M5 Junction 10 Improvements Scheme

Preliminary Environmental Information Report (PEIR)

Chapters 1-4

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Contents

Tables

Figures

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Glossary

Abbreviation	Definition
AADT	Annual Average Daily Traffic
AAWT	Annual Average Weekday Traffic
AEP	Annual Exceedance Probability
ALC	Agricultural Land Classification
AMP	Archaeological Management Plan
AONB	Area of Outstanding Natural Building
ARN	Affected Road Network
ASPT	Average Score Per Taxon
AQAL	Air Quality Assessment Level
AQMA	Air Quality Management Area
AQS	Air Quality Strategy
BAP	Biodiversity Action Plan
BCT	Bat Conservation Trust
BEIS	Department of Business, Energy and Industrial Strategy
BGS	British Geological Survey
BMV	Best and Most Versatile
BoQ	Bill of Quantities
BS	British Standards
BTO	British Trust for Ornithology
CAMS	Catchment Abstraction Management Strategy
CBC	Cheltenham Borough Council
CBC	Common Birds Census
CCC	Committee on Climate Change
CD&E	construction, Demolition and Excavation
CEMP	Construction Environmental Management Plan
CEA	Cumulative Effects Assessment
CIEEM	Chartered Institute of Ecology and Environmental Management
CIRIA	Construction Industry Research and Information Association
CL:AIRE	Contaminated Land: Applications in Real Environments
CLP	Classification, Labelling and Packaging
CMS	Continuous Monitoring Station
CO_2	Carbon Dioxide
CO_2e	Carbon Dioxide Equivalent
COP	Conference of the Parties
COSHH	Control of Substances Hazardous to Health

Abbreviation	Definition
CPS	Connecting Places Strategies
CRoW	Countryside and Rights of Way
CRTN	Calculation of Road Traffic Noise
CSZs	Core Sustenance Zones
DCO	Development Consent Order
DfT	Department for Transport
DF	Design Fix
DM	Do Minimum
DMOY	Do Minimum Scenario in the Opening Year
DMFY	Do Minimum Scenario in the Future Assessment Year
DMRB	Design Manual for Roads and Bridges
DoE	Department of the Environment
DoWCoP	Definition of Waste: Development Industry Code of Practice
DS	Do Something
DSFY	Do Something in the Future Assessment Year
DSOY	Do Something Scenario in the Opening Year
EC	European Commission
ECoW	Ecological Clerk of Works
eDNA	environmental DNA
EEA	European Economic Area
EFT	Emissions Factors Toolkit
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
END	Environmental Noise Directive
EPA	Environmental Protection Act
EPS	European Protected Species
EPUK	Environmental Protection UK
EQS	Environmental Quality Standards
EU	European Union
ES	Environmental Statement
FRA	Flood Risk Assessment
ES	Environmental Statement
GCC	Gloucestershire County Council
GCER	Gloucestershire Centre for Environmental Records
GCN	Great Crested Newt
GFirst LEP	Gloucestershire Local Enterprise Partnership
GHER	Gloucestershire Historic Environment Record
GHGs	Greenhouse Gases

Abbreviation	Definition
GLNP	Gloucestershire Local Nature Partnership
GLVIA3	Guidelines for Landscape and Visual Impact Assessment
GLTA	Ground Level Tree Assessment
GPLC	Guiding Principles for Land Contamination
GWDTE	Groundwater Dependant Terrestrial Ecosystems
GWT	Gloucestershire Wildlife Trust
HDV	Heavy Duty Vehicles
HER	Historic Environment Record
HEWRAT	Highways England Water Risk Assessment Tool
HGVs	High Good Vehicles
HIF	Housing Infrastructure Fund
HLC	Historic Landscape Characterisation
HMC	Habitat Modification Class
HMS	Habitat Modification Score
HRA	Habitat Regulations Assessments
HSI	Habitat Suitability Index
IAQM	Institute of Air Quality Management
IDB	International Drainage Board
IPCC	International Panel on Climate Change
JCS	Joint Core Strategy
JNCC	Joint Nature Conservation Committee
LAQM	Local Air Quality Management
LCAs	Landscape Character Assessments
LCRM	Land Contamination: Risk Management
LCT	Landscape Character Type
LDV	Light Duty Vehicles
LLFA	Lead Local Flood Authority
LNR	Local Nature Reserves
LOAEL	Lowest observed adverse effect level
LTP	Local Transport Plans
LVIA	Landscape and Visual Impact Assessment
MAFF	Ministry of Agriculture, Fisheries and Food
MCHW	Manual of Contract Documents for Highway Works
MHCLG	Ministry of Housing, Communities and Local Government
MMP	Materials Management Plan
MSA	Mineral Safeguarding Areas
MW	Minor Watercourse
NCA	National Character Area

Abbreviation	Definition
NERC	Natural Environment and Rural Communities
NHLE	National Heritage List for England
NIAs	Noise Important Areas
NMP	National Mapping Programme
NMU	Non- Motorised User
NNR	National Nature Reserves
NPS NN	National Policy Statement for National Networks
NOEL	No Observed Effect Level
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
NPSE	Noise Policy Statement for England
NSIP	Nationally Significant Infrastructure Projects
NSR	Noise Sensitive Receptors
NVC	National Vegetation Classification
OS	Ordnance Survey
PAH	Polyaromatic Hydrocarbons
PAS	Portable Antiquities Scheme
PCBs	Polychlorinated Biphenyls
PCF	Project Control Framework
PCL	Potential Contaminant Linkage
PCM	Pollution Climate Mapping
PCSM	Preliminary Conceptual Site Model
PEAOR	Preliminary Environmental Assessment of Options Report
PEIR	Preliminary Environmental Information Report
PINS	Planning Inspectorate
PPE	Personal Protective Equipment
PPGs	Pollution Prevention Guidelines
PPG	Planning Practice Guidance
PPS10	Planning Policy Statement 10
PPGN	Planning Practice Guidance: Noise
PRA	Preliminary Roost Assessment
PRoW	Public Right of Way
Q_{95}	The 5 percentile flow
RAMS	Risk Assessments, Method Statements
RBD	River Basin Districts
RBMP	River Basin Management Plans
RCP	Relative Concentration Pathway
RCS	River Corridor Survey

Abbreviation	Definition
RFFPs	Reasonably Foreseeable Future Projects
RHS	River Habitat Survey
RNAG	Reason for not Achieving Good
RoWIP	Rights of Way Improvement Plan
SAC	Special Area of Conservation
SHMP	Soil Handling Management Plan
SOAEL	Significant Observed Adverse Effect Level
SoCC	Statement of Community Consultation
SPD	Supplementary Planning Document
SPA	Special Protection Area
SPZ	Source Protection Zones
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage Systems
SWMP	Site Waste Management Plan
TA	Transport Assessment
TAMP	Transport Asset Management Plan
TBC	Tewkesbury Borough Council
TAR	Technical Appraisal Report
TSCS	Thin Surface Course System
UKCP18	United Kingdom Climate Projections 2018
UNFCCC	United Nations Framework Convention on Climate Change
UXO	Unexploded Ordnance
VfM	Value for Money
WCH	Walkers, Cyclists and Horse Riders
WEEE	Waste Electrical and Electronic Equipment
WER	Water Environment Regulations
WFD	Water Framework Directive
WHTP	Whalley, Hawkes, Paisley & Trigg
WSI	Written Scheme of Investigation
ZTV	Zone of Theoretical Visibility

Non-technical summary

The non-technical summary (NTS) of this Preliminary Environmental Information Report (PEIR) has been produced as a separate document.

The NTS provides a topic by topic summary of the environmental assessment undertaken to date for the M5 Junction 10 Improvements Scheme.

1. Introduction

1.1. Scheme Background

1.1.1. Gloucestershire faces significant challenges to achieve its vision for economic growth. A Joint Core Strategy (JCS) – a partnership between Gloucester City Council, Cheltenham Borough Council (CBC) and Tewkesbury Borough Council (TBC) has been formed to produce a co-ordinated strategic development plan to show how the region will develop during the period 2011 - 2031. This includes a shared spatial vision targeting 35,175 new homes and 39,500 new jobs by 2041. Major development of new housing (c.9,000 homes) and employment land (c.100ha) is proposed in strategic and safeguarded allocations in the west and north-west of Cheltenham, much of which lies within TBC's boundary as the Local Planning Authority. This development, in turn, is linked to wider economic investment, including a government supported and nationally significant 45 ha Cyber Central UK adjacent to GCHQ in west Cheltenham, as part of the Golden Valley Development, which also comprises the Garden Community Development. The Cyber Central UK hub is predicted to support c.7,500 jobs.

1.1.2. Cheltenham currently experiences significant congestion at peak times, which has led to air quality issues at various locations across the town and led to the creation of an Air Quality Management Area (AQMA) within Cheltenham. The existing M5 Junction 10 only provides access and egress to and from the north, with no connectivity to M5 south. This drives existing traffic across Cheltenham through various routes to access and leave the M5 from the south which contributes significantly to existing traffic flows in the town. To unlock the housing and job opportunities, a highways network is needed that has the capacity to accommodate the increased traffic it will generate, within a sustainable transport context.

1.1.3. An all movements junction has been identified as a key infrastructure requirement to enable the housing and economic development proposed by the Gloucestershire Local Enterprise Partnership's (GFirst LEP) Strategic Economic Plan and is central to the transport network sought by Gloucestershire County Council (GCC) in the adopted Gloucestershire Local Transport Plan. The planned housing and economic growth have been included in the adopted JCS. National Highways (formerly Highways England (changed August 2021)) also identified that improvements to M5 Junction 10 are a critical requirement to maintain the safe and efficient operation of the M5 corridor in their Birmingham to Exeter Route Strategy, whilst enabling the planned development and economic growth around Cheltenham, Gloucester and Tewkesbury. A bid was submitted in March 2019 to Homes England to the Housing Infrastructure Fund (HIF), wherein an investment case was made for the following infrastructure improvements. Funding was successfully awarded by Homes England in March 2020:

- Element 1: Improvements to Junction 10 on the M5 and a new road linking Junction 10 to west Cheltenham;
- Element 2: A38/A4019 Junction Improvements at Coombe Hill;
- Element 3: A4019 widening, east of Junction 10; and
- Element 4: An upgrade to Arle Court Park and Ride.

1.1.4. Elements 1 and 3 comprise the M5 Junction 10 Improvements Scheme (the Scheme). The upgrade to Arle Court Park and Ride (now known as the Arle Court Transport Hub) (Element 4) and the junction improvements at Coombe Hill (Element 2) were included as part of the package of improvements funded by Homes England. As they are located some distance from M5 Junction 10 and do not form part of the proposed improvement of the junction, GCC has decided to take these two elements forward as separate packages of work in order to accelerate the programme for these elements, and will deliver them through separate planning strategies.

1.1.5. An application for a Development Consent Order under S.22 of the Planning Act 2008 for the construction of improvement works to M5 Junction 10, consisting of a new all-movements junction; the widening of the A4019 east of the junction to the Gallagher Retail

Park Junction; and a new link road from the A4019 to the B4634. A small section of the A4019 will also be widened to the west of the junction.

1.1.6. The application will be submitted by GCC Strategic Infrastructure Team and will include the strategic road network controlled by National Highways as well as the local road network managed by GCC Highways Authority. If approved the DCO powers will be granted to GCC Strategic Infrastructure Team with both National Highways and GCC Highway Authority formal consultees to the Scheme.

1.2. Purpose of the Preliminary Environmental Information Report (PEIR)

1.2.1. The Scheme constitutes a Nationally Significant Infrastructure Project (NSIP) as it meets the thresholds set out in the Planning Act 2008 (as amended). A planning consent for a NSIP takes the form of a Development Consent Order (DCO). The DCO combines the grant of planning permission with a range of other separate consents. The Planning Inspectorate's Advice Note Seven 'Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements', republished May 2020, recommends that Preliminary Environmental Information (PEI) is prepared by the applicant, in this case GCC. Under Regulation 12 'Consultation Statement Requirements' of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (EIA Regulations) 'preliminary environmental information' is defined as 'information referred to in regulation 14(2) which - (a) has been compiled by the applicant; and (b) is reasonably required for the consultation bodies to develop an informed view of the likely significant environmental effects of the development (and of any associated development)'.

1.2.2. The PEI is documented in a Preliminary Environmental Information Report (PEIR). The purpose of this PEIR is to enable specialist and non-specialist consultees from the community and consultation bodies to understand the potential environmental effects of the proposed development. Effects have been predicted at this time for each environmental assessment topic, to inform consultee responses at this DCO pre-application consultation stage. The PEIR provides a preliminary account of the principal environmental issues and may be subject to change as the environmental impact assessment of the Scheme progresses. The PEIR describes the known information available in respect of the current scheme proposals developed at this preliminary design stage and its environmental effects, timescales for delivery, and alternatives that have been considered, as well as a number of uncertainties and assumptions.

1.2.3. For each environmental topic, the PEIR:

- Describes the study area and environmental baseline data collection work undertaken to date;
- Describes the existing baseline environment, based on data collection to date;
- Identifies further work that is ongoing or that is likely to be undertaken to complete the environmental impact assessment (EIA);
- Provides an assessment of the likely significant environmental impacts of the Scheme based on the currently available information; and
- Describes the range of mitigation measures that will be considered to avoid, reduce/mitigate or offset the identified environmental impact.

1.2.4. The preliminary design stage on which the assessment in this PEIR is made is referred to as the Design Fix 2 (DF2) stage. DF2 sets out the extents of the key features of the Scheme that would affect the assessment, and provides preliminary estimates of the extent of land to be disturbed during construction and operation, and key features that would impact surrounding landscapes and habitats both within the soft estate and immediately beyond the fenceline. The DF2 design builds on the Operational Concept confirmed at Design Fix 1 (DF1). The environmental assessment undertaken at the DF1 stage is presented in the Preliminary Environmental Assessment of Options Report (PEAOR).

1.2.5. Following statutory consultation, the preliminary design will be developed further to Design Fix 3 (DF3) stage. The DF3 stage will confirm the design of the Scheme (as set out in DF2) and capture any iterations associated with detailed assessment and design considerations. The DF3 design represents the Scheme proposal for final endorsement. The Environmental Statement (ES) will present the assessment of this DF3 design.

1.2.6. A precautionary approach has been applied to the assessment undertaken at this DF2 stage, so that the assessment detailed in this PEIR is considered to present a 'worst case' assessment of the extent and impacts of the Scheme at this stage.

1.3. Pre-application consultation

1.3.1. Pre-application consultation with key stakeholders and the local community provides an opportunity for interested parties to comment on the proposals while they are at a formative stage, and for potential issues to be taken into account and, where necessary, address the issues before the application is submitted for examination.

1.3.2. An Environmental Scoping Report was published on the Planning Inspectorate (PINS) website in July 2021. A Scoping Opinion was received from PINS in August 2021 based on feedback from statutory consultation bodies. A response from GCC to the Scoping Opinion comments from PINS included in Appendix 1.1 to this PEIR. Detailed feedback from the statutory consultation bodies included in the Scoping Opinion from PINS are being considered as part of this Preliminary Design Stage and will be addressed in the Environmental Statement (ES) and where possible in this PEIR.

1.3.3. GCC issued a Statement of Community Consultation (SoCC) for the Scheme in October 2021. In accordance with Regulation 10 of the Infrastructure Planning (EIA) Regulations 2017 (as amended), the SoCC sets out how GCC will consult with the local community on the PEIR, and the Scheme, the consultation programme and methods of communication.

1.3.4. Following consultation, GCC will take account of all comments and suggestions received from the consultees in relation to the proposed development and the PEIR. GCC will integrate them into further Environmental Impact Assessment (EIA) work that will be documented in an ES and submitted as part of the DCO application to the Planning Inspectorate in 2022.

1.3.5. The DCO application will also include a Consultation Report that will document the outcomes of the consultation and how this has informed the design development of the final proposal.

1.4. Competent Experts

1.4.1. In accordance with the EIA Regulations, the coordination of the environmental assessment process and inputs into each environmental topic area are being undertaken by a team of competent and qualified specialists. These specialists will work in close collaboration with the design engineers, responsible for the design of the Scheme, as part of an iterative design, consultation and assessment process. This process maximises the opportunity to avoid or reduce adverse environmental effects at source, and to identify mitigation measures to address those effects that cannot be avoided or reduced at source.

2. The Scheme

2.1.1. The infrastructure works under consideration in this PEIR comprise the following elements which are related to the changes to the strategic road network and together make up the M5 Junction 10 Improvements Scheme (hereafter referred to as the 'Scheme'):

- An all-movements junction at M5 Junction 10 (scheme element 1);
- A new West Cheltenham Link Road east of Junction 10 from the A4019 (scheme element 2); and
- Widening of the A4019 to the east of Junction 10 (scheme element 3).

2.1.2. An overview of the proposed infrastructure improvement elements that make up the Scheme are illustrated in Figure 2-1. More detailed figures showing the Scheme are provided in Appendix 2.1 (as a separate document). The location of the Scheme relative to the nearest urban areas of Cheltenham and Gloucester is shown in Figure 2-2. Details of the JCS strategic allocated sites (two sites) and the single safeguarded site are shown in Figure 2-3.

2.1. Need for the Scheme

2.1.1. The need for the Scheme is set out as part of the Scheme Background section (Section 1.1).

2.2. Scheme objectives

2.2.1. The objectives for the Scheme are:

1. Support economic growth and facilitate growth in jobs and housing by providing improved transport network connections in west and north-west Cheltenham.
2. Enhance the transport network in the west and north-west of Cheltenham area with the resilience to meet current and future needs.
3. Improve the connectivity between the Strategic Road Network (SRN) and the local transport network in west and north-west Cheltenham.
4. Deliver a package of measures which is in keeping with the local environment, establishes biodiversity net gain and meets climate change requirements.
5. Provide safe access to services for the local community and including for users of sustainable transport modes within and to west and north-west Cheltenham.

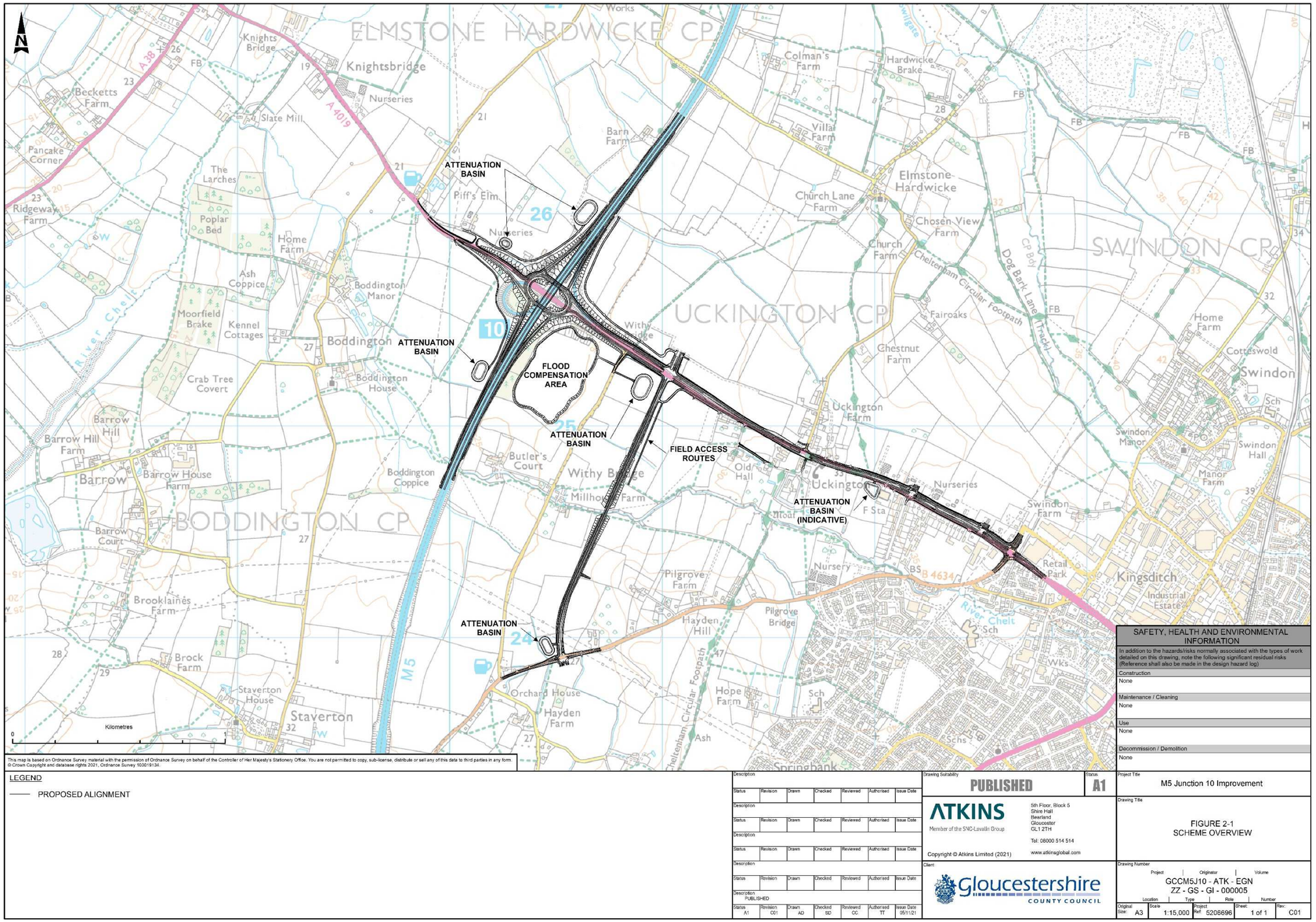


Figure 2-1 - The Scheme

2.3. Existing environment

2.3.1. This section provides a summary of the existing environment(s) within the Scheme area (the land occupied by the Scheme as shown in Figure 2-1), and the notable environments surrounding it (such as sites designated for ecological or landscape value). Further details are provided in Chapters 5 to 14 of this PEIR (produced as separate documents).

2.3.2. The area in which the Scheme is located is predominantly rural, with the land-use being a combination of arable and areas of grazing pasture (of excellent to moderate agricultural value). Traditional orchards are widespread, and the area also contains important areas of lowland meadow and floodplain grazing marsh. The Cotswolds Area of Outstanding Natural Beauty (AONB) is located 6 km to the east of M5 Junction 10.

2.3.3. Multiple watercourses cross the Scheme area, (notably the River Chelt, Leigh Brook, and River Swilgate) running from east-west as eventual tributaries to the River Severn, at least 7.5 km downstream of the Scheme. The Severn Estuary is designated as a Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar and Site of Special Scientific Interest (SSSI), reflecting its international biodiversity value and protecting it as an estuarine habitat supporting a wide range of important habitats and birds. From where the River Chelt joins the River Severn, the Severn Estuary designations are a further 40 km downstream.

2.3.4. The area to the north of the A4019 and east of the M5 is affected by surface water and river flooding. Land just south of the A4019 and extending either side of the existing M5 Junction 10 is essentially floodplain for the River Chelt and falls within Flood Zones 2 and 3, where medium and high probability of flooding is recognised. To the immediate north of the A4019 is the floodplain of the Leigh Brook, an ordinary watercourse. This is not included in Flood Zone 3 but is known to flood. There is also land in Flood Zone 3 near Stoke Orchard, to the north-east of M5 Junction 10, associated with the River Swilgate and its tributary Dean Brook.

2.3.5. There are two groundwater bodies (designated under the Water Framework Directive) within the Scheme area, namely the Severn Vale - Secondary Combined, and the Warwickshire Avon - Secondary Mudrocks. Further details on both of these is presented in Chapter 8, with locations presented in Figure 8-3.

2.3.6. The dominant arable and grassland habitats are interspersed with pockets of other terrestrial habitats, notably broadleaved and mixed plantation woodland, traditional orchards, and unimproved and semi-improved neutral grassland. Along with the watercourses, these areas provide the sites of greater nature conservation value within the Scheme area. There are two SPAs within the National Character Area (Severn Estuary SPA (23 km south-west of the Scheme (in a direct line)) and Walmore Common SPA (17.5 km south-west of the Scheme)), designated for their internationally important populations of wintering wildfowl, including Bewick's swan and shelduck.

2.3.7. Bredon Hill, 12.5 km to the north-east of the Scheme is designated as a SAC for its internationally important population of violet click beetle; and the Wye Valley and Forest of Dean SAC (21 km south-west of the Scheme) is designated for bats. Coombe Hill Canal SSSI is a disused canal designated for its groups of nationally rare and scarce invertebrates and nationally scarce plants, and is located 1.9 km west of the Scheme. At least five species of bat have been recorded within the Scheme area. Preliminary studies have identified bat roosting sites in buildings and trees within the Scheme area.

2.3.8. There is one area of known historic landfill within the Scheme area, at Colmans Farm, located to the north of the M5 Junction 10 adjacent to the motorway.

2.3.9. There are 31 designated heritage assets within the Scheme area and a further 65 non-designated heritage assets. The most notable of these are the Moat House, a moated site adjacent to the A4019 which is a Scheduled Monument, and the Grade 1 listed Chapel of St James the Great in Stoke Orchard. Previous investigations have identified the likelihood of buried archaeology across the Scheme area.

2.3.10. The greatest concentrations of private dwellings and community facilities relative to the Scheme are found in the main settlements of Gloucester and Cheltenham. There are no

main settlements in the study area. The smaller villages of Staverton and Boddington to the west, Hayden to the east and Staverton Bridge to the south are the largest settlements within the study area, with the Hamlet of Uckington spread either side of the A4019 in a key location for the Scheme. There are several isolated properties and farmsteads in the rural areas between these settlements. Notably, there is a cluster of 14 properties at Withybridge Gardens, adjacent to the existing M5 Junction 10.

2.3.11. There is a travellers' site adjacent to the southbound carriageway of the M5, approximately 400 m north of Junction 10.

2.3.12. Whilst there are some public rights of way (PRoW) within and through the Scheme area, the M5 and A4019 currently act as barriers, limiting or funnelling movement for walkers, cyclists and horse riders (WCH). Access across these transport corridors is therefore interrupted and the position of existing crossing infrastructure, which includes footbridges and subways, is likely to have shaped the preferred routes of WCH for recreation and commuting within the study area. There is little public green space due to the predominance of agricultural activity in the rural parts of the study area. Much of the land is designated as Green Belt.

2.3.13. The climate of the Scheme area is typified by relatively mild winters and warm summers with higher than UK average mean and maximum monthly temperatures. The long-term average monthly rainfall is lower than the UK average (based on 1981 – 2010 data), as are the average number of days in which heavy rainfall was experienced. In the future it is projected that, on average, the Scheme area is likely to experience hotter, drier summers and warmer, wetter winters. Alongside these changes in the average conditions, it is likely that climate change will increase the frequency and severity of extreme weather events such as heavy rainfall, storms and heatwaves.

Environmental constraints and opportunities

2.3.14. The Scheme area includes a variety of different land uses, and whilst predominantly rural there are clusters of residential properties throughout. Many of these lie within existing Noise Important Areas (NIAs) which have been designated due to traffic on the A4019.

2.3.15. There are two statutory designated AQMAs close to the Scheme (Tewkesbury Town Centre, and Cheltenham Borough). The Scheme will result in changes to traffic flows through west Cheltenham and may have the potential to alter the air quality impacts, and also the noise impacts associated with the resultant changes in traffic flows on the road network. Air quality and noise modelling has been undertaken to understand the potential impacts. Further details are presented in Chapters 5 (Air Quality) and 6 (Noise and Vibration) of this PEIR.

2.3.16. There is confirmed evidence and records for the presence of protected and notable species within the Scheme area, including bats, badgers, otter, great crested newts, terrestrial invertebrates and 31 species of birds. There are opportunities available therefore to enhance the value of land within the Scheme area for biodiversity. An extensive programme of field surveys has been undertaken to understand the presence (or absence) of protected species within the Scheme area. Further details are presented in Chapter 7 and its supporting appendices. Survey work is ongoing and full details will be provided as part of the ES.

2.3.17. The low lying nature of the Scheme area and the presence of multiple watercourses means that much of the area is floodplain and subject to numerous flood risk issues. All parts of the Scheme are likely to have an element of exacerbated flood risk and have required appropriate mitigation in the design. Detailed modelling and assessment has been undertaken to understand the baseline flood environment for the Scheme and the potential flood risks. Further details are presented in Chapter 8, and the flood risk assessment in Appendix 8.1.

2.3.18. There are known above ground structures of historic importance within the Scheme area, and the potential for buried archaeology. Opportunities are available as a result of the Scheme to improve current understanding of the buried archaeology within the Scheme area as a consequence of the further investigation work (comprising geophysical

investigation and archaeological evaluation) that will be conducted in advance of construction works.

2.4. Scheme description

Scheme location

2.4.1. M5 Junction 10 is located 48 miles to the south of Birmingham, 40 miles to the north of Bristol, 5 miles to the south of Tewkesbury, 4 miles to the north-west of Cheltenham, and 8 miles to the north-east of Gloucester.

2.4.2. The junction is in a strategically important location for the region, particularly as northern and western Cheltenham are the sites of a number of large retail parks and employment areas, and the location of planned future housing and nationally significant business development.

2.4.3. The location of M5 Junction 10 is shown in Figure 2-2.

Figure 2-2 - Location of the Scheme

2.4.4. The locations of the proposed infrastructure improvements that make up the Scheme (and collectively make up the Scheme area), the JCS allocation areas and the safeguarded site to the north-west and west of Cheltenham are illustrated in Figure 2-3.

Figure 2-3 - Location of the Scheme elements (M5 Junction 10 Improvements, A4019 Widening, and the Link Road to West Cheltenham), the allocated land at West and North-west Cheltenham, and the safeguarded land area. (Safeguarded land is land which has been identified for development in the future and is protected from conflicting development).*

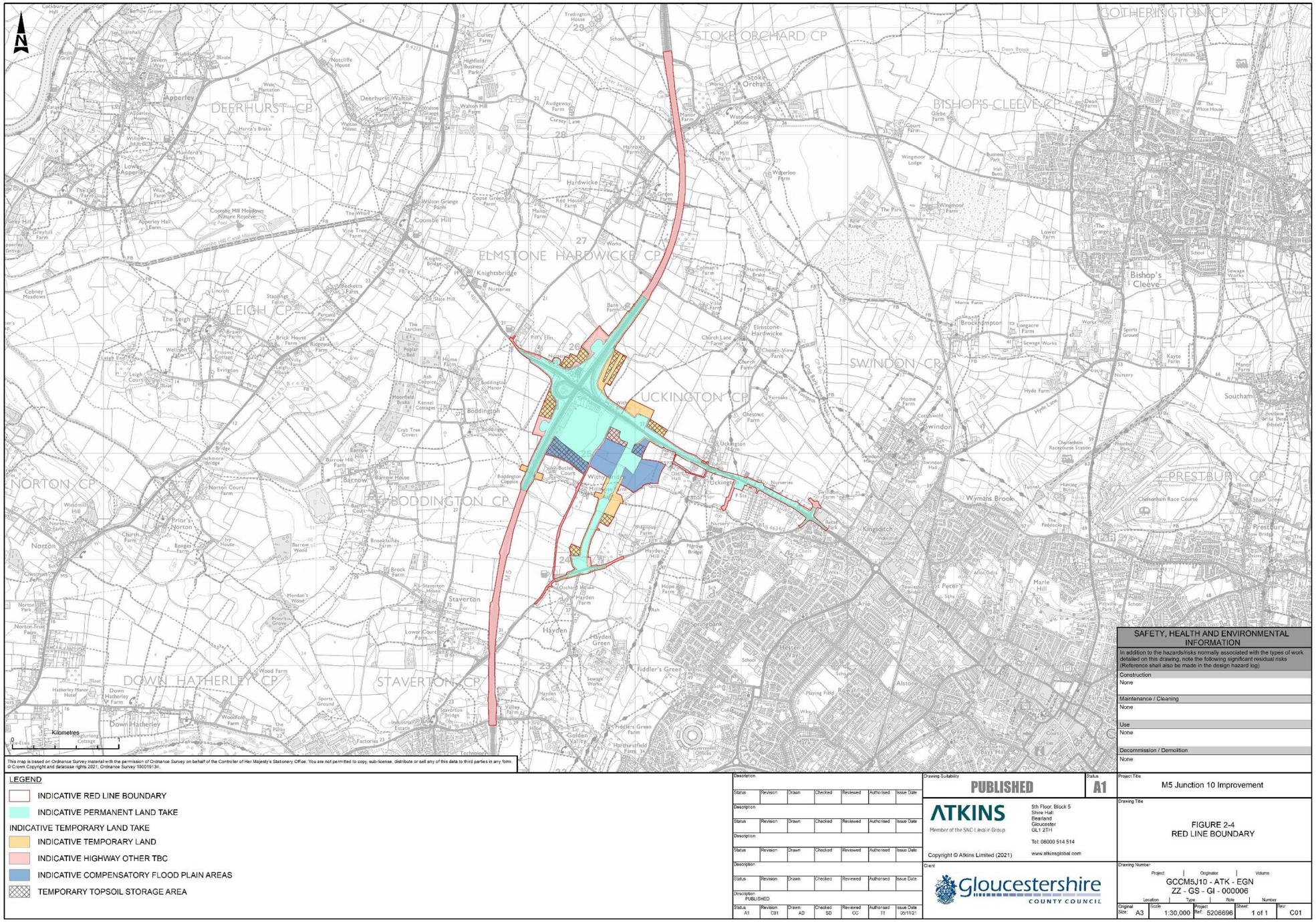


Figure 2-4 - Indicative proposed land take for the Scheme (note that the land take north and south of the M5 Junction 10 (beyond the permanent land take area) covers the locations required for new signage. Not all of this land will be required for the Scheme. The land required for new signage will all be within the existing highway boundary)

Scheme Elements

2.4.5. The elements that make up the Scheme are illustrated in Figure 2-1. A description of each element (M5 Junction 10, West Cheltenham Link Road, and the A4019 Widening) is presented below. More detailed figures showing the Scheme at DF2 stage are provided in Appendix 2.1. Further details of the Scheme, including details of the sizes of the structures identified, will be provided as part of the ES. The infrastructure elements presented and assessed in this PEIR represent the expected sizes of these elements in the DF3 design.

2.4.6. In addition to the Scheme elements described below, the figures in Appendix 2.1 show the current locations for the Scheme's drainage features, lighting, fencing and signage. The designs for these will be updated and developed further through to the completion of the DF3 design, and details will be presented as part of the ES. With regards lighting and drainage design, the current strategy for these is as follows:

- Lighting - the Scheme will utilise directional full cut-off LED luminaires at a 12m mounting height to illuminate the carriageway to standard and minimise light spill on the surrounding areas. The proposed LED luminaires have a warm white appearance for environmental reasons and will have an option to be dimmed using GCC's Central Management System.
- Drainage - the proposed surface water drainage strategy will seek to replicate the site's existing hydrology through SuDS principles. The drainage design for the upgraded and new carriageway sections will consist of gravity drainage networks, which will convey flows to suitable outfalls via attenuation basins. An overview of the locations of the attenuation basins (and the access tracks to them) is provided in Figure 2-1.

2.4.7. In addition to the three elements described below, there is the potential to repurpose Withybridge Lane as part of the Scheme. Further information on this is provided towards the end of Chapter 3 of this document.

M5 Junction 10

2.4.8. The improvements to M5 Junction 10 are to increase the capacity of the junction, and to upgrade the current restricted movements junction to an all-movements junction. To enable travel both south and north on the M5, the two existing Junction 10 sliproads will be removed, and four new slip roads will be constructed to provide access and egress to the M5 in all directions.

2.4.9. Two new overbridges will be constructed over the M5, centered either side of the existing overbridge (carrying the A4019 over the M5), which will then be demolished. The new overbridges will create a new elongated shaped roundabout junction over the M5. The A4019 will be realigned to provide an appropriate entry angle to the new roundabout. A dedicated route for cyclists and pedestrians will be provided at grade through the junction (see the section below on the A4019 Widening). Extensions will be required for the Piff's Elm and Leigh Brook culverts, that pass under the M5, as a result of the new slip roads. The planned alignment of the new slip roads means that an extension of the River Chelt culvert under the M5 will not be required.

2.4.10. An area to provide for compensatory flood storage for the Scheme has been identified to the southeast of the M5 Junction 10. The boundary of the land required for this area at DF2 stage is shown on Figure 2-1. The assessment of the flood compensation requirements for the Scheme are ongoing and further details will be provided as part of the ES.

2.4.11. Details of new field access routes to the northeast of the M5 Junction 10, which have been included in the Scheme as replacement for the existing access points that have been lost as a result of the new southbound off-slip, are presented in Figure 2-1.

West Cheltenham Link Road

2.4.12. The West Cheltenham Link Road (the 'Link Road') is a proposed new two lane road, with a segregated cycleway and footway, from the B4634 to the A4019. The Link Road is

intended to provide greater connectivity between the reconfigured M5 Junction 10 and both the West Cheltenham Strategic Allocation, Safeguarded Land and the Proposed Cyber Park.

2.4.13. The Link Road crosses predominantly agricultural land. The design of the Link Road includes flood relief structures across the floodplain to the north of the River Chelt, and a single span bridge over the River Chelt. The current design of this bridge is a structure that will be set back from the riverbanks (by 4m on each side of the river), and will have a clearance of 2.8m between the underside of the bridge and the top of the river banks.

2.4.14. To connect the Link Road with the existing A4019 (to the north) and the B4634 (to the south), two new junctions will be constructed:

- A4019 - a four-arm signalised junction with the northern arm providing access to the new developments to the north of the A4019, as safeguarded in the JCS. Pedestrian and cycle access over this junction will be incorporated into the signal phasing for this junction. The DF3 design will identify the requirements for pedestrian and cycle crossings at this location.
- B4634 - a new four arm signalised junction is proposed on the B4634 to connect both the Cyber Park and the West Cheltenham Strategic Allocation and Safeguarded Land to the M5 Junction 10 via the Link Road and the A4019. The location of this proposed junction is close to Hayden Hill Farm on the B4634, approximately 300m east of the junction for Withybridge Lane.

2.4.15. Details of new field access routes to the east of the Link Road, which have been included in the Scheme as replacement for the existing access points that have been lost as a result of the Link Road, are presented in Figure 2-1.

A4019 Widening

2.4.16. The A4019 links the M5 Junction 10 to north-west Cheltenham. Currently, the A4019 is a dual carriageway over the M5 Junction, returning to single carriageway east of the junction to serve the turning into Withybridge Lane. The A4019 continues eastwards to Cheltenham as a single carriageway, where it ties into an existing dual carriageway at the Gallagher Retail Park.

2.4.17. The section of the A4019 covered by the Scheme runs from just west of the M5 Junction 10 eastwards through to the existing dual carriageway at Gallagher Retail Park.

2.4.18. As part of the highway improvements incorporated into the Scheme, the A4019 will be widened to a dual carriageway from Withybridge Lane, eastwards through to the Gallagher Retail Park, where the Scheme will tie into the existing dual carriageway. Widening of the A4019 through Uckington will be predominantly to the southern side of the A4019. Widening to the east of Uckington will be to the northern side of the A4019.

