

A66 Northern
Trans-Pennine
project

Draft
Construction
Method and
Management
Statement

Volume 1



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Executive Summary

The A66 Northern Trans-Pennine project is a programme of works to improve the A66 between the M6 at Penrith and A1 at Scotch Corner. The project will involve upgrading single carriageway sections of road to dual carriageway standard and making improvements to the junctions along the route. The A66 is a key local, regional and national route for east/west journeys in the north of England, providing vital connections for freight, tourism and businesses across the UK.

The purpose of this Draft Construction Method Statement document is to outline the approach to managing the construction works for the A66 Northern Trans-Pennine project. This document is produced primarily to enable decision makers, local communities and other interested parties to understand the nature of the works and the various construction activities associated with the project. It is designed to be informative to those who are less familiar with construction and the methods, processes and procedures that will be implemented to deliver the project.

The Draft Construction Method Statement provides an overview on:

- Construction principles
- Indicative construction phasing and programme
- Key construction activities and processes
- Principles to inform traffic management and utilities management
- Environmental management during construction
- Health and safety considerations
- Community engagement during construction

The information provided in the Draft Construction Method Statement is subject to change, and more detailed plans, procedures and methodologies will be developed as the project develops, following continued liaison with key stakeholders and interested parties. An updated version of this document will be part of the Development Consent Order application process and then as part of the construction process.

1 Introduction

1.1 Introduction and Purpose of this Document

- 1.1.1 The purpose of this Draft Construction Method Statement (CMS) is to outline the approach to managing the construction works for the A66 Northern Trans-Pennine project (hereafter referred to as 'the project'). This document is produced primarily to enable decision makers, local communities and other interested parties to understand the nature of the works and the various construction activities associated with the project.
- 1.1.2 The information in this document provides an overview on: construction principles; key construction activities and processes; and principles to inform traffic management. In addition, the Draft CMS provides high-level indicative programme durations for each of the schemes within the project.
- 1.1.3 The Draft CMS helps to identify the impacts of the project on stakeholders and road users when works commence on this large-scale project. The Draft CMS is designed to be informative to those who are less familiar with construction and the methods, processes and procedures that will be implemented to deliver the project.
- 1.1.4 Major highways projects progress through a major projects lifecycle known as the Project Control Framework (PCF). The stages are:
- Pre-project phase:
 - Stage 0 (Strategy, shaping and prioritisation)
 - Options phase:
 - Stage 1 (Options identification)
 - Stage 2 (Option selection)
 - Development phase:
 - Stage 3 (Preliminary design)
 - Stage 4 (Statutory procedures and powers)
 - Stage 5 (Construction preparation)
 - Construction phase:
 - Stage 6 (Construction, commissioning and handover)
 - Stage 7 (Closeout)
- 1.1.5 The project is currently at PCF Stage 3, with preliminary design being undertaken.
- 1.1.6 It should be noted that the information provided in the Draft CMS is subject to change, and seeks to inform the reader of acceptable design and construction approaches that may be deployed on each of the project schemes. Construction methodology is subject to third party approvals and detailed design, and therefore more detailed plans, procedures and methodologies will be developed as the project develops, following continued liaison with key stakeholders and interested parties.
- 1.1.7 An updated version of this Draft CMS document will be part of the DCO application process and then as part of the construction process, where detailed scheme specific method statements will be produced by the relevant contractors undertaking the works.
- 1.1.8 Some information included in this report may differ from that set out in the Preliminary Environmental Information Report (PEIR). The PEIR was produced as the design of the project was still under development, and therefore should be regarded as a preliminary account of the principal environmental issues identified to date. Further information on the function and status of the PEIR is provided in the PEIR document

itself. The Environmental Statement (ES) produced for DCO submission will be informed by the updated version of this document.

1.2 Project Context

- 1.2.1 The existing A66 is a key national and regional strategic transport corridor and link for a range of travel movements. It carries high levels of freight traffic and is an important route for tourism and connectivity for nearby communities. There are no direct rail alternatives for passenger or freight movements along the corridor.
- 1.2.2 The A66 corridor lies across three local planning authority administrative areas, namely Eden District, Durham County and Richmondshire District. It runs through the North Pennines Area of Outstanding Natural Beauty (AONB) between Brough and Bowes. The Lake District National Park is approximately 2km south-west of Penrith and the Yorkshire Dales National Park is located approximately 3.5km south of the A66.
- 1.2.3 Despite the strategic importance of the A66, the route between the M6 at Penrith and the A1(M) at Scotch Corner is only intermittently dualled and has six separate sections of single carriageway. The route also carries local slow moving agricultural and other traffic making short journeys, which can have an impact on other users, especially on the single carriageway sections. The variable road standards, together with the lack of available diversionary routes when incidents occur, affects road safety, reliability, resilience and attractiveness of the route.
- 1.2.4 If the existing A66 route is not improved, it will constrain national and regional connectivity and may threaten the transformational growth envisaged by the Northern Powerhouse initiative and the achievement of the Government levelling up agenda.

1.3 Project Summary

- 1.3.1 The A66 Northern Trans-Pennine project is a programme of works to improve the A66 between the M6 at Penrith and A1 at Scotch Corner. The project will involve upgrading single carriageway sections of road to dual carriageway standard and making improvements to the junctions along the route. Parts of the project involve online widening of the carriageway and some are offline (in other words, new sections of road that follow a different route but reconnect into the main A66 alignment).
- 1.3.2 The project has been split into a number of schemes, summarised below.

M6 Junction 40 Penrith

- 1.3.3 The M6 Junction 40 Penrith scheme will provide a three-lane circulatory carriageway. The A66 between M6 Junction 40 and Kemplay Bank Roundabout will be widened to three lanes in each direction. Widening will be required on the following five approach arms to provide additional lanes and a dedicated left turn facility, each controlled under its own signal phase: M6 North, M6 South, A66 East, A66 West, and A592 Ullswater Road.

M6 Junction 40 to Kemplay Bank

- 1.3.4 The M6 Junction 40 to Kemplay Bank scheme will provide a new dual carriageway under Kemplay Bank Roundabout, allowing free-flowing traffic eastbound and westbound on the A66, improving access to Penrith and the A6. This scheme will include upgraded, replacement on- and off-slip roads to the roundabout, allowing users to safely join and leave the A66 in both directions. Minor realignment of the A6

and A686 arms will be required to accommodate the new slip roads serving the local road network.

Penrith to Temple Sowerby (Center Parcs)

- 1.3.5 The Penrith to Temple Sowerby (Center Parcs) scheme will provide full dualling of the existing A66 single carriageway section between Penrith and Temple Sowerby. The works for this section of the route will predominantly involve online widening using the existing carriageway to form one side of the new dual carriageway. The second carriageway will be constructed to the north of the existing carriageway.
- 1.3.6 A new grade-separated junction will be constructed to replace the existing Center Parcs junction to connect this facility with the new alignment of the A66. This will provide access to Center Parcs and the local road network. New left-in/left-out junctions will be provided to the B6262 and to St Ninian's Church on the Winderwath Estate, with associated acceleration and deceleration lanes to enable safe access to homes and businesses. The existing access serving Whinfell Holme Wastewater Treatment Works will also be converted to left-in/left-out, with the potential that this access will have to be relocated to the east to facilitate widening of the A66 over the existing utility corridor.

Temple Sowerby to Appleby

- 1.3.7 The Temple Sowerby to Appleby scheme is one of the schemes where there has been further consideration of sections of alternative alignments, to ensure the project complies with policy which seeks to protect the River Eden Special Area of Conservation (SAC) and heritage assets. Our evaluation of these alternatives has been informed through engagement with stakeholders, including the local communities, local authorities and environmental and heritage bodies. We have considered the options outlined and our preferred route for this scheme is the 'blue route', described below. The full reasons for this selection, and details of the other alternative alignment routes, are outlined in more detail in the Route Development Report.
- 1.3.8 The blue route is an evolved version of the route that was included in the Preferred Route Announcement (PRA) and will comprise a new offline bypass around the north of Kirkby Thore, a new bypass to the north of Crackenthorpe, and a number of new junctions and improvements. As the route travels south-east the alignment reduces the length of affected floodplain at the Trout Beck crossing. A new multi-span viaduct will be provided for the crossing over Trout Beck and its associated flood plain.
- 1.3.9 A new junction, referred to as the Temple Sowerby Bypass Junction, will provide connections between the existing A66 and the local road network. A short section of road will connect from Temple Sowerby Bypass Junction to the existing A66, allowing access for local traffic and other road users from Temple Sowerby to Crackenthorpe and to wider settlements. A new junction with merge and diverge lanes will be provided at Main Street to the north-east of Kirkby Thore. Main Street will pass over the proposed A66 alignment on a bridge structure. New bridge structures for both Station Road and Sleastonhowe Lane will enable access over the A66 for local traffic. A diversion will lead from Priest Lane to Station Road to maintain local traffic access.
- 1.3.10 At Crackenthorpe, a new junction with merge and diverge lanes on the westbound carriageway of the new A66 alignment will provide left-in/left-out access, linking to the previous A66 alignment and the B6542 and provide access to both Crackenthorpe and Appleby. Provision of an additional left-in junction to the eastbound carriageway

at the existing Appleby bypass junction will make better use of the existing infrastructure.

