



Method Statement for Works within 500 m of Wendlebury Meads and Mansmoor Closes SSSI - East West Rail Core Works

Carillion-Buckingham Joint Venture

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Carillion-Buckingham Joint Venture

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1 INTRODUCTION

1.1 Update to Method Statement

This Method Statement sets out working methods and materials to be used in the EWR core works that will be located within 500m of Wendlebury Meads and Mansmoor Closes SSSI (see *Figure 1* in *Appendix 1*). The Method Statement was produced in May 2014 for works, which commenced in June 2014. The Method Statement below has been updated to reflect additional work added to the project programme. The additional work is for the construction of an access track and a new barn at Home Farm, near Merton in Oxfordshire (Ordnance Survey grid reference for barn location SP 559 179). The proposed route to the farm track would run from an existing farm gate near Merton (at SP 57283 17383) parallel to the M40 motorway and crosses under the M40 adjacent to the railway (at SP 56143 18324). The track will be approximately 2.1 km in length. *Figure 2a* in *Appendix 1* shows the access track and barn location and an aerial photograph of the site in relation to Wendlebury Meads and Mansmoor Closes Site of Special Scientific Interest (SSSI).

1.2 Purpose of Method Statement

RSK Environment Ltd has been commissioned by Carillion-Buckingham Joint Venture (CBJV) to produce a Method Statement to discharge East West Rail (EWR) Phase 1, *Planning Condition 16 Protection of National and European Designated Sites*. Planning Condition 16 states that no development connected with EWR Phase 1 works can commence within 500m of Wendlebury Meads and Mansmoor Closes SSSI until a Method Statement for the works is approved by the local planning authority (LPA) and Natural England.

This Method Statement sets out working methods and materials to be used in the EWR core works that will be located within 500m of Wendlebury Meads and Mansmoor Closes SSSI (see *Figure 1* in *Appendix 1*).

The Method Statement sets out good working practices and specific safeguard measures to ensure that impacts on ecology are either avoided or minimised, and that the qualifying interest features of the SSSI are maintained (as specified in *Environmental Statement (ES) Volume 2*, Environmental Resources Management (ERM) 2009 and *Chiltern Railways (Bicester to Oxford Improvements) Order Code of Construction Practice (CoCP) Version 6* (Environmental Resources Management 2013)).

The Method Statement will be used by contractors and will be kept on site at all times.

It is understood that a Method Statement for the Advanced Works (RSK 2014) has been approved by Natural England (personal communication between O. Euesden, Natural England and L.Griffiths, Cherwell District Council, April 1st, 2014).

1.3 Development Proposals

Carillion plc and Buckingham Group Contracting Ltd (a joint venture (JV)) will design and build a short connecting railway just south of Bicester, where Chiltern Railways' London to Birmingham Moor Street line crosses over the Bletchly to Oxford line. The latter will be upgraded from just east of Bicester Town station to Oxford, including restoring the double track that was removed in the 1970s and installing new signalling and safety systems. Bicester Town and Islip stations will be rebuilt and additional platforms provided at Oxford; and a new station will be constructed near Water Eaton, called Water Eaton Parkway, to serve Kidlington and North Oxford.

A Transport and Works Act Order (TWAO) application (to construct the Scheme) was submitted to the Secretary of State for Transport in January 2010. Public Inquiries were held in November 2010 and May 2012. The Chiltern Railways (Bicester to Oxford Improvements) Order (the Order) was approved by the Secretary of State on 17th October 2012. The completed scheme will allow the operation of passenger services between London and Oxford in addition to existing freight services and provide additional capacity for services forming part of the East-West Rail (EWR) scheme, which will link Oxford to Milton Keynes, Bedford and beyond.

The details in this method statement relate specifically to the core works that will be located within 500m of Wendlebury Meads and Mansmoor Closes SSSI. These works will include the construction of a new overbridge at Holts Farm to replace an existing level crossing, a new track bed on the existing rail corridor, and a new bridleway (see *Figures 1 and 2* in *Appendix 1*). The works also include the construction of a new access track and barn at Home Farm (see *Figure 2a* in *Appendix 1*).

1.4 Designated Site: Wendlebury Meads and Mansmoor Closes SSSI

1.4.1 Qualifying Interest Features

The following information has been taken from the Natural England SSSI citation document for the SSSI¹.

'The 73.2 ha Wendlebury Meads and Mansmoor Closes SSSI in Oxfordshire (SP 562 175) is notified under Section 28 of the Wildlife and Countryside Act 1981. It contains a series of traditionally-managed unimproved meadows that support a complex variety of plant communities including excellent examples of some of the few surviving calcareous clay pasture communities in southern England. The flora is exceptionally diverse with more than 160 plant species present, many of which are widely distributed and intricately mixed throughout the site.'

¹ http://www.sssi.naturalengland.org.uk/citation/citation_photo/1001141.pdf

Table 1.1: Wendlebury Meads and Mansmoor Closes SSSI special interest features

Habitats	Species present
Grassland (ridges)	<i>Agrostis capillaris</i> (Common Bent), <i>Festuca rubra</i> (Red Fescue), <i>Cynosurus cristatus</i> (Crested Dog's-tail), <i>Anthoxanthum odoratum</i> (Sweet Vernal-grass) and <i>Briza media</i> (Quaking-grass) with a number of herbs including <i>Rhinanthus minor</i> (Yellow-rattle), <i>Centaurea nigra</i> (Common Knapweed), <i>Silaum silaus</i> (Pepper-saxifrage) and <i>Succisa pratensis</i> (Devil's-bit Scabious).
Hayfields	<i>Achillea ptarmica</i> (Sneezewort), <i>Dactylorhiza fuchsii</i> (Common Spotted-orchid), <i>Filipendula vulgaris</i> (Dropwort), <i>Ophioglossum vulgatum</i> (Adder's-tongue), <i>Anacamptis morio</i> (Green-winged Orchid) and <i>Serratula tinctoria</i> (Saw-wort).
Grazed fields	Plants confined to the grazed field are fewer in number and include species typical of poached ground such as <i>Achillea millefolium</i> (Yarrow), <i>Bellis perennis</i> (Daisy) and <i>Cirsium arvense</i> (Creeping Thistle).
Sedge-rich meadow	<i>Carex paniculata</i> (Greater Tussock-sedge), <i>Carex flacca</i> (Glaucous Sedge), <i>Carex disticha</i> (Brown Sedge), <i>Carex caryophylla</i> (Spring-sedge) and <i>Carex hostiana</i> (Tawny Sedge) occurring with <i>Danthonia decumbens</i> (Heath-grass) and <i>Cirsium dissectum</i> (Meadow Thistle).
Hedges	<i>Crataegus monogyna</i> (Hawthorn), <i>Prunus spinosa</i> (Blackthorn) and <i>Rosa sp.</i> (Rose species). A total of 14 woody species have been recorded in hedges bordering the Mansmoor Closes and alongside the parish boundary.
Fauna	Species present
Birds	The bird fauna includes breeding <i>Gallinago gallinago</i> (Snipe) and <i>Numenius arquata</i> (Curlew). Other species include <i>Pluvialis apricaria</i> (Golden Plover), <i>Sylvia communis</i> (Whitethroat), <i>Sylvia curruca</i> (Lesser Whitethroat), <i>Emberiza schoeniclus</i> (Reed Bunting), <i>Locustella naevia</i> (Grasshopper Warbler), <i>Milvus milvus</i> (Red Kite), <i>Falco columbarius</i> (Merlin), <i>Pyrrhula pyrrhula</i> (Bullfinch), <i>Emberiza calandra</i> (Corn Bunting), <i>Locustrella naevia</i> (Grasshopper Warbler), <i>Perix perdix</i> (Grey Partridge), <i>Passer domesticus</i> (House Sparrow), <i>Carduelis cannabina</i> (Linnet), <i>Emberiza schoeniclus</i> (Reed Bunting), <i>Sturna vulgaris</i> (Starling), <i>Alauda arvensis</i> (Skylark), <i>Vanellus vanellus</i> (Lapwing), <i>Turdus philomelos</i> (Song Thrush), <i>Cuculus canorus</i> (Cuckoo), <i>Passer montanus</i> (Tree Sparrow), <i>Emberiza citronella</i> (Yellowhammer) and <i>Tyto alba</i> (Barn Owl).

Invertebrates	The meadows support large numbers of common butterflies, including <i>Maniola jurtina</i> (Meadow Brown), <i>Pyronia tithonus</i> (Gatekeeper), <i>Lycaena phlaeas</i> (Small Copper), <i>Polyommatus icarus</i> (Common Blue), <i>Pieris napi</i> (Green-veined White) and <i>Melanargia galathea</i> (Marbled White).
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2 DESCRIPTION OF PROJECT

2.1 Purpose of Works

The EWR core works (see *Figures 1 and 2* in *Appendix 1*) will come to within 500 m of the Wendlebury Meads and Mansmoor Closes SSSI. The core works will include the construction of a new overbridge, a new trackbed in the existing rail corridor, a new bridleway, and a new access track and barn at Home Farm.

2.1.1 Holts Farm Overbridge

- Topsoil stripped and stockpiled for re-use on batters;
- Soft alluvial layers dug out and replaced with engineering fill;
- Diversion of existing ditches and installation of new drainage to outfall so as not to impact upon the SSSI;
- Construction of reinforced earth abutments;
- Construction of new approach embankments using site-won or imported engineering fill to achieve the required profile;
- Installation of new bridge deck;
- Installation of bridge parapets; and
- Surfacing to new access road.

2.1.2 New Trackbed (existing rail corridor)

- Removal of existing rail line and sleepers;
- Removal of existing rail ballast for processing and re-use;
- Re-profiling of railway corridor to achieve new trackbed levels;
- Construction of new top-surface to railway to act as haul road for traffic or for placement of bottom ballast;
- Construction of new trackbed to include the installation of geotextile separator and 300mm layer of bottom ballast;
- Installation of new permanent way (i.e. new sleepers and rail to form two new rail lines); and
- Installation of minor signalling infrastructure to facilitate the signalling works associated with the new railway.

2.1.3 New Bridleway

Replacement private rights of way and public rights of way are required to enable the landowners to continue their agricultural operations and to ensure continued proper management of the SSSI.

The new bridleway/footpath (see *Figure 2* in *Appendix 1*) will be located on existing arable/improved grassland field and will be approximately 3 m wide, formed from an

unmade field path to provide access into the Berks, Bucks and Oxon Wildlife Trust (BBOWT) Reserve. Gravel or similar material will be laid around access gates where necessary. Access is required by BBOWT for their farm machinery for hay cutting and hedging. The bridleway will lie to the west of an existing double hedge and north of a single hedge that forms the north-west boundary to the SSSI.

The creation of the bridleway will require the removal of three sections of hedgerow (see *Figure 2* in *Appendix 1*). Two 9.9 m sections of the double hedge will need to be removed for a vehicle gate, a bridleway gate, and 1 or 2 culverts over the drainage ditches. Mature trees will be retained. A small section (3.5 m gap) of a hedgerow that runs west away from the SSSI will also require removal.

2.1.4 New Access Track and Barn at Home Farm

Due to the closure of level crossings for health and safety purposes as part of the EWR line, a new access track and barn is required at Home Farm to enable the landowner to continue their agricultural operations.

The new access track (see *Figure 2a* in *Appendix 1*) will be located on existing arable fields and pasture adjacent to the M40. The track will pass under the M40 at an existing railway over-bridge. The track will also cross two branches of the New River Ray. The new barn will be located in an arable field adjacent to the railway.

The track will be approximately 2.1 km in length. It will require a 4 m wide corridor to include the concrete track, a grass verge to the north-east of the track and a surface water ditch on the south-west side (see *Figure 7* in *Appendix 1*).

2.2 Location of Works

The location of works is shown in *Figure 1, 2* and *2a* in *Appendix 1*. The new overbridge will be approximately 0.4 km west and south of the SSSI. The new trackbed will be immediately adjacent to the SSSI. The new bridleway will be approximately 10-15 m to the west of the SSSI, but will be separated by a double hedge and ditches. The new bridleway to the north of the SSSI will be separated by a narrower hedge and tree line, but will still be outside the SSSI.

The new Home Farm barn (and end of the access track) will be within 10 m of the Wendlebury Meads and Mansmoor Closes SSSI boundary at the closest point. There is a native hedgerow with standard trees that forms the boundary between the field with the new barn location and the Wendlebury Meads and Mansmoor Closes SSSI. The new barn location is within 5 m of the hedgerow at its closest.

2.3 Timetable of Works

Works within 500 m of the SSSI are scheduled to commence from 29th May 2014. They will start with earthworks, which will include track access up to and under the M40 motorway only (from 5th June to 1st July 2014). Potential culvert works and earthworks

from Holts Farm to the M40 are scheduled from late July; and cable trough, equipment bases, and bottom ballast works are scheduled from early September/October 2014.

The new overbridge works are scheduled to start from early June 2014 and should be complete by early June 2015. The associated earthworks will be completed in May/June 2015 and the trackbed completed in August 2015.

The new access track and barn works for Home Farm will commence in April 2015 and run until September 2015.

The works will be undertaken during daylight hours only (e.g. 0700 – 1700 hours).

The timeframe of works in relation to protected species is set out in *Section 3*.

2.4 Notifications / Licenses

There are three ponds referred to as ponds 74, 75 and 80 in the *Great Crested Newt Mitigation Plan* (Environmental Resources Management 2011; *Figures 3 and 4 in Appendix 1*). Great Crested Newts were recorded in these ponds. Therefore, a European Protected Species Mitigation (EPSM) licence has been granted (EPSM 2012-5337:H) to legally allow development works within 100m of the ponds to proceed.

A key part of the EPSM licence is to exclude the newts from the development area. Therefore, a translocation programme, relocating newts from the railway corridor is underway, 30 capture days have been exceeded and translocation will stop once no newts have been recorded over five days. The newts have been relocated to a receptor site, a protected area outside of the development area. The receptor sites are one meter strips between the licensed works area boundary and the newt exclusion fencing, either side of the rail line.

Habitat within 0 to 50 m of a great crested newt waterbody is described as 'core habitat' considered of high importance. Habitat within 50 – 250 m of a great crested newt waterbody is described as 'intermediate habitat', and is considered to be of moderate importance for great crested newt. And habitat within 250 – 500 m of a great crested newt waterbody is described as 'distant habitat' and is considered to be of low importance. Great Crested Newts have been found to move over considerable distances, but newts commonly move between ponds that are within 250 m of each other.

