencing

78. Although existing land-owner fencing will be retained / repaired as much as possible, some circumstances will necessitate partial or complete removal of existing fencing. Any fencing that has been removed as part of the onshore construction works will be replaced on a like-for-like basis.

## 5. Summary of Fencing and Enclosure Requirements

79. The following table shows a summary of proposed fencing and enclosures to be installed during the onshore construction works and illustrative layout drawings are presented in Appendix 1 and specification in Appendices 2 to 4.

Table 5.1 Summary of Fencing and Enclosure Requirements

Category	Fencing & Gateway Types
Construction Working Width	Post & Rail or Post & Wire or Stock Proof Fencing. Single or double gateway.
Haul Road	Chapter 8 cones or barriers. Heras panels and gateways at either end.
Access Points	Heras Fencing or Metal Hoarding. Chapter 8 Signing, Lighting and Guarding.
Primary CCS	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.
HDD Compound	Metal Hoarding with double gateways. Chapter 8 Signing, Lighting and Guarding.
Construction Work Area	Chapter 8 barriers for trenches, cones. Heras panels for excavations.
Crossings – Road, Private Tracks and Bridleways	Post & Rail with Double or Single Gateway as required. Chapter 8 Signing, Lighting and Guarding.
Crossings – Footway, Public Rights of Way and Bridleways	Post & Rail with Gateways; Chapter 8 Signing, Lighting and Guarding.
Tree Protection	Heras fencing
Hedgerow Protection	Crowd Barriers
New Planting Protection	Post & Rail or Post & Wire or Stock Proof Fencing. Additional Deer/Rabbit protection as required
Protected Species	Temporary newt/reptile fencing. Semi-permanent newt fencing. Badger exclusion Fencing.
Substation Construction Compound	Metal Hoarding with double gateways. Manual arm barrier. Chapter 8 Signing, Lighting and Guarding.
Operational Onshore Substation	Permanent Mesh Fencing and Gateways.

---

## 6. Decommissioning

80. On completion of onshore construction works, all fencing shall be removed with the exception of the substation perimeter fencing. All boundaries shall be reinstated to match existing and all reinstatements will be in agreement with local land owners. All temporary fencing shall be removed as soon as possible.
81. General parameters on removal of fences/enclosures:
- Recycle – Local Land Owners
  - Recycle – Local Recycling Centres
  - Off Hire / Return – Return to applicable depots to be re-used in future
  - Disposal – remove to applicable disposal site in line with current legislative requirements.
82. All ecological fencing will be removed under supervision of the Ecological Clerk of Works to ensure no protected species are harmed during these works.
83. Fencing for the protection of the new planting (woodland and hedgerows) will be installed post-construction and removed as required once the planting is sufficiently established.

# Appendix 1 Illustrative Fencing Drawings

Fig 1.1 Indicative Fencing Requirements for Defining a Work Area

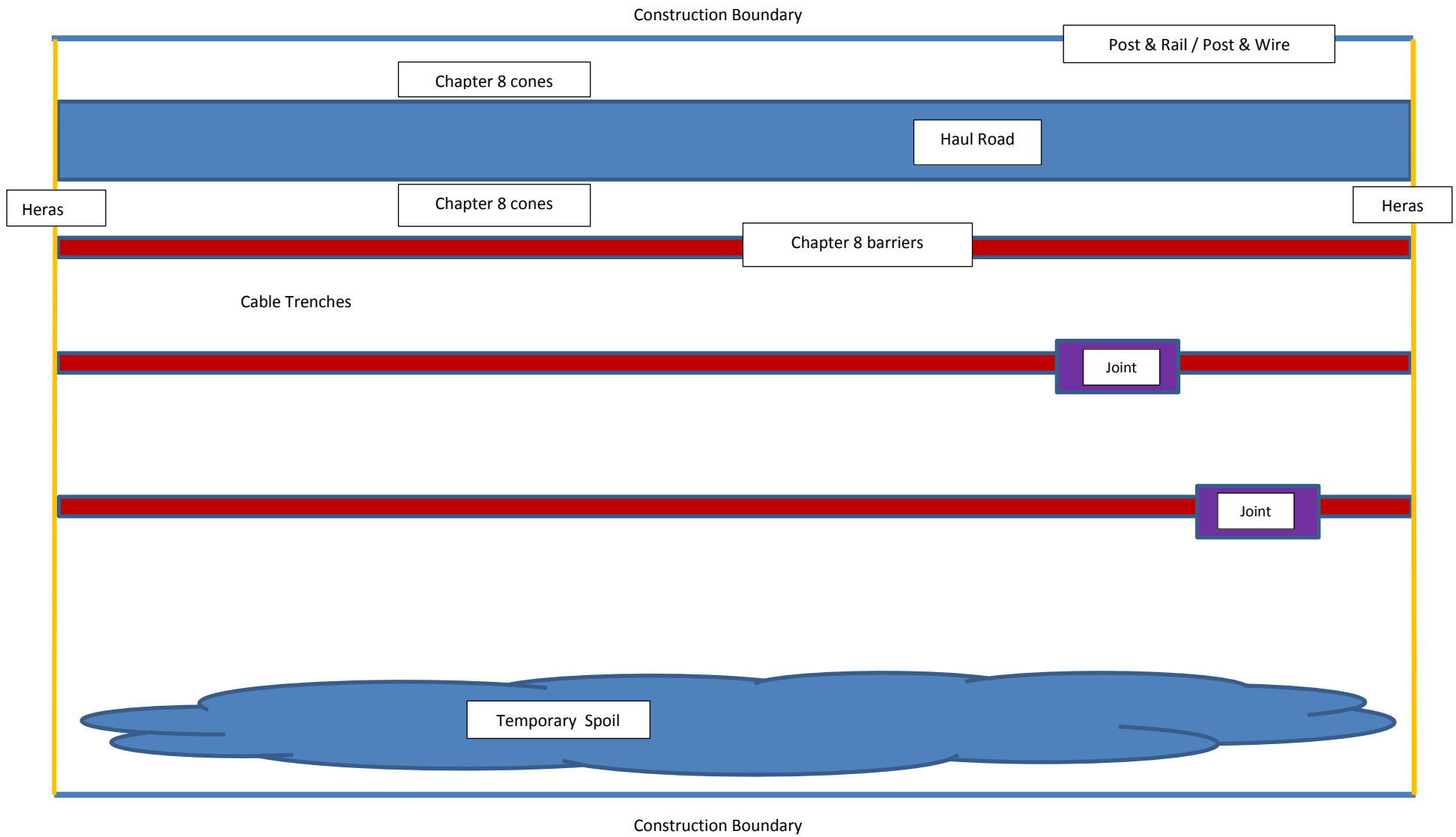


Fig 1.2 Indicative Drawing Showing Fencing Requirements at a Consolidated Construction Compound (CCS)

