

Meeting of:	Cabinet
Date of Meeting:	Thursday, 24 September 2026
Relevant Scrutiny Committee:	Place Scrutiny Committee
Item which the Chair has decided is urgent (Part I) (If yes, why)	Not applicable
Urgent Decision Procedure Used (15.14 of the Constitution) (If yes, why)	Not applicable
Item Type	Part I
Report Title:	Sully to Cosmeston Active Travel Route
Portfolio Holder:	Deputy Leader and Cabinet Member for Sustainable Places
Strategic Leadership Team:	Director of Environment and Housing
Lead Officer:	Operational Manager, Transport Services

1.0 What is this report about?

- 1.1 This report seeks to update Cabinet on the development of the Sully to Cosmeston Active Travel Route, outline progress to date, and seek approval for delegated powers and funding arrangements to progress delivery.
- 1.2 Feasibility, survey, consultation, land, safety and detailed design work have been progressively undertaken from 2021 to 2025 to inform and develop the scheme, including route options, technical surveys, stakeholder engagement, and completion of key phase designs.
- 1.3 The Council approved the planning application for the future construction of this route on 10th October 2025 [2025/00493/RG3](#).
- 1.4 The next stages of the project will focus on securing additional funding, progressing land transfer to enable delivery, review of structures, and undertaking procurement activities.

2.0 What are the Recommendations?

	Recommendations – What and How?	Reason for Recommendation – Why?
2.1	That Cabinet notes progress on design, statutory approvals, and preparatory work for the Sully to Cosmeston Active Travel Route.	To keep Cabinet informed of progress on design development, statutory approvals, and preparatory work for the Sully to Cosmeston Active Travel Route, ensuring transparency and oversight of this strategic infrastructure project.
2.2	That Cabinet approves delegated authority to the Director of Environment and Housing and Head of Neighbourhood Services, in consultation with the Deputy Leader and Cabinet Member for Sustainable Places, the Executive Leader and Cabinet Member for Performance and Resources, the Chief Executive, Head of Finance/Section 151 Officer and the Head of Legal and Democratic Services/Monitoring Officer to proceed with funding applications, land transfer arrangements, procurement of required professional services and contractors required for the scheme subject to confirmed funding, all necessary statutory approvals and compliance with the Council's Constitution and Contract Procedure Rules.	To enable timely delivery of the scheme by granting delegated authority for land transfer, tender preparation, and funding applications. This approach avoids delays that could arise from returning to Cabinet for each operational decision.
2.3	That Cabinet endorses the submission of external funding bids to the Regional Transport Authority to secure delivery funding for the scheme.	To secure external funding opportunities from the Regional Transport Authority, reducing reliance on Council resources and supporting the Council's commitment to sustainable transport and active travel objectives.
2.4	That Cabinet grants delegated authority to the Director of Environment and Housing and the Head of Neighbourhood Services to enter into and progress licences for access to third-party land where required, to enable the undertaking of surveys necessary for the development of the scheme.	To enable the timely completion of surveys required to inform the design and development of the scheme. Providing delegated authority will allow the Council to secure access to third-party land without unnecessary delay, ensuring the project can progress in accordance with planned timescales and supporting the efficient delivery of the scheme.
2.5	That Cabinet grants delegated authority to the Director of Environment and Housing and Head of Neighbourhood Services to	To enable the timely progression of the construction tender for the scheme. This approach ensures the project can advance

	Recommendations – What and How?	Reason for Recommendation – Why?
	undertake the procurement and award of contracts for the scheme, subject to confirmed funding and budget provision, receipt of the necessary statutory approvals, satisfactory land and structures arrangements, and compliance with procurement legislation and the Council's Contract Procedure Rules.	without delay, maintains continuity in delivery, and allows procurement activity to be managed efficiently within established operational and governance frameworks. It also supports the Council's commitment to delivering the scheme within planned timescales and budget parameters by allowing necessary decisions to be taken promptly as the project develops.
2.6	That Cabinet grants delegated authority to the Monitoring Officer/ Head of Legal and Democratic Services to approve the final legal documentation and complete or execute the contracts following the relevant contract award decision.	To allow efficient progression to construction by delegating authority to enter into the appropriate contract for the construction of the scheme. This ensures compliance with procurement regulations and accelerates project delivery.
2.7	That Cabinet approves delegated authority to the Director of Environment and Housing and Head of Neighbourhood Services, in consultation with the Deputy Lead and Cabinet Member for Sustainable Places, the Executive Leader and Cabinet Member for Performance and Resources, the Chief Executive, and Head of Finance / Operational Manager Financial Services and the Monitoring Officer/Head of Legal and Democratic Services to enter into a transfer agreement with Welsh Government for the land (Indicated in Appendix C) required for construction for the scheme, whether by financial consideration or other mutually agreed means.	To facilitate completion of the walking, wheeling and cycling route by authorising transfer of land as detailed in Appendix C, ensuring that all necessary land is secured for the full implementation of the route.
2.8	That Cabinet grants delegated authority to the Monitoring Officer/Head of Legal and Democratic Services to complete all necessary legal documentation associated with and ancillary to the transfer of land.	To ensure that all legal documentation required for the land transfer is completed efficiently and in accordance with statutory, regulatory, and governance requirements. This delegation enables the necessary legal processes to progress without delay, supports timely delivery of the project, and ensures that all agreements, contracts, and associated documents are executed correctly to protect the Council's legal and financial interests.
2.9	Cabinet approves additional work recommended within Appendix B to be	To provide the Council with a robust understanding of the condition of the

	Recommendations – What and How?	Reason for Recommendation – Why?
	undertaken on the structures along the route to determine current condition.	structures along the route, enabling informed decisions on future maintenance, asset management, and funding requirements.
2.10	Following satisfactory structural investigations, that delegated authority be granted to the Director of Environment and Housing and the Head of Neighbourhood Services, in consultation with the Head of Finance/Section 151 Officer and the Monitoring Officer/Head of Legal and Democratic Services, to agree the terms upon which ownership of, responsibility for, and use of the structures may transfer to the Council from the relevant legal owner, working with National Highways as manager of the Historical Railways Estate where applicable. Any transfer shall be subject to satisfactory confirmation of title and terms relating to the condition and extent of the structures, remedial works, existing and future liabilities, access and maintenance rights, funding and an appropriate commuted sum.	To allow the Council to take an informed decision regarding taking ownership and responsibility of the structures and provide a mechanism by which this can be done, if deemed appropriate.

3.0 What is the background to this report?

- 3.1 The scheme comprises of a 2.5km footway/cycleway link, and associated crossing facilities, from South Road, Sully to Cosmeston Drive, Cosmeston where it connects to the existing Railway Walk into Penarth. The scheme aims to facilitate independent walking, cycling and wheeling for everyone, including students or a less-experience cyclist. Currently there is a non-compliant 2-metre-wide footway/cycleway along Lavernock Road connecting Sully to Cosmeston. This is a congested stretch of road that carries 12,000 vehicles per day with an 85th percentile speed of 42mph.
- 3.2 This route will provide a much-improved connection between Sully (population approx. 5,000) and Penarth (population approx. 28,000). Sully does not have a train station with many residents wanting to access Penarth train station. The provision of a safe and accessible cycling route will therefore enable residents of Sully to travel more easily to Penarth and onwards to Cardiff, significantly improving access to more frequent public transport and enhancing overall connectivity.
- 3.3 The scheme has been identified within the Active Travel Network Map (ATNM) and has undertaken full consultation, has received planning permission, and has been requested by many individuals. The scheme has also been identified with the Council's adopted Local Development Plan and Local Transport Plan.

- 3.4 In Financial Year 2021/22, Arcadis Consultancy were appointed via the Construction Consultancy framework (CCS) now superseded by the Southeast Wales Technical and Professional Services (SEWTAPS) framework. Arcadis reviewed all work undertaken to date on an active travel route connecting Sully and Penarth as this has been identified as a strategic active travel route on The Council's Active Travel Network Map (ATNM) approved by Welsh Government in 2021.
- 3.5 Funding from the Welsh Government Core Active Travel funding has enabled the Council to progress with:
- Detailed design development.
 - Geo-environmental, landscape and visual appraisal, Arboriculturally survey, green infrastructure statement.
 - Public consultation and engagement (initial route consultation in 2022 [Consultation Report](#), followed by consultation on the final route option in April 2023, [Consultation Report](#))
 - Flood consequence assessment.
 - Planning and SAB statutory approvals (planning application determined October 2025 and available via the [Council's Planning Portal](#))
 - Land transfer plans. The Sully to Cosmeston scheme requires the transfer of land from Welsh Government to the Vale of Glamorgan Council.

As of Financial Year 2026/27:

- Detailed designs are complete.
 - Planning permission has been determined with SAB approval to follow.
 - Public consultation and engagement have concluded.
- 3.6 Land transfer from Welsh Government is scheduled to commence in 2026.
- 3.7 Additional structural investigations will be undertaken to provide a robust assessment of the condition of the bridges and associated structures. The findings will inform a subsequent decision on whether the Council should enter into an agreement with National Highways to assume ownership of these assets.
- 3.8 Significant development work has taken place to date which includes:

FY 2021/22 Route Options Developed

FY 2022/23 Baseline usage surveys undertaken
Topographical surveys
Public consultation on route options

FY 2023/24 Concept design completed
Ecology Surveys
Public consultation on final route design
Bridge survey report

FY 2024/25 Detailed design completed
Pre-app submitted to Planning Dept
Design of traffic signals
Camera surveys to gather data of current usage by cyclists/pedestrians

FY 2025/26 Bridge report updated
Planning application approved

3.9 A few scheme options were considered during the initial planning phases:

- Provision of an off-road shared-use route
- A segregated route
- Narrowing of highway
- An off-road segregated route

The final design is for a 4 metre segregated wide Active Travel route along the disused railway line and a 3 metre shared use alongside Lavernock Road. The final scheme design can be viewed in Appendix A – Scheme overview.

4.0 **What issues are there to be considered?**

4.1 There are 7 structures along the proposed active travel route, and an inspection report has been produced (Appendix B). The purpose of the report was to identify defects, assess compliance with the route requirements and recommend upgrade options with cost estimates.

4.2 All structures are currently judged to be in a fair to deteriorated condition with no safety-critical defects found.

4.3 Four upgrade options were developed, each with an estimated cost range, a table covering options and costs for all structures is below:

Option	Description	Cost Range
1	De-vegetation and essential repairs	£180,000–£230,000
2	Option 1 + non-essential repairs (e.g., repointing, crack repair)	£485,000–£530,000
3	Option 2 + access improvements and waterproofing	£1,050,000–£1,100,000
4	Full bridge deck replacement	£2,785,000

Option 1: Minimal intervention for safe operation; lowest cost, higher long-term maintenance.

Option 2: Improves durability and aesthetics; moderate cost.

Option 3: Adds waterproofing and maintenance access; higher upfront cost, lower long-term maintenance.

Option 4: Full replacement; highest cost, significant disruption, and loss of heritage features.

- 4.4 The structures report that has been undertaken recommends that ecological surveys are undertaken and that the identified defects are reassessed following the removal of vegetation.
- 4.5 The structures are currently owned by National Highways. National Highways has advised that it will not permit the construction of the ATR unless the Council assumes ownership of the bridges. Subject to agreement, National Highways will transfer the bridges to the Council and provide a commuted sum (amount to be confirmed) towards future inspection and maintenance costs.
- 4.6 Implementing the recommendations set out in the structures report will enable the Council to undertake the surveys and investigations required to establish the condition of the structures and identify the extent of any remedial works required. The findings will provide the evidence needed to inform decisions on future ownership, maintenance and investment requirements, support future funding bids to the Regional Transport Panel, and assist discussions with National Highways regarding the commuted sum referred to in paragraph 4.5.
- 4.7 The land required to deliver the proposed active travel route is either within the existing adopted highway network or is owned by the Welsh Government. As a result, no third-party land acquisition is anticipated. The Council will be required to enter into a land transfer agreement with the Welsh Government to secure the necessary land interests and facilitate the construction, operation and maintenance of the route. The public-sector ownership of the land significantly reduces delivery risk and provides a clear and achievable mechanism for progressing the scheme.
- 4.8 There is currently a footway alongside Lavernock Road that does not meet current Active Travel guidelines and so discourages walking, wheeling and cycling. Accident data from 2015 to 2025 records 10 incidents, 1 that included a pedal cycle, demonstrating the importance of this scheme.
- 4.9 This route is one of the most requested active travel routes in the Vale of Glamorgan, making it important that the scheme is progressed and delivered. Implementation will not only improve safety for all users but also help alleviate congestion along the corridor and provide a strategic walking, wheeling and cycling link to Penarth and onwards to Cardiff. The scheme has strong stakeholder support, as demonstrated through the consultation and engagement events that have been conducted. 89% of respondents showed strong support for the scheme, as demonstrated in the [consultation report](#) for the scheme.
- 4.10 While the majority of the route is located off highway, a section adjacent to the carriageway will require significant traffic management during construction. Given that this corridor provides the primary connection between Sully and Penarth there is a high risk of disruption. Strong communication, careful planning and sensitive management of traffic arrangements will therefore be essential.

5.0 How evidence has been used to inform the report, including the views of others?

- 5.1 Public consultation on the final route option was held between 12th April and 3rd May 2023. The consultation report can be found here ([Consultation report – Sully to Cosmeston](#)). The report summarises strong public support for the scheme.
- 5.2 The proposed scheme will create an important link to the existing Railway Walk route between Cosmeston Drive and Plymouth Road/Penarth Railway Station, helping to deliver a more comprehensive and connected active travel network. Consultation undertaken as part of the Active Travel Network Map development identified public support for this route, with respondents recognising its potential to improve connectivity, accessibility and safety for walking, wheeling and cycling. The scheme would therefore respond directly to an identified community need while maximising the benefits of existing active travel infrastructure.
- 5.3 The Council currently provides mainstream school transport to 286 pupils residing in Sully and attending Stanwell School. The absence of a continuous and safe active travel route limits opportunities for pupils to walk, wheel or cycle to school. The construction of a dedicated active travel path would remove a significant barrier to active travel, providing pupils and their families with a safe and attractive alternative to car and bus journeys. Given the volume of school trips made along this corridor, the scheme has the potential to generate a meaningful modal shift towards cycling and walking, supporting the Council's objectives for sustainable transport, improved health outcomes, reduced congestion and lower transport-related carbon emissions.
- 5.4 The scheme has been in development since 2021, with extensive feasibility work undertaken over this period, including both technical assessments and public consultation, to robustly inform its design and progression.

6.0 Next Steps

- 6.1 Land transfer of land from Welsh Government (Appendix C) will be progressed to enable delivery of the scheme. Appendix C illustrates the full extent of the land ownership in accordance with Land Registry title plans, including boundary extents and the land take required for the route. Taking ownership of this land is critical to ensuring route continuity and enabling the scheme to move forward into the construction phase.
- 6.2 Cabinet approval is sought to enter into a New Engineering Contract (NEC) for the Sully to Cosmeston Active Travel Route, ensuring full compliance with the Council's Contract Procedure Rules and national procurement legislation. The NEC framework is recommended for its collaborative approach, clear risk allocation, and alignment with industry best practice for infrastructure delivery. Following a competitive procurement process, delegated authority will enable timely progression to construction while maintaining governance oversight through consultation with the Deputy Leader and Cabinet Member for Sustainable Places, the Executive Leader and Cabinet Member for Performance and Resources, the Chief Executive, and Head of Finance/S151 Officer / Operational Manager Financial Services. This decision will confirm budget provision, secure external funding alignment, and implement a robust contract management plan to monitor performance, cost control, and legal compliance throughout the project lifecycle. The procurement documentation will be prepared internally, alongside Ardal the Council's procurement

Service. A construction contractor as well as NEC professional services to support contract administration will be required to be procured. This will also further support strong scheme governance and compliant delivery.

- 6.3 The delivery of the Sully to Cosmeston Active Travel Route represents a significant investment in sustainable transport infrastructure. To date, funding has been secured through Welsh Government Active Travel grants to progress design, feasibility and preparatory works. Future costs will primarily relate to land transfer, procurement, and construction. Further funding will need to be applied for through the Regional Transport Authority to progress the delivery of the scheme.
- 6.4 The risk register in the appendices (Appendix D – Sully to Cosmeston ATR risk register July 2026) identifies key risks linked to the delivery of the scheme. These include procurement challenges, and funding uncertainties. Mitigation measures include phased delivery to manage financial exposure, proactive submission of funding bids, and robust contract management under the NEC framework. Regular governance oversight and contingency planning will further ensure timely delivery and compliance throughout the project lifecycle.
- 6.5 Subject to Cabinet approval and satisfactory inspection outcomes, agree the transfer of the bridges from National Highways to the Council, together with a commuted sum towards future maintenance and inspection costs. The Council would undertake any necessary works to bring the structures up to the required standard prior to constructing the ATR, after which responsibility for the assets would transfer to the Council. Further details on the current condition of the bridges are provided in Appendix B.

7.0 How does this report support the Vale 2030 and Reshaping?

- 7.1 The scheme directly supports the Vale 2030 objective of creating a more sustainable and connected Vale, by delivering high-quality active travel infrastructure that reduces reliance on private vehicles and promotes healthier, low-carbon travel choices. It contributes to improving air quality, reducing congestion, and supporting the Council's response to the climate emergency.
- 7.2 The route enhances access to Penarth Train Station, leisure facilities, retails, education, employment and key services, aligning with the Council's ambition to support strong, inclusive communities, particularly for those without access to a car.

8.0 How does this support the Five Ways of Working?

- 8.1 Long-term: The scheme represents a long-term investment in sustainable transport infrastructure, addressing existing gaps in the active travel network and supporting future growth, including education and employment sites.
- 8.2 Prevention: By providing an alternative of walking and cycling along a heavily trafficked corridor, the scheme aims to reduce road traffic collisions and improve public health outcomes by encouraging active lifestyles.
- 8.3 Integration: The project aligns with national, regional and local strategies, including the Active Travel Network Map and Regional Transport Development Plan, ensuring a coordinated approach to transport and land use planning.

- 8.4 Collaboration: The scheme has been developed through collaboration with internal departments, Welsh Government, TfW, regional partners, as well as engagement with the public through consultation.
- 8.5 Involvement: Public consultation has been undertaken and demonstrated strong support for the scheme. Ongoing engagement with stakeholders will continue throughout the delivery phase to ensure the scheme reflects local needs and priorities.

Resources

9.0 Finance

- 9.1 Funding to date has been secured through Welsh Government Active Travel grant with further bids planned for Regional Transport funding to support construction phases. Surveys and all preparatory work have been funded to date via Welsh Government Active Travel Funding. Cabinet approval will allow for future funding bids and enable timely progression to procurement and construction.
- 9.2 A funding bid will be prepared and submitted to the Regional Transport Committee for the full scheme cost in September 2026.
- 9.3 Detailed cost estimates, including expenditure to date and projected scheme costs, are provided, alongside funding strategies to minimise reliance on Council resources and ensure value for money.
- 9.4 The total estimated cost of the scheme is estimated as £4,420,878 (based on 2020 rates).
- | | |
|-------------------------------------|-------------------|
| Construction total | £3,051,565 |
| Risk (20%) | £610,313 |
| Structural works | £550,000 |
| Land and legal fees | £22,000 |
| Project management and officer time | £85,000 |
| Miscellaneous | £36,000 |
| Monitoring and Evaluation | £55,000 |
| Scheme promotion | £11,000 |
| Total funding requested | £4,420,878 |
- 9.5 £344,136.58 Welsh Government Active Travel funding was spent between FY2021/22 to FY 2025/26 on developing the scheme to planning approval. Regional Transport funding would be needed to progress the project to the next stage.
- 9.6 Funding to date has been allocated as follows:

Funding Year	Cost detail	Amount spent (£)
FY 2021/22	Feasibility report Surveys	29,270.14
FY 2022/23	Route options Surveys	31,920.83
FY 2023/24	Public consultation on route options	175,100

	Detailed design Bridge condition report Camera surveys	
FY 2024/25	Planning pre-app Baseline usage surveys Signal design	77,212.86
FY 2025/26	Planning application Flood consequence assessment Bridge report updated Boundary work on third party land	30,632.75

10.0 Workforce

- 10.1 Internal officer resources are supporting the development and delivery of the project. To date, the scheme has been managed within the Neighbourhood Services area who have led on the feasibility and design. As the project transitions into the delivery phase, day-to-day management will be undertaken by the Council's Project Management Unit, working alongside Neighbourhood Services. Project team meetings will be held on a four-weekly basis, with input from relevant Council officers and specialist advisors as required. In addition, advice will be sought from the Council's Legal and Finance teams where necessary.
- 10.2 Additional specialist support will be procured as required, subject to the availability of grant funding.
- 10.3 A procurement exercise will be undertaken for the construction phase to ensure that suitably qualified contractors are appointed to deliver the project including a NEC Supervisor and Project Manager as part of the necessary project governance.