2.4.19. Two new signalised junctions will be created on the A4019 (between Uckington and the Gallagher Retail Park) as accesses from the A4019 into the future North West Cheltenham Development site (also referred to as the Elms Park Development site). Changes will also be made (as part of the Scheme) to the layout of the junction of the A4019 with the B4634 at the eastern end of the Scheme (referred to as the Gallagher junction).

2.4.20. For residents and businesses whose current access is directly onto the A4019 (for example those in Uckington, and along the southern side of the A4019 in north-west Cheltenham), short sections of new access roads will be created alongside the widened A4019 to facilitate ease of access both westbound and eastbound. This includes a new access road connecting Cooks Lane with Moat Lane (to the south of the A4019 at Uckington). The layout and design of these access roads is ongoing, with the current design shown on the figures in Appendix 2.1. Further details will be provided as part of the ES.

2.4.21. The Scheme will include a segregated cycleway and footway on the northern side of the A4019, which will extend for the full length of the proposed A4019 widening, and will provide connectivity for pedestrians and cyclists between north-west Cheltenham and the junction of the A4019 and Stanboro Lane (west of M5 Junction 10), where it will connect

to an existing footway. The current layout and design of these facilities for pedestrians and cyclists is shown in the figures in Appendix 2.1.

2.4.22. The layout of the Gallagher junction on the A4019 is still under review, and design work is continuing with this junction. At present it is proposed that in the opening year of the Scheme (2025) left and right turns will be possible off the A4019 at this junction (from both a westbound and eastbound direction). However, in order to maintain a necessary flow of traffic along the A4019 in the future, the right turn options at this junction (from both a westbound and eastbound direction) will be closed in a future year of operation, depending on the traffic demands across the junction (potentially within six years of opening). The assessment presented in this PEIR has been made on the opening year design.

2.4.23. The Scheme as described for the Gallagher junction demonstrates a practical solution, but does not preclude the consideration of alternative solutions and future additional works. The current proposals, described above, will be assessed fully in the EIA and Transport Assessment (TA) that will accompany a DCO application for the scheme. Subject to the final EIA and TA, it can be confirmed that the current scheme ensures that key vehicle and pedestrian movements through the junction can be accommodated. Future works could be promoted by GCC or by a third party (e.g. the Elms Park developer) that could change the design of the Gallagher junction and would, if required, need to be consented at the appropriate time.

Land take

2.4.24. The preliminary draft DCO pre-application site boundary or Order Limits (also known as the 'red line boundary') is shown in Figure 2-4. This includes both permanent and temporary land take for all works proposed, including both the Scheme and construction areas. The limits will be subject to minor refinement as the detailed design of the Scheme progresses, for example in the land take required along the motorway verges for new signage to the north and south of M5 Junction 10, and the areas required for compensatory floodplain, and the land predicted to incur minor changes in flood risk which will require Right to Flood agreements. The final version will be presented as part of the ES.

2.4.25. A figure for the total permanent land take area (i.e. the areas outside the existing highway boundary but within the proposed highway boundary) required for the Scheme will be presented in the ES.

2.4.26. The requirement for and extent of temporary land take is also currently being developed. The details presented in Figure 2-4 include the areas in which necessary construction activities might take place. As a general principle a 10m strip has been provided around the permanent works to enable safe construction access. This is expected to be temporary but, in some areas, this may be larger to accommodate specific requirements, for example access to communications cabinets. The temporary land take will be returned to the original owners when the Scheme has been built, and as far as possible the land will be returned in the same condition as it was before the works commenced.

Construction, operation and long-term management

2.4.27. Specific construction, operational and long-term management arrangements are not known in detail at this stage of the Scheme. Potential locations of construction compounds for the contractor have been identified and are included within the temporary land take for the Scheme (Figure 2-4). The assessments of construction effects will assume best practice, based on industry guidance and professional experience. Further details will be provided as part of the ES.

Construction

2.4.28. Construction of the Scheme is planned to commence in 2024.

2.4.29. Material will be generated as the result of new and modified highway earthworks and the excavation of drainage features. The total volume of materials generated, and required for the construction is not known in detail at this stage of the Scheme, although expected

volumes have been assessed in Chapter 12. A number of structures will be demolished or extended as part of the construction of the Scheme, including the A4019 overbridge at Junction 10 (demolished) and the Piff's Elm and Leigh Brook culverts under the M5 (extended). New structures to be built as part of the Scheme include the new River Chelt overbridge, the two new overbridges for Junction 10 and flood relief culverts under the Link Road.

2.4.30. Further information on the demolition activities planned during the construction phase, of the A4019 overbridge for example, will be provided as part of the ES. Initial assessments have been made regarding the potential impacts of dust from construction activities (in Chapter 5), and bulk wastes generated (Chapter 12).

Operation and long-term management

2.4.31. The Scheme is planned to be open for traffic in 2025. Maintenance of the Scheme will be the responsibility of GCC, although some elements will be handed over to National Highways by agreement, recognising the Highway Authority boundaries.

Decommissioning

2.4.32. In view of the indefinite life of the Scheme, it is not considered appropriate for this to form part of the environmental assessment. The focus of the Scheme will be upon seeking to minimise disruption and to re–use materials that will also form part of the materials assessment. Decommissioning of the Scheme has therefore not been included in the PEIR.

2.5. Preliminary Outline Environmental Design

2.5.1. Details of the preliminary environmental design for the Scheme are presented in Appendix 2.2 (as a separate document). These provide details for flood management, landscape, ecology and noise mitigation, where this information is available currently at DF2 stage. The proposals at this PEIR stage are outline and based on the current preliminary design presented at statutory consultation. The environmental design for the Scheme will be progressed further following the statutory consultation and a revised DF3 stage design will be presented as part of the ES. In particular, the DF3 design will include further information on the flood management measures (including flood storage and flood compensation areas), the design of the attenuation basins to provide benefits to landscape and ecology, and the requirements for noise mitigation.

2.5.2. The key aspirations of the preliminary environmental design for the Scheme are:

- Ensure the design of the infrastructure components of the project minimises direct impacts to environmental receptors;
- Avoid loss or damage to hedgerows, woodland and individual trees as far as possible by refining alignments;
- Retain or replace vegetation that contributes to landscape character of the area and provides visual amenity and screening:
    - Replacement woodland to M5 corridor and junction and for amenity and screening;
    - Boundary hedgerow with occasional trees with wildflower grass to verges along the A4019 and Link Road. New woodland plots along Link Road where greater density of screening required;
    - A4019 central reserves to be wildflower grass seeded with individual trees planted where safe and feasible; and
    - Slightly more formal planting towards retail park on A4019.
- Embed the Junction 10, widened A4019 and the Link Road into the landscape;
- Retain, replace and enhance habitats for biodiversity and visual amenity value, so as to provide habitat corridors along the Scheme;

- Planting to be varied, species rich, non-invasive, tolerant of climate change;
- Ensure the permeability of the Scheme for wildlife through the provision of wildlife crossing points; and
- Retention of existing facilities for active travel, including bus stops and PRoWs. The PRoW (between Uckington and Withy Bridge, to the north of the River Chelt) will be re-routed to cross the Link Road under the new River Chelt bridge.

2.5.3. Examples of the embedded mitigation in the design so as to minimise impacts to environmental receptors include:

- River Chelt bridge as a clear span structure (over the river) and thereby avoiding direct impacts to the river and banks;
- Embankments on the M5 at the point where the River Chelt passes under the motorway have been designed so that the existing culvert does not require extending on either side of the motorway, and consequently no more of the River Chelt is culverted;
- The existing alignment and access point for Stanboro Lane (to the northwest of the Junction 10) is retained to improve the amount of existing vegetation being conserved;
- A series of culverts under the Link Road so as not to impede the existing periodic movement of floodwater that occurs in a westerly direction out of the River Chelt from a point upstream of the Link Road;
- Wildlife crossing points for bats (hop-over points on the A4019) and badgers or otters (tunnels under the A4019 and Link Road); and
- Identification of five locations for noise barriers within the Scheme area, where such features would reduce noise levels in existing NIAs, or reduce noise levels where noise levels are modelled to exceed the Significant Observed Adverse Effect Level (SOAEL).

3. Assessment of Alternatives

3.1. Introduction

3.1.1. This chapter presents a summary of the development of the M5 Junction 10 Improvements Scheme.

3.1.2. Proposals for the improvement of the M5 Junction 10 and the A4019, and the creation a new Link Road have been under consideration since 2012. Infrastructure options have been considered in relation to the required housing numbers and whether these met the high-level social, economic and political goals expected of the JCS. The options were also tested using a traffic model to determine their efficacy.

3.1.3. To support the developments planned in west and north-west Cheltenham, a number of proposals for new and improved public transport services and walking and cycling schemes are to be implemented in the area. However, the volume and dispersed origin and destinations of the trips anticipated to be generated by the developments will present significant challenges in terms of accommodating all new trips via public transport or active modes solutions. This, coupled with uncompetitive journey times offered by public transport options, means that there will be a large residual number of trips generated by the new developments that will need to be accommodated through highways-based solutions.

3.2. Identification of options

3.2.1. The options considered were:

- Do minimum - delivering only the committed network improvements to 2031. This option failed to support the required JCS housing growth;
- DS1 (Do Something 1) - a low-cost transport solution, primarily schemes fully within existing highway boundaries. This scenario also failed to support the required housing delivery;
- DS2 to DS6a which introduced increasing levels of investment alongside demand management interventions. DS6 introduced the 'all movements' Junction 10 which was shown to meet the needs of the JCS site allocations in west and north-west Cheltenham (i.e. those which are the subject of the Homes England Bid) but not to meet the wider demands; and
- DS7, incorporating Junction 10 improvements, plus additional schemes.

3.2.2. The DS7 option enabled the delivery of 5,212 homes up to 2031 on the West and North-West Cheltenham Strategic Allocation sites. Note that this did not incorporate the housing and employment on the additional 'safeguarded' land which was identified in the JCS but not formally allocated for development. At the time of securing funding for the scheme in October 2020 the core scenario had evolved to include for 8,914 homes up to 2041 and revised modelling indicated higher traffic volumes than previously used to inform option development. This further enhanced the rationale for deselecting scheme options where traffic capacity was perceived to be a potential issue. In addition, DS7 was tested only to 2031 and no assessment of housing or employment delivery beyond 2031 was included.

3.2.3. The studies undertaken to elaborate on the DS7 proposal, to identify new infrastructure outside of the existing highway boundaries are summarised below:

- National Highways and JMP Consultants Ltd produced a report in July 2012 titled "M5 Junction 10 – feasibility study of conversion to an all movements junction". This considered four options for converting the existing junction into an all movements junction. All options proposed to keep the existing northbound entry slip loop and avoid any impact on the commercial properties in the north-west quadrant of the junction. They also sought to minimise the impacts on the residential properties on Withybridge Gardens. Because of this, all four options included at least one signalised slip road junction with the A4019.

- JMP Option 1 - incorporated loop slip roads with southbound on and off-slips as a mirror image of the proposed north facing slips;
- JMP Option 2 - incorporated parallel slip roads;
- JMP Option 3 - incorporated a new eastern roundabout on the A4019; and
- JMP Option 4 - incorporated a new eastern signalised junction on the A4019.

- National Highways and AECOM proposed two options, in an incomplete draft report titled "Option Assessment Report – M5 Junction 10 and access to the Cyber Park Access Road" (February 2018).
  - AECOM Option 1 - incorporated an upgrade of the existing M5 Junction 10 to an all movement roundabout interchange; and
  - AECOM Option 2 – incorporated an upgrade of the existing M5 Junction 10 to an all movement dumb-bell interchange.
- GCC and Amey developed six outline options for a proposed West Cheltenham Link Road and improved or new M5 Junction 10 (July 2018). These included various options of all movements junctions at M5 Junction 10, to the south, to the north and at its existing location. A comparison of the options led to the development of three Concept Options included in the bid to Homes England for funding (2019).
  - Amey Concept 1 – Junction 10 moved north of its current location;
  - Amey Concept 2 – Upgrade to the existing Junction 10; and
  - Amey Concept 3 – Junction 10 moved south of its current location.

3.2.4. The process of how these options were analysed, refined and sifted down to those presented at the non-statutory Public Consultation (October 2020), and ultimately a recommended Preferred Route is shown in the flowchart in Figure 3-1.

3.2.5. The TAR Option Development Workshop was attended by specialists in engineering, environmental and traffic modelling, to consider all previous options and to identify potential new options. The advantages and disadvantages of each option in relation to known constraints were discussed and recorded. The options that were considered most likely to provide the benefits required and have the least impact on known constraints were considered to be (as shown in Figure 3-2):

- Option 1A – as per Concept Option 1, but with M5 Junction 10 roundabout configuration amended to an elongated junction – new junction north of existing;
- Option 2 – as per Concept Option 2 – upgrade existing M5 Junction 10 with Gyratory Roundabout;
- Option 2A – as per Concept Option 2, but the Junction moved slightly north to enable the retention of the existing bridge as the southern part of the gyratory carriageway;
- Option 3 – as per Concept Option 3 – new junction South of existing;
- Option 4 – as per Concept Option 2, but with a dumbbell roundabout arrangement instead of a gyratory roundabout (not shown on Figure 3-2); and
- Option 5 – as per Concept Option 1, but with the junction located not as far north of the existing Junction 10.

3.2.6. All options included the widening of the A4019 and a new road link to the West Cheltenham Development site. The options considered for the widening of the A4019, and the new West Cheltenham Link Road are described below (Section 3.4 and Section 3.5 respectively).

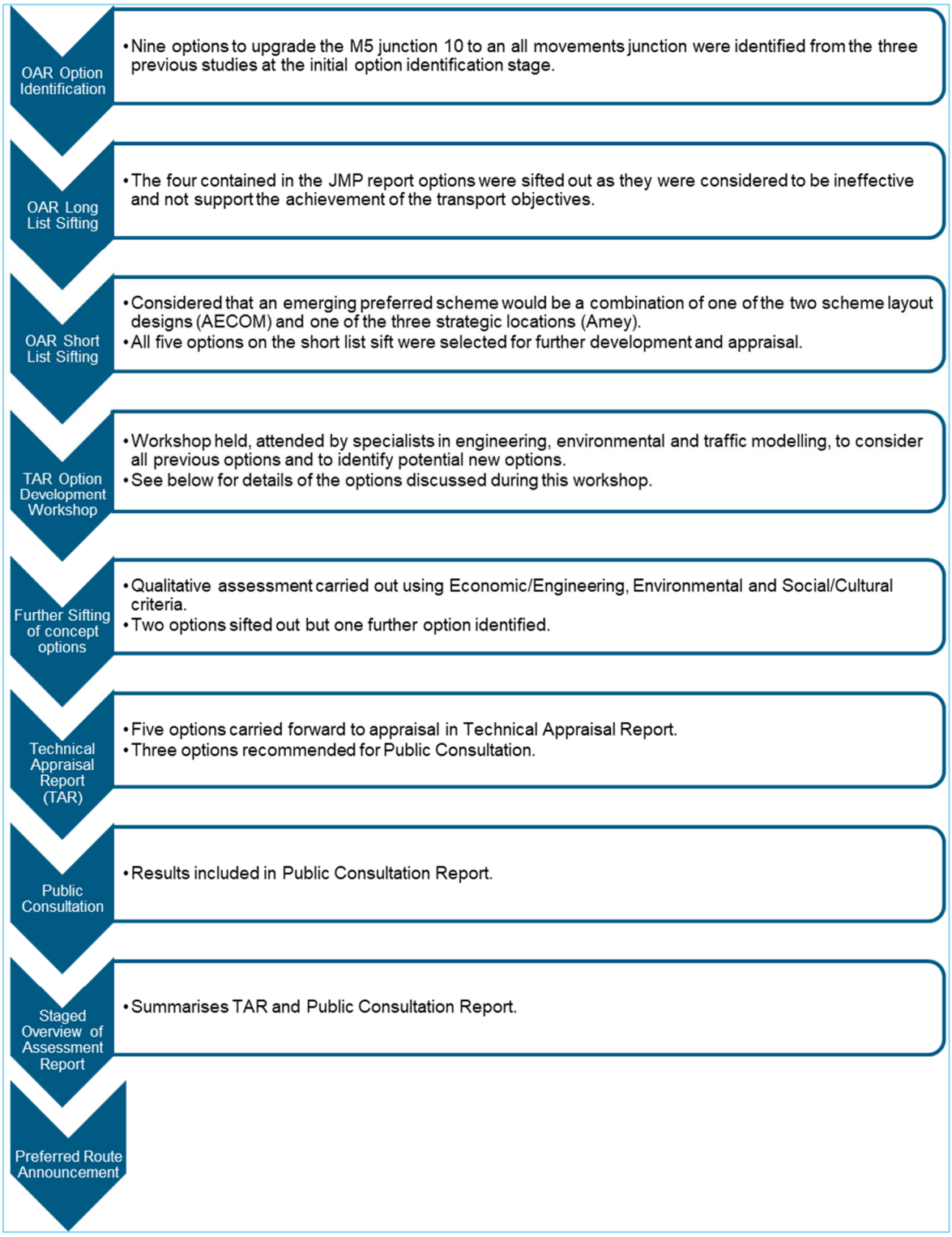


Figure 3-1 - Summary of the options sifting and assessment exercise undertaken

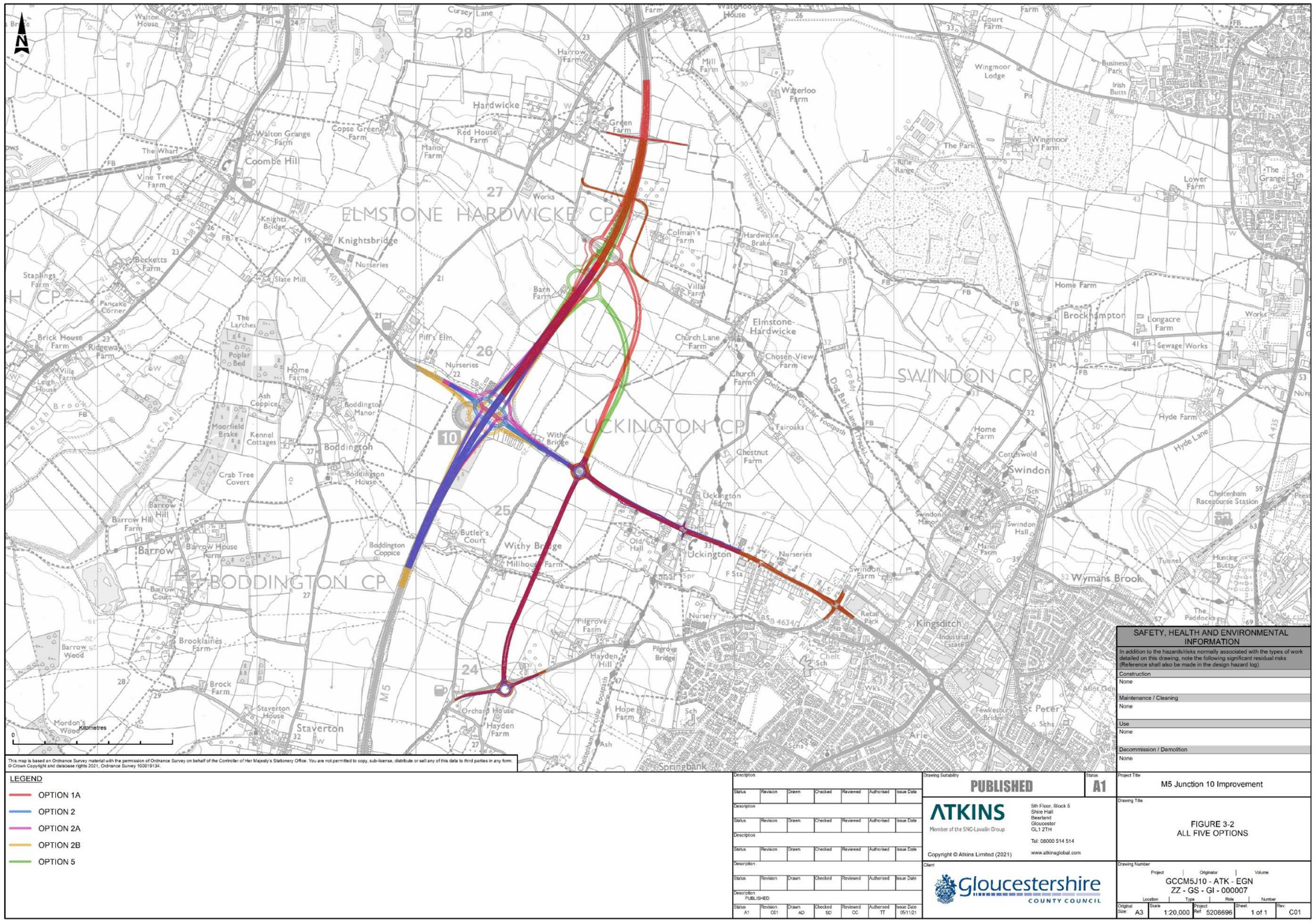


Figure 3-2 - Options 1A, 2, 2A, 2B and 5 for the M5 Junction 10 Improvements Scheme (without earthworks). All five options include the widening of the A4019 and the West Cheltenham Link Road

3.3. Sifting of M5 Junction 10 options

3.3.1. A sifting exercise was undertaken on the six concept options considered in the TAR Option Development Workshop. A qualitative assessment was carried out using a range of economic/engineering, environmental and social/cultural criteria.

3.3.2. Option 3 was considered to have unacceptable impacts on the River Chelt floodplain as it was located with the area identified as a flood zone by the Environment Agency. The option would require a large viaduct to minimise the impacts on the flood plain. The other options taken forward has lesser impacts on the flood plain. Option 4 was considered to be unable to manage the level of traffic expected to occur, relative to the other options. These two options were therefore sifted out at a first review stage.

3.3.3. As part of the sifting process, it became apparent that there was a further sub-option of Option 2, which was similar to Option 2A, but moved the junction slightly south, to enable the retention of the existing bridge as the northern part of the gyratory carriageway. This layout was called Option 2B.

3.3.4. The options carried forward to the appraisal stage were therefore:

- Option 1A – new junction North of existing;
- Option 2 – upgrade existing M5 Junction 10 with gyratory roundabout;
- Option 2A - upgrade existing M5 Junction 10 with gyratory roundabout offset to the north;
- Option 2B – upgrade existing M5 Junction 10 with gyratory roundabout offset to the south; and
- Option 5 - new junction north of existing (in alternative position to Option 1A).

3.3.5. Further information on these five options is presented below.

Option 1A – New Junction to the north of the Existing Junction 10

3.3.6. Option 1A proposed a new M5 gyratory roundabout junction with two new overbridges, replacing the existing Elmstone Hardwicke bridge approximately 1,250m north of the existing M5 Junction 10. This junction would provide access to the M5 in all directions. As a result the existing northbound on-slip and south bound off-slip at Junction 10 would no longer be required.

3.3.7. A new 50mph two-lane dual carriageway would connect the new M5 junction with the A4019 Tewkesbury Road by means of a new gyratory roundabout junction approximately 650m east of the M5. From this junction the new dual carriageway would continue south, passing over the River Chelt before tying into the B4634 Gloucester Road approximately 300m east of the existing Withbridge Lane Junction. This section of dual carriageway would provide access from the M5 to the West Cheltenham development site.

3.3.8. In addition to the new sections of dual carriageway, this option proposed that the A4019 Tewkesbury Road between the new gyratory roundabout and traffic signalised B4634 junction would be widened to provide a two lane dualled carriageway. New signalised junctions would be required at the staggered crossroads of The Green and Moat Lane in Uckington and at Homecroft Drive junction.

3.3.9. As part of the improvement works, the existing Green Farm Access Bridge would be demolished and replaced at the same location with a new longer overbridge spanning the new slip road tapers. Another new bridge would be provided approximately 400m south to replace the demolished Hardwicke Elmstone Hard Bridge.

3.3.10. This option would impact upon approximately 50% of a storage area at Barn Farm.

Option 2 – Upgrade Existing Junction 10 with Gyratory Roundabout

3.3.11. Option 2 proposed that the existing M5 Junction 10 overbridge be demolished, and a new gyratory roundabout junction be constructed over the M5, centred either side of the existing overbridge. A roundabout was considered to offer better traffic capacity than a signalised junction. To construct this roundabout and to tie into the existing A4019, the

properties to the north and south of the A4019 carriageway would need to be demolished. Slip roads would connect the junction to the M5, providing access in all directions.

3.3.12. This option included the widening of connecting sections of the A4019 from the new junction to both the east and west, the west tying in approximately 250m west of the M5 Junction 10, and the east tying in to a new A4019 gyratory roundabout junction approximately 650m east of the junction. A connection stub to the north would provide access for potential future development. From this roundabout a proposed new 50mph dual carriageway continued south, passing over the River Chelt before tying into the B4634 Gloucester Road with a new gyratory roundabout approximately 300m east of the existing Withybridge Lane junction. This section of dual carriageway would provide access from the M5 to the West Cheltenham development site.

3.3.13. In addition to the new sections of dual carriageway, the option proposed that the A4019 Tewkesbury Road, between the new gyratory roundabout and traffic signalised B4634 junction was widened to provide a two lane dualled carriageway. New signalised junctions would be required at the staggered crossroads of The Green and Moat Lane in Uckington and at Homecroft Drive junction.

3.3.14. This option would impact upon all fourteen of the residential properties at Withybridge Gardens, the two properties on the A4019 (at Withy Bridge), a large proportion of the buildings at Sheldon Nurseries and the three properties nearby, and approximately a third of the Barn Farm storage area.

Option 2A – Upgrade Existing Junction 10 with Gyratory Roundabout offset to the north

3.3.15. Option 2A is the same as Option 2 (and Option 2B) except for the changes to the existing M5 Junction 10.

3.3.16. For the M5 Junction 10, Option 2A proposed that the upgrade of the existing M5 Junction 10 to a gyratory roundabout junction would utilise the existing M5 overbridge as the southern part of the roundabout and construct one new overbridge north of the A4019. To construct the gyratory roundabout and tie the junction into the existing A4019, the properties to the north of the carriageway, both east of and west of the M5 would need to be demolished. Slip roads connect the junction to the M5, providing access in all directions. Whilst this option retained the existing overbridge, and therefore does not require the construction of two new overbridges, the existing overbridge does have headroom limitations (for traffic on the M5) and requirements for future refurbishment (as a consequence of its age), that would not be realised with a new overbridge.

3.3.17. This option would impact upon at least four of the residential properties at Withybridge Gardens, the two properties on the A4019, a large proportion of the buildings at Sheldon Nurseries and the three properties nearby, and approximately a third of the Barn Farm storage area.

Option 2B – Upgrade Existing Junction 10 with Gyratory Roundabout offset to the south

3.3.18. Option 2B is the same as Option 2 (and Option 2A) except for the changes to the existing M5 Junction 10.

3.3.19. For the M5 Junction 10, Option 2B proposed that the upgrade of the existing M5 Junction 10 to a gyratory roundabout junction would utilise the existing M5 overbridge as the northern part of the roundabout and construct one new overbridge south of the A4019. To construct the gyratory roundabout and tie the junction into the existing A4019, the properties to the south of the carriageway would need to be demolished. Slip roads connect the junction to the M5, providing access in all directions. Whilst this option retained the existing overbridge, and therefore does not require the construction of two new overbridges, the existing overbridge does have headroom limitations (for traffic on the M5) and requirements for future refurbishment (as a consequence of its age), that would not be realised with a new overbridge.

3.3.20. This option would impact upon all fourteen of the residential properties at Withybridge Gardens, a large proportion of the buildings at Sheldon Nurseries and two of the properties nearby, and approximately a third of the Barn Farm storage area.

Option 5 - New Junction to the north of the Existing Junction 10 (in alternative position to Option 1A)

3.3.21. Option 5 included a new M5 gyratory roundabout junction with two new overbridges approximately 1000m north of the existing M5 Junction 10, and south of the existing Hardwicke Elmstone Hard Bridge which would be demolished. This junction included access to the M5 in all directions, as a result the existing northbound on-slip and south bound off-slip at M5 Junction 10 would no longer be required. To accommodate the new M5 junction, some buildings at Barn Farm would also have to be demolished and the existing access road to the farm realigned.

3.3.22. A new 50mph two-lane dual carriageway was included to connect the new M5 junction with the A4019 Tewkesbury Road by means of a new gyratory roundabout junction, approximately 650m east of the M5. From this junction the new 50mph dual carriageway continued south, passing over the River Chelt before tying into the B4634 Gloucester Road approximately 300m east of the existing Withybridge Lane Junction. This section of dual carriageway would provide access from the M5 to the West Cheltenham development site.

3.3.23. In addition to the new sections of dual carriageway, it was also proposed that the A4019 Tewkesbury Road, between the new gyratory roundabout and signalised B4634 junction, be widened to provide a two lane dualled carriageway. New signalised junctions would also be required at the staggered crossroads of The Green and Moat Lane in Uckington and at Homecroft Drive junction.

3.3.24. As part of the improvement works, the existing Green Farm Accommodation Bridge would be retained.

3.3.25. This option would not impact upon any of the residential properties at Withybridge Gardens, the two properties on the A4019, Sheldon Nurseries and the three properties nearby. However it would affect all buildings and storage areas at Barn Farm.

Summary of the M5 Junction 10 options sifting

3.3.26. The sifting process for the M5 Junction options concluded that Option 1A and 5 should not be taken any further forward due to the complexities and affordability issues. It was recommended that Options 2, 2A and 2B were taken forward for further development, having all achieved a “High” value for money (VfM) category. Although all options met the Scheme objectives fully, there was marginal difference in overall benefits or disadvantages of these recommended options when compared with each other. Due to this marginal difference in benefits and disadvantages it was not possible to confirm a preferred solution at that stage. Therefore, it was proposed that Options 2, 2A and 2B be taken forward to the non-statutory public consultation (Autumn 2020).

3.4. Options for improvements to the A4019

3.4.1. Improvements to the A4019 were first identified in the August 2016 Transport Assessment as part of the Elms Park (North West Cheltenham) development application which included plans to improve the A4019 over the approximate extents from the Fire Station to its junction with the B4633 Gloucester Road.

3.4.2. Following this development application, Amey Consulting developed a Concept Option for extending the proposed improvements of the A4019 to the west to link to the proposed M5 Junction 10 and West Cheltenham Link Road improvements. These proposed improvements included the widening and upgrade of the existing A4019 to dual carriageway standard with improvements to existing junctions. The Concept Option was included and assessed in the Homes England Bid for funding in March 2019.

3.4.3. Following submission of the Homes England Bid a review was undertaken to consider the Concept Option included with the submission and to identify potential new options.

3.4.4. The options for the cross section of the A4019, that were considered most likely to provide the required benefits and have the least impact on known constraints, are listed in the bullet points below. The required benefits are those related to facilitating the planned developments by providing additional capacity on the A4019 to cope with the additional traffic associated with them:

- Option 1 – Standard dual carriageway cross section (D2UAP);
- Option 2 – Reduced central reserve width dual carriageway cross section; and
- Option 3 – No central reserve dual carriageway cross section.

Development of the A4019 cross section

3.4.5. During the design development of the junctions along the A4019, it became necessary to include dedicated right turn lanes at the signalised junctions along the route. These would require central islands in order to accommodate the traffic signals and widening of central islands to accommodate the tapers into the right turn lanes. It became apparent that a central reserve would be necessary over the whole length of the sections between the junctions in order to provide a consistent cross section between the junctions.

3.4.6. Option 1, a standard dual carriageway with central reserve widening to accommodate right turn lanes and an active travel corridor on the northern side of the A4019 was therefore carried forward into all of the shortlisted M5 Junction scheme options (Options 2, 2A and 2B).

3.5. Options for the West Cheltenham Link Road

3.5.1. The Bid to Homes England identified the need for a new road to connect the proposed West Cheltenham development site to the M5 Junction 10. The West Cheltenham Link Route Assessment Report contains an operational and environmental assessment of route options and identifies and recommends the most appropriate route.

3.5.2. A key consideration for the Link Road was that it would provide as direct a route as practical while avoiding key environmental, social and economic impacts, notably flooding, loss of property, noise and environmental constraints.

3.5.3. The assessment was carried out in two stages – a route corridor assessment and an assessment of route options within the corridor taken forward.

3.5.4. The Route Corridor Assessment identified and assessed four distinct route corridors (shown in Figure 3-3). The assessment of the route corridors was carried out using the following main assessment categories:

- Impact on floodplain;
- Directness of route from M5 Junction 10;
- Impact on properties; and
- Impact on environment (in addition to the floodplain and properties).

Sifting of the West Cheltenham Link Road options – Route corridor

3.5.5. Corridor 1 had the greatest impact on floodplain and Corridor 4 was the least direct. These two corridors were therefore discounted from further consideration.

3.5.6. Overall, it was found that Corridor 3 was the most direct, had least impact on properties, second least impact on floodplain and generally the scale of environmental impacts was less than the other corridors. Corridor 2 was the second-best performing corridor and contains existing highway infrastructure in the form of Withybridge Lane. Corridors 2 and 3 were taken forward for further consideration.

Route Corridor 2

3.5.7. Corridor 2 was identified as the second-best performing corridor as part of the initial route corridor assessment. This corridor contains existing highway infrastructure in the form of

Withybridge Lane. The suitability of the existing Withybridge Lane route as an alternative to constructing a new link road was investigated.

3.5.8. Two options were investigated for upgrading the existing Withybridge Lane to provide enhanced highway standards including segregated facilities for pedestrians and cyclists and improved resilience to flooding.

3.5.9. Corridor 2 Option 1 - developed as a 'do minimum' option to address the highway layout and cross section deficiencies within the current layout. This option was developed following existing road levels as much as possible in order to minimise land, property and environmental impacts. However, the flooding assessment has shown that the road, retained at existing levels, is likely to suffer from flooding during the 1% annual exceedance probability event (1 in 100-year return period). As a primary access route into new development sites this amount of flooding would not be appropriate and measures would be required to protect the road, reduce the risk for users, and better afford safe access and egress to the land served by the road. The environmental assessment of this option also concluded that there would be significant loss of hedgerows on at least one side of the lane and potential direct impacts on the Grade II listed buildings at Millhouse Farm.

3.5.10. Corridor 2 Option 2 - developed to address concerns raised from the flooding assessment and improve the route's resilience to flooding. However, the elevation of the route would introduce greater environmental impacts than Option 1 for this route corridor, including greater loss of existing floodplain, hedgerows and trees and the likelihood of more severe direct impacts on the Grade II listed buildings at Millhouse Farm. It was also considered that because of level differences in the existing carriageway, then a new full pavement would need to be constructed, and the re-use of the existing carriageway would not be possible.

3.5.11. The options considered for Corridor 2, utilising the existing Withybridge Lane layout concluded that this is unlikely to be suitable to cater for future traffic and walking, cycling and horse-riding demand after the Scheme and surrounding developments are in place due to the existing alignment and cross sectional restrictions.

Route Corridor 3

3.5.12. Corridor 3 was taken forward into all of the shortlisted M5 Junction 10 scheme options (Options 2, 2A and 2B). as it was the most direct, has least impact on properties, second least impact on floodplain and generally the scale of environmental impacts would be less than the other corridors. The selection of Option 3 also allows the Withybridge Lane to remain open during construction to minimise impacts on existing users.

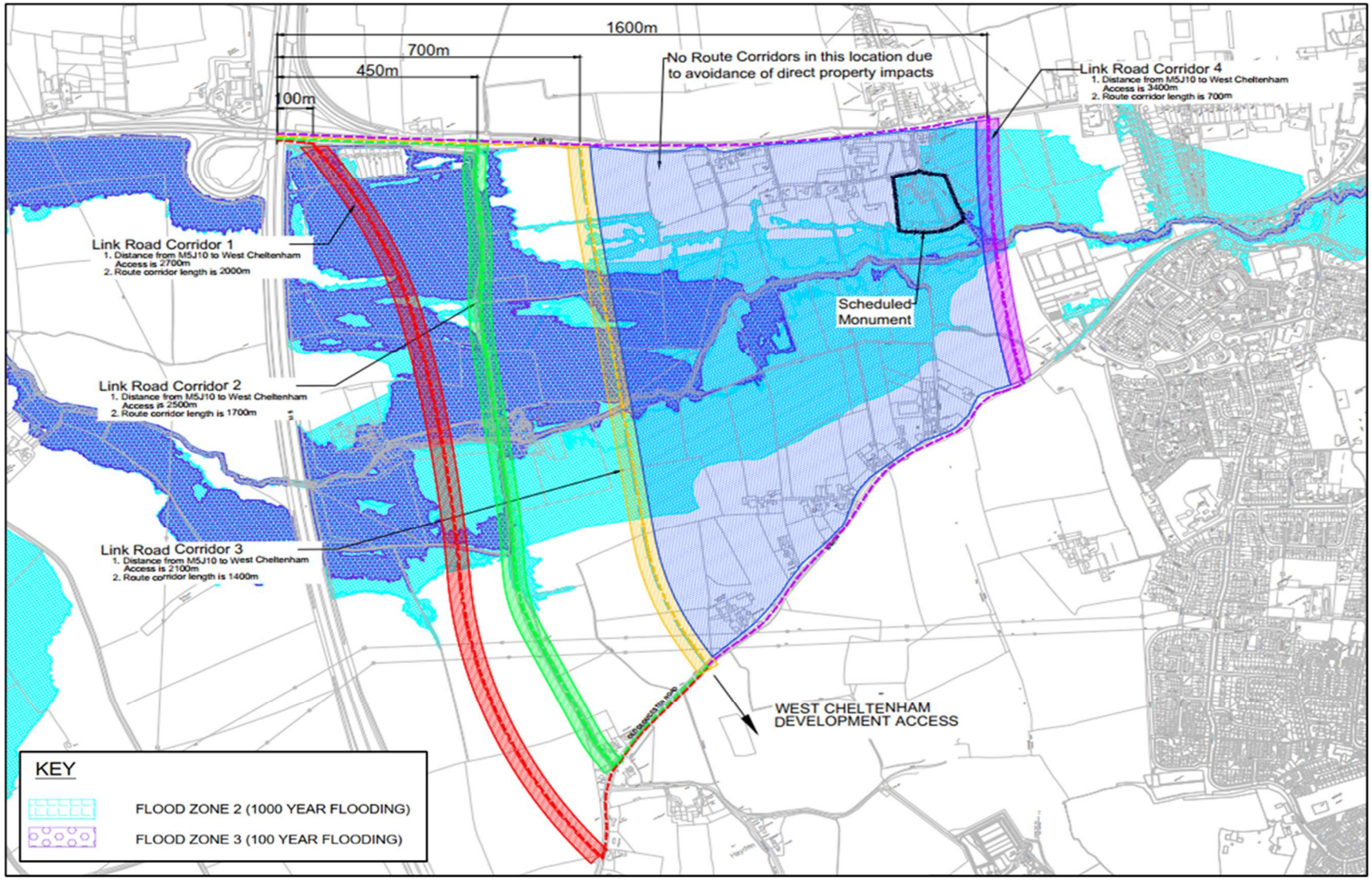


Figure 3-3 - West Cheltenham Link Road Route Corridors

3.6. Non-statutory consultation

3.6.1. In autumn 2020, GCC held a six-week non-statutory options consultation between the 14th October and the 25th November to hear views and opinions on the M5 Junction 10 Improvements Scheme. Three options were presented for M5 Junction 10 (Option 2, Option 2A and Option 2B) along with a new link road to west Cheltenham.

