



West Winch Housing Access Road

Chapter 3: Description of the Proposed Scheme

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1 Description of the Scheme

1.1 Introduction

1.1.1 This chapter provides a description of the Proposed Scheme, including a description as to how the Scheme would be constructed, alongside the assumptions used for the basis of assessment where this information is subject to confirmation. This description aligns with that used in the planning application and is consistent with the supporting plans (as identified in Section 3.3 below). The technical/topic assessments presented later in the ES are based upon the description of the Scheme in this chapter.

1.2 Overview of the Proposed Scheme

1.2.1 The Proposed Scheme is located on land to the east of West Winch village, approximately 2km south of the centre of Kings Lynn, Norfolk, between the A47 (northern extent) and the A10 (southern extent), crossing a number of agricultural land parcels. The village of North Runcton is to the east of the Proposed Scheme.

1.2.2 Norfolk County Council is applying for full planning application for the West Winch Housing Access Road (WWHAR) on approximately 68.8 hectares of land, to provide the following:

- A 3.5km long carriageway to the east of West Winch connecting the A47 with the existing A10, providing access to proposed housing development;
- Modifications to the existing Hardwick Interchange and dualling of the existing A47 between Hardwick Interchange and the housing access road;
- The housing access road will be predominantly single carriageway, with a short section of dual carriageway on the approach to the A47 and feature a total of five roundabouts including;



- A partially signalised roundabout junction where the housing access road meets the A47;
- A roundabout on the housing access road providing access to the Hardwick Green (i.e. Hopkins Homes) planned development, plus two roundabout junctions to accommodate connections to further housing development;
- A roundabout at the southern end of the housing access road, providing a connection to the existing A10 with new signalised crossings nearby;
- Treatment of local roads severed by the housing access road including an overbridge at Rectory Lane to accommodate road and bridleway users, and closure of Chequers Lane where it crosses the scheme with an at-grade signalised crossing, to maintain east to west access;
- Modifications to the existing A10 to improve safety and support its repurposing as a local traffic route;
- Construction of drainage features, including basins, and associated maintenance access tracks;
- Landscaping, and connections for non-motorised users;
- Utility diversions, including National Grid gas mains;
- Demolition of Hill Cottages on A47 Constitution Hill; and
- Temporary use of land during construction for working areas, haul routes, site compounds, and storage.

Objectives of the Proposed Scheme

- 1.2.3 The Proposed Scheme is required to facilitate and provide access to the West Winch Housing Allocation, including the proposed Hardwick Green development being promoted by the Housing Allocation in the emerging Local Plan.



- 1.2.4 The existing local highway network does not have sufficient capacity in its current form to accommodate the anticipated growth, therefore additional capacity must be created by providing a new access road.
- 1.2.5 In addition to providing capacity to facilitate housing, the WWHAR aims to accommodate strategic north-south traffic into and out of King's Lynn, improving reliability for road users, removing heavy good vehicles from residential areas and improving highway safety for residents of West Winch and other vulnerable road users to promote the use of sustainable travel modes.
- 1.2.6 The objectives for the Proposed Scheme are:
- To drive economic growth by supporting housing delivery, employment growth and Levelling Up in King's Lynn
 - To enhance the A10's role as a strategic link supporting the wider King's Lynn economy
 - To provide a more resilient road network to improve journey time reliability and safety for all users
 - To improve the quality of life for residents of West Winch by reducing the volume of non-local journeys through the village
 - To provide better conditions in West Winch and along the A10 for travel by non-motorised modes
 - To increase active mode connectivity with the wider public transport network
 - To reduce carbon emissions and improve local air quality by alleviating congestion, supporting the decarbonisation agenda
- 1.2.7 The logic map below shows how the scheme objectives link to the problems identified and the impact of not changing:
- Reducing congestion



- Supporting economic growth and regional rebalancing
- Supporting housing delivery
- Supporting all road users
- Supporting the SRN

1.2.8 The map steps through a number of components in line with DfT guidance ([Logic mapping: hints and tips guide \(tavinstitute.org\)](https://www.tavinstitute.org/)).

- Problem/context - the problems identified when establishing the need for intervention
- Inputs - what is invested e.g. money, skills, people, activities
- Output - what has been produced
- Outcomes - short and medium-term results
- Impact - long term outcomes (this are the scheme objectives)

Table 1-1 Logic Map

Problem/Context	Inputs	Outputs	Outcomes	Impacts (Scheme Objectives)
Levels of housing supply causing increase in house prices and limiting economic growth	Development of housing Development resources Implementation resources Funding for transport intervention	4,000 dwellings Creation of regional construction jobs	Increase local and regional employment labour pool Increase local economic activity through job creation Increase living standards, creation of new communities Unlock further local investment facilities and infrastructure to complement housing e.g. schools and businesses Increase home ownership Increase disposable income Increase local purchasing power	Drive economic growth by supporting housing delivery and employment growth in the region
Supply of affordable housing	Development of housing Development resources Implementation resources Funding for transport intervention	20% of dwellings are affordable Creation of regional construction jobs	Increase local and regional employment labour pool Increase local economic activity through job creation Increase living standards, creation of new communities Unlock further local investment facilities and infrastructure to complement housing e.g. schools and businesses Increase home ownership Increase disposable income Increase local purchasing power	Drive economic growth by supporting housing delivery and employment growth in the region

Problem/Context	Inputs	Outputs	Outcomes	Impacts (Scheme Objectives)
Dependency of housing on transport infrastructure	Development of housing Development resources Implementation resources Funding for transport intervention	Housing access road provides access to the allocated housing site	Increase road capacity to support further housing delivery Prevent new communities from isolation	Drive economic growth by supporting housing delivery and employment growth in the region
Congestion on local road network is holding back economic activity	Development of housing Development resources Implementation resources Funding for transport intervention	Localised dualling of the A47 between the WWHAR and the A10/A47 Hardwick Interchange junctions	Improve the reliability of journey times Improve economic prosperity by enhancing connectivity between major cities	Provide a more resilient road network to improve journey time reliability and safety for all users
Congestion on local road network is holding back economic activity	Development of housing Development resources Implementation resources Funding for transport intervention	WWHAR to become alternative to the existing route through West Winch Modification of the Hardwick Interchange	Improve journey times and reliability making the region more attractive for investment and business growth Improve connectivity and journey times, enhancing regional labour mobility Improve connectivity and journey times boosting visitor numbers supporting tourism and the local economy Increase road capacity helping to address seasonal congestion e.g. tourism seasons Unlock further housing and infrastructure developments restricted by poor regional road capacity	Improve the quality of life of residents of West Winch by reducing the volume of non-local journeys through the village Enhance the A10's role as a strategic link supporting the wider King's Lynn economy Provide a more resilient road network to improve journey time reliability and safety for all users Provide better conditions in West Winch and along the A10 for travel by non-motorised means

Problem/Context	Inputs	Outputs	Outcomes	Impacts (Scheme Objectives)
Congestion negatively influencing the quality of life for local residents and road users	Development of housing Development resources Implementation resources Funding for transport intervention	WWHAR to become alternative to the existing route through West Winch	Less congestion will provide better conditions to encourage local trips to be made by non-motorised means (walking and cycling) or public transport and better air quality for residents Existing isolated communities will have increased local and regional road links Improve road safety Reduction in time spent commuting increasing leisure time Improve the reliability of journey times	Improve the quality of life of residents of West Winch by reducing the volume of non-local journeys through the village Seek to minimise environmental impacts of intervention Provide better conditions in West Winch and along the A10 for travel by non-motorised means



1.3 Proposed Scheme Description

Document and Drawings

1.3.1 The Proposed Scheme is illustrated by a series of drawings produced to support and submitted with the planning application, which are summarised below:

- Site location plan (Chapter 1: Introduction);
- General Arrangement plan (Figure 1-1);
- Cross Sections Drawings for A47(Figure 1-2 and Figure 1-3);
- Cross Section Drawings for HAR (Figure 1-4);
- Cross Section Drawings for Rectory Lane (Figure 1-5);
- Landscaping Design Plans (Chapter 9: Landscape, Appendix 5); and
- Drainage Design Plans (Appendix 11.1.H).

1.3.2 These plans are supported by a series of design principles which provide supplementary detail. These design principles are outlined below alongside any necessary assumptions for the purposes of assessment.

Planning Application Boundary

1.3.3 All areas of land required temporarily or permanently for the construction and operational activities of the Proposed Scheme would be contained within the General arrangement Plan illustrated in Figure 3.1. The Environmental Impact Assessment (EIA) is based upon this Site Location plan and includes;

- Red Line Boundary (RBL): The areas represent the site boundary and contain Proposed Scheme design with all the construction work proposed to be undertaken as outline in this chapter; and
- Grey Line Boundary: Represents the current Scheme design.