11.0 Legal and Equalities

11.1 Does an Equalities Impact Assessment need to be completed? If not, why?

Equality considerations have been embedded in the design process to ensure accessibility for all users, consistent with the Equality Act 2010. An Equalities Impact Assessment was initiated in 2021 with a full assessment to be completed.

- 11.2 The Scheme must be progressed in accordance with the Council's Constitution and Contract Procedure Rules, the Procurement Act 2023, applicable Welsh procurement requirements, the planning permission, Sustainable Drainage Approval Body requirements and any other statutory approvals or consents required for the works.
- 11.3 The land required for the Scheme is understood to comprise existing adopted highway and land owned by Welsh Government. The proposed transfer of Welsh Government land will be subject to satisfactory title investigation and agreement of terms that provide the Council with all land and rights required to construct, access, operate, inspect, maintain, repair and renew the route. Any temporary land, construction access or working areas must also be identified and secured before construction begins.

- 11.4 The seven former railway structures are understood to form part of the Historical Railways Estate. National Highways manages that estate, including structures in Wales, on behalf of the Secretary of State for Transport. The relevant assets are generally held by the Secretary of State rather than by National Highways in its own right. The legal ownership, title and extent of each structure, and the capacity in which National Highways is acting, must therefore be verified before any transfer is agreed.
- 11.5 The Council should not accept ownership of, or ongoing responsibility for, the structures until satisfactory legal and structural due diligence has been completed. This must include confirmation of the assets and parts of the structures to be transferred, including any decks, abutments, foundations, approaches and associated land, together with the rights required for access, inspection, maintenance, repair and replacement.
- 11.6 Any transfer must also be subject to acceptable terms concerning the condition of the structures, responsibility and funding for remedial works, existing and latent defects, future inspection and maintenance liabilities, insurance, indemnities and an appropriate commuted sum. The Council must be satisfied that the financial contribution and funding arrangements properly reflect the anticipated whole-life liabilities associated with the structures.
- 11.7 No construction or associated professional services contract should be awarded unless the necessary funding and budget provision have been confirmed, the required statutory approvals and land arrangements are in place, and the Head of Finance/Section 151 Officer and Monitoring Officer/Head of Legal and Democratic Services are satisfied with the proposed financial, procurement and legal arrangements.
- 11.8 If satisfactory land or structures arrangements cannot be agreed, or the proposed works and associated liabilities cannot be accommodated within the approved funding envelope, a further report must be submitted to Cabinet before the Council enters into any binding commitment.

12.0 Key Contacts

12.1 Who are the primary officers to contact with any comments and/or queries on the report?

Lead Officer: Kyle Phillips Operational Manager Transport Services kwphillips@valeofglamorgan.gov.uk	Democratic Services Officer: Matt Swindell Cabinet and Committee Services Officer mlswindell@valeofglamorgan.gov.uk
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Appendices

Appendix A – Scheme overview

Appendix B – Structures Inspection and Options Report

Appendix C – Welsh Government Land Ownership Boundary

Appendix D – Risk Register

Background Documents

[Consultation report - Sully to Cosmeston route options - FINAL](#)

[Consultation report - Sully to Cosmeston concept](#)

[Local Transport Plan](#)

[Cardiff Capital Region Transport Plan for South East Wales](#)

[Active Travel Network Map](#)



NOTES:

- DO NOT SCALE FROM DRAWING, USE FIGURED DIMENSIONS ONLY.
- ALL UNITS IN METRES UNLESS STATED OTHERWISE.
- REFER TO DRAWING 10056562-ARC-AT-010-DR-C-00001 FOR SITE LOCATION PLAN.
- REFER TO DRAWINGS 10056562-ARC-AT-010-DR-C-00004-000006 FOR EXISTING SITE PLANS.
- REFER TO DRAWING 10056562-ARC-AT-072-DR-C-00001 & 00003 FOR TYPICAL CROSS SECTIONS.
- REFER TO DRAWINGS 10056562-ARC-AT-110-DR-C-00004-000013 FOR SHEET SETS AND FURTHER DETAIL INFORMATION.
- REFER TO DRAWINGS 10056562-ARC-AT-130-DR-C-00001-00010 FOR PROPOSED STREET LIGHTING LAYOUTS.
- THE DESIGN IS BASED ON THE ASSUMPTION THAT THE POSTED SPEED LIMIT IS REDUCED FROM 40mph TO 30mph.

LEGEND

- PROPOSED PLANNING BOUNDARY
- PROPOSED SHARED FOOTWAY/CYCLEWAY
- DRIVEWAY CROSSOVER
- PROPOSED RAISED CROSSING
- GRASSED AREA
- PROPOSED VERGE
- PROPOSED EARTHWORKS

P01	10/03/23	FIRST ISSUE	GJ	CH	MT	MG
P02	18/10/24	UPDATED FOR PLANNING	GJ	MP	SD	MG
P03	11/11/24	PLANNING BOUNDARY & ROUTE UPDATED	GJ	SD	MG	MG
Rev	Date	Description	Prod.	Chk.	Rev.	App.

VALE of GLAMORGAN
BRŷ MORGANNWG

Project: Sully to Cosmeston ATR

Site: Sully to Cosmeston Cardiff

Client: Vale of Glamorgan Council
Cynhor Bro Morgannwg
Civic Offices, Holton Road
Barry - CF63 4RU
www.valeofglamorgan.gov.uk

ARCADIS

Registered office: 80 Fenchurch Street, London EC3M 4BY

Coordinating office: Arcadis Suite 4J, 4th Floor, Hodge House, 144-166 St Mary St, Cardiff CF10 1DY
Tel: 44 (0)29 2092 6700

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Drawing Title: **ACTIVE TRAVEL ROUTE GENERAL ARRANGEMENT OVERVIEW**

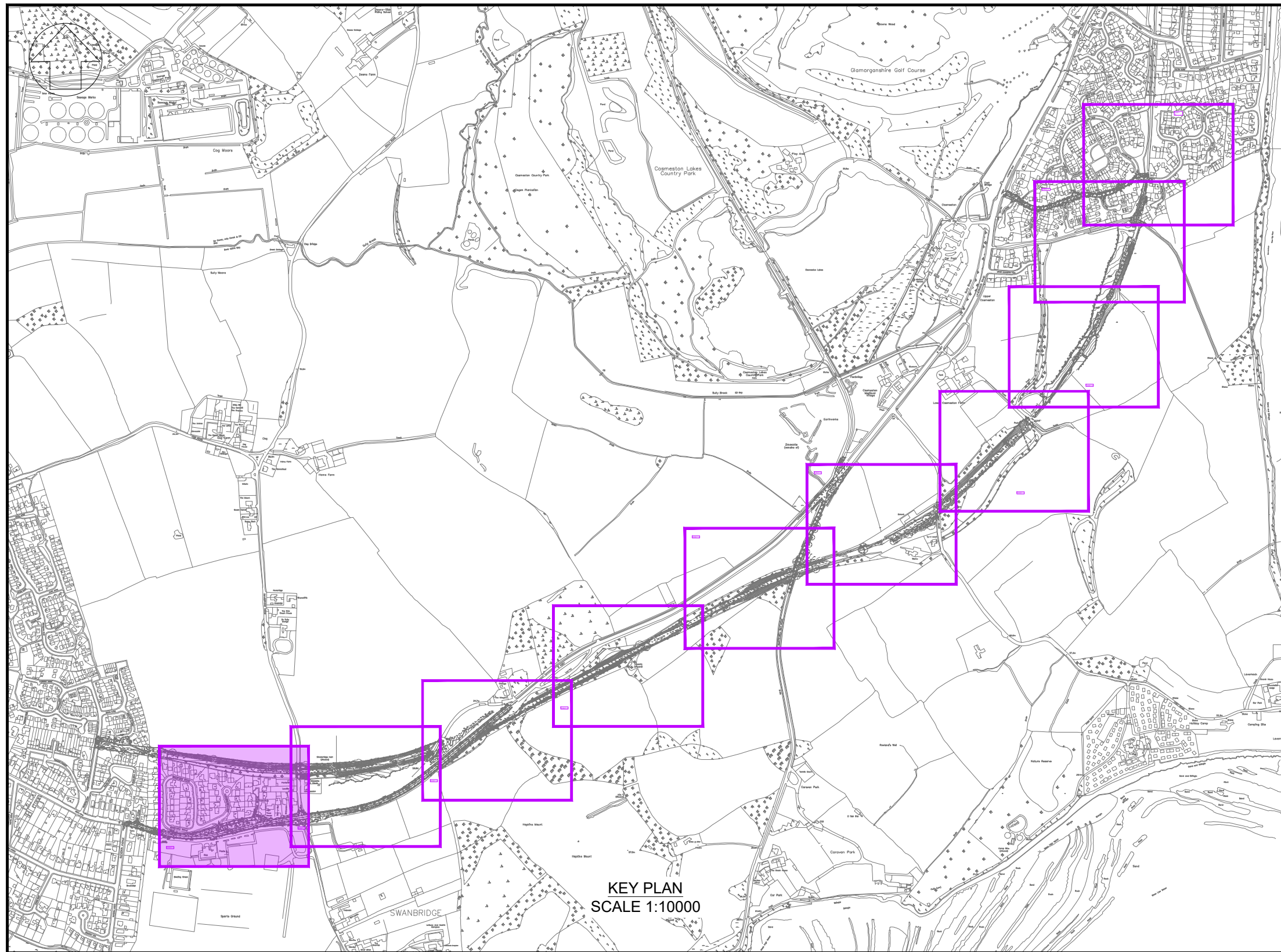
Designed: G.Jones	Signed: Digitally Signed	Date: 28/10/24
Produced: G.Jones	Signed: Digitally Signed	Date: 08/11/24
Checked: S.Davies	Signed: Digitally Signed	Date: 08/11/24
Reviewed: M.Griffiths	Signed: Digitally Signed	Date: 11/11/24
Approved: M.Griffiths	Signed: Digitally Signed	Date: 11/11/24

Design Stage: Preliminary Design

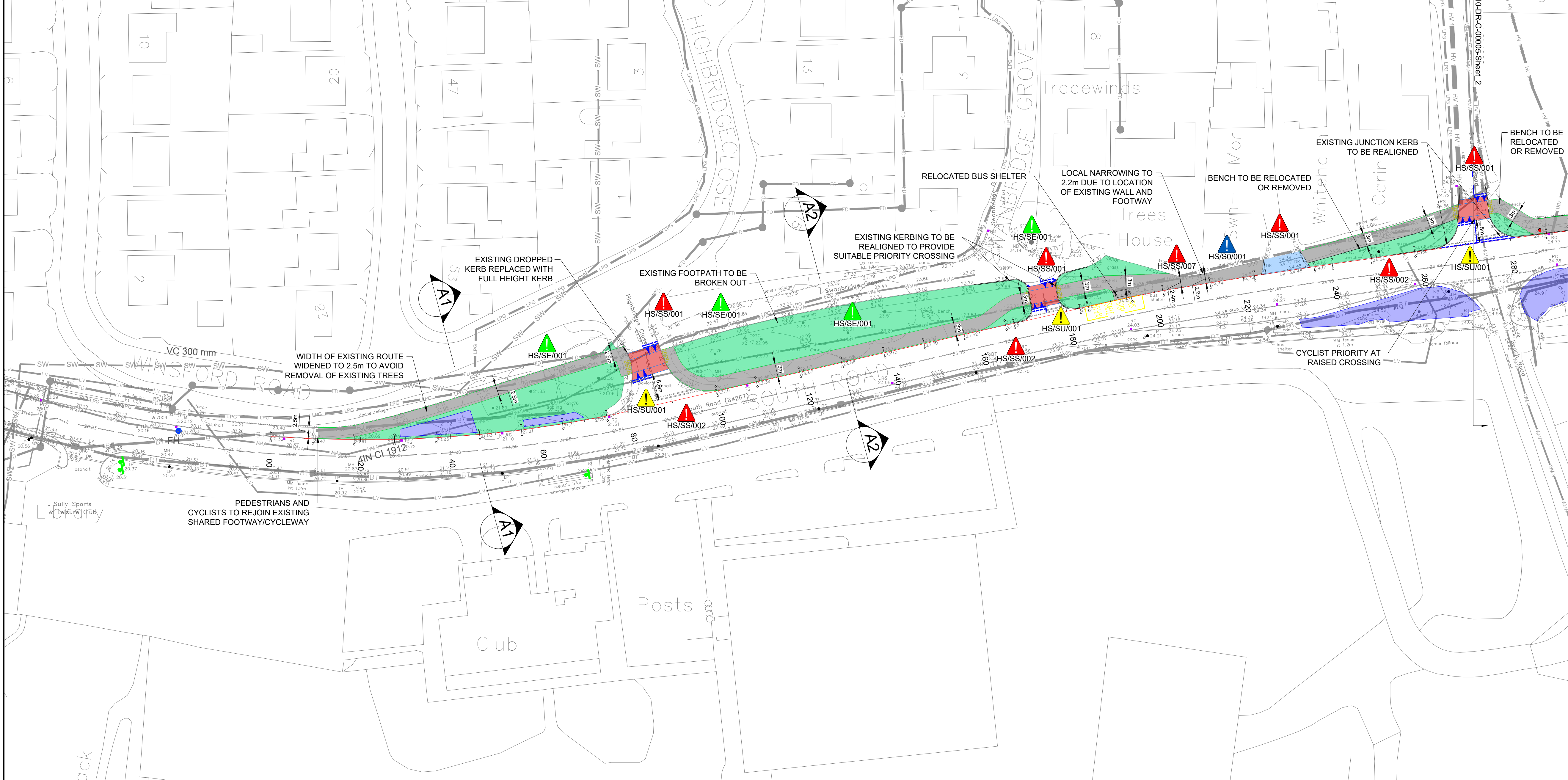
Original Size: A1	Grid: OS	Datum: ODN
Suitability Code: S1	Scale: 1:5000	Project Number: 10056562

Suitability Description: Suitable for Coordination

Drawing Number: 10056562 - ARC - AT - 110 - DR - C - 00003	Revision: P03
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SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION	WORKS STAGE
IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING:	C = CONSTRUCTION M = MAINTENANCE D = DECOMMISSION/DEMOLITION
HEALTH & SAFETY	
HS/SS/001-WORKS IN CLOSE PROXIMITY TO PUBLIC	C / M / D
HS/SS/002-WORKING NEXT TO LIVE TRAFFIC	C / M / D
HS/SU/007-LOCAL NARROWING OF EXISTING WALL AND FOOTWAY	C / M / D
ENVIRONMENTAL	
HS/SE/001-WORKS IN CLOSE PROXIMITY TO EXISTING TREE ROOT PROTECTION ZONES	C / M / D
UTILITIES	
HS/SU/001-WORKS IN CLOSE PROXIMITY TO EXISTING UTILITIES	C / M / D
OUTSTANDING APPROVALS	
HS/SO/001-ROUTE ARRANGEMENT STILL TO BE AGREED	C
IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT. TO BE READ IN CONJUNCTION WITH RISK REGISTER FOR FURTHER INFORMATION AND MITIGATION MEASURES.	



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- REFER TO DRAWING 10056562-ARC-AT-110-DR-C-00003 FOR GENERAL ARRANGEMENT OVERVIEW.
- REFER TO DRAWINGS 10056562-ARC-AT-072-DR-C-00001 & 00003 FOR TYPICAL CROSS SECTIONS.
- REFER TO DRAWING 10056562-ARC-AT-051-DR-C-00001 FOR EXISTING UTILITIES LAYOUT.
- THE DESIGN IS BASED ON THE ASSUMPTION THAT THE POSTED SPEED LIMIT IS REDUCED FROM 40mph TO 30mph.

LEGEND

- PLANNING BOUNDARY
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- PROPOSED VERGE
- PROPOSED EARTHWORKS
- PROPOSED FENCE
- PROPOSED RAIN GARDEN
- PROPOSED GULLY
- EXISTING GULLY
- PROPOSED STREET LIGHTING
- EXISTING STREET LIGHTING
- PROPOSED SIGN
- EXISTING SIGNS

Rev	Date	Description	Prod.	Chk.	Rev.	App.
P01	10/03/23	FIRST ISSUE	GJ	CH	MT	MG
P02	18/10/24	UPDATED FOR PLANNING	GJ	MP	SD	MG

VALE OF GLAMORGAN

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Client: Vale of Glamorgan Council
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www.valeofglamorgan.gov.uk

ARCADIS

Registered office: 80 Fenchurch Street, London EC3M 4BY

Coordinating office: Arcadis Suite 4d, 4th Floor, Hodge House, 144-166 St Mary St, Cardiff CF10 1DY
Tel: 44 (0)29 2092 6700

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Design Stage: Preliminary Design

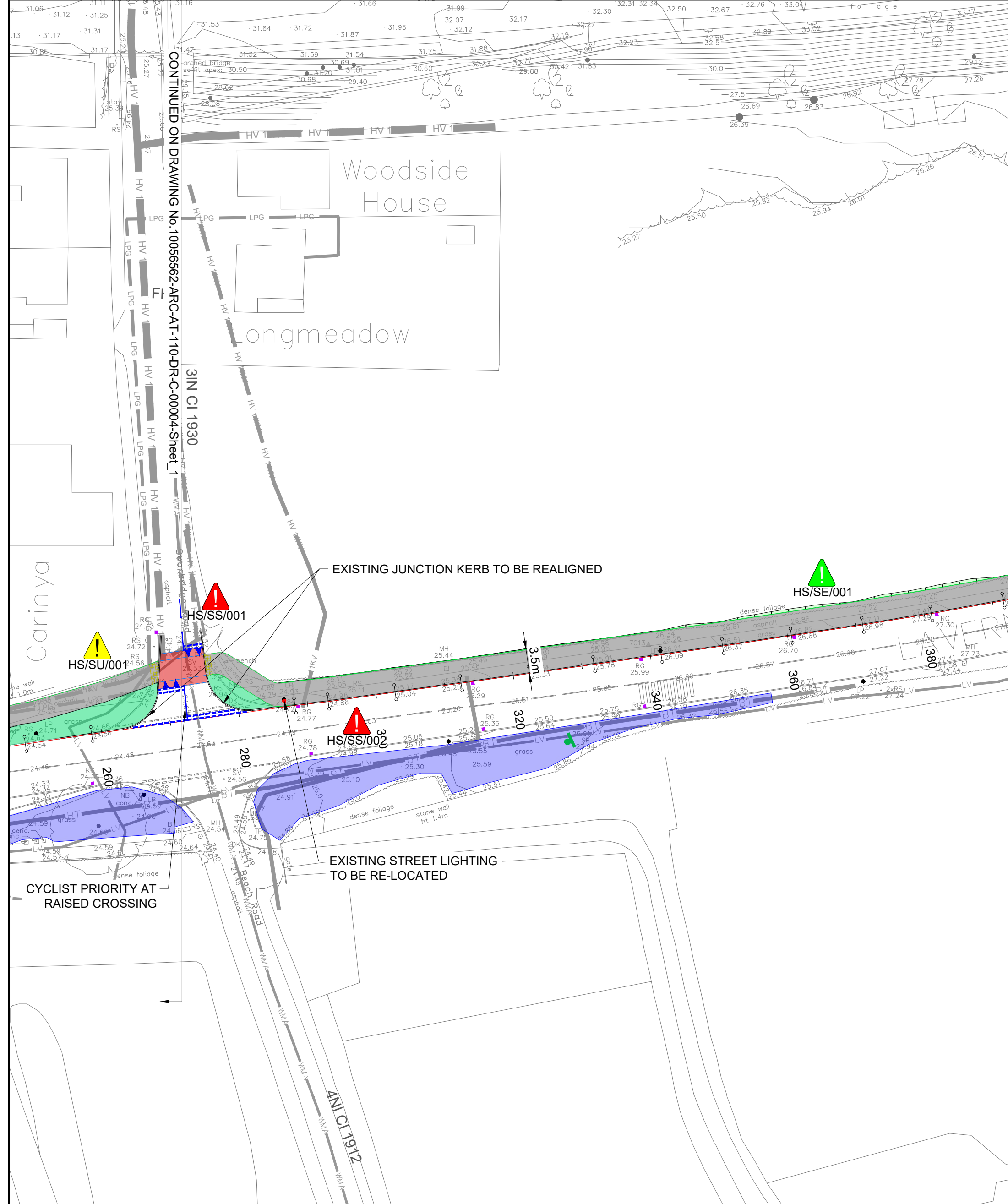
Original Size: A1 Grid: OS Datum: ODN

Suitability Code: S3 Scale: 1:500 Project Number: 10056562

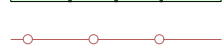
Suitability Description: Suitable for Review and Comment