3.6.2. The aim of the consultation was to identify a preferred option for the new Junction 10 design and a new link road to west Cheltenham and to ensure that the proposed improvements along the A4019 work for the local community and those who use the road network.

3.6.3. The consultation used a range of methods and approaches including letters to interested parties, leaflets, posters, press releases to newspapers and social media. A dedicated consultation website was developed where members of the public and stakeholders could view consultation documents and submit feedback online using a consultation survey.

3.6.4. Due to the COVID-19 pandemic and social distancing rules that were in place at the time of the consultation, no public or face-to-face events were held.

3.6.5. Over 400 people and organisations responded to the consultation. A total of 440 survey responses were received during the consultation period (425 online and 15 hardcopies), supplemented by 36 written responses.

3.6.6. Key findings from the consultation showed:

- More than 80% of consultation survey respondents agreed or strongly agreed there was a need for the M5 Junction 10 Improvements Scheme.
- 37% supported Option 2 over Option 2A (28%) and Option 2B (6%). This option involves upgrading the existing junction with a grade separated roundabout centred on the existing junction, rather than offsetting the new junction to the north (Option 2A) or to the south (Option 2B).
- Respondents also told us their views on specific elements of the design including the alignment and width of the proposed west Cheltenham Link road, pedestrian, cycling and horse-riding facilities.
- A number of comments were also received on environmental issues including ecology, pollution, noise and light impacts as well as the impact of exhaust emissions on climate change and carbon emissions.

3.6.7. The findings from the consultation have helped to contribute to the scheme's Preferred Route Announcement (PRA) and will continue to shape the preliminary design for the Scheme.

3.6.8. Further information from this consultation is available in the Public Consultation Report (available at www.gloucestershire.gov.uk/J10).

3.7. Preferred route option for the M5 Junction 10 Improvements Scheme

3.7.1. Of the three options shortlisted from the sifting exercise (Section 3.3), Option 2 was the option that GCC recommended should be taken forward to an application for statutory powers to construct for the M5 Junction 10 Improvements Scheme. The details of this option are those set out above in the description of the Scheme elements (Section 2.5) and Figure 2-4. Options 2A and 2B (described in Section 3.3) were not taken forward for further consideration.

3.7.2. The Option 2 comprises the changes to M5 Junction 10, the widening of the A4019 and the West Cheltenham Link Road. These are:

- For M5 Junction 10 – upgrading the existing junction with a gyratory roundabout centered around the existing bridge. The existing bridge will be demolished.
- For the A4019 – a standard dual carriageway with an active travel corridor on the

northern side of the A4019.

- For the West Cheltenham Link Road – a new road along route corridor 3.

3.8. Development of the preferred route option for the M5 Junction 10 Improvements Scheme

3.8.1. Further assessment and design development work has been carried out since the non-statutory public consultation was held in Autumn 2020. This has taken into account feedback received during that public consultation and the results of ongoing survey and assessment work.

3.8.2. This work has considered:

- Review of the alignment and cross section of the West Cheltenham Link Road;
- A4019 widening at Uckington;
- Extending the improvement works on the A4019 eastwards as far as Gallagher Retail Park (junction of the A4019 and B4634); and
- Repurposing Withybridge Lane.

3.8.3. Table 3-1 (presented at the end of this chapter) provides a summary of the design options that have been selected for the Scheme, and therefore taken forwards for assessment in this PEIR.

West Cheltenham Link Road

3.8.4. The DF1 design of the Link Road was for a two-lane dual carriageway for its full extent. Updated traffic modelling identified that the estimated peak traffic flows in both directions would be within the capacity of a single lane, and therefore a single carriageway layout would provide sufficient capacity for the forecast flows.

3.8.5. Five route options were identified and assessed for the proposed Link Road within Route Corridor 3, as shown in Figure 3-4 below. The assessment of the five route options identified little differentiation between the routes for many of the assessment categories. The largest differentiator was the need for an engineered river channel in the vicinity of the River Chelt bridge for Options 2, 4 and 5, due to the bend in the river at this location. This would likely give rise to additional impacts.

3.8.6. Based on the above issues it was considered that Options 2, 4 and 5 should be sifted out from selection.

3.8.7. For Options 1 and 3, Option 3 was considered to have a slightly more efficient use of land and was therefore considered to be the best performing option within Route Corridor 3.

3.8.8. It was therefore recommended that Option 3 from Route Corridor 3 was taken forward as the preferred option for connectivity between the M5 Junction 10 and the West Cheltenham Development Site.

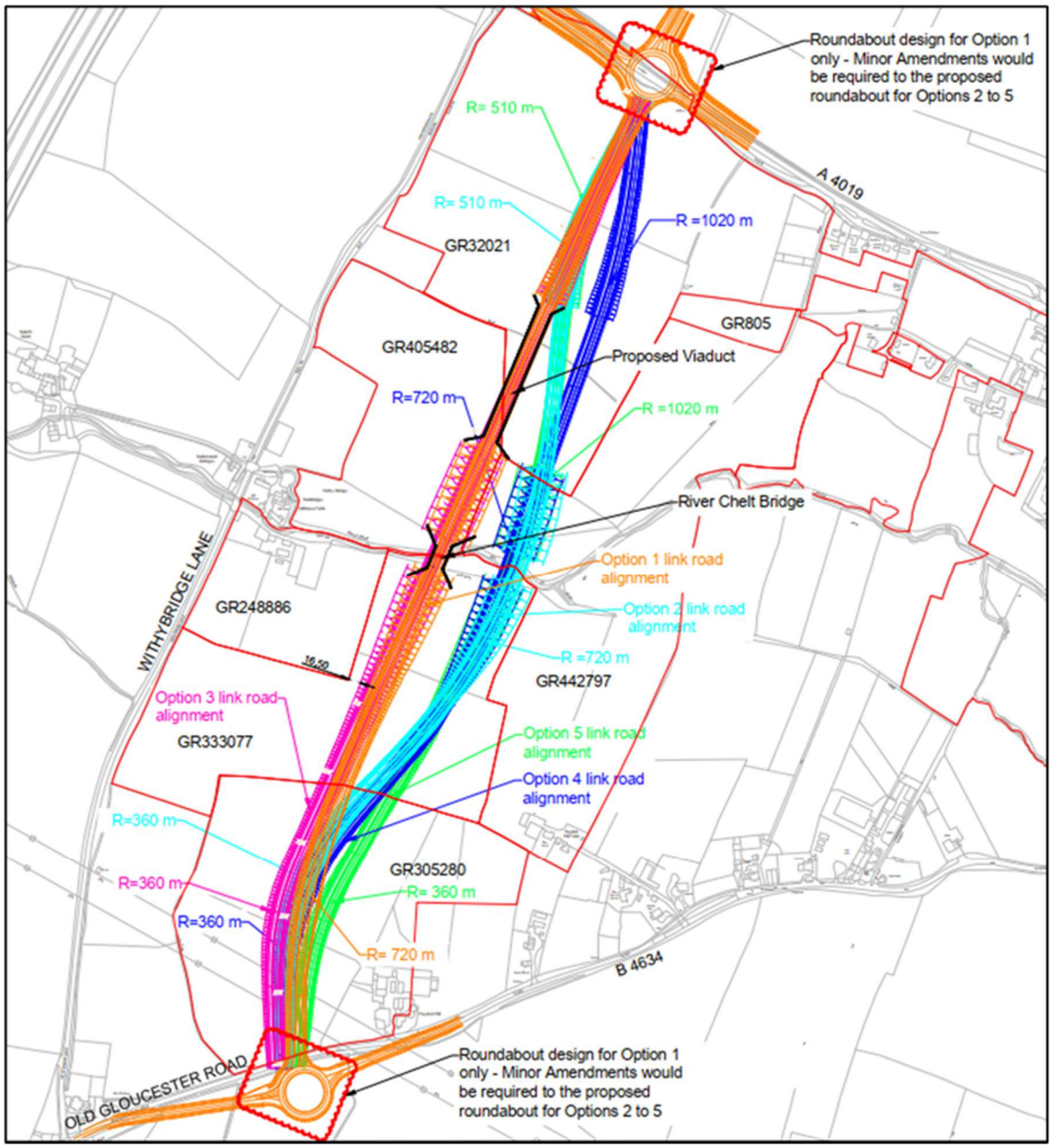


Figure 3-4 - Alignment options within Corridor 3 for the West Cheltenham Link Road (note the roundabouts shown in this figure at each end of the Link Road were replaced with signalised junctions during the development of the DF2 design)

A4019 widening at Uckington

3.8.9. Options were considered for widening the A4019 to the north or to the south through Uckington.

3.8.10. Widening to the north would impact on eleven separate plots on the northern side of the A4019 at Uckington, including the potential requirement to demolish at least two residential properties and result in the significant loss of frontages to six residential properties. Land take would be required in nine separate plots to achieve the widening to the northern side at Uckington.

3.8.11. Widening to the southern side of the A4019 would impact on six separate plots located to the south of the A4019, and would require the potential demolition of three residential properties and a farm building.

3.8.12. Widening to both the north and south sides of the A4019 would require land take within at least fifteen separate plots, affecting almost every plot bounding the A4019 at the

Uckington junction. This option would result in the loss of frontages to eleven properties and require the potential demolition of a farm building.

3.8.13. The review concluded that widening to the southern side of the A4019 at Uckington would be the preferable option, as it would impact a lesser number of plots/properties, and also allow for the introduction of pedestrian crossings on the A4019 at the junction with Moat Lane and The Green.

Eastern extent of the Scheme on the A4019

3.8.14. Under the Grant Determination Agreement (GDA) with Homes England, the remit of the Scheme covers the widening of the A4019 from Junction 10 to the junction with B4634. This includes the section adjacent to the North West Cheltenham Development site, which is also in the remit of the proposed Elms Park Development and included in their application for planning permission.

3.8.15. Due to this overlap, it was decided during early design development stage to remove the section of A4019 widening adjacent to the Elms Park Development from the Scheme on the assumption that it would be delivered using the developer's planning permission.

3.8.16. The developer's design for the A4019 widening as it stands would not meet the requirements identified by the updated M5 Junction 10 Traffic model. This is because the Gloucestershire Countywide Traffic Model (GCTM) is now being used as the base for M5 Junction 10 traffic model and it has been found to significantly increase forecasted traffic volumes when compared to the previous Central Severn Vale (CSV) base model that was used by the developer for their traffic modelling.

3.8.17. The Elms Park development was submitted for planning permission in September 2016 and has undergone a lengthy determination process. At this stage it is unclear as to when and in what format the application is likely to be approved.

3.8.18. To minimise risk and uncertainty over timing of the delivery of this section, it is now proposed that the section of A4019 linked to Elms Park to be included within the M5 Junction 10 DCO package. Based on this the eastern extent of the Scheme on the A4019 has now been reinstated to include the extents to A4019/B4634 junction at Gallagher Retail Park. This extended section will also include two new accesses to the future North West Cheltenham Development site.

Withybridge Lane – Repurposing of this road

3.8.19. There is potential for repurposing Withybridge Lane so that the movement of traffic through it is restricted.

3.8.20. This could be achieved through the closure of the road for through traffic, or the implementation of traffic calming and traffic management measures. The measures would be designed to be in keeping with the local environment. The options for Withybridge Lane are currently being reviewed, and further details, including an assessment of the potential environmental effects will be included as part of the ES.

3.9. Summary of the Scheme elements

3.9.1. Table 3-1 provides a summary of the Scheme elements which constitute the preferred option for the PEIR.

Table 3-1 - Summary of the Scheme elements which constitute the selected design as presented and assessed in the PEIR

Scheme element	Description of the element selected
M5 Junction 10	Option 2 - upgrading the existing junction with a gyratory roundabout centred around the existing A4019 bridge. The existing bridge will be demolished.
A4019	Option 1 - a standard dual carriageway with an active travel corridor on the northern side of the A4019.

Scheme element	Description of the element selected
	Widening of the existing A4019 will be to the south of the current alignment through Uckington. Improvements on the A4019 will extend eastwards to the Gallagher junction (A4019/B4634 junction).
West Cheltenham Link Road	A new road along route corridor 3. Within route corridor 3, option 3 was selected as the preferred route alignment (Figure 3-4). The road will comprise a two-way single carriageway road, with an active travel corridor along the western side. New signalised junctions will connect the Link Road into the A4019 (to the north), and the B4634 (to the south).

4. Environmental Assessment Methodology

4.1. General approach

4.1.1. EIA is a process for identifying the likely environmental effects (positive and negative) of proposed developments, and their significance, before development consent is granted.

4.1.2. The aim of an EIA is to ensure that the following are undertaken:

- A thorough assessment of likely effects of a proposed development on the environment;
- Consideration of mitigation measures and alternatives in light of potential environmental effects; and
- Assessment of the cumulative effects of the proposed development.

4.1.3. Through this process the Scheme should include measures to prevent, reduce or offset any significant, adverse environmental effects of the proposals, and enhance the positive impacts. The findings of the assessment will be presented in the ES.

4.1.4. This chapter describes the EIA process in conformance with the requirements of the Design Manual for Roads and Bridges (DMRB). For highways projects, DMRB is recognised as providing an appropriate methodology for the assessment of environmental effects. For some topics the DMRB methodology will be supplemented by separate best practice guidance where it improves the assessment of effects. Where there is no standard guidance this is stated, together with the methodology used to undertake the assessment.

4.1.5. The 2017 update to the EIA Regulations requires consideration of a number of topics that were not previously included or were considered in a different format. These are:

- Biodiversity with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC (previously flora and fauna);
- Population and human health (previously population);
- Land (not previously included);
- Vulnerability of the project to risks of major accidents and/or disasters that are relevant to the project concerned;
- Climate; and
- Heat and radiation.

4.1.6. DMRB already covers Biodiversity (LA 108), Climate (LA 114), Population and Human Health (LA 112) and Land (LA 107) in existing topics but Vulnerability, and Heat and Radiation are not currently included. Guidance from National Highways suggests that Vulnerability to risks of major accidents and/or disasters should be included in existing topic chapters. It further recommends that Heat and Radiation are scoped out as they are not relevant to highways schemes.

4.2. Environmental assessment methodology

4.2.1. The key stages of the EIA process for the Scheme are:

- Screening to determine the need for an EIA;
- Scoping;
- Defining the study area;
- Establishment of baseline conditions;
- Consideration of alternatives;

- Consultation;
- Impact assessment and identification;
- Defining assessment years;
- Development of mitigation measures;
- Prediction of residual environmental effects;
- Cumulative effects assessment (CEA);
- Transboundary impacts; and
- Environmental management.

4.2.2. These stages are discussed in more detail in the following sections.

Screening

4.2.3. Screening determines if a project requires an EIA and publication of an ES in line with the requirements of the Directive 2011/92/EU as amended by 2014/52/EU.

4.2.4. As described in Section 1.2, the Scheme is categorised as a NSIP under the Planning Act 2008, and as such requires a DCO to proceed. An EIA is required as the Scheme is Schedule 2 development under the EIA Regulations 2017 (paragraph 10(f) – construction of roads). The Environment Statement (ES) resulting from the EIA, will be submitted as part of the DCO application.

4.2.5. Therefore no further screening assessment has been undertaken for the Scheme to determine the requirement for an EIA, following the categorisation of the Scheme as a NSIP.

Scoping

4.2.6. Scoping will determine the environmental topics that should be 'scoped out' of the EIA. The appropriate level of assessment, namely whether a Simple or Detailed assessment as defined in LA 101, that should be applied to the environmental topics 'scoped in' will be set out.

4.2.7. An Environmental Scoping Report was published on the Planning Inspectorate (PINS) website in July 2021. A Scoping Opinion was received from PINS in August 2021 based on feedback from statutory consultation bodies. A response from GCC to the Scoping Opinion comments from PINS included in Appendix 1.1 to this PEIR.

4.2.8. Detailed feedback from the statutory consultation bodies included in the Scoping Opinion from PINS are being considered as part of this Preliminary Design Stage and will be addressed in the Environmental Statement (ES) and where possible in this PEIR.

Defining the study area

4.2.9. Study areas are defined individually for each environmental topic, according to the geographic scope of the potential impacts relevant to that topic or of the information required to assess those impacts. It will also draw on guidance in DMRB where this specifies the extent of study areas. The study areas are defined within each relevant topic chapter of this report.

Establishment of baseline conditions

4.2.10. The existing baseline conditions are defined to allow the assessment of changes that would be caused by the Scheme. The identification of the baseline requires the description of the existing situation and then a prediction of how it is likely to change in the absence of the Scheme.

4.2.11. The description of the baseline conditions should clearly identify receptors that may be affected by the Scheme and also their 'value' or 'sensitivity' to potential change.

Consideration of alternatives

4.2.12. The ES will include consideration of alternatives, summarising the reasoning behind the Scheme selection, as well as options considered in the design development, as required

by the EIA Regulations. This will outline details of why the proposed design has been brought forward to the outline design stage, why alternatives have been rejected.

Consultation

4.2.13. Details on the consultation undertaken to date and planned future consultation as part of the DCO process can be found in the SoCC document, produced separately from this PEIR.

4.2.14. Consultation will be undertaken with both statutory and non-statutory bodies, together with public consultation prior to submission of the DCO Application. Consultation will take place at the Scoping stage and will continue throughout the EIA process to inform the design, agree assessment methodology, and proposed mitigation options. A Consultation Report will be submitted with the DCO application that sets out full details of the consultation carried out for the Scheme, the feedback received and how this has been taken into account.

Identification of potential effects

4.2.15. Schedule 4 of the EIA Regulations 2017 requires: *A description of the likely significant effects of the development on the environment resulting from, inter alia*:

- the construction and existence of the development, including, where relevant, demolition works;
- the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources;
- the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste;
- the risks to human health, cultural heritage, or the environment (for example due to accidents or disasters);
- the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources;
- the impact of the project on climate (for example the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change; and
- the technologies and the substances used.

4.2.16. The description of the likely significant effects should cover the direct effects and any indirect, secondary, cumulative, transboundary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects of the development.'

4.2.17. A range of environmental topics may be affected by the Scheme. Effects may be negative or positive, temporary or permanent. They may also be described as:

- Direct or Primary Effect: caused by activities which are an integral part of the proposals resulting in a change in environmental conditions, such as construction works causing an increase in dust concentrations in the air;
- Indirect or Secondary Effects: due to activities that affect environmental conditions or the receptors, which in turn affects other aspects of the environment or receptors;
- Cumulative: comprising multiple effects from different sources within the proposals (Intra), or cumulatively with other developments (Inter), on the same receptors; and
- Residual: effects that remain after the positive influence of mitigation measures are taken into account.

4.2.18. Each of these effects can persist over a period of time and can be considered as:

- Short term: effects that would last for a limited duration, for example, noise generated during construction of the Scheme; and
- Long term: permanent effects from the operational activities on the Scheme.

Assessment of Significance

4.2.19. The significance of an environmental effect is typically a function of the 'value' or 'sensitivity' of the receptor and the 'magnitude' or 'scale' of the impact. Combining the environmental value of the resource or receptor with the magnitude of change produces a significance of effect category. In arriving at the significance of effect, the assessor also considers whether the effect is direct, indirect, secondary, cumulative, short, medium or long-term, permanent or temporary, positive or negative.

4.2.20. The proposed general approach will be adopted in accordance with relevant guidance and best practice. Methods and requirements specific to each assessment topic are set out in the relevant topic chapters (Chapters 5 to 14).

4.2.21. With the receptors identified and their sensitivity classified, the potential impacts of the works to these aspects, for construction and operation where appropriate, will be determined and the magnitude of the impact determined.

4.2.22. In accordance with guidance in DMRB LA 104, for each topic the assessment will combine the magnitude of the impacts and the sensitivity of the resources/receptors that could be affected in order to classify the effect (see Table 4-1) and to establish their significance (from very large to neutral). In general terms it is generally accepted that effects which are moderate or higher are deemed significant in assessments. General descriptors for the significance of effect are provided in Table 4-2.

Table 4-1 - Significance Matrix

Sensitivity of receptor	Magnitude of impact				
	Major	Moderate	Minor	Negligible	No change
Very high	Very large	Large or very large	Moderate or large	Slight	Neutral
High	Large or very large	Moderate or large	Slight or moderate	Slight	Neutral
Medium	Moderate or large	Moderate	Slight	Neutral or slight	Neutral
Low	Slight or moderate	Slight	Neutral or slight	Neutral or slight	Neutral
Negligible	Slight	Neutral or slight	Neutral or slight	Neutral	Neutral

Table Source: DMRB LA 104 Environmental assessment and monitoring Table 3.8.1

Table 4-2 - Significance categories and typical descriptions

Value	Typical descriptors
Very Large	Effects at this level are material in the decision-making process.
Large	Effects at this level are likely to be material in the decision-making process.
Moderate	Effects at this level can be considered to be material decision-making factors.
Slight	Effects at this level are not material in the decision-making process.
Negligible	No effects or those that are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

Table Source: DMRB LA 104 Environmental assessment and monitoring Table 3.7

Defining assessment years

Scheme phases

4.2.23. The EIA will include consideration of effects arising from the construction and operation of the Scheme. Decommissioning is not relevant for the Scheme as noted above (Chapter 2.4), although demolition of existing structures as part of the construction of the Scheme (for example the existing A4019 overbridge) will be considered as part of the ES.

Do-minimum and Do-something scenarios

4.2.24. The assessment of effects involves comparing a scenario with the Scheme against one without the Scheme over time. The absence and presence of the Scheme are referred to as the 'Do-Minimum' and 'Do-Something' scenarios respectively. Dependent upon the topic, the scenarios will be assessed in the baseline year and a future assessment year or a series of future assessment years (15 years after opening, or the worst year in the first 15 years of operation)[1].

Do-something scenarios

4.2.25. As described in Section 1.1, the main purpose of the Scheme is to provide the key infrastructure requirements to enable the housing and economic development set out in the JCS. As this development (c. 9,000 homes and c. 100ha of employment land) will not be operational in the opening year (2025) for the Scheme, then two Do-something scenarios have been assessed in the future year, addressing the impacts to air quality and noise and vibration from traffic arising from the Scheme with and without the development that the Scheme is intended to enable (termed the Scheme dependent development).

Dealing with uncertainty

4.2.26. EIA is an iterative process. At the time that the EIA is submitted, it is proposed that no aspects of design would vary so much as to represent effectively different schemes. The EIA would ensure it addresses the potential for a range of impacts resulting from any undecided parameters.

4.2.27. The 'Rochdale Envelope' approach is employed where the nature of the Proposed Development means that some details of the whole project have not been confirmed (for instance the precise dimensions of structures) when the application is submitted, and flexibility is sought to address uncertainty. Advice Note Nine recommends that the assessment should be based on a cautious 'worst case' approach, such that any effects would not be worse than the stated level of significance in the ES.

4.2.28. The ES will explain clearly any elements of the Scheme yet to be finalised, with justification. Where flexibility is sought in the Scheme design, the maximum potential adverse impacts of the Scheme will be assessed. The ES will confirm maximum and other dimensions of the Scheme, and that any changes to the development within such parameters would not result in significant impacts not previously identified and assessed.

Development of mitigation measures

4.2.29. Environmental assessment and design shall incorporate mitigation measures using a hierarchical system as follows, defined in DMRB LA 104:

- avoidance and prevention: design and mitigation measures to prevent the effect (e.g. alternative design options or avoidance of environmentally sensitive sites);
- reduction: where avoidance is not possible, then mitigation is used to lessen the magnitude or significance of effects; and
- remediation: where it is not possible to avoid or reduce a significant adverse effect, these are measures to offset the effect.

[1] DMRB LA111

4.2.30. The environmental assessment and design will incorporate embedded mitigation and essential mitigation. DMRB LA 104 defines embedded mitigation as '*project design principles adopted to avoid or prevent adverse environmental effects*' and essential mitigation as '*measures required to reduce and if possible offset likely significant adverse environmental effects, in support of the reported significance of effects in the environmental assessment.*'

4.2.31. Embedded mitigation will be reported in the project description. Essential mitigation will include Best Practicable Measures, construction environmental management procedures identified in the outline Construction Environmental Management Plan (CEMP) and will also describe design features that have been adapted to reduce or prevent impacts, such as noise attenuation measures. Essential mitigation is included within the assessment. Enhancement measures, measures over and above normal mitigation, will also be included within the assessment.

4.2.32. During the Option Selection Stage the need for eliminating or mitigating any adverse environmental impacts has been considered as an integral factor in option selection and route development. No specific mitigation measures were identified at this stage as they would be developed during this Preliminary Design Stage. Where possible, consideration will be given to reducing or avoiding adverse environmental impacts and these will be developed during the Scheme development as an iterative process. Where mitigation measures are required, these will be informed by survey data being collected for the purposes of the Preliminary Design Stage and developed in consultation with statutory bodies. The Scheme will include all mitigation considered necessary to reduce effects to an acceptable level and the assessment will report on this basis.

4.2.33. During construction, the responsibility for further environmental mitigation and the adherence to environmentally responsible working practices will fall to the contractor. An outline CEMP will be prepared by the designer (Atkins) in advance of the completion of the DF3 design, and refined as the Scheme progresses to construction and handover. The outline CEMP will detail practices that the contractor is to apply on site that will demonstrate commitments to environmental management. It will detail both generic and specifically targeted practices to enable construction to be undertaken with minimal impact on the environment and will also enable monitoring requirements to be set up.

Prediction of residual environmental effects

4.2.34. The residual effect will be assessed using the same system as described above to include the mitigation proposed. The residual effect as classified will be considered for its significance. Generally, effects considered to be moderate, large or very large are deemed significant; and those slight or negligible are deemed to be not significant, based on the described classification (Table 4-2) and professional judgement.

Cumulative effects assessment

4.2.35. Paragraph 5 of Schedule 4 of the EIA Regulations 2017 requires an ES to include the assessment of cumulative effects. Part (e) references the requirement to consider the cumulation of effects with other existing and/or approved projects. Therefore, the environmental effects of the Scheme will also be assessed in combination with the effects of other projects as part of the EIA process, where relevant information is available.

4.2.36. What projects that should be considered as part of a 'cumulative' assessment for these purposes is not defined in the EIA Directive or EIA Regulations 2017 and there is no standard approach to the assessment of cumulative effects, with different projects adopting different approaches. However, potential cumulative impacts with other major developments need to be identified, as required by the Directive. To aid in this, the PINS Advice Note 17 suggests the categories of developments that should be included in such cumulative assessments.

4.2.37. For the purposes of this project, the CEA will explore the way in which the predicted effects of the Scheme on receptors/resources may alter when they are considered in their totality (i.e. across all topic assessments), as well as in the context of Reasonably Foreseeable Future Projects (RFFPs) that could potentially interact with the Scheme. For the purposes

of this project, these two strands of CEA are referred to as intra-Scheme assessment and inter-project assessment, respectively.

4.2.38. The CEA will make use of two future baselines for the Scheme to be considered against, making informed assumptions to categorise the likely progression of RFFPs for the purposes of consistent assessment:

- Opening year future baseline (2025): RFFPs may be categorised as 'undeveloped'; 'under construction' in the same timeframe as the opening of the Scheme; or form new 'receptors/resources' that would be in place and operational in the same timeframe as the opening of the Scheme.
- Operational future baseline (2039): RFFPs may be anticipated to be 'under construction' in the same timeframe as the future baseline; or form new 'receptors/resources' that would be in place and operational.

4.2.39. The consideration of the cumulative impacts is drawn together on the basis of receptors and/or biophysical features deemed likely to experience effects as a consequence of cumulative impacts, whether intra-Scheme or inter-project or, potentially, both. The sensitivity of a receptor or biophysical feature to cumulative impacts and the magnitude of incremental impacts (combining to become cumulative impacts) themselves will determine the significance of the cumulative effect or effects.

4.2.40. This section provides a basic introduction to the way CEA will be approached and reported within the ES for the Scheme. The full proposed methodology is provided in Chapter 15.

Intra-Scheme assessment

4.2.41. Intra-Scheme impacts are defined as those arising within this Scheme and affecting specific receptors and/or biophysical resources. This requires consideration of the potential for in-combination impacts to emerge within the same specialist topic, as well as reviewing the interaction between impacts identified by each of the specialist topics undertaking assessment of the Scheme.

4.2.42. It is anticipated that within the ES, topic chapters will report on individual receptors/resources predicted to experience multiple topic-specific effects and comment on their likely significance (i.e. intra-Scheme cumulative effects within a specialist topic). A separate CEA summary section would then be produced to report on intra-Scheme cumulative effects that have been identified for receptors/resources predicted to experience significant effects either within a specialist topic, and/or in relation to more than one specialist topic (referred to as 'cross-topic').

Inter-Project assessment

4.2.43. Inter-project impacts are those arising between the Scheme and other developments expected to come forward within similar timeframes. This requires consideration of the impacts of the Scheme in the context of the RFFP list that will be defined for the Scheme. The methodology in Chapter 15 provides further information about the production of the RFFP list.

4.2.44. Within the ES, it is anticipated that individual topic chapters will identify which of the RFFPs are considered relevant to the assessment. Where inter-project cumulative effects are predicted in relation to a specialist topic, these are to be reported within the topic chapters, providing an indication of potential significance. A separate CEA summary section will be produced, if necessary, to address inter-project effects that have been identified for receptors/resources predicted to experience significant effects from the Scheme and at least one RFFP, either within a specialist topic, and/or in relation to more than one specialist topic (referred to as 'cross-topic').

Types of cumulative impacts

4.2.45. The CEA for the Scheme will consider effects arising from additive impacts that could be caused by other past, present or reasonably foreseeable actions interacting with the Scheme; and effects arising from in-combination impacts that arise from the interaction between impacts of a Scheme on different aspects of the environment.

Cumulative impacts – additive

4.2.46. This is where the same impact is multiplied on the basis that it arises from more than one source. This is illustrated below (Figure 4-1):

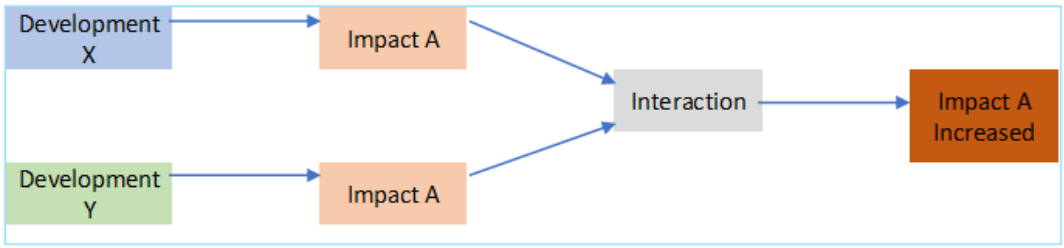


Figure 4-1 - Additive cumulative effects

4.2.47. This additive type of cumulative impact is most likely to arise in an assessment of inter-project effects. It has the potential to raise the level of impact above assessment or regulatory thresholds, even though each development has been designed not to.

4.2.48. Example - Construction noise (impact A) of the Scheme ('development X') and the construction noise associated with an adjacent RFFP ('development' Y) combines to increase the noise impact (impact A) on a group of residential properties.

Cumulative impacts – in-combination

4.2.49. This is where two different impacts interact to create a third impact. These two impacts may arise within the same specialist topic area; or arise within two or more different specialist topic areas. The issue is that the third impact is more than or different from just the first two impacts occurring together. This is illustrated below:

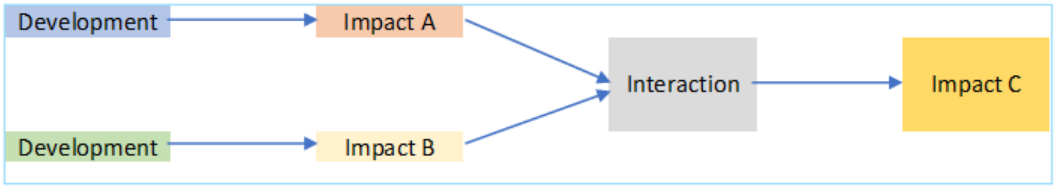


Figure 4-2 - In-combination cumulative effects

4.2.50. This type of in-combination impact could arise in consideration of both inter-project and intra-Scheme CEA. It is usually (but not always) the case that reporting of effects arising from in-combination impacts is easiest to understand when it is organised by receptor and/or biophysical feature, rather than within environmental topic chapters.

4.2.51. Example - Construction noise (impact A) and construction dust emissions (impact B) associated with the Scheme, combine to create an amenity impact (impact C) on a group of residential properties.

Transboundary impacts

4.2.52. Regulation 32 of the EIA Regulations 2017 requires PINS to notify European Economic Area (EEA) States and publicise an application for development consent if it is of the view that the proposed development is likely to have significant effects on the environment of an EEA Member State, and where relevant to consult with the EEA State affected. The Scheme is approximately 250km from France, the closest EEA State.

4.2.53. The study areas for the various environmental topics define the extent of effects anticipated and are described fully in Chapter 5 to 14 and are summarised below as follows:

- Air Quality: within 200m of the works;
- Noise and Vibration: 600m from the carriageway of the works;

- Biodiversity: 2km for statutory and non-statutory designated sites and 30 km for SACs;
- Road Drainage and the Water Environment: 1km around the works;
- Landscape and visual: within the zone of visual influence of the works, i.e. areas where the Scheme can be seen from;
- Geology and Soils: 500m from the extent of the works;
- Cultural Heritage: 500m from the works or within the area considered to be the setting of the asset;
- Materials and Waste: waste arisings within the county of Gloucestershire; and
- People and Communities: 500m from the works.

4.2.54. The study areas will cover the area where direct effects of the Scheme will be experienced as well as the area where effects on the setting of an asset might be felt, for example the setting of a listed building where the surroundings contribute to its historic value.

4.2.55. For some topics the effects of the Scheme would extend beyond the immediate area of the works. For example, the noise and air quality effects would be experienced in the surrounding area where there would be changes in traffic flows as a result of the Scheme. The method for establishing the extent of study areas in this situation is set out in the topic chapters below.

4.2.56. As none of these distances reach EEA Member States, no transboundary effects are anticipated for the Scheme.

Habitat Regulations Screening

4.2.57. The nearest European designated site to the Scheme is Walmore Common SPA located approximately 17.5km south west of the Scheme. Further details regarding this site and its qualifying interests are provided in Chapter 7 Biodiversity.

4.2.58. In accordance with the requirements of PINS Advice Note 10: Habitats Regulations Assessment (HRA) relevant to NSIPs, screening for likely significant effects will be undertaken (alone or in-combination with other projects).

4.2.59. Based on current information and the Options Selection Stage HRA Screening Matrix it is considered not likely that the Scheme could give rise to impacts on any European Sites, either for the Scheme alone, or in combination with other plans or projects.

4.2.60. Further work during the assessment stage will be undertaken to determine the effects of the Scheme including continuing surveys of bird populations, recording of existing noise levels, prediction of noise levels, assessment of likely disturbance and mitigation measures.

Health Impact Assessment and Equalities Impact Assessment

4.2.61. The assessment of the effect of the Scheme on Population and Human Health is a requirement under the EIA Regulations 2017. Guidance from National Highways indicates that this assessment is informed by the assessments in existing topics such as Air Quality and Noise. An Health Impact Assessment will be produced and reported separately to the EIA. Similarly, an Equalities Impact Assessment (EqIA) which reports the effect of the Scheme on different social groups will also be produced and reported separately.

Major accidents and disasters

4.2.62. In line with the requirements for major accidents and disasters outlined in the EIA Regulations 2017, the ES will consider:

- Vulnerability of the Scheme to risks of major accidents and/or disasters; and
- Any consequential changes in the predicted effects of that Scheme on environmental topics.

4.2.63. In considering these elements of vulnerability, the ES will:

- Apply professional judgement in consultation with GCC and National Highways to

develop Scheme specific definitions of major events. It should be noted that there is no definition of 'major' in this context;

- Identify any 'major' events that are relevant to and can affect the Scheme. Major events shall include both man-made and naturally occurring events. Not all events warrant assessment and evidence should be provided to support the view that they should be classified as major events;
- Where Major events are identified, describe the potential for any change in the assessed significance of the Scheme on relevant environmental topics in qualitative terms. Report the conclusions of this assessment within the individual environmental topics; and
- Clearly describe any assumed mitigation measures, to provide an evidence base to support the conclusions and demonstrate that likely effects have been mitigated/managed to an acceptable level.

4.2.64. Major events will be reported within the relevant environmental topic chapters.

Environmental management

4.2.65. An outline CEMP will be prepared by the designer (Atkins) in association with GCC's contractor delivery partner during this DF3 stage and refined as the Scheme progresses from development to construction and handover. The outline CEMP will detail practices that the contractor is to apply on site that will demonstrate commitments to environmental management. It will detail both generic and specifically targeted practices to enable construction to be undertaken with minimal impact on the environment and will also enable monitoring requirements to be set up. Proposals for monitoring will be developed as part of the topic impact assessments in the ES.

The discipline specific chapters of this PEIR have been produced as separate documents.

5. Air Quality

6. Noise and Vibration

7. Biodiversity

8. Road Drainage and the Water Environment

9. Landscape and Visual

10. Geology and Soils

11. Cultural Heritage

12. Materials and Waste

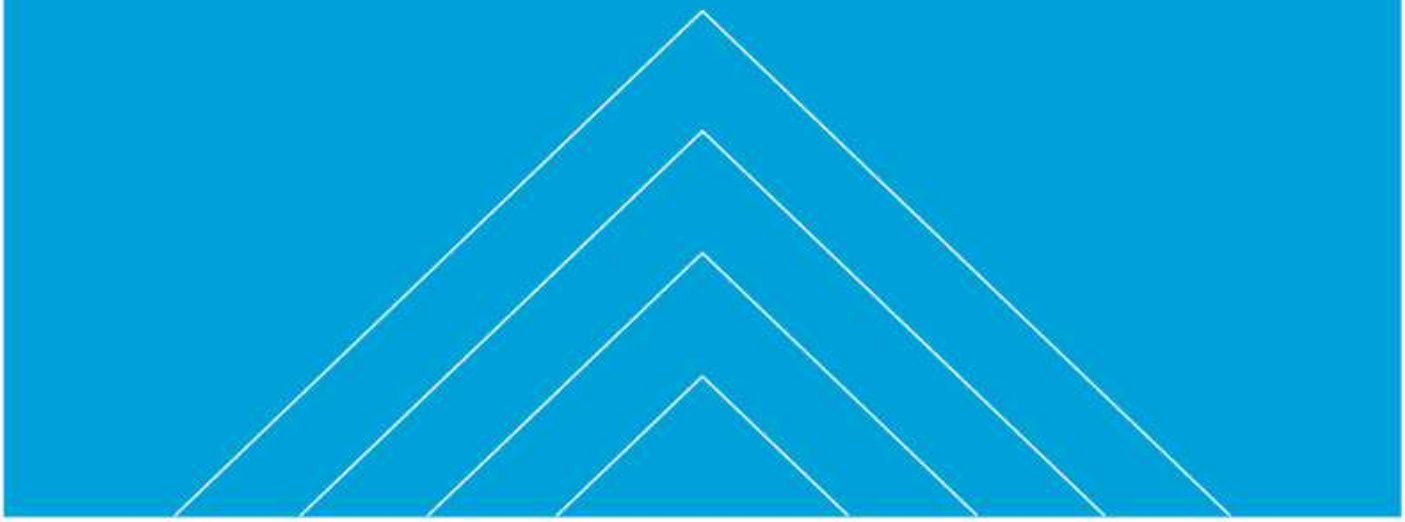
13. Population and Human Health

14. Climate

15. Cumulative Effects Assessment

Appendices to Chapters 1-4

- Appendix 1.1
- Appendix 2.1
- Appendix 2.2



Appendix 1.1

A response from GCC to the Scoping Opinion comments received from PINS.