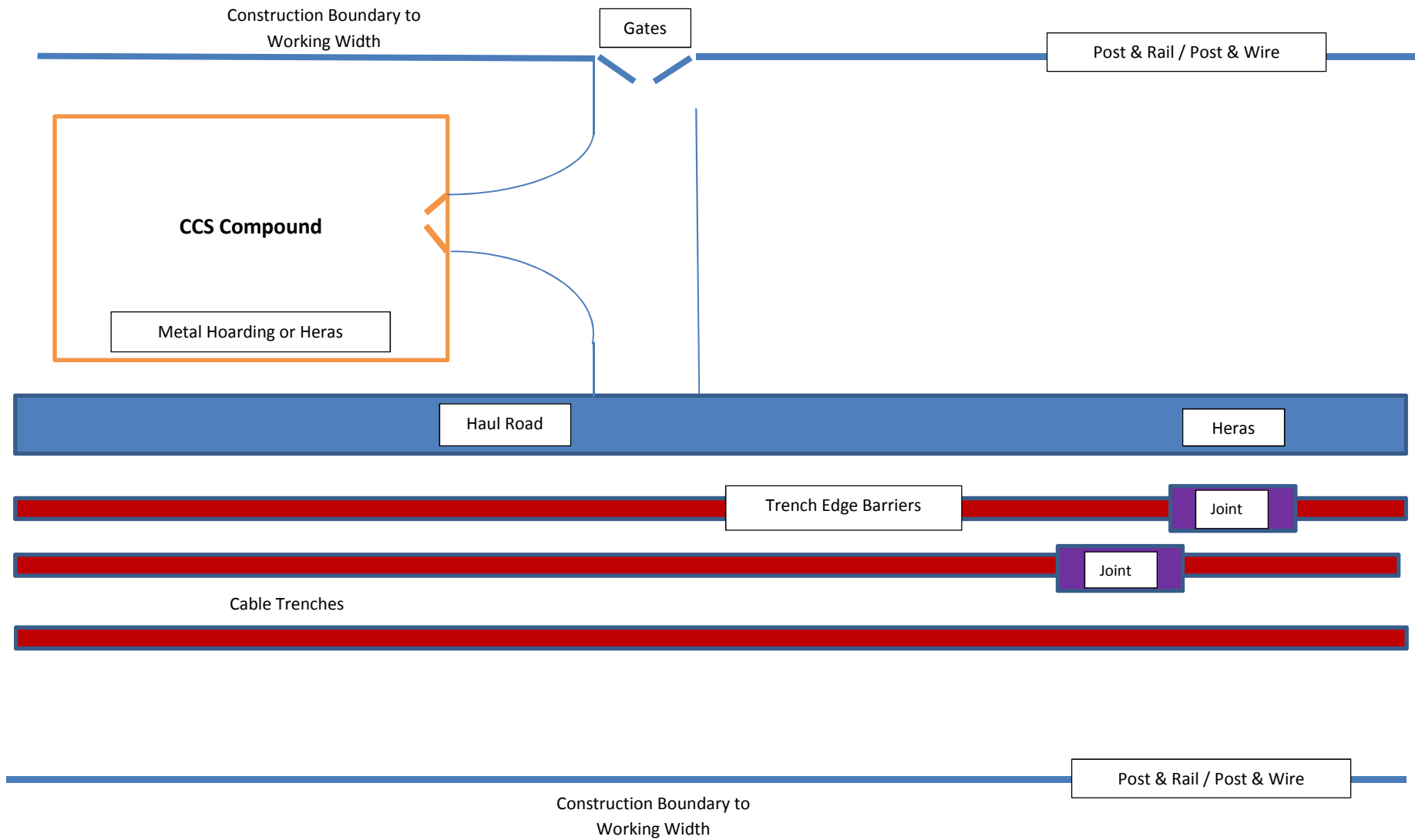
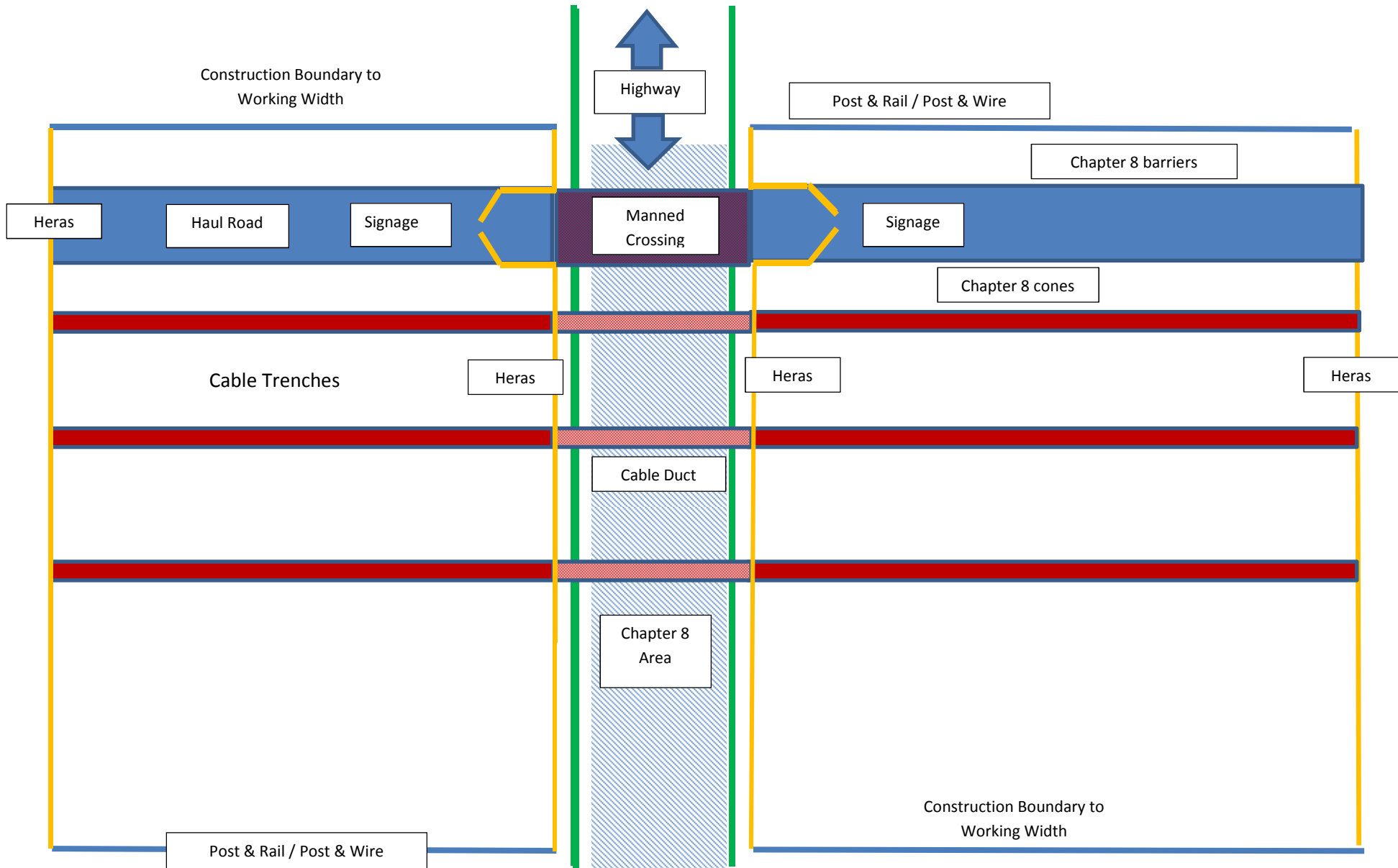




Fig 1.3. Indicative Drawing of the Fencing Requirements for a Highway/Road Crossing