Proposed Scheme Layout / land use

- 1.3.4 The main elements of the Proposed Scheme are summarised above in Section 3.2 of this chapter and are shown on Figure 3-1: General arrangement plan. As is usual for this type of planning application, the EIA is based upon a preliminary design. In the absence of a detailed design, the EIA is therefore predicated on the application of a number of maximum design parameters, which are intended to represent a reasonable 'worst case scenario'. This enables the likely significant environmental effects to be identified, whilst maintaining sufficient flexibility for the detailed design. These parameters are described within each of the technical chapters where appropriate.
- 1.3.5 The total area of land required for the construction and operation of the Proposed Scheme would be 68.8 ha.
- 1.3.6 The Proposed Scheme includes alterations to Hardwick Interchange, including the following:
- Removal of the Constitution Hill satellite roundabout;
 - Provision of new east-facing slip-roads connecting the main A47 carriageway with the interchange's circulatory carriageway below; and
 - Minor re-configuration of the southern part of the circulatory carriageway together with re-timing of the interchange's traffic signals.
- 1.3.7 The Proposed Scheme also includes the dualling of the A47 north of the existing alignment between Hardwick Interchange and the proposed A47/housing access road roundabout.
- 1.3.8 The Proposed Scheme then includes the provision of a signalised roundabout at the A47/housing access road roundabout.
- 1.3.9 South of the A47/housing access road roundabout is the Hardwick Green Access Roundabout. This roundabout provides access from the WWHAR to the Hardwick Green site. The northern arm of this roundabout is dualled up to the A47/housing access road roundabout.



1.3.10 The Proposed Scheme then includes a single carriageway road (WWHAR), that travels south towards the existing A10. Along this route, there are two additional roundabouts proposed (Metacre Roundabout and Zurich Roundabout), that will provide access to the West Winch housing site.

1.3.11 The Proposed Scheme also includes access to existing side roads through the provision of a low-speed vehicular bridge over the WWHAR along Rectory Lane, with a shared footway/cycle way on one side. There is also provision for non-motorised access at chequers lane, including Manor Farm access.

1.3.12 The Proposed Scheme then ties in to the A10, with a roundabout to facilitate housing access.

Proposed Demolition

1.3.13 Construction of the Proposed Scheme would require demolition of two dwellings– Hill Cottages on A47 Constitution Hill.

Drainage Strategy

1.3.14 No foul water drainage is required. Refer to the proposed drainage strategy (Appendix 11.1.H) for further information.

1.3.15 The Proposed Scheme will adopt the principles of Sustainable Urban Drainage Systems (SuDS) and follow the drainage hierarchy as set out in CIRIA C753 'The SuDS Manual' (**Ref. 3.3**). On-site infiltration testing has shown limited infiltration potential and variable groundwater levels. The Site has an existing network of drainage ditches that will be utilised as outfalls. It is envisaged that the storm water generated from the road will be collected by a series of filter drains, gullies and drainage kerbs where it will be discharged to a series of minimum 225 mm diameter below ground pipes. The drainage network will be designed under full pipe/drain conditions to accommodate the 1 in 2-year storm event. The network will also be designed to ensure that no surcharging occurs in the 1 in 5-year storm event and no flooding in the 1 in 30-year return period storm.



1.3.16 Storm water will be attenuated in a series of basins, which will have an integral sediment forebay. Discharge to the receiving watercourses will be limited to the greenfield QBAR or mean annual flood rate or 2l/s/ha whichever is the greater for each catchment. It is proposed that the drainage system for the National Highways element of the Proposed Scheme and the local highways adopted element will have separate and self-contained drainage systems.

1.3.17 The SuDS treatment drains will ensure that the drainage system meets the requirement of the CIRIA C753 simple indices approach for mitigation of pollutants, a Highways England Water Risk Assessment Tool (HEWRAT) assessment is also underway to ensure that pollution mitigation requirements are in-line with National Highways requirements for the National Highways element of the road.

Lighting strategy

1.3.18 The Street lighting design includes for the A47 and dualled section of the HAR, inclusive of the Hopkins roundabout. The only other area Street lit is Chequer's Lane pedestrian crossing which has 3 Lighting Columns on either side.

Biodiversity Strategy

1.3.19 The Proposed Scheme has the potential to have adverse impacts on habitats, species and sites (referred to as Important Ecological Features) during construction and during the operation of the Proposed Scheme once completed. Mitigation measures have therefore been embedded within the design of the Proposed Scheme and have been put forward as additional mitigation measures that will be secured through planning condition and delivered during detailed design and construction.

1.3.20 Embedded mitigation includes the provision of landscaping that will reduce impacts on certain species and provide compensatory habitat to reduce the impact of habitat loss. This includes habitat planting to reduce collision risk as well as extensive woodland and hedgerow creation that will contribute to the



compensation for the loss of priority habitats. In addition, the boundary of the Proposed Scheme and location of features such as drainage ponds have been adapted to avoid sensitive areas and reduce the impact of habitat loss that will occur during the construction phase. The drainage strategy also identifies measures to reduce the potential for pollution during operation of the Proposed Scheme. The design of the A47 underpass has focussed on maintaining the connectivity for wildlife including bats.

- 1.3.21 Measures to reduce impacts during construction are also presented that will avoid water-borne pollution and reduce dust pollution during construction. Measures to protect retained trees and habitats are also presented.
- 1.3.22 Additional mitigation is proposed that will be designed and provided as the detailed design progresses. This includes additional mitigation during construction that will be detailed within a Construction and Environmental Management Plan. This will also detail the measures required to ensure that impacts upon legally protected species are designed and implemented. In advance of construction, a licence from Natural England will need to be sought for Great Crested Newts and it is anticipated that the District Level Licensing scheme will be used. The landscape proposals will also be developed further to ensure that the areas of compensatory habitat are designed to optimise their ecological value. A Landscape and Ecological Management Plan will be produced to detail these design measures and the ongoing management requirements. To reduce the impact of lighting during operation of the Proposed Scheme a sensitive lighting strategy will be design that will reduce impacts upon sensitive areas and reduce impacts on sensitive species such as bats. An offsite reptile receptor site will also need to be identified and secured in advance of construction to ensure that reptiles are able to be relocated from construction areas.
- 1.3.23 Accounting for the embedded and additional mitigation measures, the Proposed Scheme is anticipated to have residual significant effects at a Local scale on habitats due to habitat loss and bats due to lighting and noise disturbance.



1.3.24 A Biodiversity Net Gain Assessment is being completed to determine whether the Proposed Scheme will achieve 10% net gain in biodiversity. It is anticipated through previous interim assessments that the Proposed Scheme will not achieve the 10% net gain target and it is expected that a net loss will be calculated. Therefore, offsite habitat creation will need to be secured to ensure that that 10% target is achieved. This is likely to be secured through a planning condition.

Landscape Strategy

1.3.25 The proposed landscape scheme has been designed to deliver greater structural and species diversity than is currently provided by the largely intensive agricultural management that exists within and adjacent to the Proposed Scheme.

1.3.26 The following specific landscape mitigation measures are embedded within the Proposed Development:

- Retention, protection and enhancement of existing trees, hedgerows and woodland where possible, to maintain the existing landscape character of the local area;
- Provision of new native tree belts to provide visual enclosure and to screen views from sensitive receptors in close proximity to the PDS;
- Provision of new lengths of native hedgerow, some with native trees, surrounding the proposed development, to provide visual enclosure and enhance the setting of nearby residential properties and public rights of way within or in close proximity to the PDS;
- Provision of scattered native tree planting to break up the massing of the proposed development; and
- Enhancement of site boundary margins, through proposed species rich grassland in line with ecological requirements.



1.3.27 Additional measures that could be secured by condition:

- Management of existing and proposed landscape features during the lifetime of the Proposed Development.

Embedded (primary) Mitigation

1.3.28 **Table 1-2** below describes the proposed 'embedded' (environmental design) mitigation measures that are considered to be an inherent part of the Proposed Scheme i.e. the project design principles adopted to avoid or prevent adverse environmental effects. These embedded (primary) mitigation measures should not be confused with additional (secondary and tertiary) mitigation proposed in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment, which are described within each technical chapter.

