

A47 Blofield to North Burlingham Dualling

Scheme Number: TR010040

Volume 6

6.1 Environmental Statement **Chapter 2 – The Proposed Scheme**

APFP Regulation 5(2)(a)

Planning Act 2008

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

September 2021

Deadline 4

Infrastructure Planning

Planning Act 2008

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

A47 Blofield to North Burlingham
Development Consent Order 202[x]

**CHAPTER 2
THE PROPOSED SCHEME**

Regulation Number:	Regulation 5(2)(a)
Planning Inspectorate Scheme Reference	TR010040
Application Document Reference	6.1
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Version	Date	Status of Version
Rev 0	December 2020	Application Issue
Rev 1	July 2021	Deadline 1
Rev 2	September 2021	Deadline 4

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2. The Proposed Scheme

2.1. The need for the Proposed Scheme

- 2.1.1. The need for the Proposed Scheme is comprehensively set out in Section 3 of the Case for the Scheme (**TR010040/APP/7.1**).
- 2.1.2. Whilst around half of the A47 is already dual carriageway, the Blofield to North Burlingham section is not, with studies having identified that the single carriageway section of the road no longer meets the needs of its users. Sandwiched between two dual carriageway sections, the Blofield to North Burlingham stretch of the road acts as a bottleneck, resulting in congestion and leading to longer and unreliable journey times.
- 2.1.3. There are a number of reasons for these delays. Previous investigations have highlighted these reasons as:
- difficulty of accessing and crossing the A47 from side road junctions
 - standard of the road and junctions
 - traffic levels outgrowing the capacity of the road, causing tailbacks and delays
 - limited opportunities for overtaking slower moving vehicles
 - development in the local area
- 2.1.4. The Blofield to North Burlingham section of the A47 also has a poor safety record, with a total of 42 collisions recorded on the section between 2014 and 2018 (giving an average of nearly 9 collisions per year).
- 2.1.5. In addition, the greater Norwich area is set to see major housing and employment growth.
- 2.1.6. In developing the Proposed Scheme, Highways England aim to address these issues by improving the traffic flow, reducing journey times on the route, increasing the route safety and resilience and improving the environment. The Proposed Scheme is also intended to support economic growth by making journeys safer and more reliable.

2.2. Proposed Scheme objectives

Supporting economic growth

- 2.2.1. The Proposed Scheme aims to reduce congestion related delay, improve journey time reliability and increase the overall capacity of the A47. This will help

contribute to sustainable economic growth by supporting employment and residential development opportunities.

Making a safer network

- 2.2.2. Improving road safety for all road users by designing to modern highway standards appropriate for a major A road.

A more free-flowing network

- 2.2.3. Increasing the resilience of the junction in coping with incidents such as collisions, breakdowns, maintenance and extreme weather. The improved A47 from Blofield to North Burlingham will be more reliable, reducing journey times and providing capacity for future traffic growth.

Protected environment

- 2.2.4. We will protect the environment by minimising adverse impacts and where possible, improving the environmental effects of transport on those living along the route of the new and existing road. We will do this by reducing the impact on the natural and built environment by the new road and any associated works.

An accessible and integrated network

- 2.2.5. To ensure the proposals consider local communities and access to the road network, providing a safer route between communities for cyclists, pedestrians, equestrians and vulnerable users where a need is identified.

Value for money

- 2.2.6. To ensure that the Proposed Scheme is affordable and delivers good value for money.

2.3. Location of Proposed Scheme

- 2.3.1. The A47 from Blofield to North Burlingham is located approximately 9km to the east of Norwich and forms part of the main arterial highway route connecting Norwich and Great Yarmouth. The Proposed Scheme is an offline alignment running parallel to the south of the existing A47. The layout extents are shown in the General Arrangement Plans **(TR010040/APP/2.6)**.
- 2.3.2. The surrounding area is a generally flat and low-lying landscape. It has limited topographic variation and slopes gently from west to east, becoming flatter as it merges with the Broads.
- 2.3.3. The area is also characterised by isolated farmsteads and small, nucleated villages with large medieval churches which are linked by a dense network of

lanes. Larger populations include Blofield to the west, Acle to the east and North Burlingham located centrally to the Proposed Scheme, adjacent to the eastbound carriageway of the existing A47.

- 2.3.4. In the immediate vicinity of the existing A47 there are agricultural fields enclosed by hedgerows with mature trees and small areas of woodland. The existing A47 is partially lined by mature trees and hedgerows, but is more widely characterised by a context of open arable farmland with limited field boundary vegetation.

2.4. Baseline scenario

- 2.4.1. Figure 1.1 (Scheme overview) **(TR010040/APP/6.3)** provides a location of the Proposed Scheme.