# Appendix 2 Temporary Fencing Specifications

## Post & Rail

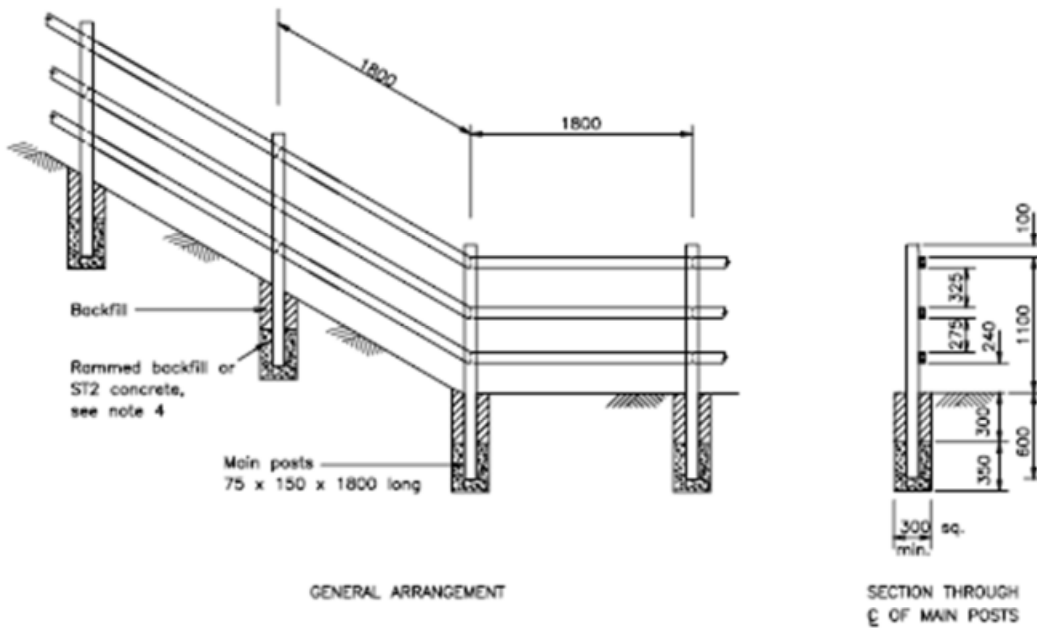
Posts will be knocked into the ground with the use of a mechanical or manual fence knocker to a depth of 600mm. Where circumstances do not allow posts to be knocked into the ground then post holes shall be excavated to a depth of 600mm x 300mm x 300mm. The excavations will be backfilled with the use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

Dimensions:

Posts 75mm x 150mm x 1800mm long

Rails 38mm x 87mm

Post spacing 1800mm centre spacing



## Post & 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 or 300 mm ST2 Concrete fill with 300mm compacted backfill.

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 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 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.

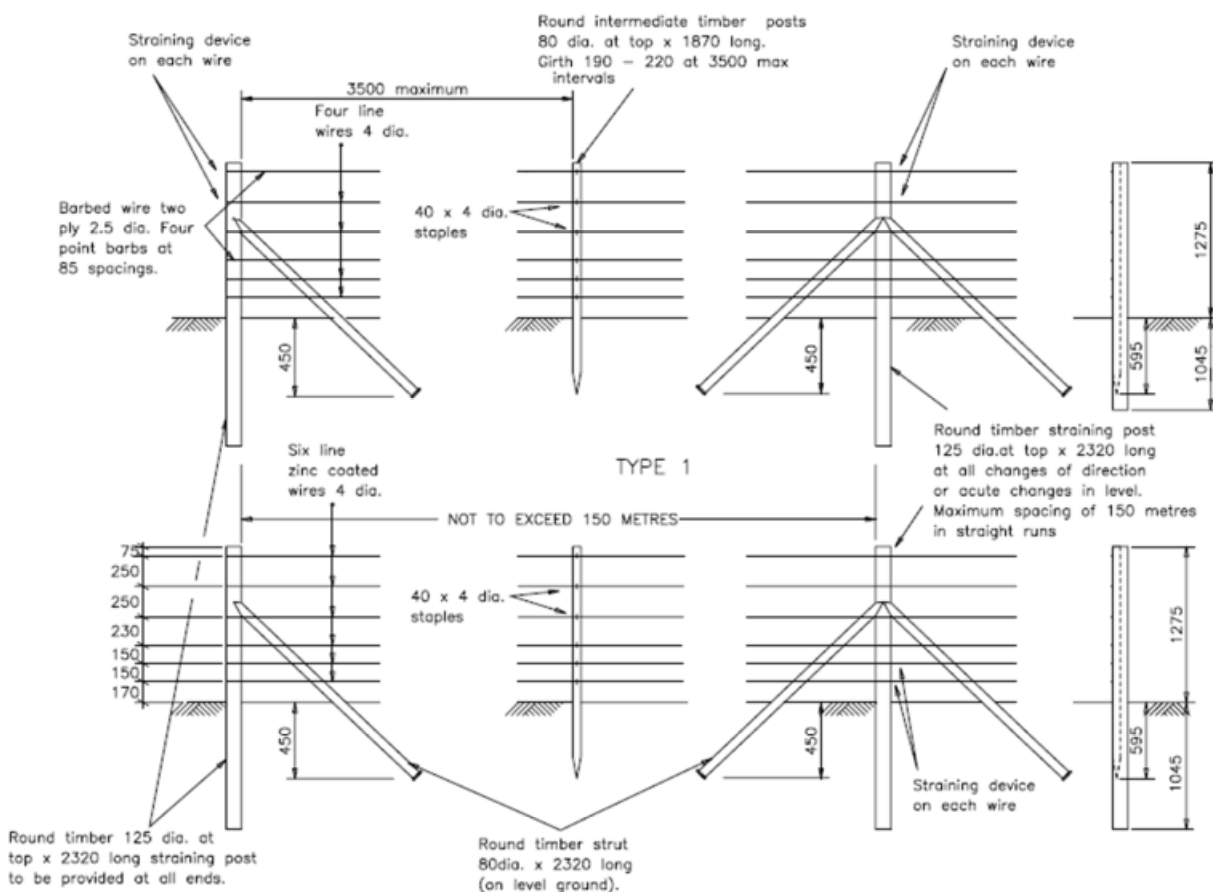
Dimensions:

Terminal/Strain Posts Round 125mm x 2320mm long

Intermediate Post Round 80mm x 1870mm long installed maximum 3500mm intervals

Strain Supports installed where there is a change of direction or 150m maximum spacing

Rectangular Mild Steel Galvanised Hinge Joint Wire Mesh Fencing



## 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 300 mm ST2 Concrete fill with 300mm compacted backfill.

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 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 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.