Appleby to Brough (Warcop)

- 1.3.11 The Appleby to Brough (Warcop) scheme comprises dualling a section of single carriageway between Coupland Beck and Brough, with a number of junction improvements to enable access on and off the A66 to improve user safety and reduce congestion. Appleby to Brough is one of the schemes where there has been further consideration of sections of alternative alignments, to ensure the project complies with policy which seeks to protect the North Pennines Area of Outstanding Natural Beauty (AONB) located to the north of the existing A66. Our evaluation of these alternatives has been informed through engagement with stakeholders, including the local communities, local authorities and environmental bodies. We have considered the options outlined and our preferred route for this scheme is the 'black-blue-blue route', described below. The full reasons for this selection, and details of the other alternative alignment routes, are outlined in more detail in the Route Development Report.
- 1.3.12 The western extent of the black-blue-black route comprises 2.6km of online widening with a new westbound carriageway to the south of the existing carriageway. A left-in/left-out junction will be provided at Café 66 providing access to the eastbound carriageway. A replacement underpass will be provided for New Hall Farm and Far Bank End and a left in/left out junction will be provided on the westbound carriageway. A new junction will provide a link to the B6259 to Sandford/Warcop.
- 1.3.13 The central part of the black-blue-black route will follow the line of the existing A66, by using the old A66 as the new eastbound carriageway and building the new westbound carriageway to the south. A new structure is proposed to cross the Moor Beck, and a new local road will be provided to the north of the new A66 dual carriageway in order to maintain local access and facilitate movement on and off the A66 to both Warcop and the Ministry of Defence facility.
- 1.3.14 The eastern portion of the black-blue-black route will continue to follow an alignment to the south of the existing A66 before tying into the Brough Bypass. The de-trunked sections of the A66 will enable use for access to the local road network west of Warcop and a new local road will be provided to the north from Turks Head into Brough. A left-only T-junction with diverge and merge tapers on the westbound carriage will be provided to maintain access to the properties on the south side of the new dual carriageway. Eastbound local movements to Brough would be via the accommodation bridge to join with the local road into Brough.

Bowes Bypass

- 1.3.15 The Bowes Bypass scheme will closely follow the existing A66 alignment to the north of the village of Bowes, with a new adjacent eastbound carriageway to the north. The existing carriageway will be changed to carry westbound traffic. At the junction with the A67, a new an underbridge will carry the proposed eastbound carriageway. Two new slip roads will accommodate traffic travelling to and from the east, providing access to and from the A67 and Bowes village. Access from Bowes to the A66 (via the Roman road known as The Street, and locally known as Low Road) will be stopped up, with the upgraded grade-separated Bowes Junction providing safer access for local traffic.
- 1.3.16 The A67 will be widened to the east to create a staggered junction and a right-turn lane for the eastbound on-slip. The existing eastbound off-slip will be realigned to the

north to make way for the new eastbound A66 carriageway. The existing westbound on-slip will have minor improvements made to create a safer merge.

Cross Lanes to Rokeby

- 1.3.17 The Cross Lanes to Rokeby scheme will be divert the A66 to the south of the Old Rectory and St. Mary's Church before re-joining the existing road at Rokeby.
- 1.3.18 The Cross Lanes to Rokeby scheme is one of the schemes where there has been further consideration of sections of alternative alignments, to ensure the project complies with policy which seeks to heritage assets. Our evaluation of these alternatives has been informed through engagement with stakeholders, including the local communities, local authorities and environmental and heritage bodies. There are alternative junction location options to produce three possible route options. We have considered the options outlined and our preferred route for this scheme is the 'black route', described below. The full reasons for this selection, and details of the other alternative alignment routes, are outlined in more detail in the Route Development Report.
- 1.3.19 Under the black route, at Cross Lanes it is proposed to remove the existing junctions which provide access to the B6277 Moorhouse Lane and Cross Lanes Organic Farm and Café, replacing it with a compact grade-separated junction on the A66, west of the existing Cross Lanes junction. The B6277 Moorhouse Lane and Rutherford Lane would be linked via a structure over the A66. Under the black route, at Rokeby it is proposed to remove the existing junction, replacing it with a compact grade-separated junction west of St. Mary's Church and the Old Rectory. This junction would be an underpass arrangement and would avoid direct impact on the Registered Park and Garden and the Old Rectory.

Stephen Bank to Carkin Moor (Layton)

- 1.3.20 The Stephen Bank to Carkin Moor (Layton) scheme will comprise a new dual carriageway section between Stephen Bank and Carkin Moor Farm. The new dual carriageway will be to the north of the existing A66 and the properties at Fox Hall and Mainsgill Farm, re-joining the existing A66 alignment after Mainsgill Farm.
- 1.3.21 The existing A66 will be de-trunked and will be used as a collector road for local access. In order to maintain existing access, this section of road will be realigned over a distance of 600m to facilitate the revised vertical realignment of Collier Lane, with an overbridge will be provided to link Collier Lane to the de-trunked A66. A new grade-separated junction to the western boundary of the existing alignment of Moor Lane will provide connectivity between the de-trunked A66 and the proposed mainline of the new A66. The southern section of Moor Lane will be realigned and placed into a cutting beneath the proposed mainline, and ultimately connected to grade-separated junction. The road will be widened through Carkin Moor Scheduled Monument to Carkin Moor Farm within the existing cutting, reducing impact on the scheduled monument itself.

A1(M) Junction 53 Scotch Corner

- 1.3.22 The A1(M) Junction 53 Scotch Corner scheme will widen the existing Middleton Tyas Lane approach at Scotch Corner roundabout from one lane to two lanes. In addition, it is proposed to alter road markings and kerbs on the circulatory carriageway to provide three lanes on the existing northern bridge structure.

1.4 Structure of this Document

1.4.1 This Draft CMS report will look to provide the reader with more information regarding the following topics in relation to the A66 project works:

- Construction Principles (**Chapter 2**) – A summary of the key principles that will be considered and managed during the design and delivery of the A66 project. Details are not provided for individual schemes, with the approaches being adopted across all schemes.
- Indicative Construction Phasing and Programme Overview (**Chapter 3**) – A summary of key construction sequences for the project, both offline and online along with high level indicative dates for key elements on each scheme.
- Indicative Construction Plant and Vehicles, Methods and Materials Overview (**Chapter 4**) – A summary of the likely construction methods and material management to be adopted on the project.
- Construction Traffic Management Principles Overview (**Chapter 5**) – A summary of key approaches to be adopted or considered when looking to safely manage traffic and construction works on the project.
- Utilities Management Overview (**Chapter 6**) – A summary of the key approaches to managing utilities through diversion or protection measures.
- Construction Environmental Management Overview (**Chapter 7**) – A summary of the key project and wider project environmental considerations during the design and construction stages.
- Health and Safety Overview (**Chapter 8**) – A summary of the importance of health and safety on the project and how it must be actively managed with engagement with all parties, with alignment to our safety goals and incentives.
- Community Engagement Overview (**Chapter 9**) – A summary of the key community engagement approaches to be adopted on the project in line with Highways England's wider approaches.

2 Construction Principles

2.1 Overarching Principles of Construction Management

2.1.1 The project incorporates eight schemes (of which some are combined for reporting purposes and so in this document are referred to as single schemes) – from M6 Junction 40 in Penrith to the west, to A1(M) Junction 53 Scotch Corner to the east. Whilst each scheme has its own context and bespoke elements associated with topography, land or structure requirements, all eight schemes will follow the same shared construction principles which will be core to the design and delivery of the project. These shared construction principles are set out in the remainder of this section.

2.2 Optimum Route Design

2.2.1 For each scheme, efficient route design will be considered noting the benefits and impacts of the route, material movements and the impacts on stakeholders. Further information on route design and evolution can be found in the Route Development Report.

2.2.2 Construction impacts have been considered in route selection and will continue to be during detailed design. Where possible, new land take has been reduced, along with the visual impacts on the surrounding area. The strategy for most schemes has been to look to identify an earthworks balance where material is excavated and then deposited to achieve a net balance, reducing material movements, disturbance and other associated construction impacts. Further development of earthworks design will continue as the detailed construction programme is finalised.

2.3 Minimising Disruption and Maintaining Safety for Users

2.3.1 The project construction design and management will take note of the long-term impacts of the schemes, looking to optimise the schemes route selection to improve safety and journey reliability time. Whilst also considering these factors, other road users and stakeholders' needs will be evaluated and incorporated into the design. This includes the provision of dedicated walkers, cyclists and horse-rider (WCH) infrastructure, and improved underpass or overbridge connections and the need to facilitate additional access roads or crossing points. Further information on this can be found in the Project Design Report.