Table A1-1 - Summary of the responses from GCC to the comments made by PINS in the scoping opinion received August 2021

Comment	GCC Response
Description of the proposed development	
The ES should include the following: • a description of the Proposed Development comprising at least the information on the site, design, size, and other relevant features of the development; and • a description of the location of the development and description of the physical characteristics of the whole development, including any requisite demolition works and the land-use requirements during construction and operation phases. The description of the Proposed Development in the Scoping Report does not provide the size of the proposed development, either in terms of the overall length, width of carriageways and other components, or the vertical alignments of cuttings or embankments. The likely dimensions, including height, of the proposed West Cheltenham Link Road viaduct crossing of the River Chelt are not described. The ES should describe the scale of the Proposed Development, in particular including all details which have been used to inform the assessment of environmental effects. The description in the Scoping Report does not include any detailed information on proposed fencing, noise attenuation barriers, drainage features, lighting, gantries, or signage. Again, the ES should contain the relevant information necessary to establish the basis of the assessment of likely significant effects.	The information to address these points will be included in the ES. Some of this information is provided in the PEIR (Chapter 2). The more detailed information requested will be provided as part of the ES.
Figure 1-1 shows the proposed operational layout. While this figure includes a scale, it has been produced at a low resolution with a limited level of detail and is not annotated with any of the information highlighted above. The Inspectorate advises that the ES is accompanied by	Note that it is Figure 2-1 that presents the overall operational layout in the PEIR. This has been increased to A3 size to improve readability. Additional figures have been included in Appendix 2.1 showing the Scheme in more detail.

Comment	GCC Response
sufficiently detailed plans at an appropriate scale showing the design parameters on which the assessment of likely significant effects has been based.	
Chapter 2 of the Scoping Report explains that the existing exit slip roads at M5 Junction 10 will be removed and the existing overbridge will be demolished under the Proposed Development. The ES should include a description of these works and any other demolition requirements and assess any significant effects where these could occur.	The information to address these points will be included in the ES.
The Scoping Report describes the intention to include cycling and pedestrian routes within the new M5 Junction 10 arrangement, adjacent to the A4019 as part of the widening works, and as segregated routes along the proposed West Cheltenham Link Road. The layout of these features is not visible on Figure 1-1. The integration of the new infrastructure with existing features is also briefly described, for example the inclusion of access to properties along the A4019 within Uckington. The Inspectorate would expect the ES to include a description of these features, supported by sufficiently detailed plans at an appropriate scale, and an assessment of any likely significant effects.	These details are shown on the more detailed figures provided in Appendix 2.1.
Paragraphs 2.4.2 and 3.3.48 to 3.3.49 of the Scoping Report discuss the option to designate Withybridge Lane as a quiet lane to enhance the equestrian, cycling, and walking facilities within the area as part of the Scheme, and provide an outline of the traffic management measures required to achieve this. Should this element be taken forward as part of the Proposed Development, it should be fully described in the ES along with an assessment of the associated likely significant environmental effects.	The information to address these points will be included in the ES.
Paragraph 2.4.17 of the Scoping Report discusses the intended restoration of land taken temporarily by the Proposed Development, and the areas affected are shown on Figure 2-5. The ES should provide as much detail as possible on the nature of the restoration works and proposed management operations (including timescales), and a description and assessment of the associated likely significant effects.	The information to address these points will be included in the ES.

Comment	GCC Response
It is appreciated that at this stage details of the construction period are not known, although it is noted that potential construction compound locations are included within the temporary land-take identified in Figure 2-5. The ES must clearly set out the assumptions made in the environmental assessments with respect to construction phasing, working hours, relevant working methodologies, and overall timescales for the construction period. Where known, the nature and quantity of materials used (including soil) should be described and an assessment provided of the associated likely significant effects.	The information to address these points will be included in the ES. Current information on quantities of bulk materials is provided as part of Chapter 12 of the PEIR (Materials and Waste chapter).
It is noted that the Proposed Development is not intended to be decommissioned, however, the Inspectorate would expect the ES to provide an assessment of any likely significant effects of the removal of any elements of the Proposed Development during construction and operation, as part of the relevant environmental aspect assessments carried out e.g., the materials and waste assessment.	This will be addressed as part of Chapter 12 of the ES (Materials and Waste chapter), with regards to the demolition of existing structures within the Scheme, for example the existing A4019 overbridge.
Alternatives	
The EIA Regulations require that the Applicant provide 'A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects'. The Inspectorate notes the information provided in Chapter 3 of the Scoping Report and Paragraph 4.3.7 stating the Applicant's intention to consider alternatives within the ES. The Inspectorate would expect to see a discrete section in the ES that provides details of the reasonable alternatives studied and the reasoning for the selection of the chosen option(s), including a comparison of the environmental effects.	Information on alternatives, and an assessment of their respective environmental effects is included in Chapter 3 of the PEIR.
Flexibility	
A number of the chapters within the Scoping Report refer to 'scheme options' (Chapters 5, 7, 9, 10, 11, 13, and 14) and Chapter 7 refers to an 'Option 2B'. Chapter 3 of the Scoping Report states that a preferred option, 'Option 2' has been chosen and does not indicate that multiple	Following the preferred route announcement for the Scheme, a single option was selected (Option 2).

Comment	GCC Response
options remain under consideration. The project description in the ES must be consistently reflected throughout the assessments presented. Where multiple options are being considered, these should be clearly defined and described within the project description in the ES.	The PEIR has assessed this single option only, and this approach will be continued through for the ES.
The Applicant should make every attempt to narrow the range of options and explain clearly in the ES which elements of the Proposed Development have yet to be finalised and provide the reasons. At the time of application, any Proposed Development parameters should not be so wide-ranging as to represent effectively different developments. The development parameters should be clearly defined in the draft Development Consent Order (dDCO) and in the accompanying ES. It is a matter for the Applicant, in preparing an ES, to consider whether it is possible to robustly assess a range of impacts resulting from a large number of undecided parameters. The description of the Proposed Development in the ES must not be so wide that it is insufficiently certain to comply with the requirements of Regulation 14 of the EIA Regulations.	Comment noted. The ES will assess a single option only.
Relevant National Policy Statements (NPSs)	
Sector-specific NPSs are produced by the relevant Government Departments and set out national policy for NSIPs. They provide the framework within which the Examining Authority (ExA) will make their recommendation to the Secretary of State and include the Government's objectives for the development of NSIPs. The NPSs may include environmental requirements for NSIPs, which Applicants should address within their ES. The designated NPS relevant to the Proposed Development is the NPS for National Networks (NPS NN). Chapter 1 of the Scoping Report identifies this and sets out the background to identification of the NSIP status of the Proposed Development, and the national, regional, and local policy considered relevant to the Proposed Development.	No further action required.
Scope of the Assessment	
The Inspectorate recommends that in order to assist the decision-making process, the Applicant uses tables:	Item 1 – a table has been included as Appendix 1.1 to the PEIR. Items 2-5 – a tabular approach will be reviewed for inclusion in the ES.

Comment	GCC Response
• to demonstrate how the assessment has taken account of this Opinion; • to identify and collate the residual effects after mitigation for each of the aspect chapters, including the relevant interrelationships and cumulative effects; • to set out the proposed mitigation and/or monitoring measures including cross-reference to the means of securing such measures (e.g., a dDCO requirement); • to describe any remedial measures that are identified as being necessary following monitoring; and • to identify where details are contained in the Habitats Regulations Assessment (HRA report)(where relevant), such as descriptions of National Site Network sites and their locations, together with any mitigation or compensation measures, that inform the findings of the ES.	
The Inspectorate would expect the ES to include figures as necessary to show: • the parameters of the Proposed Development assessed; • the study areas applied in the assessments and predicted extent of impacts where applicable; • relevant baseline data such as the locations of identified receptors; and • the location and design of mitigation measures as applicable to the assessment of residual effects.	Figures containing this information will be provided as part of the ES.
The Inspectorate considers that where a DCO application includes works described as 'Associated Development', that could themselves be defined as an improvement of a highway, the Applicant should ensure that the ES accompanying that application distinguishes between; effects that primarily derive from the integral works which form the proposed (or part of the proposed) NSIP and those that primarily derive from the works described as Associated Development. This could be presented in a suitably compiled summary table. This will have the benefit of giving greater confidence to the Inspectorate that what is proposed is not in fact an additional NSIP defined in accordance with s22 of the PA2008.	This will be reviewed for the M5 Junction 10 Improvements Scheme and further information will be included in the ES if required. Currently, no Associated Development works are planned.

Comment	GCC Response
The ES should identify any other types of works which are necessary to deliver the integral proposals but do not form part of the proposed road improvement NSIP, for example utilities works, and assess any associated environmental effects. It is noted from Figure 1-1 of the Scoping Report that the southern extent of the Proposed Development crosses the path of overhead electrical lines and the proposed DCO boundary appears to include existing electrical pylons. Where such utilities works comprise an NSIP in their own right, the relevant NPS should be identified and consideration should be given to the relevance of the environmental requirements of that NPS, for example NPS for Electricity Networks Infrastructure (EN-5). The ES should clearly set out the NPSs which are of relevance to the Proposed Development.	Noted. Currently there are no other types of works identified to deliver the works described. There are no works planned for example to the overhead electrical lines referred to.
Baseline Scenario	
The ES should include a description of the baseline scenario with and without implementation of the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge.	This is addressed in the PEIR with regards to impacts to air quality (Chapter 5) and noise (Chapter 6) in assessing the Do Minimum and Do Something scenarios.
The Inspectorate notes the information in the Scoping Report on the Joint Core Strategy (JCS) and the role of the Proposed Development in the delivery of strategic development plans. It is noted from Paragraph 1.1.1 that the time period for the JCS spans 2011 to 2031 and up to 2041 in relation to new homes and employment land. It is not clear from the information on the JCS allocation areas to what extent proposals may come forward within the timescales of the Proposed Development. The Inspectorate advises that the ES should provide relevant information on ongoing developments within the vicinity of the Proposed Development application site, and clearly state which developments will be assumed to be under construction or operational as part of the future baseline.	This information will be included as part of the ES. The methodology used for the cumulative effects assessment (CEA) is described in Chapter 4 of the PEIR (as described in the PEIR) sets out the way in which the assumptions regarding Reasonably Foreseeable Future Projects (RFFPs) will be noted and how this will be taken into consideration in the ES.
Forecasting methods or evidence	
The ES should contain the timescales upon which the surveys which underpin the technical assessments have been based. For clarity, this information should be provided either in the introductory chapters of the	Information will be provided in the respective chapters of the PEIR and the ES.

Comment	GCC Response
ES (with confirmation that these timescales apply to all chapters), or in each aspect chapter.	
The Inspectorate notes and welcomes the information in Chapter 4 of the Scoping Report and expects the ES to include a similar chapter setting out the overarching methodology for the assessment, which clearly distinguishes effects that are 'significant' from 'non-significant' effects. Any departure from that methodology should be described in individual aspect assessment chapters.	Similar information is presented in Chapter 4 of the PEIR. This will also be included in the ES.
The ES should include details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information and the main uncertainties involved.	Details will be provided in the ES as applicable.
Residues and Emissions	
The EIA Regulations require an estimate, by type and quantity, of expected residues and emissions. Specific reference should be made to water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation and quantities and types of waste produced during the construction and operation phases, where relevant. This information should be provided in a clear and consistent fashion and may be integrated into the relevant aspect assessments.	Information will be provided in the respective chapters of the PEIR and the ES.
The Inspectorate notes from Chapter 4 of the Scoping Report that the methodologies within the DMRB are intended to be applied to the assessments, and that heat and radiation are not included within the scope of this guidance (Paragraph 4.1.6). The Scoping Report proposes to scope out assessment of heat and radiation on the basis of advice from Highways England that they are not relevant to highways schemes. The Inspectorate agrees that while significant environmental effects from heat and radiation are not likely to result from the Proposed Development, the ES should provide information on the reasoning undertaken to reach this conclusion, supported by reference to industry standards and guidance, and professional judgement.	The assessment has been undertaken in line with the methodology set out in DMRB. An assessment of heat and radiation have therefore been scoped out of the assessment as per the recommendations of DMRB.
Mitigation and monitoring	

Comment	GCC Response
Any mitigation relied upon for the purposes of the assessment should be explained in detail within the ES. The likely efficacy of the mitigation proposed should be explained with reference to residual effects. The ES should also address how any mitigation proposed is secured, with reference to specific DCO requirements or other legally binding agreements. The ES should identify and describe any proposed monitoring of significant adverse effects and how the results of such monitoring would be utilised to inform any necessary remedial actions. The Inspectorate notes the information in Chapter 4 of the Scoping Report with regards to the application of the mitigation hierarchy. The ES should clearly distinguish between measures which are proposed as mitigation, compensation, or enhancement.	This information will be presented as part of the ES.
Risks of Major Accidents and/or Disasters	
The ES should include a description and assessment (where relevant) of the likely significant effects resulting from accidents and disasters applicable to the Proposed Development. The description and assessment should consider the vulnerability of the Proposed Development to a potential accident or disaster and also the Proposed Development's potential to cause an accident or disaster. The assessment should specifically assess significant effects resulting from the risks to human health, cultural heritage, or the environment. Any measures that will be employed to prevent and control significant effects should be presented in the ES.	This information will be reviewed as part of the ES.
Climate and Climate Change	
The ES should include a description and assessment (where relevant) of the likely significant effects the Proposed Development has on climate (for example having regard to the nature and magnitude of greenhouse gas emissions) and the vulnerability of the project to climate change. Where relevant, the ES should describe and assess the adaptive capacity that has been incorporated into the design of the Proposed Development.	The ES will include a climate chapter (Chapter 14) that considers the effects the Scheme could have on climate (emissions) as well as how climate could affect it, i.e. an assessment of climate vulnerability. The vulnerability assessment will include consideration of adaptive capacity that will be embedded into the design.
Transboundary Effects	

Comment	GCC Response
The Inspectorate notes the information provided in Chapter 4 of the Scoping Report which sets out the requirements of Regulation 32 of the EIA Regulations and the requirement of Schedule 4 Part 5 of the EIA Regulations for an ES to include a description of the likely significant transboundary effects to be provided in an ES. Chapter 4 identifies the nearest European Economic Area (EEA) State as France (250 km from the Proposed Development) and sets out the anticipated spatial extent of the environmental effects considered. The Scoping Report states that the Proposed Development is not considered likely to have significant effects on a EEA State. Having considered this information and the nature and location of the Proposed Development, the Inspectorate is not aware that there are potential pathways of effect to any EEA states but recommends that, for the avoidance of doubt, the ES details any such consideration and assessment.	Addressed within Chapter 4 of the PEIR.
Reference list	
A reference list detailing the sources used for the descriptions and assessments must be included in the ES.	Information will be included in the ES.
Coronavirus (COVID-19) Environmental Information and Data Collection	
The Inspectorate understands that measures adopted in response to COVID-19 may have consequences for an Applicant's ability to obtain relevant environmental information for the purposes of their ES. For example, the ability to conduct specific surveys and obtain representative data may be affected by these measures. The ES should explain any such limitations and any assumptions made relating to the environmental information on which it relies.	Details will be included in the ES as applicable.
Air Quality	
Further assessment of ecological receptors Paragraph 5.12.4 states that further assessment is not recommended based on the absence of sensitive ecological receptors. The Inspectorate	The information referenced in 5.12.4 was based on the location of designated (national and European) ecological receptors within the provisional study area presented in the PEAOR. However, as noted at 5.5.1, this conclusion will be reviewed for the ES, once the most up to date traffic data is available to determine

Comment	GCC Response
does not agree to scope out assessment of air quality effects on ecological receptors for the following reasons: i. Paragraph 5.5.1 states an absence of 'designated ecological receptors' 'within the vicinity of the study area'. It goes on to state that the study area will be reviewed as the ARN is revised so it is not yet known if the absence of designated sites will remain the case once this process of refinement is undertaken; ii. ii. There is no information on whether any non-designated sensitive ecological receptors may be affected, for example the hedgerow network, orchards, and deciduous woodland identified in Chapter 7 of the Scoping Report; and iii. There is insufficient information on the receptors likely to be affected to scope out further assessment of this matter. The ES should provide an assessment of the likely significant effects of air quality changes on ecological receptors, with cross reference to the relevant aspect chapter as appropriate.	the affected road network (ARN) and study area for the scheme. In addition to identifying national and European ecological sites within 200m of the ARN, other designated nature conservation habitats including local wildlife sites and ancient woodland which are included in IAQM guidance will also be identified within the study area. However, the effects on the hedgerow network, orchards and deciduous woodland are not required to be assessed as part of the air quality assessment.
<u>Baseline environment</u> The ES should ensure that it is based on the most up to date information possible, including the location, extent, and nature of existing Air Quality Management Areas (AQMA). Comments from CBC are noted regarding recent changes to AQMA within its administrative area and the Inspectorate advises the Applicant to discuss the applicable baseline with CBC and other relevant stakeholders.	A summary of the baseline environment will be included in the ES. This will include information on AQMAs as well as data from air quality monitoring stations within the study area. The information included within the ES will be based on the most up to date information available at the time of writing the report. The assessment will take into account the recent changes to the CBC AQMA.
<u>Continuous monitoring data</u> The Scoping Report mentions a delayed CBC plan to install additional monitoring stations. It is not clear whether these stations will be operational in time for any monitoring data to be included in the ES, however the Inspectorate advises that all sources of data and any limitations to data collection are set out in the ES.	New automatic air quality monitoring stations (continuous and low-cost sensors) have been added to the CBC monitoring network. Published results from these recording stations will be incorporated into the baseline description. This information will not be incorporated specifically into the dispersion model, which will consider a 2019 base year. Air quality monitoring recorded in 2020 and 2021 are generally considered to be compromised due the temporary change in travel habits during the COVID-19 pandemic.
<u>Study area for air quality modelling</u>	The study area will be defined using the screening criteria in IAQM 2017 guidance which are considered to be industry best practice. The IAQM screening criteria are

Comment	GCC Response
While it is considered likely that roads within central Cheltenham within the AQMA will be susceptible to changes in operational traffic, other areas may also be similarly susceptible, in particular any roads close to the threshold of air quality objective compliance. The Inspectorate notes the intention to consult with CBC and recommends that the Applicant seeks to agree the final extent of the study area for modelling of air quality effects with CBC.	more stringent than other commonly used criteria such as those provided in Highways England's DMRB for strategic road schemes. Where the traffic changes do not meet screening criteria, then changes to air quality can be considered negligible. Where locations are close to (within 10%) the threshold of air quality objective compliance, the traffic changes with the Scheme will be reviewed to ensure they meet the criteria for assessment. A description of the proposed scope of assessment, including study area and assessment criteria was sent to CBC on 7th April 2021. No response has been received to date.
Noise and Vibration	
Operational vibration Given the information provided on the nature of the Proposed Development and the surrounding area, the Inspectorate agrees that significant effects from vibration during operation are unlikely to occur and that this matter can be scoped out of the assessment in the ES.	No further action required. Vibration will be scoped out of the ES.
Noise surveys The Scoping Report states that baseline noise surveys were planned for Spring 2021. The ES should explain why the chosen survey period is representative of typical baseline conditions, given the potential for variations in traffic flows and therefore noise levels during the COVID19 pandemic.	The surveys took place after the 17th May, when indoor socialising was allowed, in order for the noise levels to be as 'normal' as possible during the pandemic. An explanation will be included in the ES.
Noise sources The Scoping Report states that all other noise sources aside from road traffic have been excluded from this stage of assessment of the baseline, given the land use within 600m of the Proposed Development. The Inspectorate notes that as the proposed DCO boundary and the study area are yet to be finalised, further survey of the baseline noise environment is proposed. As part of this survey work consideration should be given to the potential overlap of the construction phases of nearby areas allocated for development described in Chapter 1 of the Scoping Report. It would be helpful if the ES included cross-reference between the noise assessment and the assessment of cumulative effects, as appropriate.	A cumulative assessment of the Scheme, with development areas, will be included in the ES.

Comment	GCC Response
Mitigation measures Where mitigation measures involve physical construction such as bunds, noise barriers and screening, the ES should consider the environmental effects and opportunities associated with these, e.g. the potential for significant effects on visual receptors or ecological receptors.	This will be included in the ES.
Extent of residual effects The Scoping Report states that properties within 100m of works could be subject to significant effects from construction noise. The Inspectorate notes that this is not consistent with the extent prior to mitigation of 300m (Paragraph 6.2.2), and it is not explained how this level of effectiveness of the currently undefined mitigation measures has been arrived at. The ES should clearly explain the anticipated effectiveness of the specific mitigation measures proposed when reporting the predicted residual effects.	This will be included in the ES.
Determination of significant of residual effects It is noted that noise levels may be significant following mitigation. The ES should explain whether construction noise levels will be of sufficient magnitude and duration to trigger a requirement for noise insulation or temporary rehousing.	This will be included in the ES.
Biodiversity	
Features identified to be of less than local importance It is not possible based on the information provided to identify the specific features included in this broad valuation, and whether the valuation applied has been agreed with the relevant consultees. Therefore, it is not possible to scope this matter out at this stage and the Inspectorate advises that details of the features identified and to what extent their valuation has been discussed with stakeholders are reported in the ES, and further justification provided for exclusion of significant environmental effects.	Noted. Statutory consultation will take place from December 2021, supported by the PEIR. Consultation has been ongoing with Natural England. Further information will be included in the ES.
Wye Valley and Forest of Dean bat sites SAC The Inspectorate understands from the Scoping Report that the SAC is located 20km from the Proposed Development site and notes the	Further detail will be included in the updated HRA, which will also be included in the ES.

Comment	GCC Response
application of the Bat Conservation Trust (BCT) core sustenance zones. The Inspectorate agrees that there is evidence to suggest that significant effects are unlikely. However, it is unclear how the bat survey data (noted as ongoing) has informed the exclusion of significant effects. The ES should include this information.	
Severn Estuary SAC/SPA/Ramsar/SSSI The Scoping Report presents generalised information on the likely quantities and types of pollutants taken into account and the mitigation to be applied to minimise adverse effects to watercourses which are hydrologically connected to the Severn Estuary. Given the distance between the potentially affected watercourses and the designations, the Inspectorate agrees that the likelihood of significant effects is low. However, information on the specific residual effects is not provided and the Inspectorate would expect to see a fully reasoned rationale for excluding significant effects, supported by more detailed information in the ES. The Inspectorate welcomes the intended inclusion of these designated sites in the HRA screening report for the Proposed Development and advises that this is coordinated with the EIA reported in the ES.	Noted. Further detail will be included in the updated HRA, which will also be included in the ES.
Walmore Common SPA and Coombe Hill Canal SSSI The Scoping Report suggests that based on surveys and research, Bewick's swan, the qualifying feature of the SPA, does not utilise habitats within the study area. Based on the information provided, it is agreed that there is no evidence for a pathway for significant effects to occur, and the Inspectorate agrees to scope this site out of the EIA subject to this remaining the case. Specific information on the location of wintering bird surveys is not provided in the Scoping Report and the Inspectorate would expect this information to be included within the ES.	Noted. Further detail, including the location of the wintering bird surveys, will be included in the ES. Further detail will also be included in the updated HRA.
Water vole and dormouse, further surveys for these species The Inspectorate notes that these species are considered to be absent following the survey work undertaken of the suitable habitat present, and that no further surveys are proposed. The Inspectorate accepts that if these species are demonstrated to be absent from the Proposed Development area no significant effects will occur. However, the	Noted. Further detail will be included in the ES.

Comment	GCC Response
reasoning behind the exclusion of likely significant effects should be included in the ES, supported by evidence of the survey locations and specific information on the habitats affected by the Proposed Development.	
Terrestrial invertebrates The Scoping Report proposes to scope out effects on terrestrial invertebrates on the basis that there will be no relevant habitat loss. However, habitat loss is not the only relevant impact-effect pathway. While the Inspectorate accepts the rationale regarding noble chafer habitat loss in this paragraph in principle, insufficient information has been provided regarding other impact pathways and resulting effects for terrestrial invertebrates to allow these to be scoped out. The ES must include an assessment of the likely significant effects on this ecological feature from habitat loss in the case of the terrestrial invertebrates in general, and from other impacts in the case of noble chafer.	Noted. Further detail will be included in the ES.
Badger and plants Paragraph 7.13.5 proposes to scope badgers and plants out of the assessment in the ES due to these features being of below local value. From Table 7-1 this statement appears to relate to common and widespread plant species, but it is not clear if it extends to invasive non-native species (INNS) and it is noted that the Scoping Report records Himalayan balsam as present within the study area. For clarity, the ES should provide sufficient information on ecological features that require record and assessment for legal reasons to allow the need for appropriate mitigation to be identified and subsequently considered by the decision-maker. The Inspectorate expects badger and INNS to be addressed in the ES in this capacity. While the desk study data is reported in Table 7-1 as having an absence of records of notable plant species, no targeted botanical surveys are reported in the Scoping Report and it is acknowledged within the document that desk study data alone cannot be relied upon as confirmation of absence. The Inspectorate does not agree to scope notable plant species of conservation concern out of the ES at this stage due to the uncertainty around the risk of significant effects. Should further information be available to provide certainty that no	Features that have been identified to be of less than local importance are not considered to be important ecological features, however sufficient information will be provided about such features in order that appropriate mitigation can be developed, to comply with legislation. Badgers and INNS will be addressed in this way. Regarding notable plants the valuation has not just relied on desk study data. As discussed in Table 7-1, extensive Phase 1 habitat surveys have been undertaken at the optimal time of year for botanical survey. These concluded that the intensively managed agricultural habitats which dominate the study area are unlikely to support notable plant species, and only common and widespread plant species were observed during the surveys, even within the small areas of semi-improved grassland (which were noted as having the potential to support notable plant species). This is considered to provide robust justification for scoping out notable plant species. It should be noted that further Phase 1 habitat surveys of targeted areas will be undertaken to validate the existing phase 1 habitat survey data, and the assessment will be updated following such surveys.

Comment	GCC Response
significant effects would occur, this feature can be scoped out of the assessment.	
Study area and changes to the Proposed Development boundary The ES should respond to any changes to the extent of the Proposed Development, updating the environmental assessments as necessary including a review of the appropriateness of the study areas applied in capturing the extent of likely significant effects.	Further details will be provided in the ES as required.
Currency of data and validation surveys The Inspectorate notes the suite of work already carried out and the information provided in the Scoping Report on ongoing data collection and the need for survey validation in order to ensure the ES is based on up-to-date information. The Applicant is advised that as well as the work discussed in the Scoping Report, other survey work may be required (e.g. an arboricultural survey as advised by CBC and Tewkesbury Borough Council in their responses provided in Appendix 2 of this Scoping Opinion). The desk study information may also need to be updated. The Applicant is encouraged to seek advice as far in advance as possible from relevant stakeholders to ensure a robust basis for the assessment.	An arboricultural survey is being undertaken for the Scheme. The desk study information was updated in April 2021.
Value of ecological features In Table 7-1 all terrestrial habitats, all bat species, all other notable mammals, and all breeding and wintering bird species are grouped together and assigned the same value. The Inspectorate considers that this approach may lead to under valuation of some features within these wider groups. The Applicant is advised to seek agreement on the valuation assigned to ecological features with relevant stakeholders.	Noted. Further detail to justify the valuation of species/species groups will be included in the ES. Statutory consultation will take place from December 2021, supported by the PEIR. Consultation has been ongoing with Natural England.
Potential impacts The Inspectorate notes the statement that this is not an exhaustive list of potential impacts, but advises that lighting impacts during construction and operation, and increased recreational disturbance should be considered in the ES where applicable. It is noted that prevention of illumination is listed under mitigation for bat species in Paragraph 7.7.8, however disturbance from lighting is not acknowledged as a potential impact of the Proposed Development. While pollution events and dust are	Noted, these potential impacts will be considered in the ES.

Comment	GCC Response
listed here, nitrogen deposition (including from ammonia emissions) is not, and the Inspectorate would expect the ES to include an assessment of likely significant effects in this regard.	
Potential effects and mitigation measures There remains uncertainty around the risks of encountering some protected species and species of conservation concern. Within this section potential effects are described in a general way and typical mitigation measures are outlined. The ES should identify specific mitigation for particular features/ locations and describe these measures in detail, including how they will be secured in the dDCO or other legal mechanism. Monitoring is mentioned in Chapter 4 in general terms. The ES should explain what monitoring or ongoing management is intended for the ecological mitigation measures to ensure their effectiveness and appropriateness.	Noted, further details will be provided in the ES.
Mitigation for great crested newts – District Level Licensing (DLL) Scheme The Inspectorate notes the possibility of pursuing the DLL Scheme as an alternative to the mitigation described for great crested newts. The ES should provide evidence regarding how and where this approach has been used in relation to the proposal, which should include a counter-signed certificate from Natural England, or a similar approval from an alternative DLL provider. It is noted that the mitigation for great crested newt may also be relied upon to reduce adverse effects on common toad. Should the DLL Scheme approach be adopted the implications for other ecological features including common toad should be considered and if necessary alternative mitigation for these features should be included within the ES.	Noted, further details will be provided in the ES.
Road drainage and the Water Environment	
Flood risk from tidal flooding, from sewers, and from artificial waterbodies The Inspectorate considers that it is appropriate to scope out the risks of flooding from tidal flooding based on absence of these sources within the study area. Noting the information on the likely risk from sewers and in relation to the Dowdeswell Reservoir, the Inspectorate agrees that likely	The ES will present the rationale for scoping the various sources of flood risk as provided in the scoping information.

Comment	GCC Response
significant effects from flooding are unlikely to occur from these sources. The Inspectorate agrees to scope out these sources from detailed assessment, however the ES should present the rationale provided in the scoping information.	
Flood risk – sequential test It is noted that the Proposed Development is located in areas classified as Flood Zone 2 and 3. The Scoping Report does not currently refer to the sequential/exemption test, however it is assumed that this information will be provided in the Flood Risk Assessment intended to support the ES (Table 8-4). The ES should explain how the tests have been applied and they have informed the design layout and flood mitigation requirements for the Proposed Development, where relevant.	The ES will explain how the sequential test, and as may be required the exception test, has been applied to the Scheme.
Baseline information The ES should include the necessary information to establish whether shallow perched groundwater or springs could be present and subject to significant environmental effects.	This information will be included as part of the ES. Background mapping will be used to identify locations of springs with cross reference to hydrogeological information to develop a conceptual understanding.
Assumptions and limitations The Scoping Report details that information relating to flood risk baseline conditions and known incidents of flooding will be sourced from the Environment Agency. The Inspectorate would expect this to include the most up to date climate change allowances, as stated in the Scoping Report as being applied to the FRA (Paragraph 8.10.3). Whilst noting that the applicant is Gloucestershire County Council, the ES should ensure to include data from the relevant council(s) departments as the Lead Local Flood Authority, other relevant local authorities responsible for preparing flood plans, or the relevant internal drainage boards(s).	The ES will apply the July 2021 climate change allowances provided by the Environment Agency. The current assessments use the previous values, which are higher than those to now be applied.
Mitigation measures The Scoping Report mentions temporary and permanent flood/surface water storage and compensation areas as part of the intended mitigation measures for the Proposed Development. The ES should confirm the location and design parameters/specifications of these features and the intended timing of implementation. The ES should assess any associated	The ES will present the intended locations for the compensatory floodplain and flood storage area, as well as a description of how they perform.

Comment	GCC Response
significant environmental effects of their construction and operation as part of the Proposed Development.	
Landscape and Visual	
Landscape character at a national and county level The Inspectorate agrees that based on the information provided, the Proposed Development is unlikely to give rise to significant effects on landscape character at a national and county level. The Inspectorate agrees that this matter can be scoped out of the assessment in the ES.	No further action required.
Visual receptors at Hardwicke, Hayden and Hayden Green, Springbank and Springbank Primary Academy, Pilgrove Way and Pilgrove Way playground, Hayden allotments, and Swindon Village. The Inspectorate understands the reasoning presented in Table 9-2, and considers it likely that subject to finalisation of the study area and design of the Proposed Development that this reasoning would lead to a conclusion of neutral visual effects. However, little evidence to support the reasoning provided is included in the Scoping Report, and importantly, the study area and understanding of the Proposed Development's impacts are yet to be finalised. Therefore, the ES should provide an assessment of the likely significant effects on these receptors where these could occur, or provide evidenced reasoning to support the conclusion that they would be unaffected.	The information to address these points will be included in the ES.
Landscape and visual receptors outside of 1km The Scoping Report states that the Zone of Theoretical Visibility (ZTV) and study area will remain under review during the assessment. The Inspectorate agrees that given the information provided on the location of the Proposed Development and the surrounding landscape features, that landscape receptors beyond 1km can be scoped out of further assessment in the ES. The Inspectorate notes the rationale in Paragraph 9.2.4 of the Scoping Report with regard to the identified visual receptors. Subject to the outcomes of the further refinements to the Proposed Development and to the ZTV providing evidence that no significant visual effects beyond 1km are likely, The Inspectorate agrees to scope out visual receptors beyond 1km from the DCO boundary.	No further action required.

Comment	GCC Response
Study area and use of ZTV It is noted from the Scoping Report that the proposed ZTV may be applied along with field work and consultation to identify the final selection of viewpoints. The Inspectorate notes the approach is not yet defined, and advises that the ES must fully explain and justify the methodology used to refine the study area.	The information to address these points will be included in the ES.
Identification of receptors Figure 9-1 indicates the location of potential landscape and visual receptors; with visual receptors labelled as VR1, VR2 etc. The receptors are not identified by name on this Figure, however Table 9-2 lists visual receptors by name/description but without reference to these labels. The ES should ensure that where number references are used that they are consistent on any relevant figures and tables presented within it.	The information to address these points will be included in the ES.
Assumptions and limitations The ES should include an assessment of potential landscape and visual effects for both daytime and night-time conditions, in particular in relation to the identified requirement to assess the effects on longer distance views and on adjacent residential receptors.	The information to address these points will be included in the ES, however the night-time effects will be high-level and not quantitative.
Operational impacts As well as the environmental design features specifically mentioned in the Scoping Report, the Inspectorate advises that impacts from noise attenuation measures should also be assessed.	The information to address these points will be included in the ES.
Mitigation and likely residual effects The phrases ‘short term’ and ‘long term’ are not defined here. As proposed elsewhere in this chapter of the Scoping Report, the ES must consider the temporal aspect of the likely significant effects, and explain any assumptions made around the length of time needed for mitigation measures to become effective e.g. maturation of the mitigation planting identified in Section 9.7. This information should be clearly defined in the ES when identifying the residual effects of the Proposed Development.	The information to address these points will be included in the ES.
Geology and Soils	

Comment	GCC Response
Soils of other importance e.g. designated nature conservation sites; or deciduous woodland designated as Priority Habitats and/or National Forest Inventory sites The Inspectorate agrees that where a particular type of feature is absent from the study area and therefore no pathway exists for significant effects to occur, that effect can be scoped out of the ES. The Scoping Report states that no relevant nature conservation designated sites are present within the study area, but provides limited evidence in this regard. While the Inspectorate agrees to scope out soils of importance associated with these designations, this evidence should be presented in the ES. Areas of woodland which are designated as Priority Habitats and/or National Forest Inventory sites are identified within the vicinity of Junction 10. The Scoping Report states that effects on soils associated with the priority habitats can be scoped out based on the habitats' limited dependence on the soil type present. The Inspectorate is content to scope this matter out of the geology and soils assessment.	Details on the environmentally sensitive sites present within the Scheme boundary have been included within the PEIR baseline. Noted - soils of importance associated with environmentally sensitive sites and effects on soils associated with the priority habitats will be scoped out of the ES.
Bedrock geology and superficial deposits (including geological designations) Given the information provided the Inspectorate agrees that it is appropriate to scope out geological designations, given the absence of any such designations within the study area.	Noted - geological designations will be scoped out of the ES.
Hydrology The Scoping Report refers to the study area and then states that there are no licenced surface water abstractions "on site". The ES should be clear in its terminology when referring to the study area applied. Hydrological and hydrogeological assessments should also include, where available, information on private water abstraction supplies.	The information has been amended to refer to the Scheme terminology in the PEIR and will be carried through to the ES.
Design and mitigation – requirements for ground investigation The ES should indicate whether ground investigations are proposed to be undertaken to inform the ES or for detailed design works. Where ground investigation information is not proposed to inform the assessments within the ES, the data sources and methodology that have been applied should be explained and justified in the ES.	A ground investigation for the Scheme was completed in August 2021. The results will be presented and considered within the ES.

Comment	GCC Response
Effects associated with water quality The Inspectorate notes that Paragraph 10.1.3 of the Scoping Report states that effects associated with water quality are assessed within Chapter 8 (Road Drainage and the Water Environment). However, Table 10-1 and Table 10-2 set out the methodology for determining significance of effects to surface water features based on DMRB LA113. Chapter 8 also states that this methodology has been applied within its proposed scope. The ES should avoid duplication of the assessment of significant effects on surface water quality, making cross reference between relevant chapters where necessary.	Although the same methodology has been used to assess impact each chapter considers a different impact to the surface water and groundwater receptors. Chapter 10 considers the effects to surface water and groundwater from land contamination. Chapter 8 consider effects related to surface water, hydromorphology, flood risk and groundwater.
Cultural Heritage	
Geophysical survey The Scoping Report refers to the requirement to undertake a geophysical survey in order to identify unknown archaeological assets. The ES should explain how the geophysical survey will be used to inform the requirement for additional mitigation measures, for example trial trenching or other intrusive survey methods.	The geophysical survey and trial trenching for the proposed link road have been conducted and will inform the assessments reported in the ES. The ES will consider the results of both geophysical survey and evaluation trenching in its findings and address the need for additional mitigation.
Archaeological management plan The Scoping Report recommends production of an Archaeological Management Plan. The ES should make it clear as to what stage of the Proposed Development this is required, e.g. in advance of or during construction, and set out how the plan is to be legally secured e.g. by DCO requirement.	The ES will address the need for the Archaeological Management Plan and the way in which it will be secured.
Materials and Waste	
Material demand and waste produced during operation (including maintenance) The Inspectorate considers that significant effects from operational and maintenance material demand and waste arisings are unlikely, based on the predicted minimal volume and low hazard potential of waste. It is agreed to scope out the effects of material demand and waste produced during operation and maintenance of the Proposed Development.	Comment noted. No further action required.