Existing baseline scenario

- 2.4.2. The existing baseline scenario refers to the conditions that currently exist in the area within which the Proposed Scheme would be implemented.
- 2.4.3. The A47 Corridor is ranked second nationally for fatalities on A roads and the accident severity ratio is above average. The existing A47 within the Proposed Scheme is a single carriageway.
- 2.4.4. The A47 Blofield to North Burlingham (eastbound) currently has an average speed during the morning peak significantly lower than the daily average. This is an indicator of congestion and affects journey times and journey time reliability on the road.
- 2.4.5. These indicators show that the section of the A47 between Blofield and North Burlingham is already over capacity.
- 2.4.6. The resilience of this section of the A road is an issue as there are no suitable alternative routes in the event of its closure, for example from an accident or vehicle breakdown.
- 2.4.7. The existing conditions within the scheme boundary and surrounding area relevant to each of the individual topics is reported in chapters 5 to 14 of this Environmental Statement (ES) **(TR010040/APP/6.1)** under the section 'Baseline Conditions'.

Future baseline scenarios

- 2.4.8. Existing baseline conditions which will change and evolve without the implementation of the Proposed Scheme are included as part of the environmental impact assessment (EIA) and are referred to as the future baseline. Changes to the existing baseline conditions may occur due to a

combination of influences, for example climate, traffic flows and new developments.

- 2.4.9. The future baseline scenarios considered in the ES are defined in Chapter 4 Environmental Assessment Methodology (**TR010040/APP/6.1**), and a list of developments included as part of the future baseline is provided.

2.5. Proposed Scheme description

- 2.5.1. The Proposed Scheme description text should be read in conjunction with the Masterplan (**TR010040/APP/6.8**) and the General Arrangement Plans (**TR010040/APP/2.6**).

Proposed A47 mainline

- 2.5.2. At the western end of the Proposed Scheme, the proposed mainline alignment of the A47 dual carriageway departs from the existing alignment of the A47 at Yarmouth Road, and continues parallel to the south of the existing A47, crossing over Lingwood Road and Lingwood Lane (which will both be stopped up) before re-joining the existing A47 alignment east of the existing junction with the B1140 South Walsham Road / White House Lane.
- 2.5.3. The proposed alignment removes right turns across this section of the A47 and allows for safer and easier merging and diverging to and from the improved A47.
- 2.5.4. The proposed alignment contains one new layby for use by all. This will replace an existing layby which is located east of the B1140 junction and is to be closed as part of the Proposed Scheme.

Fencing, barriers and road signage

- 2.5.5. Fencing will be provided to delineate the highway boundary and is indicated in General Arrangement Plans (**TR010040/APP/2.6**).
- 2.5.6. Safety barriers and road signage are also included in the Proposed Scheme.
- 2.5.7. Noise barriers have been included as part of the Proposed Scheme design at the locations described in Table 2-1 and as presented in Figure 11.2 (**TR010040/APP/6.3**).

Table 2-1 : Permanent noise barrier requirements

Noise barrier ID	Location	Height (m)	Approximate length (m)	Type	Insertion loss, IL (dB)	Sound insulation category
1	North Blofield	3	265	Reflective	9.8	B3
2	Poplar Farm, Lingwood Road	3	400	Absorptive (Class A1)	4.8	B2
3	The White House, Acle Road	3	170	Reflective	4.8	B2
4	1 and 2 Hall Cottages, The Windle	2	130	Reflective	5.6	B2

2.5.8. The required noise barrier specification is presented in Table 2-1 and has been determined in accordance with DMRB LD 119 *Road side environmental mitigation and enhancement*. The required category of airborne sound insulation category is specified as per BS EN 1793-2. The category of absorptive performance is specified as per BS EN 1793-1 and in accordance with the stated requirements with DMRB LA 111.

Detrunking the existing A47

2.5.9. Where the existing A47 is proposed to be de-trunked it will serve as a local access for residents. This will include reducing the carriageway width to a minimum of 5.5m, from the existing 9m, and includes a new combined foot/cycleway provided on the north side of the carriageway connecting Yarmouth Road at Blofield east to the existing footway which commences at Main Road in North Burlingham via the Blofield Overbridge.

2.5.10. Between the mainline chainages 1900 and 2550, see General Arrangement Plans (**TR010040 /APP/2.6**), the proposed A47 mainline corridor is restricted by the existing A47 to the north and residential properties to the south. The distance between the existing de-trunked A47 and the proposed mainline is less than 30m at this location. To prevent headlight dazzle from vehicles travelling in the opposing directions, earth bunds have been incorporated into the design to screen the two roads. This consists of bunding to a height of 2.5m above the proposed alignment level.