2.3.2 The design will also take note of the implications of constructing the schemes whilst maintaining an operational A66, ensuring the works consider road users, WCH's and other stakeholders.

2.4 Optimum Works Phasing and Traffic Management

2.4.1 In order to deliver the schemes with minimum disruption, the construction phasing and traffic management logistics will be developed to ensure a balance is achieved on reducing the total duration of the works, whilst also ensuring a functional and safe road network is maintained during such works. Key schemes such as M6 Junction 40 to Kemplay Bank will feature significant traffic management interfaces due to the complexities of constructing the new road close to the M6, with notable traffic movements required to be maintained.

2.4.2 It is expected that during periods of construction there will be some limitations imposed on traffic, with some minor diversions expected for a small percentage of

traffic wanting to make shorter journeys. Such traffic management strategies will be communicated to road users and consultation with stakeholders to make them aware in advance, which may include but not be limited to stakeholder engagement events, letter drops, online communications or interactive road signs.

- 2.4.3 Through efficient design, construction activities will be optimised to undertake a large percentage of work away from live traffic, through phasing of the works and traffic management layouts. For a small percentage of works, additional traffic management will be required with some diversions and road closures possible to key activities such as bridge beam installations or key road connection points. Where possible any closures or additional traffic management controls will look to be minimised and implemented during off peak hours or periods, which may include overnight works or weekends.
- 2.4.4 Further information on construction traffic management is provided in Section 5: Construction Traffic Management Principles Overview.

2.5 Managing Environmental Impacts

- 2.5.1 Detailed construction methodologies will be closely assessed and selected to minimise construction impacts as far as possible, pursuant to the controls that will be put in place through Environmental Management Plans ('EMP'), compliance with which will be secured through the DCO.
- 2.5.2 As part of this, close attention will be paid to material movements, with the aim of seeking to achieve a cut and fill balance where possible to ensure large scale plant and vehicle emissions from earthworks are reduced.
- 2.5.3 Furthermore, key commitments relating to waste management, noise, dust and vibration, as set out in the EMP will be implemented, and where necessary, monitored. Surface run off and water discharge will also be controlled and where applicable, approvals or licences agreed to ensure there is no detriment to local water courses.
- 2.5.4 Further information on construction environmental management is provided in Section 7: Construction Traffic Environmental Management Overview.

2.6 Suitable Compound Locations

- 2.6.1 For a project of this scale and length, several access points or independent haul routes, work areas and compounds will need to be established. These will vary by scheme depending on their service requirements, traffic management phasing and the works being undertaken. Where bridges, overbridges, underpasses and culverts are required, more plant and materials will be required, thus larger work areas are to be expected.
- 2.6.2 On completion of the permanent works, some work locations will be integrated within the schemes landscaping helping to reduce further permanent works, whilst others will be removed.
- 2.6.3 When selecting locations for compounds or works, it will be ensured wherever possible and practical that: the areas are encompassed as part of the permanent works; that impacts to local stakeholders are minimised; and that suitable access and egress points to prevent disruption to the 'live' A66 are provided.
- 2.6.4 Compounds could range from small satellite areas of 2,000m² up to larger areas of 40,000m² or over, with proposed operative numbers and site working hours being

key to location selection. Suitable parking provisions will be made available to prevent local stakeholders from being impacted by the works.

- 2.6.5 The compound sizes will be relative to the available land, connectivity with the A66 and interface with utilities to minimise the environmental impacts of the works. Table 1 presents indicative main compound locations for each of the schemes.

Table 1: Indicative compound locations per scheme

Indicative compound locations per scheme			
Scheme / Chainage	Location Descriptor	Compound Type	Approximate Duration
M6 Junction 40 to Kemplay Bank	Potential compound located to the east of J40 on the M6 close to Cumbria council depot (A66 Westbound to M6 Southbound).	Site welfare, site vehicles, traffic management vehicles and small material storage.	61 months
	Potential compound located to the south, accessed via the local police headquarters access road.	Site welfare, site vehicles, traffic management vehicles and material storage area.	
Penrith to Temple Sowerby	Potential compound located to the north of the A66 with new access road formed off the main road.	Site welfare, site vehicles, traffic management vehicles and material storage.	45 months
	Potential compound located to the south of the A66 between the A66 and the junction with Center Parcs with new access road formed off the main road.	Site welfare, site vehicles, traffic management vehicles and material storage.	
Temple Sowerby to Appleby	Potential compound located to the north of the A66 where the route deviates from the existing A66 with new access road formed off the main road.	Site welfare, site vehicles, traffic management vehicles and material storage.	36 months
	Potential compound located to the north of the new A66, location near new proposed left-in/left-out junction A66 or utilisation of a possible designated material storage area.	Site welfare, site vehicles, traffic management vehicles and material storage.	
Appleby to Brough (Warcop)	Potential compound located to the south of the A66, between Sandford at the B6259 and Moorhouse Lane, with new access road formed off the B6259.	Site welfare, site vehicles, traffic management vehicles and material storage.	35 months
	Potential compound located to the south of the A66, between Warcop and Flitholme junctions passing East Field Farm, with new access road formed off the main road.	Site welfare, site vehicles, traffic management vehicles and material storage.	

Indicative compound locations per scheme			
Scheme / Chainage	Location Descriptor	Compound Type	Approximate Duration
Bowes Bypass	Potential compound located to the west of Clint Lane to the north of the A66 with new access road formed off the A67.	Site welfare, site vehicles, traffic management vehicles and material storage.	36 months
Cross Lanes to Rokeby	Potential compound located to the north of the A66, west of Cross Lanes Organic Farm Shop with new access road formed off the B6277.	Site welfare, site vehicles, traffic management vehicles and material storage.	27 months
	Potential compound located to the south of the A66, east of The Old Rectory with new access road formed off the existing A66.	Site welfare, site vehicles, traffic management vehicles.	
Stephen Bank to Carkin Moor	Potential compound located to the north of the A66, east of Collier Lane with new access road formed off Collier Lane.	Site welfare, site vehicles, traffic management vehicles and material storage.	18 months
A1(M) Junction 53 Scotch Corner	No compound proposed	Not applicable	Not applicable

2.6.6 Further information on construction compounds is provided in Section 4.5: Construction Compound and Site Welfare Facilities.

2.7 Material Management and Storage

- 2.7.1 For each of the schemes on the project, there will be varying storage requirements for imported materials and excavated earthworks fill. On each scheme, areas will look to be selected to optimise fill and reduce vehicle movements, both helping to reduce traffic for local road users and help with suitability imperatives. A key scheme that may require a large material import due to lack of locally recoverable fill from road construction activities is Cross Lanes to Rokeby.
- 2.7.2 Where possible storage areas will be established in those locations where large fill requirements are needed or where key structures are required. This will be subject to topography and land suitability. Material movements will be carefully programmed to reduce storage periods and subsequent double handing of the material, with a focus on first time placement.
- 2.7.3 Materials, both those brought onto the scheme and site-won, will look to be stored correctly to prevent deterioration and subsequent waste, as well as to minimise environment impacts and reduce water generation.
- 2.7.4 Chemicals, fuels, oils and other hazardous materials will be kept within locked storage areas with access restricted. For the storage of fuels and oils, adequate containment and, where required, secondary containment will be used. Bulk storage tanks will be integrally bunded and located within compound areas, away from general traffic movements and surface water drains and secured against

- unauthorised discharge. Adequate provisions of spill protection measures will be provided at work and compound locations.
- 2.7.5 All timber products are to be from a 'Chain of Custody' source and certified to ensure legality and sustainability.
- 2.7.6 On the project there will be a commitment to reuse and recycle, driven predominantly by excavated topsoil and sub soil, but also with aggregates, demolition waste and timber products for associated concrete works. On some schemes such as M6 Junction 40 to Kemplay Bank, where sections of existing roads may be removed, material will look to be recovered and used within the schemes' permanent or temporary works, subject to no contamination or suitability issues.
- 2.7.7 Chemicals, fuels, oils and other hazardous materials will be kept within locked storage areas with access restricted. For the storage of fuels and oils, adequate containment and where required secondary containment will be used. Bulk storage tanks will be integrally bunded and located within compound areas, away from general traffic movements and surface water drains and secured against unauthorised discharge. Adequate provisions of spill protection measures will be provided at work and compound locations.
- 2.7.8 All timber products are to be from a 'Chain of Custody' source and certified to ensure legality and sustainability.
- 2.7.9 On the project there will be an imperative to reuse and recycle, driven predominantly by excavated topsoil and sub soil, but also with aggregates, demolition waste and timber products for associated concrete works. On some schemes such as M6 Junction 40 to Kemplay Bank, where sections of existing roads may be removed, material will look to be recovered and used within the schemes permanent or temporary works, subject to no contamination or suitability issues.