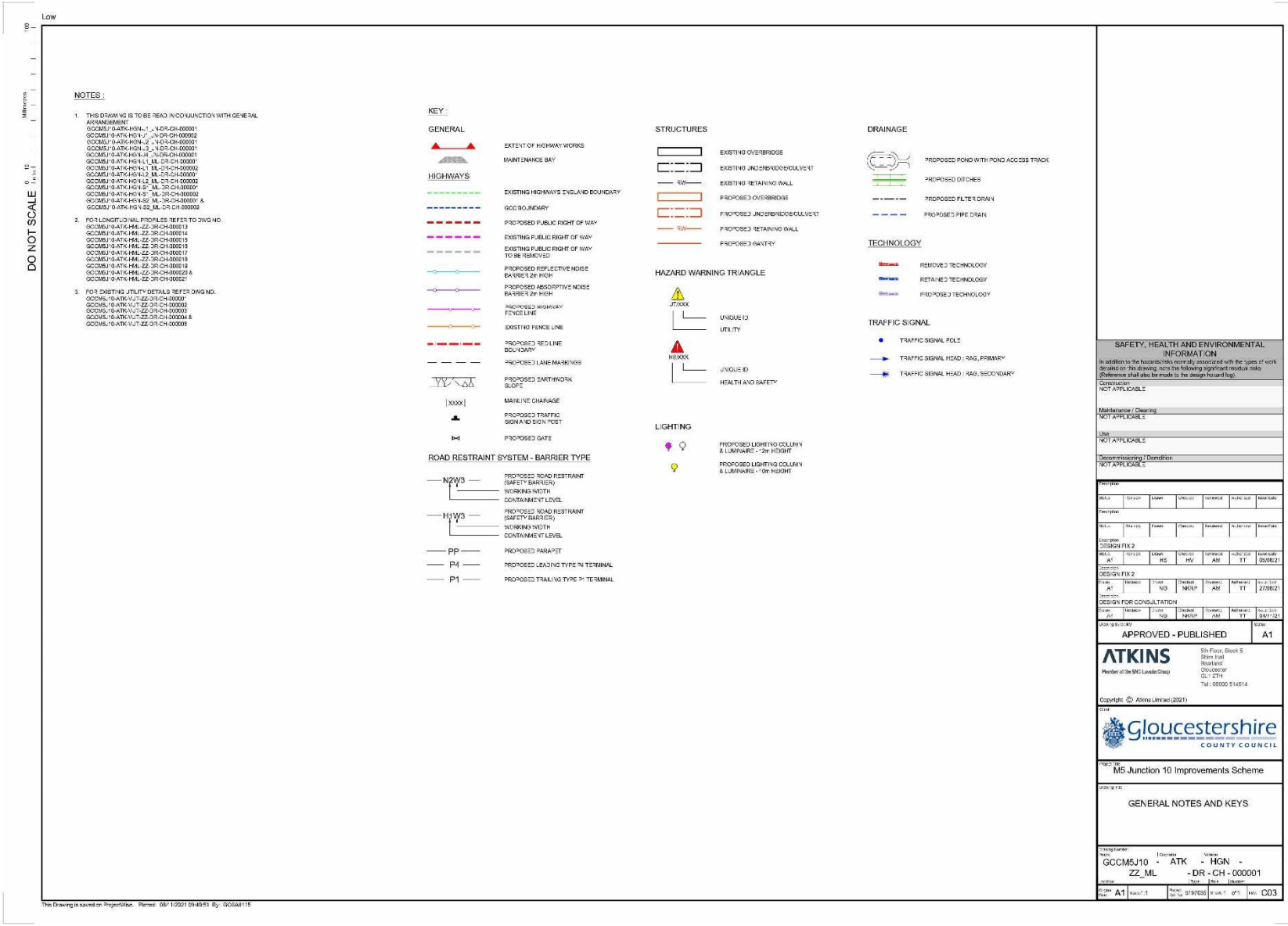
Comment	GCC Response
Mineral Safeguarding areas and mitigation The Scoping Report states that Mineral Consultation/Safeguarded Areas have been identified, and the assessment criteria in Table 12-4 include consideration of sterilisation of safeguarding sites. However, this potential impact is not explicitly identified in Section 12.6 and mitigation is not discussed. The ES should include an assessment of the potential for mineral sterilisation as a result of the proposed Development, and any required mitigation measures to prevent sterilisation occurring, for example whether prior extraction could be included as a mitigation measure for the Scheme.	The information to address these points will be included in the ES, including mitigation such as prior extraction, however this needs to be balanced against the requirements to retain excavated material on site to offset the need to import materials for the Scheme construction such as embankments.
Population and Human Health	
Financial compensation No environmental matters have been proposed to be scoped out of the assessment. The Inspectorate agrees that financial compensation lies outside the scope of EIA.	Noted - financial compensation lies outside the scope of EIA.
Timing of construction effects and of mitigation Whilst the precise timing of construction activities and phasing of the Proposed Development are not yet known, these have potential to alter the magnitude of impacts. The ES should clearly set out the anticipated timing and duration of construction effects and the proposed implementation of mitigation measures, within the context of the overall phasing of the proposals. This should include any relevant 'advance works', and works included within the Proposed Development as mitigation for other environmental effects.	The information to address these points, regarding timing and duration of construction effects and proposed implementation of mitigation measures, will be included in the ES. Some of this information is provided in the PEIR (Chapter 2). The more detailed information requested will be provided as part of the ES. The assessment of magnitude of impacts will take into account embedded mitigation. Essential (additional) mitigation measures, as outlined in the comment, will then be clearly stated before a residual effect is then determined. This will be reported in the ES.
Population effects – WCH enhancement opportunities The Scoping report states that opportunities exist for enhancement to routes used by walkers, cyclists, and horse riders. The ES should clearly describe any such measures to be implemented, ensuring consistency between the proposed DCO, the overall project description in the ES, and relevant aspect assessments in the ES such as the assessment of population effects.	The EIA process will evaluate the opportunities for WCH enhancement. Any measures to be carried forward to implementation will be clearly described, in a manner consistent with the overall project description.
Climate	

Comment	GCC Response
Extreme weather events during construction The Inspectorate considers that further assessment of extreme weather events during construction may be scoped out on the basis that proposed measures for management of extreme weather events would be incorporated within the CEMP.	No further action required.
Specific major accident scenarios and quantitative assessment The Scoping Report states that no assessment of specific major accident and disaster scenarios requiring repair, maintenance or replacement works to be carried out that would lead to additional GHG emissions beyond those anticipated in normal operation. On the basis of the uncertain nature of such events, the Inspectorate considers that this matter may be scoped out.	No further action required.
Mitigation for carbon emissions If opportunities to reduce and sequester carbon emissions are sought through third-party projects, the ES must demonstrate what if any elements of this are to be included within the proposed DCO, and how any such measures on which the ES relies are intended to be legally secured.	This will be considered at the ES stage, although such opportunities may not have been fully explored at that stage.
Carbon budgets and project stages The Scoping Report indicates that construction would take place within the third carbon budget (up to the end of 2022), the anticipated opening year of the Proposed Development is 2025 within the fourth carbon budget. The operational year of assessment is not identified in this chapter, although it is understood that the operational phase extends beyond the end of the 5th Carbon Budget period (2032) and that the 6th Carbon Budget has been set at 2033-2037. The ES should clearly explain the anticipated contributions of each project phase within the context of the applicable carbon budget when emissions would occur, including in relation to a defined operational phase.	Information will be presented in the ES.
Construction material supply and transport The Scoping Report states that emissions from these sources will be included in the assessment, however, no study area has been set and it is	Information will be presented in the ES.

Comment	GCC Response
not explained how the activity data, or the emissions factors are to be determined. This information should be provided in the ES.	
Emissions from change in land use For clarity, the ES should define the threshold of 'significant areas of land use change' which would trigger this specific assessment.	This detail will be defined in the ES in accordance with DMRB LA 114 paragraph 3.12.
Cumulative Impact Assessment	
Reasonably Foreseeable Future Projects (RFFP) long List Review The review of the developments to be included within the RFFP list for cumulative effects should be undertaken as close as possible to the commencement of the ES assessment to ensure the most up to date information is used. The Applicant should seek to agree the list with relevant stakeholders, in particular the local planning authorities.	An RFFP list has been created to inform the PEIR. This will be reviewed as late as practicable within the ES production programme; and relevant stakeholders will be invited to comment on the proposed RFFP shortlist.
RFFP long list for consultation It is noted that this table does not include the other proposals identified in Chapter 1 of the Scoping Report included in the package of improvements to be taken forward separately, namely the upgrade to Arle Court Park and Ride (Arle Court Transport Hub) and junction improvements at Coombe Hill. It is acknowledged that this list will be subject to review and refinement, however the ES should ensure that the other developments of relevance to each aspect assessment are clearly justified and that the summary chapter for cumulative effects is consistent with this information.	The list will be refined as per the comment and will align with the other proposals outlined in Chapter 1 of the Scoping Report.

Appendix 2.1

Figure A2-1 – General arrangement figures – comprising sheets 1-13


Low
DO NOT SCALE
NOTES :
1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH GENERAL ARRANGEMENT
GCCM5J10-ATK-HGN-1_1-DR-CH-000001
GCCM5J10-ATK-HGN-J_1-DR-CH-000002
GCCM5J10-ATK-HGN-J_2-DR-CH-000001
GCCM5J10-ATK-HGN-3_1-DR-CH-000001
GCCM5J10-ATK-HGN-M_1-DR-CH-000001
GCCM5J10-ATK-HGN-L1_ML-DR-CH-000001
GCCM5J10-ATK-HGN-L1_ML-DR-CH-000002
GCCM5J10-ATK-HGN-L2_ML-DR-CH-000001
GCCM5J10-ATK-HGN-L2_ML-DR-CH-000002
GCCM5J10-ATK-HGN-L3_ML-DR-CH-000001
GCCM5J10-ATK-HGN-L3_ML-DR-CH-000002
GCCM5J10-ATK-HGN-S2_ML-DR-CH-000001 &
GCCM5J10-ATK-HGN-S2_ML-DR-CH-000002
2. FOR LONGITUDINAL PROFILES REFER TO DWG NO.
GCCM5J10-ATK-HML-ZZ-DR-CH-000013
GCCM5J10-ATK-HML-ZZ-DR-CH-000014
GCCM5J10-ATK-HML-ZZ-DR-CH-000015
GCCM5J10-ATK-HML-ZZ-DR-CH-000016
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GCCM5J10-ATK-HML-ZZ-DR-CH-000018
GCCM5J10-ATK-HML-ZZ-DR-CH-000019
GCCM5J10-ATK-HML-ZZ-DR-CH-000020 &
GCCM5J10-ATK-HML-ZZ-DR-CH-000021
3. FOR EXISTING UTILITY DETAILS REFER DWG NO.
GCCM5_10-ATK-VJT-ZZ-DR-CH-00000*
GCCM5_10-ATK-VJT-ZZ-DR-CH-000002
GCCM5_10-ATK-VJT-ZZ-DR-CH-000003
GCCM5_10-ATK-VJT-ZZ-DR-CH-000004 &
GCCM5_10-ATK-VJT-ZZ-DR-CH-000005
KEY :
GENERAL
EXTENT OF HIGHWAY WORKS
MAINTENANCE BAY
HIGHWAYS
EXISTING HIGHWAYS ENGLAND BOUNDARY
GCC BOUNDARY
PROPOSED PUBLIC RIGHT OF WAY
EXISTING PUBLIC RIGHT OF WAY
EXISTING PUBLIC RIGHT OF WAY TO BE REMOVED
PROPOSED REFLECTIVE NOISE BARRIER 2m HIGH
PROPOSED ABSORPTIVE NOISE BARRIER 2m HIGH
PROPOSED HIGHWAY FENCE LINE
EXISTING FENCE LINE
PROPOSED RED LINE BOUNDARY
PROPOSED LANE MARKINGS
PROPOSED EARTHWORK SLOPE
xxxx
MAINLINE CHAINAGE
PROPOSED TRAFFIC SIGN AND SIGN POST
PROPOSED GATE
ROAD RESTRAINT SYSTEM - BARRIER TYPE
N2W3
PROPOSED ROAD RESTRAINT (SAFETY BARRIER)
WORKING WIDTH
CONTAINMENT LEVEL
H1W3
PROPOSED ROAD RESTRAINT (SAFETY BARRIER)
WORKING WIDTH
CONTAINMENT LEVEL
PP
PROPOSED PARAPET
P4
PROPOSED LEADING TYPE P4 TERMINAL
P1
PROPOSED TRAILING TYPE P1 TERMINAL
STRUCTURES
EXISTING OVERBRIDGE
EXISTING UNDERBRIDGE/CULVERT
RW
EXISTING RETAINING WALL
PROPOSED OVERBRIDGE
PROPOSED UNDERBRIDGE/CULVERT
RW
PROPOSED RETAINING WALL
PROPOSED GANTRY
HAZARD WARNING TRIANGLE
J7/XXX
UNIQUE ID
UTILITY
HS/XXX
UNIQUE ID
HEALTH AND SAFETY
LIGHTING
PROPOSED LIGHTING COLUMN & LUMINAIRE - *0m HEIGHT
PROPOSED LIGHTING COLUMN & LUMINAIRE - *0m HEIGHT
DRAINAGE
PROPOSED POND WITH POND ACCESS TRACK
PROPOSED DITCHES
PROPOSED FILTER DRAIN
PROPOSED PIPE DRAIN
TECHNOLOGY
REMOVED TECHNOLOGY
RETAINED TECHNOLOGY
PROPOSED TECHNOLOGY
TRAFFIC SIGNAL
TRAFFIC SIGNAL POLE
TRAFFIC SIGNAL HEAD : RAG, PRIMARY
TRAFFIC SIGNAL HEAD : RAG, SECONDARY
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).
Construction
NOT APPLICABLE
Maintenance / Cleaning
NOT APPLICABLE
Use
NOT APPLICABLE
Decommissioning / Demolition
NOT APPLICABLE
Description
DESIGN FIX 2
Description
DESIGN FIX 2
Description
DESIGN FOR CONSULTATION
APPROVED - PUBLISHED
A1
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5th Floor, Block 5
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Gloucester
GL1 2TH
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Client
Gloucestershire COUNTY COUNCIL
Project No
M5 Junction 10 Improvements Scheme
Drawing Title
GENERAL NOTES AND KEYS
Drawing Number
GCCM5J10 - ATK - HGN - ZZ_ML - DR - CH - 000001
Status
A1
Revision
C03
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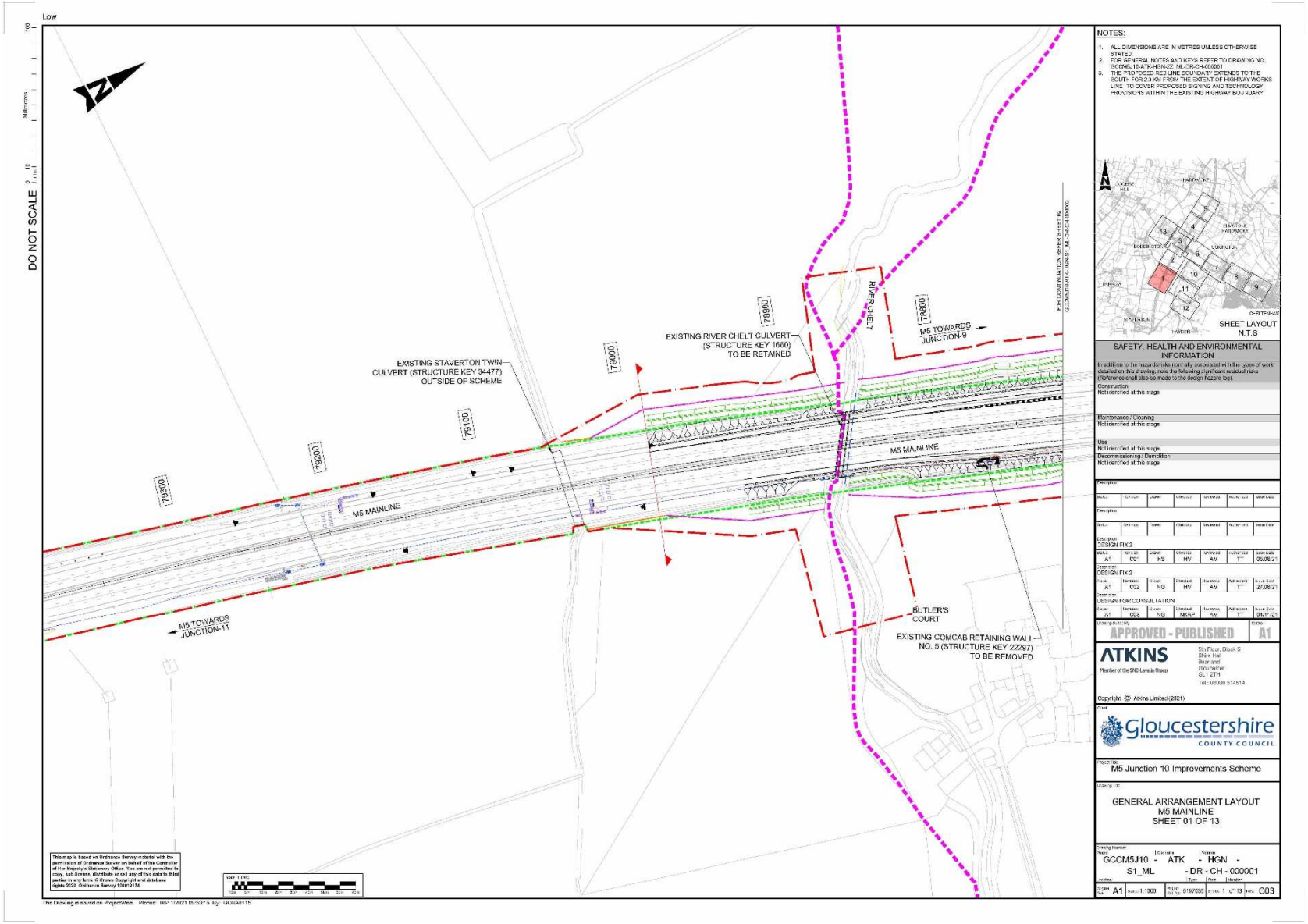
Low
DO NOT SCALE
EXISTING STAVERTON TWIN CULVERT (STRUCTURE KEY 34477) OUTSIDE OF SCHEME
EXISTING RIVER CHELT CULVERT (STRUCTURE KEY 1660) TO BE RETAINED
RIVER CHELT
M5 MAINLINE
M5 TOWARDS JUNCTION-11
M5 TOWARDS JUNCTION-9
BUTLER'S COURT
EXISTING COMCAB RETAINING WALL NO. 5 (STRUCTURE KEY 22297) TO BE REMOVED
79300
79200
79100
79000
78900
78800
NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. FOR GENERAL NOTES AND KEYS REFER TO DRAWING NO. GCCM5J10-ATK-HGN-ZZ_ML-DR-CH-000001
3. THE PROPOSED RED LINE BOUNDARY EXTENDS TO THE SOUTH FOR 2.3 KM FROM THE EXTENT OF HIGHWAY WORKS LINE TO COVER PROPOSED SIGNING AND TECHNOLOGY PROVISIONS WITHIN THE EXISTING HIGHWAY BOUNDARY
SHEET LAYOUT N.T.S
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).
Construction
Not identified at this stage
Maintenance / Cleaning
Not identified at this stage
Use
Not identified at this stage
Decommissioning / Demolition
Not identified at this stage
DESIGN FIX 2
DESIGN FIX 2
DESIGN FOR CONSULTATION
APPROVED - PUBLISHED
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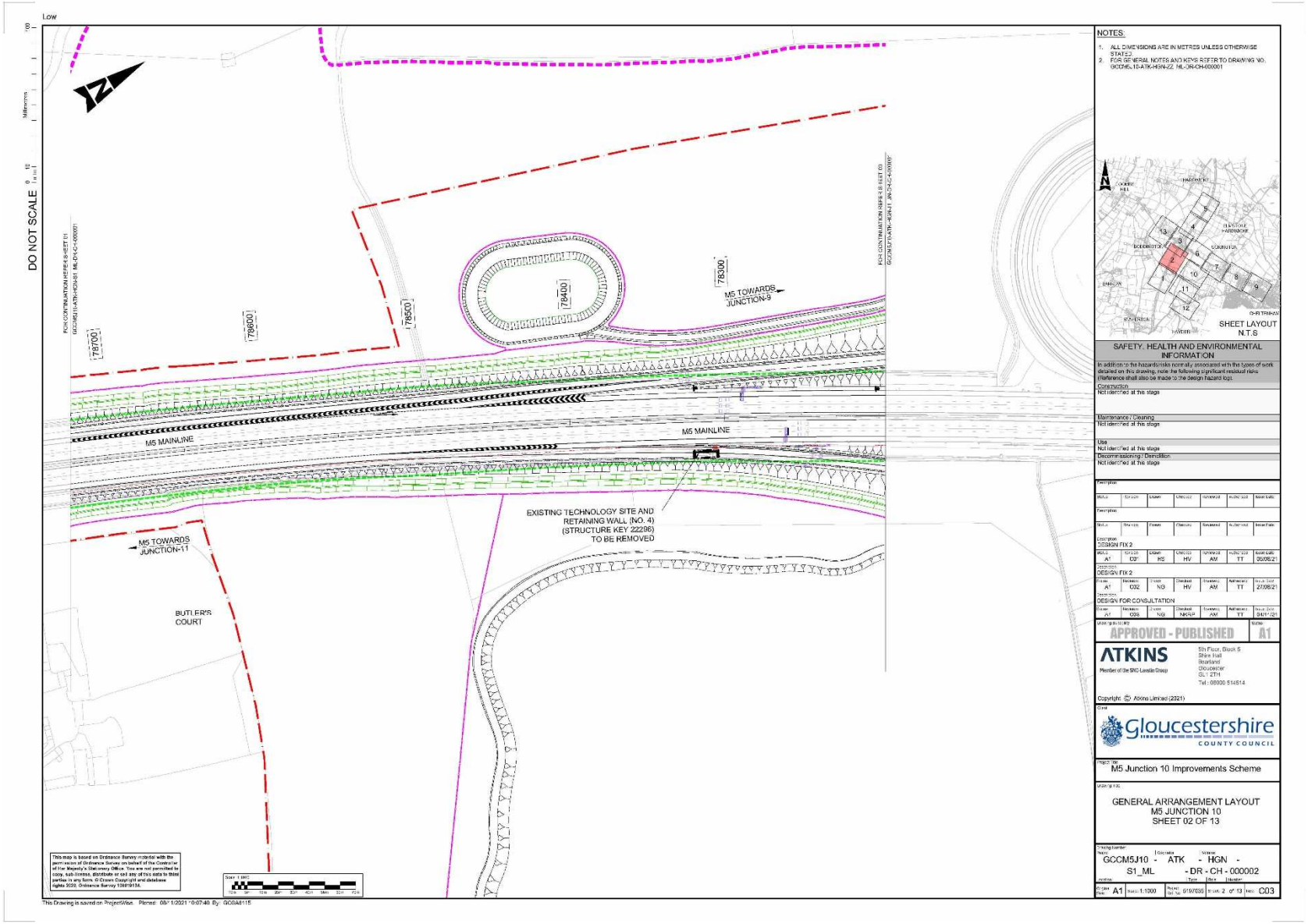
M5 Junction 10 Improvements Scheme
GENERAL ARRANGEMENT LAYOUT
M5 MAINLINE
SHEET 01 OF 13
GCCM5J10 - ATK - HGN - S1_ML - DR - CH - 000001
A1
C03


Low
DO NOT SCALE
78700
78600
78500
78400
78300
M5 MAINLINE
M5 MAINLINE
M5 TOWARDS JUNCTION-9
M5 TOWARDS JUNCTION-11
EXISTING TECHNOLOGY SITE AND RETAINING WALL (NO. 4) (STRUCTURE KEY 22296) TO BE REMOVED
BUTLER'S COURT
NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. FOR GENERAL NOTES AND KEYS REFER TO DRAWING NO. GCCM5J10-ATK-HGN-ZZ_ML-DR-CH-000001
SHEET LAYOUT N.T.S
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).
Construction
Not identified at this stage
Maintenance / Cleaning
Not identified at this stage
Use
Not identified at this stage
Decommissioning / Demolition
Not identified at this stage
DESIGN FIX 2
DESIGN FIX 2
DESIGN FOR CONSULTATION
APPROVED - PUBLISHED
A1
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M5 Junction 10 Improvements Scheme
GENERAL ARRANGEMENT LAYOUT
M5 JUNCTION 10
SHEET 02 OF 13
GCCM5J10 - ATK - HGN - S1_ML - DR - CH - 000002
A1
1:1000
C03
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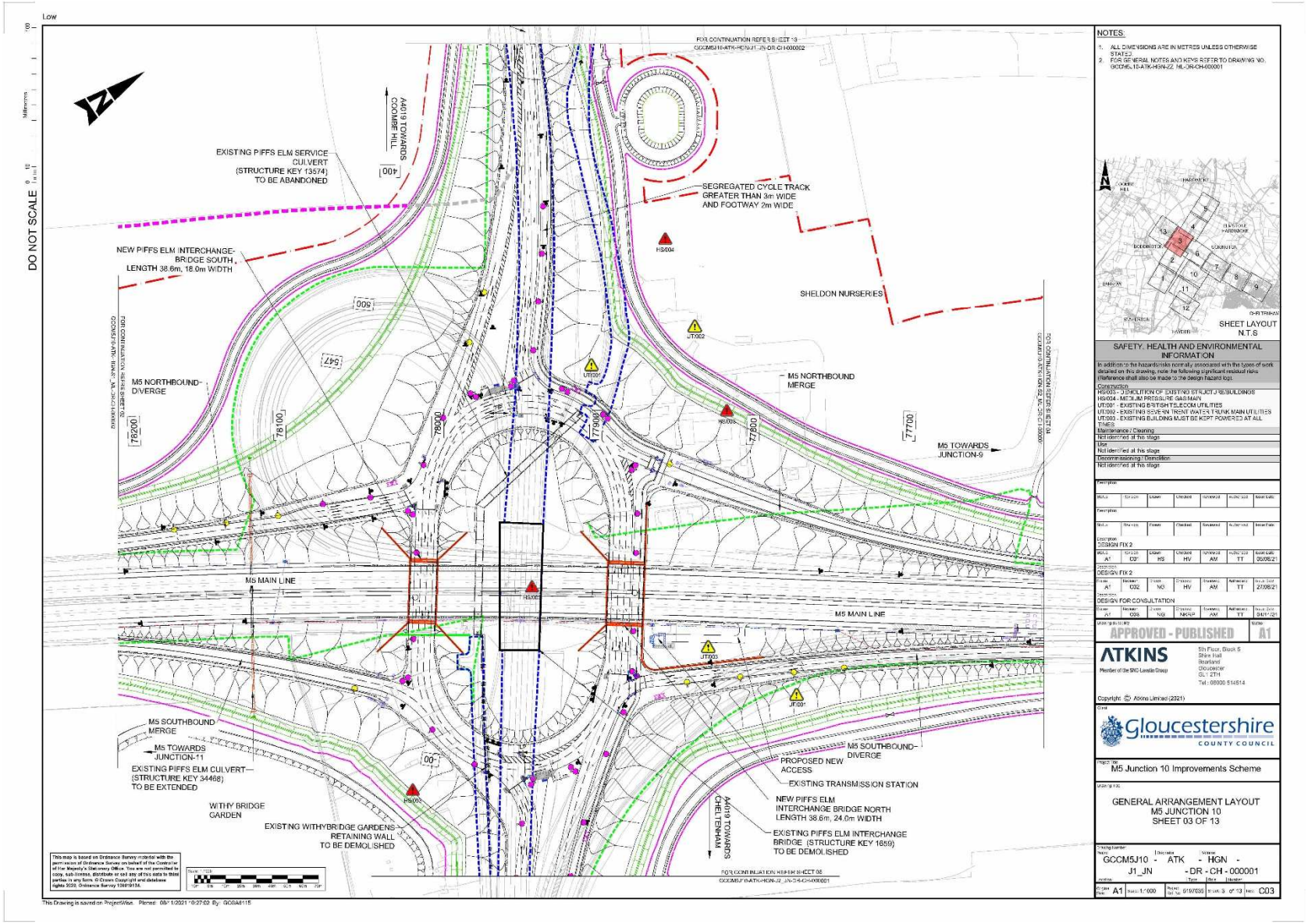
Low
DO NOT SCALE
EXISTING PIFFS ELM SERVICE CULVERT (STRUCTURE KEY 13574) TO BE ABANDONED
A4019 TOWARDS COMBE HILL
SEGREGATED CYCLE TRACK GREATER THAN 3m WIDE AND FOOTWAY 2m WIDE
NEW PIFFS ELM INTERCHANGE BRIDGE SOUTH LENGTH 38.6m, 18.0m WIDTH
SHELDON NURSERIES
M5 NORTHBOUND DIVERGE
M5 NORTHBOUND MERGE
M5 TOWARDS JUNCTION-9
M5 MAIN LINE
M5 MAIN LINE
M5 SOUTHBOUND MERGE
M5 TOWARDS JUNCTION-11
EXISTING PIFFS ELM CULVERT (STRUCTURE KEY 34468) TO BE EXTENDED
WITHY BRIDGE GARDEN
EXISTING WITHYBRIDGE GARDENS RETAINING WALL TO BE DEMOLISHED
M5 SOUTHBOUND DIVERGE
PROPOSED NEW ACCESS
EXISTING TRANSMISSION STATION
NEW PIFFS ELM INTERCHANGE BRIDGE NORTH LENGTH 38.6m, 24.0m WIDTH
EXISTING PIFFS ELM INTERCHANGE BRIDGE (STRUCTURE KEY 1659) TO BE DEMOLISHED
A4019 TOWARDS CHELTENHAM
NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. FOR GENERAL NOTES AND KEYS REFER TO DRAWING NO. GCCM5J10-ATK-HGN-ZZ_ML-DR-CH-000001
SHEET LAYOUT N.T.S
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
Construction
HS/003 - DEMOLITION OF EXISTING STRUCTURES/BUILDINGS
HS/004 - MEDIUM PRESSURE GAS MAIN
UT/001 - EXISTING BRITISH TELECOM UTILITIES
UT/002 - EXISTING SEVERN TRENT WATER TRUNK MAIN UTILITIES
UT/003 - EXISTING BUILDING MUST BE KEPT POWERED AT ALL TIMES
Maintenance / Cleaning
Not identified at this stage
Use
Not identified at this stage
Decommissioning / Demolition
Not identified at this stage
DESIGN FIX 2
DESIGN FIX 2
DESIGN FOR CONSULTATION
APPROVED - PUBLISHED
A1
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Gloucester
GL1 2TH
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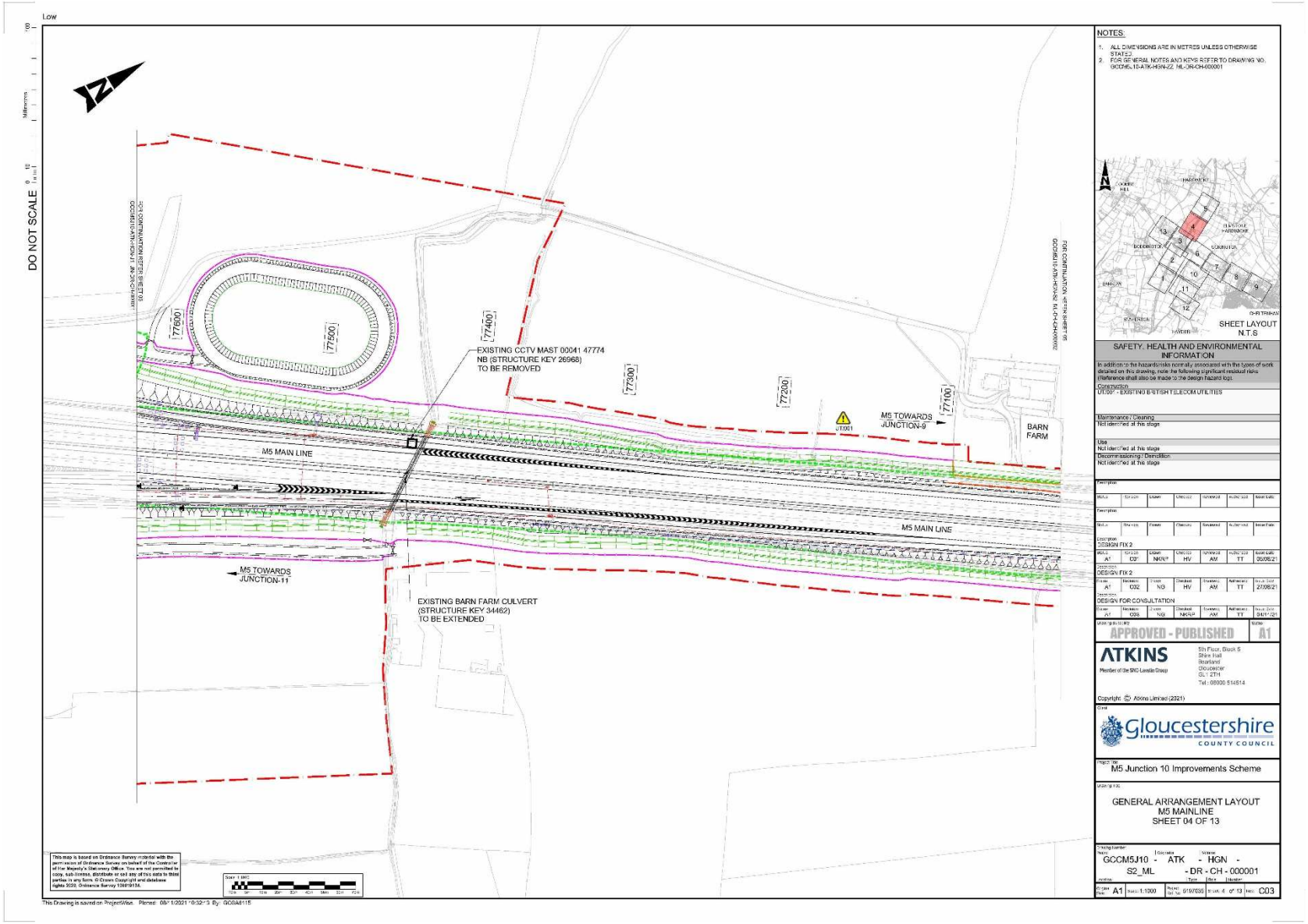
Project No
M5 Junction 10 Improvements Scheme
Drawing Title
GENERAL ARRANGEMENT LAYOUT
M5 JUNCTION 10
SHEET 03 OF 13
Drawing Number
GCCM5J10 - ATK - HGN - J1_JN - DR - CH - 000001
Drawing Size A1
Scale 1:1000
Rev C03


Low
DO NOT SCALE
EXISTING CCTV MAST 00041 47774
NB (STRUCTURE KEY 26968)
TO BE REMOVED
M5 MAIN LINE
M5 TOWARDS JUNCTION-9
M5 TOWARDS JUNCTION-11
BARN FARM
EXISTING BARN FARM CULVERT
(STRUCTURE KEY 34462)
TO BE EXTENDED
NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. FOR GENERAL NOTES AND KEYS REFER TO DRAWING NO. GCCM5J10-ATK-HGN-ZZ_ML-DR-CH-000001
SHEET LAYOUT N.T.S
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
DESIGN FIX 2
DESIGN FOR CONSULTATION
APPROVED - PUBLISHED
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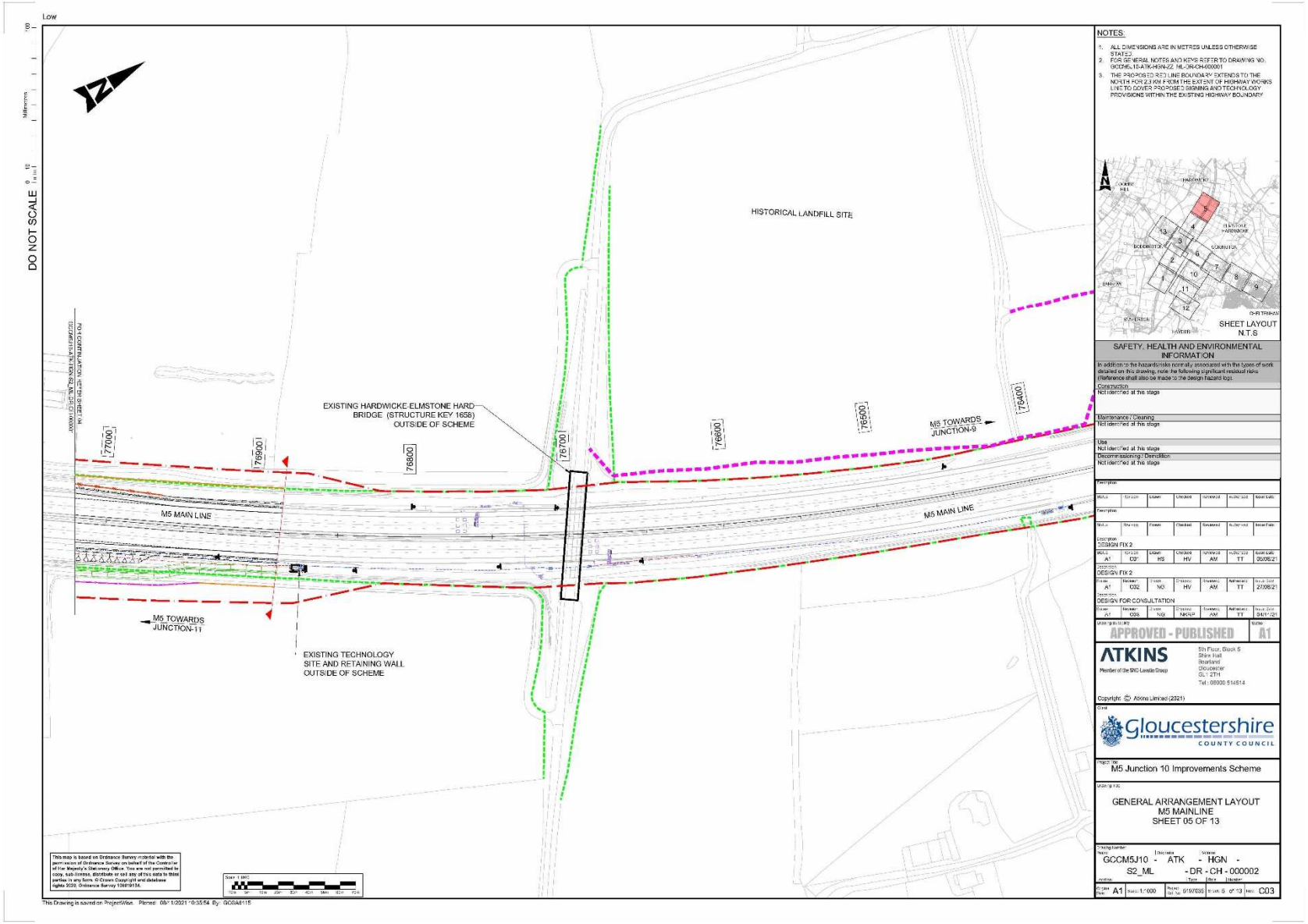
M5 Junction 10 Improvements Scheme
GENERAL ARRANGEMENT LAYOUT
M5 MAINLINE
SHEET 04 OF 13
GCCM5J10 - ATK - HGN - S2_ML - DR - CH - 000001
C03