Table 1-2 Embedded (Environmental Design) Mitigation Measures

Environmental Factor	Embedded (Environmental Design) Mitigation Measure
Air Quality	<p>Embedded mitigation measures and best practice included within the Proposed Scheme during construction (OCEMP in Appendix 18-1) include:</p> <ul style="list-style-type: none"> • Storage of potentially dusty materials as far as practicable from sensitive receptors and with appropriate screening/containment to minimise dust emissions; • Promptly clear any spillages of potentially dusty materials; • Minimise material drop heights and avoid double handling; • Enforcement of vehicle speed limits on site; • Regular inspection and maintenance of haul road surfaces; • Damping down of unpaved surfaces during dry conditions to minimise dust emissions; • Wheel washing; • Regular inspections of unpaved surfaces; • Ensure all loads of potentially dusty materials leaving the site are covered to prevent dust emissions/loss of materials during transit; • Regular inspection and cleansing of all paved surfaces including the public highway in the vicinity of site access points; and • Use vacuum sweepers for cleaning of hard paving/public highway as deemed required. <p>There are no design measures to specifically mitigate operational effects in relation to air quality.</p> <p>Additional measures relating to operations, construction; track out and earthworks are provided in Volume 1, Chapter 6: Air Quality of this ES.</p>
Ecology	<p>The following specific ecology mitigation measures are embedded within the Proposed Scheme:</p> <p>Drainage Design</p> <p>The location of drainage and attenuation ponds has been revised throughout the Scheme to reduce the loss of HPI. The location of these changes has been discussed individually within Volume 1, Chapter 8: Ecology.</p> <p>The proposed drainage strategy will utilise SuDS components to manage the surface run-off entering the watercourses, ensuring that water quality treatment and pollution control requirements are met. Prior to discharging into watercourses, surface water run-off will be conveyed within a network of swales before discharging into attenuation ponds/basins. These ponds, which will support emergent and submerged vegetation along their shoreline and in shallow zones, provide both attenuation and enhance treatment processes. Therefore, this embedded mitigation design will control the levels of suspended sediment and pollutants entering the watercourse, reducing impacts and effects on aquatic macroinvertebrates and fish.</p> <p>Area Southeast of Hardwick Interchange</p> <ul style="list-style-type: none"> • The location of the attenuation pond southeast of the Hardwick Interchange been amended to its current position further west to potentially reduce woodland habitat loss and potentially avoid impacting upon ponds containing great crested newts. The retention other habitat would also mitigate the effect of habitat loss upon protected and notable species, including birds, bats and reptiles, • Compensatory planting has been incorporated into the landscape proposals. The plans incorporate woodland planting and it is envisaged that woodland rides, glades, ponds and other features will be incorporated at detailed design stage to create areas with ecological complexity.
Ecology	<p>A47 Embankments and Verges</p> <ul style="list-style-type: none"> • Replacement woodland and hedgerow planting has been incorporated into the landscape proposals that will run parallel to the widened road on the southern and northern embankments of the A47. This will allow replacement of the existing habitats as it is assumed that these areas will need to be cleared to facilitate construction of the proposed Scheme.

Environmental Factor	Embedded (Environmental Design) Mitigation Measure
Ecology	<p>A47 Underpass</p> <ul style="list-style-type: none"> • Static bat detector data from the A47 underpass recorded the highest number of bat call registrations throughout the survey area. The majority of activity was attributed to Common and Soprano Pipistrelle. Myotis species and Brown Long-eared Bat were also recorded in relatively high numbers compared with the rest of the static detector locations. Barbastelle Bats were recorded at this location; however, the numbers were very low. Crossing point surveys at this location also recorded continuous foraging through the underpass and using surrounding woodland rides and habitat. Species recorded during crossing point surveys were Common and Soprano Pipistrelle, and Brown Long-eared Bat. Barbastelle were not recorded during the crossing point surveys. Bats were very rarely recorded at road height and at risk of vehicle collision, with the majority using the tunnel to pass under the A47. • The existing underpass is round structure, constructed of corrugated metal and concrete. Photographs of the tunnel entrances are presented in Appendix F. It is approximately 4.1m high, 6m wide and 35m long. The tunnel entrance on the northern extent is bounded by ditches, arable cropland and hedgerows, scrub and woodland which runs parallel to the A47 along its northern boundary. To the south, the tunnel entrance is bounded by the mosaic of habitats that are located southeast of the Harwick Interchange, which include wet woodland, lowland mixed deciduous woodland, wetlands and grassland. Woodland runs parallel along the southern boundary of the A47. The southern tunnel entrance is tapered, following the shape of the road embankment. • The Proposed Scheme will require the construction of a new slip road onto the A10 and Hardwick Interchange at this location that will require the lengthening of the underpass which will be extended by 26m to a total length of 61m (76m to the toe of the new embankment) once constructed. • To ensure that bats are able to continue to use the A47 underpass once constructed, mitigation has been embedded into the design and engineering options for the new structure. This has ensured that the dimensions (height and width) and shape of the underpass will be largely unchanged through the proposals. The use of underpasses by bats is typically influenced by the underpass type, height and the amount of forest (woodland) and hedgerows in the surrounding landscape and this has been the focus of mitigation design. • The aim of the mitigation is to retain and extend the existing underpass structure and, where possible, to maintain the height and width. The underpass will also be constructed using the same round corrugated metal structure, retaining the same tapered entrance on the southern extent. This design option has been selected over more traditional underpass designs that were also considered. Continuation of the existing structure design will enable the dimensions of the underpass to be maintained so far as possible. • The topography of the land at the location of the new underpass and slip road means that the profile of the tunnel will need to be tapered (reduced in height) towards the southern extent. This is to prevent drainage issues where the southern extent of the underpass would otherwise be lower than the proposed ground levels. The new section of the underpass will therefore taper in height from the existing section at 4.1m to between 3.6m and 3.7m at the southern entrance. A reduction of up to 0.5m (12%). The southern entrance to the new tunnel will be flared to existing tunnel height (4.1m) to encourage bats to continue using the structure and the width will remain unchanged through the length of the underpass. • Planting is incorporated into the landscape proposals surrounding the tunnel and running parallel to the A47 on the north and south embankments to replace that which is lost to the scheme through the widening of the A47 and creation of the new slip road.
Ecology	<p>Agricultural Barns South of the A47</p> <ul style="list-style-type: none"> • The agricultural barns south of the A47 will be retained within the Proposed Scheme.
Ecology	<p>Area North of the Proposed A10/A47 Roundabout Junction</p> <ul style="list-style-type: none"> • Woodland planting has been incorporated into the landscape proposals to the north of the new A10/A47 roundabout junction. This planting is primarily to contribute to habitat compensation for lowland mixed deciduous woodland that will be lost to the Proposed Scheme. The majority of this woodland loss will occur directly south of this location, where the Proposed Scheme passes through the area of Lowland Mixed Deciduous west of Sheep's Course Wood. • In addition to the compensatory woodland planting, the attenuation ponds have been relocated from the area south of the A47 to the arable cropland north of the A47. These measures have been incorporated into the design to reduce the loss of lowland mixed deciduous woodland and reduce the impact upon protected and notable species that utilise these habitats.
Ecology	<p>Area West of Sheep's Course Wood</p> <ul style="list-style-type: none"> • The Scheme Boundary has been significantly reduced in the mosaic of habitat that is located to the west of Sheep's Course Wood. These measures have been integrated into the design to reduce woodland and grassland loss and retained a larger buffer of retained habitat to the Sheep's Course Wood CWS. This retained buffer will also reduce the effects upon protected and notable species that utilise these habitats.
Ecology	<p>Area between Sheep's Course Wood and Rectory Lane</p> <ul style="list-style-type: none"> • The Scheme Boundary has been extended to the east of the new road alignment to accommodate woodland habitat compensation along the eastern boundary of the Proposed Scheme. This woodland compensation extends between Sheep's Course Wood and Rectory Lane. This will contribute to compensation for lowland mixed deciduous woodland and species that utilise this habitat, reduce lighting impacts on neighbouring habitat and allow connectivity for protected and notable species, including bats from Sheep's Course Wood.
Ecology	<p>Rectory Lane Overpass</p> <ul style="list-style-type: none"> • Woodland planting has been incorporated into the landscape proposals for the embankment of the proposed new Rectory Lane overpass to reduce light pollution and maintain bat connectivity through the Scheme along Rectory Lane.

Environmental Factor	Embedded (Environmental Design) Mitigation Measure
Ecology	<p>Rectory Lane to North Runcton Common and Chequers Lane</p> <ul style="list-style-type: none"> The Scheme Boundary has been extended to the east of the Proposed Scheme between Rectory Lane and North Runcton Common. This additional land will be used for compensatory woodland planting that will also provide a connective corridor between Sheep's Course Wood and North Runcton Common, reduce lighting impacts from the road and new roundabout northeast of the North Runcton Common which is a potentially important area for bats within the vicinity of the Scheme. The woodland creation will also continue between the Proposed Scheme and the Scheme Boundary to create a woodland buffer at the western boundary of North Runcton Common. Woodland planting has been incorporated into the landscape proposals to the north and south of the proposed new footway crossing at Chequers Lane which will be stopped to road traffic. The woodland planting will maintain connectivity for bats through the landscape and reduce lighting impacts from lighting at the crossing.
Ecology	<p>Area South of Chequers Lane</p> <p>Woodland planting has been incorporated into the landscape proposals along the east of the new road as it extends between Chequers Lane and the attenuation ponds in the southern extent. Woodland planting is also incorporated around these ponds to reduce lighting impacts.</p>
Landscape and Visual	<p>The following specific landscape mitigation measures are embedded within the Proposed Scheme:</p> <ul style="list-style-type: none"> Retention, protection and enhancement of existing trees, hedgerows and woodland where possible, to maintain the existing landscape character of the local area; Provision of new native tree belts to provide visual enclosure and to screen views from sensitive receptors in close proximity with the Proposed Scheme; Provision of new lengths of native hedgerow, some with native trees, surrounding the Proposed Scheme, to provide visual enclosure and mitigate effects upon the setting of nearby residential properties and public rights of way within or in close proximity to the Proposed Scheme; Provision of scattered native tree planting to break up the massing of the Proposed Scheme; and Planting/landscaping of site boundary margins, through proposed species rich grassland in line with ecological requirements.