Yarmouth Road junction

2.5.11. The Yarmouth Road junction is proposed to be adjusted to suit the re-aligned A47, with the gap in the central reservation closed to right turning vehicles.

2.5.12. The private means of access to High Noon Lane with existing direct, at grade access on the eastbound carriageway of the A47 would be stopped up. The Proposed Scheme would provide access from the detrunked A47 west. General

improvements to the surrounding local junctions and accesses at the Sparrow Hall properties would also be made.

- 2.5.13. A westbound merge lane will be provided, to assist vehicles joining the A47. A retaining wall is included in the design for this element to prevent permanent land take of the adjacent residential gardens.
- 2.5.14. The new junction layout includes lighting columns (see paragraph 2.5.31 – 2.5.39 for more detail).

Blofield Overbridge Southern Approach

- 2.5.15. From the Yarmouth Road junction, Waterlow will be realigned south of the A47 to tie-in with proposed Blofield Overbridge. This alignment generates an area of segregated land between it and the proposed A47 mainline.

B1140 junction

- 2.5.16. The existing staggered cross-roads where the B1140 crosses the A47 are to be replaced with a compact grade separated junction, allowing for safer and easier merging and diverging to and from the proposed A47. This junction arrangement also provides an overbridge for traffic travelling north / south crossing the A47. The existing A47 would be de-trunked and realigned to tie into the compact grade separated junction.
- 2.5.17. Parallel merge and diverge lanes will be provided to mitigate speed differentials between side road and mainline traffic. Revised access arrangements are provided for residents south of the existing A47.

Agricultural access track

- 2.5.18. An unbound track is proposed to provide access to the agricultural land south of the proposed A47 mainline, accessed via the Access Road off the southern approach to the proposed Blofield Overbridge.

North Burlingham access

- 2.5.19. The existing junction at the eastern extent of North Burlingham connects Main Road to the existing A47 as a one-way single carriageway travelling out of North Burlingham. The Proposed Scheme introduces a new junction, North Burlingham Access, that provides vehicle access in both directions and reduces diversion time for vehicles approaching North Burlingham from the east.

Walking, cycling and horse riding amenity

- 2.5.20. In total, the Proposed Scheme provides approximately 0.3km of new footpath and 6.3km of new shared footway / cycleway provision to the area.
- 2.5.21. The completed works, in combination with existing infrastructure and routes would allow walkers to travel in a continuous loop from Blofield to the B1140 junction to North Burlingham and back to Blofield.
- 2.5.22. WCH proposed provision is shown on Figure 12-2 (**TR010040/APP/6.3**). Key areas and routes include:

Blofield to North Burlingham

- 2.5.23. Where the existing A47 is unaffected by the dualling, it is proposed to be de-trunked and serve as a local access road for residents, with a new shared footway / cycleway provided on the north side of the existing carriageway.
- 2.5.24. This provision would connect with existing footways at Yarmouth Road, Blofield east, and at Main Road in North Burlingham via the Blofield Overbridge. These new sections of infrastructure will provide a new travel corridor and improved connectivity between Blofield and North Burlingham for walkers and cyclists.

B1140 Junction

- 2.5.25. The new compact grade separated junction includes footway and cycleway provision across the overbridge.
- 2.5.26. New footway / cycleway provision will connect with existing footways at the eastern extents of North Burlingham and lead over the overbridge via a crossing at the de-trunked A47. This would provide a new crossing point at this location that does not require crossing the live traffic of the trunk road.
- 2.5.27. South of the B1140 junction the footway / cycleway connects to a further footway / cycleway running east to west, and south of the Proposed Scheme. The footway/cycleway also follows the B1140 and into Acle Road. Cyclists travelling south would re-join the local road network at this point.

East and west travel south of the proposed mainline

- 2.5.28. The Proposed Scheme provides a new Public Right of Way (PRoW) footpath / cycleway connecting from Blofield to the B1140 junction. This route connects with multiple existing north / south permissive routes, footpath Burlingham FP3, Lingwood Road and Lingwood Lane.

- 2.5.29. This consists of an unbound footpath / cycleway running east to west, starting on the footway of the Access Road which provides a link to the Blofield Overbridge:
- adjacent to the proposed agricultural access track passing Lingwood Road to FP3
 - adjacent to the agricultural access track and then the maintenance track from FP3 to permissive Burlingham Woodland Walks
 - adjacent to the existing Burlingham Trails Network (bridleway) to Lingwood Lane with a short diversion of approximately 50m round the proposed soakaway
 - a new footpath / cycleway from Lingwood Lane to the B1140

Structures

2.5.30. The Proposed Scheme includes three new key structures. These structures comprise the Blofield Overbridge and B1140 Overbridge, as well as the West Retaining Wall (Engineering Drawings and Sections (**TR010040/APP/2.5**)).