Drawing Number: 10056562 - ARC - AT - 110 - DR - C - 00004

Revision: P02

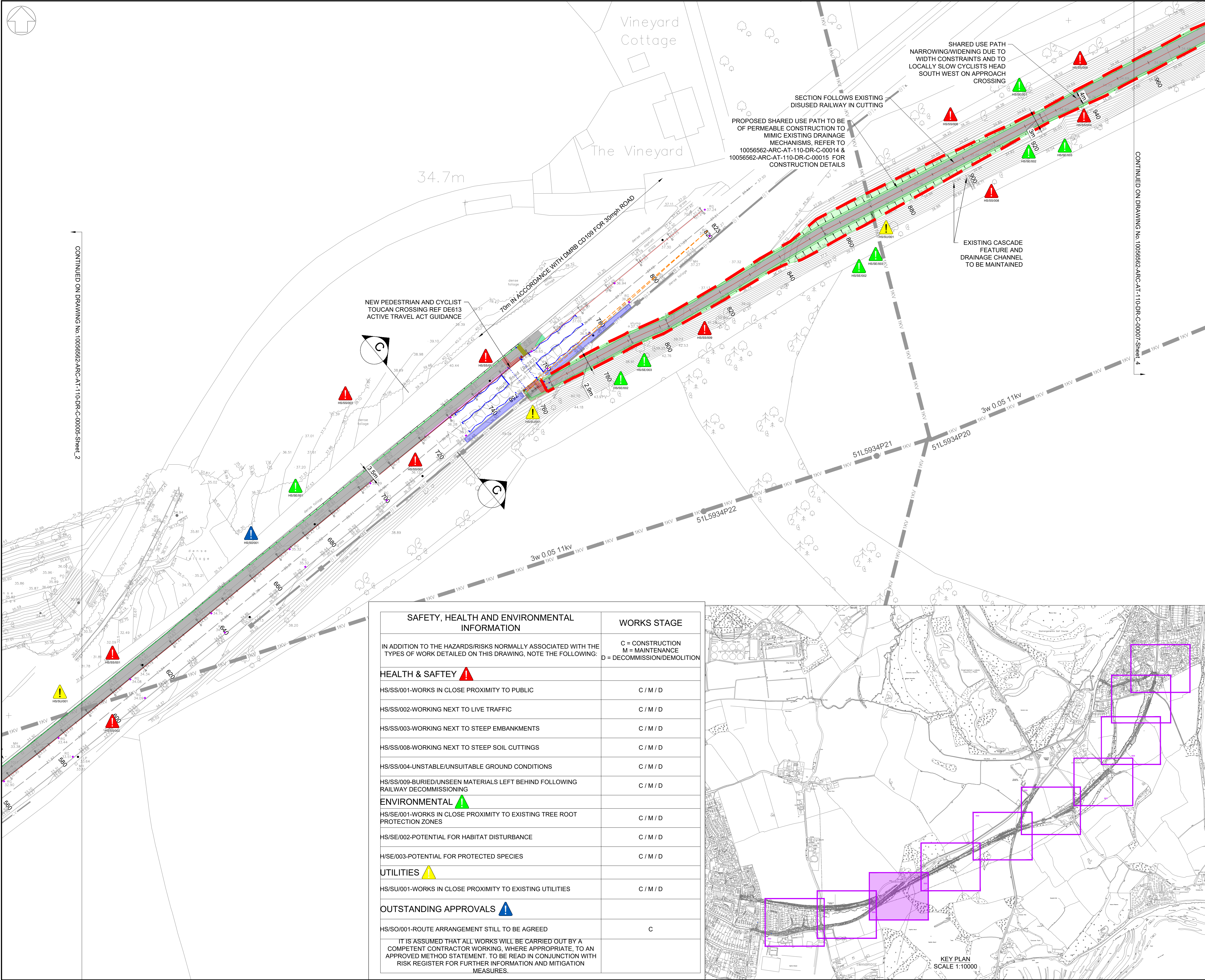
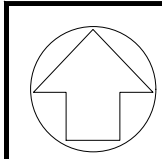


The map shows a road area with a proposed station location marked by a blue triangle and labeled 'HS/IS0/001'. The map includes contour lines, a road labeled 'South Road (84267)', and various elevation points. Two black triangles with the letter 'B' are also present, pointing towards the station location.

- | | |
|---|----------------------------------|
| LEGEND | |
|  | PLANNING BOUNDARY |
|  | PROPOSED SHARED FOOTWAY/CYCLEWAY |
|  | PROPOSED RAISED CROSSING |
|  | GRASSED AREA |
|  | PROPOSED VERGE |
|  | PROPOSED EARTHWORKS |
|  | PROPOSED FENCE |
|  | PROPOSED RAIN GARDEN |
|  | PROPOSED GULLY |
|  | EXISTING GULLY |
|  | PROPOSED STREET LIGHTING |
|  | EXISTING STREET LIGHTING |
|  | PROPOSED SIGN |
|  | EXISTING SIGNS |

	
Project:	
Sully to Cosmeston ATR	
Site	Client
Sully to Cosmeston Cardiff	Vale of Glamorgan Council Cyngor Bro Morgannwg Civic Offices, Holton Road Barry - CF63 4RU www.valeofglamorgan.gov.uk

Drawing Title:			
ACTIVE TRAVEL ROUTE GENERAL ARRANGEMENT SHEET 2			
Designed:	Signed	Date	
D. Doyle	Digitally Signed	10/10/24	
Produced:	Signed	Date	
D. Doyle	Digitally Signed	10/10/24	
Checked:	Signed	Date	
M. Pearson	Digitally Signed	18/10/24	
Reviewed:	Signed	Date	
S. Davies	Digitally Signed	18/10/24	
Approved:	Signed	Date	
D. Griffiths	Digitally Signed	18/10/24	
Design Stage:			
Preliminary Design			
Original Size:	Grid:	Datum:	
A1	OS	ODN	
Suitability Code:	Scale:	Project Number:	
S3	1:500	10056562	
Suitability Description:			
Suitable for Review and Comment			
Drawing Number:			Revision:
10056562 - ARC - AT - 110 - DR - C - 00005			P02



- NOTES:
- DO NOT SCALE FROM DRAWING, USE FIGURED DIMENSIONS ONLY.
 - ALL UNITS IN METRES UNLESS STATED OTHERWISE.
 - REFER TO DRAWING 10056562-ARC-AT-110-DR-C-00003 FOR GENERAL ARRANGEMENT OVERVIEW.
 - REFER TO DRAWING 10056562-ARC-AT-072-DR-C-00001 & 00003 FOR TYPICAL CROSS SECTIONS.
 - REFER TO DRAWING 10056562-ARC-AT-051-DR-C-00001 FOR EXISTING UTILITIES LAYOUT.
 - THE DESIGN IS BASED ON THE ASSUMPTION THAT THE POSTED SPEED LIMIT IS REDUCED FROM 40mph to 30mph.

LEGEND	
	PLANNING BOUNDARY
	PROPOSED SHARED FOOTWAY/CYCLEWAY
	PROPOSED VERGE
	PROPOSED EARTHWORKS
	PROPOSED FENCE
	PROPOSED RAIN GARDEN
	PROPOSED GULLY
	EXISTING GULLY
	PROPOSED STREET LIGHTING
	EXISTING STREET LIGHTING
	PROPOSED STAGGERED REMOVABLE BOLLARDS
	PROPOSED SIGN
	VISIBILITY SPLAYS

Rev	Date	Description	Prod.	Chk.	Rev.	App.
P01	10/03/23	FIRST ISSUE	GJ	CH	MT	MG
P02	18/10/24	UPDATED FOR PLANNING	DD	MP	SD	MG

VALE OF GLAMORGAN
BRO MORGANNWG

Project: Sully to Cosmeston ATR

Site: Sully to Cosmeston Cardiff
Client: Vale of Glamorgan Council
Cynhor Bro Morgannwg
Civic Offices, Holton Road
Barry - CF63 4RU
www.valeofglamorgan.gov.uk

ARCADIS

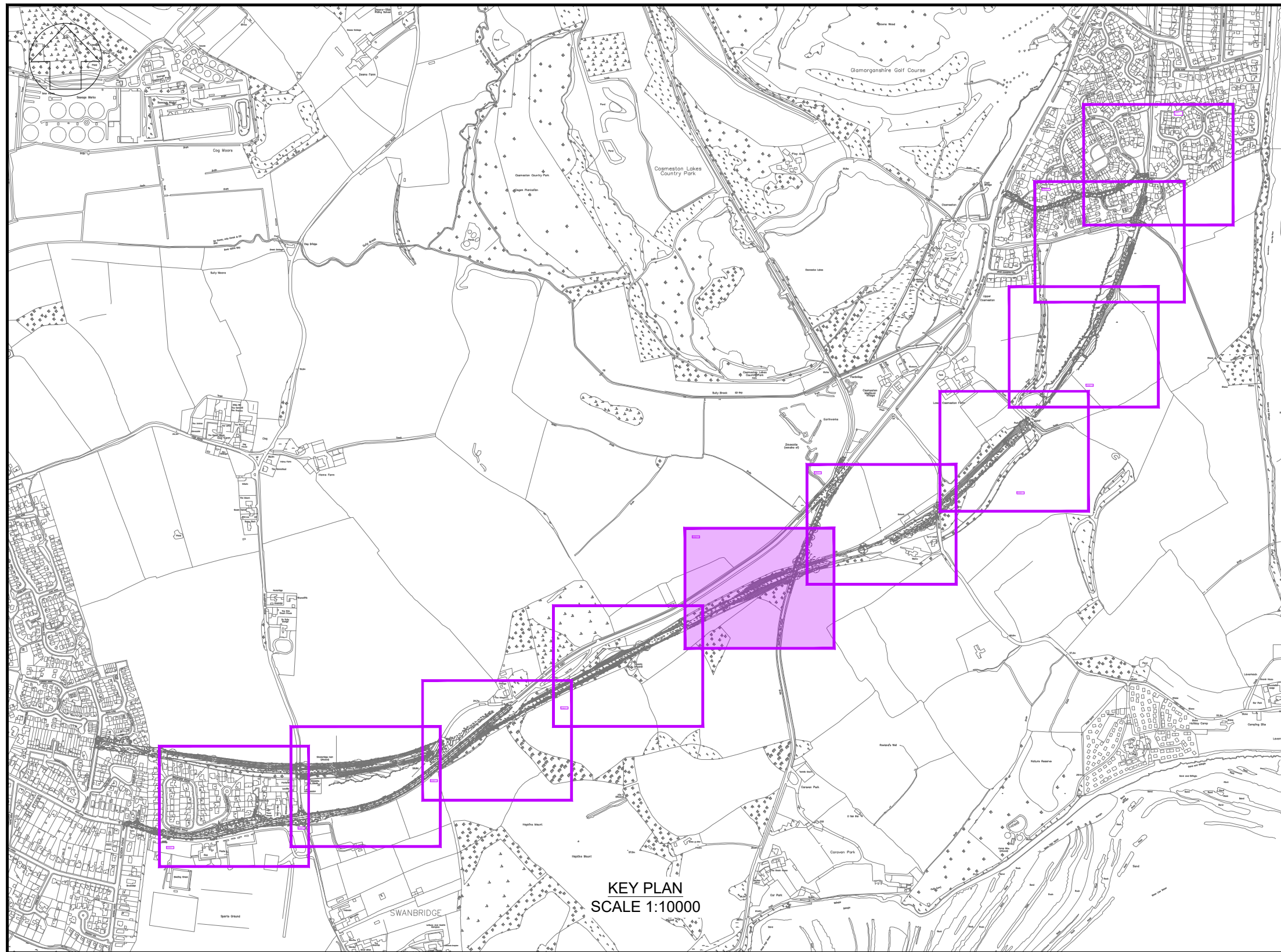
Registered office: 80 Fenchurch Street, London EC3M 4BY
Coordinating office: Arcadis Suite 4d, 4th Floor, Hodge House, 144-166 St Mary St, Cardiff CF10 1DY
Tel: 44 (0)29 2092 6700

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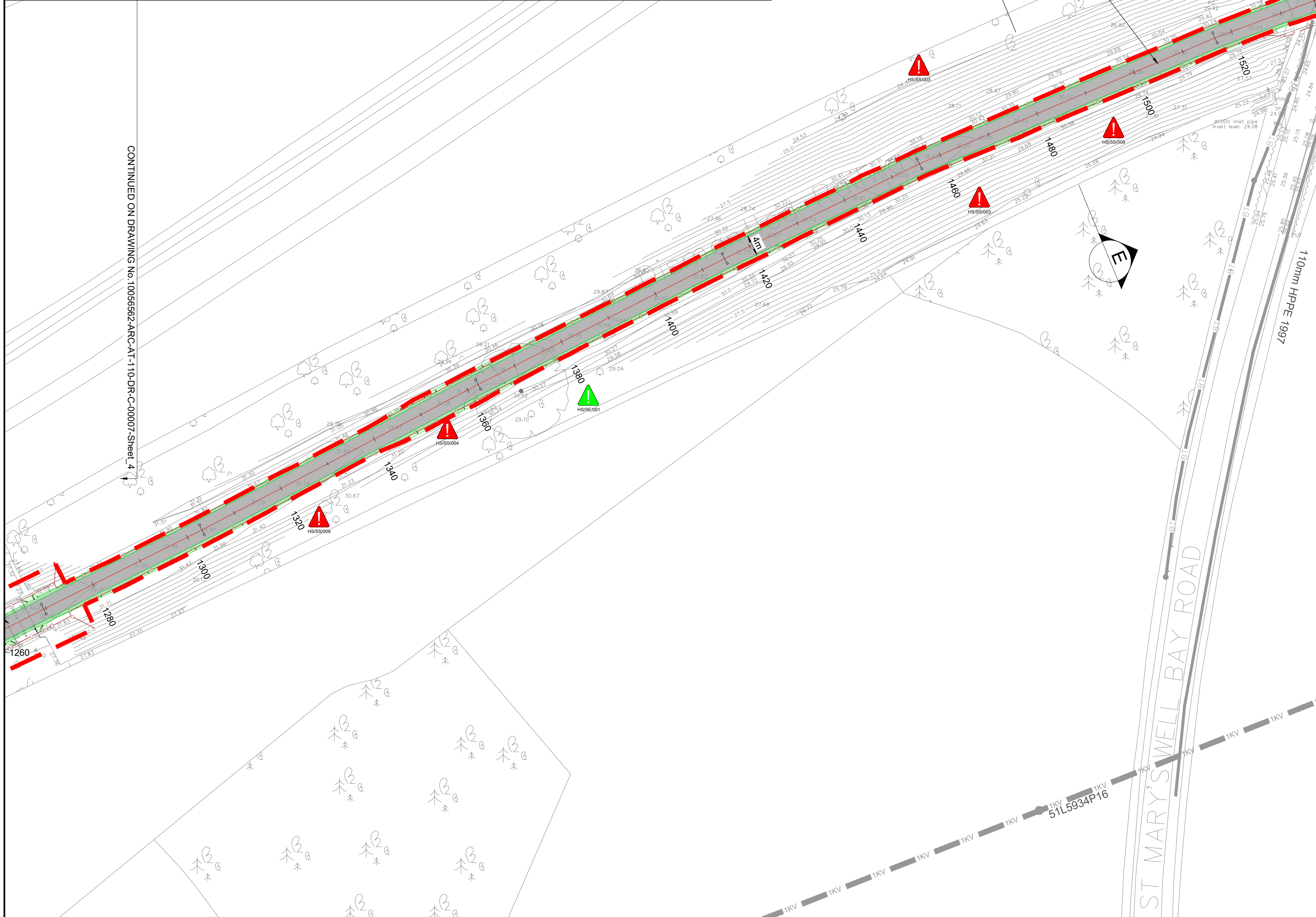
Drawing Title:		
ACTIVE TRAVEL ROUTE GENERAL ARRANGEMENT SHEET 3		
Designed: D Doyle	Signed: Digitally Signed	Date: 10/10/24
Produced: D Doyle	Signed: Digitally Signed	Date: 10/10/24
Checked: M Pearson	Signed: Digitally Signed	Date: 18/10/24
Reviewed: S Davies	Signed: Digitally Signed	Date: 18/10/24
Approved: M Griffiths	Signed: Digitally Signed	Date: 18/10/24
Design Stage: Preliminary Design		
Original Size: A1	Grid: OS	Datum: ODN
Suitability Code: S3	Scale: 1:500	Project Number: 10056562
Suitability Description:		
Suitable for Review and Comment		
Drawing Number: 10056562 - ARC - AT - 110 - DR - C - 00006		Revision: P02



	110	211	3	000001
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KEY PLAN
SCALE 1:10000



SECTION FOLLOWS EXISTING
DISUSED RAILWAY EMBANKMENT

EXISTING PARAPET HEIGHT TO BE
INCREASED, VIA THE USE OF A PEDESTRIAN
P4 PARAPET, TO A TOTAL HEIGHT OF 1.8m
ABOVE SHARED USE PATH LEVEL

ROUTE CROSSES OVER
EXISTING BRIDGE

PROPOSED ROAD MARKINGS

FLEX MSE RETAINING WALL.
TO BE DESIGNED BY OTHERS.

CONTINUED ON DRAWING No. 10056562-ARC-AT-110-DR-C-00009-Sheet 6

- NOTES:
- DO NOT SCALE FROM DRAWING, USE FIGURED DIMENSIONS ONLY.
 - ALL UNITS IN METRES UNLESS STATED OTHERWISE.
 - REFER TO DRAWING 10056562-ARC-AT-110-DR-C-00003 FOR GENERAL ARRANGEMENT OVERVIEW.
 - REFER TO DRAWING 10056562-ARC-AT-072-DR-C-00001 & 00003 FOR TYPICAL CROSS SECTIONS.
 - REFER TO DRAWING 10056562-ARC-AT-051-DR-C-00001 FOR EXISTING UTILITIES LAYOUT.
 - THE DESIGN IS BASED ON THE ASSUMPTION THAT THE POSTED SPEED LIMIT IS REDUCED FROM 40mph TO 30mph.