Environmental Factor	Embedded (Environmental Design) Mitigation Measure
Noise and Vibration	<p>The Proposed Scheme is situated in a predominantly commercial setting, with employment areas (Hardwick Narrow Industrial Estate and Hardwick Industrial Estate) are located along the A47.</p> <p>The main sources of noise will come from the A10 and A47 carriageway traffic movements.</p> <p>The adoption of Best Practicable Means (BPM), as defined in the Control of Pollution Act 1974, will be a fundamental primary mitigation measure. The manifestation of BPM will be a series of noise and vibration control measures, which will be incorporated within the Construction Environmental Management Plan.</p> <p>Construction Noise:</p> <ul style="list-style-type: none"> • all construction plant used on the site will be in good working order and certificates of inspection and maintenance will be held on site and available on request; • all plant items will be properly maintained and operated according to manufacturers' recommendations and in such a manner as to avoid causing excessive noise and vibration; • as far as reasonably practicable, all plant items will be sited so that noise and vibration at nearby sensitive properties is minimised; • all plant items operating intermittently on the site will be shut down in the intervening periods; • all pneumatic tools will be fitted with silencers or mufflers where practicable; • no loud music or loud radios will be played on the site; • construction vehicles will not idle on local roads waiting to enter the site; • works (including deliveries) will be programmed such that the requirement for working outside normal working hours is minimised; • where construction works are occurring within 50m of a residential property, if appropriate, temporary environmental noise barriers will be installed around plant items to provide screening; and • the importance of noise and vibration and its potential to affect those living and working nearby will be included in the general induction training for the site and specific training will be given to staff who will have particular responsibility for managing noise and vibration during construction. <p>Operational Noise:</p> <ul style="list-style-type: none"> • Mitigation for operational road traffic noise can be considered in terms of mitigating the source, the pathway of noise or at the receiver. • In terms of mitigation at source, this includes the design of the road itself, the 3D alignment of the carriageways and the road surface type. • The Proposed Scheme alignment has been designed to avoid passing close to residential receptors as far as reasonably practicable. Further information on the environmental constraints considered in the evolution of the Proposed Scheme alignment is provided in Chapter 4. • The pavement surface type can reduce the noise levels produced by vehicles. The Proposed Scheme has a design speed lower than 75 kph and as such would not gain a benefit from a low noise surface (based on the road surface corrections provided in DMRB LA 111). • The path of noise between source and receiver can be mitigated through screening measures in the form of earth bunds or acoustic barriers. • Screening measures for noise mitigation generally only provide notable benefits in terms of noise level reduction where receptors are within 300m of the road carriageway. As the majority of residential receptors are further than this distance to the Proposed Scheme carriageway, the benefits from additional screening measures design would be limited. Furthermore, DMRB LA 111 advises that the value for money of operational noise mitigation should be considered. The value for money can be calculated based on a comparison of the cost of the mitigation, against the monetised acoustic benefits of the mitigation to human receptors in residential properties. For acoustic mitigation to be value for money, notable noise level decreases at multiple residential properties are generally required. In this case, as the dwellings within close proximity of the Proposed Scheme are fairly isolated, acoustic barriers would not be value for money. Furthermore, given the large distances to most of the residential properties within the detailed calculation area, the benefits from additional acoustic barriers would likely be too small to be perceptible to existing residents. • Finally, secondary glazing or noise insulation can be installed for individual receptors in order to reduce noise levels inside dwellings. The NIR sets our eligibility criteria which should be met in order for properties to be offered noise insulation. In the case of the Proposed Scheme, generally noise levels at dwellings within the detailed calculation area are low and an enhanced façade sound insulation performance would have limited benefit to residents inside their homes as it is likely that acceptable internal noise levels would be achieved with their existing façade and glazing. In any case, noise insulation is generally not considered as mitigation for a significant effect as it only reduces internal noise levels but not external levels. <p>Further information is provided in Volume 1, Chapter 10: Noise and Vibration of this ES.</p>
Population and Human Health	<ul style="list-style-type: none"> • Appropriate diversions implemented for any PRow obstructed during construction in order to minimise effects on accessibility and severance for WCHs. Where appropriate diversions are not available, temporary closures may be required; • Any PRow, footway or carriageway diversions or closures undertaken during construction to be clearly advertised and signed prior to commencement of works. The signage should display the temporary diversion routes in place; • Design of the diverted routes for WCH to consider vulnerable user groups and ensure accessibility is maintained for users with limited mobility where practicable; • Contractors to liaise with residents, businesses and other user groups prior to the commencement of construction works to ensure they are aware of the programme and nature of the works, in particular, any works which are planned to take place at night. Any out of hours construction work to be agreed with Norfolk City Council (as relevant) in advance; • Access to residential and commercial properties will be maintained throughout the construction period, in agreement with occupants; and • Good practice measures outlined within the Construction Environmental Management Plan and Construction Traffic Management Plan would be implemented in order to avoid conflict with WCHs, local residents and nearby businesses. <p>Further information is provided within Volume 1, Chapter 15 Population and Human Health of this ES.</p>

Environmental Factor	Embedded (Environmental Design) Mitigation Measure
Traffic and Transport	<ul style="list-style-type: none"> • Monitoring of freight traffic and construction workforce movements during the construction phase, the Proposed Scheme will be monitored through a Construction Traffic Management Plan (CTMP), a Construction Worker Travel Plan prepared to manage and monitor construction workforce movement to and from the NWL site and a Construction Environmental Management Plan (CEMP) to assess the construction impacts on the environment. These will be secured through appropriately worded planning conditions. • During the detailed planning of construction works, efforts will also be made to minimise the footprint of all construction activities to less than the worst-case scenario assessed within this ES. • The assessment of the impact of construction traffic within this chapter has concluded that there are not expected to be any significant adverse effects during construction. <p style="margin-left: 40px;">Severance</p> <ul style="list-style-type: none"> • Construction access, traffic and temporary diversions will be controlled through the CTMP. This will set out how construction traffic will be managed and its impact minimised. • Driver Delay • Construction access, traffic and temporary diversions will be controlled through the CTMP. This will set out how construction traffic will be managed and its impact minimised. • Pedestrian and Cycle Delay • There will be some disruption to footway and cycle routes usually unavoidable during construction of a project of this nature. Construction access, traffic and temporary diversions will be controlled through the CTMP. This will set out how construction traffic will be managed and its impact minimised. <p style="margin-left: 40px;">Fear and Intimidation</p> <ul style="list-style-type: none"> • Construction traffic will be routed mainly via A and B Roads and local roads only at the point of accessing the project site entrances. The construction vehicles would be managed by the contractor in accordance with the CTMP to ensure movements are controlled to appropriate routes to minimise fear and intimidation. • Accidents and Safety • Whilst the overall effect on accidents and safety is expected to be minor, it is considered appropriate to ensure that high levels of safety awareness are at the core of construction operations on the surrounding network as HGV movements contribute to a large proportion of cycle deaths. As part of the CTMP, standards will be set for the compliance with the Freight Operator Recognition Scheme that includes driver awareness training. Further details will be set out in the CTMP. • Further information is provided below within Section 3.3.13, Operational Access and Movement, and Volume 1, Chapter 16: Traffic and Transport of this ES.
Water Environment	<p>The following forms of embedded mitigation have been considered within the construction phase assessment:</p> <ul style="list-style-type: none"> • The Outline Construction Environmental Mitigation Plan (oCEMP) details mitigation measures that would manage environmental impacts during construction. The oCEMP sets out how construction activities would be undertaken in accordance with appropriate good practice guidance, such as CIRIA's control of water pollution from construction sites (C532) (Ref.11.46). The oCEMP would also include the requirements for any licences and permits required for the construction of the Proposed Scheme. Specific mitigation measures included within the oCEMP that are relevant and haven been included within the assessment of likely effects are specified in the tables below; and • Areas for temporary use during construction which include the construction compounds are generally located away from the unnamed land drains and are located away from the named watercourses. <p>The following forms of embedded mitigation have been considered within the operation phase assessment:</p> <ul style="list-style-type: none"> • Implementation of a new surface water drainage system prepared in accordance with latest standards and guidance; • The surface water drainage system includes attenuation ponds to provide a buffering and filtration mechanism, such that particulates and contaminants within the surface water discharge are removed prior to entering underlying groundwater; and • Existing drainage ditches and channels flows will be maintained by the installation of culverts under the new road.