Ponds 74 and 75 are within the SSSI boundary and are located next to and within 50 m of the rail track, respectively. Ponds 74 and 75 are over 500 m from the overbridge works area, Pond 80 is outside of the SSSI boundary and is within 100 m of the track and approximately 350 m from the overbridge works area. Therefore, the track works are located within 'intermediate habitat. Although the track within 100 meters of ponds 74, 75 and 80 will have had newts excluded from the works area, there is potential for newts to be present within track habitat outside of this 100 m. This is because newts are known to disperse more than 250 m as detailed above. Therefore, it has been agreed as a precautionary approach that the track works within 250 m of ponds 74, 75 and 80 will be carried out after a destructive and/or hand search of the track has been completed. This will involve vegetation removal, soil strip, and dismantling railway



infrastructure under supervision of an ecologist. This is to ensure that no newts are unintentionally killed, or injured during the works.

Any newts found during the above works or incidentally found during works within 500 m of the ponds will be translocated by a trained member of staff to the receptor site in accordance with the existing provisions of the licence.

2.5 Revisions

Should changes to the works be required, the LPA and Natural England will be consulted to determine whether the changes pose a potential threat to the nature conservation interest of the SSSI.

Any amendments to the work activity will be fed back into the Method Statement.

3 SUMMARY OF CONSTRUCTION IMPACTS

In summary the construction activities comprise:

- the construction of a new overbridge;
- the construction of a new trackbed;
- the construction of a new bridleway; and
- the construction of a new access track and barn at Home Farm.

There will be no direct impact on the Wendlebury Meads and Mansmoor Closes SSSI from the EWR Core Works. The new overbridge is approximately 0.4 km west and south of the SSSI and, therefore, too far away for direct impact. Furthermore, the new bridleway will simply be an unmade field margin involving no construction as such. However, the construction of the new trackbed will involve high numbers of construction vehicles and associated works for approximately 110 days and will be located immediately adjacent to the SSSI boundary. Furthermore, the new barn and access track at Home Farm will come within 10 m of the SSSI boundary. Therefore, the SSSI is potentially susceptible to impacts from these activities during the construction period. These impacts were identified in the *Environmental Statement Volume 2 (Chapters 5 - 156)* (Environmental Resources Management 2009) as follows:

- disturbance and damage from construction works within or immediately adjacent to the boundary of the SSSI;
- ground water/ surface water pollution and change to hydrological regime;
- dust smothering; and
- the introduction of invasive species.

4 POTENTIAL IMPACTS AND MITIGATION MEASURES

The following headings cover the potential impacts and the mitigation measures. Providing that mitigation measures are adhered to, no significant impact on the SSSI is predicted (Environmental Resources Management 2009). This Method Statement will be kept on site at all times and the contractors must be given ecological awareness training prior to the onset of construction. This will inform them of the location and sensitivity of the adjacent SSSI and the importance of implementing the mitigation measures described here.

Should any re-siting of works be required, the ecologist should be contacted immediately to ensure that the working corridor or associated infrastructure will be moved only to areas of habitat with equal or lower nature conservation value, and will not be moved to any areas that may increase the impact of the scheme. Natural England may need to be contacted for approval.

4.1 Dust

4.1.1 Potential Impact

Dust from the construction of the new trackbed, overbridge, access track and barn may impact on plant and animal species in the SSSI. Dust may have physical effects on plants (e.g. smothering, blockage and damage to stomata, shading, abrasion of leaf surface or cuticle) and cumulative effects (e.g. stress on already stressed plants). Long-term damage can result from chemical changes in the soil, e.g. changes in the species composition or community structure. Dust inhaled by animal species may have adverse physiological effects on the respiratory system.

4.1.2 Mitigation Measures

The construction works will take place under the working procedures and best practices set out in *Chapter 7 Dust and Air Pollution* of the *CoCP* (Environmental Resources Management 2013) and *Chapter 13 Air Quality and Dust* of the *Environmental Statement Volume 2* (Environmental Resources Management 2009). These procedures include standard and targeted control measures to avoid the creation and spread of dust particles during works, including:

- The provision of a physical barrier between the works areas and sensitive habitats in designated sites.
- Watering and damping down of potential sources of dust including aggregate materials. Tractors and water bowsers will be available for this.
- Maintaining maximum possible separation of the work areas from designated sites.
- Timing of works, avoiding periods of heavy rainfall to avoid leachate, and very dry periods when dust may blow about.

- Limit on-site vehicle speeds to 20 mph.
- The use of construction machinery designed to minimise dust generation.

4.2 Vehicle Movements

4.2.1 Potential Impact

Plant species in the SSSI may be impacted by vehicle pollution and vehicle incursion into the SSSI. Air pollution from vehicle exhausts, can have adverse effects on plant or animal health. For example, by way of nitrogen enrichment that can alter plant communities by changing species composition.

4.2.2 Mitigation Measures

- Temporary work areas (including site access) will wherever possible be situated on existing areas of hard standing, bare ground or areas of low nature conservation value (e.g. arable fields or improved grassland).
- The working area will be fenced to control the incursion of personnel and vehicles into adjacent habitats.
- Vehicle movements on site will be restricted to allocated routes only, so that adjacent vegetation is not directly affected, and so that soil compaction is restricted to these routes.
- Construction vehicles will be checked regularly for leaks of oil, fuel or other fluids, and will be equipped with spillage contingency kits.
- No construction vehicles will enter the SSSI.
- Construction vehicle movements will be restricted to daylight hours (i.e. 0700 to 1700 hours).
- Atmospheric pollution will be reduced by the following advice to drivers: shutting off engines when the vehicle is idle for more than one minute; turning off air conditioning five minutes before entering the compound; and not accelerating or braking sharply.

4.3 Habitat Loss

4.3.1 Potential Impact

Construction of the new overbridge and the new tracks will require the clearance of dense scrub and hedgerows located within and adjacent to the rail line. The new bridleway will require the clearance of three sections of hedgerow. The new access track will require the clearance of small sections of scrub, broad-leaved plantation woodland, and riverbank vegetation. However, the majority of the new track will run through arable field and tall ruderal habitat, which are common and widespread habitats of low botanical value.

The SSSI habitat will not be directly impacted.

4.3.2 Mitigation Measures

- Habitat loss will be limited to the minimum needed for the safe implementation of the works.
- The clearance of mature trees will be avoided.
- Temporary work areas (including site access) will wherever possible be situated on existing areas of hard standing, bare ground, or other areas of low nature conservation value (e.g. arable fields or improved grassland).
- Hedgerows and mature trees will be protected using root-protection zones.
- On completion of the scheme, vegetation (e.g. new hedges and trees) will be re-planted along the rail corridor and roads.

4.4 Ground Water and Surface Water Pollution and Drainage

4.4.1 Potential Impact

Runoff from construction works can alter the natural drainage conditions and potentially cause ground or surface water pollution. As specified in *Chapter 9 Water Resources and Flood Risk* in the *Environmental Statement Volume 2* (Environmental Resources Management 2009) Wendlebury Meads and Mansmoor Closes SSSI is highly sensitive to changes in drainage conditions. Therefore, should impacts occur they would be of moderate to major significance.

New drainage is proposed for the overbridge and culverts will be built adjacent to the new bridleway where it crosses a hedge (see *Figure 2* in *Appendix 1*). The new bridleway is located adjacent to a ditch associated with the existing hedgerow. The low level of use of the bridleway will present no risk of hydrocarbon pollution of the drained water (Environmental Resources Management 2010).

The proposed drainage of the track leading to the overbridge and related earthwork approaches will be provided by ditches with all surface water runoff attenuated before being discharged into any existing drainage system. Drainage of the track and earthworks north of the railway will drain northwards (away from the track) and to the south of the railway, attenuated runoff will be discharged into the existing ditches adjacent to Mansmoor Road. Attenuation storage for the overbridge will be through the use of linear features (i.e. oversized ditches) (see *Figure 5* in *Appendix 1*).

There will be new drainage systems installed in approximately 500m of track, from just west of the M40 Motorway. They will discharge into an existing watercourse at Chainage 115940, which is immediately east and west of the SSSI boundary (i.e. the SSSI is either side of the railway line). Given the existing topography in this drainage catchment, Atkins who has designed the drainage suggest that there is a negligible change in the runoff being discharged into the watercourse at Chainage 115940 (P. Stanbury, Project Manager, Atkins, email communication, May 8th 2014). This is because the extent of the existing rail corridor will, in the completed scheme remain unchanged from the existing situation. There is no effective increase in impermeable

area as all rainwater will fall onto the railway ballast and embankment. Existing drainage ditches at the toe of the existing railway embankment will be removed and replaced with filter drains to collect greenfield surface water run-off from the embankment; filter drains will be laid with a comparable hydraulic gradient (approximately 1 in 650) and existing outfalls will be re-used. The overall change in runoff characteristics is, therefore, considered to be negligible.

Ditches to the west of the existing Holts Farm level crossing will be backfilled and will be replaced with a filter drain. Surface water filter drains, surface water ditches, and existing ditches will be used. A carrier drain will be used to the south of the railway to mitigate risk of drainage impact on pond 77 (see *Figure 6* in *Appendix 1*). The pond is not within the SSSI boundary and is not subject to the newt EPS licence application.

The new access track for Home Farm will be a 4 m wide unreinforced concrete track, it will have a surface water ditch adjacent to it on the south-west side from Merton Road to the railway line only (see *Figure 7* in *Appendix 1*). A storage tank adjacent to the new barn will hold water fed off from the barns gutters. A report was produced by Wallingford Hydrosolutions Limited (*Appendix 3*) to assess the impacts from the new barn and track on the hydrological integrity of the SSSI. It was assessed that the potential impacts to the SSSI as a result of the development is through reduced water quality. This is both through the construction of the access track and barn foundations as well as continued use of the track and barn. Only a small section of track and barn borders the SSSI boundary. Where the development area does not border the SSSI boundary the risk of pollution of the SSSI is greatly reduced. Any runoff from the construction of the track is likely to be attenuated by the surrounding fields and will not drain directly to the SSSI. The topography of the area is such that runoff would not drain towards the SSSI and mitigation measures will ensure that runoff is directed away from the SSSI. Best practice pollution prevention measures would be followed throughout construction. The residual impacts of the effects of reduced water quality on the SSSI are considered to be of negligible significance (Wallingford Hydrosolutions Limited 2015).

Construction management measures to prevent adverse impacts on the SSSI from water pollution including spill leakages and piling works are specified in *Chapter 9 Protection of the Water Environment* of the CoCP (Environmental Resources Management 2013) and in *Chapter 9 (Water Resources and Flood Risk) of the Environmental Statement Volume 2* (Environmental Resources Management 2009).

Works will be undertaken according to Environment Agency Pollution Prevention Guidelines (PPGs) to prevent any pollution incidents affecting ecologically sensitive habitats.

4.4.2 Mitigation Measures

- Ditch diversions and new drainage installations in connection with the new overbridge works will be so constructed as to ensure that there is no impact upon the SSSI.
- Temporary drains will be no larger than is needed to ensure free drainage of tracks and work areas.
- Ditches and drains will be regularly maintained and checked for blockages.

- Watercourses will be protected from sedimentation and from run-off from pollution incidents. They will be further protected by such systems as wheel washing areas, pollution valves, and temporary water storage.
- Best practice construction methods would be followed in accordance with the Environment Agency Pollution Prevention Guidance.
- Cut-off drains would be utilised during construction to ensure that the runoff from the construction area does not enter the SSSI.
- Equipment would be provided to contain and clean up any spills. If any on-site storage of fuels, lubricants or chemicals is required, these would be contained within an area bunded to 110 %.
- Any refuelling of machinery would be within the bund or have secondary containment.
- Associated pipework would be located above ground and protected from accidental damage.
- Drip trays would be placed under standing machinery.
- Routine monitoring of sediment control measures would be undertaken.
- During excavation activities, surface water flows would be captured through cut-off drains to prevent water entering excavations or eroding exposed surfaces. If dewatering of excavations is required, pumped discharges would be treated before release to the surrounding land away from the SSSI. Measures would be taken to ensure water flowing away from dewatering / washout areas does not re-enter excavations.
- The movement of construction traffic would be controlled to minimise soil compaction and disturbance.
- Long term drainage from the hardstanding and barn would be directed away from the SSSI.

4.5 Invasive Species

4.5.1 Potential Impact

No invasive species have been recorded in the vicinity of the SSSI (e.g. along the railway adjacent to the SSSI, where invasive species are relatively likely as they often spread on railways). Therefore, care should be taken to prevent the introduction of invasive species through dirty lorries or imported hardcore or soil. Should invasive species be identified within the construction zone, the following measures will be implemented.

4.5.2 Mitigation Measures

- The guidance provided in the Department of Environment, Food and Rural Affairs (DEFRA) (2011) *Helping to Prevent the Spread of Invasive Non-Native Species, Horticultural Code of Practice* will be followed.
- If any invasive species listed on *Schedule 9, Part II of the Wildlife and Countryside Act 1981*, as amended is identified within the works area or in close proximity to the boundary, a strategy to ensure the control of the species



and prevent their spread in and beyond the site will be devised by qualified specialists following the Environment Agency's guidelines.

4.6 Protected Species

4.6.1 Potential Impact

Protected and notable species known or likely to be present in adjacent habitats include breeding birds, Great Crested Newts and common reptiles. Hedges, scrub and trees provide nest sites for birds and sheltering habitat for reptiles and Great Crested Newt during their terrestrial phase. The following measures will be implemented to ensure that any protected species that use the site are protected from the impacts of construction.

In the unlikely event that a protected species or notable species is found during the works, the works will immediately be suspended and ecological advice will promptly be taken.

A reptile method statement has been prepared by BSG Ecology for other sections of the route (see *Appendix 2*). The method statement approach has been previously agreed with Natural England (Charlotte Frizzell, Land Use Operations – 2nd August 2013) and should also be followed in association with these core works.

4.6.2 Mitigation Measures

- Any works within 250 m of ponds 74, 75 and 80 will be carried out under an ecological watching brief involving a careful and systematic hand search for Great Crested Newts and also the hand-dismantling of any potential places of refuge for newts.
- The new access track and Barn work will follow a Great Crested Newt method statement for works.
- Toolbox talks will be provided on site prior to any construction works to explain potential ecological issues that may arise and what to do about them.
- Vegetation removal (e.g. trees and scrub) will take place outside of the breeding bird season (which runs from March to August, inclusive). Where this is not possible, a search for any nesting birds prior to vegetation clearance will be undertaken by an ecologist. If any nests are found, they will be protected by an exclusion zone. Works may then proceed up to, but not within, this exclusion zone. Works may be completed once an ecologist has confirmed that the young have fledged the nest. If nesting birds are found at any time during clearance works, the work will stop immediately and an ecologist will be consulted.
- All excavations or earthworks must be covered overnight to prevent any animal from becoming trapped (or ramps should be provided to enable escape). Excavations must be checked for any animals prior to backfilling.
- Rubble, spoil and any other materials should be stored off the ground e.g. on pallets, or placed in skips to ensure that suitable temporary refuges for Great Crested Newt are not created.
- The duration of ground works will be kept as short as possible.