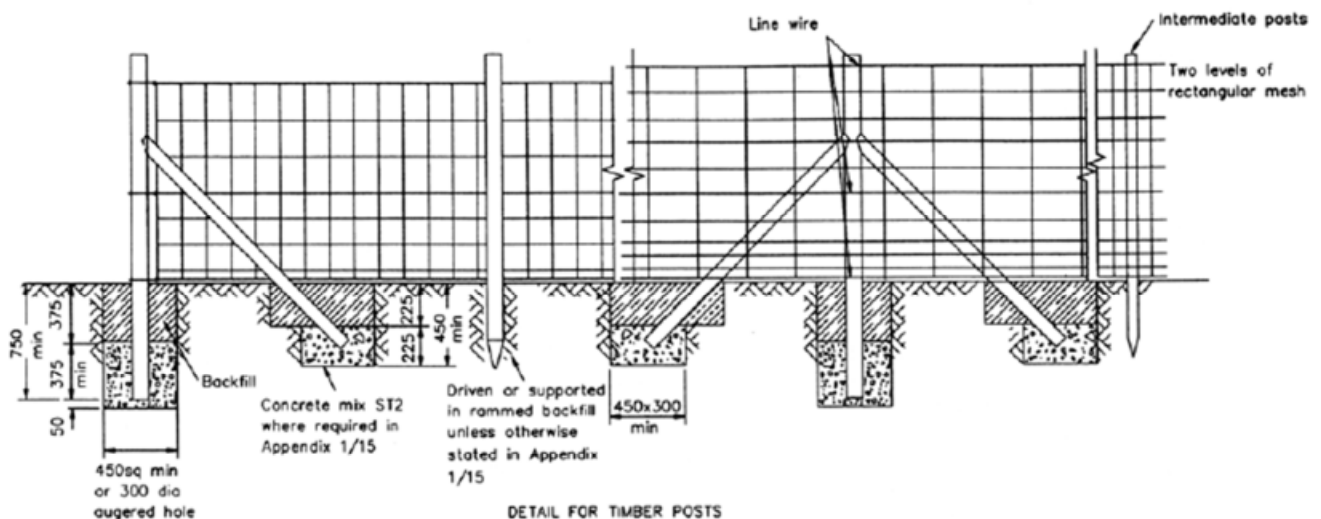
Terminal/Strain Posts Round 125mm x 2320mm long

Intermediate Post Round 80mm x 1870mm long installed maximum 3500mm intervals

Strain Supports installed where there is a change of direction or 150000mm maximum spacing

Rectangular Mild Steel Galvanised Hinge Joint Wire Mesh Fencing

2 x Strands of 2 Ply HT 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.

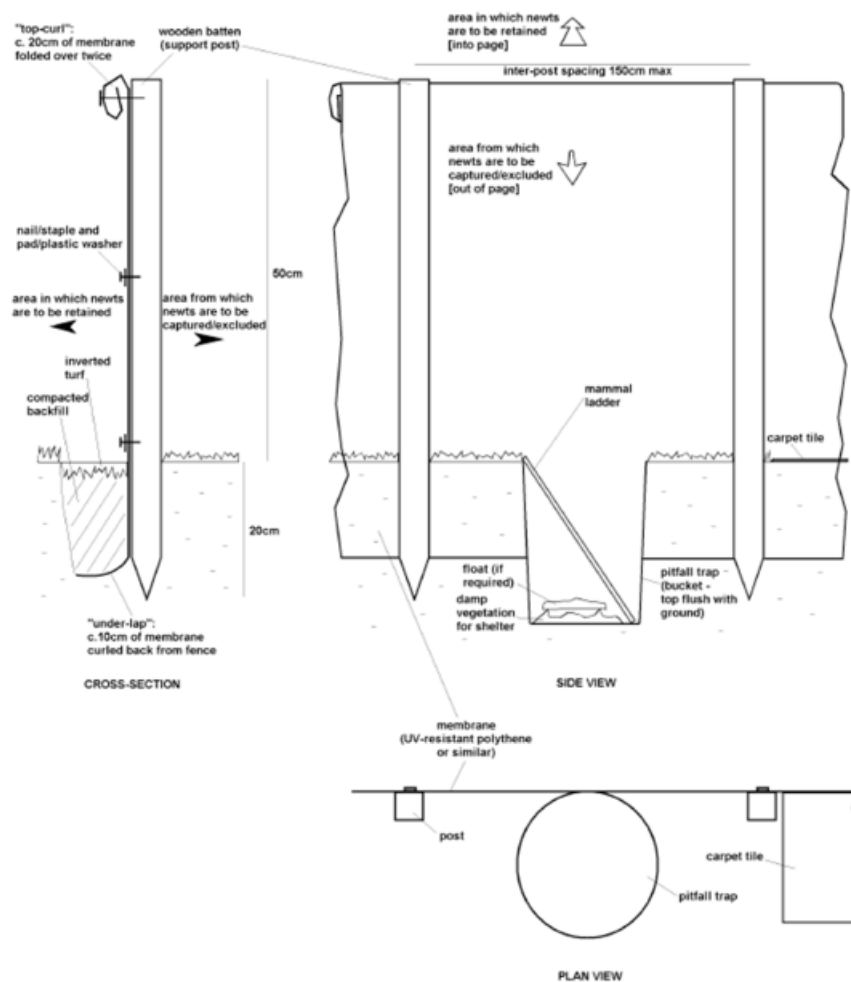


## Newt / Reptile Fencing

Using a tractor mounted chain trencher or boxer pedestrian trencher make a trench 200mm deep and 150mm wide to fit the membrane into following trench excavations 50mmx50mmx900mm timber stakes will be installed along the edge of the trench. Stakes will be knocked in to a depth of 300mm at 1.5 metre centres along the fence line. Stakes will be transported to the works area using a tele-handler or vehicle and trailer.

1000 Gauge 250 micron Polythene or Woven Polypropylene will be installed along the trench. This material is on a 1 metre x 100 metre roll and will be rolled out and attached to the stakes by hand. A roll/fold will be placed in the top of the membrane before being attached with a clout and steel washer to the stake. This roll will form an overhang which cannot be climbed by the reptiles. The bottom of the polythene is then installed into trench, including a minimum of 100mm under-lap. A minimum of 3 clout nails are to be used to attach the membrane to each stake.

The trench will then be backfilled by hand or using the mini-excavator and the backfill compacted by foot. Where ever possible a silt fence plough will be used to install the membrane directly into the ground to avoid the need for open trenches and backfilling. The stakes will be installed as described above. No trenches will be left open overnight. All fence lines will be checked for gaps.



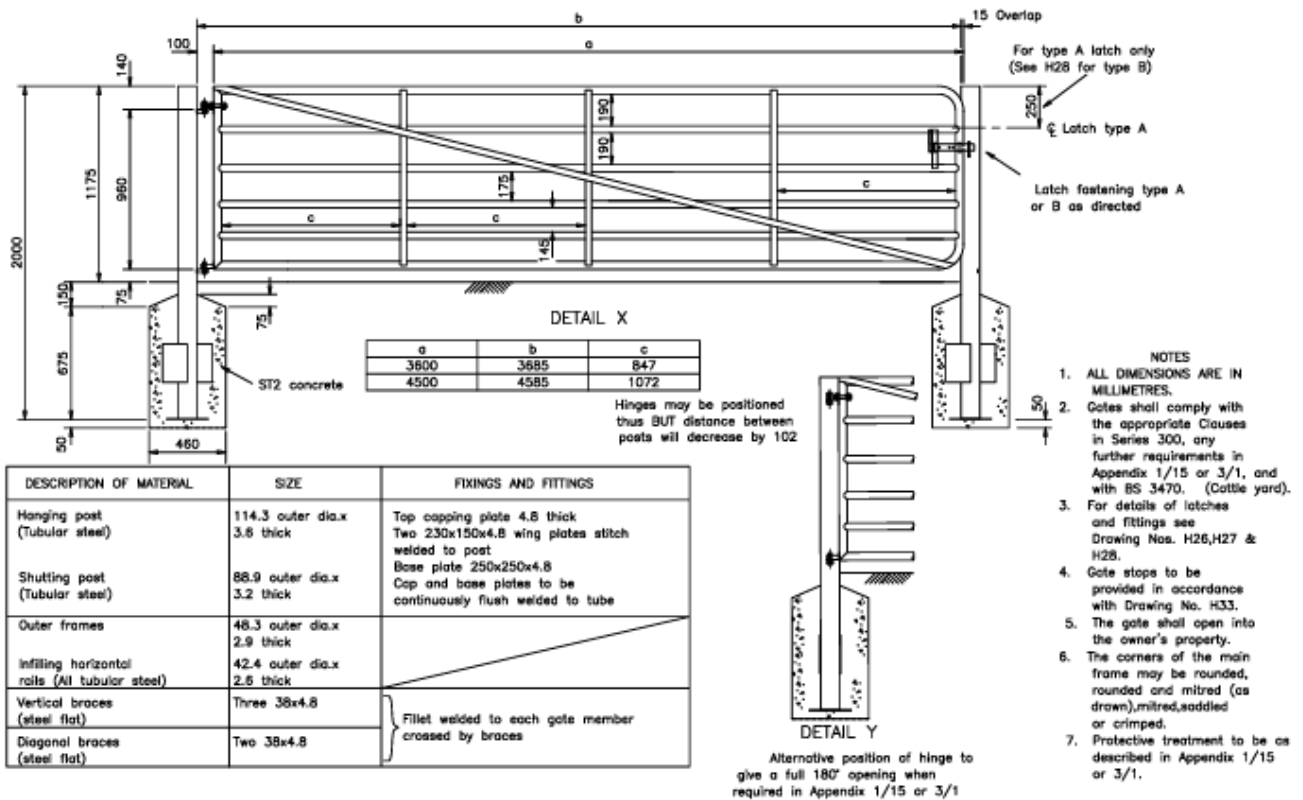
# Appendix 3 Temporary Gateway Specifications