Environmental Factor	Embedded (Environmental Design) Mitigation Measure
Geology and Soils	<p>Embedded mitigation measures to be delivered through the implementation of the Construction Environmental Management Plan (CEMP).</p> <p>The Principal Contractor will be required to implement measures which have summarised below to minimise the risk of contamination from construction activities:</p> <ul style="list-style-type: none"> • Provision of designated storage facilities with appropriate signage. • Separate inert, non-hazardous and hazardous waste to include the completion of a waste classification. • Skips and storage receptacles will be sheeted/lidded and remain closed when waste will not be deposited into them. • Comply with air quality management measures. • Provision of spill kits, bunding/drip trays and securing and restricting access to fuel storage containers. • Correct storage of oil-based materials will comply with the Control of Pollution (Oil Storage) (England) Regulations 2001, as amended, and GPP2: Above ground oil storage tanks. Should fund removal of underground storage tanks, and relevant government guidance must be complied with. • Comply with the GPP26: safe storage – drums and intermediate bulk containers in relation to commercial storage handling and use. • Comply with CIRIA C741. Environmental Good Practice on Site (4th Edition) (CIRIA, 2015) (Ref:12.26). • Comply with CIRIA C532. Control of Water Pollution from Construction Sites (CIRIA, 2011). (Ref:12.27). <p>The measures will be secured by a planning condition, completed by a competent qualified person; and approved by the Local Authority and Environment Agency.</p> <ul style="list-style-type: none"> • Targeted ground investigation and Generic Quantitative Risk Assessment (GQRA). • Remediation works where required to include removal of impacted soils and subsewunt validation. • Concrete design and barrier pipes to withstand any aggressive ground conditions. • Re-use of chemically suitable site-won and imported soils. • Implementation of surface water drainage systems to include interceptors for any future fuel chemical spills. • Provision of cover systems over any contamination that will remain in the ground including proposed hardstanding and a clean cover of topsoil within designated open / landscaping areas. <p>Further information is provided within Volume 1, Chapter 12: Geology and Soils of this ES.</p>

Environmental Factor	Embedded (Environmental Design) Mitigation Measure
Climate	<p>The magnitude of GHG emissions associated with the design and construction phase of the Proposed Scheme can be minimised by, amongst others:</p> <p>Design optimisation to reflect the carbon reduction hierarchy (detailed below and found in clause 4.3 of PAS 2080) (Ref 14.22):</p> <ul style="list-style-type: none"> • Avoid: align the outcomes of the project and/or programme of work with the net zero transition at the system level and evaluate the basic need at the asset and/or network level; • Switch: assess alternative solutions and then adopt one that reduces whole life emissions through alternative scope, design approach, materials, technologies for operational carbon reduction, among others, while satisfying the whole life performance requirements; • Improve: identify and adopt solutions and techniques that improve the use of resources and design life of an asset/network, including applying circular economy principles to assess materials/products in terms of their potential for reuse or recycling after end of life; • Minimise any expected tree loss during the construction of the Proposed Scheme; • Using more efficient construction plant and delivery vehicles, and/or those powered by electricity from alternative/lower carbon fuels; contractor to ensure high performance of plant and equipment through strong record of, and ability to ensure correct maintenance and servicing of vehicle fleet to avoid polluting emissions; • If possible, the contractor is to select and engage with material suppliers considering their policies and commitments to reduction of GHG emissions, including actions to reduce embodied emission in materials; • Maximise the local sourcing of materials; • Use of local waste management facilities; • Re-use of materials onsite rather than taking offsite as a waste; • The Construction Contractor should have training policies and management protocols in place to avoid idling of engines, spills of fuels (for example, when refuelling) and safe/environmentally sensitive driving techniques to maximise fuel saving; • Designing, specifying and constructing the Proposed Scheme with a view to maximising the potential for reuse and recycling of materials / elements at the end-of-life-cycle stage; and • Where possible consider the use of innovative construction methods to reduce plant use. <p>In accordance with DMRB LA114 methodology (Ref: 14.35), the 'likelihood-consequence' approach has been used to assess the significance of effects of climate change on the Proposed Scheme, while taking into account embedded mitigation obtained on consultation with the various topic specialists. Significant effects were identified in relation to:</p> <ul style="list-style-type: none"> • Risk of heat exhaustion / heat stroke to end users; • Wind-blown snow, dust and smoke can impact mobility by reducing visibility distance, thereby increasing the risk of accidents. <p>For these effects, the following additional mitigation measures were proposed:</p> <ul style="list-style-type: none"> • Local on-the-ground temperature sensors can be installed which will serve as warning signals for end users during extreme heat events; • Cool routes or shaded walkways can be included in the design to provide temporary cooling shelters for pedestrians; • Lighter colour paving options should be preferred to create more reflective paved surfaces that reduce heat risk; • Permeable pavements, including reinforced grass pavements, can also have a cooling effect through evaporation; • Roadway Visibility Forecast can be put in place by identifying potential smoke pathways and modelling surface smoke and winds, particularly during winters. <p>The magnitude of GHG emissions associated with the eventual operation of the Proposed Scheme can be minimised by, amongst others:</p> <ul style="list-style-type: none"> • Opportunities to sequester carbon through increased tree planting; and • Use road surface options with greater longevity, to reduce frequency of replacements throughout use phase. <p>Orienting the building so that a large proportion of the façade Further information is provided below within Volume 1, Chapter 14: Climate of this ES.</p>



1.4 Construction Proposals

Programme

1.4.1 It is currently anticipated that construction will commence in 2025 and is expected to be completed in late 2027. Site clearance and establishment of compounds is assumed to occur before end of March 2025.

1.4.2 The peak period of construction is assumed to be the first main earthworks season when about 70-80% of earthwork volume is assumed to be shifted to/from site. The remaining 20-30% of imported fill and arisings are assumed to be transported on or off site in the second earthworks season. The optimum time of year for earthworks is expected to be April to September.

Proposed Demolition Activities

1.4.3 Demolition of two dwellings- Hill Cottages on A47 Constitution Hill will be required.

Proposed Key Construction Activities

1.4.4 The key construction works are likely to be divided into four broadly sequential activities:

- Site clearance and foundations;
- Utilities Diversions;
- Major infrastructure; and,
- Landscaping and minor infrastructure.

Construction Programme and Proposed Key Construction Activities

1.4.5 The Construction work is currently due to commence in 2025 and continue until the road opening in late 2027. The key construction activities are summarised sequentially below (although there is likely to be some overlap between each stage / individual processes):



- **Enabling Works.** This will focus on logistics including compound set up as illustrated in general arrangement plan (Figure 1-1), establishing haul roads, fence removal and installation of temporary fencing.
- **Site Clearance.** This will entail removal of existing fencing, vegetation clearance and topsoil stripping.
- **Utility Diversion.** This will entail the diversion of utilities required to construct the scheme including the diversion and upgrade of two gas main feeder pipes.
- **Earthworks.** Pre-earthwork drainage installation, bulk earthworks, stockpile maintenance and logistics
- **Structures (overbridge, underpass extension and culverts).** Area preparation and temporary works platform installation, piling, steel and concrete works, structural fills and beams and deck installation.
- **Drainage and Ancillary Works.** Installation of longitudinal drainage (carrier drains, filter drains, swales), constructing Infiltration basins, service lighting ducts.
- **Pavement.** Caping and subbase construction, base, binder and surface course.
- **Finishing Works.** Installing vehicle restraints system, signage, lighting, road markings and boundary fencing.
- **Landscaping.** Topsoil laying, seeding and tree planting.
- **Biodiversity Net Gain (BNG).** A BNG Assessment has been completed for the Proposed Scheme and the results of this assessment are presented in the Biodiversity Net Gain Assessment (Annex 8.17) (WSP, 2023p). This assessment measures the change in biodiversity through development (expressed as biodiversity units), with a target to achieve a minimum of 10% net gain in biodiversity units. The 10% BNG requirement has not been met within the Scheme



Boundary, therefore offsite habitat creation will need to be secured.
This is discussed further within the BNG Assessment **Chapter 8 Biodiversity**.

- **Stockpile and Material Management.**

1.4.6 Where appropriate, these activities are discussed in further detail within the paragraphs below.

Approach to Enabling Works

1.4.7 Temporary Fencing will be installed to secure the work areas from unauthorised access. Additional zones may require specific fencing, for example stockpiles and ecologically sensitive areas. Higher fencing will be required at risk areas, and around compounds. Where possible, permanent fencing will be installed instead of temporary fencing for cost efficiency.