2.8 Safe Construction Management

- 2.8.1 Safety in design, construction and operation is paramount and will remain at the project's core throughout. The project is aligned to Highways England's health and safety commitments, with the clear focus of ensuring everyone associated with the A66 project, whether that be construction worker, road users and other stakeholders go 'home safe and well'. A positive health and safety culture will be instilled from concept design through to final handover and maintenance, throughout the supply chain.
- 2.8.2 The project will follow the Construction, Design and Management Regulations, ensuring the design represents a safe and constructable solution that maintains the safety of the workforce and general public.
- 2.8.3 On the project, site safety will be the highest priority. Plant and people interfaces will be managed with segregated walkways, appropriate signage and through audible or visual deterrent warning devices fitted to plant and machinery where suitable.
- 2.8.4 The workforce themselves play the biggest role in safe construction practices. The project will ensure that all operatives are suitably qualified and trained to undertake work on the schemes. Works will be planned and managed to ensure that the workforce's exposure to noise, dust and vibration is managed. All employees working on the schemes will be suitably briefed and empowered to stop work where they have any concerns.
- 2.8.5 Traffic management is an essential part of undertaking the works safely, both for the workforce and public. It will be appropriately planned, communicated and

implemented, ensuring works can take place with adequate segregation and diversions where appropriate from the live A66 traffic or other associated local roads.

2.9 Construction Duration

- 2.9.1 Construction durations will be realistic and reflective of the challenge of undertaking a number of complex infrastructure schemes both online (close proximity to live traffic) and offline, with various different construction phases to ensure the A66 remains 'live' (as in, the existing A66 can continue to be used as the new alignment or additional carriageways are constructed) and the workforce remains safe.
- 2.9.2 Offsite manufacturing will be utilised across the schemes where possible and appropriate, to minimise works on the A66 and reduce programme durations. Offsite manufacture of concrete and or steel structural elements could be used across all schemes, but due to the size of the Temple Sowerby to Appleby – Crackenthorpe scheme, offsite manufacture could be a significant opportunity where a bridge is required to cross the watercourse.
- 2.9.3 Principles from Highways England's Customer Service Strategy will form the basis of our approach to engagement and communications during construction. We will work to develop positive relationships with our customers and neighbours through providing timely and accurate information of our road works, such as keeping the public and local communities informed of timescales of scheme works. We will be preparing a Construction Engagement & Communications Strategy setting out the key construction activities and how we plan to communicate this to our customers and neighbours. It is likely that we would communicate construction activities through media announcements, social media accounts and posts, stakeholder and community events, stakeholder meetings and/or through roadside information signs. This Strategy would sit alongside the traffic management and diversion plans working together to form an overarching plan for construction.
- 2.9.4 Most construction works will be undertaken during standard day working hours of 7:30am until 6pm. In some instances, it may be essential to undertake works at night or weekends due to traffic management restrictions, with additional traffic management or closures required for works such as road connections or interface points, bridge beam lifts and deck pours. This will be considered further for the DCO application stage and the ES will consider the impacts of night time working.

3 Indicative Construction Phasing and Programme Overview

3.1 Phases of Construction

3.1.1 For each of the schemes on the project similar phases of works will be followed, with the amount of work being undertaken proportional to the size of the scheme.

- The **preparation phase of works** will encompass site access points, access roads, compounds and service diversion or protection measures.
- The **initial construction phase of works** will see the undertaking of mainline diversion routes, remediation to the carriageway for traffic management layout changes and possible demolition or ground remediation if required.
- The **main construction phase of works** will see the main construction works commence with the traffic management in place and will be divided into sub-phases to enable online and offline works to be completed whilst maintaining A66 traffic flows. As part of this phase a significant proportion of landscaping will take place.
- The **concluding phase of works** will see the demobilisation of temporary access points, access roads, compounds and the remaining landscaping undertaken.

3.1.2 As part of the works phases, the key works likely to be undertaken for each scheme are set out in Section 3.2 and Section 3.3. This information serves as a guide, with refinement on the approach to be finalised by the contractors undertaking the works. It should be noted that some elements of works could be undertaken at a different times dependent on feasibility, programme and technical constraints, and therefore a number of phases may all take place simultaneously, with the exception of the concluding phase.

3.1.3 As part of the project early works, elements of ground investigation and archaeology investigation will look to be undertaken early in the project to identify and challenges with respect to the permanent works design and proposed layout. These works are essential and will help inform the detailed design process.

3.2 Early Works

3.2.1 3.2.1 The preparation and initial works comprise of works outlined in Section 3.1, and may consists of:

- Contractor inductions, competency checks and training will be undertaken at various stages along the construction process (approach to be finalised in method statements and health and safety compliance documents).
- Contractor mobilisation, including access points and roads to situate temporary accommodation. This may also include the establishment of crossing points or temporary overbridge structures for scheme that have large scale earthworks operations.
- Site access and security with perimeter fencing.
- Delivery of larger plant items along with imported materials and supplies. Such equipment or materials will be used to construct larger temporary accommodation, access roads, parking, waste storage areas and material storage areas.
- Areas of interest, historical or protected importance be secured and fenced to prevent access.

- Temporary closures or diversion of footpaths or smaller access roads to facilitate early works on the schemes. This will be identified in greater detail at a later stage.
- Vegetation clearance in required work zones in line with the proposed design and approvals.
- Diversion of services or protection of services that do not require large scale traffic management. Works to be undertaken predominantly offline with the A66 still live. On some schemes there are number of high importance services that require attention to enable the main construction works programme to be reduced, helping to minimise the impacts for A66 road users.

3.3 Main Works

3.3.1 The main works are likely to consist of the main construction and concluding phases of works outlined in Section 3.1, and may consist of:

- Changes to drainage and surface water channels undertaken where required at possible cross over or pinch points to enable traffic to be effectively moved or relocated when required. Such works may be undertaken during quieter periods (such as overnight or weekends) wherever possible with temporary traffic management in place, but such works will be refined during the A66 project planning stages.
- Provision of suitable cross over locations, street furniture and relocation of some assets where required, along with areas of the central reserve remediating or reconstructing to enable traffic to be diverted safely away from the work locations. On all schemes, it is likely such works will take place within the existing dual carriageway parts approaching the schemes from either the westbound or eastbound direction with traffic likely to be restricted to one lane in each direction.
- For some schemes, to enable the offline construction works to be optimised diversion roads will be constructed close to the A66 to enable traffic to be located away from key construction works. The Stephen Bank to Carkin Moor scheme is likely to utilise a number of diversions to enable efficient construction whilst ensuring the A66 traffic flows are maintained.
- Any demolition works will be undertaken in a controlled process with safety controls and exclusion zones in place to keep stakeholders and road users safe.
- Establishment of traffic management, with A66 traffic diverted to enable work areas to become available. This will be undertaken in different phases utilising the existing A66 or the new carriageway to complete all works. Road connections and interface points will be appropriately managed to ensure traffic continues to flow, with minimal road closures being used to complete the roadworks.
- Delivery of plant and materials, to commence earthworks, structures and associated deep drainage. In most instances access will be granted to vehicles from the existing A66 via dedicated access and egress points. Once in the work area plant can be offloaded and used along with materials being delivered and excavated material moved. Vehicle movements will be carefully planned to ensure they are optimised, reducing double handling of material and reducing impacts on stakeholders or road users. Suitable provisions will be put in place to reduce vehicles moving the workforce to work locations, with work durations and times reflective to the work tasks. Where possible, most works taking place offline will commence during the day.

- During the works, structures including underpasses and overbridges (including abutments and piers) along with associated deep drainage will be constructed in line with the traffic management phasing. Works will be maximised within offline sections to reduce any potential road closures or restrictions required to be during online works. Where structures are required to be built close to live traffic, suitable temporary works provisions will be implemented to keep road users safe. Where structures are required to be constructed close to watercourses or floodplain areas, suitable measures will be adopted to keep the workforce safe, without causing damage or deterioration to the environment.
- Material excavation, movement, storage and placement. All schemes on the project, require earthworks to be undertaken to some extent to improve the new road alignment, improve safety and improve journey reliability times. As part of the earthwork's strategy, material will be excavated using a variety of plant including dozers and excavators. The material will be loaded into wagons and transported via dedicated haul routes or the current A66 to the desired location (ideal scenario) where it will be placed using both excavators and dozers. Compaction plant will then be used to ensure the material is suitably placed. Where works are taking place close to stakeholders, suitable communication will be established, along with possible mitigation measures to reduce the impacts of the construction works.
- Utility works not undertaken as part of the early site works (for example, due to access difficulties and traffic management challenges). Where possible, diversion routes adopted as part of the construction works will look to be permanently adopted. These works will be predominantly undertaken offline within the phased traffic management work areas.
- As part of the construction works, new local access roads, WCH routes and segregation fencing or screening installed. Such plant and materials movements will be coordinated with the main road construction and associated structures.
- Excavation and construction of water drainage ditches and attenuation ponds completed to control surface water runoff on the new A66 without having detrimental effects on the local environment. The earthworks and vehicle movements associated with these tasks will form part of the material and logistics management plan for all other works. The programming of such works will be driven by land availability and access.
- As the core works are completed within sections of the schemes, landscaping works will be undertaken along with the removal of temporary access roads, access points and other associated temporary works structures that have been used to facilitate construction.
- The final stage of the construction works will be the de-mobilisation of compound and storage areas on the project along with any access roads that will not be adopted by landowners through prior agreement. The remaining landscaping works will then be completed.