LEGEND

- PLANNING BOUNDARY
- PROPOSED SHARED FOOTWAY/CYCLEWAY
- PROPOSED VERGE
- PROPOSED EARTHWORKS
- PROPOSED FENCE
- PROPOSED STAGGERED REMOVABLE BOLLARDS
- VISIBILITY SPLAYS

Rev	Date	Description	Prod.	Chk.	Rev.	App.
P01	10/03/23	FIRST ISSUE	GJ	CH	MT	MG
P02	18/10/24	UPDATED FOR PLANNING	DD	MP	SD	MG



Project:
Sully to Cosmeston ATR

Site	Client
Sully to Cosmeston Cardiff	Vale of Glamorgan Council Cynfor Bro Morgannwg Civic Offices, Holton Road Barry - CF63 4RU www.valeofglamorgan.gov.uk



Registered office: 80 Fenchurch Street, London EC3M 4BY
Coordinating office: Arcadis Suite 4d, 4th Floor, Hodge House, 144-166 St Mary St, Cardiff CF10 1DY
Tel: 44 (0)29 2092 6700

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ACTIVE TRAVEL ROUTE
GENERAL ARRANGEMENT
SHEET 5

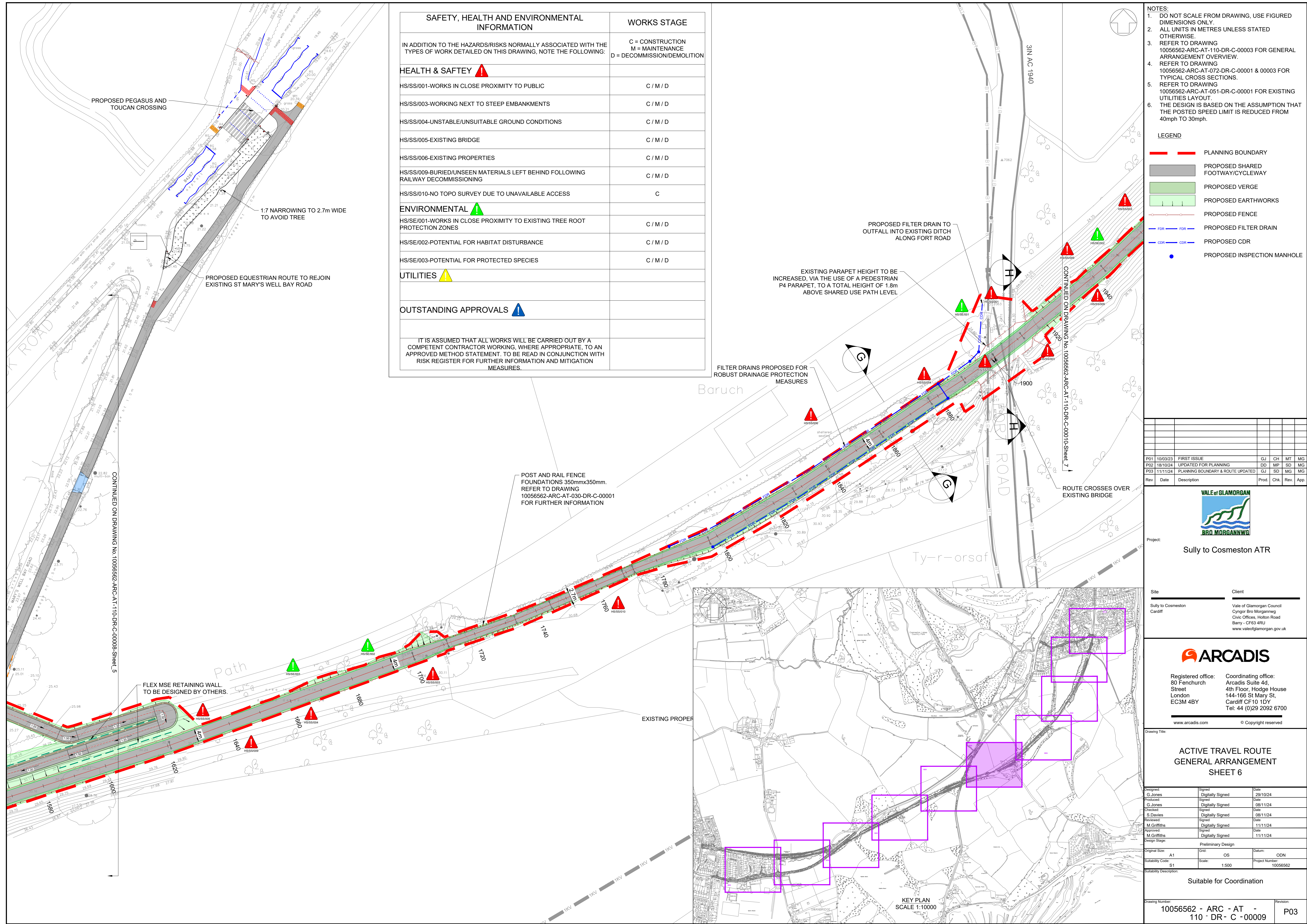
Designed: D. Doyle	Signed: Digitally Signed	Date: 10/10/24
Produced: D. Doyle	Signed: Digitally Signed	Date: 10/10/24
Checked: M. Pearson	Signed: Digitally Signed	Date: 18/10/24
Reviewed: S. Davies	Signed: Digitally Signed	Date: 18/10/24
Approved: M. Griffiths	Signed: Digitally Signed	Date: 18/10/24

Original Size: A1	Grid: OS	Datum: ODN
Suitability Code: S3	Scale: 1:500	Project Number: 10056562

Suitable for Review and Comment

Drawing Number: 10056562 - ARC - AT - 110 - DR - C - 00008	Revision: P02
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SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION	WORKS STAGE
IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING:	C = CONSTRUCTION M = MAINTENANCE D = DECOMMISSION/DEMOLITION
HEALTH & SAFETY	
HS/SS/001-WORKS IN CLOSE PROXIMITY TO PUBLIC	C / M / D
HS/SS/003-WORKING NEXT TO STEEP EMBANKMENTS	C / M / D
HS/SS/004-UNSTABLE/UNSUITABLE GROUND CONDITIONS	C / M / D
HS/SS/005-EXISTING BRIDGE	C / M / D
HS/SS/009-BURIED/UNSEEN MATERIALS LEFT BEHIND FOLLOWING RAILWAY DECOMMISSIONING	C / M / D
ENVIRONMENTAL	
HS/SE/001-WORKS IN CLOSE PROXIMITY TO EXISTING TREE ROOT PROTECTION ZONES	C / M / D
HS/SE/002-POTENTIAL FOR HABITAT DISTURBANCE	C / M / D
HS/SE/003-POTENTIAL FOR PROTECTED SPECIES	C / M / D
UTILITIES	
OUTSTANDING APPROVALS	
IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT. TO BE READ IN CONJUNCTION WITH RISK REGISTER FOR FURTHER INFORMATION AND MITIGATION MEASURES.	



SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION	WORKS STAGE
IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING:	C = CONSTRUCTION M = MAINTENANCE D = DECOMMISSION/DEMOLITION
HEALTH & SAFETY	
HS/SS/001-WORKS IN CLOSE PROXIMITY TO PUBLIC	C / M / D
HS/SS/003-WORKING NEXT TO STEEP EMBANKMENTS	C / M / D
HS/SS/004-UNSTABLE/UNSUITABLE GROUND CONDITIONS	C / M / D
HS/SS/005-EXISTING BRIDGE	C / M / D
HS/SS/006-EXISTING PROPERTIES	C / M / D
HS/SS/009-BURIED/UNSEEN MATERIALS LEFT BEHIND FOLLOWING RAILWAY DECOMMISSIONING	C / M / D
HS/SS/010-NO TOPO SURVEY DUE TO UNAVAILABLE ACCESS	C
ENVIRONMENTAL	
HS/SE/001-WORKS IN CLOSE PROXIMITY TO EXISTING TREE ROOT PROTECTION ZONES	C / M / D
HS/SE/002-POTENTIAL FOR HABITAT DISTURBANCE	C / M / D
HS/SE/003-POTENTIAL FOR PROTECTED SPECIES	C / M / D
UTILITIES	
OUTSTANDING APPROVALS	
IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT. TO BE READ IN CONJUNCTION WITH RISK REGISTER FOR FURTHER INFORMATION AND MITIGATION MEASURES.	

- NOTES:
- DO NOT SCALE FROM DRAWING, USE FIGURED DIMENSIONS ONLY.
 - ALL UNITS IN METRES UNLESS STATED OTHERWISE.
 - REFER TO DRAWING 10056562-ARC-AT-110-DR-C-00003 FOR GENERAL ARRANGEMENT OVERVIEW.
 - REFER TO DRAWING 10056562-ARC-AT-072-DR-C-00001 & 00003 FOR TYPICAL CROSS SECTIONS.
 - REFER TO DRAWING 10056562-ARC-AT-051-DR-C-00001 FOR EXISTING UTILITIES LAYOUT.
 - THE DESIGN IS BASED ON THE ASSUMPTION THAT THE POSTED SPEED LIMIT IS REDUCED FROM 40mph TO 30mph.

LEGEND

- PLANNING BOUNDARY
- PROPOSED SHARED FOOTWAY/CYCLEWAY
- PROPOSED VERGE
- PROPOSED EARTHWORKS
- PROPOSED FENCE
- PROPOSED FILTER DRAIN
- PROPOSED CDR
- PROPOSED INSPECTION MANHOLE

Rev	Date	Description	Prod.	Chk.	Rev.	App.
P01	10/03/23	FIRST ISSUE	GJ	CH	MT	MG
P02	18/10/24	UPDATED FOR PLANNING	DD	MP	SD	MG
P03	11/11/24	PLANNING BOUNDARY & ROUTE UPDATED	GJ	SD	MG	MG



Project:	Sully to Cosmeston ATR
Site:	Sully to Cosmeston Cardiff
Client:	Vale of Glamorgan Council Cynghor Bro Morgannwg Civic Offices, Holton Road Barry - CF63 4RU www.valeofglamorgan.gov.uk



Registered office: 80 Fenchurch Street London EC3M 4BY	Coordinating office: Arcadis Suite 4d, 4th Floor, Hodge House 144-166 St Mary St, Cardiff CF10 1DY Tel: 44 (0)29 2092 6700
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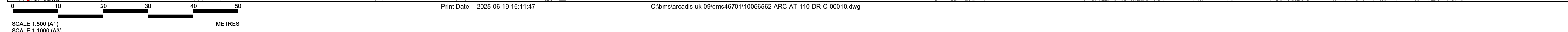
ACTIVE TRAVEL ROUTE
GENERAL ARRANGEMENT
SHEET 6

Designed: G.Jones	Signed: Digitally Signed	Date: 28/10/24
Produced: G.Jones	Signed: Digitally Signed	Date: 08/11/24
Checked: S.Davies	Signed: Digitally Signed	Date: 08/11/24
Reviewed: M.Griffiths	Signed: Digitally Signed	Date: 11/11/24
Approved: M.Griffiths	Signed: Digitally Signed	Date: 11/11/24

Design Stage:	Preliminary Design
Original Size:	A1
Grid:	OS
Datum:	ODN
Suitability Code:	S1
Scale:	1:500
Project Number:	10056562

Suitable for Coordination

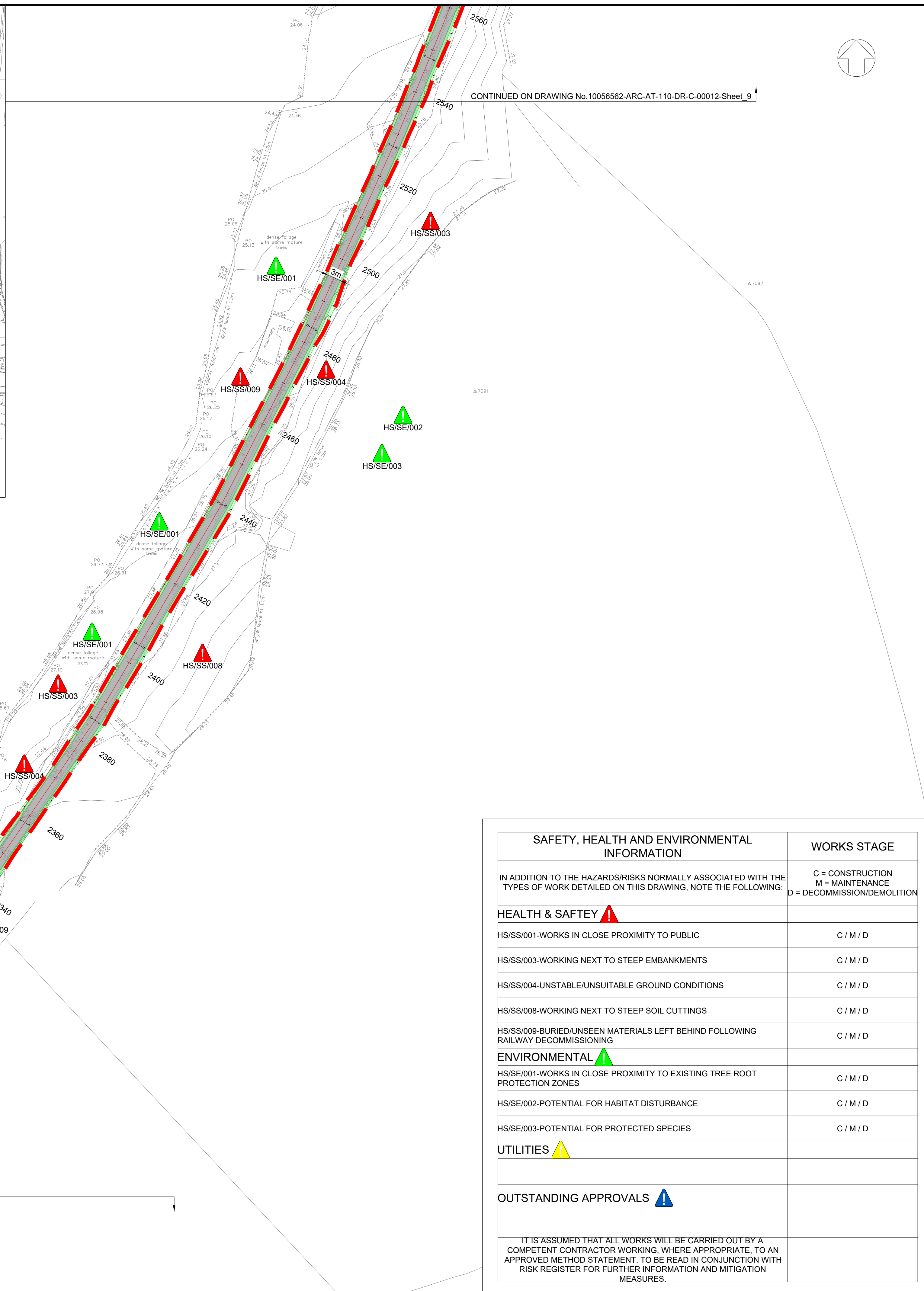
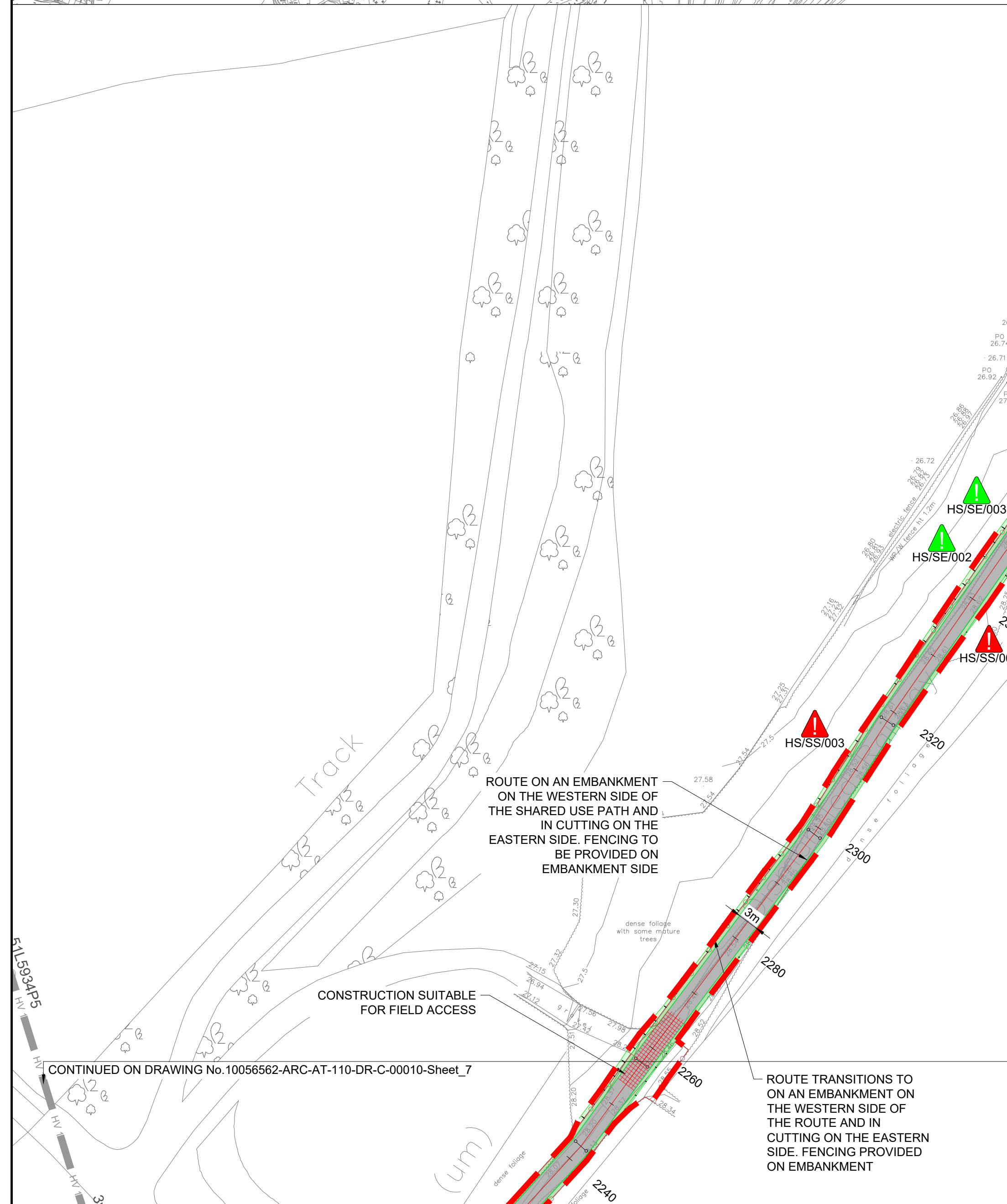
Drawing Number: 10056562 - ARC - AT - 110 - DR - C - 00009	Revision: P03
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- LEGEND**
- | | |
|---|----------------------------------|
|  | PLANNING BOUNDARY |
|  | PROPOSED SHARED FOOTWAY/CYCLEWAY |
|  | PROPOSED VERGE |
|  | PROPOSED EARTHWORKS |
|  | PROPOSED FENCE |

P01	10/03/23	FIRST ISSUE	GJ	CH	MT	MG			
P02	18/10/24	ISSUED FOR PLANNING	DD	MP	SD	MG			
P03	11/11/24	PLANNING BOUNDARY & ROUTE UPDATED	GJ	SD	MG	MG			
Rev	Date	Description	Prod.	Chk.	Rev.	App.			





- | | |
|--------|---|
| NOTES: | |
| 1. | DO NOT SCALE FROM DRAWING, USE FIGURED DIMENSIONS ONLY. |
| 2. | ALL UNITS IN METRES UNLESS STATED OTHERWISE. |
| 3. | REFER TO DRAWING
10056562-ARC-AT-110-DR-C-00003 FOR GENERAL ARRANGEMENT OVERVIEW. |
| 4. | REFER TO DRAWING
10056562-ARC-AT-072-DR-C-00001 & 00003 FOR TYPICAL CROSS SECTIONS. |
| 5. | REFER TO DRAWING
10056562-ARC-AT-051-DR-C-00001 FOR EXISTING UTILITIES LAYOUT. |
| 6. | THE DESIGN IS BASED ON THE ASSUMPTION THAT THE POSTED SPEED LIMIT IS REDUCED FROM 40mph TO 30mph. |

LEGEND

-  PLANNING BOUNDARY
 PROPOSED SHARED FOOTWAY/CYCLEWAY
 PROPOSED VERGE
 PROPOSED EARTHWORKS
 PROPOSED FENCE

P01	10/03/23	FIRST ISSUE	GJ	CH	MT	MG			
P02	18/10/24	UPDATED FOR PLANNING	DD	MP	SD	MG			
P03	11/11/24	PLANNING BOUNDARY & ROUTE UPDATED	GJ	SD	MG	MG			
Rev	Date	Description	Prod.	Chk.	Rev.	Appr.			