- Where possible, the surrounding grassland around the new overbridge will be kept short (i.e. regularly mown or grazed) to discourage any protected or notable species from seeking cover in this area.
- The works will be undertaken during the day only.

4.7 Lighting and Noise

4.7.1 Potential Impact

The works will be undertaken during daylight hours only. Lighting and noise is not listed as an operation likely to damage the special interest of the SSSI on Natural England's information page². This is because the SSSI is designated for its plant communities rather than fauna. However, noise from construction works may affect animal species within and adjacent to the SSSI. Traffic noise can reduce the distance over which acoustic signals can be heard ("acoustic masking") and produce non-auditory physiological effects such as increased heart rate and general stress reaction. Behavioural effects vary between animal species, but can include abandonment of territory and lost reproduction. Birds are likely to maintain a stand-off distance from the works and be displaced into other suitable areas.

The noise for the bridge and trackbed construction from lorries, forklifts etc will be intermittent, therefore, only minor to low noise impacts are expected (Environmental Resources Management 2013).

The following measures (taken from *Chapter 6 Noise and Vibration* within the *CoCP* (Environmental Resources Management 2013) and *Environmental Statement* (Environmental Resources Management 2009) will so far as possible be implemented to reduce impacts relating to noise.

4.7.2 Mitigation Measures

- The works will be limited to daylight hours.
- Traffic will be limited to 20 mph.
- Plant will be operated in an appropriate manner to minimise noise emissions (including regular maintenance of the plant).
- Modern, silenced and well-maintained plant will be used at all times (fitted where appropriate with efficient attenuators or acoustic covers). All relevant plant and equipment will meet the noise limit and noise marking requirements prescribed by the Noise Emission in the Environment by Equipment for Use Outdoors Regulations 2001, implementing EU Directive 2000/14/EC.
- Equipment, including vehicles, will be shut down when not in use or throttled down to a minimum.
- The Contractor will adhere to the codes of practice for construction working and piling set out in BS 5228 'Noise Control on Construction and Open Sites' insofar as these are reasonably practicable and applicable to the construction works.

² <http://www.sssi.naturalengland.org.uk/Special/sssi/old/OLD1001141.pdf>



- Raised voices will be kept to a minimum.

5 DESCRIPTION OF ACTIVITIES, RISKS AND MITIGATION

Table 5.1: General Activities

General Activity	Environmental Risk	Mitigation/ Environmental Control Measures (this list is not exhaustive and detailed mitigation and control measures should be followed as detailed in the CoCP and ES)	Timing	Roles and Responsibilities	Plan Ref.	Cross Reference with CoCP and ES	Action Completed (Y/N)
General Site Management	Land Contamination – Dust	<p>Damp down potential dust sources</p> <p>Provide a physical barrier between works areas and sensitive habitats</p> <p>Time works to avoid very dry periods</p> <p>Limit vehicle speed (e.g. 20 mph)</p>	June 2014 – September 2015	Construction Site Manager	Figures 1,2, 5 and 6, Appendix 1	CoCP – Chapter 7 ES – Chapter 13	
	Land Contamination – Ground water / surface water pollution	<p>Locate all oil storage tanks away from waterbodies</p> <p>Use tanks that are double skinned or surrounded by a bund, capable of retaining 110% of tank volume</p> <p>Maintain all plant equipment</p> <p>Keep temporary drains to a minimum</p> <p>Avoid transportation of fuel across the site</p> <p>Provide spillage kits</p>	June 2014 – September 2015	Construction Site Manager	Figures 1,2, 5 and 6, Appendix 1	CoCP – Chapter 9 ES – Chapter 9	

General Activity	Environmental Risk	Mitigation/ Environmental Control Measures (this list is not exhaustive and detailed mitigation and control measures should be followed as detailed in the CoCP and ES)	Timing	Roles and Responsibilities	Plan Ref.	Cross Reference with CoCP and ES	Action Completed (Y/N)
	Land Contamination – Invasive species	<p>Follow the EA guidelines for invasive species control and eradication</p> <p>Follow good practice in order to avoid unintentional introduction of invasive species (e.g. through newly imported hardcore or soil and vehicles).</p>	June 2014 – September 2015	Construction Site Manager	N/A	CoCP – Chapter 10 ES – Chapter 8	
	Noise levels	<p>Limit traffic to 20 mph.</p> <p>Operate plant to minimise noise emissions</p> <p>Use modern silenced plant</p> <p>Shut down equipment when not in use</p> <p>Keep shouting and raised voices to a minimum</p>	June 2014 – September 2015	Construction Site Manager	N/A	CoCP – Chapter 6 ES – Chapter 6	
Construction - Site Clearance (soil stripping and vegetation removal)	Damage to habitats and species outside the SSSI site boundary (e.g. habitat loss, encroachment)	<p>Contractors to be made aware of the location of the SSSI</p> <p>Site fence to be kept intact to control incursion of personnel or works vehicles into adjacent habitats</p> <p>Works areas to be sited on habitats of low ecological value (e.g. arable field and or</p>	June – October 2014, April/May 2015	Construction Site Manager	Figures 1 and 2, Appendix 1	CoCP – Chapter 10 ES – Chapter 8	

General Activity	Environmental Risk	Mitigation/ Environmental Control Measures (this list is not exhaustive and detailed mitigation and control measures should be followed as detailed in the CoCP and ES)	Timing	Roles and Responsibilities	Plan Ref.	Cross Reference with CoCP and ES	Action Completed (Y/N)
		<p>improved grassland)</p> <p>Mature trees to be protected</p> <p>Report any incidents that may cause damage to the SSSI to an ecologist</p>					
	<p>Protected or notable species (disturbance) (e.g. habitat loss, noise)</p>	<p>Avoid works during the breeding bird period or undertake a nesting bird check prior to vegetation clearance</p> <p>Carry out work under ecological watching briefs (hand searches and destructive searches) within Great Crested Newt licenced areas (i.e. up to 250 m of ponds 74, 75 and 80)</p> <p>Undertake the works during daytime hours only</p> <p>Provide tool box talks, where necessary</p> <p>Cover excavations overnight or provide ramps to allow animals to escape</p> <p>Rubble, spoil and other materials to be stored off the ground</p>	<p>June 2014 – September 2015</p>	<p>Construction Site Manager Ecologist</p>	<p>Figures 3 and 4, Appendix 1</p>	<p>CoCP – Chapter 6 and 10 ES – Chapter 6 and 8</p>	

General Activity	Environmental Risk	Mitigation/ Environmental Control Measures (this list is not exhaustive and detailed mitigation and control measures should be followed as detailed in the CoCP and ES)	Timing	Roles and Responsibilities	Plan Ref.	Cross Reference with CoCP and ES	Action Completed (Y/N)
		Immediately suspend works if protected species or notable species are found and take advice from ecologist immediately					

6 REFERENCES

Environmental Resources Management (2010) *Accommodation Works at Holts Farm Bridge and Potential Impacts on Wendlebury Meads SSSI, Appendix ASC 4*. Environmental Resources Management, London.

Environmental Resources Management (2009) *The Chiltern Railways (Bicester to Oxford Improvements) Order Environmental Statement: Volume 2, Assessment of Impacts*. Environmental Resources Management, London.

Environmental Resources Management (2013) *Project 0172205 Chiltern Railways (Bicester to Oxford Improvements) Order, Code of Construction Practice – Version 6*. Environmental Resources Management, London.

Department of Environment, Food and Rural Affairs (2011) *Helping to Prevent the Spread of Invasive Non-Native Species, Horticultural Code of Practice*. Department of Environment, Food and Rural Affairs, London.

RSK (2014) *Site Clearance Method Statement – East West Rail Advance Works*. RSK, Helsby.

RSK (2014) *Method Statement for Works within 500 m of Wendlebury Meads and Mansmoor Closes SSSI – East West Rail Advanced Works*. RSK, Helsby.

Wallingford Hydrosolutions Limited (2015) *Network Rail – Home Farm Barn and Access Track, Wendlebury Meads and Mansmoor Closes SSSI*. Wallingford Hydrosolutions Limited, Wallingford.

APPENDIX 1

FIGURES

Figure 1 – Wendlebury Meads SSSI and Core Works Location Plan

Figure 2 – PRow General Arrangement Beebont Bridleway

Figure 2a – Designated Sites within 1 km

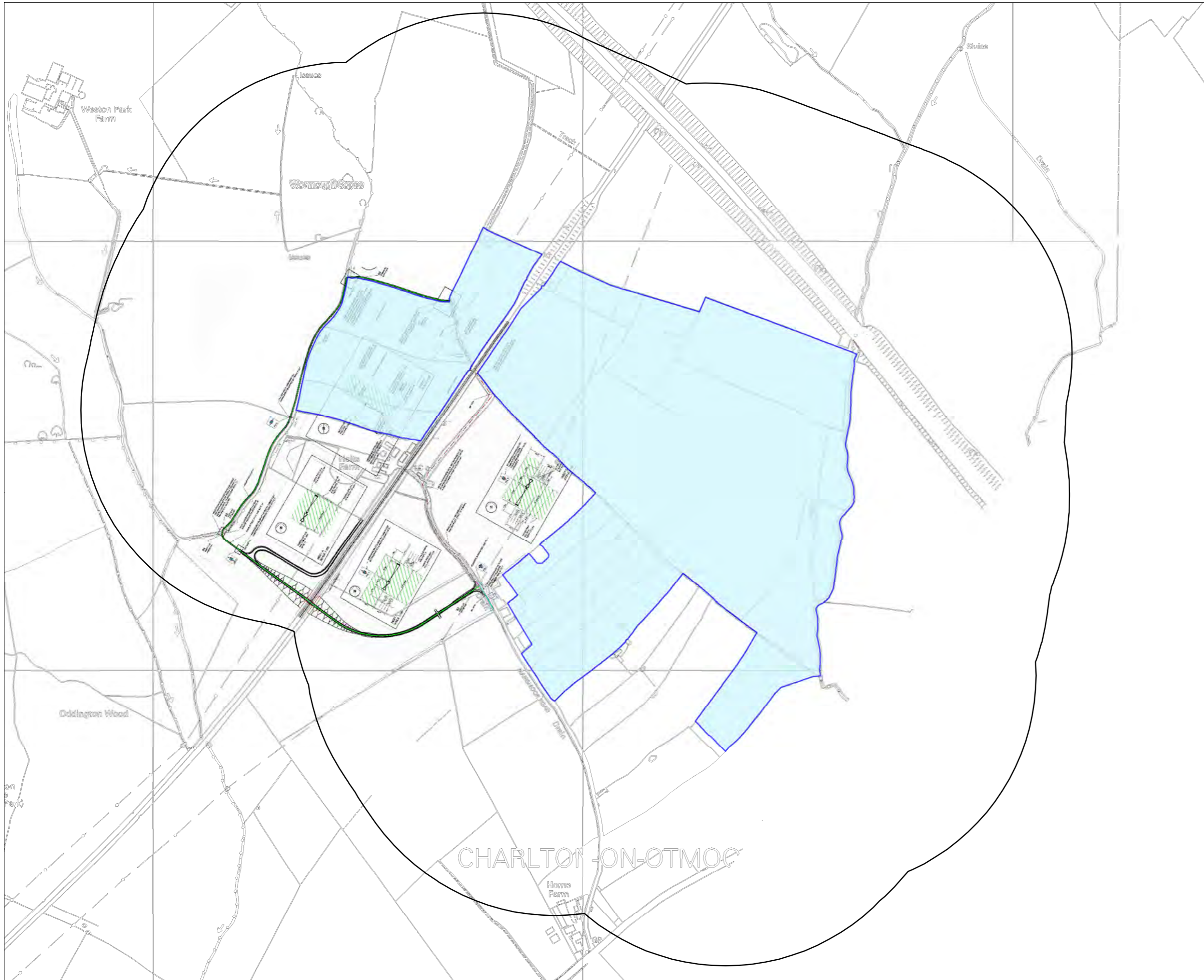
Figure 3 – Meta-population 3 Holts Farm Crossing: Impacts

Figure 4 – Meta-population 3 Holts Farm Crossing: Capture and Exclusion Measures

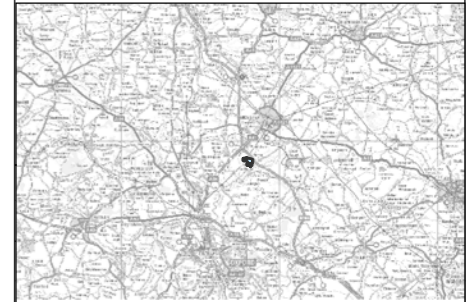
Figure 5 – General Arrangement Holts Farm Accommodation Track Proposed Drainage

Figure 6 – General Arrangement Holts Farm, Railway Line Drainage

Figure 7 – General Arrangement Access Track



Legend:
 Wendlebury Meads SSSI
 500m buffer



Rev	Date	Description	Dm	Chk	App
00	09.05.14	855375	RG	JB	TC

East West Rail



TITLE: Figure 1
 Wendlebury Meads SSSI and
 Core Works Location Plan

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Metres

SCALE: 1:8,500 @ A3

REV 00

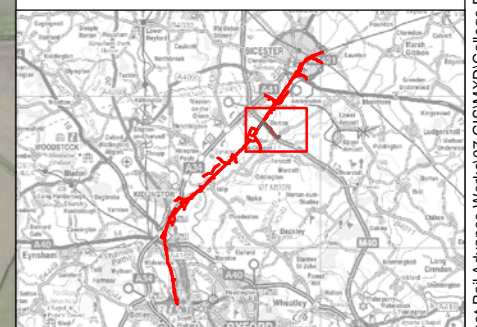


- Legend:**
- Proposed barn and access track
 - Access track
 - 1km buffer
 - Site of Special Scientific Interest (SSSI)
 - Ancient Semi-Natural Woodland (ASNW)
 - Local Wildlife Site (LWS)
 - Wildlife Trust Reserve (WTR)