1.4.8 Robust planning and procedures will be in place from the start of construction and before ground-breaking activity, to ensure service protection for utilities affected by the works. The Principal Contractor will engage with statutory undertakers at the earliest opportunity for utility diversions and protection.

1.4.9 To mitigate the risk of exposing unchartered services during construction activities, Ground Penetrating Radar surveys will be done on site and reviewed, carrying out trial holes where required. The Principal Contractor will be implementing a permit systems framework site-wide to minimise risks of service damage.

Approach to Site Clearance

1.4.10 Before trees and other vegetation are removed, the following actions and considerations will be met:

- Design will minimise the need to fell trees;
- Works will comply with measures in the Outline CEMP and Arboricultural Method Statement (**Chapter 8: Ecology, Appendix 17**);
- Drop zones are clearly marked;



- Excavators and dozers will complete clearance of smaller vegetation;
and
- Stripped areas will be graded to falls to prevent water ponding.

1.4.11 Topsoil stripping will take into account weather conditions where practicable and the use of appropriate equipment will ensure the soil is not mishandled or its properties are damaged. Where soil depth is 300mm or less, dozers will trim the area, if deeper, excavators will strip the topsoil compliant with DEFRA Best Practice guidance (Code of Practice for Sustainable Use of Soils on Construction Sites).

Approach to Earthworks

1.4.12 Earthworks methodologies will remain aligned with good practice procedures, for example DEFRA's Code of Practice for Sustainable Use of Soils on Construction Sites. The Principal Contractor will plan robustly to ensure efficient productivity, guided by a comprehensive Site waste management plan and materials management plan.

1.4.13 Temporary haul roads will provide temporary routes for earthworks heavy machinery within the footprint of the main line cuttings and embankments that will:

- reduce environmental impact by minimising earthworks movements;
and
- avoid disruption to public highways through adoption of robust on-site logistics.

Approach to Pavement

Subgrade

1.4.14 This will mainly be formed of a capping layer (in situ cement stabilisation) and a sub-base layer (cement in-situ stabilisation). Lime stabilisation will be considered before capping (up to 400mm) to reduce excessive moisture, to implement a sustainable solution avoiding disposal and import of material.



1.4.15 The capping layer will be formed by uniformly spreading cement, scarifying it into the ground and compacting to obtain a foundation base.

1.4.16 Sub-base will be an analogous process. The material will be site won where practicable and laid with the same procedure as for the Earthworks.

Pre-asphalt

1.4.17 A primer coat will be applied to protect formation and sub-base. The precast kerbing will be installed, with a concrete bedding to lay the asphalt against.

Asphalt

1.4.18 Pavement comprises a base, binder and surface course profile of bituminous material. When the underlying layer is prepared and dry, asphalt will be laid using paver. The paver screeds will be manually monitored, ensuring levels are compliant taking allowance of subsequent compaction. Levels will be continuously monitored per layer, along with the relevant density testing.

1.4.19 Compaction is anticipated to be by steel wheel and three-pin rollers, immediately after the material is laid. Floor saws will cut the excess of material at day joints, to form a straight edge to lay against.

Approach to Road Furniture

1.4.20 The street furniture installation works towards the end of the construction sequence will include:

Vehicle restraint systems

1.4.21 Barriers will be installed once asphalt is completed. If foundations are required, these will be dug before laying the surface course. Generally, posts will be driven using a rig through the pavement and parapets will be installed as part of the bridge works.

1.4.22 Once posts are installed, signs and lights will be erected using mobile elevating working platforms.

Markings

1.4.23 Paint markings will be installed with hot mix marking trucks, during dry weather.



Approach to Landscaping

1.4.24 Topsoil will be handled to provide a structured, uncompacted, well-aerated soil and prevent anaerobium and waterlogging, the method will adhere to the following:

- Operation will be in adequate dry conditions, minimising driving over completed areas;
- Seeding will be planned for favourable seasons to enhance growing;
- The loose tipping method will be used (best practice guidelines); and
- After decompaction and re-aeration, the landscape planting will follow within the construction phase.

Construction Working Hours

1.4.25 For the trunk road works it is anticipated that the standard working hours will be 07:00 – 19:00 during weekdays and 08:00 – 13:00 on Saturdays. No works will be carried out on Sundays, without prior agreement with the Local Planning Authority. It is assumed that the vast majority of works will be undertaken during daytime core working hours. However, there is the potential for some out of hours works to be required along the A47 upgrades.

1.4.26 For all other works it is anticipated that normal working hours will be 0700 hours to 1700 hours during weekdays and 08:00 – 13:00 on Saturdays, with night working being used where necessary to avoid unnecessary impacts on travel routes. No works will be carried out on Sundays, without prior agreement with the Local Planning Authority.

1.4.27 This will however be reviewed against relevant guidance and through discussions with BCKLWN. Any exceptions to standard working hours / practices would be agreed with BCKLWN in advance. The working hours will be secured via an appropriately worded condition.



Construction Compounds

1.4.28 There will be four site compounds as illustrated in **Figure 1-1 General arrangement plan**, two of which would be main site compounds - one at the north end of the WWHAR alignment and the other at the southern junction with A10, where the majority of welfare, car parking and site offices will be located. In addition two satellite compounds will be located at Hardwick Roundabout and at the rectory Lane bridge for layout and storage of materials.

Construction access / haulage routes, traffic and Parking

1.4.29 In advance of appointment of a main contractor to provide early guidance on construction, the Environmental Statement has been prepared on the basis of an assumed construction methodology which is expected to offer a feasible scenario that could be undertaken. However, the detail of the full Construction Environmental Management Plan will be worked up during the determination period of the planning application.

1.4.30 The majority of the Proposed scheme (WWHAR road element) can be constructed offline through open countryside in a predominantly rural area to help minimise disruption.

1.4.31 The only online roundabout is to be located at the interface between WWHAR and A47. This will need to be constructed with traffic management in place to allow shuttle working whilst the carriageway is reduced to single lane working at times.

1.4.32 The WWHAR link from A47 to A10 is assumed to be constructed to base course prior to the A47 dualling works and Hardwick roundabout works. The WWHAR alignment itself can be used as an internal haul road for import of construction materials and export of arisings and waste with minimal construction traffic impact on West Winch village.

1.4.33 The peak period of construction is assumed to be the first main earthworks season when about 70-80% of earthwork volume is assumed to be shifted to/from site. The remaining 20-30% of imported fill and arisings are assumed



to be transported on or off site in the second earthworks season. The optimum time of year for earthworks is expected to be April to September.

- 1.4.34 There will be traffic disruption whilst the Constitution Hill roundabout is being removed and new slip roads installed. It is anticipated that the existing roundabout could be converted temporarily to a signalised 'T' junction whilst the roundabout. Twelve weekend closures of the A47 will be required for the slip road works at Hardwick Roundabout.
- 1.4.35 As a worst-case scenario, all staff working at the site and all LGV movements are assumed to travel to site between 7am and 9am on a typical weekday during the peak construction phase and depart from the site between 4pm and 6pm. All HGV movements are assumed to be spread evenly across the site working hours covering a 10 hour day. HGV routes will be restricted to designated HGV suitable routes including A10, A47, A17, A1 and A149.
- 1.4.36 A small number (4-6) escorted abnormal loads (due to length or width exceeding the standard legal articulated vehicle parameters) would be required for the delivery of bridge components at Rectory lane. Where possible these will be carried out during times of low traffic movement on the surrounding highway network.
- 1.4.37 For imported materials to supply the capping layer materials, a potential local supplier has been identified close to the site located at Middleton (about 3km east of West Winch). Their typical vehicle types for transporting capping material are assumed to be 20 Tonnes per vehicle as standard loads. The associated vehicle movements will be routed via A47 and East Winch Road (to the east of West Winch) to access Middleton Aggregates.
- 1.4.38 Other imported materials during the peak construction period are assumed to be imported from Grantham via A47, A17 and A1 to the west.
- 1.4.39 There is also a licenced recycling company at Middleton, where exported material can also be disposed of. Vehicle movements to and from Middleton are expected to have a standard maximum load capacity of 20T assumed.



The associated vehicle movements will be routed via A47 and East Winch Road (to the east of West Winch) to access Middleton Aggregates.

Safety, security and fencing

1.4.40 Site traffic will be kept separate from pedestrian and vehicular traffic during construction. Construction work areas will be fenced off from the general public.

1.4.41 Traffic barriers and suitable signage will be erected to alert pedestrians and vehicular traffic of the works and the temporary safety precautions that are in place.