Project: Sully to Cosmeston ATR

Site	Client
Sully to Cosmeston Cardiff	Vale of Glamorgan Council Cynghor Bro Morgannwg Civic Offices, Holton Road Barry - CF63 4RU www.valeofglamorgan.gov.uk



Registered office: 80 Fenchurch Street
London
EC3M 4BY

Coordinating office:
Arcadis Suite 4d,
4th Floor, Hodge House
144-166 St Mary St,
Cardiff CF10 1DY
Tel: 44 (0)29 2092 6700

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Drawing Title

ACTIVE TRAVEL ROUTE
GENERAL ARRANGEMENT
SHEET 8

Designed: G.Jones	Signed Digitally Signed	Date 29/10/24
Produced: G.Jones	Signed Digitally Signed	Date 08/11/24
Checked: S.Davies	Signed Digitally Signed	Date 08/11/24
Reviewed: M.Griffiths	Signed Digitally Signed	Date 11/11/24
Approved: M.Griffiths	Signed Digitally Signed	Date 11/11/24

Design Stage: Preliminary Design

Original Size: A1	Grid: OS	Datum: ODN
Suitability Code:	Scale:	Project Number:

S1
Cultivability Determination

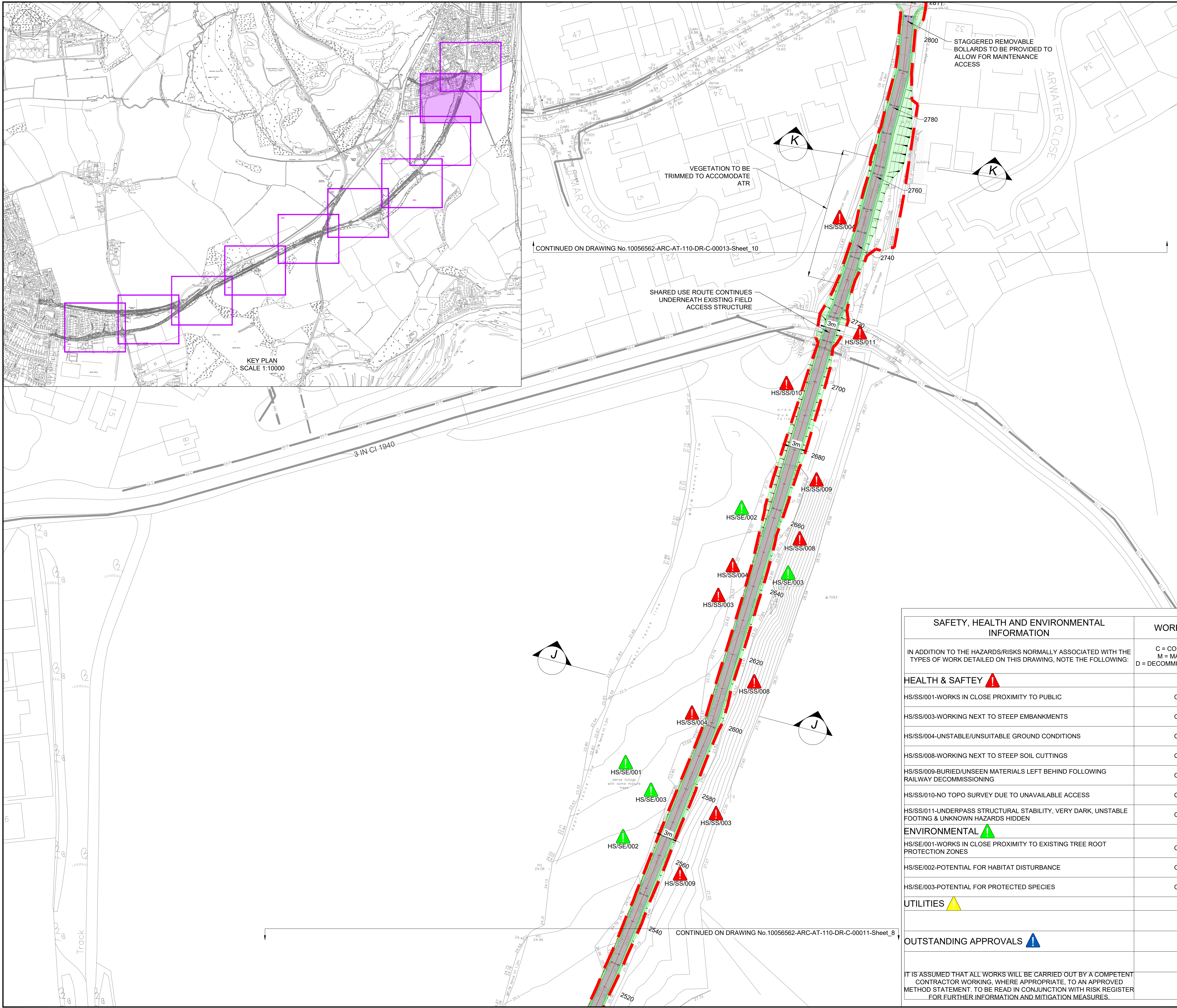
Suitable for Coordination

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Drawing Number: 10056562 - ARC - AT -
110 - RB - C 00011

12

PC



- NOTES:
- DO NOT SCALE FROM DRAWING, USE FIGURED DIMENSIONS ONLY.
 - ALL UNITS IN METRES UNLESS STATED OTHERWISE.
 - REFER TO DRAWING 10056562-ARC-AT-110-DR-C-00003 FOR GENERAL ARRANGEMENT OVERVIEW.
 - REFER TO DRAWING 10056562-ARC-AT-072-DR-C-00001 & 00003 FOR TYPICAL CROSS SECTIONS.
 - REFER TO DRAWING 10056562-ARC-AT-051-DR-C-00001 FOR EXISTING UTILITIES LAYOUT.
 - THE DESIGN IS BASED ON THE ASSUMPTION THAT THE POSTED SPEED LIMIT IS REDUCED FROM 40mph to 30mph.

LEGEND

- PLANNING BOUNDARY
- PROPOSED SHARED FOOTWAY/CYCLEWAY
- PROPOSED VERGE
- PROPOSED EARTHWORKS
- PROPOSED FENCE

Rev	Date	Description	Prod.	Chk.	Rev.	App.
P01	10/03/23	FIRST ISSUE	GJ	CH	MT	MG
P02	18/10/24	UPDATED FOR PLANNING	DD	MP	SD	MG
P03	11/11/24	PLANNING BOUNDARY & ROUTE UPDATED	GJ	SD	MG	MG



Project: Sully to Cosmeston ATR

Site	Client
Sully to Cosmeston Cardiff	Vale of Glamorgan Council Cynfor Bro Morgannwg Civic Offices, Holton Road Barry - CF63 4RU www.valeofglamorgan.gov.uk



Registered office: 80 Fenchurch Street, London EC3M 4BY
Coordinating office: Arcadis Suite 4d, 4th Floor, Hodge House, 144-166 St Mary St, Cardiff CF10 1DY
Tel: 44 (0)29 2092 6700

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ACTIVE TRAVEL ROUTE
GENERAL ARRANGEMENT
SHEET 9

Designed:	Signed:	Date:
G.Jones	Digitally Signed	28/10/24
Produced:	Signed:	Date:
G.Jones	Digitally Signed	08/11/24
Checked:	Signed:	Date:
S.Davies	Digitally Signed	08/11/24
Reviewed:	Signed:	Date:
M.Griffiths	Digitally Signed	11/11/24
Approved:	Signed:	Date:
M.Griffiths	Digitally Signed	11/11/24

Design Stage:	Preliminary Design
Original Size:	A1
Grid:	OS
Datum:	ODN
Suitability Code:	S1
Scale:	1:500
Project Number:	10056562

Suitable for Coordination

Drawing Number:	10056562 - ARC - AT - 110 - DR - C - 00012
Revision:	P03

SAFETY, HEALTH AND ENVIRONMENTAL INFORMATION	WORKS STAGE
IN ADDITION TO THE HAZARDS/RISKS NORMALLY ASSOCIATED WITH THE TYPES OF WORK DETAILED ON THIS DRAWING, NOTE THE FOLLOWING:	C = CONSTRUCTION M = MAINTENANCE D = DECOMMISSION/DEMOLITION
HEALTH & SAFETY	
HS/SS/001-WORKS IN CLOSE PROXIMITY TO PUBLIC	C / M / D
HS/SS/003-WORKING NEXT TO STEEP EMBANKMENTS	C / M / D
HS/SS/004-UNSTABLE/UNSUITABLE GROUND CONDITIONS	C / M / D
HS/SS/008-WORKING NEXT TO STEEP SOIL CUTTINGS	C / M / D
HS/SS/009-BURIED/UNSEEN MATERIALS LEFT BEHIND FOLLOWING RAILWAY DECOMMISSIONING	C / M / D
HS/SS/010-NO TOPO SURVEY DUE TO UNAVAILABLE ACCESS	C / M / D
HS/SS/011-UNDERPASS STRUCTURAL STABILITY, VERY DARK, UNSTABLE FOOTING & UNKNOWN HAZARDS HIDDEN	C / M / D
ENVIRONMENTAL	
HS/SE/001-WORKS IN CLOSE PROXIMITY TO EXISTING TREE ROOT PROTECTION ZONES	C / M / D
HS/SE/002-POTENTIAL FOR HABITAT DISTURBANCE	C / M / D
HS/SE/003-POTENTIAL FOR PROTECTED SPECIES	C / M / D
UTILITIES	
OUTSTANDING APPROVALS	
IT IS ASSUMED THAT ALL WORKS WILL BE CARRIED OUT BY A COMPETENT CONTRACTOR WORKING, WHERE APPROPRIATE, TO AN APPROVED METHOD STATEMENT. TO BE READ IN CONJUNCTION WITH RISK REGISTER FOR FURTHER INFORMATION AND MITIGATION MEASURES.	

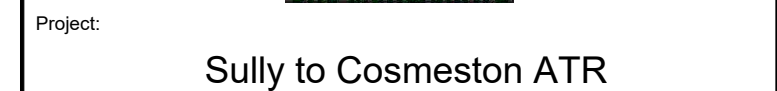


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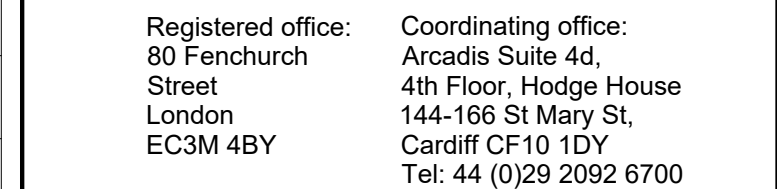
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- LEGEND
- | | |
|---|----------------------------------|
|  | PLANNING BOUNDARY |
|  | PROPOSED SHARED FOOTWAY/CYCLEWAY |
|  | PROPOSED VERGE |
|  | PROPOSED EARTHWORKS |
|  | EXISTING FOOTWAY/CYCLEWAY |
|  | PROPOSED FENCE |

P01	10/03/23	FIRST ISSUE	GJ	CH	MT	MG	
P02	18/10/23	UPDATED FOR PLANNING	GJ	MP	SD	MG	
P03	11/11/24	PLANNING BOUNDARY & ROUTE UPDATED	GJ	SD	MG	MG	
Rev	Date	Description	Prod.	Chk.	Rev.	App.	



Site	Client
Sully to Cosmeston Cardiff	Vale of Glamorgan Council Cyngor Bro Morgannwg Civic Offices, Holton Road Barry - CF63 4RU www.valeofglamorgan.gov.uk



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Drawing Title:

ACTIVE TRAVEL ROUTE
GENERAL ARRANGEMENT
SHEET 10

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Checked: S.Davies	Signed Digitally Signed	Date 08/11/24
Reviewed: M.Griffiths	Signed Digitally Signed	Date 11/11/24
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SULLY TO COSMESTON ATR

Structural Interventions - Investigation and Options Report

Document reference - 10056562-ARC-AT-160-RP-S-000001

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Sully To Cosmeston ATR

Structural Interventions - Investigation and Options Report

Author

Louis Brown



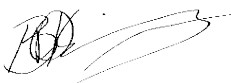
Checker

Andrew Thomas



Reviewer

Ben King



Approver

Jeff Lynn



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A01	29/06/2024	Louis Brown	First Issue

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Executive summary

This report, prepared by Arcadis Consulting (UK) Limited for the Vale of Glamorgan Council, focuses on recommended structural interventions needed for 7 No. bridges along the proposed Active Travel Route (ATR) between Sully and Cosmeston. The structures examined are masonry arch bridges on the decommissioned Cadoxton branch of the Taff Vale Railway. The report includes findings from a visual survey of each structure along the route, including a general condition assessment, highlighting defects related to durability and aesthetics, such as failed waterproofing, vegetation cover, missing wingwall ends and coping stones at one bridge and cracks in masonry within the sub-structure of two other bridges. There are no safety-critical defects identified in any of the structures. The report also recommends four options for upgrading the structures, along with cost estimates for each option. Additionally, the report highlights requirements for the ATR, including loadings, dimensions, and parapet height, and identifies constraints such as site access, land consents, neighbouring properties, proposed housing development, and evidence of persons sleeping rough. Further scheme development is anticipated, such as an ecology survey and reassessment of defect scope and associated repair costs after de-vegetation works. Some repairs may not be required depending on the final routing of the ATR.

1 Introduction

This report has been prepared by Arcadis Consulting (UK) Limited for Vale of Glamorgan Council (VoG) addressing in support of the proposed Active Travel Route (ATR) between Sully and Cosmeston. This report focuses on the findings from a visual survey of the structures along this route, outlining the defects identified and recommending structural interventions required to facilitate this ATR. For details on the overarching scheme please refer to report ref. 10048316-ARC-XX-010-SP-C-0002-P01 "Sully-Cosmeston Active Travel Report, dated 03/2023.

All condition images used within this report were taken during site inspections works undertaken by Arcadis on 29th and 30th Jan 2024, with any other figure sources linked within their description captions.

1.1 Description of Structures

The structures covered within this report are all single span masonry arch underbridges used to carry the Cadoxton branch of the historic Taff Vale Railway (TVR) Line, except for Cosmeston Farm Underpass where the railway ran underneath. The track and ballast have since been removed, with the topside of each structure now carrying an unmade footpath. Extensive vegetation growth is present at each site, meaning that parts of some structures were not accessible. Each structure is discussed in more detail later in this report, with key information on the location of each structure shown in Table 1 below:

Structure Name	Obstacle crossed	Location		Ordnance Survey Reference
		Easting	Northing	
Swanbridge Road Bridge	Public Highway	316195	167888	ST164680
St. Mary's Well Bay Road Bridge	Public Highway	317541	168502	ST175685
Fort Road Bridge	Public Highway	317869	168642	ST178686
Cosmeston Farm Underpass	Public Footpath	318316	169305	ST183693
Additional Structure 1 (ST167681)	N/A	316729	168106	ST167681
Additional Structure 2 (ST172683)	Private farm / field access	317290	168383	ST172683
Additional Structure 3 (ST180688)	Private farm / field access	318075	168846	ST180688

Table 1 – Summary of structure locations

The location of each of these structures is shown in Figure 1 below:



Figure 1 – Location Plan

1.2 Project Scope

The original project scope included four structures but the original scope has been extended to include an additional three structures. The additional structures have no identifying names, and so are numbered from west to east with their OS grid references appended. All structures are listed as follows:

Bridges within original scope

- Swanbridge Road
- St Mary's Well Bay
- Fort Road
- Cosmeston Farm Underpass

Additional Structures

- Additional Structure 1 (ST167681)
- Additional Structure 2 (ST172683)
- Additional Structure 3 (ST180688)

Arcadis' scope of works regarding the structures above was laid out within the offer letter from Vale of Glamorgan Council, dated 4th December 2023, and is as follows.

- Review of background information
- Undertaking of general visual structural inspection
- Preparation of inspection and options report, including description of general structural condition and any proposed repair. High-level options review to include alternatives to repair and indicative costs associated.
 - The option review excludes detailed consideration of design aspects, such as extending parapet height to meet equestrian standards as this is considered beyond the scope of structural interventions, this is to be covered within design development of the ATR itself.
- Preparation of GA drawings for each of the structures detailing any apparent defects and repairs
- Arcadis' scope of works does not include review or assessment of structural capacity at this stage

1.3 Summary of defects and costs

A summary of the defects identified and adherence to ATR spatial requirements is included in Table 2 below. See section 2.2 for details of spatial requirements for the ATR and section 3 for an overview of the general condition of each structure.

Structure Name	Clear deck width (>3.5m?)	Parapet height (>1.8m?)	Waterproofing failure present? (Y/N)	% covered in vegetation	Evidence of bridge strike? (Y/N)	Essential repair required? (Y/N)
Swanbridge Road Bridge	7.7m (>3.5m)	1.55m (<1.8m)	Y	40%	N	N
St. Mary's Well Bay Road Bridge	7.8m (>3.5m)	1.55m (<1.8m)	Y	40%	Y	N
Fort Road Bridge	7.8m (>3.5m)	1.45m (<1.8m)	N	50%	Y	Y
Cosmeston Farm Underpass	7.7m* (>3.5m)	N/A	Y	70%	N/A	N
Additional Structure 1 (ST167681)	N/A	N/A	N	60%	N/A	N
Additional Structure 2 (ST172683)	7.7m (>3.5m)	1.50m (<1.8m)	Y	70%	N	N
Additional Structure 3 (ST180688)	7.8m (>3.5m)	Unknown	Y	70%	N	N

*Refers to clear span between abutments as the structure at Cosmeston Farm is an underpass

Table 2 – Overview of adherence to ATR spatial requirements and general condition of each structure

Section 4 outlines 4 No. options for upgrading each of the structures:

- Option 1 – De-vegetation works and essential repair
- Option 2 – Non-essential repair in addition to Option 1
- Option 3 – Installation of access and structure waterproofing in addition to Option 2
- Option 4 – Bridge deck replacement

Section 5 outlines estimated costs for carrying out each of these options. These costs are estimated based on entries in Spons Price Book (adjusted for inflation), as well as typical proprietary product information available online. These cost totals are summarised in Table 3 below. Note that lower and upper bound costs for Fort Road Bridge relate to the type of repair required for the crack to the north eastern wingwall, pending a detailed survey; see sections 3.3 and 4.1 for further information.

As of the writing of this report, the proposed active travel route bypasses the old Cadoxton Branch in the westernmost part of the route, and instead follows & adapts the existing pedestrian/cycle route along Lavernock Road- see report ref. 10048316-ARC-XX-010-SP-C-0002-P01 “Sully-Cosmeston Active Travel Report. This means that the route as it stands is unlikely to pass through Swanbridge Road Bridge or Additional Structure 1 (S167681). As such, the cost totals given in Table 3 for each option including and excluding these two structures is given.

Structure Name	Option 1		Option 2		Option 3		Option 4
	Lower bound	Upper bound	Lower bound	Upper bound	Lower bound	Upper bound	
Swanbridge Road Bridge	£20,000		£65,000		£165,000		£570,000
St. Mary's Well Bay Road Bridge	£20,000		£65,000		£165,000		£565,000
Fort Road Bridge	£25,000	£75,000	£60,000	£455,000	£65,000	£115,000	£455,000
Cosmeston Farm Underpass	£35,000		£85,000		£180,000		£400,000
Additional Structure 1 (ST167681)	£10,000		£20,000		£20,000		£145,000
Additional Structure 2 (ST172683)	£35,000		£85,000		£210,000		£300,000
Additional Structure 3 (ST180688)	£35,000		£105,000		£245,000		£350,000
Total cost estimate- structures on proposed ATR	£150,000	£200,000	£400,000	£795,000	£865,000	£915,000	£2,070,000
Total cost estimate- all structures	£180,000	£230,000	£485,000	£530,000	£1,050,000	£1,100,000	£2,785,000

Table 3 – Cost summary- all options for structures on proposed ATR and all structures

2 Review of information

2.1 Information Reviewed Prior to Investigation Works

The information reviewed prior to the undertaking of the investigation works is listed within the table below:

Document	Document Available? (Y/N)	Date reviewed
Historical drawings	N	N/A
Detailed Examination Report	N	N/A
Visual Examination Report	N	N/A
Assessment Report	N	N/A
Inspection Report	N	N/A
Buried Services Report	Y	13/07/2022

Table 4 – List of relevant reviewed documents

2.2 Requirements

Due to the use case of the proposed active travel route, the structures will need to be confirmed adequate by a designer at detailed design stage to support the following loadings:

- Maintenance vehicles – LM1 and 2 in line with BS EN 1991-2 (British Standards Institution, 2003).
- Pedestrian loading – LM4 in line with BS EN 1991-2, and horizontal actions to BS EN 1991-1 (British Standards Institution, 2002).
- Equestrian loading – live load of 5kN/m², with local checks with Point Load of 8.12kN in line with British Horse Society, 'Advice on Bridges, gradients and steps in England and Wales' (The British Horse Society, 2016)
- Wind and snow loadings – Wind and snow loadings to BS EN 1991-1-4 (British Standards Institution, 2005) and BS EN 1991-1-3 (British Standards Institution, 2003) respectively and their respective National Annexes

To facilitate the Active Travel Route, the following dimensions also need to be met (also refer to Figure 2):

- Clear deck width – 3.5m in line with CD353 "Design Criteria for footbridges" (Standards for Highways, 2020). 4m is preferred by British Horse Society; refer to Table 3 of the Sully to Cosmeston ATR Route Report for details of the proposed route width.
- Parapet Height – 1.8m in line with CD377 "General requirements for road restraint systems" (Standards for Highways, 2021); it is assumed that any deviation from the required parapet height will be mitigated by installation of 1.8m fence panels inboard of bridge parapets).
- A reinforced concrete strip foundation may be required inside of the existing masonry parapets to support the 1800mm high steel or GRP parapets.