Warmough Copse LWS & ASNW

Woodside Meadow WTR

Wendlebury Meads and Mansmoor Closes SSSI



Rev	Date	Description	Dm	Chk	App
00	19.02.15	855375	RG	RB	TC

East West Rail

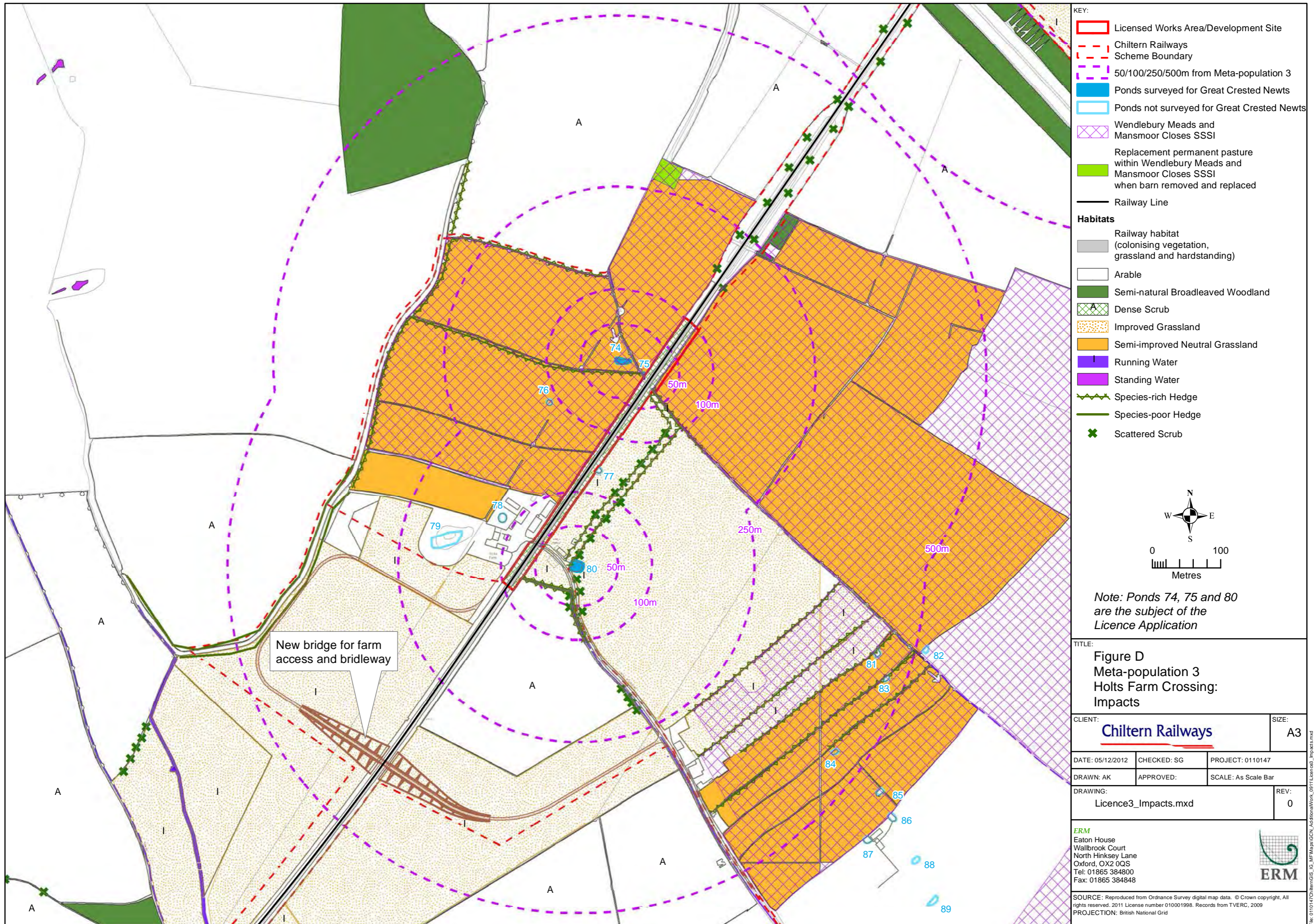
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Designated Sites within 1 km

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Metres

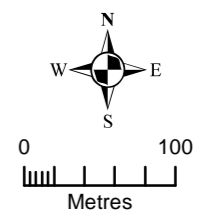
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REV 00

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community



- KEY:**
- Licensed Works Area/Development Site
 - Chiltern Railways
 - Scheme Boundary
 - 50/100/250/500m from Meta-population 3
 - Ponds surveyed for Great Crested Newts
 - Ponds not surveyed for Great Crested Newts
 - Wendlebury Meads and Mansmoor Closes SSSI
 - Replacement permanent pasture within Wendlebury Meads and Mansmoor Closes SSSI when barn removed and replaced
 - Railway Line
- Habitats**
- Railway habitat (colonising vegetation, grassland and hardstanding)
 - Arable
 - Semi-natural Broadleaved Woodland
 - Dense Scrub
 - Improved Grassland
 - Semi-improved Neutral Grassland
 - Running Water
 - Standing Water
 - Species-rich Hedge
 - Species-poor Hedge
 - ✕ Scattered Scrub



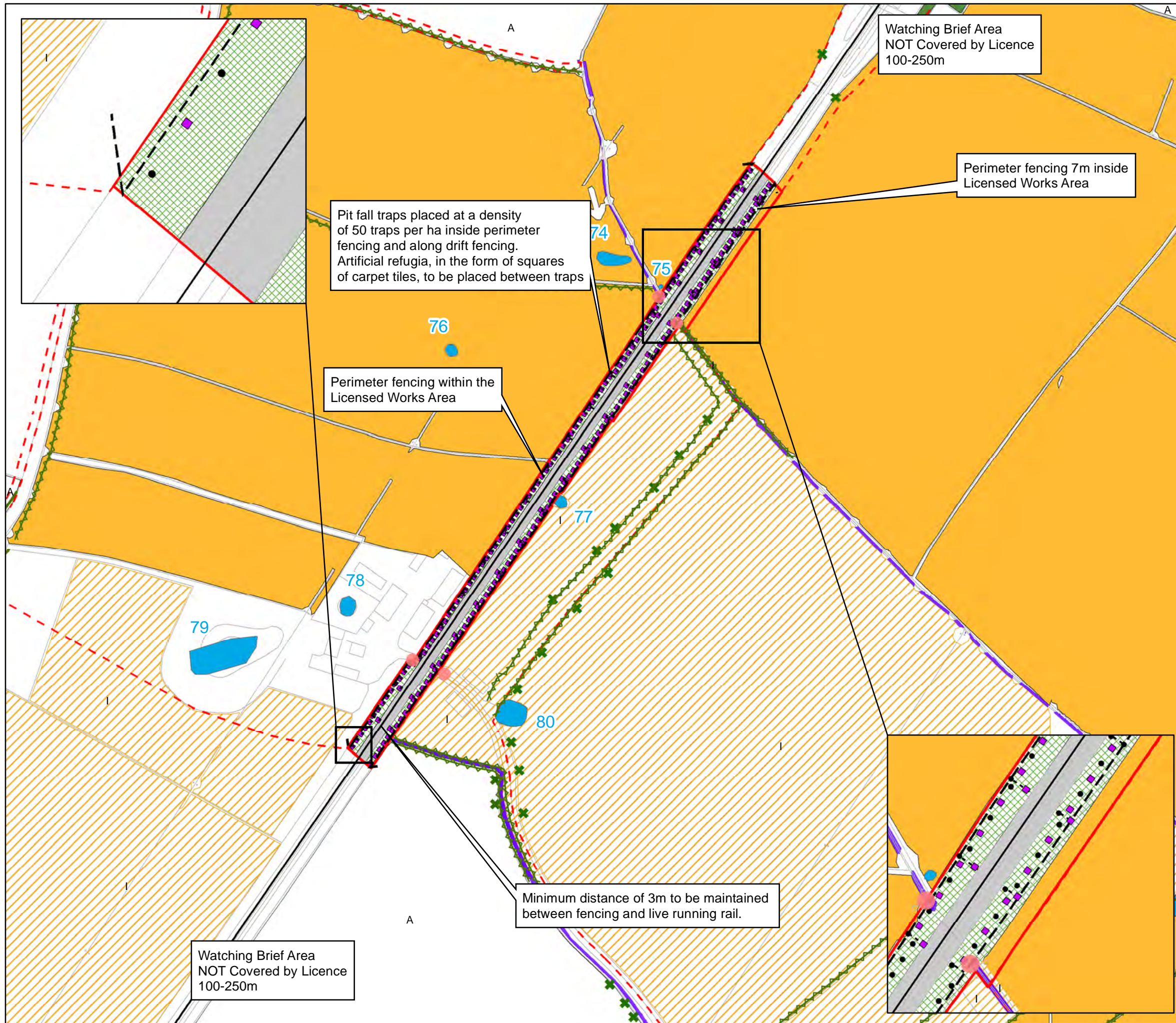
Note: Ponds 74, 75 and 80 are the subject of the Licence Application

TITLE:
 Figure D
 Meta-population 3
 Holts Farm Crossing:
 Impacts

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DATE: 05/12/2012	CHECKED: SG	PROJECT: 0110147
DRAWN: AK	APPROVED:	SCALE: As Scale Bar
DRAWING: Licence3_Impacts.mxd		REV: 0

ERM
 Eaton House
 Wallbrook Court
 North Hinksey Lane
 Oxford, OX2 0QS
 Tel: 01865 384800
 Fax: 01865 384848

SOURCE: Reproduced from Ordnance Survey digital map data. © Crown copyright, All rights reserved. 2011 License number 010001998. Records from TVERC, 2009
PROJECTION: British National Grid



KEY:

- Licensed Works Area/Development Site
- Chiltern Railways Scheme Boundary
- Ponds
- Perimeter Fencing
- Drift Fencing
- Pit fall traps
- Artificial Refugia
- Newt gate/access point

Habitats

- Railway habitat (colonising vegetation, grassland and hardstanding)
- Arable
- Dense Scrub
- Improved Grassland
- Unimproved Neutral Grassland
- Running Water
- Species-rich Hedge
- Species-poor Hedge
- ✕ Scattered Scrub

0 100
Metres

Note: Ponds 74, 75 and 80 are the subject of the Licence Application

TITLE:
 Figure E4(a)
 Meta-population 3
 Holts Farm Crossing: Capture and Exclusion Measures

CLIENT: Chiltern Railways		SIZE: A3
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DRAWN: AK	APPROVED:	SCALE: As Scale Bar
DRAWING: Licence3_CaptureExclusion.mxd		REV: B

ERM
 Eaton House
 Wallbrook Court
 North Hinksey Lane
 Oxford, OX2 0QS
 Tel: 01865 384800
 Fax: 01865 384848

SOURCE: Reproduced from Ordnance Survey digital map data. © Crown copyright. All rights reserved. 2011 License number 010001998. Records from TVERC, 2009
 PROJECTION: British National Grid

B01 SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
 IN ADDITION TO THE HAZARDS/RISKS ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING SIGNIFICANT RESIDUAL RISKS

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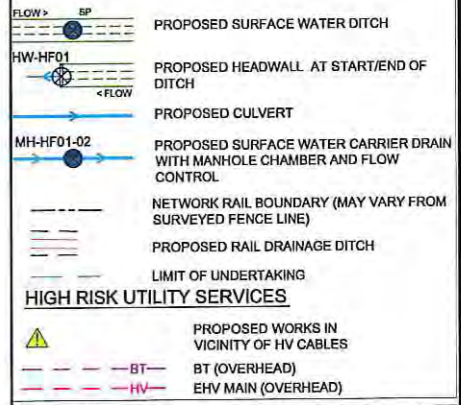
MAINTENANCE/CLEANING
 AS ABOVE. RISK OF BLOCKAGES IN CARRIER DRAINS/CULVERTS AND HYDRO-BRAKES. REFER TO PIPE MANUFACTURER'S INSTRUCTIONS REGARDING JETTING PRESSURE TO AVOID PIPE DAMAGE. SILT TO BE REMOVED FROM MANHOLE CHAMBERS AND DITCHES. REFER TO HYDRO-BRAKE MANUFACTURER'S INSTRUCTIONS REGARDING MAINTENANCE.

USE
 N/A

DECOMMISSIONING/DEMOLITION
 AS CONSTRUCTION

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 Date: 24/03/2014
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 455222

- Notes**
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED. ALL LEVELS ARE IN METRES ABOVE PROJECT DATUM. ALL COORDINATES ARE BASED ON "OBB12 SNAKE GRID".
 - THIS DRAWING IS NOT TO BE SCALED.
 - REFER TO DRAWING SERIES 5114534-ATK-DRG-DR-023312-023314 FOR THE LOCATION AND DETAILS OF ALL CATCHPITS, PIPES AND DITCHES, INCLUDING SETTING OUT POINTS ALONG DITCHES.
 - DRAWING TO BE READ IN CONJUNCTION WITH SPECIFICATION 5114534-ATK-DRE-SPC-020001.
 - REFER TO 5114534-ATK-DRG-DR-020100 AND 020101 FOR CONSTRUCTION DETAILS OF DITCHES AND FILTER DRAINS.
 - FOR DETAILS OF EARTHWORKS (EXCLUDING DITCHES) REFER TO EARTHWORKS DRAWINGS REF 5114534-ATK-DRG-DR-080230 - 080232.
 - TOPOGRAPHICAL SURVEY FROM 5114534-ATK-MOD-SU-000001 TRACK ALIGNMENT FROM 5114534-ATK-MOD-TR-000052.
 - THE SERVICE INFORMATION SHOWN ON THESE DRAWINGS HAS BEEN COLLATED FROM SERVICE RETURNS DATED 12/11/2012 IN RELATION TO THE EAST WEST RAIL CORRIDOR. NO LIABILITY OF ANY KIND WHATSOEVER IS ACCEPTED BY ATKINS LIMITED, ITS SERVANT OR AGENTS, FOR ANY ERROR OR OMISSION IN RESPECT OF INFORMATION CONTAINED ON THE PLANS PROVIDED. THIS PLAN IS A COMPILATION OF A NUMBER OF PLANS PROVIDED AT DIFFERENT SCALES AND IS INTENDED TO PROVIDE A GRAPHICAL REPRESENTATION OF SERVICES WITHIN THE AREA AND IT IS IMPOSSIBLE TO GUARANTEE ACCURACY. IN ADDITION IT IS A COMPILATION OF INFORMATION SUPPLIED BY UTILITY COMPANIES WHO DO NOT GUARANTEE THE ACCURACY OF THE INFORMATION. THE UNDERGROUND SERVICES MUST BE VERIFIED AND ESTABLISHED ON SITE BEFORE ANY EXCAVATION IS CARRIED OUT. IT IS THE RESPONSIBILITY OF ANY ON SITE CONTRACTOR TO IDENTIFY AND LOCATE ANY UTILITY PLANT PRIOR TO DEVELOPMENT WORK GOING AHEAD.
 - THE EXTENT OF ENVIRONMENTAL BARRIERS ADJACENT TO THE CESS IS IN ABEYANCE. THIS MUST BE CO-ORDINATED WITH THIS DRAINAGE DESIGN BEFORE CONSTRUCTION.
 - NO FENCELINE OR LAND BOUNDARIES ARE SHOWN, REFER TO HIGHWAYS DRAWINGS 5114534-ATK-DRG-HW-120105 TO 120106



Rev	Date	Description of Revisions	Drawn	Chkd	Appr
B01	07/02/14	FORM 003 SUBMISSION	SH	ML	ARL

For Approval

Chiltern Railways

Marylebone Station,
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London, W1T 6JZ

Contractor(s)