Low
DO NOT SCALE
HISTORICAL LANDFILL SITE
EXISTING HARDWICKE ELMSTONE HARD BRIDGE (STRUCTURE KEY 1656) OUTSIDE OF SCHEME
M5 MAIN LINE
M5 MAIN LINE
M5 TOWARDS JUNCTION-9
M5 TOWARDS JUNCTION-11
EXISTING TECHNOLOGY SITE AND RETAINING WALL OUTSIDE OF SCHEME
77000
76900
76800
76700
76600
76500
76400
NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. FOR GENERAL NOTES AND KEYS REFER TO DRAWING NO. GCCM5J10-ATK-HGN-ZZ_ML-DR-CH-000001
3. THE PROPOSED RED LINE BOUNDARY EXTENDS TO THE NORTH FOR 2.3 KM FROM THE EXTENT OF HIGHWAY WORKS LINE TO COVER PROPOSED SIGNING AND TECHNOLOGY PROVISIONS WITHIN THE EXISTING HIGHWAY BOUNDARY.
SHEET LAYOUT N.T.S
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).
Construction
Not identified at this stage
Maintenance / Cleaning
Not identified at this stage
Use
Not identified at this stage
Decommissioning / Demolition
Not identified at this stage
DESIGN FIX 2
DESIGN FIX 2
DESIGN FOR CONSULTATION
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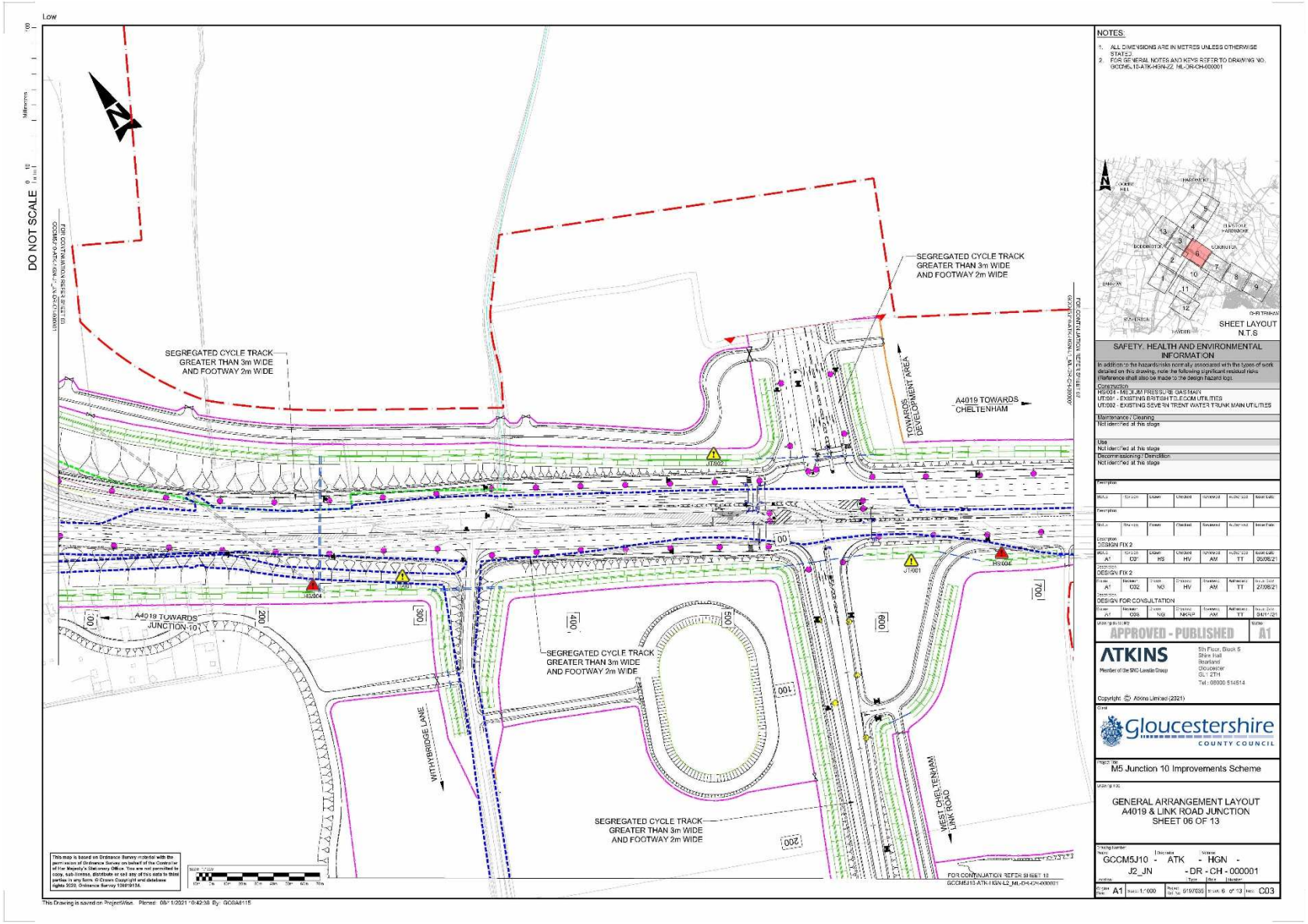
GENERAL ARRANGEMENT LAYOUT
M5 MAINLINE
SHEET 05 OF 13
GCCM5J10 - ATK - HGN - S2_ML - DR - CH - 000002
C03


Low
DO NOT SCALE
SEGREGATED CYCLE TRACK
GREATER THAN 3m WIDE
AND FOOTWAY 2m WIDE
A4019 TOWARDS
CHELTENHAM
TOWARDS
DEVELOPMENT AREA
A4019 TOWARDS
JUNCTION 10
WITHYBRIDGE LANE
WEST CHELTENHAM
LINK ROAD
FOR CONTINUATION REFER SHEET 12
GCCM5J10-ATK-EGN-L2_ML-DR-CH-000001
NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. FOR GENERAL NOTES AND KEYS REFER TO DRAWING NO. GCCM5J10-ATK-HGN-ZZ_ML-DR-CH-000001
SHEET LAYOUT
N.T.S
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).
Construction
HS/004 - MEDIUM PRESSURE GAS MAIN
UT/001 - EXISTING BRITISH TELECOM UTILITIES
UT/002 - EXISTING SEVERN TRENT WATER TRUNK MAIN UTILITIES
Maintenance / Cleaning
Not identified at this stage
Use
Not identified at this stage
Decommissioning / Demolition
Not identified at this stage
DESIGN FIX 2
DESIGN FIX 2
DESIGN FOR CONSULTATION
APPROVED - PUBLISHED
A1
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COUNTY COUNCIL
M5 Junction 10 Improvements Scheme
GENERAL ARRANGEMENT LAYOUT
A4019 & LINK ROAD JUNCTION
SHEET 06 OF 13
GCCM5J10 - ATK - HGN - J2_JN - DR - CH - 000001
C03
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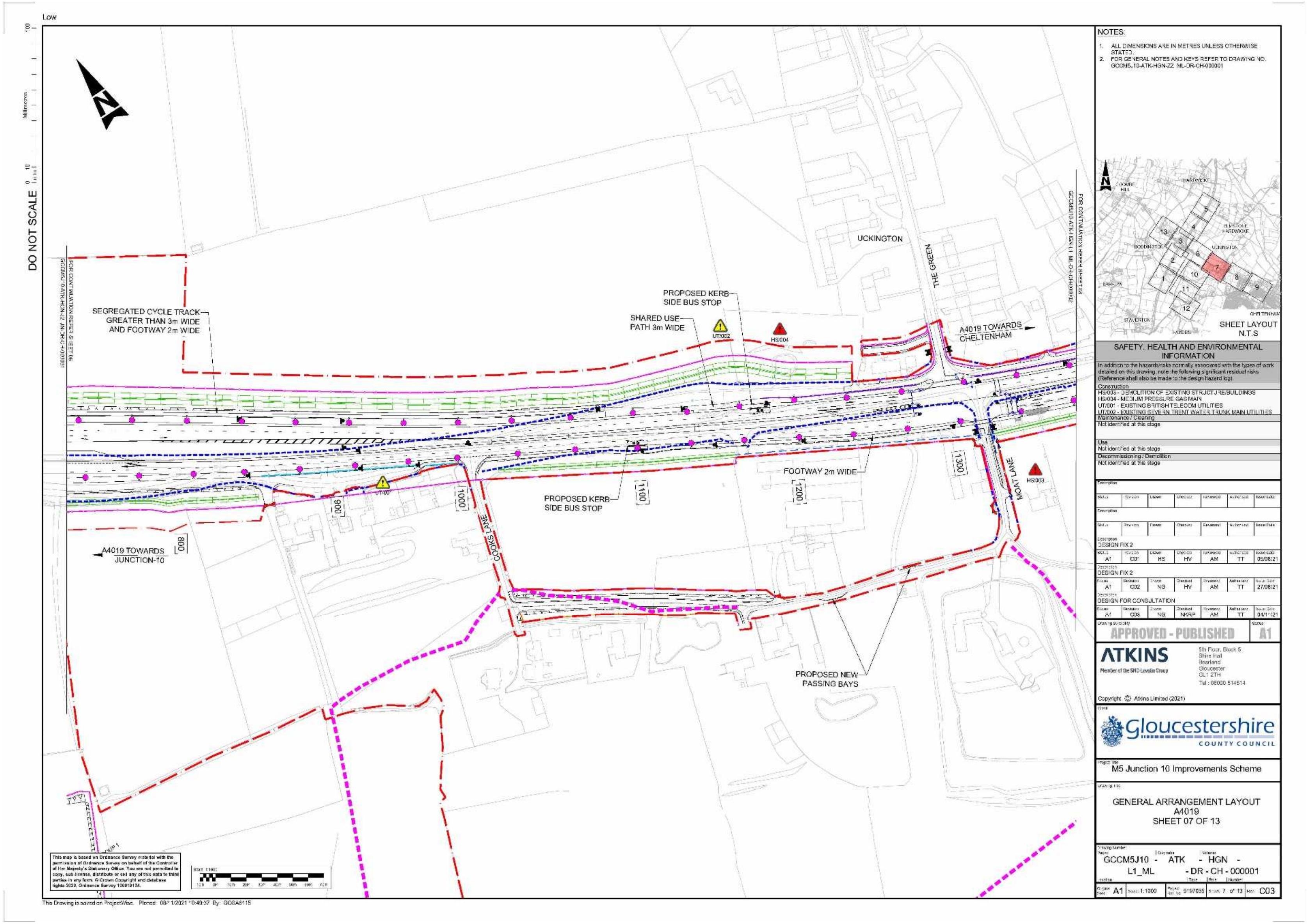
DO NOT SCALE
NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
UCKINGTON
THE GREEN
SEGREGATED CYCLE TRACK GREATER THAN 3m WIDE AND FOOTWAY 2m WIDE
SHARED USE PATH 3m WIDE
PROPOSED KERB SIDE BUS STOP
A4019 TOWARDS CHELTENHAM
FOOTWAY 2m WIDE
MOAT LANE
COOKS LANE
PROPOSED KERB SIDE BUS STOP
A4019 TOWARDS JUNCTION-10
PROPOSED NEW PASSING BAYS
SHEET LAYOUT N.T.S
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
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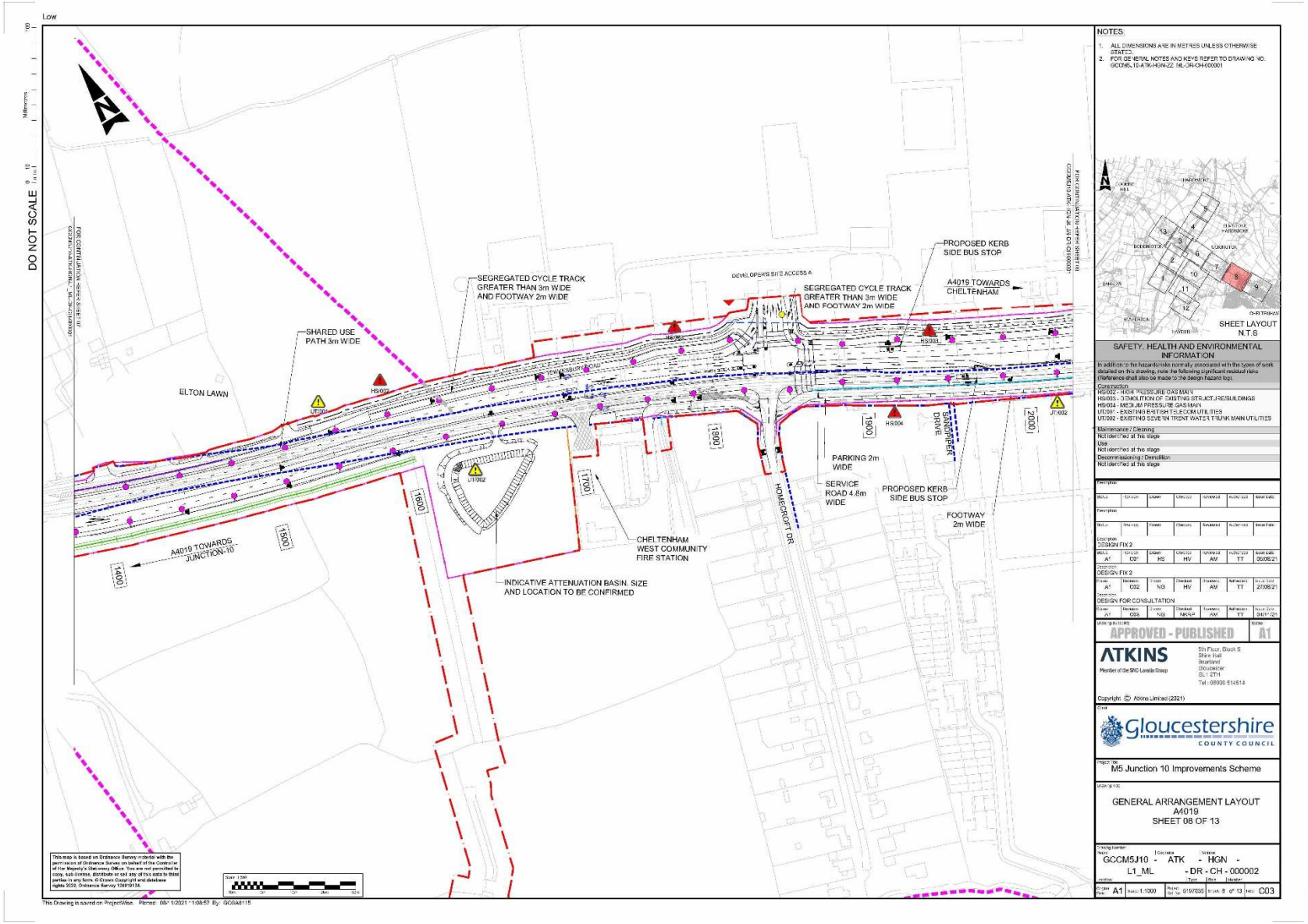
Gloucestershire COUNTY COUNCIL
M5 Junction 10 Improvements Scheme
GENERAL ARRANGEMENT LAYOUT
A4019
SHEET 07 OF 13
GCCM5J10 - ATK - HGN -
L1_ML - DR - CH - 000001
C03


Low
DO NOT SCALE
NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. FOR GENERAL NOTES AND KEYS REFER TO DRAWING NO. GCCM5J10-ATK-HGN-ZZ-ML-DR-CH-000001
SHEET LAYOUT N.T.S
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).
Construction
HS/002 - HIGH PRESSURE GAS MAIN
HS/003 - DEMOLITION OF EXISTING STRUCTURES/BUILDINGS
HS/004 - MEDIUM PRESSURE GAS MAIN
UT/001 - EXISTING BRITISH TELECOM UTILITIES
UT/002 - EXISTING SEVERN TRENT WATER TRUNK MAIN UTILITIES
Maintenance / Cleaning
Not identified at this stage
Use
Not identified at this stage
Decommissioning / Demolition
Not identified at this stage
DESIGN FIX 2
DESIGN FIX 2
DESIGN FOR CONSULTATION
APPROVED - PUBLISHED
A1
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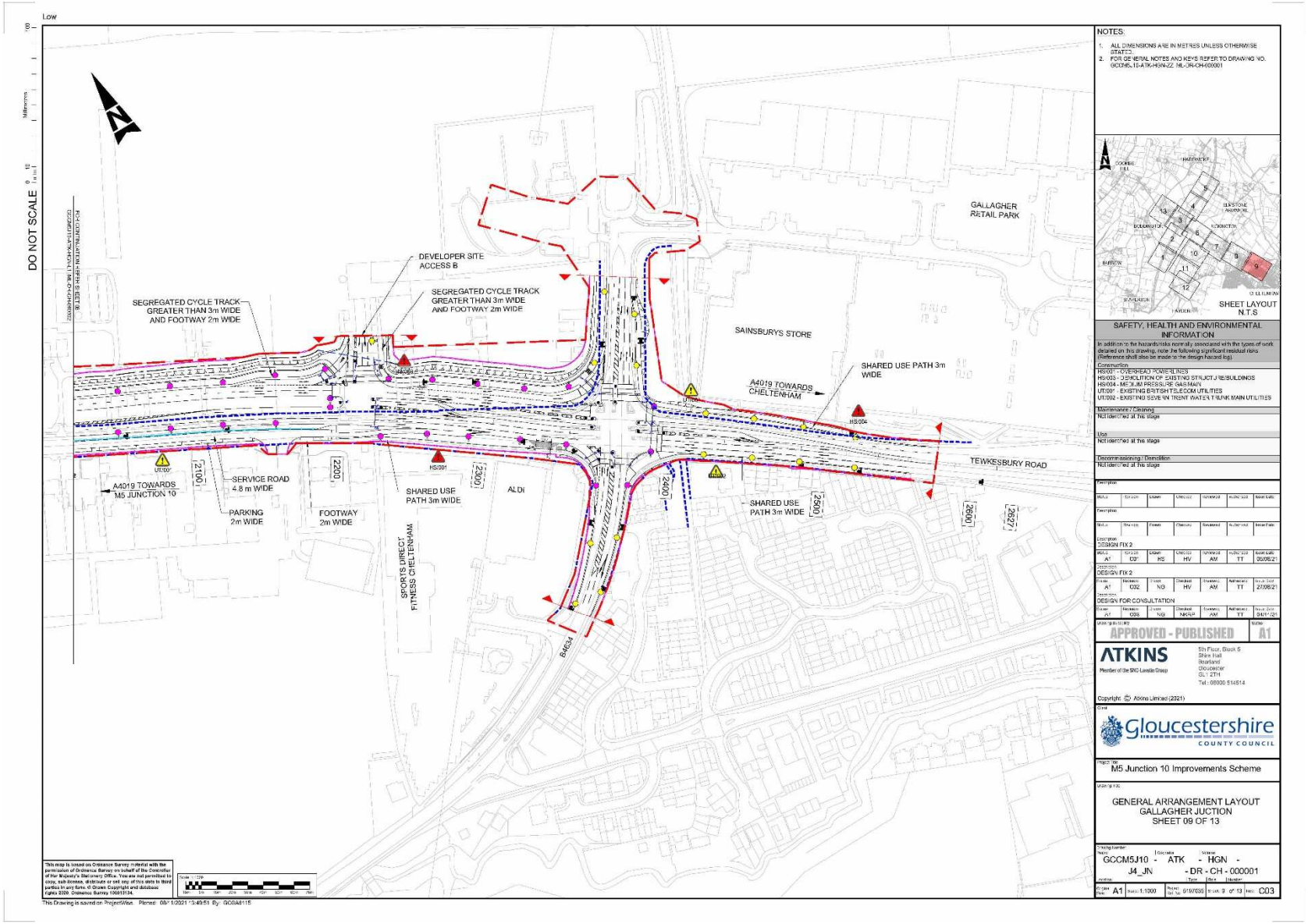
GENERAL ARRANGEMENT LAYOUT
A4019
SHEET 08 OF 13
GCCM5J10 - ATK - HGN - L1_ML - DR - CH - 000002
C03
SEGREGATED CYCLE TRACK GREATER THAN 3m WIDE AND FOOTWAY 2m WIDE
SHARED USE PATH 3m WIDE
ELTON LAWN
A4019 TOWARDS JUNCTION 10
A4019 TOWARDS CHELTENHAM
PROPOSED KERB SIDE BUS STOP
DEVELOPERS SITE ACCESS A
PARKING 2m WIDE
SERVICE ROAD 4.8m WIDE
FOOTWAY 2m WIDE
HOMECROFT DR
CHELTENHAM WEST COMMUNITY FIRE STATION
INDICATIVE ATTENUATION BASIN. SIZE AND LOCATION TO BE CONFIRMED
HS/002
HS/003
HS/004
UT/001
UT/002
1400
1500
1600
1700
1800
1900
2000


Low
DO NOT SCALE
NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. FOR GENERAL NOTES AND KEYS REFER TO DRAWING NO. GCCM5J10-ATK-HGN-ZZ-ML-JN-CH-000001
SHEET LAYOUT N.T.S
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference should also be made to the design hazard log).
Construction
HS/001 - OVERHEAD POWERLINES
HS/003 - DEMOLITION OF EXISTING STRUCTURE/BUILDINGS
HS/004 - MEDIUM PRESSURE GAS MAIN
UT/001 - EXISTING BRITISH TELECOM UTILITIES
UT/002 - EXISTING SEVERN TRENT WATER TRUNK MAIN UTILITIES
Maintenance / Cleaning
Not identified at this stage
Use
Not identified at this stage
Decommissioning / Demolition
Not identified at this stage
DESIGN FIX 2
DESIGN FIX 2
DESIGN FOR CONSULTATION
APPROVED - PUBLISHED
A1
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Gloucester
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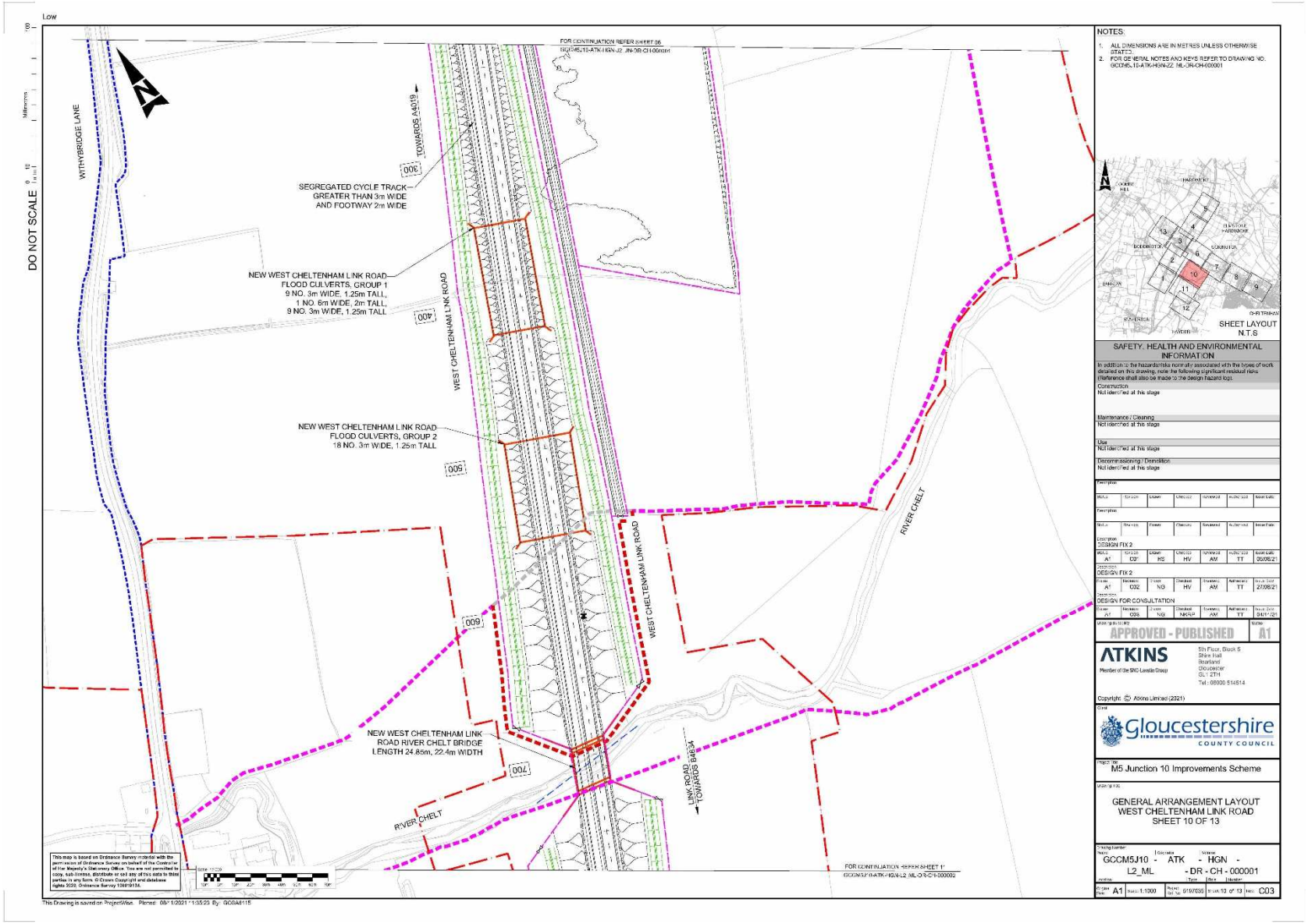
M5 Junction 10 Improvements Scheme
GENERAL ARRANGEMENT LAYOUT
GALLAGHER JUNCTION
SHEET 09 OF 13
GCCM5J10 - ATK - HGN - J4_JN - DR - CH - 000001
A1
1:1000
C03
SEGREGATED CYCLE TRACK GREATER THAN 3m WIDE AND FOOTWAY 2m WIDE
DEVELOPER SITE ACCESS B
SEGREGATED CYCLE TRACK GREATER THAN 3m WIDE AND FOOTWAY 2m WIDE
GALLAGHER RETAIL PARK
SAINSBURYS STORE
SHARED USE PATH 3m WIDE
A4019 TOWARDS CHELTENHAM
TEWKESBURY ROAD
A4019 TOWARDS M5 JUNCTION 10
SERVICE ROAD 4.8 m WIDE
PARKING 2m WIDE
FOOTWAY 2m WIDE
SHARED USE PATH 3m WIDE
ALDI
SHARED USE PATH 3m WIDE
SPORTS DIRECT FITNESS CHELTENHAM
B4634
2100
2200
2300
2400
2500
2600
2627
HS/001
HS/003
HS/004
UT/001
UT/002


Low
DO NOT SCALE
WITHYBRIDGE LANE
TOWARDS A4019
SEGREGATED CYCLE TRACK GREATER THAN 3m WIDE AND FOOTWAY 2m WIDE
NEW WEST CHELTENHAM LINK ROAD FLOOD CULVERTS, GROUP 1 9 NO. 3m WIDE, 1.25m TALL, 1 NO. 6m WIDE, 2m TALL, 9 NO. 3m WIDE, 1.25m TALL
NEW WEST CHELTENHAM LINK ROAD FLOOD CULVERTS, GROUP 2 18 NO. 3m WIDE, 1.25m TALL
WEST CHELTENHAM LINK ROAD
RIVER CHELT
NEW WEST CHELTENHAM LINK ROAD RIVER CHELT BRIDGE LENGTH 24.86m, 22.4m WIDTH
LINK ROAD TOWARDS B4634
FOR CONTINUATION REFER SHEET 36
FOR CONTINUATION REFER SHEET 1
NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. FOR GENERAL NOTES AND KEYS REFER TO DRAWING NO. GCCM5J10-ATK-HGN-ZZ-ML-DR-CH-000001
SHEET LAYOUT N.T.S
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
Construction
Not identified at this stage
Maintenance / Cleaning
Not identified at this stage
Use
Not identified at this stage
Decommissioning / Demolition
Not identified at this stage
DESIGN FIX 2
DESIGN FIX 2
DESIGN FOR CONSULTATION
APPROVED - PUBLISHED
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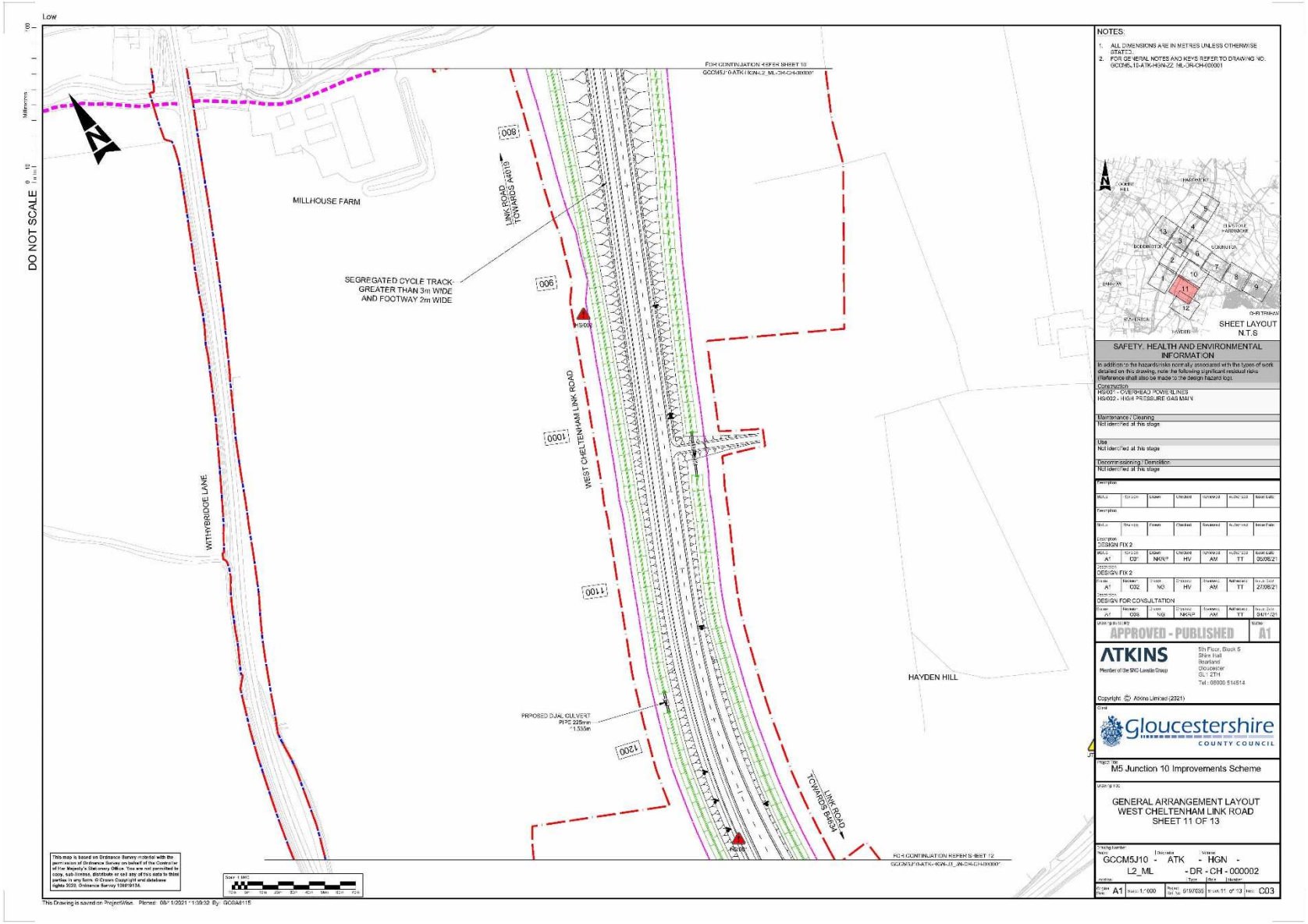
Gloucestershire COUNTY COUNCIL
M5 Junction 10 Improvements Scheme
GENERAL ARRANGEMENT LAYOUT
WEST CHELTENHAM LINK ROAD
SHEET 10 OF 13
GCCM5J10 - ATK - HGN - L2_ML - DR - CH - 000001
C03


Low
DO NOT SCALE
MILLHOUSE FARM
WITHYBRIDGE LANE
WEST CHELTENHAM LINK ROAD
SEGREGATED CYCLE TRACK GREATER THAN 3m WIDE AND FOOTWAY 2m WIDE
LINK ROAD TOWARDS A4019
LINK ROAD TOWARDS B4634
HAYDEN HILL
PROPOSED DUAL CULVERT PIPE 225mm
1:333m
FOR CONTINUATION REFER SHEET 10
FOR CONTINUATION REFERS SHEET 12
NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. FOR GENERAL NOTES AND KEYS REFER TO DRAWING NO. GCCM5J10-ATK-HGN-ZZ_ML-DR-CH-000001
SHEET LAYOUT N.T.S
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).
Construction
HS/001 - OVERHEAD POWERLINES
HS/002 - HIGH PRESSURE GAS MAIN
Maintenance / Cleaning
Not identified at this stage
Use
Not identified at this stage
Decommissioning / Demolition
Not identified at this stage
DESIGN FIX 2
DESIGN FIX 2
DESIGN FOR CONSULTATION
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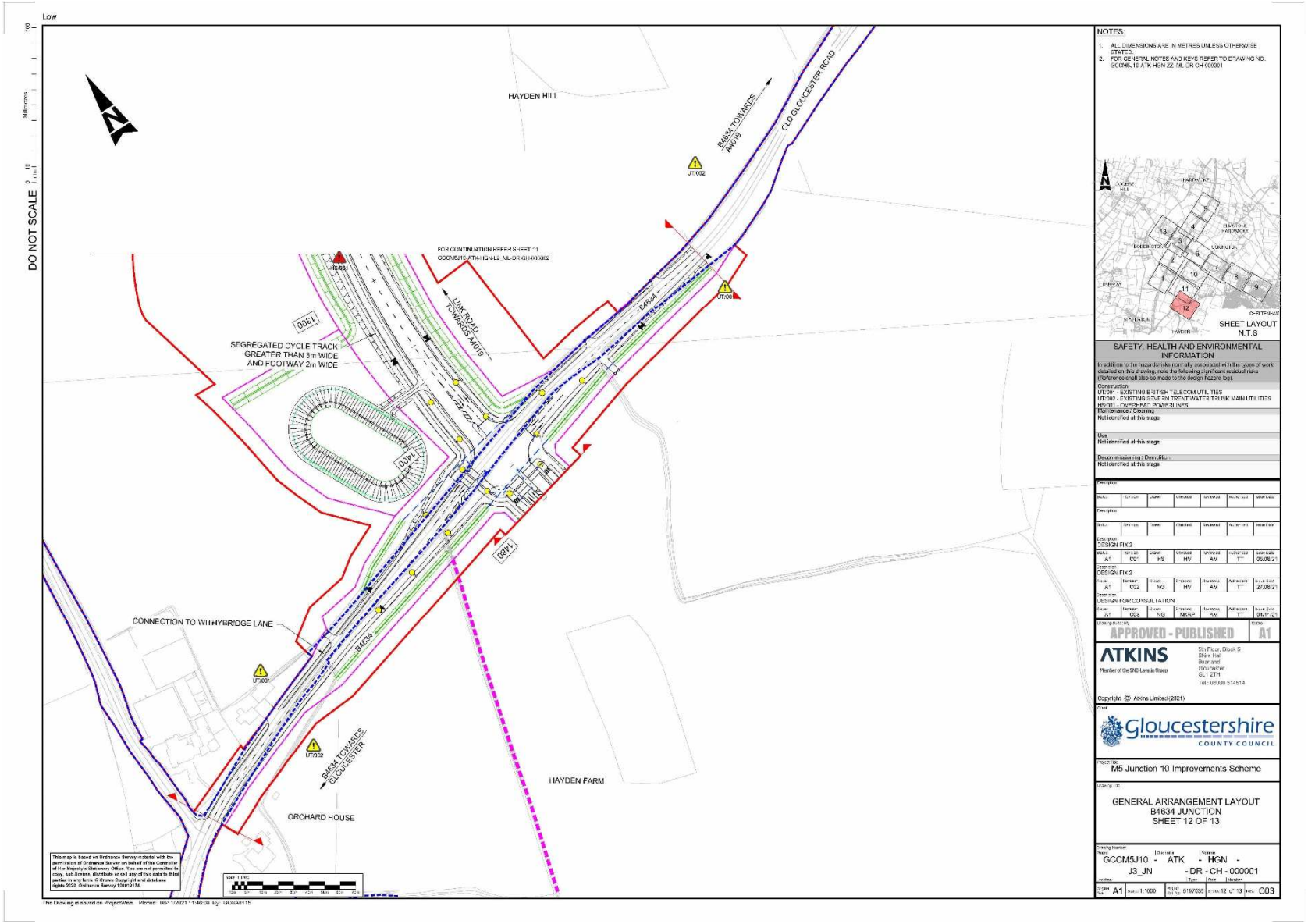
M5 Junction 10 Improvements Scheme
GENERAL ARRANGEMENT LAYOUT
WEST CHELTENHAM LINK ROAD
SHEET 11 OF 13
GCCM5J10 - ATK - HGN - L2_ML - DR - CH - 000002
C03