2.5.31. Both overbridges are proposed two spans with precast prestressed beam composite decks. This will ensure the structures are cost-effective and are straightforward to maintain. The new structures will be built off-line alongside the old A47 with few construction constraints in terms of buried services or existing structures.

Blofield Overbridge

- a new skew crossing at the western end of the Proposed Scheme which carries a link road over the proposed A47 mainline. The link will connect Yarmouth Road and the town of Blofield to the west with the detrunked A47 and the village of North Burlingham

B1140 Overbridge

- a new square crossing at the eastern end of the Proposed Scheme which forms part of a compact grade-separated junction and provides a north-south connection between South Walsham Road (B1140) and Acle Road (B1140)
- 2.5.32. Recent ground investigation has been utilised to carry out preliminary foundation design. Spread foundations have not been considered in the options due to the excessive bearing pressures and differential settlements expected therefore, both bridges at the abutments and piers are piled.
- 2.5.33. Due to their quick construction time, cost and flexibility reinforced soil wingwalls are proposed for both structures. Ground improvement in the form of stone columns are required beneath the reinforced soil wingwalls at Blofield Overbridge.

West Retaining Wall

- 2.5.34. There is a proposed retaining wall at the western end of the Proposed Scheme at the junction between Yarmouth Road and the new alignment of the A47. It is located adjacent to the south western onslip side of the junction. The retaining wall varies in height up to approximately 3.5m.
- 2.5.35. Three options are currently proposed:
- precast reinforced concrete units supported on a mass concrete foundation
 - eco-crib recycled mixed polymer retaining wall system
 - a sheet piled solution
- 2.5.36. All 3 options have adopted rapid and/or off site construction techniques to minimise construction time, enhance safety and reduce cost. The contractor will be allowed to choose the best value system prior to construction based on its construction strategy.

Lighting

- 2.5.37. The environmental assessment has been undertaken on a lighting design described below and is considered to be the maximum number of lighting columns required. This is a worst case scenario approach to the assessment. Consultation has been undertaken with relevant stakeholders including Norfolk County Council.
- 2.5.38. More detailed design work and further consultation will be completed in later stages of detailed design to reduce and eliminate road lighting where possible and safe to do so. Thereby meaning the actual potential effect of the lighting could be reduced from that being assessed.

Columns and luminaires

- 2.5.39. The current lighting design is that 8m and 10m tall columns with LED luminaires would be located in verges (or at the back of footways where applicable) and oriented perpendicular to the carriageway. Luminaires would be mounted with zero degree tilts to ensure upward light spill is minimised.
- 2.5.40. Electrical supply to the lighting columns would be connected to a feeder pillar with cables routed through ducting that is buried in verges and beneath the carriageway where applicable.

B1140 junction

- 2.5.41. The existing A47 carriageway section in proximity to the B1140 junction is lit with lighting columns. This lighting would be removed as part of the Proposed Scheme before being replaced by the Proposed Scheme lighting.
- 2.5.42. The provision of new road lighting is proposed along the A47 mainline, adjacent to both the eastbound and westbound carriageways, within the extents of the junction. The lighting of the overbridge would increase the overall height of the lighting columns compared to the existing baseline conditions.
- 2.5.43. The provision of new road lighting is proposed on the B1140 at the two junctions located north of the proposed A47 mainline and the three junctions located to the south. The approach to each junction would be illuminated for the length of carriageway necessary to provide five seconds of driving distance at the posted speed limit. This would reduce the overall the length of lit carriageway on the A47 at this junction area.

Yarmouth Road junction

- 2.5.44. The proposed lighting is located on the verge of the approach and exit on the A47 westbound carriageway. There are lighting columns which extend down Yarmouth Road adjacent to the eastbound carriageway and a single lighting column adjacent to the eastbound carriageway of Waterlow.
- 2.5.45. Proposed columns on Yarmouth Road and A47 back onto residential properties but would be fitted with back light shields to mitigate light spill.

Drainage

Existing drainage

- 2.5.46. Where possible, existing drainage will remain in place at the tie-ins with the existing A47. Filter drains and soakaways may be relocated in some sections on the approaches to junctions at the eastern and western extents of the Proposed Scheme, to maintain the operation of the drainage on the existing A47.
- 2.5.47. Where existing direct discharges to streams are not taking any increased road run-off from the Proposed Scheme, these outfalls will remain in place.