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West Midlands
B1 1TF

Tel: +44 (0)121 483 5000
Fax: +44 (0)121 483 6333

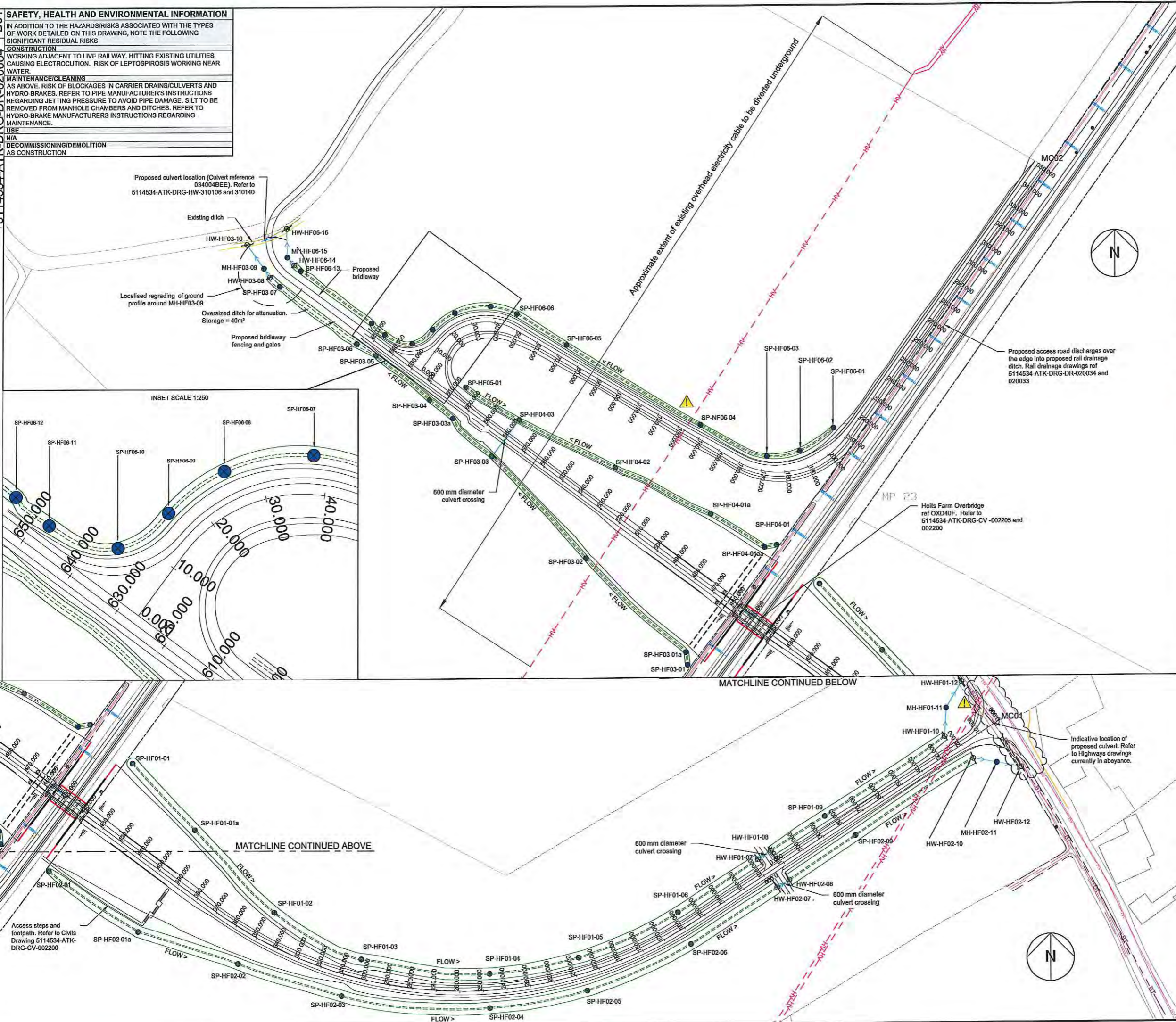
Project

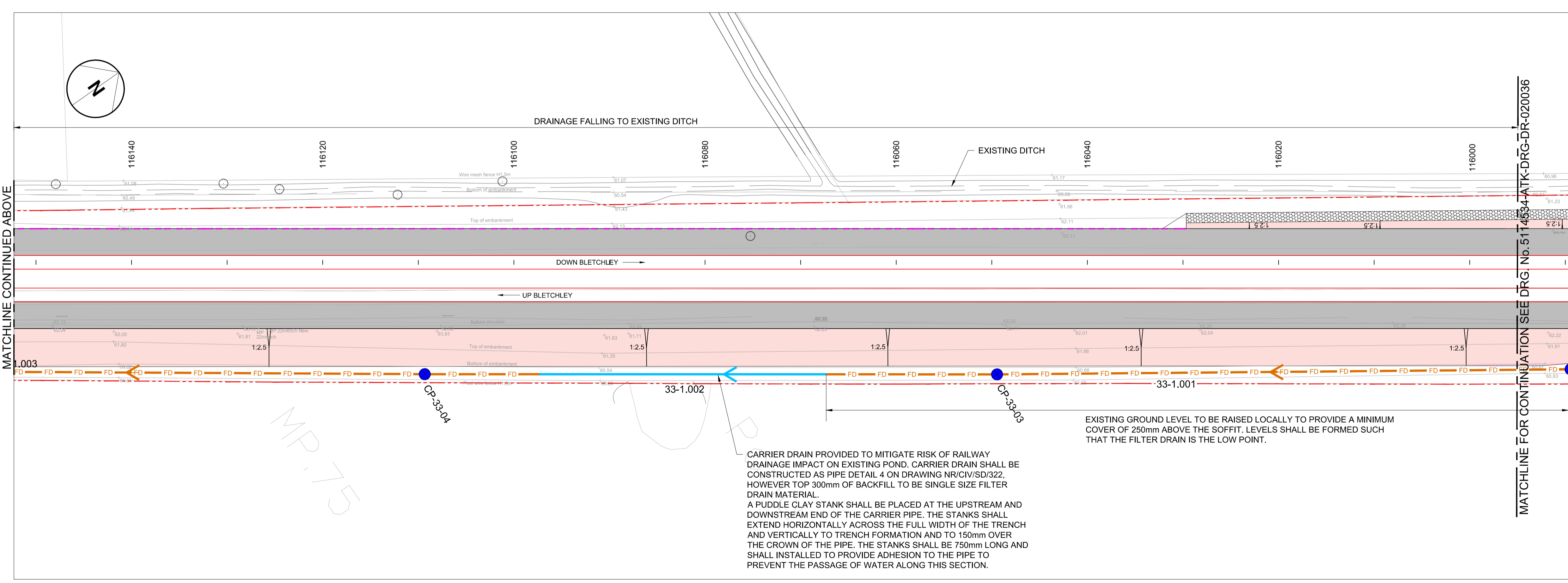
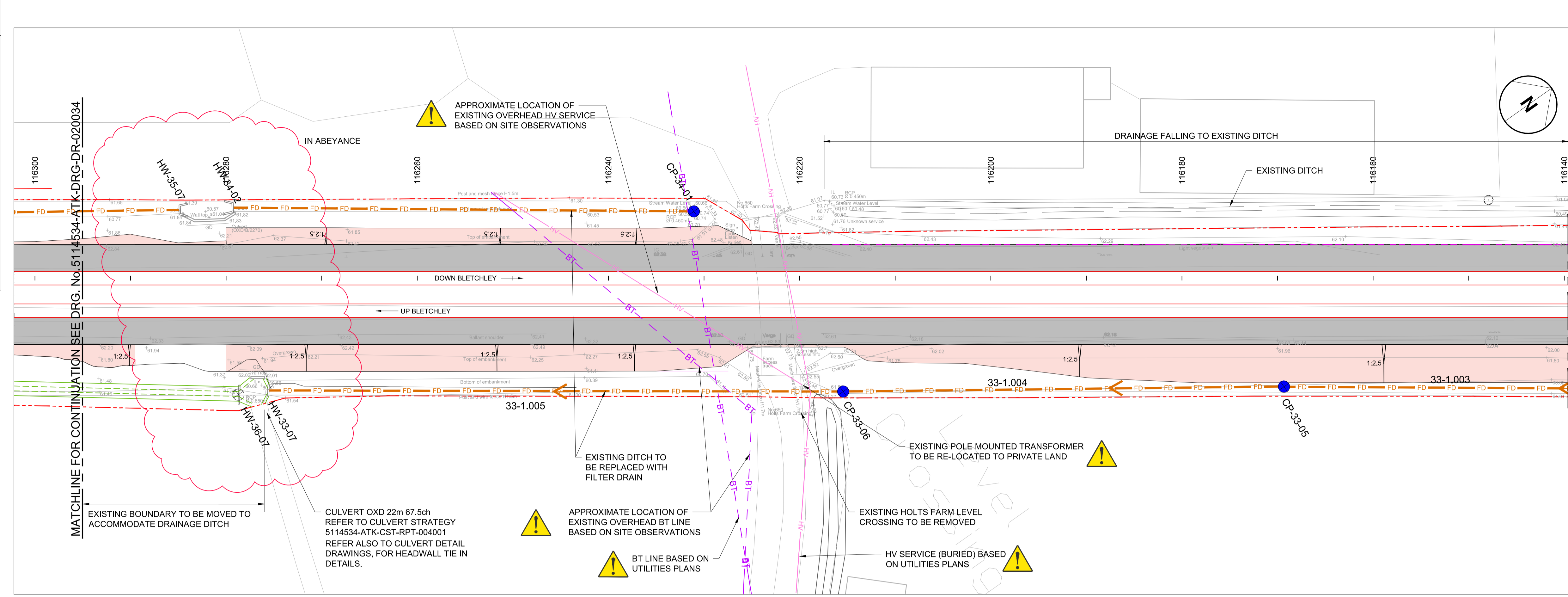
EAST WEST RAIL PHASE 1

Drawing Title

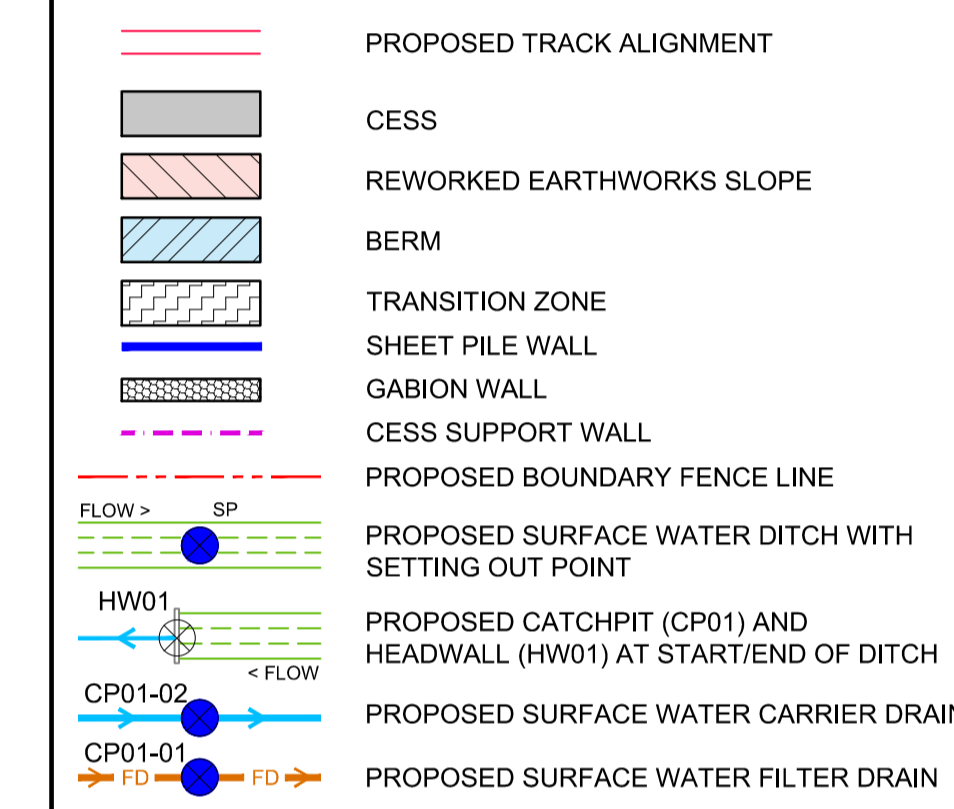
GENERAL ARRANGEMENT
HOLTS FARM
ACCOMMODATION TRACK
PROPOSED DRAINAGE

Designed	S. HASSANI	Signed		Date	21/11/13
Drawn	M. REHMAN	Signed		Date	21/11/13
Checked	M. LAWRENCE	Signed		Date	21/11/13
Approved	A. ROSE	Signed		Date	22/11/13
Scale(s)	1:750	ELR & Mileage	OXD 23M 04C		
Alternative Reference		Sheet	1	of	1
Drawing Number	5114534-ATK-DRG-DR-020064	Revision			





- Legend/Notes
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED. ALL LEVELS ARE IN METRES ABOVE PROJECT DATUM. ALL CO-ORDINATES ARE BASED ON "OBB12 SNAKE GRID".
 - THIS DRAWING IS NOT TO BE SCALED.
 - REFER TO DRAWING SERIES 5114534 - ATK - DRG - DR - 020200 FOR THE LOCATION AND DETAILS OF ALL CATCHPITS, PIPES AND DITCHES, INCLUDING SETTING OUT POINTS ALONG DITCHES.
 - ALL DRAINAGE ELEMENTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE SPECIFICATION 5114534 - ATK - DRE - SPC-020001.
 - CATCHPITS SHALL BE CONSTRUCTED IN ACCORDANCE WITH NETWORK RAIL DRAWING NR/CV/SD/351. FOR INVERT LEVELS REFER TO MANHOLE SCHEDULES (NOTE 3). WHERE THERE IS A DISCREPANCY THE PROJECT DRAWINGS SHALL TAKE PRECEDENCE. 50/351 AND DRAWING 5114534-ATK-DRG-DR-020102.
 - REFER TO 5114534 - ATK - DRG - DR - 020100 AND 020101 FOR CONSTRUCTION DETAILS OF DITCHES AND FILTER DRAINS.
 - FOR DETAILS OF EARTHWORKS (EXCLUDING DITCHES) REFER TO EARTHWORKS DRAWINGS SERIES FROM 5114534-ATK-DRG-GE-001021, INCLUDING CROSS SECTIONS AS CROSS REFERENCED FROM THOSE DRAWINGS. IF THERE IS A DISCREPANCY BETWEEN EARTHWORKS DESIGN AND DRAINAGE DESIGN, THIS SHALL BE DISCUSSED WITH THE DRAINAGE ENGINEER.
 - TOPOGRAPHICAL SURVEY FROM 5114534-ATK-MOD-SU-000001 TRACK ALIGNMENT FROM 5114534-ATK-MOD-TR-000052.
 - EXISTING SERVICES INFORMATION AFFECTING THE INSTALLATION OF THE DRAINAGE SYSTEM IS SHOWN. SERVICE ROUTES ARE BASED ON STATUTORY UNDERTAKERS' INFORMATION, HOWEVER, THE CONTRACTOR SHALL CONFIRM THE LOCATION OF ALL KNOWN AND UNKNOWN SERVICES PRIOR TO COMMENCING CONSTRUCTION WORKS.
 - THE EXTENT OF ENVIRONMENTAL BARRIERS ADJACENT TO THE CESS IS IN ABEYANCE. THIS MUST BE CO-ORDINATED WITH THE DRAINAGE DESIGN BEFORE CONSTRUCTION.