3.4 Sequencing and Programme

- 3.4.1 The sequencing and programming of the schemes are very similar, due to the nature of the works being undertaken. Where possible some elements on schemes could be delayed or accelerated relative to other schemes to help maximise benefits, most notably with earthworks and cut or fill balance requirements. The works will be divided into two main categories for programming purposes, with offline and online works.

Where possible offline works will be maximised through several traffic management phases, but it will also be essential to undertake online works.

3.4.2 Offline works may include but are not limited to the following activities:

- Haul roads
- Compounds
- Service diversions
- Embankment structures
- Abutments and piers
- Underpasses
- Deep drainage
- Main road construction

3.4.3 Online works may include but are not limited to the following activities:

- Access points off the A66
- Some service diversions
- Changes to central reserve areas for traffic management
- Installation and changes to traffic management
- Deep drainage connection
- Underpass connections
- Bridge beam and deck installations
- Road connections

3.4.4 The table below provide an outline view on the key works to be undertaken and the possible start dates along with durations. The variance in the possible start and finish dates reflects the inclusion of all eight schemes with the project wide programme. **It should be noted that the following information is indicative and will be finalised when the design has been approved and accepted. Start dates may be subject to change subject to detail design and approvals.**

Table 2: Project wide indicative high level programme dates

Project wide indicative high level programme dates				
	Start		Finish	
Ground & Archaeology investigation	2021	Q3	2023	Q2
Preparation & initial works - Enabling works for access	2022	Q4	2024	Q1
Preparation & initial works - Site establishment compounds, access roads	2023	Q3	2024	Q1
Preparation & initial works - Service diversions or protection measures	2022	Q3	2023	Q4
Main works - Service diversions or protection measures	2024	Q1	2026	Q4
Demolition works / site preparation works	2024	Q1	2025	Q1
Main works - Traffic management	2024	Q1	2026	Q4
Main works including landscaping works	2024	Q1	2028	Q4
Road commissioning	2026	Q2	2028	Q4

4 Indicative Construction Plant and Vehicles, Methods and Materials Overview

4.1 Overview

4.1.1 This section provides indicative information on the typical construction plant and vehicles, methods and materials that may be used on each of the schemes, with possible exceptions on A1(M) Junction 53 Scotch Corner which has a smaller scope of works. Until detail scheme design development is complete, the below information remains subject to refinement and change.

4.2 Plant and Vehicles

4.2.1 The following types of plant and vehicles are examples of the plant expected to be used on the project:

- **360 excavator** – This is a large excavation machine which sits on a rotating base with or without tracks. The machine is able to excavate a variety of ground condition, to differing depths along with the accurate placement of material. Excavators can have a variety of attachments, including buckets and hydraulic breakers and munchers to undertake demolition works. This type of plant will be commonly used to install services, roads and embankments, along with excavating foundations, ponds and ditches.
- **Earthworks roller** – This consists of a steel drum on which round or rectangular feet are attached to help compact placed earth. The plant can be used with or without a vibration function depending on the task, ground and degree of compaction required. This type of plant will be commonly used to compact embankments, large areas of fill or landscape zones.
- **Road construction roller** - This is fitted with one or two smooth surfaced drums that vary in width depending on the size of machine and weight selected. The drums have the ability to dead roll or vibrate the ground under the item of plant, depending on the compaction criteria and any restrictions. This type of plant will be commonly used to compact granular material for road constructions, asphalt surfacing, crane platforms or large laydown areas.
- **Bulldozer** – This is track or wheel-mounted with a forward-facing blade controlled by hydraulic rams. This type of plant will be commonly used to strip or remove vegetation, along with moving or levelling large volumes of earth in an efficient manner. They can also be used to reduced level dig large areas in preparation for embankments, ponds or structures to be built or formed.
- **Telehandler** – This is fitted with wheels and a large powerful telescopic boom with articulating head used of lifting or support materials. It can also be registered to be road legal, enabling the movement of materials both on site and between site locations. This type of plant will be commonly used to lift, move or support timber, wooden sheeting, concrete blocks, drainage products and other small to medium tools or products.
- **Ready-mix concrete wagon** – This is a road-travelling wagon that transports ready-mixed concrete from batching facilities to sites. The vehicles feature a large steel drum that continuously rotates to keep the concrete mixed which can unload the material via a metal chute. This type of plant will be commonly used to supply concrete for protection slabs, underpasses, overbridges and associated foundation, stem or deck elements.
- **Concrete pump** – This combines the abilities of a pump and crane. It features outriggering legs for stability and a large hydraulic pump at the core with hopper

to receive and pressurise the concrete into a feeder hose. They can move large volumes of concrete over significant distances to enable large concrete structures to be constructed quickly and efficiently. This type of plant will be commonly used to move concrete for protection slabs, underpasses, overbridges and associated foundation, stem or deck elements.

- **Dump truck (or dumper)** – There are a variety of dump trucks that could be used on the project including both articulated and non-articulated, depending on the amount of material to be moved and the working space restrictions. They feature a large steel storage bucket that is able to tip in the vertical plane to deposit the material, which is commonly loaded by another item of plant. This type of plant will be used to move excavated soil, aggregate, demolition waste and some construction materials.
- **Eight-wheel road wagon** – These material movement wagons are seen across the road network and are used to transport material to or between work locations. They feature a large steel container that is mounted to the back of a road legal lorry and have the ability to incline the container to release the transported load quickly. This type of vehicle will be commonly used to move earth and aggregate.
- **Wheel-mounted mobile crane** – This is mounted on a wheeled chassis with outrigger legs that are used to provide additional stability during lifts. The crane features a large telescopic boom with winch cable and lifting attachments. It is able to rotate 360 degrees in the horizontal plane to undertake lifting operations, with the amount of weight and distance it can operate at, proportional to the size and ground conditions. This type of plant will be commonly used to lift concrete shuttering, materials and small plant items.
- **Track-mounted mobile crane** – This is similar to a wheel mounted mobile crane but features large tracks with no supplementary outriggers. The main boom is normally a ridged lattice and not telescopic. It is normally used where construction works are required for longer periods and is also able to pick and carry loads, whilst also operating in slightly higher wind speeds. This type of plant will be commonly used to lift concrete shuttering, materials and small plant items.

4.3 Plant, Vehicles and Materials Movement

- 4.3.1 Plant and material movements will vary on each scheme due to the amount of earthworks, landscaping, new road construction and number of structures required. Schemes that may involve a significant number of wagon movements include: Temple Sowerby to Appleby – Crackenthorpe, Appleby to Brough and Stephen Bank to Carkin Moor. This is subject to final design development, route selection and approvals.
- 4.3.2 Plant movement will be undertaken to facilitate the establishment of the working areas on each scheme, with plant delivered via traffic management access points. There will be several small vehicles that access the schemes on a daily basis, to transport the workforce along with smaller ‘just-in-time’ materials.
- 4.3.3 The most notable plant and material movements on each project will be the movement of excavated material to meet cut and fill requirements. This will most likely be undertaken with dump trucks or eight-wheeled road wagons. The delivery of materials is likely to be via a variety of means, including concrete wagons, eight-wheeled road wagons and heavy goods vehicles. depending on the size, shape and type of material.

- 4.3.4 All vehicle movements will be coordinated and planned, with routes established offline where required to mitigate the impacts on the 'live' A66 traffic flows. Where vehicles require access and egress to work areas from the A66 they will require compliant high visibility safety measures to be fitted and will enter or exit via designated traffic management locations.
- 4.3.5 Where plant is required to work close to sensitive areas or close to stakeholders, additional measures are likely to be implemented which may have an impact on the type of plant selected or the number of and/or speed of the movements within an agreed period.