## Single Gateway

Typical arrangements for single gateway will be steel gates with steel posts unless otherwise requested by land owners. The gateway shall be 3600mm wide by 1000mm high.

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

All gates will be fitted with warning and information signs.



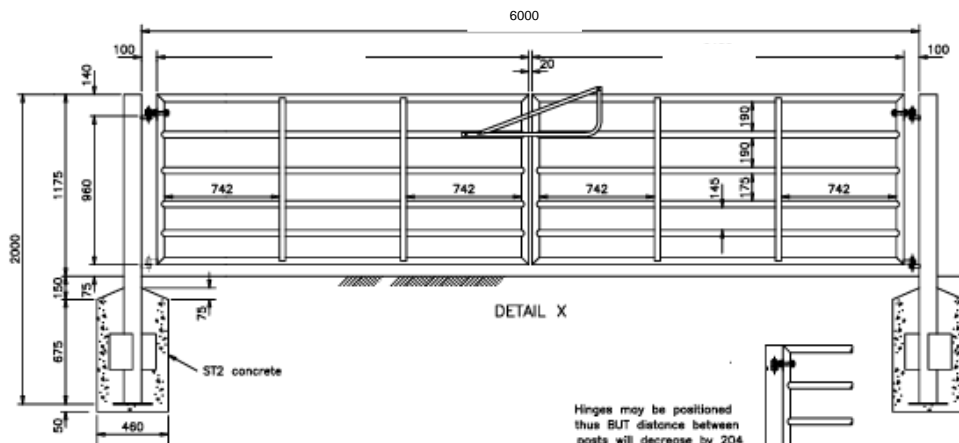


## Double Gateway

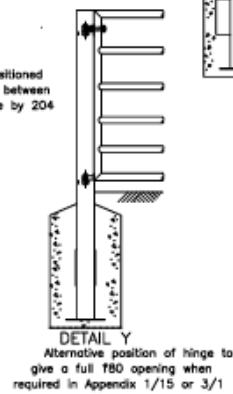
Typical arrangements for double gateway will be steel gates with steel posts unless otherwise requested by land owners. The gateway shall be 6000mm wide by 1000mm high.

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

All gates will be fitted with warning and information signs.



DESCRIPTION OF MATERIAL	SIZE	FIXINGS AND FITTINGS
Posts (Tubular steel)	114.3 outer dia.x 3.6 thick	Top capping plate 4.8 thick Two 230x150x4.8 wing plates stitch welded to post Base plate 250x250x4.8 Cap and base plates to be continuously flush welded to tube
Outer frames	48.3 outer dia.x 2.9 thick	
Infilling horizontal rails (All tubular steel)	42.4 outer dia.x 2.6 thick	
Vertical braces (steel flat)	Four 38x4.8	Fillet welded to each gate member crossed by braces



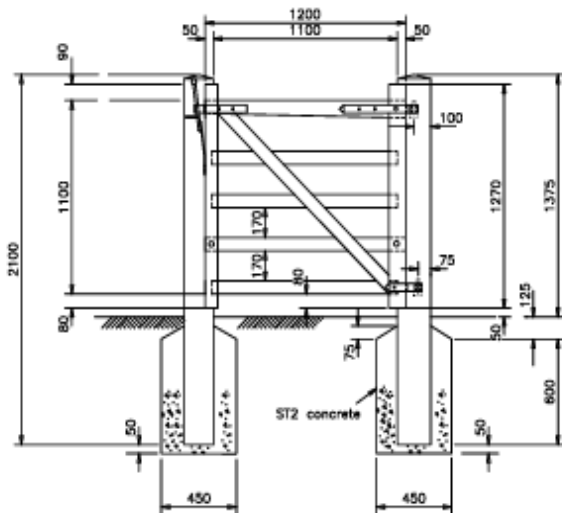
- NOTES
1. ALL DIMENSIONS ARE IN MILLIMETRES.
  2. Gates shall comply with the appropriate Clauses in Series 300, any further requirements in Appendix 1/15 or 3/1 and with BS 3470. (Cattle yard.)
  3. For details of latches and fittings see Drawing Nos. H26 and H29
  4. Gate stops to be provided in accordance with Drawing No. H33.
  5. The gate shall open into the owner's property.
  6. The corners of the main frame may be rounded, rounded and mitred, mitred (as drawn), saddled or crimped.
  7. Protective treatment to be as described in Appendix 1/15 or 3/1.

## Pedestrian Gates

At these crossing points a minimum of 2 sections, 3600mm, of post and rail fencing will be installed either side of the gateway.

All gateways shall be installed to open away from the construction site.

All gateway entrances shall be a minimum of 1000mm wide.



DESCRIPTION OF TIMBER MATERIALS	SIZE
Hanging post	200x200x2100 long
Shutting post	175x175x2100 long
Hanging stile	100x75
Shutting stile	75x75
Top rail	100x75 tapering to 75x75
Under rails	75x25
Brace housed in top rail	75x25