Infiltration rates

- 2.5.48. Infiltration rates have been collected from testing undertaken during the ground investigation.
- 2.5.49. An infiltration basin and frequent soakaways have been included in the design, which emulates the existing drainage regime at these locations on the existing

A47. These infiltration facilities will receive surface water discharges from the new road and will maintain existing greenfield discharge rates.

2.5.50. Treatment in the form of filter drains and infiltration basin / soakaways and separate spillage containment will also form part of the drainage system.

2.5.51. The inclusion of deep soakaways has been considered necessary on the Proposed Scheme due to:

- attaining volumes of storage required within the space available
- test results demonstrating inadequate infiltration at shallower depths
- avoid the creation of flow paths to properties downstream

Flood improvements

2.5.52. It is expected that road run-off from approximately 400m of existing A47 carriageway may have to be brought into the new section of the drainage system due to the Proposed Scheme. These discharges would be attenuated utilising the new infiltration systems. This would reduce the likelihood of flooding downstream.

Structure drainage

2.5.53. Deck drainage will be provided on the bridges.

2.5.54. Back of wall drainage is proposed for the West Retaining Wall and will drain to an existing ditch at this location.

Carriageway drainage

2.5.55. The new carriageway will drain to filter drains and discharge to an infiltration basin located to the south of the new Blofield Overbridge and to frequent soakaways across the Proposed Scheme, providing treatment of the surface water run-off and maintaining greenfield discharge rates.

2.5.56. Additional spillage containment at the discharge points will be provided where required.

2.5.57. Proposed drainage systems include:

- Kerbed sections of the mainline will be drained utilising gullies or a combined kerb and gully system, discharging to the filter drains or carrier drains in the verges.
- Filter drains will be provided at the toe of any cuttings along the mainline. The filter drains will collect run-off from the slopes or carriageway.
- Central reserve drainage will be provided where the road is in super-elevation.

- Toe drains, where required, draining embankments greater than 1.5m in height, will drain via ditches to soakaways or along existing surface water pathways.

- 2.5.58. Side road links to the new carriageway will drain to soakaways. Where the existing A47 is de-trunked and will link into the proposed new alignment at the B1140 junction, the existing drainage will remain in place where possible with some realignment. This existing drainage system will be maintained through the junction, collected and diverted back into the existing drainage at the western tie-in.
- 2.5.59. Natural overland drainage and existing ditches / streams between the existing A47 and the proposed new mainline will be intercepted by new ditches and conveyed along the natural drainage paths as far as possible. This will involve pipe crossings of the proposed new mainline.
- 2.5.60. A new footway/cycleway is proposed for the existing A47. The footway will result in realignment of existing drainage on the existing A47 and new gullies and / or combined kerb drainage units which will tie-in to the new drainage networks and to existing drainage where possible. Some drainage on the existing A47 will be unaffected where the road falls away from the footway. At these locations it is proposed to provide a fall in the footway towards the road. This new footway will extend into the de-trunked A47 west to allow for safe crossing north of the Blofield Overbridge. Additional gullies and or combined kerb drainage units will be provided to facilitate this extended footway.
- 2.5.61. On the B1140, which provides access to the White House (Coach house), an existing ditch will be culverted to allow access to a field west of the existing road.

2.6. Construction, operation and long-term management

- 2.6.1. The approach to construction described below is indicative but it is representative of the likely approach to be adopted. Further provisions in relation to construction of the Proposed Scheme are provided in the Environmental Management Plan (EMP) (TR010040/APP/7.7).

Land required for Proposed Scheme

- 2.6.2. The rights to compulsorily acquire the land required to deliver the Proposed Scheme are being sought by Highways England through the DCO application.
- 2.6.3. Temporary and permanent land requirements have been identified through a combination of the design-development and environmental assessment, and through engagement with landowners that would be affected by the Proposed

Scheme. These are defined by the Order limits illustrated in the Land Plans (TR010040/APP/2.2).

2.6.4. Land take requirements include:

- 15.68ha of existing land owned by Highways England within the red line boundary
- 47.4ha of new permanent land take for operation of the Proposed Scheme
- 40.16ha of temporary land take for construction (including 12.0ha for new rights)(for Blofield)

Construction programme

2.6.5. The construction stage for the Proposed Scheme has been informed by the appointed contractor, although some aspects are likely to be refined during the detailed design for the Proposed Scheme.

2.6.6. The impacts of construction activities are considered in each chapter of this ES. Assessment has been based on the information provided in this chapter and on standard best practice construction techniques.

2.6.7. Construction is anticipated to take approximately 22 months. This would be carried out in phases, so not all sections of the Proposed Scheme would be under construction for the full period.