Rev	Date	Description of Revisions	Drawn	Chkd	Appr
B01	06/01/14	FOR APPROVAL FORM 003	MJ	PP	AMR

FOR APPROVAL

Contractor(s)

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Project
EAST WEST RAIL PHASE 1

Drawing Title
**GENERAL ARRANGEMENT
OXD LINE DRAINAGE
Ch 115995 TO Ch 116295**

Designated	Signed	Date
S. NAYLOR	Signed	04/10/2013
M. JOLIN	Signed	04/10/2013
P. PERRY	Signed	04/10/2013
A. ROSE	Signed	04/10/2013

Scale(s) 1:250 ELR & Mileage 115959 TO 116295

Alternative Reference N/A Sheet 35 of 63

Drawing Number 5114534-ATK-DRG-DR-020035 B01

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SERVICES LEGEND:

BT	BT (OVERHEAD)	SCOTTISH SOUTHERN ENERGY (GAS)
CW	CABLE AND WIRELESS	EHV MAIN
HP	GAS (HIGH PRESSURE)	EHV MAIN (OVERHEAD)
IP	GAS (INTERMEDIATE PRESSURE)	HV MAIN
LP	GAS (LOW PRESSURE)	HV MAIN (OVERHEAD)
MP	GAS (MEDIUM PRESSURE)	LV MAIN
GC	GLOBAL CROSSING	LV MAIN (OVERHEAD)
GPSS	GOVERNMENT PIPELINES & STORAGE SYSTEM	SEWER
		WATER SEWER
		VIRGIN MEDIA
		WATER
		WATER MAIN

⚠ FILTER DRAINS SHALL NOT BE TRAFFICKED DURING CONSTRUCTION AND AS PART OF MAINTENANCE. IN SOME LOCATIONS COVER IS REDUCED TO 200mm

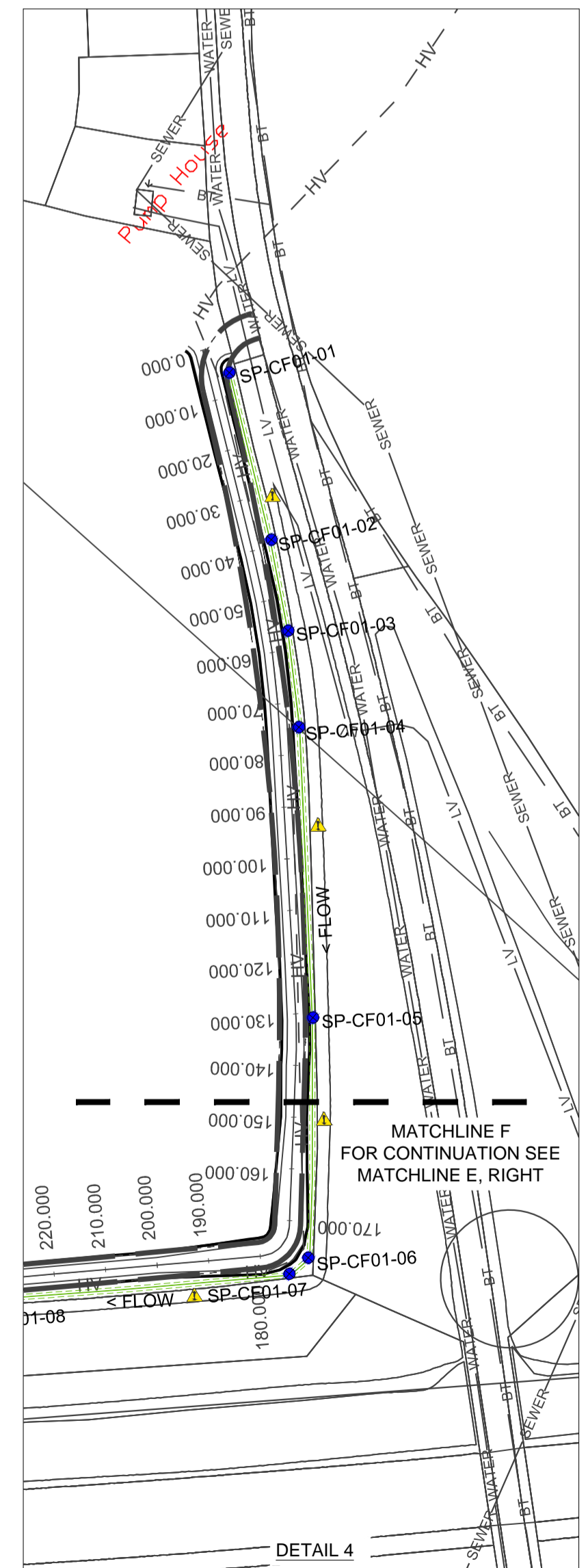
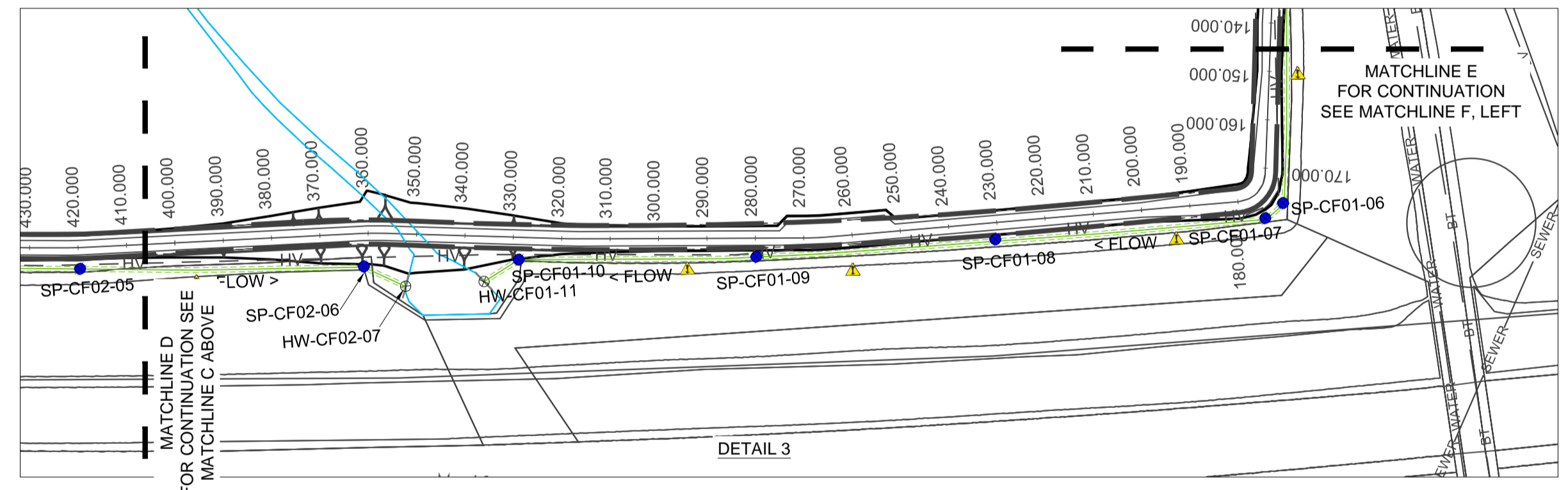
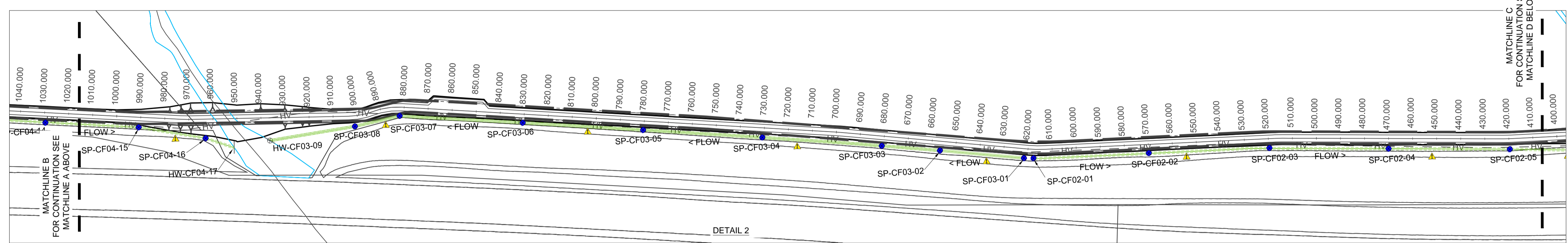
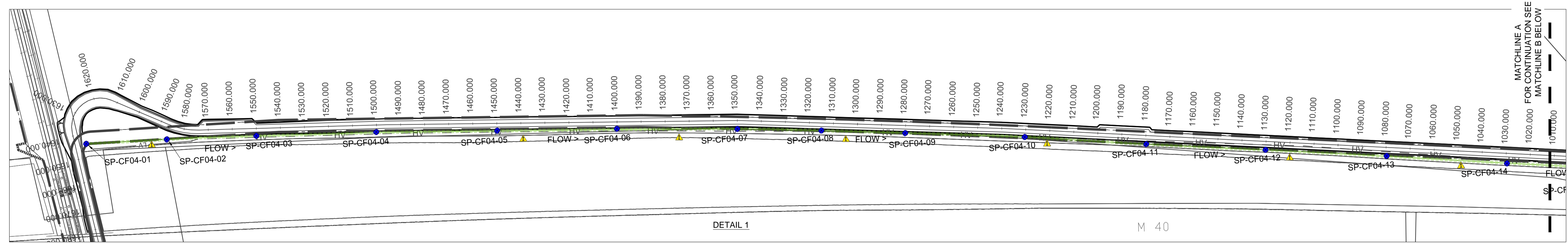
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION

IN ADDITION TO THE HAZARDS/RISKS ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING SIGNIFICANT RESIDUAL RISKS

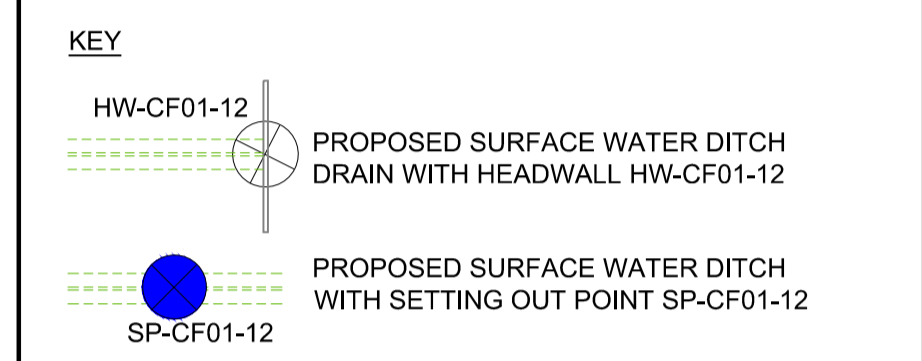
CONSTRUCTION
WORKING ADJACENT TO LIVE RAILWAY, HITTING EXISTING UTILITIES CAUSING ELECTROCUTION, FLOODING (INCLUDING SEWAGE), OR GAS LEAKAGE. RISK OF LEPTOSPIROSIS WORKING NEAR WATER. CONFINED SPACES WORKING.

MAINTENANCE/CLEANING
AS ABOVE. PIPES REQUIRE CLEANING. REFER TO PIPE MANUFACTURER'S INSTRUCTIONS REGARDING JETTING PRESSURE TO AVOID PIPE DAMAGE. SILT TO BE REMOVED FROM CATCHPITS. LIMITED COVER DEPTH - NO VEHICULAR ACCESS

USE
N/A
DECOMMISSIONING/DEMOLITION
AS ABOVE



- Legend/Notes
- ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED. ALL LEVELS ARE IN METRES ABOVE PROJECT DATUM. ALL CO-ORDINATES ARE BASED ON "OBB12 SNAKE GRID"
 - THIS DRAWING IS NOT TO BE SCALED.
 - DRAWING TO BE READ IN CONJUNCTION WITH SPECIFICATION 5114534-ATK-DRE-SPC-020001.
 - HYDRO-BRAKE MANHOLE CHAMBERS SHALL BE CONSTRUCTED IN ACCORDANCE WITH DRAWING 5114534-ATK-DRG-DR-020106. WHERE THERE IS A DISCREPANCY PROJECT DRAWINGS SHALL TAKE PRECEDENCE.
 - REFER TO 5114534-ATK-DRG-DR-020100 TO 020102 FOR CONSTRUCTION DETAILS OF DITCHES AND FILTER DRAINS.
 - ALL RUN LENGTHS ARE MEASURED TO THE CENTRE OF SETTING OUT POINTS AS SHOWN ON THE GENERAL ARRANGEMENT DRAWINGS.
 - THIS DRAWING SHALL BE READ IN CONJUNCTION WITH THE DRAINAGE GENERAL ARRANGEMENT DRAWINGS.
 - WHERE THERE IS A DISCREPANCY WITH COVER LEVELS, THE COVER LEVELS (GROUND LEVELS) PROPOSED ON EARTHWORKS DRAWINGS SHALL TAKE PRECEDENCE.
 - THE SETTING OUT POINTS (E.G. SP-CF01-01) ON THE MANHOLE SCHEDULE PROVIDE THE BED LEVEL OF THE DITCH ON THE CENTRE LINE OF THE CHANNEL PLUS THE PROPOSED TOP OF DITCH (BANK) LEVEL.