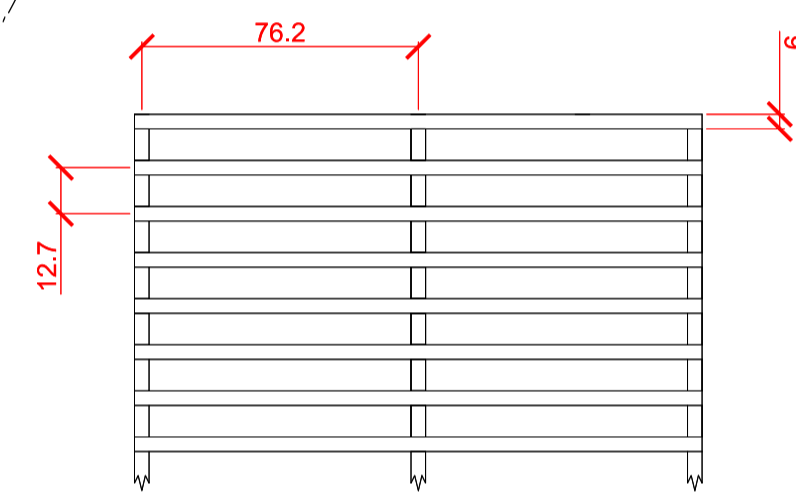
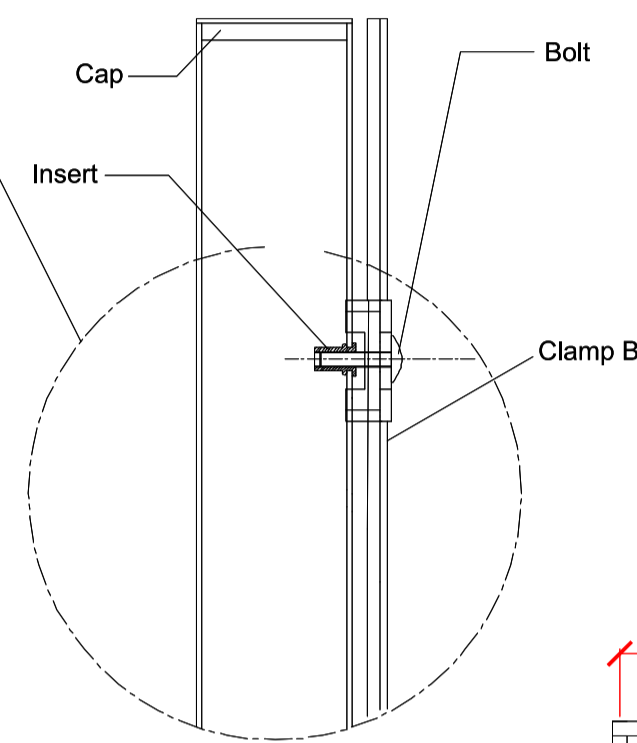
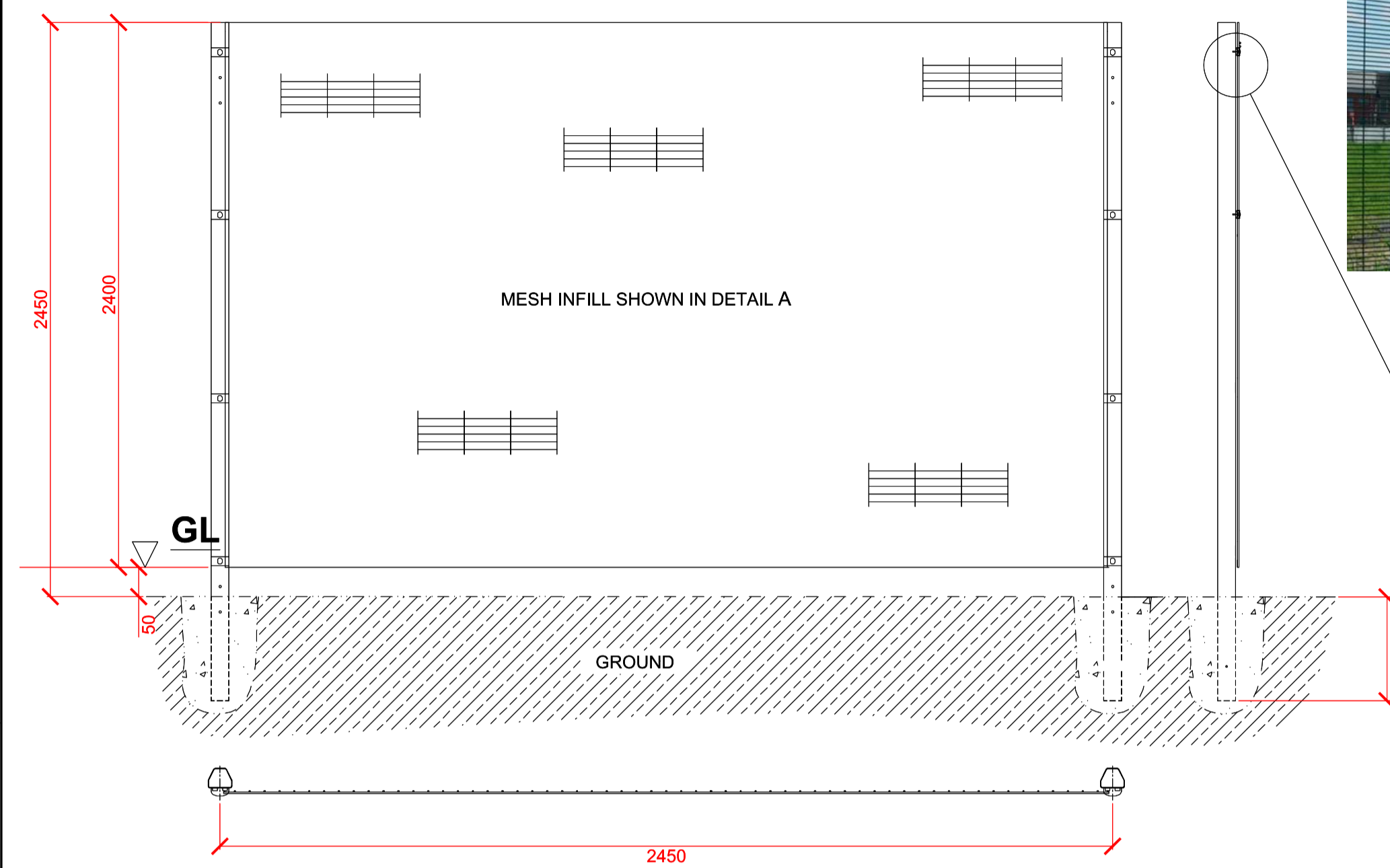
For brideways, the width shall be increased to 1525mm and incorporate a vertical opening handle.