2.6.8. The proposed phases of construction are set out in Table 2-2 (Construction phasing programme). Enabling and site preparation work would be largely carried out during Phase 0, with the main works carried out during Phases 1 to 7 before final compound removal in Phase 8.

Table 2-2 : Construction phasing programme

Phase	Traffic management stage	Approximate programme	Key Construction Activities
0	Site preparation and utility diversions	Six months (month 1 to 6)	Utility diversionary works completed including BT Openreach, Cadent Gas, Vodafone, Anglian Water, UKPN, Virgin media and Vodafone. Compound and welfare areas constructed for main works. Hardstanding areas will be constructed topsoil stripped and subbase installed. Areas for car parking will be surfaced as required. Clearance of vegetation undertaken as required to enable the works.
1	Offline construction, including overbridges and retaining wall	Twelve months (month 6 to 17)	Construction of carriageway offline from existing A47. Activities including topsoil strip, cut / fill earthworks, drainage installation, carriageway construction including capping, subbase and the bitumen bound layers.

Phase	Traffic management stage	Approximate programme	Key Construction Activities
			Construction of offline structures including new overbridges and retaining walls. Sheet piling, bored piling and concrete works will be undertaken.
2	Construct the new Blofield Overbridge Southern Approach	Four months (month 9 to 12)	New Blofield Overbridge Southern Approach involves topsoil strip, cut / fill earthworks, drainage installation, carriageway construction including capping, sub-base and the bitumen bound layers.
3	Traffic using new Blofield Overbridge Southern Approach and construct further section of new carriageway	Six months (month 12 to 17)	Main works will involve completion of carriageway pavement and road restraint systems. Landscaping will commence. Road lighting installed where required.
4	Construct cross-overs either end of existing east bound dual carriageway. Small sections of contraflow used to enable new west bound carriageway to tie-in to existing A47. Traffic to remain on existing single carriageway.	Two months (month 16 to 17)	Cross-overs will be constructed by removing existing central reservation and road restraint at either end of the Proposed Scheme. Central reservation will have carriageway construction inlaid.
5	Weekend and overnight closures (as required) to finalise tie-in to new westbound dual carriageway	One month (month 17)	Tie-ins will require existing carriageway to be cold milled and new overlays installed that join the new carriageway to the existing carriageway at either end of the Proposed Scheme.
6	Traffic using new westbound carriageway as single carriageway. Construct connecting roads over now disused A47, remainder of approach ramps and east bound carriageway tie-ins completed.	Five months (month 17 to 21)	Completion of east bound carriageways. Construction of new approach ramps to new overbridge structures. Activities include topsoil strip, cut/fill earthworks, drainage installation, carriageway construction including capping and subbase and the bitumen bound layers. Road restraint installed. Road lighting installed where required. Landscaping works will continue.
7	Final tie-ins and finishing works. Overnight closures used as required to tie-in new eastbound carriageway.	Two months (month 20 to 21)	Final tie-ins will require existing carriageway to be cold milled and new overlays installed that join the new carriageway to the existing carriageway at either end of the Proposed Scheme. On completion of final surfacing works traffic use new carriageways, temporary cross-overs will be removed, permanent road markings will be installed, and road restraint systems will be completed at the temporary cross-over locations.
8	Compound removal	Two months (month 21 to 22)	Compound and site welfare will be removed. Hardstanding areas will be removed and the site re-topsoiled. Area will be re-landscaped as required.

Construction compounds and site accesses

2.6.9. Construction compound locations have been identified in balance of practical locations near key areas of work and avoidance of environmental impact (such as retention of trees and hedgerows, fitting withing context of the landscape). The areas are shown in Table 2-3.

- 2.6.10. The main construction compound is proposed to the east of Lingwood Lane with an available area for a car park on the western side.
- 2.6.11. Three satellite compounds are proposed. Two satellite compounds will service the construction of the proposed B1140 junction, one north of the junction and one to the west. The third satellite compound will service the west end of the Proposed Scheme. The compound would include temporary site offices, parking, and welfare facilities. Table 2-3 indicates indicative timings of use of each of the compound locations.