Bulk Earthworks

- 4.3.6 Where possible, bulk earthworks movements will take place down the new A66 route to limit the impacts on local stakeholders and users of the 'live' A66. Where there are limitations or where material is required to be stored or stockpiled a distance from where it is being excavated, dedicated haul routes will be considered and established where possible. In some instances, these will be made permanent and adopted as farm access roads.
- 4.3.7 In some situations on some schemes, it will be essential to use the existing A66 to move bulk earthworks material. Where this is required, traffic management will be assessed along with potential additional measures to protect the highway and road users.
- 4.3.8 For some schemes, temporary underpasses or overbridges will be considered to enable the efficient movement of bulk earthworks, helping to reduce material haul distances and interfaces with road users or stakeholders. Possible schemes (subject to final design and approvals) that may benefit from a temporary overbridge to make plant and material movements more efficient include Appleby to Brough and Cross Lanes to Rokeby.
- 4.3.9 For some schemes, bulk earthwork material that is unable to be placed at a fill requirement location will be taken to identified material storage areas, where it will be safely stored ready for use or incorporated into landscaping elements. Across the project there is an aim for all excavated material to be incorporated into the works unless it is unsuitable or untreatable, in order to prevent off-site disposal and increased movements.

Imported or Building Materials

- 4.3.10 Across each scheme, the type, amount and nature of the materials being delivered will determine how and where they are delivered. For the larger materials and quarried-based products, it is likely that they will be delivered direct to the work areas on each scheme. This will help reduce double handling, prevent damage to the product and optimise the construction programme.
- 4.3.11 Key materials that will be delivered close to the works areas on each scheme include quarried and recycled stone, large precast concrete products, formwork and shuttering, ready-mix concrete, steel bridge beams and asphalt-based products.
- 4.3.12 Smaller materials associated with drainage, ducting, lighting and communications are likely to be delivered to larger compound locations on each scheme, where the materials will be package managed and distributed out to the work areas using appropriately sized transport.

4.4 Site Access Points and Haul Roads

- 4.4.1 To undertake service diversion works and enable access off the A66 at work locations, access points will be formed along with site haul roads to enable the movement of plant and people efficiently at each of the schemes. Where required, it is likely that changes will be made to kerbing to enable access and egress. If services are present, protection slabs may be required dependent on the level of protection required.
- 4.4.2 To construct the access points, additional traffic management measures may be required. Once constructed, the access roads may be able to be completed offline with materials being supplied via the newly formed access and egress point. This will be assessed on a scheme-by-scheme basis.

4.5 Construction Compound and Site Welfare Facilities

- 4.5.1 Across the project, site compounds and satellite welfare facilities will be required to act as hubs for the workforce, project management and for vehicle or material storage, as discussed in section 2.6. The size of the compounds will vary on each scheme with the possibility of some large establishments being shared across two schemes. For each of the compound locations an access and egress will be formed as well as access roads.
- 4.5.2 As part of the site establishment works, drainage requirements will be assessed and where appropriated additional surface runoff attenuation will be provided. Key services will be diverted from identified locations and fed to the compounds where possible. This will help prevent off-grid power generation and onsite water or water storage, helping to improve the environmental impacts of the scheme whilst also mitigating additional vehicle movements and noise for stakeholders.
- 4.5.3 Temporary office and welfare facilities will be required on the schemes with the size of the setup relative to the works being undertaken and expected duration. For long term compounds, parking areas may receive an additional asphalt layer to improve site conditions and help reduce dust and noise for stakeholders and local communities.
- 4.5.4 On completion of the works the welfare units will be removed and the stone and asphalt areas excavated and sent off-site, with the area reinstated. The subsoil and topsoil will then be regraded, with a final landscaping package to ensure the area is left in good condition and in keeping with the local area.

4.6 Service Diversion and Protection

- 4.6.1 As part of any service diversions and protection measures form an integral part of the design, planning and construction process. Across all schemes on the project there are services which will require diverting or protecting to enable construction. In some instances, there will be a requirement for additional traffic management measures to be implemented to enable the works to be undertaken safely.
- 4.6.2 For larger interventions (which may include gas and electricity diversions), works are likely to be undertaken prior to the main works commencing on site. This will help to reduce disruption to stakeholders and road users, whilst ensuring the service is safely relocated ready for the construction works.
- 4.6.3 In many instances, smaller services currently located in the verges will be able to remain and will instead require temporary or permanent protection measures.

4.7 New Road Construction

- 4.7.1 As part of the road widening or construction process, new road carriageways are required to be constructed. Acknowledging that the design of each scheme has not been finalised, it is likely that the following construction process could be followed:
- Remove vegetation, topsoil and excavate subsoil within the specified dimensions of the pavement road box. Due to the changes in vertical alignment on the scheme, it may be essential to excavate more material out to reach the desired depth or in some instances undertake embankment construction works where the road is higher than existing levels.
 - Imported stone (quarried or recycled) will then be deposited, levelled and compacted in layers in accordance with works specifications. This will be built up to within the start of the bituminous layer.
 - Kerbs are likely to be installed next, along with associated road drainage elements, with the kerbs being bedded on imported ready-mix concrete and supported on the rear face in preparation for the placement of bituminous material.
 - Bituminous material will be brought in and placed in layers.

4.8 Overbridge Construction

- 4.8.1 Several new overbridges are to be constructed across the project to carry roads over the A66. They will incorporate a deck supported on piers and abutments, which in turn is supported by foundations.
- 4.8.2 To construct a typical overbridge, it is common to prepare a work area in each verge and potentially one in the central reserve, depending on the structures span and support arrangements. Depending on traffic management restrictions, this may need to be undertaken across a number of phases. Subject to the site's ground investigation records and the size of the overbridge required, foundations may be a pile raft solution, individual piles or a mass fill concrete base.
- 4.8.3 To construct the piled foundation solution, a typical piling rig will be used to undertake the drilling and concreting of the piles below ground. Piles are normally circular columns in the ground, ranging from depths of 5m to over 15m made from concrete and steel reinforcement. Depending on the design these piles could be connected together at the surface with a large reinforced concrete structure which forms part of the abutment or pier walls.
- 4.8.4 To form the abutment and pier walls, it is likely that they will be cast insitu on site using concrete and steel reinforcement but this could also be undertaken offsite and the abuments/walls brought to site. To construct the walls, large wooden or metal shutters will be constructed to contain the concrete and steel reinforcement. Concrete will then be poured into the enclosed shutter using a crane or concrete pump.
- 4.8.5 Depending on the overbridge design and span arrangements, a central pier may not be required. In addition, the abutment walls could also be formed from precast units or reinforced concrete columns that are surrounded by earth retained solutions.
- 4.8.6 To form the bridge deck, it is likely that steel or precast concrete beams will be manufactured offsite and brought to the scheme in question via large road transport vehicles during a traffic management closure of the A66. The beams will then be lifted into position using a crane from a dedicated lift site on or off the A66 road.

- 4.8.7 Depending on the bridge deck design and size, an onsite pre-casting facility may be considered if it forms a viable construction and environmental solution. Infrastructure requirements must also be taken into consideration when evaluating this option.
- 4.8.8 Depending on the number of beams, their width and spacing, it is likely that precast panels will be placed between the beams to formulate the complete deck. It is then likely that steel reinforcement will be fixed on the newly formed surface and concrete placed, to integrate the beams and support formwork.

4.9 Underpass Construction

- 4.9.1 Several new underpasses are to be constructed across the project to carry roads under the A66. There are also a number of underpasses that are required to be extended. They are constructed in a similar process to an overbridge, with the asset commonly being situated below ground level. The underpass features foundations, retaining walls and a deck-type roof structure to enable the safe movement of people. It could also be constructed from cast in situ or pre-cast box culverts dependent on design, ground conditions and suitability.
- 4.9.2 To construct the underpass, excavation works will take place to reduce level dig the land to the underpass level. Depending on the foundations, the area could then have a piling platform installed to facilitate a piling rig to install reinforced concrete piles or see a large deep excavation formed to enable a mass fill concrete foundation to be constructed.
- 4.9.3 The construction of the walls is likely to be similar to the methodology detailed for the overbridge abutment walls.
- 4.9.4 The bridge deck roof will be constructed in a very similar format to that described in the overbridge section (Section 4.8).

4.10 Retaining Wall Construction

- 4.10.1 Across the project there are requirements for retaining walls where there is insufficient land available to conventionally grade the land at a shallow slope angle between two level differences.
- 4.10.2 Retaining walls can be constructed from a variety of different methods and materials, with their suitability dependent on ground conditions, topography, access, retained height requirements, retained length requirements and design life. The main (but not exhaustive) types of retained solution are listed below:
- **Continuous bored pile walls** – Continuous bored piles are a type of embedded retaining wall solution that are used to retain large level differences. The bored piles are commonly installed from ground level using a piling rig. Depending on the type of piling rig selected, concrete will be poured into the augured hole and followed by a steel reinforcement cage. Once the concrete has cured, earth can be excavated on one side of the pile to enable material to be retained. Where further support is required, a concrete slab may be cast against the piles to provide additional support.
 - **Steel sheet pile-driven walls** – Sheet-piled walls are achieved by driving high strength corrugated sections of interlocking metal into the ground. The steel sections are driven individually using either high frequency vibration and/or impacting the head of the pile with a large weight. Once one pile is installed to the correct level, the next pile is pitched into position and the process continues. The wall acts in cantilever and facilitates material to be excavated out from one side to enable a retained wall solution. This type of installation method is

normally faster to install but commonly not used where very deep retaining wall solutions are required.