Low
DO NOT SCALE
HAYDEN HILL
B4634 TOWARDS A4019
OLD GLOUCESTER ROAD
SEGREGATED CYCLE TRACK GREATER THAN 3m WIDE AND FOOTWAY 2m WIDE
LINK ROAD TOWARDS A4019
B4634
CONNECTION TO WITHYBRIDGE LANE
B4634 TOWARDS GLOUCESTER
HAYDEN FARM
ORCHARD HOUSE
NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. FOR GENERAL NOTES AND KEYS REFER TO DRAWING NO. GCCM5J10-ATK-HGN-ZZ-ML-DR-CH-000001
SHEET LAYOUT N.T.S
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
Construction
UT/007 - EXISTING BRITISH TELECOM UTILITIES
UT/002 - EXISTING SEVERN TRENT WATER TRUNK MAIN UTILITIES
HS/001 - OVERHEAD POWERLINES
Maintenance / Cleaning
Not identified at this stage
Use
Not identified at this stage
Decommissioning / Demolition
Not identified at this stage
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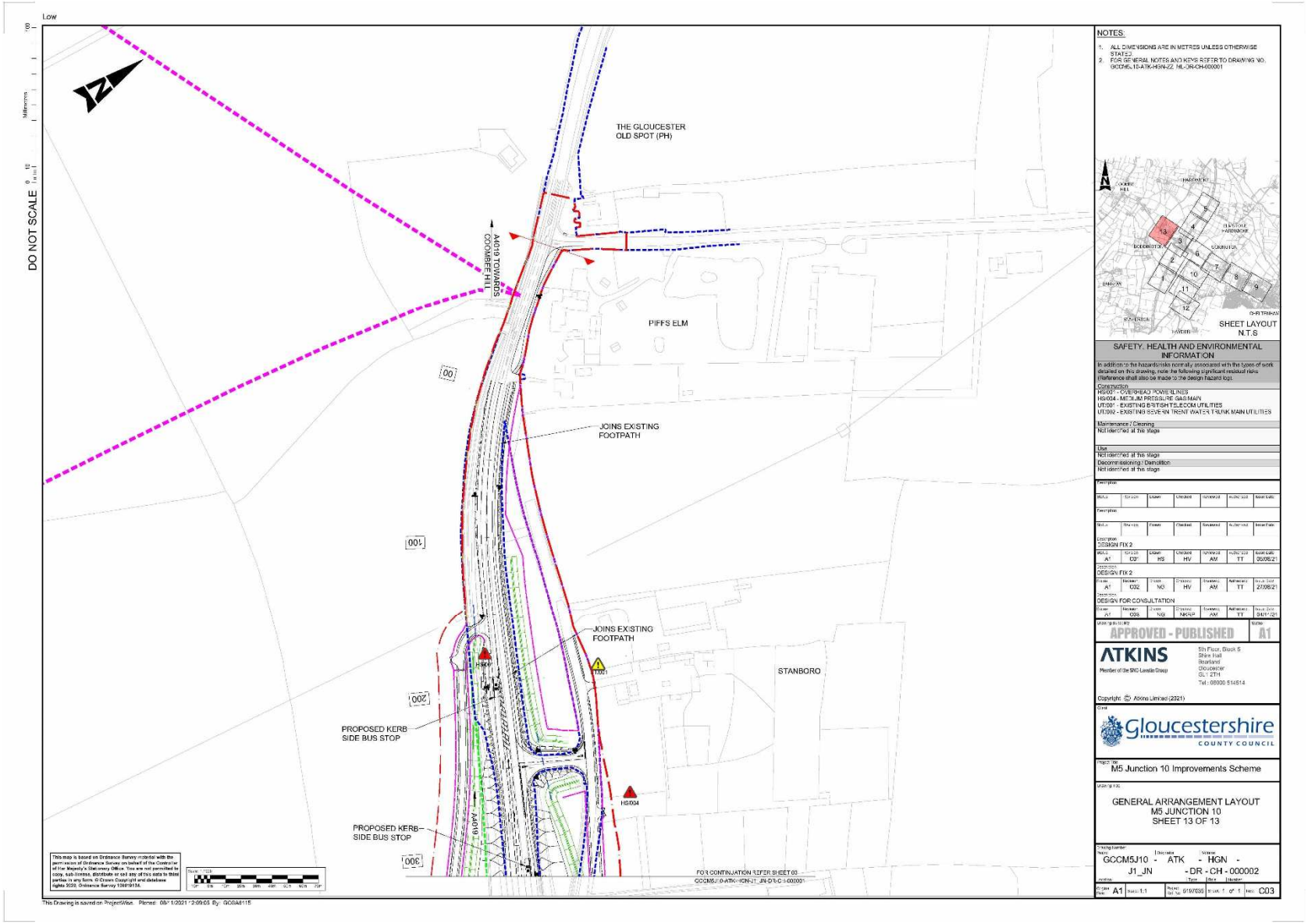
B4634 JUNCTION
SHEET 12 OF 13
GCCM5J10 - ATK - HGN - J3_JN - DR - CH - 000001
C03


Low
DO NOT SCALE
THE GLOUCESTER OLD SPOT (PH)
A4019 TOWARDS COOMBE HILL
PIFFS ELM
JOINS EXISTING FOOTPATH
JOINS EXISTING FOOTPATH
STANBORO
PROPOSED KERB SIDE BUS STOP
PROPOSED KERB SIDE BUS STOP
A4019
HS004
HS001
FOR CONTINUATION REFER SHEET 03
GCCM5J10-ATK-HGN-J1_JN-DR-C-000003
NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED
2. FOR GENERAL NOTES AND KEYS REFER TO DRAWING NO. GCCM5J10-ATK-HGN-ZZ_ML-DR-CH-000001
SHEET LAYOUT N.T.S
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).
Construction
HS/001 - OVERHEAD POWER LINES
HS/004 - MEDIUM PRESSURE GAS MAIN
UT/001 - EXISTING BRITISH TELECOM UTILITIES
UT/002 - EXISTING SOVERN TRENT WATER TRUNK MAIN UTILITIES
Maintenance / Cleaning
Not identified at this stage
Use
Not identified at this stage
Decommissioning / Demolition
Not identified at this stage
DESIGN FIX 2
DESIGN FIX 2
DESIGN FOR CONSULTATION
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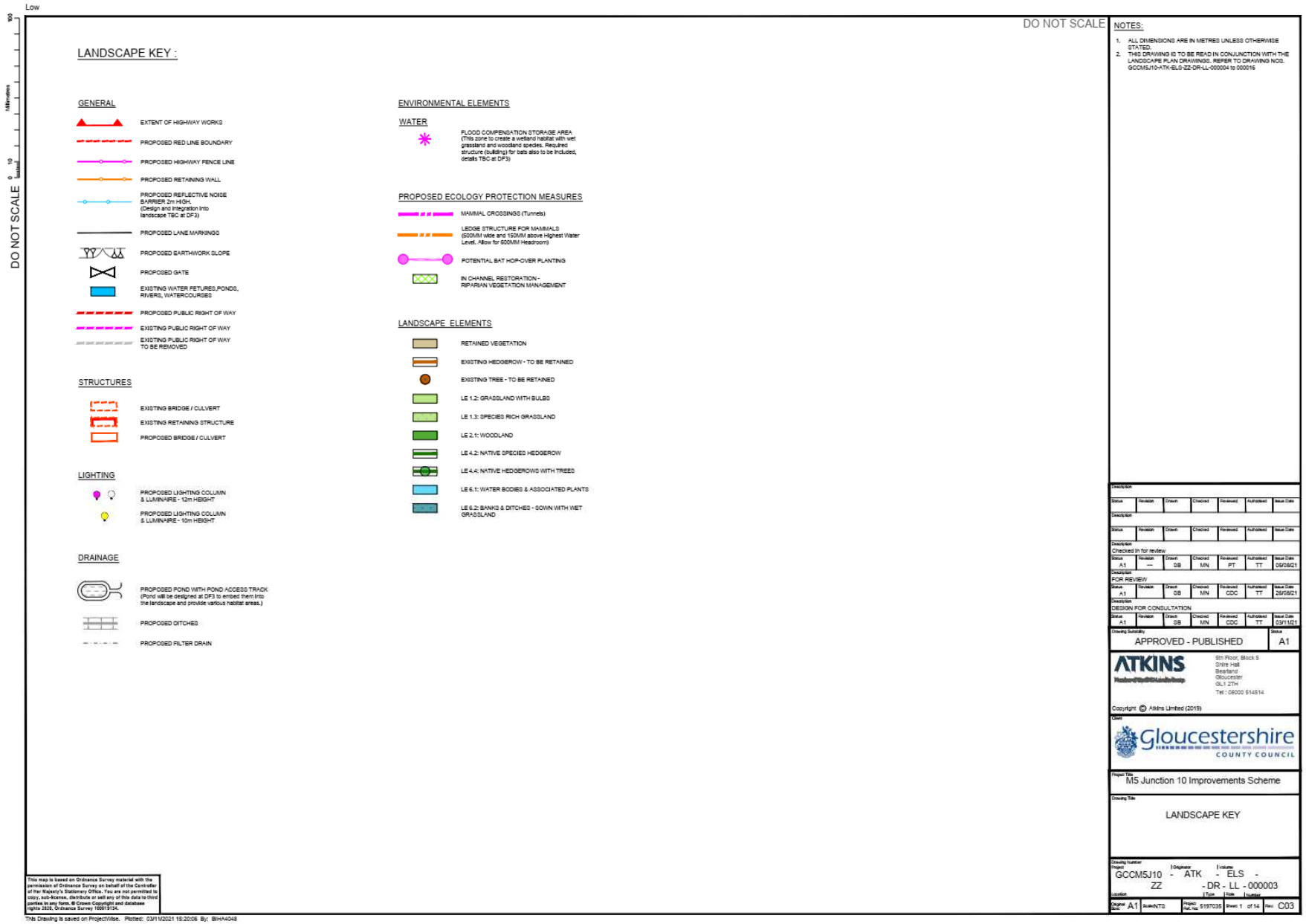
GENERAL ARRANGEMENT LAYOUT
M5 JUNCTION 10
SHEET 13 OF 13
GCCM5J10 - ATK - HGN - J1_JN - DR - CH - 000002
C03

Appendix 2.2

Figure A2-2 – Landscape design figures – comprising a landscape key and sheets 1-13


Low
DO NOT SCALE
DO NOT SCALE
LANDSCAPE KEY :
GENERAL
EXTENT OF HIGHWAY WORKS
PROPOSED RED LINE BOUNDARY
PROPOSED HIGHWAY FENCE LINE
PROPOSED RETAINING WALL
PROPOSED REFLECTIVE NOISE BARRIER 2m HIGH. (Design and Integration into landscape TBC at DF3)
PROPOSED LANE MARKINGS
PROPOSED EARTHWORK SLOPE
PROPOSED GATE
EXISTING WATER FETURES,PONDS, RIVERS, WATERCOURSES
PROPOSED PUBLIC RIGHT OF WAY
EXISTING PUBLIC RIGHT OF WAY
EXISTING PUBLIC RIGHT OF WAY TO BE REMOVED
STRUCTURES
EXISTING BRIDGE / CULVERT
EXISTING RETAINING STRUCTURE
PROPOSED BRIDGE / CULVERT
LIGHTING
PROPOSED LIGHTING COLUMN & LUMINAIRE - 12m HEIGHT
PROPOSED LIGHTING COLUMN & LUMINAIRE - 10m HEIGHT
DRAINAGE
PROPOSED POND WITH POND ACCESS TRACK (Pond will be designed at DF3 to embed them into the landscape and provide various habitat areas.)
PROPOSED DITCHES
PROPOSED FILTER DRAIN
ENVIRONMENTAL ELEMENTS
WATER
FLOOD COMPENSATION STORAGE AREA (This zone to create a wetland habitat with wet grassland and woodland species. Required structure (building) for bats also to be included, details TBC at DF3)
PROPOSED ECOLOGY PROTECTION MEASURES
MAMMAL CROSSINGS (Tunnels)
LEDGE STRUCTURE FOR MAMMALS (600MM wide and 150MM above Highest Water Level. Allow for 600MM Headroom)
POTENTIAL BAT HOP-OVER PLANTING
IN CHANNEL RESTORATION - RIPARIAN VEGETATION MANAGEMENT
LANDSCAPE ELEMENTS
RETAINED VEGETATION
EXISTING HEDGEROW - TO BE RETAINED
EXISTING TREE - TO BE RETAINED
LE 1.2: GRASSLAND WITH BULBS
LE 1.3: SPECIES RICH GRASSLAND
LE 2.1: WOODLAND
LE 4.2: NATIVE SPECIES HEDGEROW
LE 4.4: NATIVE HEDGEROWS WITH TREES
LE 6.1: WATER BODIES & ASSOCIATED PLANTS
LE 6.2: BANKS & DITCHES - SOWN WITH WET GRASSLAND
NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE LANDSCAPE PLAN DRAWINGS. REFER TO DRAWING NOS. GCCM5J10-ATK-ELS-ZZ-DR-LL-000004 to 000016
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M5 Junction 10 Improvements Scheme
LANDSCAPE KEY
GCCM5J10 - ATK - ELS - ZZ - DR - LL - 000003
A1
C03
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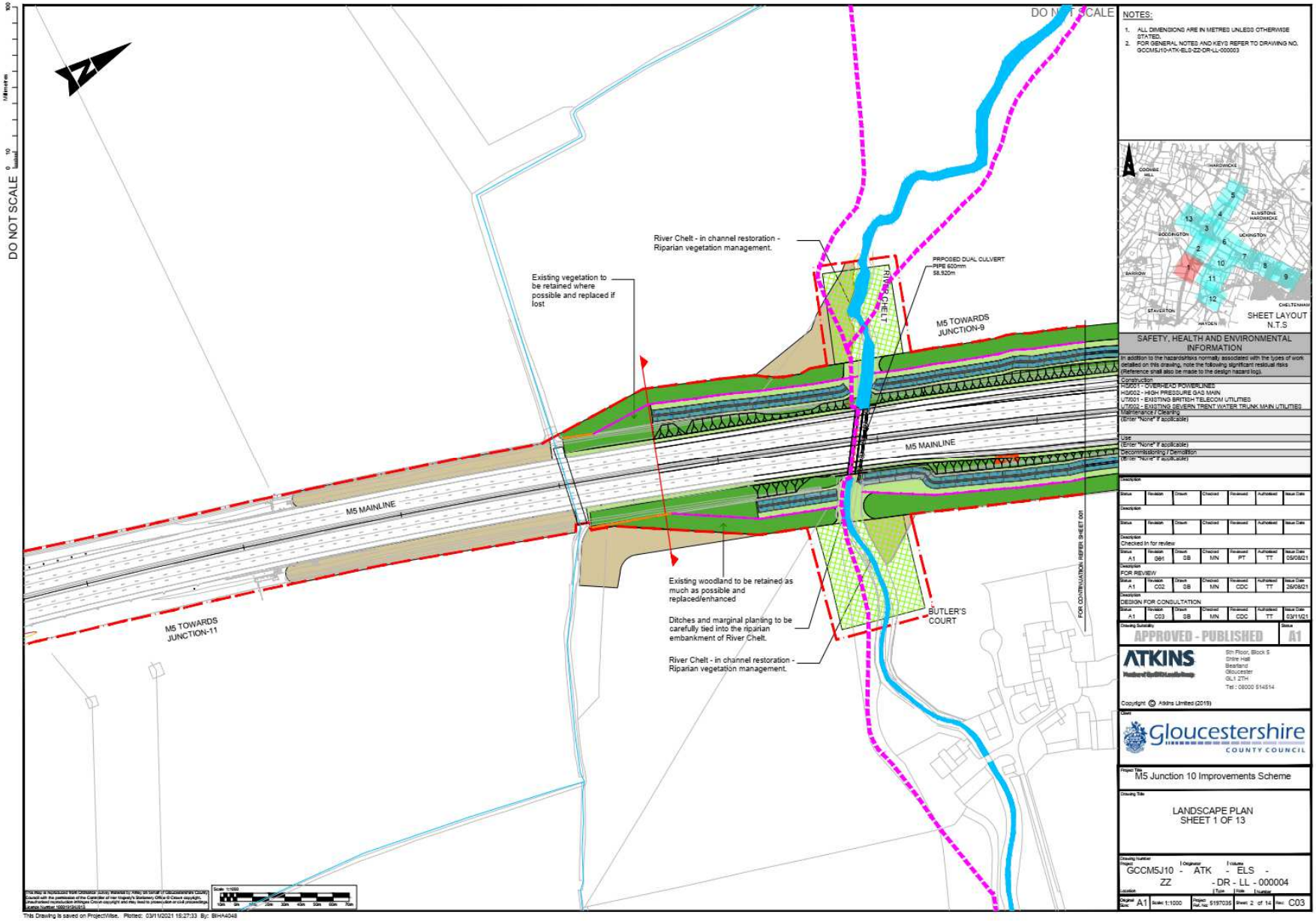
DO NOT SCALE
River Chelt - in channel restoration - Riparian vegetation management.
Existing vegetation to be retained where possible and replaced if lost
PROPOSED DUAL CULVERT PIPE 600mm 58.520m
RIVER CHELT
M5 TOWARDS JUNCTION-9
M5 MAINLINE
M5 MAINLINE
M5 TOWARDS JUNCTION-11
Existing woodland to be retained as much as possible and replaced/enhanced
Ditches and marginal planting to be carefully tied into the riparian embankment of River Chelt.
River Chelt - in channel restoration - Riparian vegetation management.
BUTLER'S COURT
FOR CONTINUATION REFER SHEET 001
NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. FOR GENERAL NOTES AND KEYS REFER TO DRAWING NO. GCCM5J10-ATK-ELS-ZZ-DR-LL-000003
SHEET LAYOUT N.T.S
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).
Construction
HS/001 - OVERHEAD POWERLINES
HS/002 - HIGH PRESSURE GAS MAIN
UT/001 - EXISTING BRITISH TELECOM UTILITIES
UT/002 - EXISTING SEVERN TRENT WATER TRUNK MAIN UTILITIES
Maintenance / Cleaning
(Enter "None" if applicable)
Use
(Enter "None" if applicable)
Decommissioning / Demolition
(Enter "None" if applicable)
Checked in for review
FOR REVIEW
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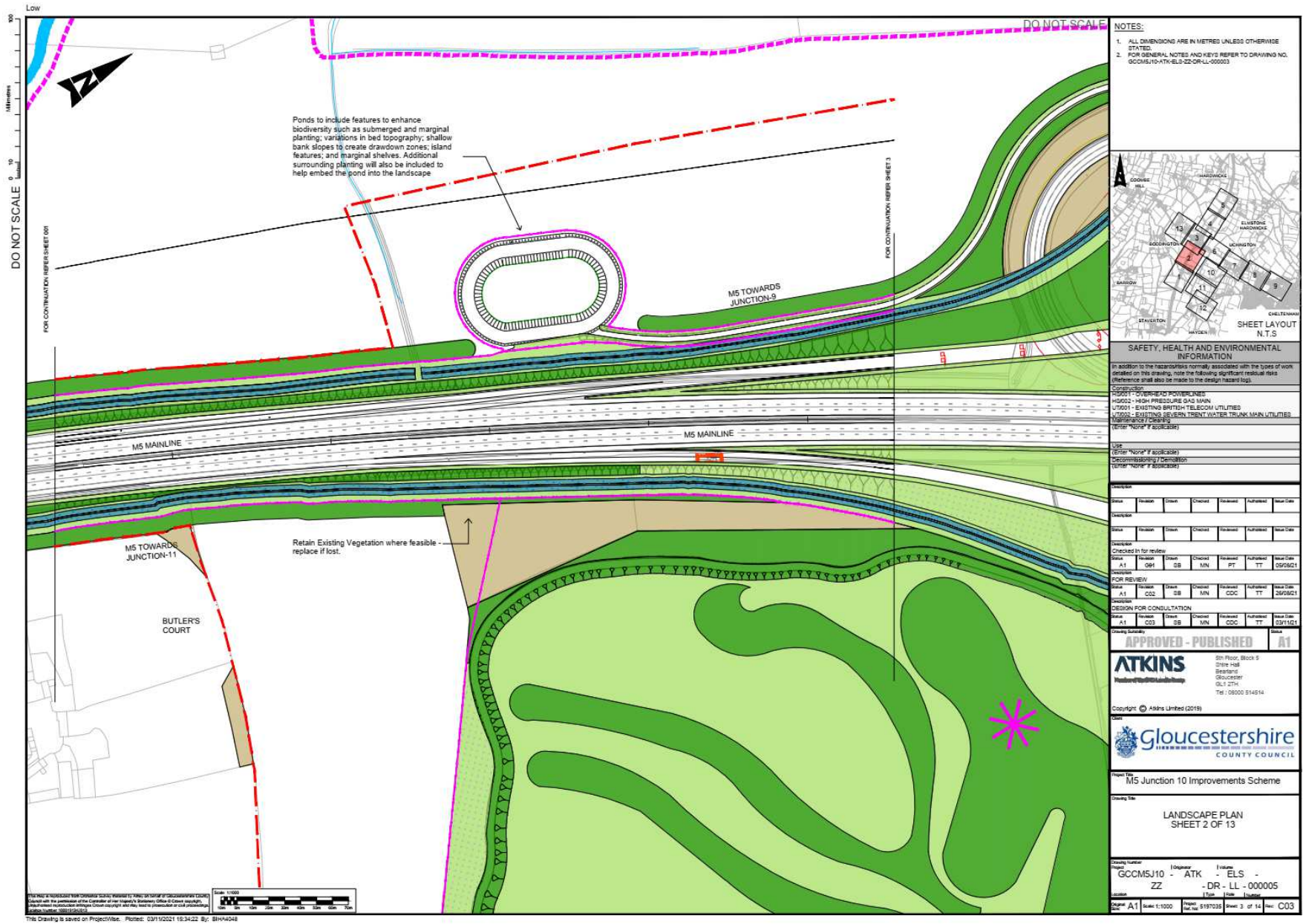
M5 Junction 10 Improvements Scheme
LANDSCAPE PLAN SHEET 1 OF 13
GCCM5J10 - ATK - ELS - ZZ - DR - LL - 000004
A1
C03


Low
DO NOT SCALE
DO NOT SCALE
Ponds to include features to enhance biodiversity such as submerged and marginal planting; variations in bed topography; shallow bank slopes to create drawdown zones; island features; and marginal shelves. Additional surrounding planting will also be included to help embed the pond into the landscape
M5 TOWARDS JUNCTION-9
M5 MAINLINE
M5 MAINLINE
M5 TOWARDS JUNCTION-11
Retain Existing Vegetation where feasible - replace if lost.
BUTLER'S COURT
FOR CONTINUATION REFER SHEET 001
FOR CONTINUATION REFER SHEET 3
NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. FOR GENERAL NOTES AND KEYS REFER TO DRAWING NO. GCCM5J10-ATK-ELS-ZZ-DR-LL-000003
SHEET LAYOUT N.T.S
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks: (Reference shall also be made to the design hazard log).
Construction
HS/001 - OVERHEAD POWERLINES
HS/002 - HIGH PRESSURE GAS MAIN
UT/001 - EXISTING BRITISH TELECOM UTILITIES
UT/002 - EXISTING SEVERN TRENT WATER TRUNK MAIN UTILITIES
Maintenance / Cleaning
(Enter "None" if applicable)
Use
(Enter "None" if applicable)
Decommissioning / Demolition
(Enter "None" if applicable)
Checked In for review
FOR REVIEW
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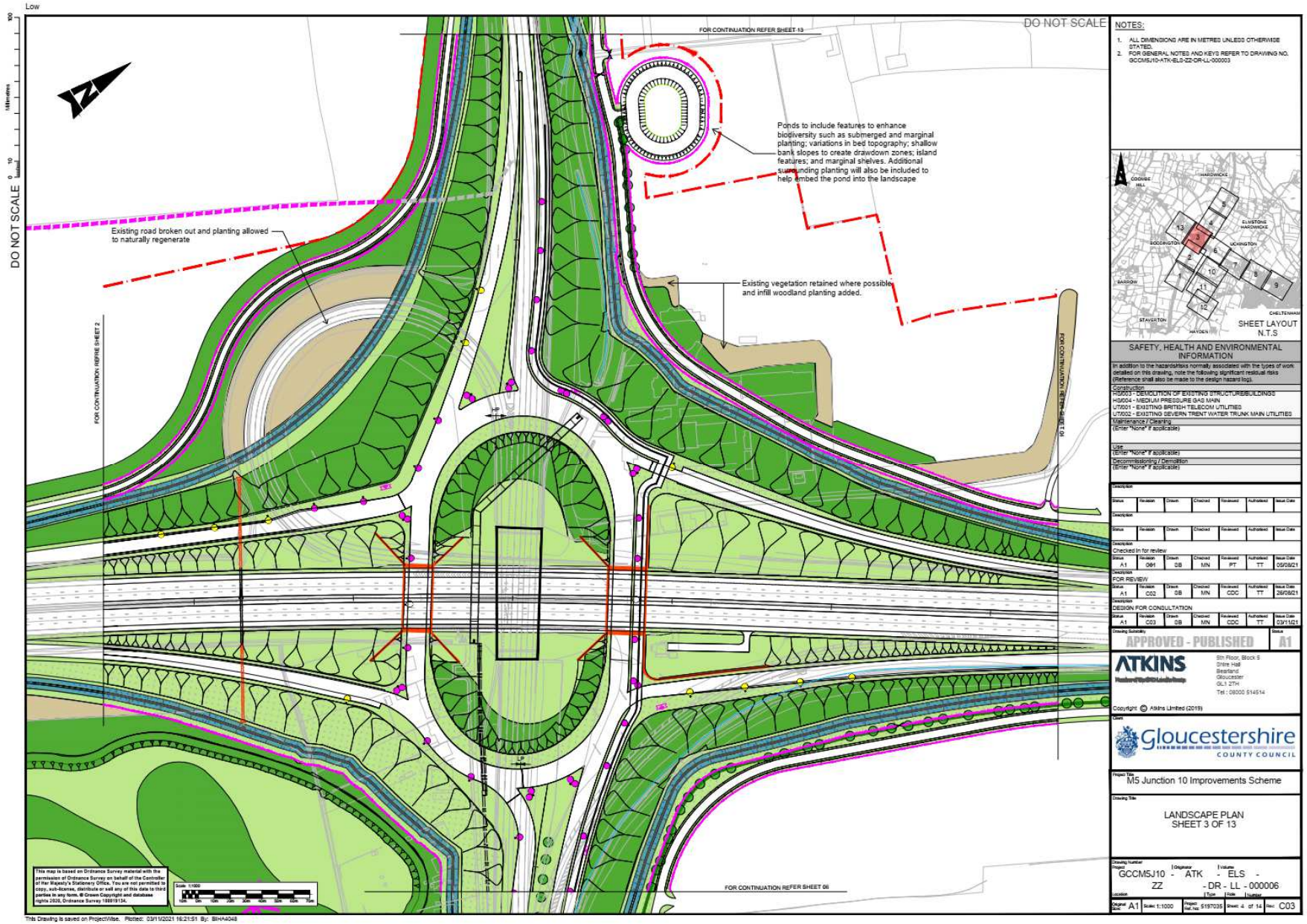
M5 Junction 10 Improvements Scheme
LANDSCAPE PLAN SHEET 2 OF 13
GCCM5J10 - ATK - ELS - ZZ - DR - LL - 000005
A1
C03