1.4.42 Routes will be clearly signed, well maintained and adequately illuminated.

Construction Plant

1.4.43 The construction plant was not known at the time of writing. However, for assessments within this ES, assumptions have been drawn from BS 5228:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites part 1'.

Construction Waste

1.4.44 The main contractor will be required to investigate opportunities to minimise waste arising at source and, where such waste generation is unavoidable, to maximise the recycling and reuse potential of construction materials.

1.5 Implementation of mitigation identified in the ES

1.5.1 It is anticipated that the mitigation measures identified in the ES will be implemented and secured through the reserved matters applications and secured through planning conditions as necessary.

1.6 Key Construction Practices

1.6.1 It is likely that the construction works will be undertaken in accordance with the UK's 'Considerate Constructors Scheme' to help ensure that contractors carry out their operations in a safe and considerate manner, and actively minimise environmental risks.



- 1.6.2 In accordance with the Environment Agency's Pollution Prevention Guidance Notes, all construction works will be undertaken with suitable temporary drainage and pollution prevention measures in place. Further information on construction pollution mitigation measures is outlined in **Volume 1, Chapter 11: Water Environment**.
- 1.6.3 Further construction practices and mitigation measures are referred to in technical chapters 6 to 17.
- 1.6.4 Outline CEMP is being produced as part of this planning submission. The Principal Contractor will adopt the Outline CEMP and produce the detail CEMP for implementation at the construction phase.



1.7 References

- **Reference 3.1:** National Planning Policy Framework (2023). [Online] [National Planning Policy Framework \(publishing.service.gov.uk\)](https://www.gov.uk/publishing-service) [Accessed December 2023]
- **Reference 3.2:** Carlisle City Council (2016). [Online] accessed via [Carlisle District Local Plan 2015-2030](#) [Accessed October 2023]
- **Reference 3.3:** CIRIA C753 'The SuDS Manual'. [Update to the SuDS Manual - GOV.UK \(www.gov.uk\)](#) [Accessed October 2023]

Figure 1-1 General arrangement Plan

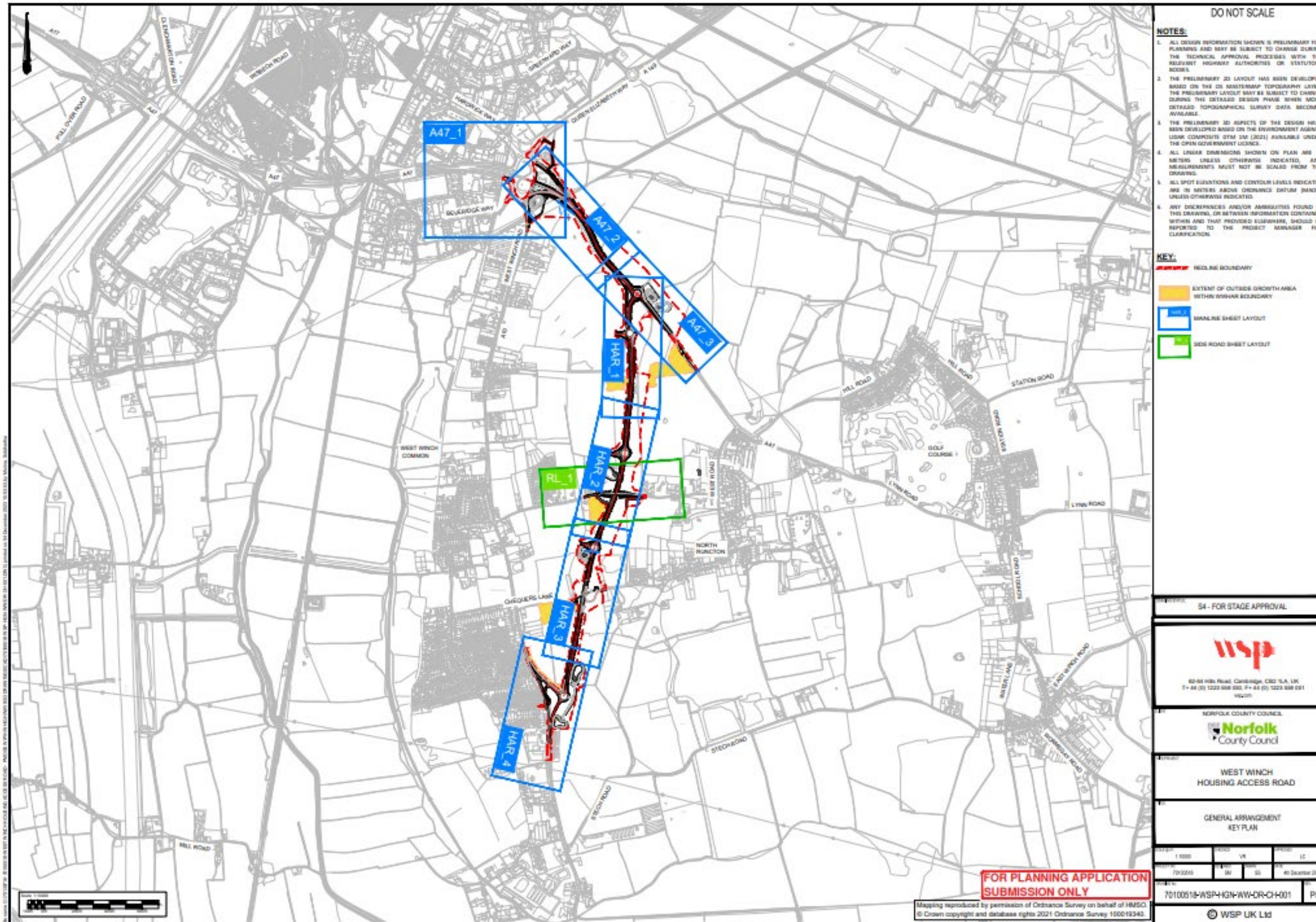


Figure 1-2 Cross Sections Drawings For A47 (Sheet 1 of 2)

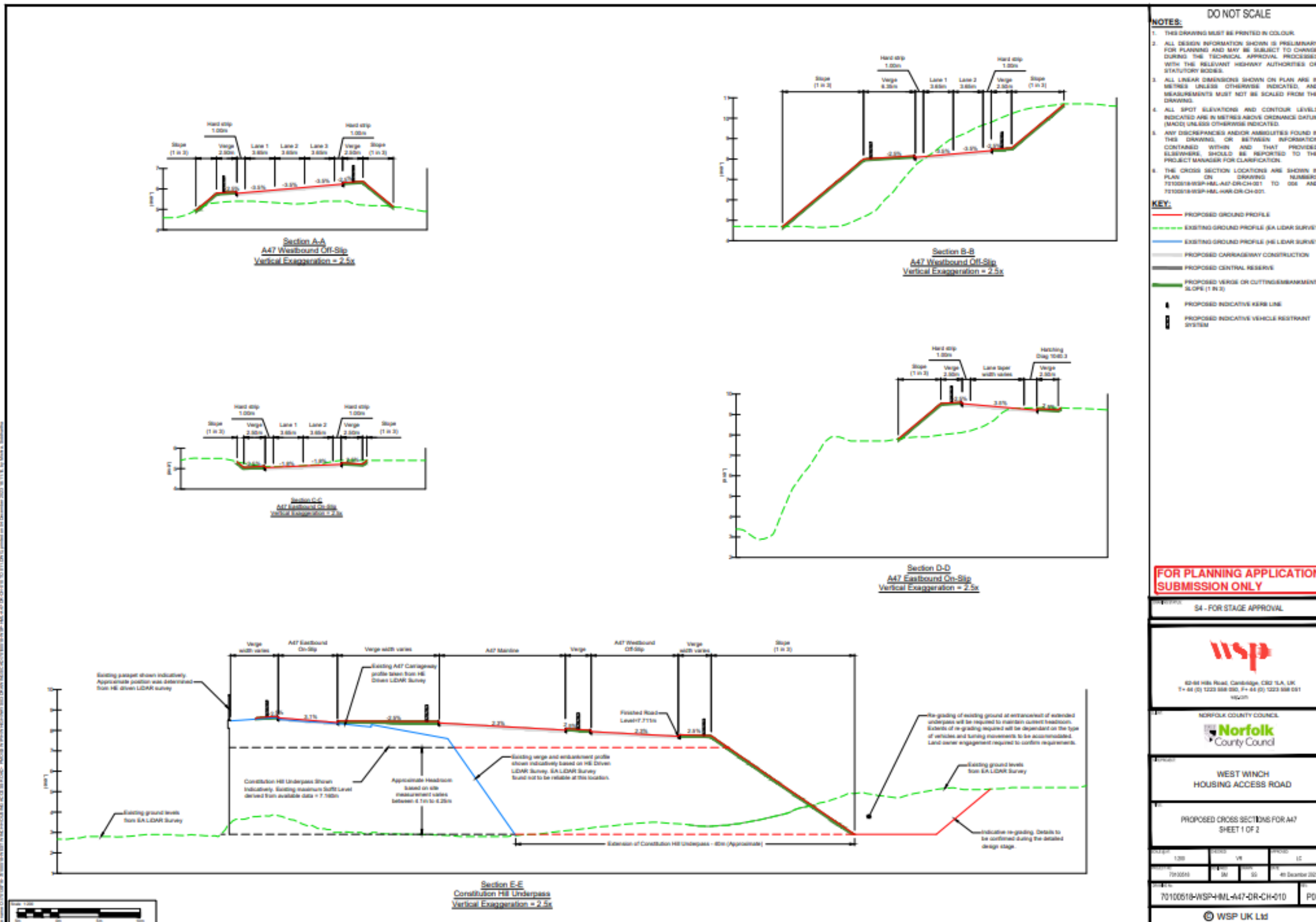


Figure 1-3 Cross Sections Drawings For A47 (Sheet 2 of 2)