- **Reinforced concrete cantilevered walls** – These are concrete formed walls that integrate into an embankment, with fill material subsequently backfilled around the wall as it is constructed. The walls commonly feature a horizontal base and vertical wall section that are connected to utilise the fill material weight on the rear side of the wall to aid with stability. Walls can be pre-cast or cast in-situ. The size and width of the wall will be determined by the topography, ground and retained height requirements.
- **Mechanically stabilised or earth-retained solution walls** – Stabilised or reinforced earth walls are similar to reinforced concrete walls, in that they utilise the fill material to help support the wall. Reinforced earth walls are formed by placing and compacting layers of granular material between plastic geotextile fibres, with a concrete block face.

4.11 Earthworks

- 4.11.1 All the schemes involve the movement of materials, including the movement of cut or fill earthworks across the schemes (and in some cases between schemes). As part of the design, all schemes look to achieve a cut and fill balance whilst optimising the horizontal and vertical road geometry to improve traffic flows and safety. This is subject to final design and approvals. Based on current designs the Cross Lanes to Rokeby scheme may require a notable import of earth to enable the construction.
- 4.11.2 Due to the nature of the topography on the project, some scheme areas require large cuts and other areas require large proportions of fill. The key earthworks on the project are associated with the construction of the new A66 road, underpasses, overbridges, drainage ditches and attenuation ponds.
- 4.11.3 On the project, material will look to be excavated and moved when there are suitable locations to deposit the material within the permanent works design. This helps to optimise plant movements and reduce the environmental impacts of moving large volumes of material. When programme constraints do not allow, material will be moved to suitable stockpile locations along the schemes, where it will be stored in bunded areas ready to be transported again to its destination. Where possible, the material stockpiles will be located close to large future fill areas to reduce transport movements.
- 4.11.4 It is possible there may be a net shortage of earthworks material early in the project, which could be supplemented in the short term with the use of local borrow pit locations.
- 4.11.5 The movement of material on each of the schemes will be given detailed consideration to ensure the optimum routes are identified. Across the project, a number of independent haul roads may be established to help move material offline, with possible crossing points introduced to reduce or eliminate A66 movements.
- 4.11.6 On some schemes, the new A66 route will act as the haul road route and for some schemes that maintain large sections of the A66, it will be unavoidable to introduce material movements on the A66. Where possible, any haul roads and access points that are constructed will look to be adopted or incorporated into the permanent works.
- 4.11.7 The formation of drainage ditches and attenuation ponds will look to be undertaken early in the project unless access constraints do not permit. Such drainage will aid the control of surface run off, with additional settlement controls in place where required.

4.12 Drainage

- 4.12.1 Across the schemes a large amount of new drainage is required due to new routes being selected and additional widening of online existing routes. Common elements of drainage will include road gullies, kerb drainage units, carrier drains, filter drains, catch pits and chambers. The depth and size of the assets will vary and will be proportional to the volume of water required to be moved or attenuated.
- 4.12.2 Where possible existing assets will look to be used, with additional attenuation measures implemented to prevent overloading the current systems. Larger drainage products will most likely be delivered directly to the works areas, with smaller items delivered to compound areas in preparation redistribution out on each of the schemes.

5 Construction Traffic Management Principles Overview

- 5.1.1 To enable the safe and smooth delivery of the project, traffic management will be carefully planned for each scheme, to enable traffic to keep flowing whilst permitting construction works to be undertaken safely. As detailed designs are developed on each scheme, bespoke traffic management plans will be produced which will take into account current A66 traffic flows, turning requirements, and stakeholder access needs.
- 5.1.2 This Draft CMS does not serve as a detailed traffic management guide, but instead outlines the key traffic management principles which will be reflected in the bespoke traffic management plans:
- **Formation of access points** – Localised traffic management is likely to be required to enable contractors to safely form access points off the A66 to enable haul roads, work areas or service diversions to be undertaken. To enable these access points to be undertaken safely, it is likely to require off-peak lane closures and/or temporary traffic signals.
 - **Offline works** – Where possible schemes will be programmed and planned to optimise offline working, maintaining A66 existing routes for as long as possible. Traffic management will be required around the tie-in points between the new and existing carriageways, or where the offline works may be too close to the existing A66 to carry out works without any protection.
 - **Traffic navigation in traffic management areas** – Traffic will then be guided through the traffic management along the A66, using the available extent of the existing carriageway width so as not to restrict movement or introduce further hazards, along with new temporary relief sections to enable main offline construction works of junctions, overbridges and underpasses.
 - **Traffic navigation on new road sections** – On completion of the first major phase of offline works, it will be essential to switch the traffic to enable the second phase of offline works to take place, where traffic is moved onto newly built sections of temporary relief road or new carriageway.
 - **Online working during less busy periods** – To safely install, switch and remove traffic management in single lane sections, and areas where the existing road width do not allow for a safe work area under a single lane closure alone, closures will be required. Such closures will occur during less busy periods (such as overnight) where this is possible. For large construction elements, weekend closures may also be required. For some of the online work areas, it may not be possible to undertake some work activities safely such as drainage, kerbing and vehicle restraint works, thus closures during less busy times may also be needed for some elements.
 - **Large activity road closures** – For some of the structures on the scheme, it will be essential to coordinate longer traffic management periods to safely install bridge beam and deck elements with no live traffic. In these instances, diversion routes will be set up with significant communication and press releases to ensure drivers and stakeholders are well informed. A full closure for a section of the A66 may be required for a weekend to undertake such work, with diversions established along with advanced notifications.
 - **Traffic management at junctions** – Traffic management will be used to complete online works such as junctions and road tie-in points, with closures during less busy periods potentially required where road reconstruction is required or service crossings.

- **Keeping traffic moving** – The traffic management will be designed to allow traffic to travel through the works at the highest safe speed permissible. This speed should be no lower than is required to maintain safety. Where possible, the project will look to maintain a 60mph speed limit, although lower limits may be applied where working widths are tight and to manage the safety of road users and/or the workforce.

6 Utilities Management Overview

- 6.1.1 On the project, each scheme has specific services that will need to be diverted or protected as per the indicated methodologies list earlier in this report. Detailed work will be undertaken, covering the key services on each scheme, how they interact with the new A66, and the measures required.
- 6.1.2 Construction of the project will require the diversion, relocation or protection of several existing utility assets including water, wastewater, electricity and telecommunications. Wherever possible, services will be maintained, with engineered solutions sought to overcome challenges. Consultation will be undertaken with service providers and stakeholders regarding the services.
- 6.1.3 Wherever possible and required, services will be diverted or protected early in the project to mitigate potential programme delays. In some instances where carriageway crossings are required, it may be more efficient to deploy traffic management early and in isolation of the main works. This will help ensure that phased works are not affected or restricted.
- 6.1.4 The affected statutory utilities infrastructure is predominately located alongside roads. The main exceptions are high voltage electricity cables and water mains which commonly run direct between fixed asset points. The required diversions will be planned in detail by the contractor as part of the construction works.
- 6.1.5 On the project, key schemes that will require increased utilities management due to the number or complexity of the services are likely to be M6 Junction 40 to Kemplay Bank, Penrith to Temple Sowerby and Temple Sowerby to Appleby – Crackenthorpe.

7 Construction Environmental Management Overview

7.1 Overview

- 7.1.1 On the project, from design through to construction, environmental impacts will be considered and appropriately managed. This will be done pursuant to detailed iterations of Environmental Management Plans, which will be in accordance with the first stage Environmental Management Plan submitted with the DCO application.
- 7.1.2 Furthermore, following the recent publications of Highways England's 2030/2040/2050 Net Zero Plan, Highway England have key environmental imperatives to be met as part of the construction of their projects, with a key focus on Net Zero, which looks for designers and contractors to achieve net zero emissions generation or impacts on maintenance and construction projects by 2040.

7.2 Environmental Impacts and Control Measures

- 7.2.1 There are a number of environmental impacts which have the potential to arise from the construction phase of the project, which will need to be mitigated for during construction of the project, pursuant to EMPs. The EIA process and Environmental Statement will consider required mitigation measures, and further details will be provided as part of the updated version of this document produced for DCO submission. Construction environmental management measures will also be covered in the EMP which will be submitted with the DCO application.