- HIGH RISK UTILITY SERVICES
- PROPOSED WORKS IN VICINITY OF HV CABLES
 - BT (OVERHEAD)
 - EHV MAIN (OVERHEAD)
 - LV MAIN

Rev	Date	Description of Revisions	Drawn	Chkd	Appr
01	04/02/15	ISSUE FOR APPROVAL	AM	AS	AR



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EAST WEST RAIL PHASE 1

Drawing Title

**COLLEGE FARM
ACCESS TRACK
GENERAL ARRANGEMENT
SHEET 1 OF 1**

Designed	A. MARKOWYCZ	Signed		Date	03/02/15
Drawn	A. MARKOWYCZ	Signed		Date	03/02/15
Checked	A. SHORT	Signed		Date	03/02/15
Approved	A. ROSE	Signed		Date	05/02/15
Scale(s)	1:1000 ELR & Mileage				



APPENDIX 2

REPTILE METHOD STATEMENT

**Chiltern Railways Bicester to
Oxford Improvements Order**
Reptile Method Statement

August 2013

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Issuing office

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Client	ERM
Job	Chiltern Railways Bicester to Oxford Improvements Order
Report title	Reptile Method Statement
Draft version/final	FINAL
File reference	5288.07_MS_rept_pnke_080813.docx

	Name	Position	Date
Originated	Pete Newbold	Senior Ecologist	06 August 2013
Reviewed	Kerry Elliott	Principal Ecologist	08 August 2013
Approved for issue to client	Kerry Elliott	Principal Ecologist	08 August 2013
Issued to client			08 August 2013

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Nothing in this report constitutes legal opinion. If legal opinion is required the advice of a qualified legal professional should be secured.

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1 Introduction

Background

- 1.1 The Chilterns Railways route between Bicester and Oxford will be subject to essential railway track maintenance works, to be carried out under a Transport and Works Act Order (TWAO), works will include the widening of the existing railway track and the re-profiling of existing railway embankments, scheduled to start in the summer of 2013.
- 1.2 Reptile surveys were undertaken to support the Environmental Impact Assessment for the Scheme, and reported in the Environmental Statement, which accompanied the above TWAO application. These surveys were undertaken in September 2009 (presence/absence surveys of 8 sample sites along the Chiltern Railways line between Bicester and Oxford) and May 2010 (population count surveys in three areas where reptile presence was confirmed).
- 1.3 The results of these surveys are summarised in the table below. Plans showing the locations of the three known reptile sites are provided in Appendix 1.

Table 1: Results of reptile survey

Site	Species	2009 Peak count	2010 Peak count	Population size
Wolvercote tunnel south	Slow worm	3	14	Medium
	Grass snake	0	1	Low
Wolvercote tunnel north	Slow worm	3	6	Medium
	Grass snake	9	3	Low
Langford industrial estate	Slow worm	2	0	None
	Grass snake	0	0	None

- 1.4 The reptile population scores in the above table are based on the peak count of adults observed under artificial refugia placed at a density of up to 10 per hectare, by one person in one day. At the Wolvercote tunnel sites (north and south) refugia were placed at a density of approximately 34 per hectare at the time of the 2010 survey: the population size class assessment is therefore likely to suggest a larger population size than if refugia had been placed at a density of 10 per hectare. Despite the high density of refugia, only very low numbers of grass snakes were recorded at both the Wolvercote Tunnel sites (north and south), along with a low/medium population of slow-worm.
- 1.5 Only very low numbers of slow worm were recorded at the Langford Industrial Estate in 2009. No grass snakes were recorded at the Langford Industrial Estate site during either survey.
- 1.6 Ahead to the start of construction works required under the approved scheme, vegetation clearance will be required in order to remove existing areas of semi-natural habitat and create a clean and barren works footprint. A method of working has therefore been discussed and agreed with Natural England, to be employed by those contractors undertaking pre-commencement vegetation clearance works. This method statement sets out the agreed methods for undertaking the vegetation clearance works and has been prescribed with a view to ensuring the works are undertaken in a manner that can be reasonably expected to avoid breach in protected species legislation relating to the UK's common and widespread species of reptiles.

2 Legislation

- 2.1 The common, widespread species of reptile (slow worm *Anguis fragilis*, grass snake *Natrix natrix*, adder *Vipera berus* and common lizard *Zootoca vivipara*) are protected through Sections 9(1) and 9(5) of the Wildlife and Countryside Act 1981 as amended by the Countryside and Rights of Way Act 2000, making it an offence to:
- a. Intentionally or recklessly kill or injure any reptile
 - b. Sell, offer for sale, possess or transport for the purchase of sale or publish advertisements to buy or sell any reptile

3 Method Statement

- 3.1 Due to the legislation protecting reptiles, and given the nature of the proposed vegetation clearance works, a method statement for the works is necessary to minimise the risk of an offence being committed. In general, the measures to be adopted include the employment of sensitive working techniques and avoidance of damage and/or destruction to suitable reptile hibernating habitat/features. This approach has been discussed in consultation with Natural England and was approved by them in August 2013 (Charlotte Frizzell, Land Use Operations – 2nd August 2013), superseding a previously approved strategy prepared in support of the original TWAO application in 2010¹.
- 3.2 The strategy below is designed specifically for both Wolvercote tunnel south and north where there are medium populations of slow worm and low populations of grass snake, as well as the Langford Industrial Estate site, where very low numbers of slow-worm were recorded.
- 3.3 Whilst populations of reptiles have been identified within discrete areas of habitat within the scheme boundary where it runs between Oxford and Bicester, given the nature of the habitats present and the fact that the railway corridor itself will provide a dispersal corridor for reptiles, it is conceivable that low numbers of reptiles also occur within other areas included within the scheme boundary outside of those identified in Table 1. It is therefore essential that the potential for reptiles to occur elsewhere within the scheme is communicated effectively across the project team to ensure that, where necessary, appropriate precautions are taken elsewhere within the scheme to ensure that no reptiles are intentionally or recklessly killed or injured as part of the works. This includes making all staff/contractors on site aware of the potential for reptiles to occur, how to identify them and the relevant legislation that protects them as detailed in Section 2. This method statement should therefore be circulated to all contractors involved in the project and undertaking construction works.

Method statement principles

- 3.4 The broad principles of this method statement, as discussed and agreed with Natural England, are as follows:
- c. Undertake habitat management works within the sites during the reptiles' active period (i.e. spring/summer) to allow reptiles to safely disperse from the works footprint into areas of retained and suitable habitat adjacent to the Scheme.
 - d. Ensure vegetation clearance works within known reptile areas adopt sensitive techniques, to allow reptiles the opportunity to safely disperse from the areas of works into adjacent and retained habitats.
 - e. Where appropriate an Ecological Clerk of Works (ECoW) will be present during vegetation clearance works to ensure compliance with the method statement.
 - f. Reinstate habitat following completion of the works suitable for reptiles (i.e. scattered scrub and tussocky grassland); including features that can be used by sheltering reptiles (e.g. log piles).

Method statement approach

- 3.5 The vegetation removal will be undertaken in phases and will accord with the methodology below:
- a. Vegetation removal will be undertaken using hand tools (strimmers etc.), and under the supervision of a suitably qualified ecologist, reducing the vegetation height first to approximately 30cm.
 - b. All arisings will then be removed and any exposed features suitable for sheltering reptiles, e.g. log and brash piles, dismantled by hand under the supervision of a suitably experienced ecologist.
 - c. Once the working footprint has been checked and any suitable features removed, the vegetation will be immediately further reduced to a height of 5-10cm and maintained at this

¹ ERM (2010) Chiltern Railways (Bicester to Oxford Improvements) – Reptile Mitigation Plan. ERM, July 2010.

level for the duration of the works (i.e. minimum mowing regime of once every six weeks during growing season)

- d. All vegetation removal will commence closest to the railway corridor and progress outwards to encourage reptile dispersal away from the works area.
- e. The works outlined above will be undertaken at a time of year when the majority of the reptile population are active and thus more able to disperse away from clearance works (i.e. March to September). As detailed above, the works will be supervised by a suitably experienced ecologist.
- f. Vegetation will then be kept unsuitable for reptiles for the duration of the construction works.
- g. Low numbers of grass snakes have been recorded at both Wolvercote Tunnel sites. Where there might be features suitable for breeding grass snake (e.g. piles of grass clippings), their removal will be undertaken in September once hatchlings have begun to disperse. This will also be undertaken in the presence of a suitably qualified ecologist.

- 3.6 Following completion of the works, reptiles will be free to recolonize the reptile sites. This will be encouraged by providing features suitable for sheltering reptiles within the sites (i.e. log and brick piles). Reinstated habitat, where this falls within the reptiles sites, will also be planted with a mosaic of scrub and tussocky grassland such that it provides high quality habitat for reptiles in the same locality in the longer term.

Method statement conclusion

- 3.7 It is considered that the proposed mitigation strategy represents reasonable avoidance measures to avoid harm to individual reptiles that is proportionate to the identified risk of killing and injury during construction works. Through the reinstatement/creation of features suitable for sheltering reptiles, and the provision of high quality habitat suitable for reptiles in the form of a tussocky grassland/scrub mosaic, the extent of suitable reptile habitat offered by the sites will be maintained in the long-term. Reinstated habitat will be like for like in terms of total area, ensuring that there is no net loss of local reptile conservation status in terms of habitat quality, quantity and connectivity.

4 Appendices

Appendix 1: Reptile Site Location Plans



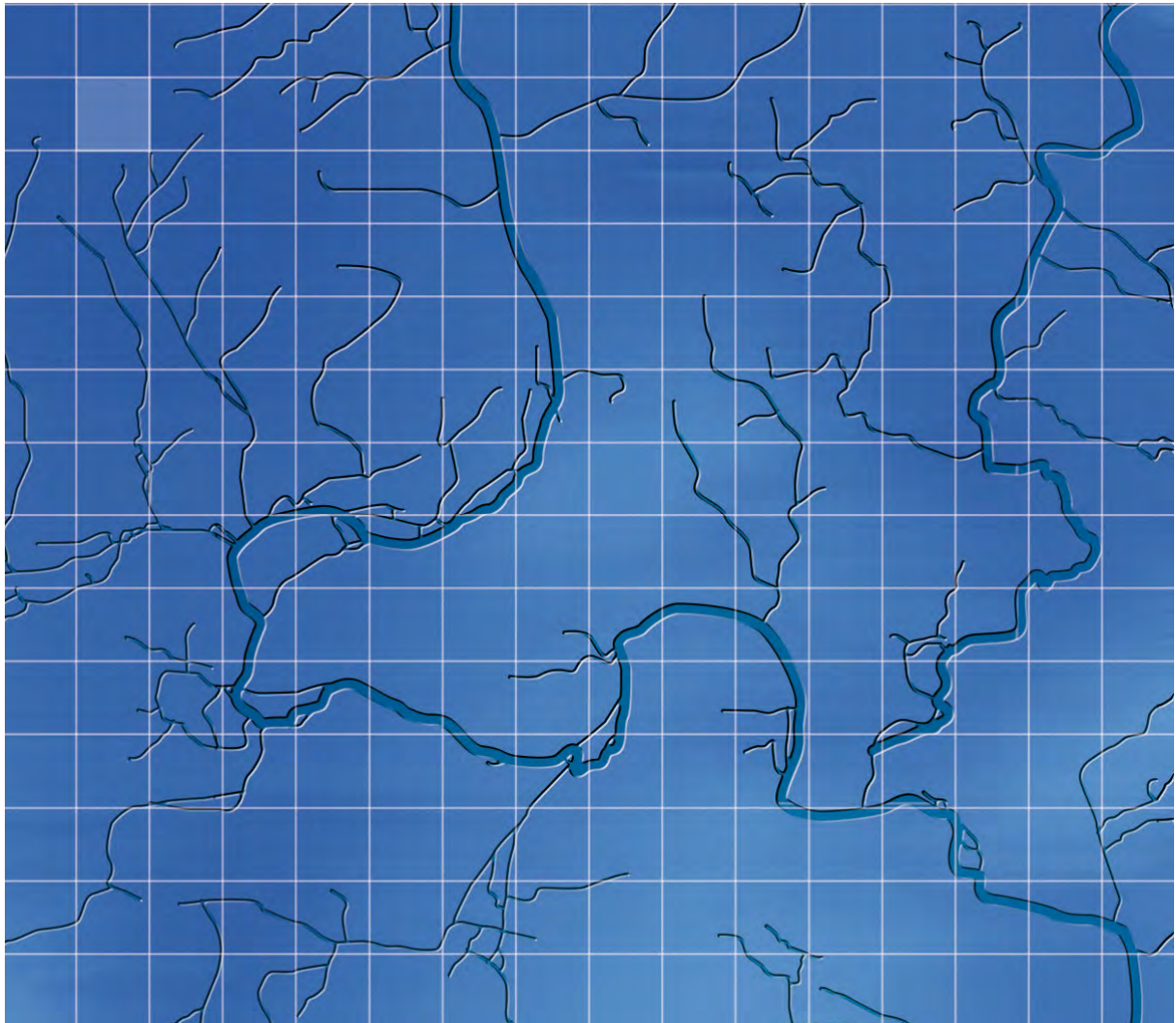


APPENDIX 3 WALLINGFORD HYDROSOLUTIONS LIMITED REPORT

Network Rail - Home Farm barn and access track

February 2015

Wendlebury Meads and Mansmoor Closes SSSI



Wallingford HydroSolutions Limited

Network Rail - Home Farm barn and access track Wendlebury Meads and Mansmoor Closes SSSI

Document issue details

WHS1160

Version number	Issue date	Issue status	Issuing Office
1	20/02/2015	Draft	Wallingford

For and on behalf of Wallingford HydroSolutions Ltd.

Prepared by N. Brisland

Approved by J. Jeans
Position *Senior Consultant*

Date **20 February 2015**

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This report has been produced in accordance with the WHS Quality Management system which is certified as meeting the requirements of ISO 9001:2008 and ISO 14001:2004

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1 Introduction

This report provides an assessment of the impacts of development activities associated with East West Rail Phase 1 project on the Wendlebury Meads and Mansmoor Closes Special Site of Scientific Interest (SSSI). Wallingford Hydrosolutions has been commissioned to assess the impacts the development of Home Farm barn and access track will have on the hydrological integrity of the SSSI as part of the associated planning application. The development activities assessed within this report consist of the construction of a 4m wide unreinforced concrete access track and development of a barn and associated hardstanding located at NGR SP 560179. The total area of development assessed within this report is 945m², the development areas are identified in Figure 1. This report firstly describes the assessment methodology in Section 2, followed by a description of the designated site in Section 3. An assessment of the impacts on the designation and a description of any proposed mitigation is presented in Section 1. A summary of the findings are then presented in Section 1.

2 Methodology

Evaluation of the existing SSSI baseline environment will be assessed through a desk based study considering the following sources of information:

- Natural England SSSI Citation
- OS Mapping at 1:10,000
- LiDAR 2m Topographic Data

Due to the presence of a designated site this area is considered to have a high sensitivity. The assessment of impacts on the surface water and SSSI baseline environment of the development has been conducted using the following process:

1. Examination of infrastructure design and construction methodologies.
2. Identification of potential impacts.
3. For each potential impact, identification of best practice and mitigation measures to avoid, minimise or remedy any adverse effects and enhancement measures to deliver potential positive benefits.
4. Identification of residual impacts and assessment of effects following the implementation of mitigation measures. The residual magnitude of change will be determined using the criteria presented in Table 1.