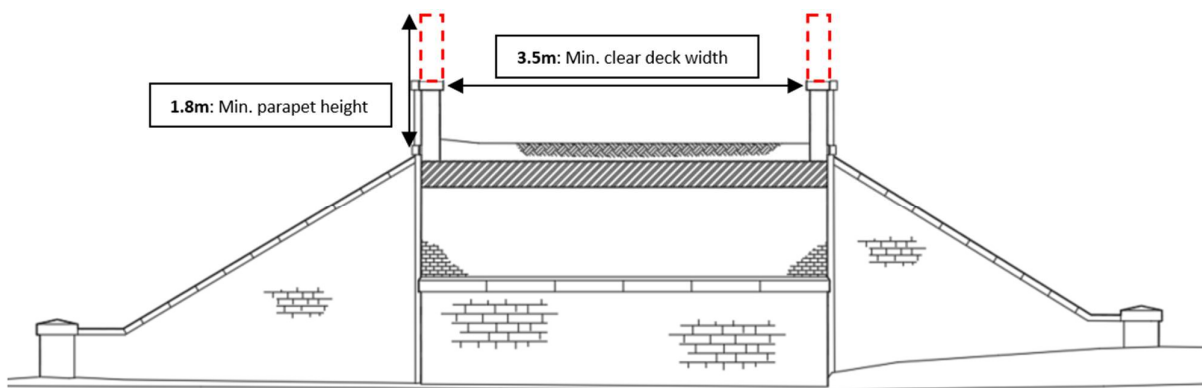


Figure 2 – Indicative spatial requirements on deck for typical structure on ATR

For Cosmeston Farm Underpass only, the following requirement must be met:

- Clear height under arch – 3.7m, for full width of the ATR where it passes below the structure, in line with British Horse Society recommendations- see Figure 3 below

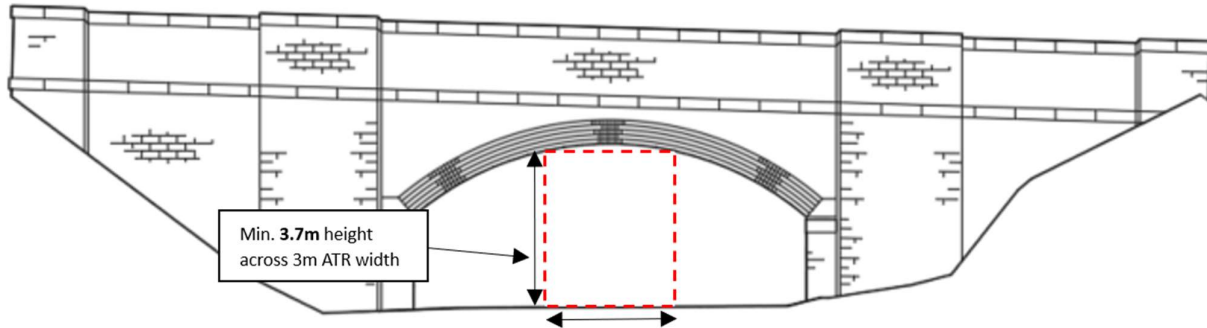


Figure 3 – Indicative spatial requirements for Cosmeston Farm Underpass

Discussion on whether the existing structures currently meet these requirements is included in section 3. These requirements should be discussed in further detail during the next stage of design.

2.3 Constraints

As the railway has been out of commission for a considerable time there are constraints present that are likely to affect the proposed works and Active Travel Route as a whole:

Site Access – The route between each structure is currently overgrown and de-vegetation works will be required to facilitate repair. Furthermore, where a highway does not pass beneath the structure, access via the topside will likely be required to facilitate maintenance and repair through the lifespan of the Active Travel Route. Note that site access may also inform design and construction methodology and should be considered as part of subsequent design stages.

Neighbours to structures / land permissions – Certain structures throughout the route are located either adjacent to private property or are situated within private farm fields. To facilitate construction and maintenance, all necessary permissions, licenses and consents will need to be arranged.

Proposed housing development – An area surrounding the eastern portion of the proposed ATR known as the Upper Cosmeston Farm Site has been approved by the Welsh Government to be sold to developers to facilitate the construction of 500 new homes (Austin-Smith:Lord, 2023). The ATR and the development must therefore be mutually integrated to ensure compatibility of design.

Evidence of persons sleeping rough – There has been evidence of persons sleeping rough found within the vicinity of some of the structures; this has been raised to the asset owner for action. Works will therefore need to implement sufficient security measures. This report also recommends that any proposed housing development should involve consideration of temporary and permanent low-cost housing for persons sleeping rough in the area.

3 Site Investigations

The following section describes the overall condition of each of the structures. Please refer to the corresponding contract drawings referenced in Appendix B for location and more detailed extent of defects.

3.1 General condition – Swanbridge Road Bridge

The structure is in fair condition. Common defects present throughout include:

Deterioration of pointing present throughout the structure (circa 20% of all joints).

There are also signs of separation between the top course of masonry within the wingwalls and their coping stones. The brickwork within the arch barrel is spalling for approximately 20% of its surface.

Vegetation is present over circa 40% of the structure, requiring clearance.

Signs of deterioration of the structure waterproofing is present in the form of patches of moisture and leachate both within the arch barrel face and the high and low mileage wingwalls.

The clear deck width exceeds 3.5m in line with standard CD353 “Design Criteria for footbridges” and the 4m width preferred by British Horse Society. However, the parapets do not meet the minimum height of 1.8m in line with CD377 “General requirements for road restraint systems”.

The limited carriageway height signage shows signs of minor deterioration but does not require replacement.

Currently the topside of the structure is free-draining and comprises an unmade footpath.

No defects present are deemed to be essential requiring urgent repair, with all repairs pertaining to durability and aesthetics, and all possible making use of conventional bridge / masonry repair methods / techniques.

	
Figure 4 – Swanbridge Road North Elevation	Figure 5 – Swanbridge Road South Elevation
	
Figure 6 – Swanbridge Road Wingwall – General Condition	Figure 7 – Swanbridge Road Arch Barrel

Table 5 – General Condition Photos – Swanbridge Road Bridge

3.2 General condition – St Mary's Well Bay Road Bridge

The structure is in overall fair condition.

There are 2 No. vertical cracks on the right-hand side of the western abutment affecting 5 No. courses of masonry- refer to Figure 12. The cause of this crack is difficult to determine without a more detailed survey. Signs of crack monitoring is present in the form of grout telltales over the cracks, showing no signs of worsening. As such, no repair beyond repointing is proposed.

Common defects present throughout include:

Deterioration of pointing present throughout the structure (circa 15% of all joints).

There are displaced coping stones on the north western wingwall. The brickwork within the arch barrel is showing light spalling for approximately 20% of its surface, with evidence of a bridge strike shown on the northern voussoir continuing along the arch barrel.

Vegetation is present over circa 40% of the structure, requiring clearance.

Signs of deterioration of the structure waterproofing is present in the form of patches of moisture and leachate across the arch barrel face and on the voussoirs.

The clear deck width exceeds 3.5m in line with standard CD353 "Design Criteria for footbridges" and the 4m preferred width by British Horse Society. However, the parapets do not meet the minimum height of 1.8m in line with CD377 "General requirements for road restraint systems".

The limited carriageway height signage appears in fair condition and does not require replacement.

Currently, the topside of the structure is free-draining and comprises an unmade footpath.

All repairs are possible making use of conventional bridge repair methods / techniques, including the vertical cracking.



Figure 8 – St Mary's Well Bay North Elevation



Figure 9 – St Mary's Well Bay South Elevation

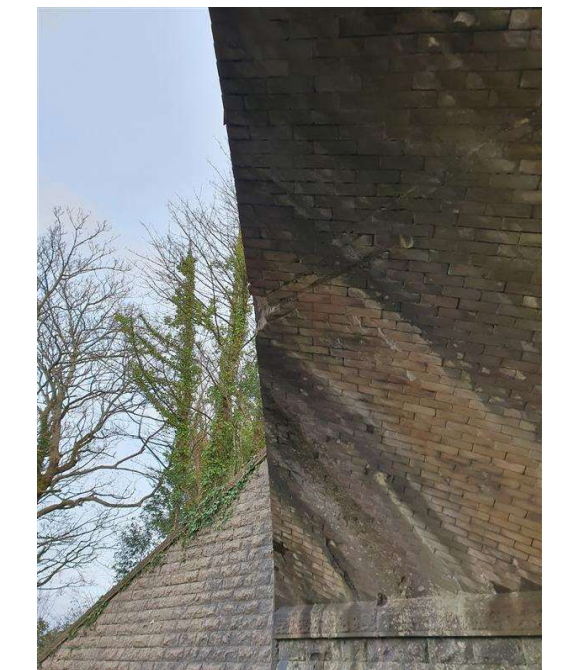
	
Figure 10 – St Mary's Well Bay Wingwall – General Condition	Figure 11 – St Mary's Well Bay Arch Barrel
	
Figure 12 – St Mary's Well Bay Cracking RHS of Western Abutment	Figure 13 – St Mary's Well Bay Evidence of Bridge Strike

Table 6 – General Condition Photos – St Mary's Well Bay Road Bridge

3.3 General condition – Fort Road Bridge

The structure is in overall fair condition.

There is a severe progressive vertical crack affecting the masonry on the north eastern wingwall- refer to Figure 18 and Figure 19. Based on information supplied by the client related to the extent of this crack and upon comparing Google Maps images from 2008-2023 (refer to Figure 21 to Figure 23), there are signs of this worsening over time with the wingwall showing displacement towards the carriageway. Without additional monitoring and investigation, the cause of the crack is difficult to determine; however, the proximity of a tree within the earth retained by the wingwall, as well as historic maps data showing this tree being felled and partially re-growing, indicates that root growth from this tree could be responsible for the crack. There are no signs of current monitoring of this crack; it is recommended this area is locally cleared and structural monitoring implemented. **Repair of this crack is deemed essential to enable the construction of the ATR.**

Common defects present throughout include;

Deterioration of pointing on the parapets and wingwalls. circa 10% of all joints.

The brickwork within the arch barrel is spalling for approximately 5% of its surface, with evidence of a bridge strike shown on the southern voussoir continuing along the arch barrel, refer to Figure 20

Vegetation is present over circa 50% of the structure, requiring clearance.

Ingress of moisture is present throughout the arch barrel showing potential failure of the structure waterproofing.

The clear deck width exceeds 3.5m in line with standard CD353 “Design Criteria for footbridges” and the 4m preferred width by British Horse Society. However, the parapets do not meet the minimum height of 1.8m in line with CD377 “General requirements for road restraint systems”.

The limited carriageway height signage appears in fair condition and does not require replacement.

Currently the topside of the structure is free draining and comprises an unmade footpath.

All repairs are possible making use of conventional bridge repair methods, including the crack in the north eastern wingwall which is advised to be addressed at the earliest possible time.



Figure 14 – Fort Road North Elevation



Figure 15 – Fort Road South Elevation



Figure 16 – Fort Road Wingwall – General Condition



Figure 17 – Fort Road Arch Barrel



Figure 18 – Fort Road North Eastern Wingwall crack width (>20mm)

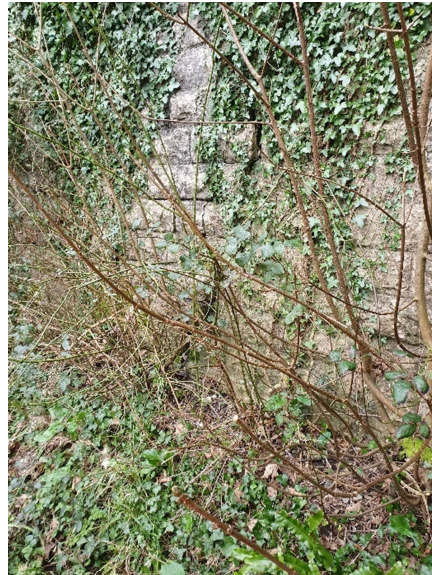


Figure 19 – Fort Road North Eastern Wingwall displacement



Figure 20 – Fort Road Evidence of Bridge Strike

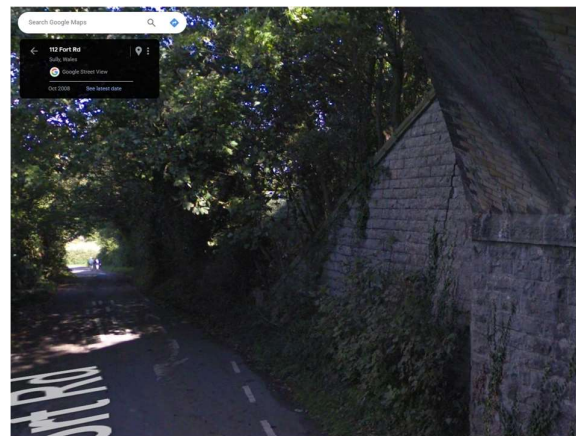


Figure 21 - Fort Road Wingwall Crack - Google Street View 2008

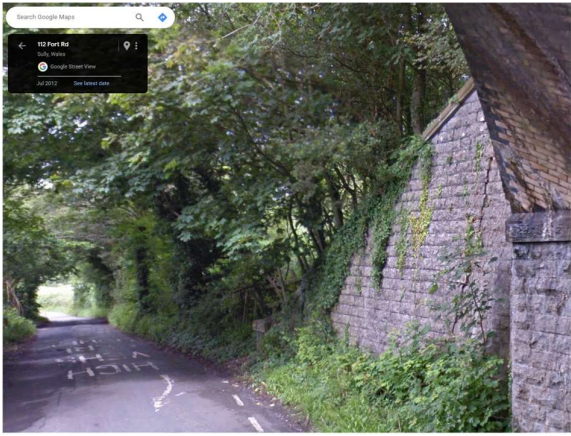
	
Figure 22 - Fort Road Wingwall Crack - Google Street View 2012	Figure 23 - Fort Road Wingwall Crack - Google Street View 2019

Table 7 – General Condition Photos – Fort Road Bridge

3.4 General condition – Cosmeston Farm Underpass

The structure is in fair condition.

Common defects present throughout include;

Deterioration of pointing present throughout the structure (circa 20% of all joints).

There are displaced stones on the northern parapet including, the top layer of masonry and coping stone throughout the parapet's length, with ~5% of the parapet affected. The southern parapet is completely covered by vegetation. Spalling is present on the northern voussoir, with 2No. bricks heavily spalled.

Vegetation is present over circa 70% of the structure, requiring clearance.

Signs of deterioration of the structure waterproofing is present in the form of patches of moisture and leachate across the arch barrel face and parts of the abutments.

As the ATR passes beneath this structure the dimensional requirements differ from the other structures, refer to Section 2.2.

The clear width between abutments exceeds the 3.5m in line with standard CD353 "Design Criteria for footbridges" and the 4m preferred by British Horse Society. Based on existing levels in the topographical survey, the 3.7m minimum height preferred by the British Horse Society across the proposed 3m-width ATR is not achieved at the southern face of the arch; however, as this ground varies greatly in this area, it is anticipated that re-levelling works will be undertaken as part of the ATR works. This levelling of the ATR should ensure that the minimum height of 3.7m is provided for the full ATR width under the whole arch, for equestrians.

As this structure spans an unmade footpath no limited clearance signage is present.

Currently the topside of the structure comprises a free-draining unmade footpath.

No defects present are deemed to be essential requiring urgent repair, with all repairs pertaining to durability and aesthetics, and all possible making use of conventional bridge repair methods / techniques.



Figure 24 – Cosmeston Farm North Elevation



Figure 25 – Cosmeston Farm South Elevation

	
Figure 26 – Cosmeston Farm Wingwall – General Condition	Figure 27 – Cosmeston Farm Arch Barrel

Table 8 – General Condition Photos – Cosmeston Farm Underpass

3.5 General condition – Additional Structure 1 (ST167681)

The structure is deemed to be in fair condition

Debris / discarded materials are present surrounding the structure, requiring clearance / disposal.

Common defects present throughout include;

Deterioration of pointing is present through the structure (circa 20% of all joints).

Vegetation is present over circa 60% of the structure, requiring clearance.

The underside of this structure is only currently accessible via private road.

As the deck of the structure has been removed and only the one of the abutments and its wingwalls remain, it is deemed unlikely this structure will be utilised within the proposed active travel route.

No defects present deemed to be severe requiring urgent repair, with all repairs possible through use of conventional bridge repair methods / techniques.

	
Figure 28 – Additional Structure 1 Eastern Abutment	Figure 29 – Additional Structure 1 South Eastern Wingwall
	
Figure 30 – Additional Structure 1 North Eastern Wingwall	Figure 31 – Discarded materials adjacent to Additional Structure 1

Table 9 – General Condition Photos – Additional Structure 1 (ST167681)

3.6 General condition – Additional Structure 2 (ST172683)

The structure is in fair condition.

During inspection works signs of persons sleeping rough beneath the structure were present in the form of a tent and other associated belongings, this has been raised via Integrated Observation (IO).

Common defects present throughout include;

Deterioration of pointing present throughout the structure (circa 50% of all joints).

The parapets are showing extensive joint gaps due to the vegetation growing in and around them. There is also a crack within a coping stone on southern parapet.

There are signs of separation between the top course of masonry within the wingwalls and their coping stones, as well as the abutments and the cill. 3 No. bricks have broken off the southern voussoir.

Vegetation is present over circa 70% of the structure, requiring clearance.

Signs of deterioration of the structure waterproofing is present in the form of patches of moisture and leachate across the arch barrel face and parts of the abutments.

The topside of the structure comprises a free-draining unmade footpath.

Currently there is no means of access to the underside of the structure via easily accessible public rights of way sufficient for use by maintenance vehicles.

No defects present are deemed to be essential requiring urgent repair, with all repairs pertaining to durability and aesthetics, and all possible making use of conventional bridge repair methods.



Figure 32 – Additional Structure 2 North Elevation



Figure 33 – Additional Structure 2 South Elevation

	
Figure 34 – Additional Structure 2 Wingwall – General Condition	Figure 35 – Additional Structure 2 Arch Barrel

Table 10 – General Condition Photos – Additional Structure 2 (ST172683)

3.7 General condition – Additional Structure 3 (ST180688)

The structure is in deteriorated condition.

Common defects present throughout include;

Deterioration of pointing present throughout the structure (circa 30% of all joints).

The wingwalls are all missing stones at their extremities, with coping stones partially missing along length of wingwalls. It is recommended the missing portions of the wingwalls are capped; however, this is not deemed an essential repair.

Vegetation is present over circa 70% of the structure, requiring clearance.

Signs of deterioration of the structure waterproofing is present in the form of patches of moisture and leachate across the arch barrel face and abutments.

The topside of the structure comprises a free-draining unmade footpath.

Currently there is no means of access to the underside of the structure via easily accessible public rights of way sufficient for use by maintenance vehicles.

All repairs are possible making use of conventional bridge repair methods / techniques.



Figure 36 – Additional Structure 3 North Elevation



Figure 37 – Additional Structure 3 South Elevation



Figure 38 – Additional Structure 3 Wingwall – General Condition



Figure 39 – Additional Structure 3 Arch Barrel



Figure 40 – Additional Structure 3 Missing Wingwall End

Table 11 – General Condition Photos – Additional Structure 3 (ST180688)

4 Optioneering

4.1 Option 1 – De-vegetation works and essential repair

Option 1 comprises the undertaking of only essential repairs and the undertaking of de-vegetation works, creating a minimal viable estimate for works to bring the structures to a safe operational state.

De-vegetation works are required at all structures, to ensure that they can be safely accessed as part of the ATR and that the presence of any additional defects can be assessed. This includes the entirety of the decks of most structures and most of their elevations.

Ecological assessment will be required to determine presence of any endangered or protected flora / fauna present within de-vegetation extents prior to works, along with any mitigation measures required i.e. seasonal working or habitat replacement.

A crack has been located within the substructure of Fort Road Bridge, present within north eastern wingwall. The current understanding of the extent and nature of this crack is limited to findings within the visual surveys only; the precise extent and cause of the crack will need to be assessed following vegetation removal to understand what the appropriate repair method and sequence must be; as such, the accuracy of the cost estimate of this repair indicative only. To provide a range of potential costs lower and upper bounds have been produced; the lower bound estimate including simple stitching and re-grouting of the crack and the upper bound estimate including excavation behind the wingwall, removal of offending tree roots and partial reconstruction of the wingwall.

Following de-vegetation works, additional defects may become apparent, and the scope of essential repair may require revisiting.

Advantages	Disadvantages
• Lowest initial capital required • Shortest programme for completion • Minimal design time required as all repairs are NR standard details	• Higher maintenance / repair costs over lifespan of active travel route relative to Option 2 • Condition of structures not rectified / improved (subsequent inspection may result in repair proposals to increase score) • Access issues for maintenance still present

Table 12 – Option 1 – Summary of advantages and disadvantages

4.2 Option 2 – Non-essential repair in addition to Option 1

Option 2 comprises the undertaking of any repairs, in addition to those deemed essential, that will improve the condition of the structures. The extent of these repairs is detailed below:

Repointing, to varying degrees, is proposed throughout all structures. Open joints are present throughout, with wingwalls frequently show stepped openings running diagonally down (approximately parallel to the coping stones) from the main bridge structure. Open joints between masonry and coping stones/stringers are also common; this will require re-setting.