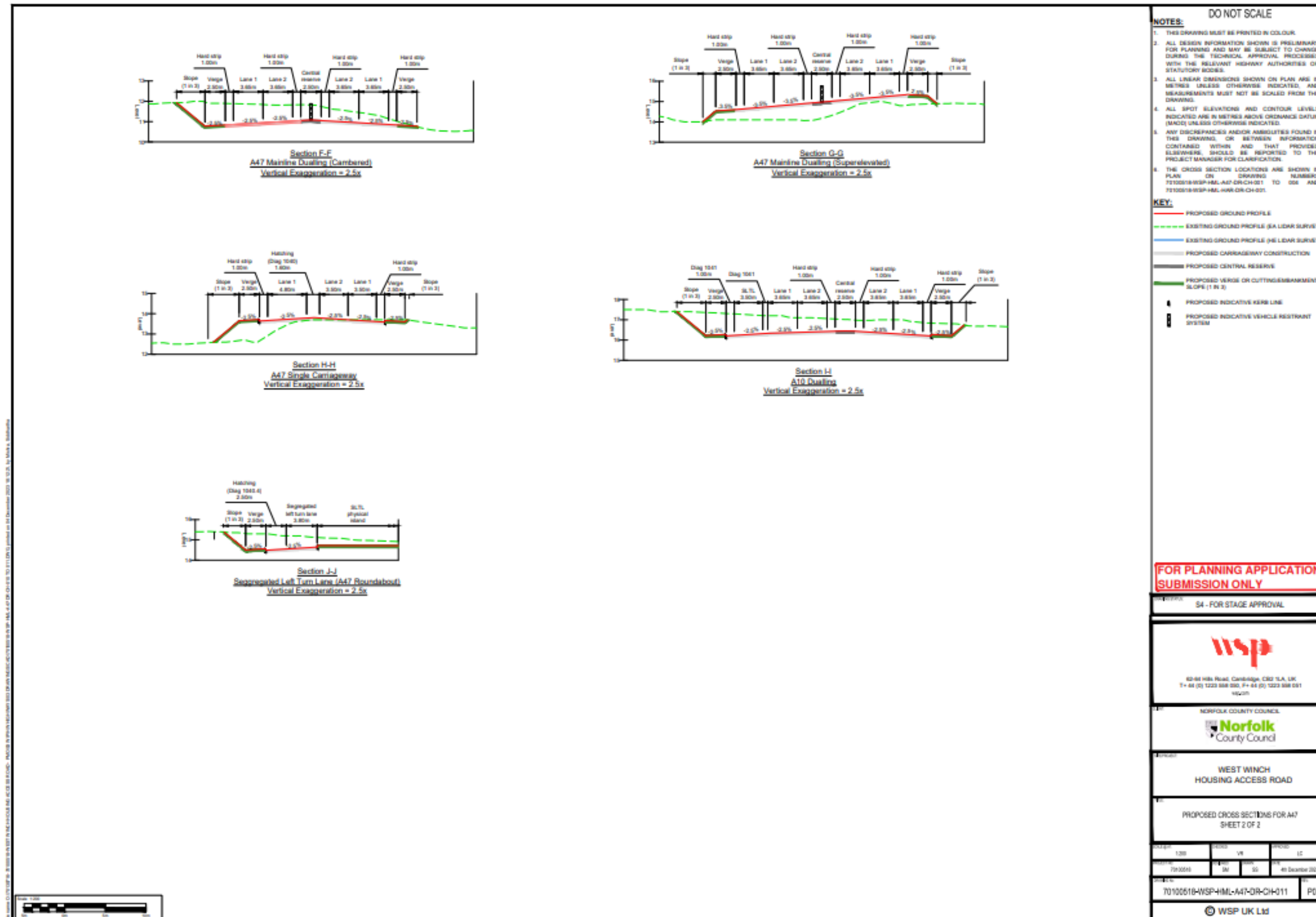


Figure 1-4 Cross sections Drawings for HAR

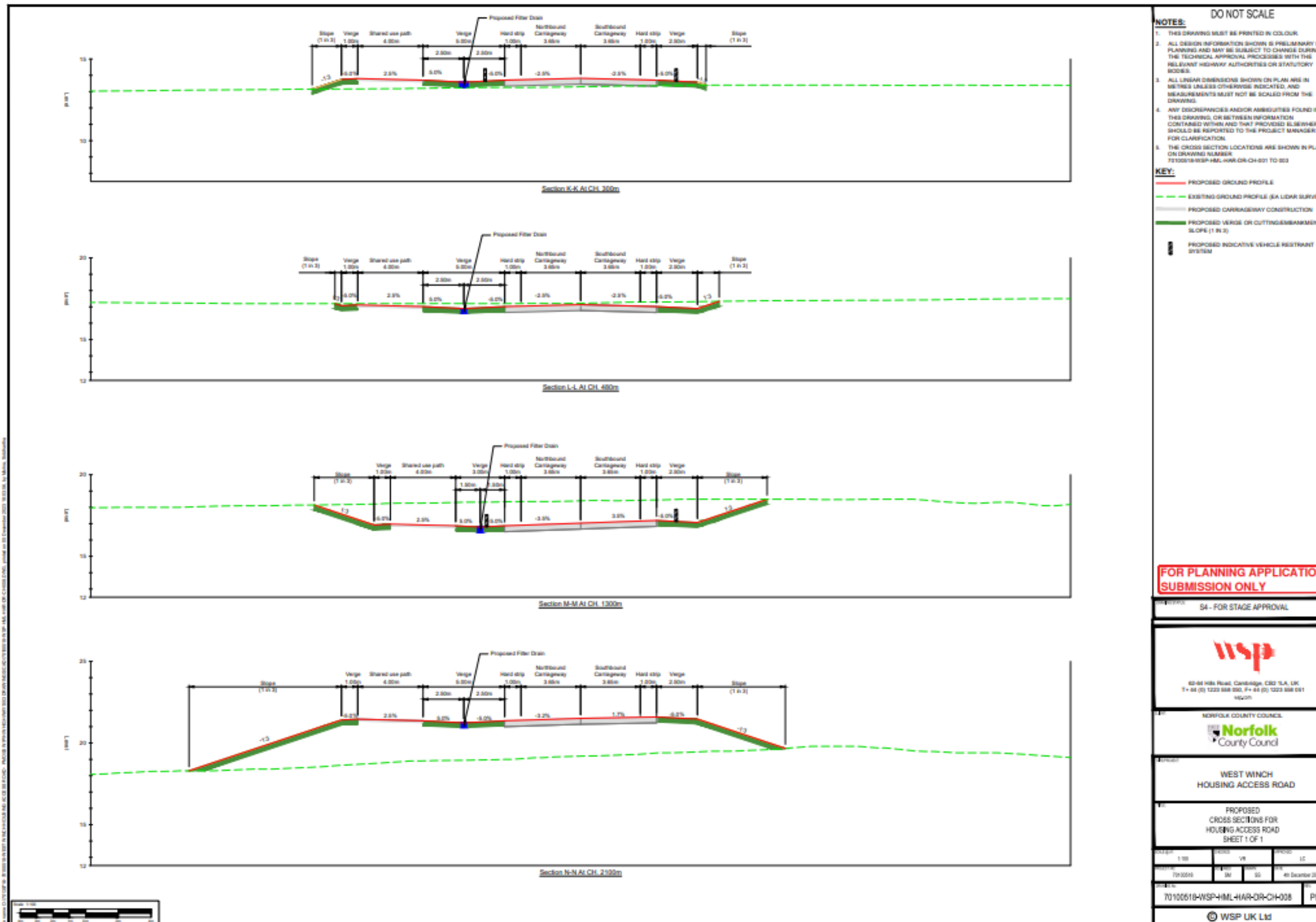


Figure 1-5 Cross section Drawing for Rectory Lane