8 Health and Safety Overview

- 8.1.1 Health and safety on the project remains of paramount importance, across the design, construction and operation stages. The project will actively look to engage with management, the workforce and stakeholders to drive a proactive health and safety culture that will enable construction to take place seamlessly alongside the live A66 traffic. The project will challenge ways of working and standard practises to improve and develop safer ways of working that not only consider the workforce but the end user and associated stakeholders.
- 8.1.2 In summary of the health and safety principles noted in Section 2, it should be highlighted that the project is aligned to Highways England's health and safety commitments, with the clear focus of ensuring everyone associated with the A66 project, whether that be construction worker, road users and other stakeholders go 'home safe and well'.
- 8.1.3 All working on behalf of Highways England will align with our approach through the Collaborative Performance Framework (CPF) scoring system. During construction, contracts will develop a Safety Maturity Plan that demonstrates what actions are required by the contractor to ensure alignment.
- 8.1.4 A positive health and safety culture is instilled from concept design through to final handover and maintenance. The culture will be actively challenged and will be aligned with stakeholder engagement, promoting new learning. The A66 project will build off effective leadership and capable individuals, working as a team to ensure design and delivery are health and safety focused with clear expectations on what is required. This will be implemented throughout the supply chain, with the use of Common Intent Documents. In addition, Highways England's 'Raising the Bar' guidance will help provide practical guidance on how to comply with the Common Intent documents.
- 8.1.5 To ensure the safe construction of elements on schemes, temporary works will be closely managed to ensure the ground is suitably supported when undertaking such construction works. For elements such as underpasses, overbridges and culverts, temporary works will be required to enable construction whilst the A66 remains safe and operational. This is applicable to almost all schemes on the project.
- 8.1.6 On the project, site safety will be the highest priority. Plant and people interfaces will be managed with segregated walkways, appropriate signage and through audible or visual deterrent warning devices fitted to plant and machinery where suitable.
- 8.1.7 Technology will be utilised within plant to reduce or mitigate the need for operatives to work close to large machinery or be exposed to dust, noise or vibration. This might include Global Positioning System- (GPS)-guided excavation, compaction and placement plant for earthworks operations, and remote-control compaction machinery within deep excavations. Efforts to reuse and recycle materials on the project will also help reduce plant and vehicle movements, which in turn reduces expose and improves safety.
- 8.1.8 The workforce themselves play the biggest role in safe construction practices. The project will ensure that all operatives are suitably qualified and trained to undertake work on the schemes.
- 8.1.9 The design and traffic management strategy will ensure worker safety is a priority. It is imperative that all those who work on the road network are protected to undertake these improvement works without harm. Protection zones will be established to keep road users away from the construction works and where close interface is required, additional controls will be introduced and managed.

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- 8.1.10 Works will be planned and managed to ensure that the workforce's exposure to noise, dust and vibration is managed. All employees working on the schemes will be suitably briefed and empowered to stop work where they have any concerns.
 - 8.1.11 More detailed health and safety approaches and compliance with legislation will be covered in detailed construction reports as the project progresses.

9 Community Engagement Overview

- 9.1.1 Meaningful engagement with the local communities and stakeholders who are likely to be affected by the construction of the project will form an integral part of construction planning, programming, implementation, and delivery. Whilst the project will deliver benefits, road construction can also impact on those who live and work along the route as well as road users themselves. Understanding local perspectives on the main risks and opportunities relating to construction is not only welcome, but vital. It is therefore critical that everyone has the opportunity to provide feedback both before and during the construction process, and that local stakeholders are kept informed at each stage of the process.
- 9.1.2 Highways England will ensure that:
- Ensuring engagement and participation are inclusive, open, and transparent.
 - Participants are encouraged to get involved at the appropriate time, by using the networks established by the project and engaging using different methods to maximise the reach of this engagement.
 - Information is provided at key stages to allow for full consideration.
 - Communication is facilitated through a range of methods in a range of appropriate locations.
 - All enquiries will be fully considered, and feedback provided.
- 9.1.3 Highways England is committed to placing public engagement and meaningful dialogue with directly affected communities and other stakeholders at the heart of the construction process. At this stage in the development of the project, it is too early to define the exact ways in which the project will interact with local communities. However, potential mechanisms which are being considered to encourage engagement with local communities and stakeholders include:
- Continue to utilise the Community Liaison Groups (CLG) which are already established to support each local area. These groups are typically made up of representatives from the local community who are well placed to communicate messages to their networks. The CLG meetings provide an opportunity for details about the works and construction to be shared with the community representatives and opportunities for questions and answer sessions from the local community.
 - CLGs chaired by a Public Liaison Officer (PLO) who are a direct line of contact and are responsible for direct engagement with landowners and local communities on the ground.
 - Focus Groups are established and maintained as a forum for discussing themes in more detail. Focus Groups allow sharing of information and communication across representatives for specific themes and interest groups. There are currently dedicated Focus Groups for the following areas:
 - business and freight;
 - emergency and public services;
 - statutory environmental bodies;
 - walking, cycling and horse riding; and
 - local authorities.
 - An Incident Management Plan is developed in conjunction with the local authorities, Highways England, local Police forces, Traffic Officers and other emergency services.
 - A 24/7 Traffic Safety Control Officer (TSCO) presence is made available on site and the TSCO will be the first point of contact in the event of an incident.

- The Highways England telephone line is used to enable members of the public to raise any issues which will the project delivery team will respond to in a timely manner.
- Dedicated social media accounts could be used to disseminate relevant information.

9.1.4 It is recognised that engaging with the communities affected by the project and maintaining that engagement is key to the success of the project. This will be explored and identified in more detail as part of the development of a Community Engagement Plan. It is this document that will inform and direct the over-arching community engagement strategy throughout the construction process.

10 Glossary

Term	Definition
Applicant	Highways England
Application	This refers to an application for a Development Consent Order. An application consists of a series of documents and plans which are submitted to the Planning Inspectorate and published on its website.
Assessment	A process by which information about effects of a proposed plan, project or intervention is collected, assessed and used to inform decision-making.
Best Practicable Means	The best practicable environmental option - defined in the Control of Pollution Act 1974 and Environmental Protection Act 1990 as measures which are 'reasonably practicable having regard among other things to local conditions and circumstances, to the current state of technical knowledge and to financial implications'.
Consent	A statutory permission given to an applicant by a statutory authority, such as the local planning authority or the Secretary of State, that allows a development to be carried out within a specific area of land.
Consultation	A process by which regulatory authorities, statutory and non-statutory bodies are approached for information and opinions regarding a development proposal.
Design Manual for Roads and Bridges (DMRB)	A set of documents that provide a comprehensive manual system which accommodates all current standards, advice notes and other published documents relating to the design, assessment and operation of trunk roads.
Development Consent Order (DCO)	The means of obtaining permission for developments categorised as nationally significant infrastructure projects.
Ground investigation	To obtain information on the physical properties of soil and rock around a site.
Grade-separated junction	Roads crossing the carriageway pass at a different level, so as not to disrupt the flow of traffic. Slip roads connect the carriageway to the junction.
Impact	Change that is caused by an action (for example land clearing (action) during construction which results in habitat loss (impact)).
Legislation	A law or set of laws proposed by a government and given force/made official by a parliament.
Listed building	A structure which has been placed on the Statutory List of Buildings of Special Architectural or Historic Interest to protect its architectural and historic interest.
Monitoring	A continuing assessment of the performance of the project, including mitigation measures. This determines if effects occur as predicted or if operations remain within acceptable limits, and if mitigation measures are as effective as predicted.

Term	Definition
National Networks National Policy Statement 2014 (NN NPS)	A national policy document issued by the government which sets out the government’s objectives and the need for the development of nationally significant infrastructure projects on road and rail networks in England. It is also known as National Policy Statement for National Networks. The NN NPS is the basis for the examination of a Development Consent Order application by the Planning Inspectorate and decisions by the Secretary of State. It was adopted as national policy by the UK Parliament in March 2015.
Operational	The functioning of a project on completion of construction.
Regulations	Official rules or acts to control something, generally made in relation to legislation.
Scoping	The process of identifying the issues to be addressed by the EIA process. It is a method of ensuring that an assessment focuses on the important issues and avoids those that are considered to be not significant.

11 Abbreviations List

Term	Definition
24/7	24 hours a day, seven days a week
CMS	Construction Method Statement
COSHH	Control of Substances Hazardous to Health
DCO	Development Consent Order
EMP	Environmental Management Plan(s)
GI	Ground Investigation
GPR	Ground Penetrating Radar
GPS	Global Positioning System
ha	Hectares
km	Kilometre
m ²	Square metres
m ³	Cubic metres
mph	Miles per hour
TSCO	Traffic Safety Control Officer
WCH	Walkers, cyclists and horse-riders

On 20 August 2021, it was announced that Highways England would be changing its name to National Highways. The name change reflects the role of the strategic road network – to connect the nation’s regions – and the part it plays in setting Highway’s standards across the UK.

We have continued this consultation under the Highways England branding to avoid confusion but will be rebranding this project as of 8 November.

The remit of the organisation has not changed and we will continue to operate and maintain England’s motorways and A roads.