Additional Structure No. 3 has had the extremities of its wingwalls removed; to rectify this it is recommended that they are re-built to improve the aesthetics of the structure and to avoid future loss of masonry throughout the lifespan of the structure.

There is also cracking present on the western abutment of St. Mary's Well Bay Road Bridge; it is proposed that this is repaired to mitigate further deterioration at this location.

Masonry arch bridges on active railways are subject to regular loading from rolling stock which increases the fatigue on the structure and thus the quantity and severity of defects such as open joints, and can exacerbate existing cracks. However, as these structures are proposed to form part of an active travel route, these structures will not be subject to such high dynamic loading, and therefore repairs such as re-pointing and other preventative measures can form part of a cost-effective maintenance regime for such structures.

Advantages	Disadvantages
- Reduction in expected maintenance cost over life of structure - Condition of each structure is improved - Aesthetics of structures will be increased (public perception)	- Additional expense relative to Option 1 - Increased construction programme relative to Option 1 - Access issues for maintenance still present

Table 13 – Option 2 – Summary of advantages and disadvantages

4.3 Option 3 – Installation of access and structure waterproofing in addition to Option 2

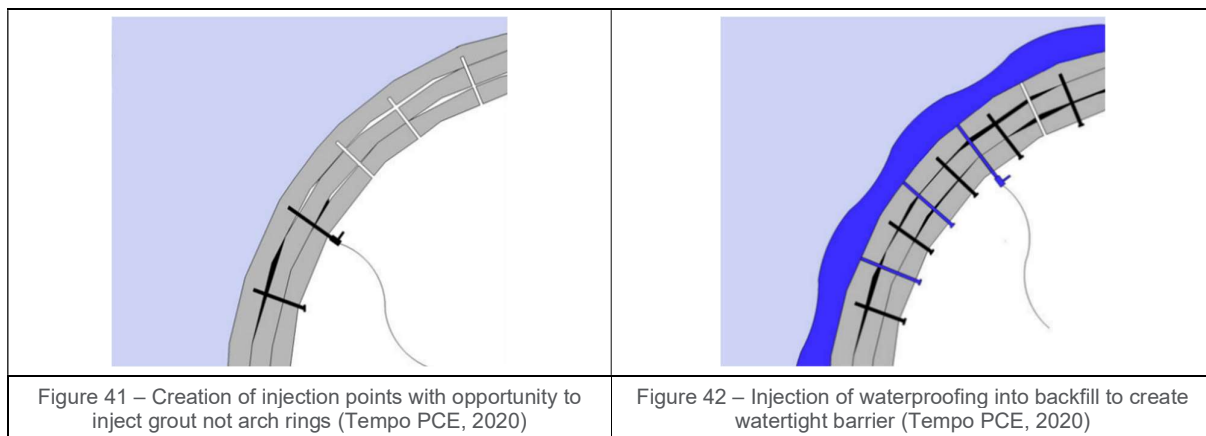
Option 3 comprises the repair of structural waterproofing, as well as the installation of access to the underside of the structures from the topside, to ease maintenance for structures that do not have sufficient existing access for use by maintenance vehicles.

Evidence of damage to the structure waterproofing course is present at most structures within this package in varying degrees, with the presence of moisture on abutments, arches and spandrel walls common. Injection waterproofing can be applied directly to the affected areas without the need for topside excavation; this typically involves drilling holes from the underside, which allow a treatment chemical such as elastomer gel to be injected behind the affected surface to prevent further moisture incursion. Temporary works design would be required to facilitate this.

An alternative to this would be the surfacing of the structures with an impermeable surfacing and the installation of structure drainage to redirect or capture the surface water from the structure. However, as this is contrary to the proposed use of permeable paving through the Active Travel Route, this has been discounted.

A further alternative would involve excavating all the fill on top of the structures and re-waterproofing the top of the structures. However, potential contaminated arisings are likely to occur if this is carried out, since structures of this type were typically coated in a tar-based substance to provide waterproofing. Furthermore, such excavations would impact the loading on the structure temporarily, and would require planning to phase the excavation works, to store the fill and to provide a temporary exclusion zone around the structure. This alternative may become preferred dependant on the depth of surfacing proposed throughout the ATR.

The installation of injection waterproofing from the underside of a masonry arch is depicted within the figures below:



The list of structures deemed to require repair of their waterproofing is detailed below:

- Swanbridge Road Bridge
- St Mary's Well Bay Road Bridge
- Cosmeston Farm Underpass

- Additional Structure 2 (ST172683)
- Additional Structure 3 (ST180688)

Access to the underside of each of the structures, via public rights of way suitable for maintenance vehicles, is not present at all structures across the route. To facilitate ease of maintenance through the lifespan of the structures it is proposed access is installed from the topside of these structures. If these accesses are to be used for maintenance only, then a lockable gate will be required to prevent public usage. Examples of access are shown within the figures below:



The list of structures deemed to require installation of access form their topsides are listed below:

- Additional Structure 2 (ST172683)
- Additional Structure 3 (ST180688)

Advantages	Disadvantages
• Ease of repair / maintenance due to improved access • Mitigation of defects caused by water ingress i.e. spall, deterioration of pointing etc. • Reduced maintenance work and running costs over lifespan of active travel route (defects caused by water ingress mitigated) • Condition of each structure is improved • Aesthetics of structures will be increased (public perception)	• Increase costs relative to Options 1 and 2 • Increased construction programme relative to Options 1 and 2 • Slight increase in carbon footprint due to material increase • Structure Access will require maintenance (minimal and can be included within regular structural maintenance)

Table 14 – Option 3 – Summary of advantages and disadvantages

4.4 Option 4 – Bridge deck replacement

Masonry arch bridge deck replacements require significant demolition to accommodate a new deck, along with substantial substructure reconstruction. This would include removal of backfill above the deck and behind the abutments, grading back to suitable angle, demolition of the arch using mechanical excavators, reconstruction of the cill beam above the abutments, reconstruction of the new arches and lifting in t new steel bridge deck. The deck would need to be sufficiently strong to support the ATR as well as any maintenance vehicles required to service the route.

Complete road closures are necessary during all masonry arch overbridge deck replacements due to demolition debris falling to the ground below and the need for completely unconstrained access during reconstruction. This process can impact access to locations like the Sully to Cosmeston route with no alternative access routes; any residents whose properties' access is prevented by such a road closure would require a temporary route diversion to enable emergency services to access the structures, or to temporarily

rehome residents. Additionally, the demolition generates a significant amount of waste material, including era-specific contaminants, leading to significant removal costs.

Deck replacements with modern materials and construction methods can give better assurance in terms of the durability of such structures. However, as these structures will not be subject to railway loading, there is little benefit in this sense, since the structures have already been shown to be capable of withstanding historic railway loading, and therefore, the relatively light loading from the ATR will be well within the strength requirements of these bridges.

Additional Structure 1 (ST167681) constitutes a single remaining abutment and its wingwalls. This therefore means that there is no existing deck to demolish and replace. However, it is possible to demolish the remaining structure and grade the fill behind. This option is included within option 4 for comparison with option 1-3.

Advantages	Disadvantages
• Reduced quantity of masonry • Enhanced design life of new bridge elements	• Increase costs relative to Options 1, 2 and 3 • Increased construction programme relative to Options 1 2 and 3 • Large increase in carbon footprint due to removal and replacement of existing materials • Complete road closure required throughout demolition and reconstruction • Loss of heritage railway structures and reduced aesthetics

5 Costings

Costs within the following section have been given the following contingencies:

- A 20% risk allocation to account for additional project-related costs, i.e., identifying further defects through subsequent investigations
- A further 30% to account for factors outside control of the project, e.g., changes to the supply chain or economy (inflation etc.)

Re-pointing costs have been allocated a nominal contingency according to the percentage covered by vegetation, allowing for further re-pointing requirements identified following de-vegetation.

The costs provided below have been produced based on costs within the Spons Railway Price book adjusted for inflation, coupled with typical costs of proprietary products. This has been checked against the experience of past projects undertaken by Arcadis, and further supplemented by direct quotations for injection waterproofing works by a specialist suppliers and installers.

As mentioned in section 1.3, Swanbridge Road Bridge or Additional Structure 1 (S167681) do not form part of the proposed ATR, and cost totals including AND excluding these two structures is given for each option.

5.1 Option 1 – De-vegetation works and essential repair

This section contains an itemised breakdown of the costs associated with Option 1 for each of the structures.

In summary the total envisaged costs for each structure for Option 1 are as per Table 15:

Structure	Total cost	
	Lower bound	Upper bound
Swanbridge Road Bridge	£20,000	
St. Mary's Well Bay Road Bridge	£20,000	
Fort Road Bridge	£25,000	£75,000
Cosmeston Farm Underpass	£35,000	
Additional Structure 1 (ST167681)	£10,000	
Additional Structure 2 (ST172683)	£35,000	
Additional Structure 3 (ST180688)	£35,000	
Option 1 cost estimate- structures on proposed ATR	£150,000	£200,000
Option 1 cost estimate- all structures	£180,000	£230,000

Table 15 – Option 1 – Cost summary

The assumptions listed in Table 16 are contained within the cost estimates for Option 1.

Assumptions
• No habitat replacement is necessary i.e. no endangered or protected species are present • De-veg can occur without specialist equipment / approach as invasive species such as Japanese Knotweed are not present • De-vegetation works will not uncover further defects with essential repairs required (minimal design fee and construction support fee included as worst-case) • Scaffolding will be in form of tower scaffold – including PAS-certified staff to erect scaffold.

Table 16 – Option 1 – Assumptions

	Cost Element	Quantity	Rate	Total
Preliminaries	Site set up / Land Access / Site compound	2 weeks	£3,000	£6,000
	Scaffolding (Single Tower Scaffold)	1 week	£500	£500
Pre-construction	De-vegetation works (40% of structure)	-	-	£5,000
Civil Engineering Works	Masonry repairs – essential	-	-	£0
Contingency	Project risk (+20%)	-	-	£2,300
	External factors (+30%)	-	-	£4,140
Total Cost Estimate (rounded up to nearest (£5k))				£20,000

Table 17 – Option 1 – Swanbridge Road Bridge Costing

	Cost Element	Quantity	Rate	Total
Preliminaries	Site set up / Land Access / Site compound	2 weeks	£3,000	£6,000
	Scaffolding (Single Tower Scaffold)	1 week	£500	£500
Pre-construction	De-vegetation works (40% of structure)	-	-	£5,000
Civil Engineering Works	Masonry Repairs – essential	-	-	£0
Contingency	Project risk (+20%)	-	-	£2,300
	External factors (+30%)	-	-	£4,140
Total Cost Estimate				£20,000

Table 18 – Option 1 – St Mary's Well Bay Road Bridge Costing

	Cost Element	Quantity	Rate	Total	
				Lower bound	Upper bound
Preliminaries	Site set up / Land Access / Site compound	2 weeks	£3,000	£6,000	
	Scaffolding (Single Tower Scaffold)	1 week	£500	£500	
Pre-construction	De-vegetation works (50% of structure)	-	-	£7,500	
Civil Engineering Works	Masonry Repairs – essential	-	-	£1,000	£32,200
Contingency	Project risk (+20%)	-	-	£3,000	£9,240
	External factors (+30%)	-	-	£5,400	£16,632
Total Cost Estimate (rounded up to nearest (£5k))				£25,000	£75,000

Table 19 – Option 1 – Fort Road Bridge Costing

	Cost Element	Quantity	Rate	Total
Preliminaries	Site set up / Land Access / Site compound	3 weeks	£3,000	£9,000
	Scaffolding (Single Tower Scaffold)	2 weeks	£500	£1,000
Pre-construction	De-vegetation works (70% of structure)	-	-	£12,000
Civil Engineering Works	Masonry Repairs – essential	-	-	£0
Contingency	Project risk (+20%)	-	-	£4,400
	External factors (+30%)	-	-	£7,920
Total Cost Estimate (rounded up to nearest (£5k))				£35,000

Table 20 – Option 1 – Cosmeston Farm Underpass Costing

	Cost Element	Quantity	Rate	Total
Preliminaries	Site set up / Land Access / Site compound	1 week	£3,000	£3,000
	Scaffolding (Single Tower Scaffold)	1 week	£500	£500
Pre-construction	De-vegetation works (60% of structure)	-	-	£2,000
Civil Engineering Works	Masonry Repairs – essential	-	-	£0
Contingency	Project risk (+20%)	-	-	£1,100
	External factors (+30%)	-	-	£1,980
Total Cost Estimate (rounded up to nearest (£5k))				£10,000

Table 21 – Option 1 – Additional Structure 1 (ST167681) Costing

	Cost Element	Quantity	Rate	Total
Preliminaries	Site set up / Land Access / Site compound	3 weeks	£3,000	£9,000
	Scaffolding (Single Tower Scaffold)	2 weeks	£500	£1,000
Pre-construction	De-vegetation works (70% of structure)	-	-	£12,000
Civil Engineering Works	Masonry Repairs – essential	-	-	£0
Contingency	Project risk (+20%)	-	-	£4,400
	External factors (+30%)	-	-	£7,920
Total Cost Estimate (rounded up to nearest (£5k))				£35,000

Table 22 – Option 1 – Additional Structure 2 (ST172683) Costing

	Cost Element	Quantity	Rate	Total
Preliminaries	Site set up / Land Access / Site compound	3 weeks	£3,000	£9,000
	Scaffolding (Single Tower Scaffold)	2 weeks	£500	£1,000
Pre-construction	De-vegetation works (70% of structure)	-	-	£12,000
Civil Engineering Works	Masonry Repairs – essential	-	-	£0
Contingency	Project risk (+20%)	-	-	£4,400
	External factors (+30%)	-	-	£7,920
Total Cost Estimate (rounded up to nearest (£5k))				£35,000

Table 23 – Option 1 – Additional Structure 3 (ST180688) Costing

5.2 Option 2 – Non-essential repair in addition to Option 1

This section contains an itemised breakdown of the costs associated with Option 2 for each of the structures.

In summary, the total envisaged costs for each structure for Option 2 are as per Table 24:

Structure	Total cost	
	Lower bound	Upper bound
Swanbridge Road Bridge	£65,000	
St. Mary's Well Bay Road Bridge	£65,000	
Fort Road Bridge	£60,000	£105,000
Cosmeston Farm Underpass	£85,000	
Additional Structure 1 (ST167681)	£20,000	
Additional Structure 2 (ST172683)	£85,000	
Additional Structure 3 (ST180688)	£105,000	
Option 2 cost estimate- structures on proposed ATR	£400,000	£445,000
Option 2 cost estimate- all structures	£485,000	£530,000

Table 24 – Option 2 – Cost summary

The assumptions listed in Table 25 are contained within the cost estimates for Option 2.

Assumptions
- No habitat replacement is necessary i.e. no endangered or protected species are present - De-veg can occur without specialist equipment / approach as invasive species such as Japanese Knotweed are not present - Scaffolding will be in form of tower scaffold – including PAS-certified staff to erect scaffold. - Re-pointing works assessed using - Use of 2 No. tower scaffold, gang of 4 No. staff undertaking repair works. - Costs of road closures / traffic management not included within estimate

Table 25 – Option 2 – Assumptions

Cost Element	Quantity	Rate	Total
Preliminaries	Design works	-	£10,000
	Site set up / Land Access / Site compound	4 weeks	£3,000
	Traffic management	3 weeks	£1,500
De-vegetation	Scaffolding (1 No. Tower Scaffold)	1 week	£500
	De-vegetation works (40% of structure)	-	£5,000
Civil Engineering Works	Masonry repairs – essential	-	£0
	Masonry repairs – re-pointing (20% of structure)	2 weeks	£2,500
	Repointing allowance due to 40% veg cover	-	£3000
	Scaffolding (2 No. Tower Scaffold)	2 weeks	£1,000
Contingency	Project risk (+20%)	-	£7,800
	External factors (+30%)	-	£14,040
Total Cost Estimate (rounded up to nearest (£5k))			£65,000

Table 26 – Option 2 –Swanbridge Road Bridge Costing

	Cost Element	Quantity	Rate	Total
Preliminaries	Design works	-	-	£10,000
	Site set up / Land Access / Site compound	4 weeks	£3,000	£12,000
	Traffic management	3 weeks	£500	£1,500
De-vegetation	Scaffolding (1 No. Tower Scaffold)	1 week	£500	£500
	De-vegetation works (40% of structure)	-	-	£5,000
Civil Engineering Works	Masonry repairs – essential	-	-	£0
	Masonry repairs – re-pointing (15% of structure)	2 weeks	£2,000	£4,000
	Repointing allowance due to 40% veg cover	-	£3000	£3000
	Masonry repairs – crack repair	1 day	£1,000	£1,000
	Scaffolding (2 No. Tower Scaffold)	2 weeks	£1,000	£2,000
Contingency	Project risk (+20%)	-	-	£7,800
	External factors (+30%)	-	-	£14,040
Total Cost Estimate (rounded up to nearest (£5k))				£65,000

Table 27 – Option 2 – St Mary's Well Bay Road Costing

	Cost Element	Quantity	Rate	Total	
				Lower bound	Upper bound
Preliminaries	Design works	Item	-	£10,000	
	Site set up / Land Access / Site compound	3 weeks	£3,000	£9,000	
	Traffic management	2 weeks	£500	£1,000	
De-vegetation	Scaffolding (1 No. Tower Scaffold)	1 week	£500	£500	
	De-vegetation works (50% of structure)	-	-	£7,500	
Civil Engineering Works	Masonry repairs – essential	-	-	£1,000	£32,200
	Masonry repairs – re-pointing (10% of structure)	1 week	£2,500	£2,500	
	Repointing allowance due to 50% veg cover	-	£3000	£3500	
	Scaffolding (2 No. Tower Scaffold)	1 week	£1,000	£1,000	
Contingency	Project risk (+20%)	-	-	£7,200	£13,440
	External factors (+30%)	-	-	£12,960	£24,192
Total Cost Estimate (rounded up to nearest (£5k))				£60,000	£105,000

Table 28 – Option 2 - Fort Road Bridge Costing

	Cost Element	Quantity	Rate	Total
Preliminaries	Design works	Item	-	£10,000
	Site set up / Land Access / Site compound	5 weeks	£3,000	£15,000
	Traffic management	4 weeks	£500	£2,000
De-vegetation	Scaffolding (1 No. Tower Scaffold)	2 weeks	£500	£1,000
	De-vegetation works (70% of structure)	-	-	£12,000
Civil Engineering Works	Masonry repairs – essential	-	-	£0
	Masonry repairs – re-pointing (20% of structure)	2 weeks	£2,500	£5,000
	Repointing allowance due to 70% veg cover	-	£4500	£4500
	Scaffolding (2 No. tower scaffold)	2 weeks	£1,000	£2,000
Contingency	Project risk (+20%)	-	-	£10,300
	External factors (+30%)	-	-	£18,540
Total Cost Estimate (rounded up to nearest (£5k))				£85,000

Table 29 – Option 2 – Cosmeston Farm Underpass Costing

	Cost Element	Quantity	Rate	Total
Preliminaries	Site set up / Land Access / Site compound	1 week	£3,000	£3,000
	Scaffolding (Single Tower Scaffold)	1 week	£500	£500
Pre-construction	De-vegetation works (60% of structure)	-	-	£2,000
Civil Engineering Works	Masonry Repairs – essential	-	-	£0
	Masonry repairs – re-pointing (20% of structure)	1 week	£1,000	£1,000
	Repointing allowance due to 60% veg cover	-	£3000	£3000
	Scaffolding (1 No. tower scaffold)	1 week	£500	£500
Contingency	Project risk (+20%)	-	-	£2,000
	External factors (+30%)	-	-	£3,600
Total Cost Estimate (rounded up to nearest (£5k))				£20,000

Table 30 – Option 2 – Additional Structure 1 (ST167681) Costing

	Cost Element	Quantity	Rate	Total
Preliminaries	Design works	Item	-	£10,000
	Site set up / Land Access / Site compound	5 weeks	£3,000	£15,000
	Traffic management	4 weeks	£500	£2,000
De-vegetation	Scaffolding (1 No. Tower Scaffold)	2 weeks	£500	£1,000
	De-vegetation works (70% of structure)	-	-	£12,000
Civil Engineering Works	Masonry repairs – essential	-	-	£0
	Masonry repairs – re-pointing (20% of structure)	2 weeks	£2,500	£5,000
	Repointing allowance due to 70% veg cover	-	£4500	£4500
	Scaffolding (2 No. tower scaffold)	2 weeks	£1,000	£2,000
Contingency	Project risk (+20%)	-	-	£10,300
	External factors (+30%)	-	-	£18,540
Total Cost Estimate (rounded up to nearest (£5k))				£85,000

Table 31 – Option 2 – Additional Structure 2 (ST172683) Costing

	Cost Element	Quantity	Rate	Total
Preliminaries	Design works	Item	-	£10,000
	Site set up / Land Access / Site compound	5 weeks	£3,000	£15,000
	Traffic management	4 weeks	£500	£2,000
De-vegetation	Scaffolding (1 No. Tower Scaffold)	2 weeks	£500	£1,000
	De-vegetation works (70% of structure)	-	-	£12,000
Civil Engineering Works	Masonry repairs – essential	-	-	£0
	Masonry repair – capping missing wingwall ends	4No.	£4,000	£12,000
	Masonry repairs – re-pointing (30% of structure)	2 weeks	£3,000	£6,000
	Repointing allowance due to 70% veg cover	-	£4500	£4500
	Scaffolding (2 No. tower scaffold)	2 weeks	£1,000	£2,000
Contingency	Project risk (+20%)	-	-	£12,900
	External factors (+30%)	-	-	£23,220
Total Cost Estimate (rounded up to nearest (£5k))				£105,000

Table 32 – Option 2 – Additional Structure 3 (ST180688) Costing

5.3 Option 3 – Installation of access and structure waterproofing in addition to Option 2

This section contains an itemised breakdown of the costs associated with Option 3 for each of the structures. In summary, the total envisaged costs for each structure for Option 3 are as per Table 33:

Structure	Total cost	
	Lower bound	Upper bound
Swanbridge Road Bridge	£165,000	
St. Mary's Well Bay Road Bridge	£165,000	
Fort Road Bridge	£65,000	£115,000
Cosmeston Farm Underpass	£180,000	
Additional Structure 1 (ST167681)	£20,000	
Additional Structure 2 (ST172683)	£210,000	
Additional Structure 3 (ST180688)	£245,000	
Option 3 cost estimate- structures on proposed ATR	£865,000	£915,000
Option 3 cost estimate- all structures	£1,050,000	£1,100,000

Table 33 – Option 3 – Cost summary

The assumptions listed in Table 34 are contained within the cost estimates for Option 3.