# Appendix 4 Substation Fencing Specification



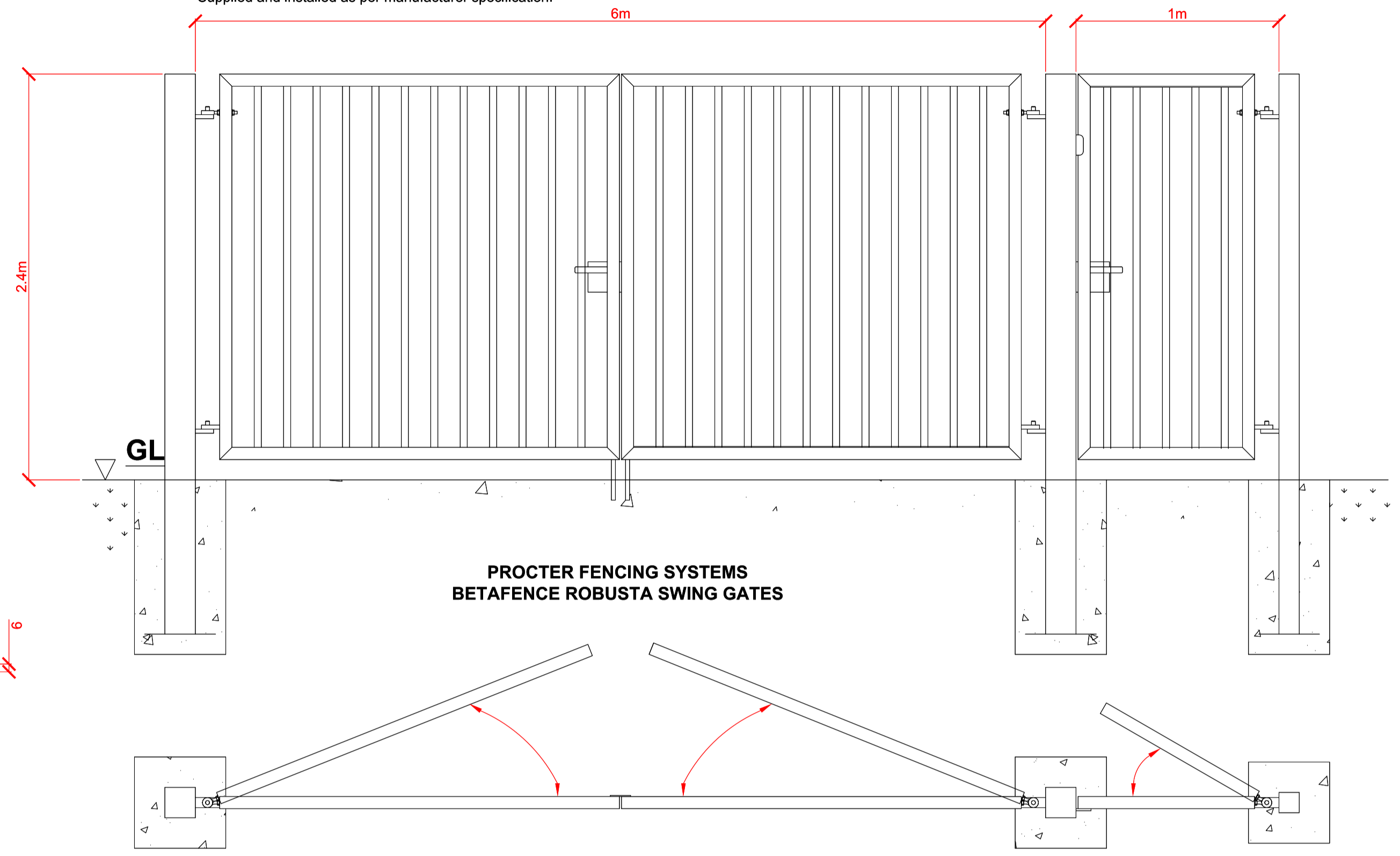
**F1: Security fence**

Manufacturer: Procter fencing Ltd. or similar approved  
 Product: Betafence Securifor 358@ & Super 6  
 Height: 2400mm  
 Panel Width: 2515mm  
 Material: 6mm wires  
 Posts: 60 x 60mm  
 Finish: Galvanised and polyester coated (Colour to be confirmed)  
 Installed to manufacturers specification.



**F1a: Substation gate**

Manufacturer: Procter fencing Ltd. or similar approved  
 Product: Betafence Robusta Swing Gates  
 Clear opening: 6m  
 Height: 2.4m  
 Material: Steel  
 Finish: Galvanised and polyester coated (Colour to be confirmed)  
 Supplied and installed as per manufacturer specification.



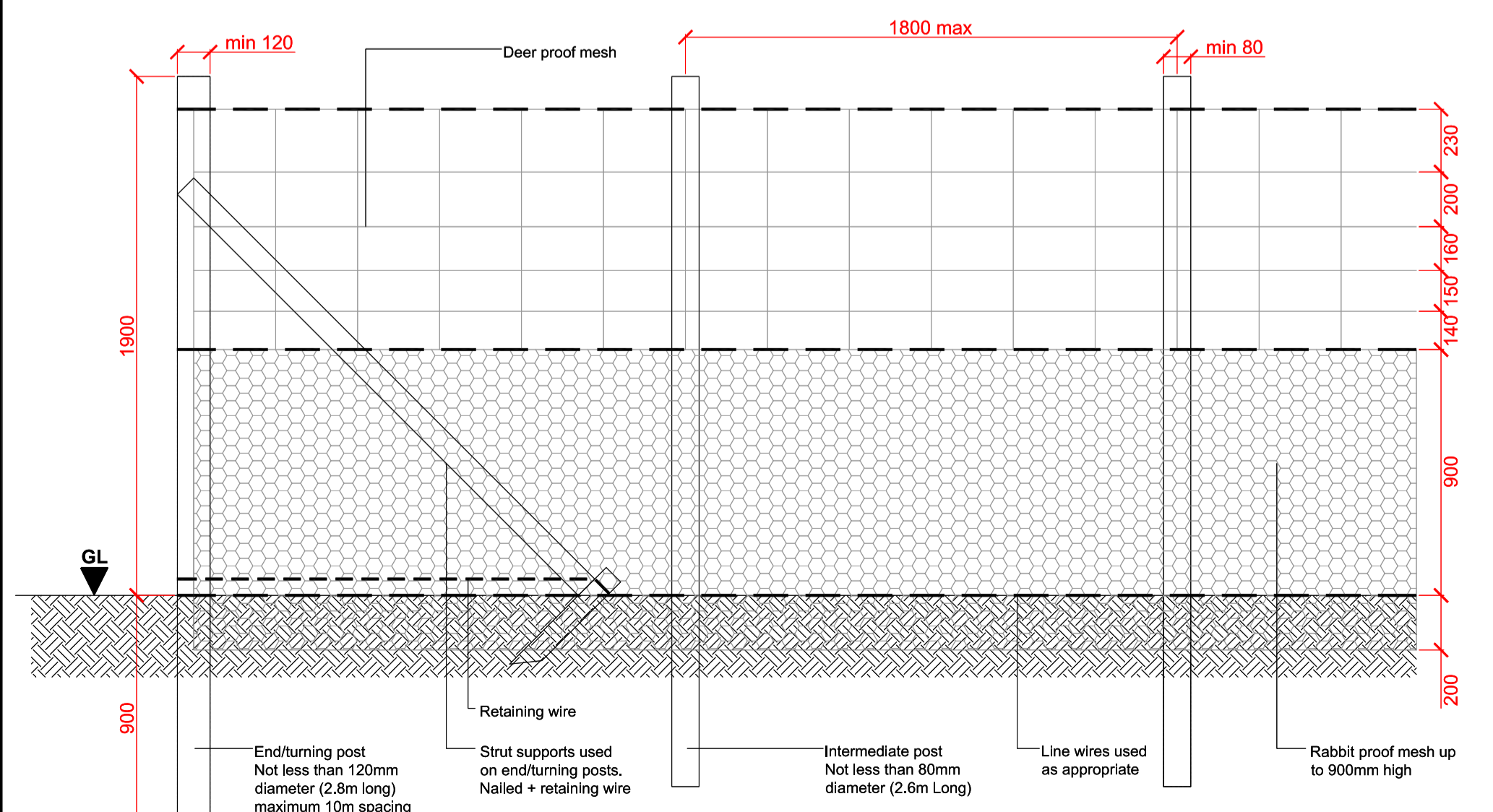
**F1** sheet D02  
**Betafence Super 6 mesh fence**  
 Scale: 1:20@A1