Table 2-3 : Proposed compound details

Compound	Approximate area	Indicative timings
Main compound – east of Lingwood Lane	1.65ha	22 months
Car park for main compound – west of Lingwood Lane	0.55ha	15 months
Satellite compounds – south of proposed A47	1.2ha 1.0ha	15 months
Satellite compound – southeast of proposed B1140 junction	1.35ha	15 months
Satellite compound – northeast of proposed B1140 junction	1.35ha	15 months

Material storage and stockpiles

- 2.6.12. Topsoil (and potentially subsoil) will need to be removed from the proposed mainline alignment and then temporarily stockpiled until needed for re-use.
- 2.6.13. Stockpiling will also be required for imported general fill and aggregates for use in the permanent works.
- 2.6.14. The stockpiles would generally be located at the perimeter of working areas, approximately 2m to 3m in height (in accordance with British Standard BS3882: 2015), so that they would also screen the works from the public.
- 2.6.15. Soils removed from areas identified as being of designated archaeological importance would be subject to specific procedures, defined in the EMP **(TR010040/APP/7.7)**.

Construction traffic

- 2.6.16. A haul route is included in Figure 2.1 **(TR010040/APP/6.3)**. The remainder of the haul routes would be located under the footprint of the Proposed Scheme for the on-site vehicle movements, as well as the use of the wider existing road network.
- 2.6.17. Lingwood Lane would be closed south of these compounds during the construction period.

- 2.6.18. Construction traffic arriving from off site would consist of vehicles delivering the products required for the construction of the Proposed Scheme, including concrete, bitumen, aggregates and pipes.
- 2.6.19. Some deliveries would arrive as abnormal loads, such as large construction plant. In most cases these construction traffic movements, as well as site worker journeys, would be directly to and from the main compound area next to the proposed B1140 junction. Table 2-4 provides a summary of the likely heavy goods vehicle (HGV) movements. Note that the total of lorry trips per day would not exceed 300.

Table 2-4 : HGV daily totals during construction

Phase	Max number of lorry trips per day	Indicative locations	Approximate programme
0	75	Compounds	Six months (month 1 to 6)
1	150	Site wide	Twelve months (month 6 to 17)
2	25	Compounds and Waterlow	Four months (month 9 to 12)
3			Six months (month 12 to 17)
4	50	Compounds and cross-over locations	Two months (month 16 to 17)
5	50	Compounds and carriageway tie-in locations	One month (month 17)
6	150	Compounds and embankments north of existing A47	Five months (month 17 to 21)
7	100	Compounds and final tie-in locations	Two months (month 20 to 21)
8	75	Compounds	Two months (month 21 to 22)

- 2.6.20. For the purposes of the EIA, it is assumed that 75% of all deliveries would go to the main construction compound at the proposed B1140 junction, 20% to the satellite compounds and 5% to the laydown areas.
- 2.6.21. The outline traffic management plan (**TR010040/APP/7.8**) defines the measures used to reduce the impacts from construction traffic, including measures to reduce worker vehicle movements and to reduce HGV movements, particularly at peak periods. This will be implemented by the contractor.

Existing A47 during construction

- 2.6.22. The Proposed Scheme is an offline alignment, allowing traffic to continue to use the existing A47 as works progress on the main dualling section.
- 2.6.23. Appropriate traffic management measures would be put in place to ensure that traffic flows on the existing A47 and other local roads are maintained, whilst allowing safe working at the interface between the existing road network and the Proposed Scheme.

Construction methods

- 2.6.24. The construction of the Proposed Scheme would use typical construction techniques associated with major infrastructure projects.
- 2.6.25. Indicative timescales for daytime, night-time and weekend working for each phase are presented in Table 2-5.

Table 2-5 : Indicative working times during construction

Phase	Indicative working hours	Indicative locations	Approximate programme
0	Predominantly daytime works. Overnight works to construct works accesses.	Compounds	Six months (month 1 to 6)
1	Predominantly daytime works. Overnight works to construct works accesses.	Site wide	Twelve months (month 6 to 17)
2	Predominantly daytime works. Overnight and weekend works required to complete tie-ins.	Compounds and Waterlow	Four months (month 9 to 12)
3	Predominantly daytime works. Overnight works if required.		Six months (month 12 to 17)
4	Predominantly daytime works. Overnight works required to construct A47 cross-overs.	Compounds and cross-over locations	Two months (month 16 to 17)
5	Daytime, overnight and weekend works required to complete A47 tie-ins.	Compounds and carriageway tie-in locations	One month (month 17)
6	Predominantly daytime works. Overnight and weekend works required to complete A47 tie-ins.	Compounds and embankments north of existing A47	Five months (month 17 to 21)
7	Predominantly daytime works. Overnight works required to complete vehicle restraint systems and removal of cross-overs.	Compounds and final tie-in locations	Two months (month 20 to 21)
8	Predominantly daytime works. Overnight works if required.	Compounds	Two months (month 21 to 22)

- 2.6.26. Piling would likely be required to construct the support for the western retaining wall and overbridges, and possibly elsewhere for the retained cuttings. Major bridge structures would be likely to be built using combinations of 'cast-in-situ' elements and imported 'off-site' pre-cast elements craned into place.
- 2.6.27. Earthworks, including cuttings and embankments, would be required to create the route alignment. The cuttings and embankments would be constructed using a 'cut-and-fill' approach, using the alignment to move materials along the route corridor. The formation of the road surface would use standard techniques, including construction of capping, sub-base and pavement layers.