Table 1: Magnitude of Change

Magnitude	Changes to the Baseline Environment
Large	Long term loss of resource and/or quality; partial loss of or damage to key characteristics, features or elements.
Moderate	Long term measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one or more key characteristics, features or elements; or Short term loss of resource and/or quality; partial loss of or damage to key characteristics, features or elements.
Small	Long term very minor loss or detrimental alteration to one or more characteristics, features or elements; or Short term measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements.
Negligible	Short term very minor loss or detrimental alteration to one or more characteristics, features or elements.
No Change	No loss or alteration of characteristics, features or elements.

The final level of effect of the residual impacts upon the SSSI is defined as a function of the sensitivity of the receptor (high) and the magnitude of change to the baseline environments as presented in Table 2. Moderate or Major effects are deemed significant. Effects that are of a Minor, Negligible change or result in No Change are judged to be not significant.

Table 2: Significance Criteria

Site Sensitivity	Magnitude of Change				
	Large	Moderate	Small	Negligible	No Change
High	Major	Moderate	Minor	Negligible	None

3 Designation

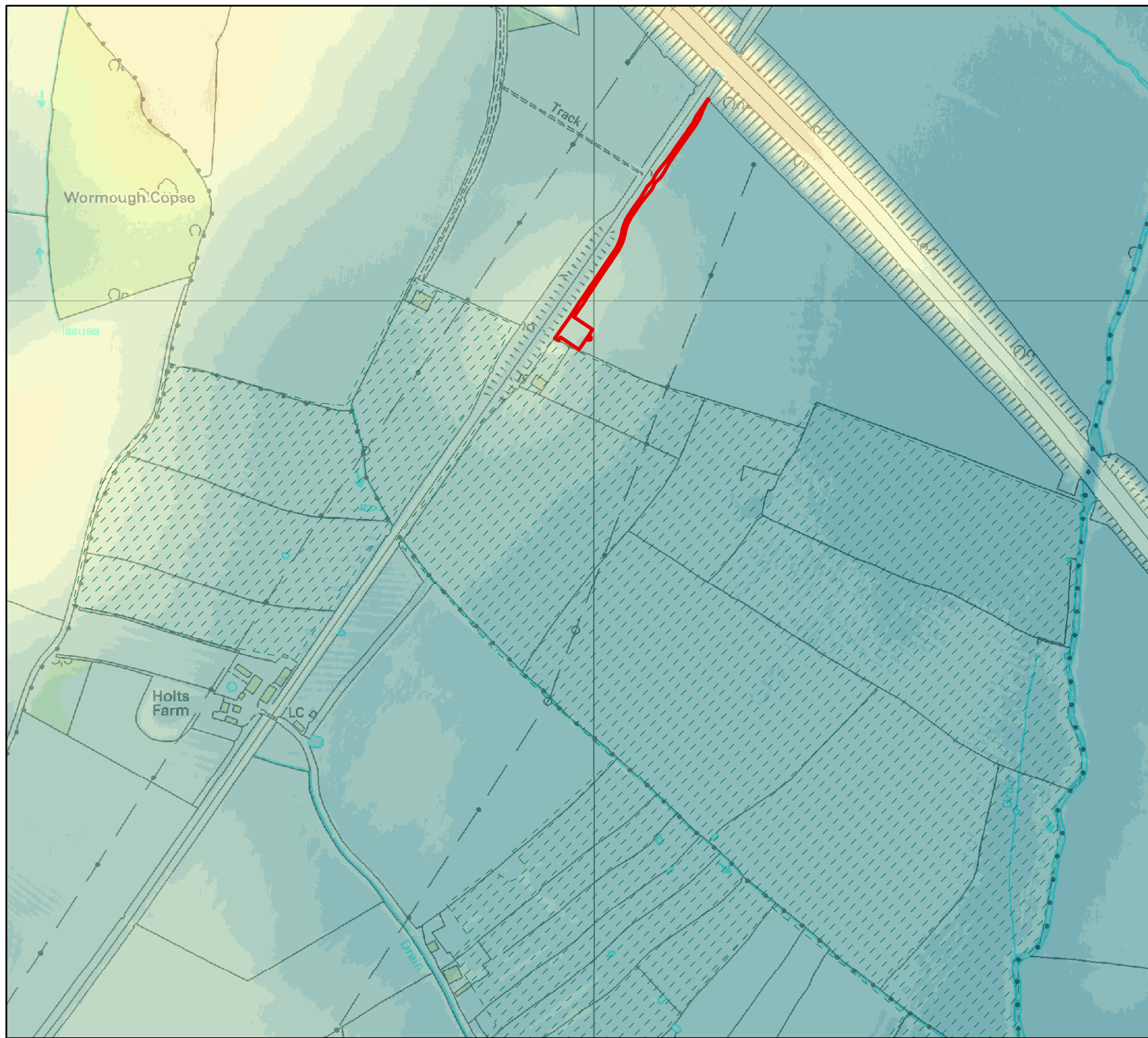
The Wendlebury Meads and Mansmoor Closes SSSI is located approximately 5km south of Bicester, 1.5km southeast of the village of Wendlebury and 100m south of the M4 motorway (approx. 20m at its closest point) as presented in Figure 1. The SSSI lies either side of the railway line, totals 254.1 ha in size and includes 10 fields.

The SSSI consists of a series of traditionally-managed unimproved neutral meadows supporting a complex variety of plant communities¹. The meadows represent a rare calcareous clay pasture community which have increased in rarity as a result of agricultural improvement and urbanisation. The history of the fields is varied with some being used for arable farming during the early 1900’s and others used primarily for summer grazing and haymaking. The use of pesticides and herbicides has been very limited and ploughing has not been undertaken since 1920.

The ridge and furrow fields (historically ploughed) and hayfields contain different grassland and plant species. The hedgerows also provide further habitat not found within the fields themselves. A full description of the plant communities are presented in the SSSI citation in Appendix 1. One field located on the edge of the tributary of the River Ray, consists of the sedge-rich meadow type which is predominantly a western community. This field is the only known place where the community is found growing in association with several ridge and furrow species.

The SSSI is underlain by impermeable Oxford Clay and much of the area is covered by loamy or clayey soil. There are four recognised soil types within the area and short term flooding from the River Ray is common. The area has a gentle downward sloping gradient to the south east with a total elevation change of approximately 7 m. The two highest points are located in the far west of the site (66 m Above Ordnance Datum (AOD)) and northwest point of the eastern section (65 m AOD) as shown in figure 1.

¹ Wendlebury Meads and Mansmoor Closes SSSI Citation. Available at: (<http://designatedsites.naturalengland.org.uk/SiteDetail.aspx?SiteCode=S1001141&SiteName=WENDLEBURY MEADS &countyCode=&responsiblePerson=>)



LEGEND

- Planning Boundary
- ▨ SSSI

Elevation (m)

58 - 59	67 - 68
59 - 60	68 - 69
60 - 61	69 - 70
61 - 62	70 - 71
62 - 63	71 - 72
63 - 64	72 - 73
64 - 65	73 - 74
65 - 66	74 - 75
66 - 67	75 - 76

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Title: Figure 1



4 Assessment of Impacts

This section assesses the potential impacts on the SSSI which could arise as a result of the development described in Section 1. This is then followed by a description of any mitigation measures which would alleviate or reduce the potential impacts. The resultant residual impacts following the implementation of the mitigation measures are then presented.

4.1 Potential Impacts

The development areas for the Home Farm barn, associated hardstanding and access tracks are located alongside the railway line to the north of the SSSI boundary (Figure 1). Therefore the direct potential impacts of the proposed development on the SSSI are on the water quality, surface drainage and flood risk, as detailed below.

4.1.1 Reduced Water Quality

Any reduced water quality within runoff from the proposed access track and barn during construction or in the long term could impact on the plant species of the SSSI resulting in a detrimental effect.

Necessary ground disturbance would occur during the construction period, where the covering vegetation would be disturbed within construction zones, exposing the underlying soils. Temporarily exposed and stockpiled soil offer a readily mobilised source of sediment. The access track and barn are proposed within an agricultural field, which is shown to be ploughed within aerial photography. The exposure of the soils during construction would be no greater than following ploughing, where the exposed soils would cover a much greater area than the constructions zone.

Control of groundwater levels could be required during excavation works for the barn foundations to ensure the excavation do not fill with water. Any direct or pumped runoff from the excavation works is likely to contain very high sediment concentrations.

There would be the potential during the construction period for pollution from accidental spillage, leakage of stored materials, incorrect use of toxic substances and runoff during storm events which could pollute the areas surrounding the construction zone. In the long term use of the barn and hardstanding within animal husbandry could also result in increased nutrient levels within the runoff from these areas. Figure 1 presents the detailed topography of the area on a 2m grid. This is a very flat and dry area (Standardised Annual Average Rainfall: 608 mm) and therefore surface runoff would be limited and slow. The proposed barn and hardstanding are located towards the peak of a small rise in the local topography. Due to the slight ridge along the edge of the field to the south east of the proposed barn, surface runoff from the barn would flow south away from the SSSI.

4.1.2 Surface Drainage and Flood Risk

As noted above the topography of the area, means that runoff from the application boundary would not directly flow into the SSSI. The increased semi-permeable hardstanding and impermeable foundations and track have the potential to increase runoff rates from these areas. The development of the access track and the proposed barn structure are both within Flood Zone 1, meaning that it is not at any significant risk of flooding.

4.2 Mitigation

The following measures would be used to mitigate any potential impacts on the water quality and surface water drainage:

- Best practice construction methods would be followed in accordance with the Environment Agency Pollution Prevention Guidance.
- Cut-off drains would be utilised during construction to ensure that the runoff from the construction area does not enter the SSSI.
- Equipment would be provided to contain and clean up any spills. If any on-site storage of fuels, lubricants or chemicals is required, these would be contained within an area bunded to 110 %.
- Any refuelling of machinery would be within the bund or have secondary containment. Associated pipework would be located above ground and protected from accidental damage.
- Drip trays would be placed under standing machinery.
- Routine monitoring of sediment control measures would be undertaken.
- During excavation activities, surface water flows would be captured through cut-off drains to prevent water entering excavations or eroding exposed surfaces. If dewatering of excavations is required, pumped discharges would be treated before release to the surrounding land away from the SSSI. Measures would be taken to ensure water flowing away from dewatering / washout areas does not re-enter excavations.
- The movement of construction traffic would be controlled to minimise soil compaction and disturbance.
- Correct design of the track and barn drainage is an important element in minimising erosion and the potential for pollution. Long term drainage from the hardstanding and barn would be directed away from the SSSI.

4.3 Residual Impacts

The potential impacts of this development on the SSSI are primarily related to decreased water quality during both construction and long term use of the barn and track. Only a small section of track and barn borders the SSSI boundary. Where the development area does not border the SSSI boundary the risk of pollution of the SSSI is greatly reduced. Any runoff from the construction of the track is likely to be attenuated by the surrounding fields and will not drain directly to the SSSI. The topography of the area is such that runoff would not drain towards the SSSI and mitigation measures will ensure that runoff is directed away from the SSSI. Best practice pollution prevention measures would be followed throughout construction. The changes in water quality are considered to have a negligible magnitude of change resulting in a **negligible** residual impact.

It is considered that there would be no significant increase in flood risk from increased impermeable areas resulting in no significant impact.

5 Summary

The Wendlebury Meads and Mansmoor Closes SSSI is designated for its series of traditionally-managed unimproved neutral meadows supporting a complex variety of plant communities. The development areas, which consist of an access track and new barn lie to the north of the main SSSI and outside of the drainage pathway to the SSSI.

The main potential impacts to the SSSI as a result of the development is through reduced water quality. This is both through the construction of the access track and barn foundations as well as continued use of the track and barn. Through the incorporation of pollution prevention and drainage mitigation measures the impact of reduced water quality is greatly reduced. The residual impacts of the effects of reduced water quality on the SSSI are considered to be of negligible significance.

**Appendix 1 Wendlebury Meads and Mansmoor Closes SSSI
Citation**

The flora is exceptionally diverse with more than 160 plant species present, many of which are widely distributed throughout the site and are intricately mixed within the fields.

As with all suites of meadows there are individual differences resulting from varying drainage patterns, management (summer grazing or hay) and soils. However, the general grassland type of the ridges is that of common bent *Agrostis capillaris*, red fescue *Festuca rubra*, sweet vernal grass *Anthoxanthum odoratum* and quaking grass *Briza media*, together with yellow rattle *Rhinanthus minor*, pepper-saxifrage *Silaum silaus* and devil's-bit scabious *Succisa pratensis*. The furrows are characterised by marsh foxtail *Alopecurus geniculatus*, tufted hair-grass *Deschampsia cespitosa*, amphibious bistort *Polygonum amphibium*, lesser spearwort *Ranunculus flammula*, creeping Jenny *Lysimachia nummularia*, ragged robin *Lychnis flos-cuculi* and lady's smock *Cardamine pratensis*.

Plants confined largely to the hayfields include sneezewort *Achillea ptarmica*, common spotted orchid *Dactylorhiza fuchsii*, dropwort *Filipendula vulgaris*, adder's tongue *Ophioglossum vulgatum*, green-winged orchid *Orchis morio*, common milkwort *Polygala vulgaris*, cowslip *Primula veris* and saw-wort *Serratula tinctoria*. Plants confined to the grazed field are fewer in number and include species typical of poached ground such as yarrow *Achillea millefolium*, daisy *Bellis perennis* and creeping thistle *Cirsium arvense*, all occurring within a species-rich mixture. Plants particularly associated with the sedge-rich meadow include carnation, glaucous, brown, spring and tawny sedges *Carex panicea*, *C. flacca*, *C. disticha*, *C. caryophylla* and *C. hostiana* respectively, occurring with heath grass *Danthonia decumbens* and locally abundant meadow thistle *Cirsium dissectum*. Other plants recorded which are characteristic of traditionally managed grasslands include frog orchid *Coeloglossum viride*, betony *Stachys officinalis*, dyer's greenweed *Genista tinctoria*, spiny restharrow *Ononis spinosa* and great burnet *Sanguisorba officinalis*. There is a particularly diverse flora of dandelions *Taraxacum* spp. with 11 different species currently recorded.

The hedges provide a habitat for other plants not found within the fields. They are mainly composed of hawthorn, with blackthorn and rose also abundant. The hedges with the greatest variety of species are those bordering the Mansmoor Closes and the one alongside the parish boundary. The latter has a total of 14 species recorded including field maple *Acer campestre* and spindle *Euonymus europaeus*, both of which are often associated with long-established hedges.

The bird fauna of Wendlebury Meads includes breeding snipe and curlew. Other species recorded include golden plover, whitethroat, lesser whitethroat, reed bunting, green woodpecker, grasshopper warbler and barn owl. The meadows support large numbers of common butterflies, including meadow brown, hedge brown, small copper, common blue, green veined white and marbled white.