**F1a** sheet D02  
**Substation entrance gate**  
 Scale: Not to Scale @A1

**F2: Deer proof fence (with rabbit proof mesh)**

Description: Wooden post fencing with wire mesh netting  
 Height: 1.9m  
 Material: All timber shall be FSC pressure treated larch or other softwood as approved.  
 End/Turning Posts: Minimum 120mm diameter 2800mm (1900mm above ground) at intervals no greater than 10m. Posts to be driven to minimum depth 900mm.  
 Intermediate Posts: Minimum 80mm diameter 2600mm (1900mm above ground) at intervals no greater than 1.8m. Posts to be driven to minimum depth 700mm.  
 Rabbit proof mesh: Ground level to 900mm high (plus 200mm sub ground level) Galvanised wire netting with max 31mm apertures, 18g wire gauge (BS EN 10223-2). Netting to be fixed securely to fence posts. Mesh to extend into trench at bottom of fence line 200mm below ground level. Trench to be backfilled.  
 Deer proof mesh: 900mm - 1800mm: Double width netting deer fencing 6/90/30, max 200x300mm. High Tensile steel wire 2.5mm diameter.  
 Fixings: All fixings to be appropriately sized and galvanised to BS EN ISO 1461  
 Assembly:  
 1. Fencing to follow the ground profile with small adjustments to height as necessary to obtain flowing alignment.  
 2. Line wires used as appropriate with Lashing rods, retaining wire used for strut retention.  
 3. BS 1722 Part 7 applies

Refer to: Forestry Commission, Forest Fencing Technical Guide for further information. Contractor to confirm final fence configuration for approval.

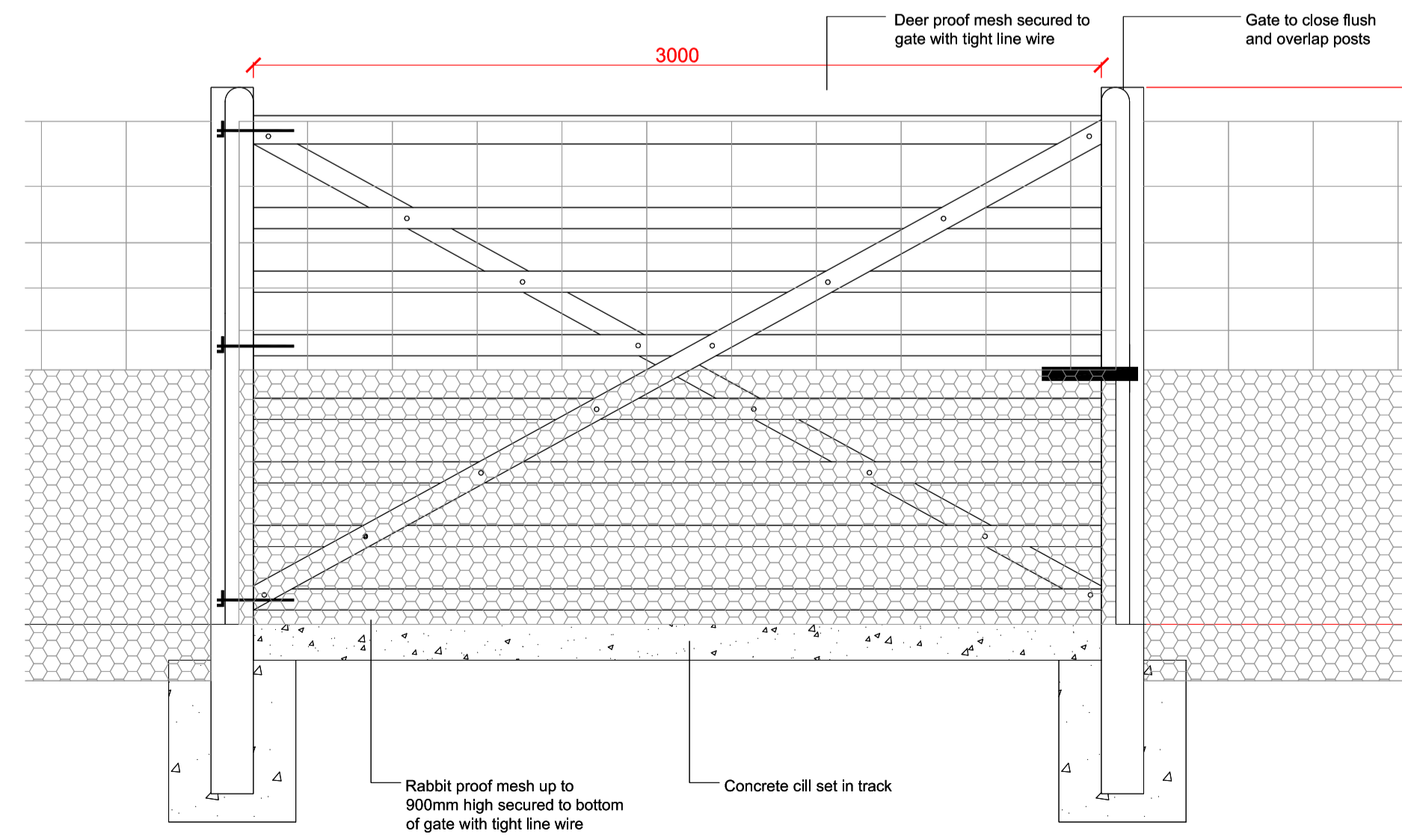


**F2** sheet D02  
**Deer proof fence (with rabbit proof mesh)**  
 Scale: 1:20@A1

**F3: Access gate**

Description: Wide single leaf timber field gate, with heavy top rail and cross bracing  
 Height: 1.9m  
 Gate width: 3m  
 Material: All timber shall be FSC pressure treated larch or other softwood as approved.  
 Finish: New planed finish  
 Top rail: 100mm x 75mm, edges chamfered  
 Under rail/ cross braces: 75 x 25mm  
 Hanging and slam stiles (rounded top): 100 x 75mm  
 Fixings: All joints to be morticed and tenoned, Rail and brace crossings to be bolted with stainless steel bolts.  
 Gate posts: 150x150mm Slamming post 175 x 175mm Hanging Post  
 Foundation: To engineer's detail  
 Hanging fittings:  
 • Heavy Galvanized Adjustable Hinge Set,  
 • 1 Loop Over Catch,  
 • 1 Anti Lift Device  
 • Fitting of Irons to Gate

Refer to: Forestry Commission, Forest Fencing Technical Guide for further information. Contractor to confirm final fence configuration for approval.



**F3** sheet D02  
**Gate**  
 Scale: 1:20@A1

- NOTES:**
- This drawing is to be read in conjunction with all other drawings and specifications.
  - Any discrepancies found between this drawing and other drawings and specifications in construction status documents must be referred to the Landscape Architect prior to work commencing.
  - This drawing must not be copied in whole or in part without prior written consent of Optimised Environments Ltd.
  - Any survey information shown is based upon surveyors topographical survey.
  - This drawing is for performance only. All structural elements, foundations, build up and fixing to engineer's detail and specification.

	Status Stamp:	Project:	East Anglia ONE Wind Farm (EA ONE)			
		Location:	EAST ANGLIA			
	Status Stamp:	Drg. Title:	APPENDIX 5 TYPICAL CONSTRUCTION DETAILS: FENCING Final for Discharge			
		Contractors Drg. No.:	EA1-GRD-DG-OPEN-796_D002			
Client:	Date of First Issue: 16/12/15	Drg. No.:	Sheet:	1	Rev:	04
	Prepared: SW	Reviewed: BS	Approved: MO	Next:	-	Size: A1
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