Plant and equipment

- 2.6.28. Construction of the Proposed Scheme would require a large quantity of plant and equipment. The volume of earth to be moved would require large excavators, dump trucks, bulldozers, compactors, graders, bowsers and stabilising plant.
- 2.6.29. Plant numbers and usage will be determined by the chosen construction method although for the purposes of assessment, preliminary plant lists have been used to consider construction impacts in chapter 11 Noise and vibration **(TR010040/APP/6.1)**.

Utilities

- 2.6.30. Construction of the Proposed Scheme is likely to require the diversion, relocation or protection of existing utility assets.
- 2.6.31. Diversion route corridors have been used as a worst case scenario to assess the potential impacts in line with EIA principles. These corridors are shown in the Works Plans **(TR010040/APP/2.3)**.

Demolition

- 2.6.32. The Proposed Scheme does not require the demolition of existing buildings or major structures.

Excavated materials

- 2.6.33. Construction of the Proposed Scheme would require excavation in places to form cuttings for the highway and this material would then be used to form embankments. This is considered in greater detail in chapter 10 Material assets and waste **(TR010040/APP/6.1)**.

Environmental management plan

- 2.6.34. An EMP **(TR010040/APP/7.7)** has been prepared in to include construction, operational and maintenance mitigation measures which have been defined in part by the requirements which arise from the assessments presented in this ES.
- 2.6.35. In line with DMRB LA 120 (Environmental Management Plan), the EMP establishes a suitable mechanism to link assessment assumptions and DCO requirements. The EMP is secured by Requirement 2 to the Draft DCO **(TR010040/APP/3.1)** and is a live document which will be revised as more information becomes available throughout the lifetime of the Scheme.

Operation and long-term management

- 2.6.36. Once the proposed A47 mainline is opened, it would form part of the A47 trunk road and the wider strategic road network.
- 2.6.37. The new A47 mainline would be managed by Highways England on a day to day basis using the monitoring and control systems in accordance with the relevant design standards.
- 2.6.38. Maintenance is defined as actions needed to inspect, repair, adjust, alter, remove, replace or reconstruct all aspects that relate to the Proposed Scheme.
- 2.6.39. Long-term maintenance and repairs would be undertaken as required to maintain the appropriate standards for the strategic road network.
- 2.6.40. Two maintenance laybys are included which are near to both junctions and the two major structures to facilitate off-network maintenance access.
- 2.6.41. The two overbridges (the Blofield Overbridge and the B1140 Overbridge), have been designed as fully integral structures without bearings. This reduces the maintenance requirement of both structures. Inspections would be required of the bridge piers, including the pier within the central reserve. Lane closures would be required to safely facilitate the inspections.
- 2.6.42. The de-trunked A47 and new side roads would become the responsibility of the local highway authority.

Limits of Deviation

- 2.6.43. The assessments included within this ES are based on the design of the Proposed Scheme described within this chapter and presented in the General Arrangement Plans **(TR010040/APP/2.6)**.
- 2.6.44. Where appropriate, limits of deviation have been incorporated within the Order limits to allow minor modifications to be made to the Proposed Scheme during the detailed design and construction stages. Such flexibility is required, for example, to enable the construction contractor to alter their working procedures or make minor adjustments to the position of certain infrastructure in response to unforeseen conditions identified on site.
- 2.6.45. The limits of deviation have been determined based on the design and construction factors, and have been taken into consideration as part of the EIA.
- 2.6.46. The vertical limits of deviation are 1m up and 1m down referenced against the vertical profile levels indicated on the Engineering Drawings **(TR010040/APP/2.5)**.

2.6.47. The horizontal limits of deviation are by up to a maximum of 3 metres either side of the centreline of that work as shown on the Works Plans **(TR010040/APP/2.3)**.

2.6.48. In no case would the Proposed Scheme extend beyond the defined Order limits.

2.7. Decommissioning

2.7.1. It is considered highly unlikely that the Proposed Scheme would be demolished before the end of its design life of 60 years as the road would have become an integral part of the strategic road network.

2.7.2. In the event of the Proposed Scheme needing to be demolished, this would conform to the statutory process at that time, including EIA if required. Demolition of the Proposed Scheme is not therefore considered further in this ES.