Low
DO NOT SCALE
FOR CONTINUATION REFER SHEET 13
Ponds to include features to enhance biodiversity such as submerged and marginal planting; variations in bed topography; shallow bank slopes to create drawdown zones; island features; and marginal shelves. Additional surrounding planting will also be included to help embed the pond into the landscape
Existing road broken out and planting allowed to naturally regenerate
Existing vegetation retained where possible and infill woodland planting added.
FOR CONTINUATION REFER SHEET 2
FOR CONTINUATION REFER SHEET 10
FOR CONTINUATION REFER SHEET 06
NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. FOR GENERAL NOTES AND KEYS REFER TO DRAWING NO. GCCM5J10-ATK-ELS-ZZ-DR-LL-000003
SHEET LAYOUT N.T.S
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).
Construction
HS/003 - DEMOLITION OF EXISTING STRUCTURES/BUILDINGS
HS/004 - MEDIUM PRESSURE GAS MAIN
UT/001 - EXISTING BRITISH TELECOM UTILITIES
UT/002 - EXISTING SEVERN TRENT WATER TRUNK MAIN UTILITIES
Maintenance / Cleaning
(Enter "None" if applicable)
Use
(Enter "None" if applicable)
Decommissioning / Demolition
(Enter "None" if applicable)
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M5 Junction 10 Improvements Scheme
LANDSCAPE PLAN
SHEET 3 OF 13
GCCM5J10 - ATK - ELS - ZZ - DR - LL - 000006
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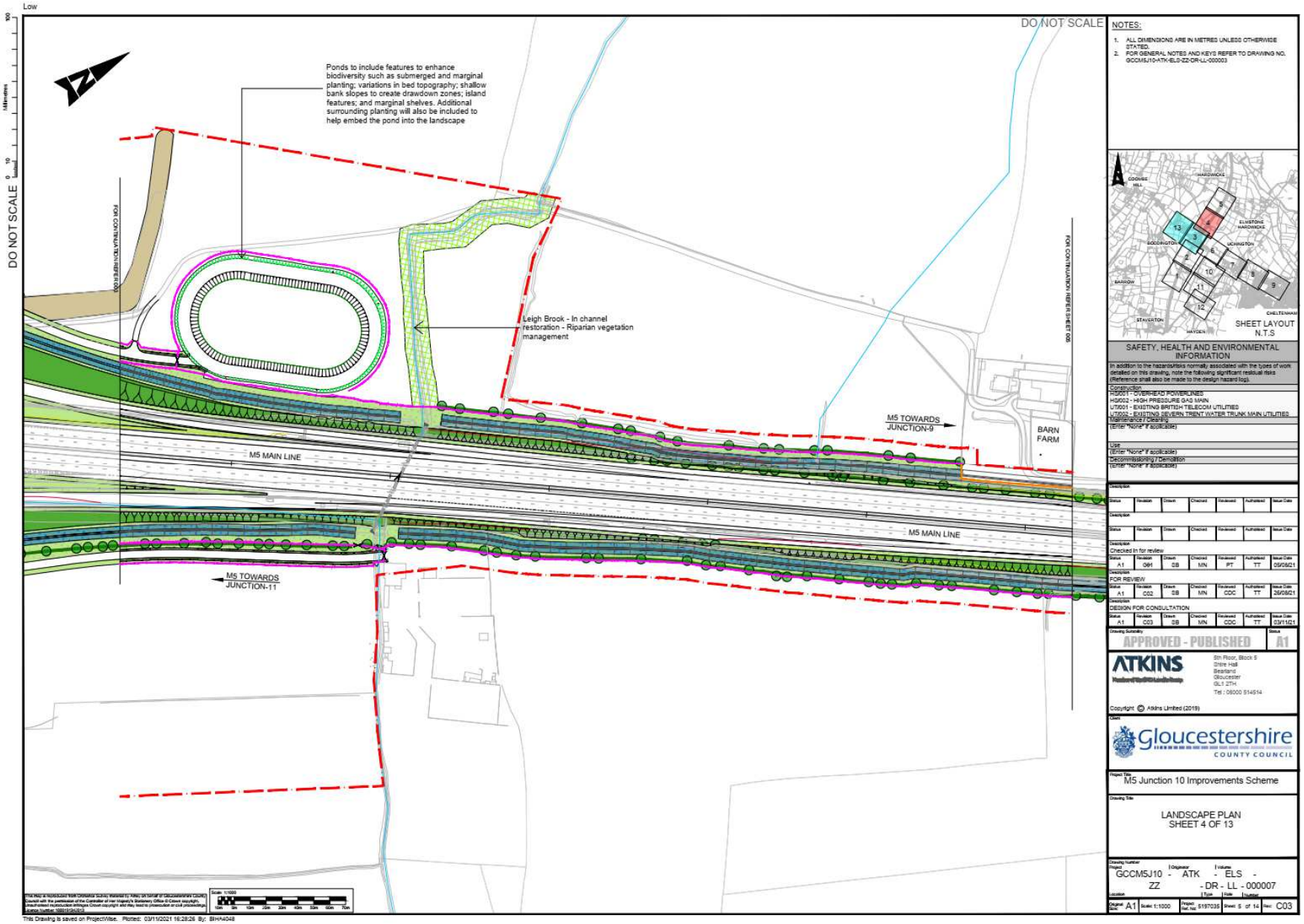
Low
DO NOT SCALE
DO NOT SCALE
Ponds to include features to enhance biodiversity such as submerged and marginal planting; variations in bed topography; shallow bank slopes to create drawdown zones; island features; and marginal shelves. Additional surrounding planting will also be included to help embed the pond into the landscape
Leigh Brook - In channel restoration - Riparian vegetation management
M5 MAIN LINE
M5 MAIN LINE
M5 TOWARDS JUNCTION-9
M5 TOWARDS JUNCTION-11
BARN FARM
FOR CONTINUATION REFER SHEET 003
FOR CONTINUATION REFER SHEET 003
NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. FOR GENERAL NOTES AND KEYS REFER TO DRAWING NO. GCCM5J10-ATK-ELS-XZ-DR-LL-000003
SHEET LAYOUT N.T.S
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks: (Reference shall also be made to the design hazard log).
Construction
HS/001 - OVERHEAD POWERLINES
HS/002 - HIGH PRESSURE GAS MAIN
UT/001 - EXISTING BRITISH TELECOM UTILITIES
UT/002 - EXISTING SEVERN TRENT WATER TRUNK MAIN UTILITIES
Maintenance / Cleaning
(Enter "None" if applicable)
Use
(Enter "None" if applicable)
Decommissioning / Demolition
(Enter "None" if applicable)
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SHEET 4 OF 13
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A1
Scale: 1:1000
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Sheet: 5 of 14
Rev: C03
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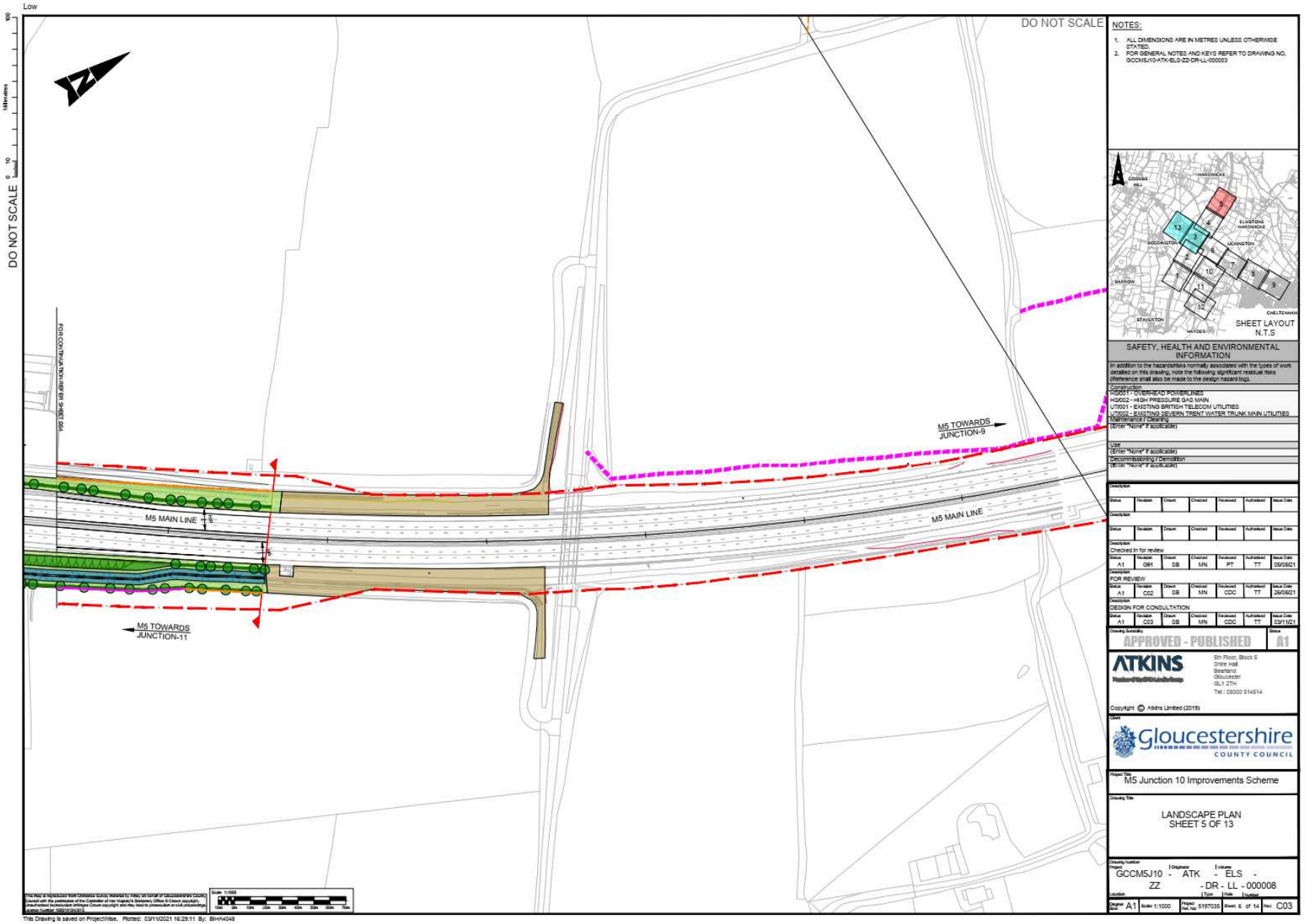
Low
DO NOT SCALE
DO NOT SCALE
NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. FOR GENERAL NOTES AND KEYS REFER TO DRAWING NO. GCCM5J10-ATK-ELS-ZZ-DR-LL-000003
FOR CONTINUATION REFER SHEET 004
M5 MAIN LINE
M5 MAIN LINE
M5 TOWARDS JUNCTION-9
M5 TOWARDS JUNCTION-11
SHEET LAYOUT N.T.S
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).
Construction
HS001 - OVERHEAD POWERLINES
HS002 - HIGH PRESSURE GAS MAIN
UT0001 - EXISTING BRITISH TELECOM UTILITIES
UT0002 - EXISTING SEVERN TRENT WATER TRUNK MAIN UTILITIES
Maintenance / Cleaning
(Enter "None" if applicable)
Use
(Enter "None" if applicable)
Decommissioning / Demolition
(Enter "None" if applicable)
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SHEET 5 OF 13
GCCM5J10 - ATK - ELS - ZZ - DR - LL - 000008
C03
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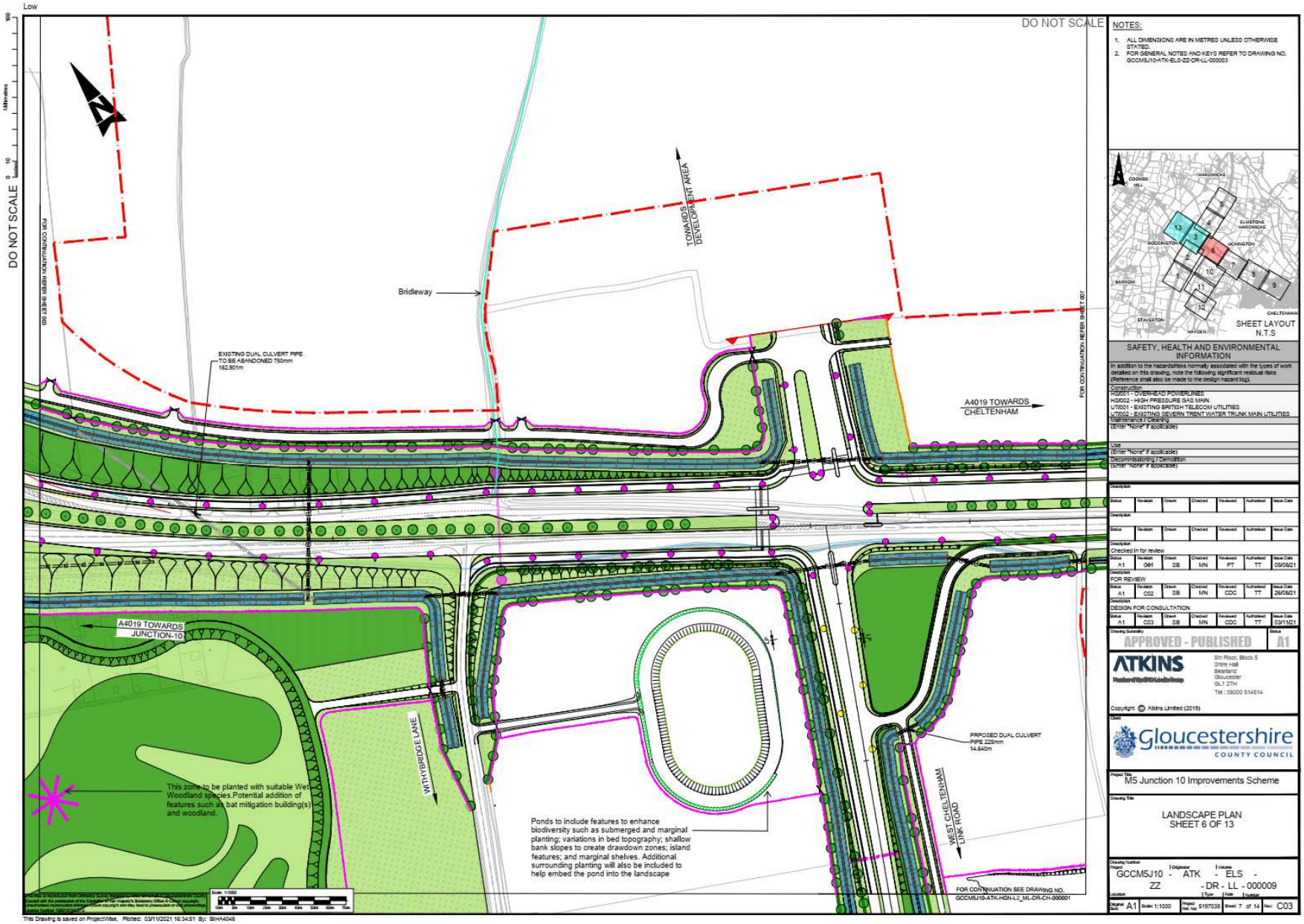
DO NOT SCALE
NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. FOR GENERAL NOTES AND KEYS REFER TO DRAWING NO. GCCM5J10-ATK-ELS-ZZ-DR-LL-000003
SHEET LAYOUT N.T.S
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).
Construction
HS/001 - OVERHEAD POWERLINES
HS/002 - HIGH PRESSURE GAS MAIN
UT/001 - EXISTING BRITISH TELECOM UTILITIES
UT/002 - EXISTING SEVERN TRENT WATER TRUNK MAIN UTILITIES
Maintenance / Cleaning
(Enter "None" if applicable)
Use
(Enter "None" if applicable)
Decommissioning / Demolition
(Enter "None" if applicable)
Checked in for review
FOR REVIEW
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LANDSCAPE PLAN
SHEET 6 OF 13
GCCM5J10 - ATK - ELS - ZZ - DR - LL - 000009
A1
1:1000
S197035
7 of 14
C03
Bridleway
EXISTING DUAL CULVERT PIPE TO BE ABANDONED 750mm 182.901m
TOWARDS DEVELOPMENT AREA
A4019 TOWARDS CHELTENHAM
A4019 TOWARDS JUNCTION-10
WITHYBRIDGE LANE
WEST CHELTENHAM LINK ROAD
PROPOSED DUAL CULVERT PIPE 225mm 14.640m
This zone to be planted with suitable Wet Woodland species.Potential addition of features such as bat mitigation building(s) and woodland.
Ponds to include features to enhance biodiversity such as submerged and marginal planting; variations in bed topography; shallow bank slopes to create drawdown zones; island features; and marginal shelves. Additional surrounding planting will also be included to help embed the pond into the landscape
FOR CONTINUATION SEE DRAWING NO. GCCM5J10-ATK-HGN-L2_ML-DR-CH-000001
FOR CONTINUATION REFER SHEET 007
FOR CONTINUATION REFER SHEET 005
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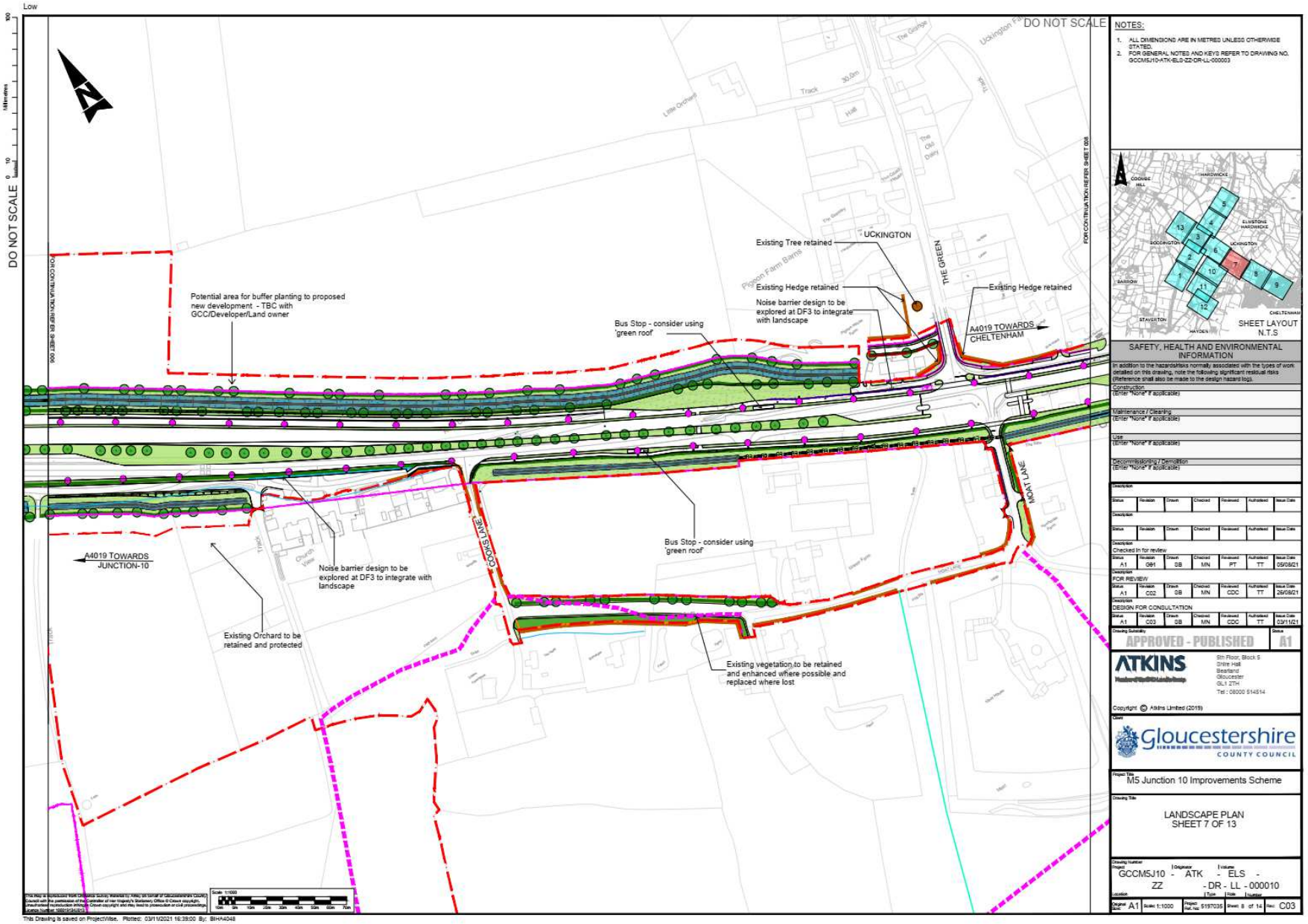
Low
DO NOT SCALE
DO NOT SCALE
NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. FOR GENERAL NOTES AND KEYS REFER TO DRAWING NO. GCCM5J10-ATK-ELS-ZZ-DR-LL-000003
Potential area for buffer planting to proposed new development - TBC with GCC/Developer/Land owner
Existing Tree retained
Existing Hedge retained
Noise barrier design to be explored at DF3 to integrate with landscape
Bus Stop - consider using 'green roof'
A4019 TOWARDS CHELTENHAM
A4019 TOWARDS JUNCTION-10
Noise barrier design to be explored at DF3 to integrate with landscape
Existing Orchard to be retained and protected
Bus Stop - consider using 'green roof'
Existing vegetation to be retained and enhanced where possible and replaced where lost
UCKINGTON
THE GREEN
COOKS LANE
MOAT LANE
FOR CONTINUATION REFER SHEET 006
SHEET LAYOUT N.T.S
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
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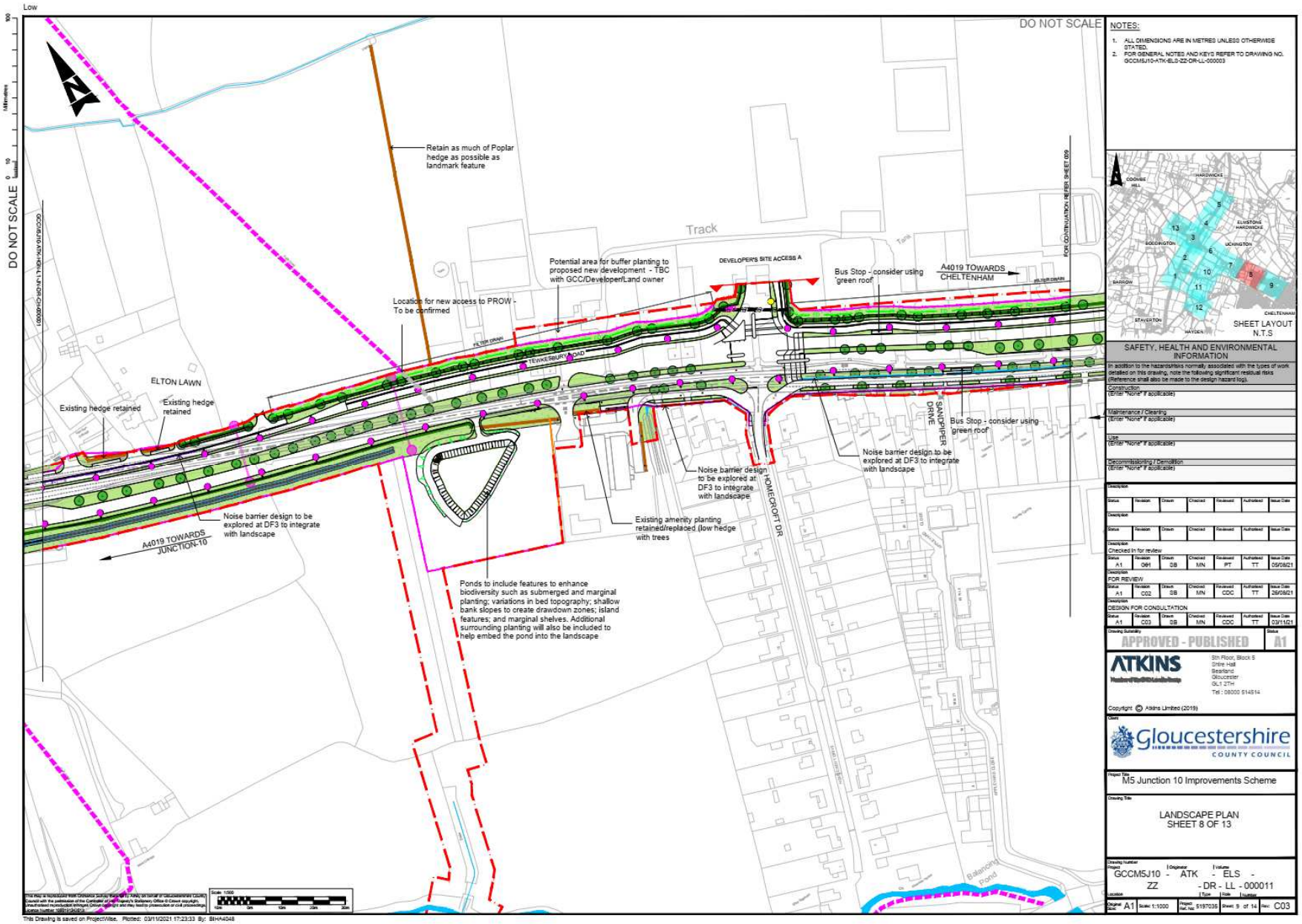
LANDSCAPE PLAN SHEET 7 OF 13
GCCM5J10 - ATK - ELS - ZZ - DR - LL - 000010
A1
C03


Low
DO NOT SCALE
DO NOT SCALE
Retain as much of Poplar hedge as possible as landmark feature
Track
Potential area for buffer planting to proposed new development - TBC with GCC/Developer/Land owner
DEVELOPER'S SITE ACCESS A
Bus Stop - consider using 'green roof'
A4019 TOWARDS CHELTENHAM
Location for new access to PROW - To be confirmed
TEWKESBURY ROAD
ELTON LAWN
Existing hedge retained
Existing hedge retained
Noise barrier design to be explored at DF3 to integrate with landscape
A4019 TOWARDS JUNCTION-10
Noise barrier design to be explored at DF3 to integrate with landscape
Existing amenity planting retained/replaced (low hedge with trees
Noise barrier design to be explored at DF3 to integrate with landscape
SANDPIPER DRIVE
Bus Stop - consider using 'green roof'
HOMEGROFT DR
Ponds to include features to enhance biodiversity such as submerged and marginal planting; variations in bed topography; shallow bank slopes to create drawdown zones; island features; and marginal shelves. Additional surrounding planting will also be included to help embed the pond into the landscape
Balancing Pond
FOR CONTINUATION REFER SHEET 009
NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. FOR GENERAL NOTES AND KEYS REFER TO DRAWING NO. GCCM5J10-ATK-ELS-ZZ-DR-LL-000003
SHEET LAYOUT N.T.S
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).
Construction
(Enter "None" if applicable)
Maintenance / Cleaning
(Enter "None" if applicable)
Use
(Enter "None" if applicable)
Decommissioning / Demolition
(Enter "None" if applicable)
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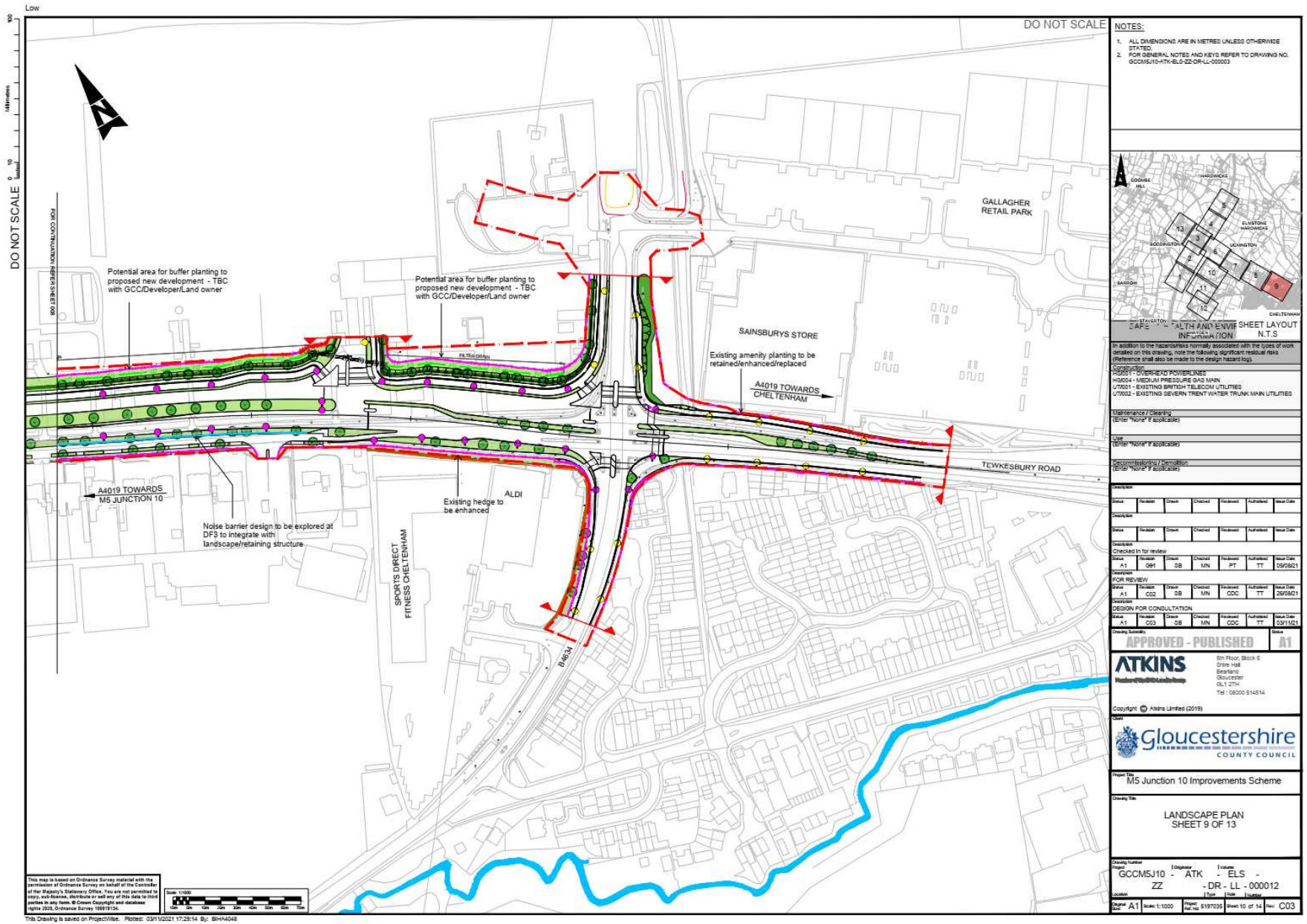
M5 Junction 10 Improvements Scheme
LANDSCAPE PLAN
SHEET 8 OF 13
GCCM5J10 - ATK - ELS - ZZ - DR - LL - 000011
A1
C03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DO NOT SCALE
DO NOT SCALE
N
Potential area for buffer planting to proposed new development - TBC with GCC/Developer/Land owner
Potential area for buffer planting to proposed new development - TBC with GCC/Developer/Land owner
GALLAGHER RETAIL PARK
SAINSBURYS STORE
Existing amenity planting to be retained/enhanced/replaced
A4019 TOWARDS CHELTENHAM
TEWKESBURY ROAD
A4019 TOWARDS M5 JUNCTION 10
Noise barrier design to be explored at DF3 to integrate with landscape/retaining structure
Existing hedge to be enhanced
ALDI
SPORTS DIRECT FITNESS CHELTENHAM
B4634
NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. FOR GENERAL NOTES AND KEYS REFER TO DRAWING NO. GCCM5J10-ATK-ELS-ZZ-DR-LL-000003
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M5 Junction 10 Improvements Scheme
LANDSCAPE PLAN SHEET 9 OF 13
GCCM5J10 - ATK - ELS - ZZ - DR - LL - 000012
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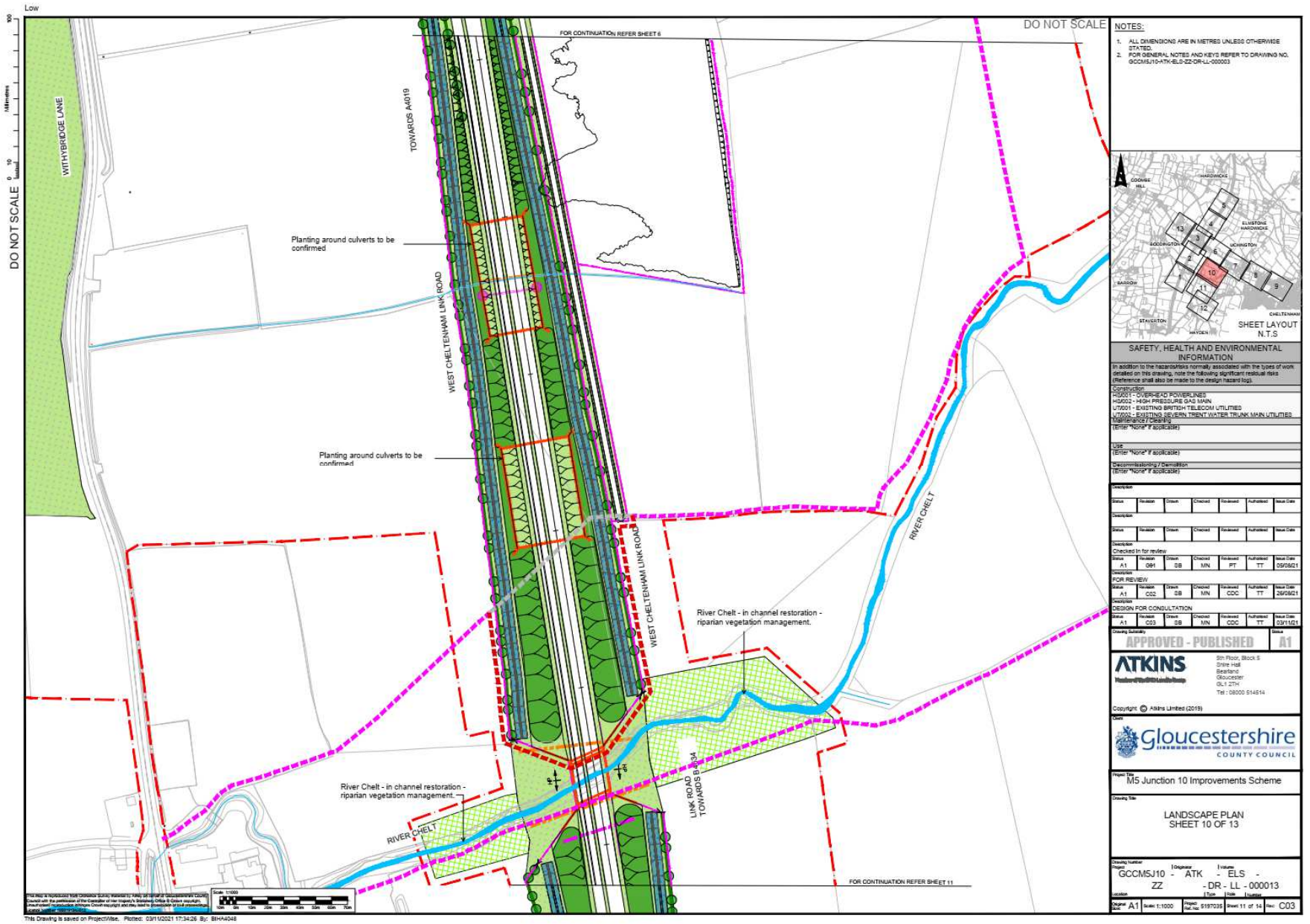
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DO NOT SCALE
WITHYBRIDGE LANE
TOWARDS A4019
WEST CHELTENHAM LINK ROAD
FOR CONTINUATION REFER SHEET 6
Planting around culverts to be confirmed
Planting around culverts to be confirmed
River Chelt - in channel restoration - riparian vegetation management.
River Chelt - in channel restoration - riparian vegetation management.
RIVER CHELT
RIVER CHELT
LINK ROAD TOWARDS B4634
FOR CONTINUATION REFER SHEET 11
DO NOT SCALE
NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. FOR GENERAL NOTES AND KEYS REFER TO DRAWING NO. GCCM5J10-ATK-ELS-ZZ-DR-LL-000003
SHEET LAYOUT N.T.S
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks: (Reference shall also be made to the design hazard log).
Construction
HS0001 - OVERHEAD POWERLINES
HS0002 - HIGH PRESSURE GAS MAIN
UT0001 - EXISTING BRITISH TELECOM UTILITIES
UT0002 - EXISTING SEVERN TRENT WATER TRUNK MAIN UTILITIES
Maintenance / Cleaning
(Enter "None" if applicable)
Use
(Enter "None" if applicable)
Decommissioning / Demolition
(Enter "None" if applicable)
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GL1 2TH
Tel : 08000 514514
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M5 Junction 10 Improvements Scheme
LANDSCAPE PLAN
SHEET 10 OF 13
GCCM5J10 - ATK - ELS - ZZ - DR - LL - 000013
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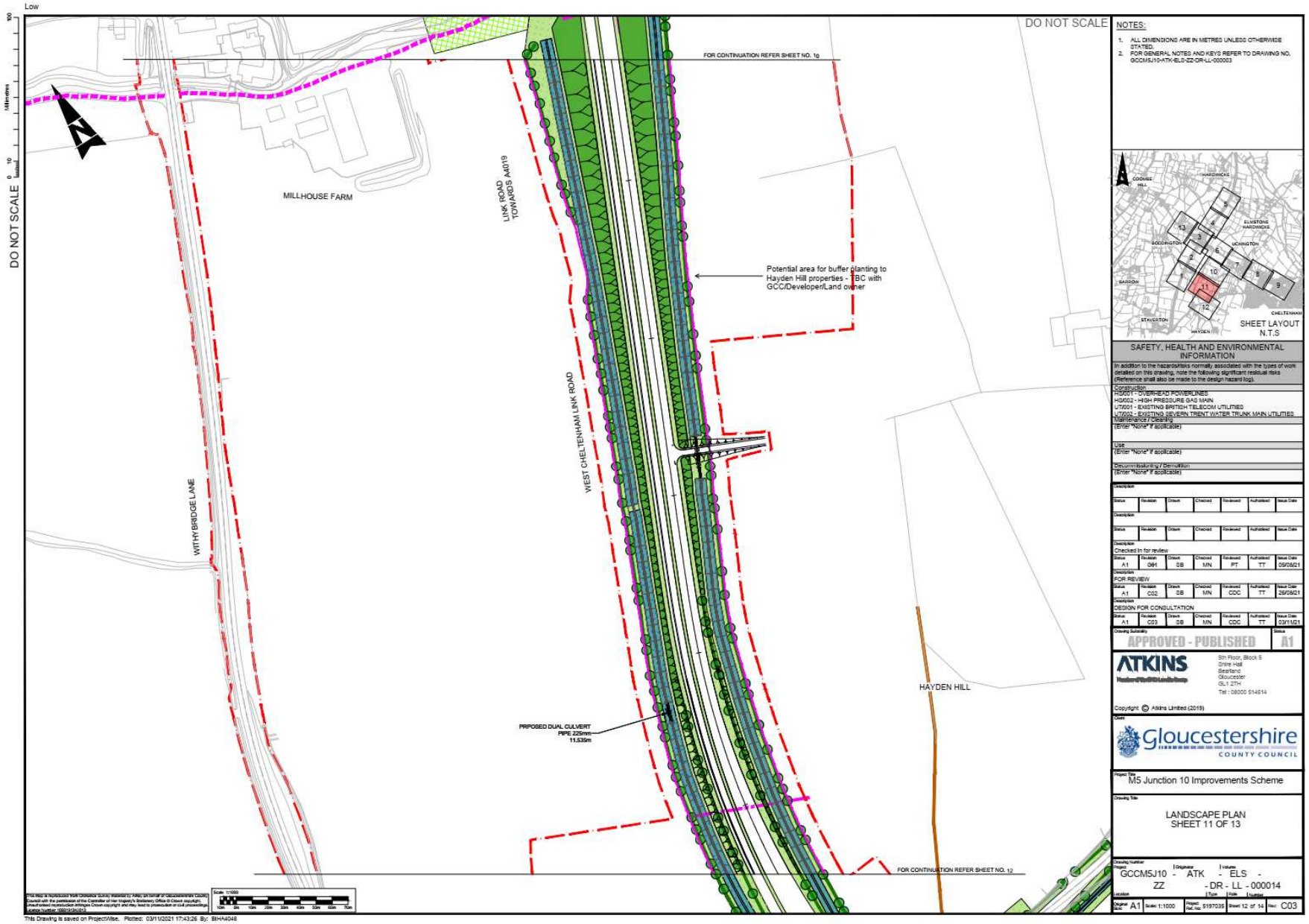
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FOR CONTINUATION REFER SHEET NO. 10
MILLHOUSE FARM
LINK ROAD TOWARDS A4019
WEST CHELTENHAM LINK ROAD
WITHYBRIDGE LANE
Potential area for buffer planting to Hayden Hill properties - TBC with GCC/Developer/Land owner
PROPOSED DUAL CULVERT PIPE 225mm 11.535m
HAYDEN HILL
FOR CONTINUATION REFER SHEET NO. 12
NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. FOR GENERAL NOTES AND KEYS REFER TO DRAWING NO. GCCM5J10-ATK-ELS-ZZ-DR-LL-000003
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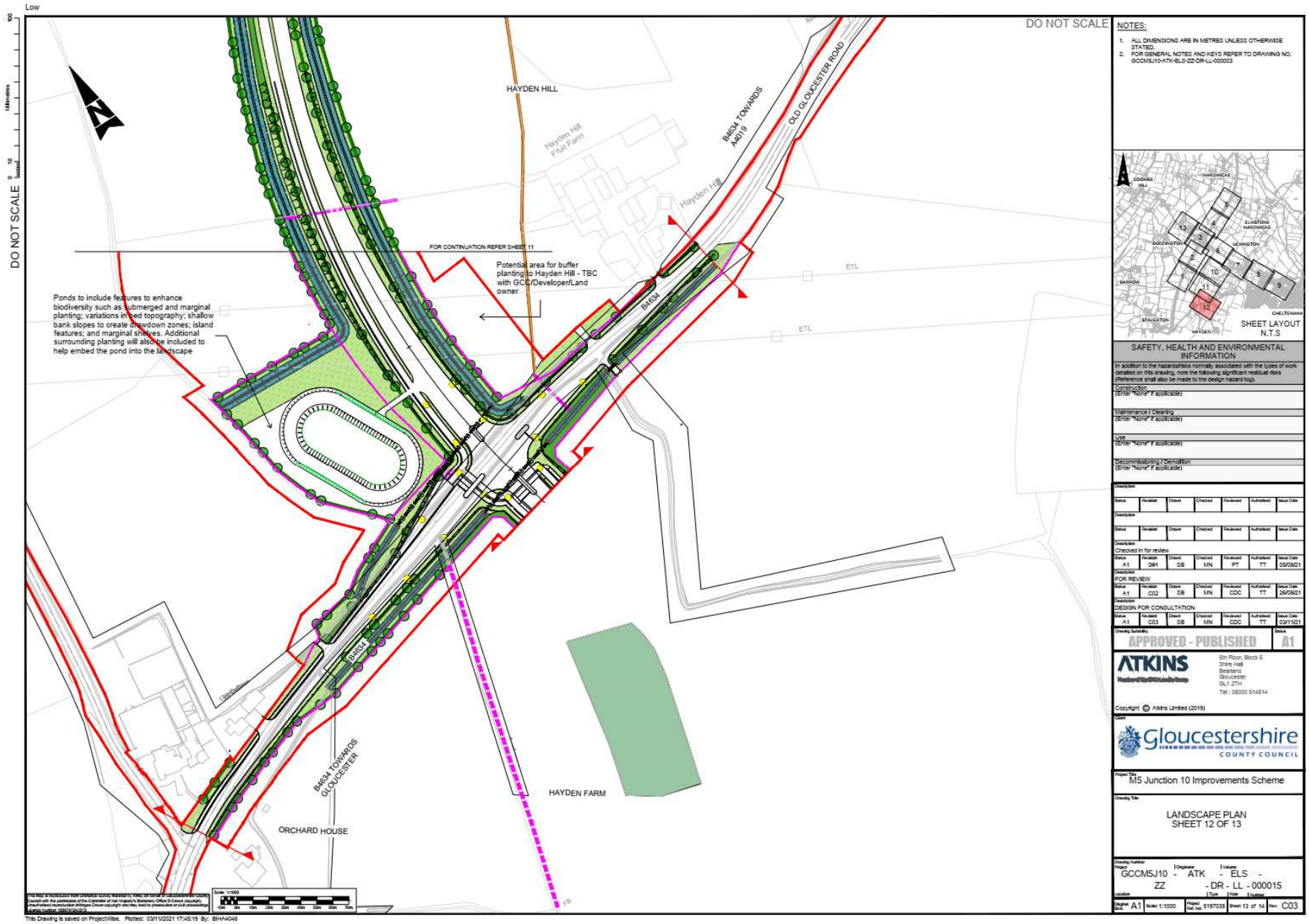
LANDSCAPE PLAN
SHEET 11 OF 13
GCCM5J10 - ATK - ELS - ZZ - DR - LL - 000014
C03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NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. FOR GENERAL NOTES AND KEYS REFER TO DRAWING NO. GCCM5J10-ATK-ELS-ZZ-DR-LL-000003
HAYDEN HILL
Hayden Hill Fruit Farm
B4634 TOWARDS A4019
OLD GLOUCESTER ROAD
FOR CONTINUATION REFER SHEET 11
Potential area for buffer planting to Hayden Hill - TBC with GCC/Developer/Land owner
Ponds to include features to enhance biodiversity such as submerged and marginal planting; variations in bed topography; shallow bank slopes to create drawdown zones; island features; and marginal shelves. Additional surrounding planting will also be included to help embed the pond into the landscape
B4634
ETL
B4634 TOWARDS GLOUCESTER
HAYDEN FARM
ORCHARD HOUSE
FB
SHEET LAYOUT N.T.S
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).
Construction
(Enter "None" if applicable)
Maintenance / Cleaning
(Enter "None" if applicable)
Use
(Enter "None" if applicable)
Decommissioning / Demolition
(Enter "None" if applicable)
Checked In for review
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GL1 2TH
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SHEET 12 OF 13
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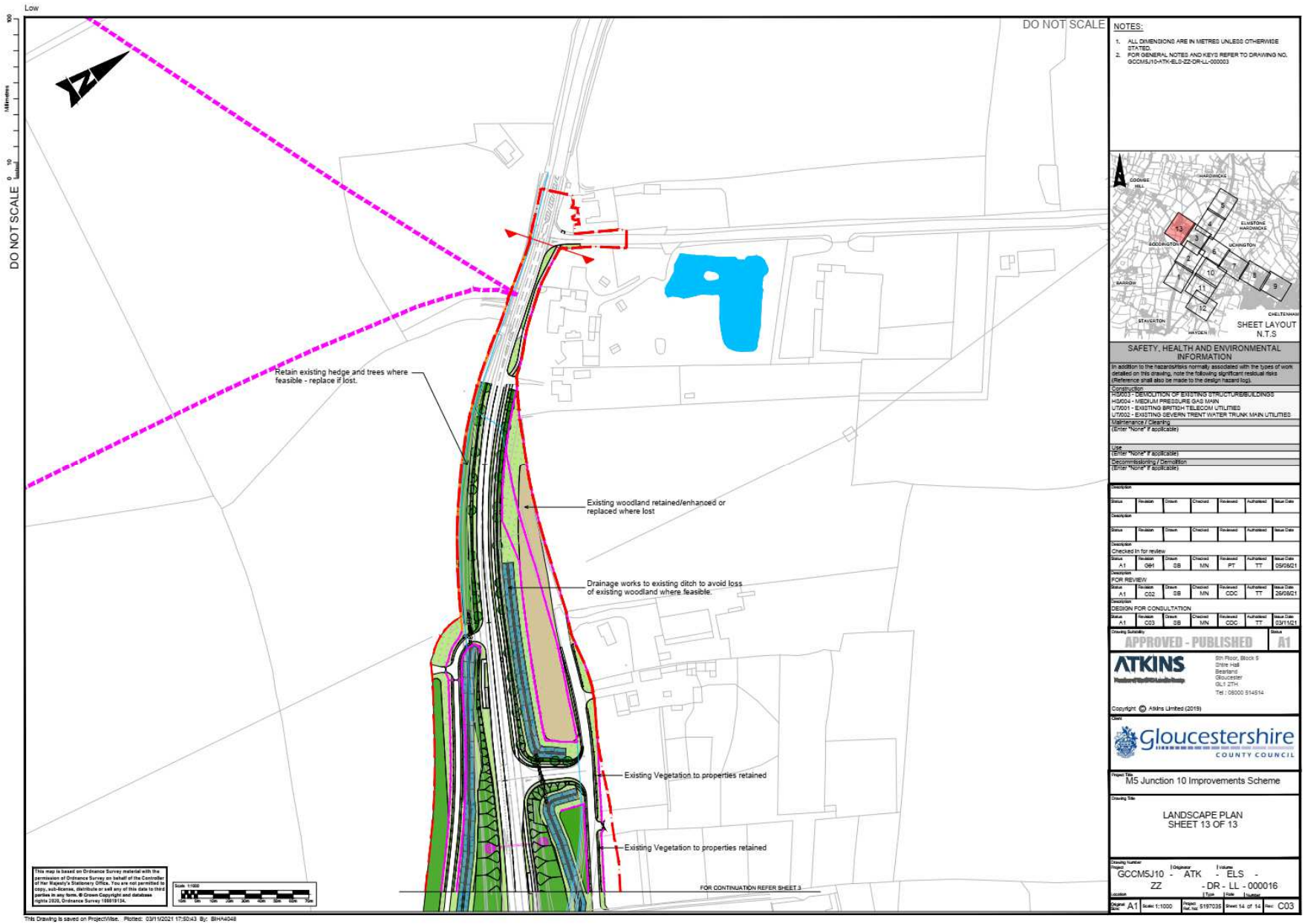
Low
DO NOT SCALE
DO NOT SCALE
Retain existing hedge and trees where feasible - replace if lost.
Existing woodland retained/enhanced or replaced where lost
Drainage works to existing ditch to avoid loss of existing woodland where feasible.
Existing Vegetation to properties retained
Existing Vegetation to properties retained
FOR CONTINUATION REFER SHEET 3
NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS OTHERWISE STATED.
2. FOR GENERAL NOTES AND KEYS REFER TO DRAWING NO. GCCM5J10-ATK-ELS-ZZ-DR-LL-000003
SHEET LAYOUT N.T.S
SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION
In addition to the hazards/risks normally associated with the types of work detailed on this drawing, note the following significant residual risks (Reference shall also be made to the design hazard log).
Construction
HS/003 - DEMOLITION OF EXISTING STRUCTURES/BUILDINGS
HS/004 - MEDIUM PRESSURE GAS MAIN
UT/001 - EXISTING BRITISH TELECOM UTILITIES
UT/002 - EXISTING SEVERN TRENT WATER TRUNK MAIN UTILITIES
Maintenance / Cleaning
(Enter "None" if applicable)
Use
(Enter "None" if applicable)
Decommissioning / Demolition
(Enter "None" if applicable)
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LANDSCAPE PLAN
SHEET 13 OF 13
GCCM5J10 - ATK - ELS - ZZ - DR - LL - 000016
A1
C03

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