Assumptions
- No habitat replacement is necessary i.e. no endangered or protected species are present - De-veg can occur without specialist equipment / approach as invasive species such as Japanese Knotweed are not present - Scaffolding will be in form of tower scaffold – including PAS-certified staff to erect scaffold. Cost £500 per day per scaffold - Re-pointing works assessed using - Use of 2 No. tower scaffold, gang of 4 No. staff undertaking repair works. £600 per day for full gang. Rate of 0.75m² per 2 hours to clean and repoint per staff member, total rate 1.5m² per hour. - Access will only be required at Additional Structures 2 and 3 - Access will be in form of stepped access match NR standard detail NR/CIV/SD/370 - Waterproofing will be in the form of injection waterproofing, installed from underside of structure - Injection Waterproofing will only be required at Swanbridge Road, St Mary's Well Bay Road, Cosmeston Farm Underpass, Additional Structure 2 (ST172683) and Additional Structure 3 (ST180688) - Structure access will be for maintenance and inspection only, not for use by public

Table 34 – Option 3 – Assumptions

Cost Element		Quantity	Rate	Total
Preliminaries	Design works	Item	-	£10,000
	Site set up / Land Access / Site compound	4 weeks	£3,000	£12,000
	Traffic management	3 weeks	£500	£1,500
De-vegetation	Scaffolding (1 No. Tower Scaffold)	1 week	£500	£500
	De-vegetation works (40% of structure)	-	-	£5,000
Civil Engineering Works	Masonry repairs – all	-	-	£10,000
	Structure Access	-	-	£0
	Injection Waterproofing			£61,750
	Construction design support	-	-	£2,000
Contingency	Project risk (+20%)	-	-	£20,550
	External factors (+30%)	-	-	£36,990
Total Cost Estimate (rounded up to nearest (£5k))				£165,000

Table 35 – Option 3 – Swanbridge Road Bridge Costing

Cost Element		Quantity	Rate	Total
Preliminaries	Design works	-	-	£10,000
	Site set up / Land Access / Site compound	4 weeks	£3,000	£12,000
	Traffic management	3 weeks	£500	£1,500
De-vegetation	Scaffolding (1 No. Tower Scaffold)	1 week	£500	£500
	De-vegetation works (40% of structure)	-	-	£5,000
Civil Engineering Works	Masonry repairs – all	-	-	£10,000
	Structure Access	-	-	0
	Injection Waterproofing			£61,750
	Construction design support	-	-	£2,000
Contingency	Project risk (+20%)	-	-	£20,550
	External factors (+30%)	-	-	£36,990
Total Cost Estimate (rounded up to nearest (£5k))				£165,000

Table 36 – Option 3 – St Mary's Well Bay Road Costing

Cost Element	Quantity	Rate	Total	
			Lower bound	Upper bound
Preliminaries	Design works	-	-	£10,000
	Site set up / Land Access / Site compound	4 weeks	£3,000	£12,000
	Traffic management	3 weeks	£500	£1,500
De-vegetation	Scaffolding (1 No. Tower Scaffold)	1 week	£500	£500
	De-vegetation works (50% of structure)	-	-	£7,500
Civil Engineering Works	Masonry repairs – all	-	-	£8,000
	Structure Access	-	-	0
	Injection Waterproofing			£0
	Construction design support	-	-	£2,000
Contingency	Project risk (+20%)	-	-	£8,300
	External factors (+30%)	-	-	£14,940
Total Cost Estimate (rounded up to nearest (£5k))			£65,000	£115,000

Table 37 – Option 3 – Fort Road Bridge Costing

Cost Element	Quantity	Rate	Total
Preliminaries	Design works	Item	-
	Site set up / Land Access / Site compound	5 weeks	£3,000
	Traffic management	4 weeks	£500
De-vegetation	Scaffolding (1 No. Tower Scaffold)	2 weeks	£500
	De-vegetation works (70% of structure)	-	-
Civil Engineering Works	Masonry repairs – all	-	-
	Structure Access	-	-
	Injection Waterproofing		
	Construction design support	-	-
Contingency	Project risk (+20%)	-	-
	External factors (+30%)	-	-
Total Cost Estimate (rounded up to nearest (£5k))			£180,000

Table 38 – Option 3 – Cosmeston Farm Underpass Costing

Cost Element	Quantity	Rate	Total
Preliminaries	Site set up / Land Access / Site compound	1 week	£3,000
	Scaffolding (Single Tower Scaffold)	1 week	£500
Pre-construction	De-vegetation works (60% of structure)	-	-
Civil Engineering Works	Masonry Repairs – all	-	-
	Structure Access		
	Injection Waterproofing		
	Construction design support		
Contingency	Project risk (+20%)	-	-
	External factors (+30%)	-	-
Total Cost Estimate (rounded up to nearest (£5k))			£20,000

Table 39 – Option 3 – Additional Structure 1 (ST167681) Costing

Cost Element		Quantity	Rate	Total
Preliminaries	Design works	Item	-	£10,000
	Site set up / Land Access / Site compound	5 weeks	£3,000	£15,000
	Traffic management	4 weeks	£500	£2,000
De-vegetation	Scaffolding (1 No. Tower Scaffold)	2 weeks	£500	£1,000
	De-vegetation works (70% of structure)	-	-	£12,000
Civil Engineering Works	Masonry repairs – all	-	-	£11,500
	Structure Access	-	-	£40,000
	Injection Waterproofing			£40,375
	Construction design support	-	-	£2,000
Contingency	Project risk (+20%)	-	-	£26,775
	External factors (+30%)	-	-	£48,195
Total Cost Estimate (rounded up to nearest (£5k))				£210,000

Table 40 – Option 3 – Additional Structure 2 (ST172683) Costing

Cost Element		Quantity	Rate	Total
Preliminaries	Design works	Item	-	£10,000
	Site set up / Land Access / Site compound	5 weeks	£3,000	£15,000
	Traffic management	4 weeks	£500	£2,000
De-vegetation	Scaffolding (1 No. Tower Scaffold)	2 weeks	£500	£1,000
	De-vegetation works (70% of structure)	-	-	£12,000
Civil Engineering Works	Masonry repairs – all	-	-	£24,500
	Structure Access	-	-	£40,000
	Injection Waterproofing			£49,875
	Construction design support	-	-	£2,000
Contingency	Project risk (+20%)	-	-	£31,275
	External factors (+30%)	-	-	£56,295
Total Cost Estimate (rounded up to nearest (£5k))				£245,000

Table 41 – Option 3 – Additional Structure 3 (ST180688) Costing

5.4 Option 4: Bridge deck replacement

This section contains an overview the costs associated with Option 4. This is considered in a single case based on a bridge of an equivalent size to those on the Sully to Cosmeston ATR.

In summary, the total envisaged costs for each structure for Option 4 are as per Table 33:

Structure	Total cost
Swanbridge Road Bridge	£570,000
St. Mary's Well Bay Road Bridge	£565,000
Fort Road Bridge	£455,000
Cosmeston Farm Underpass	£400,000
Additional Structure 1 (ST167681)	£145,000
Additional Structure 2 (ST172683)	£300,000
Additional Structure 3 (ST180688)	£350,000
Option 4 cost estimate- structures on proposed ATR	£2,070,000
Option 4 cost estimate- all structures	£2,785,000

Table 42 – Option 4 – Cost summary

Since only a single abutment remains of Additional Structure 1 (ST167681), this structure would effectively require near complete reconstruction to be considered. To provide a comparison with the other options, the costing for this structure for option 4 is based on a total removal of the existing structure and regrading of its retained earth behind, as this is in line with one of the benefits of option 4 being reduced maintenance requirements of the legacy structures. Table 43 lists the elements considered when estimating the costs for Option 4.

Cost elements
• Design of bespoke bridge deck and integration with existing substructure (4m-wide deck assumed in all cases, to meet minimum width requirements) • Excavate 75% of the existing backfill • Temporary works on the carriageway • Road closure and alternative access to dwellings (structures on an active highway) • Hire of plant and fencing • Arch demolition, including waste removal • Abutment preparation, including construction of new cill beams • Installation of new concrete arches • Installation of new bridge deck • Waterproofing of structure • Backfilling the abutments • Re-pointing (utilise costs from option 2, but divide by 2 to account for masonry that will be removed) • Essential repairs (option 1) • Additional Structure 1 (ST167681) – complete demolition of abutment and wingwalls; excavation and backfill regraded behind structure

Table 43 – Option 4 – Cost elements considered

Cost Element		Quantity	Rate	Total
Preliminaries	Design works	Item	-	£50,000
	Site set up / Land Access / Site compound	6 weeks	£3,000	£18,000
	Plant delivery (crane)	-	£3500	£5250
	Security fencing (hire and assembly)	-	£4500	£4500
	Traffic diversion	-	£8000	£8000
De-vegetation	Scaffolding (1 No. Tower Scaffold)	1 week	£500	£500
	De-vegetation works (40% of structure)	-	-	£5,000
Demolition and reconstruction	Arch deconstruction (inc. waste removal)	-	£45,750	£45,750
	Reconstruction of arch (inc. waterproofing)	-	-	£115,000
	Backfill arch/deck	-	-	£115,000
Contingency	Project risk (+20%)	-	-	£73,400
	External factors (+30%)	-	-	£132,120
Total Cost Estimate (rounded up to nearest (£5k))				£570,000

Table 44 – Option 4 – Swanbridge Road Bridge Costing

Cost Element		Quantity	Rate	Total
Preliminaries	Design works	Item	-	£50,000
	Site set up / Land Access / Site compound	6 weeks	£3,000	£18,000
	Plant delivery (crane)	-	£3500	£5250
	Security fencing (hire and assembly)	-	£4500	£4500
	Traffic diversion	-	£8000	£8000
De-vegetation	Scaffolding (1 No. Tower Scaffold)	1 week	£500	£500
	De-vegetation works (40% of structure)	-	-	£5,000
Demolition and reconstruction	Arch deconstruction (inc. waste removal)	-	£45,750	£70,800
	Reconstruction of arch (inc. waterproofing)	-	-	£175,000
	Backfill arch/deck	-	-	£24,150
Contingency	Project risk (+20%)	-	-	£72,240
	External factors (+30%)	-	-	£130,032
Total Cost Estimate (rounded up to nearest (£5k))				£565,000

Table 45 – Option 4 – St Mary's Well Bay Road Bridge Costing

Cost Element		Quantity	Rate	Total
Preliminaries	Design works	Item	-	£50,000
	Site set up / Land Access / Site compound	6 weeks	£3,000	£18,000
	Plant delivery (crane)	-	£3500	£5250
	Security fencing (hire and assembly)	-	£4500	£4500
	Traffic diversion	-	£8000	£8000
De-vegetation	Scaffolding (1 No. Tower Scaffold)	1 week	£500	£500
	De-vegetation works (50% of structure)	-	-	£7,500
Demolition and reconstruction	Arch deconstruction (inc. waste removal)	-	£45,750	£46,500
	Reconstruction of arch (inc. waterproofing)	-	-	£140,000
	Backfill arch/deck	-	-	£11,950
Contingency	Project risk (+20%)	-	-	£58,440
	External factors (+30%)	-	-	£105,192
Total Cost Estimate (rounded up to nearest (£5k))				£455,000

Table 46 – Option 4 – Fort Road Bridge Costing

Cost Element		Quantity	Rate	Total
Preliminaries	Design works	Item	-	£50,000
	Site set up / Land Access / Site compound	6 weeks	£3,000	£18,000
	Plant delivery (crane)	-	£3500	£5250
	Security fencing (hire and assembly)	-	£4500	£4500
	Traffic diversion	-	-	£0
De-vegetation	Scaffolding (1 No. Tower Scaffold)	1 week	£500	£500
	De-vegetation works (50% of structure)	-	-	£7,500
Demolition and reconstruction	Arch deconstruction (inc. waste removal)	-	£45,750	£45,750
	Reconstruction of arch (inc. waterproofing)	-	-	£115,000
	Backfill arch/deck	-	-	£12,000
Contingency	Project risk (+20%)	-	-	£51,700
	External factors (+30%)	-	-	£93,060
Total Cost Estimate (rounded up to nearest (£5k))				£400,000

Table 47 – Option 4 – Cosmeston Underpass Costing

Cost Element		Quantity	Rate	Total
Preliminaries	Design works	Item	-	£5,000
	Site set up / Land Access / Site compound	3 weeks	£3,000	£9,000
	Security fencing (hire and assembly)	-	£4500	£3,050
	Traffic diversion	-	-	£0
De-vegetation	Scaffolding (1 No. Tower Scaffold)	1 week	£500	£500
	De-vegetation works (60% of structure)	-	-	£2,000
Demolition and reconstruction	Deconstruction of abutment and wingwalls	-	-	£3,900
	Excavate, backfill & regrade retained earth	-	-	£68,750
Contingency	Project risk (+20%)	-	-	£18,440
	External factors (+30%)	-	-	£33,192
Total Cost Estimate (rounded up to nearest (£5k))				£145,000

Table 48 – Option 4 – Additional Structure 1 (ST167681) Costing

Cost Element		Quantity	Rate	Total
Preliminaries	Design works	Item	-	£50,000
	Site set up / Land Access / Site compound	6 weeks	£3,000	£18,000
	Plant delivery (crane)	-	£3500	£5250
	Security fencing (hire and assembly)	-	£4500	£4500
	Traffic diversion	-	-	£0
De-vegetation	Scaffolding (1 No. Tower Scaffold)	1 week	£500	£500
	De-vegetation works (70% of structure)	-	-	£12,000
Demolition and reconstruction	Arch deconstruction (inc. waste removal)	-	-	£26,700
	Reconstruction of arch (inc. waterproofing)	-	-	£70,000
	Backfill arch/deck	-	-	£5,800
Contingency	Project risk (+20%)	-	-	£38,550
	External factors (+30%)	-	-	£69,390
Total Cost Estimate (rounded up to nearest (£5k))				£300,000

Table 49 – Option 4 – Additional Structure 2 (ST172683) Costing

Cost Element		Quantity	Rate	Total
Preliminaries	Design works	Item	-	£50,000
	Site set up / Land Access / Site compound	6 weeks	£3,000	£18,000
	Plant delivery (crane)	-	£3500	£5250
	Security fencing (hire and assembly)	-	£4500	£4500
	Traffic diversion	-	-	£0
De-vegetation	Scaffolding (1 No. Tower Scaffold)	1 week	£500	£500
	De-vegetation works (70% of structure)	-	-	£12,000
Demolition and reconstruction	Arch deconstruction (inc. waste removal)	-	-	£35,850
	Reconstruction of arch (inc. waterproofing)	-	-	£90,000
	Backfill arch/deck	-	-	£7,350
Contingency	Project risk (+20%)	-	-	£44,690
	External factors (+30%)	-	-	£80,442
Total Cost Estimate (rounded up to nearest (£5k))				£350,000

Table 50 – Option 4 – Additional Structure 3 (ST172683) Costing

6 Recommendations for Further Scheme Development

Upon reviewing the options and associated costs in this report, it is recommended that the following items are undertaken:

- Confirm route of ATR to identify which structures require work
- Complete route-wide ecology survey, which is work-in-progress as of writing this report.
- If/when proposed de-vegetation works have been completed, reassess scope of defects and associated repair costs.
- Perform detailed structural survey, to confirm the integrity of the structures by means of intrusive surveys, e.g. trial pits and coring, and subsequent structural assessment & calculations.
- Reassess and refine of route requirements to determine if further works are required on the structures.
- Establish detailed land and access requirements route-wide- in particular, any proposed earthworks around the structures would pass through or over private land in the form of fields.
- The ATR scheme should look to interface with the proposed housing development at Upper Cosmeston Farm, and consideration of writing this into the planning permission consent should be given. This report also recommends that any proposed housing development should involve consideration of temporary and permanent low-cost housing for persons sleeping rough or otherwise in vulnerable living conditions in the area.

7 References

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Appendix A Associated Documents

Document Title	Document Reference	Revisions
SULLY-COSMESTON ACTIVE TRAVEL REPORT	10048316-ARC-XX-010-SP-C-0002	P01
RISK REGISTER	10056562-ARC-AT-XXX-RG-Z-00001	P01
DESIGN DECISION AND ASSUMPTIONS LOG	10056562-ARC-AT-160-RG-S-000001	P01
DESIGNER'S RISK ASSESSMENT	10056562-ARC-AT-160-RA-S-000001	P01

Table 51 – Associated Documents

Appendix B Associated Drawings

Drawing Title	Drawing Number	Revision
SWANBRIDGE ROAD BRIDGE EXISTING GENERAL ARRANGEMENT SHEET 1 OF 3	10056562-ARC-AT-DR-S-100001	A01
SWANBRIDGE ROAD BRIDGE EXISTING GENERAL ARRANGEMENT SHEET 2 OF 3	10056562-ARC-AT-DR-S-100002	A01
SWANBRIDGE ROAD BRIDGE EXISTING DEFECTS AND CONDITION PHOTOS SHEET 3 OF 3	10056562-ARC-AT-DR-S-100003	A01
ST MARY'S WELL BAY ROAD BRIDGE EXISTING GENERAL ARRANGEMENT SHEET 1 OF 3	10056562-ARC-AT-DR-S-200001	A01
ST MARY'S WELL BAY ROAD BRIDGE EXISTING GENERAL ARRANGEMENT SHEET 2 OF 3	10056562-ARC-AT-DR-S-200002	A01
ST MARY'S WELL BAY ROAD BRIDGE EXISTING DEFECTS AND CONDITION PHOTOS SHEET 3 OF 3	10056562-ARC-AT-DR-S-200003	A01
FORT ROAD BRIDGE EXISTING GENERAL ARRANGEMENT SHEET 1 OF 3	10056562-ARC-AT-DR-S-300001	A01
FORT ROAD BRIDGE EXISTING GENERAL ARRANGEMENT SHEET 2 OF 3	10056562-ARC-AT-DR-S-300002	A01
FORT ROAD BRIDGE EXISTING DEFECTS AND CONDITION PHOTOS SHEET 3 OF 3	10056562-ARC-AT-DR-S-300003	A01
COSMESTON FARM UNDERPASS EXISTING GENERAL ARRANGEMENT SHEET 1 OF 3	10056562-ARC-AT-DR-S-400001	A01
COSMESTON FARM UNDERPASS EXISTING GENERAL ARRANGEMENT SHEET 2 OF 3	10056562-ARC-AT-DR-S-400002	A01

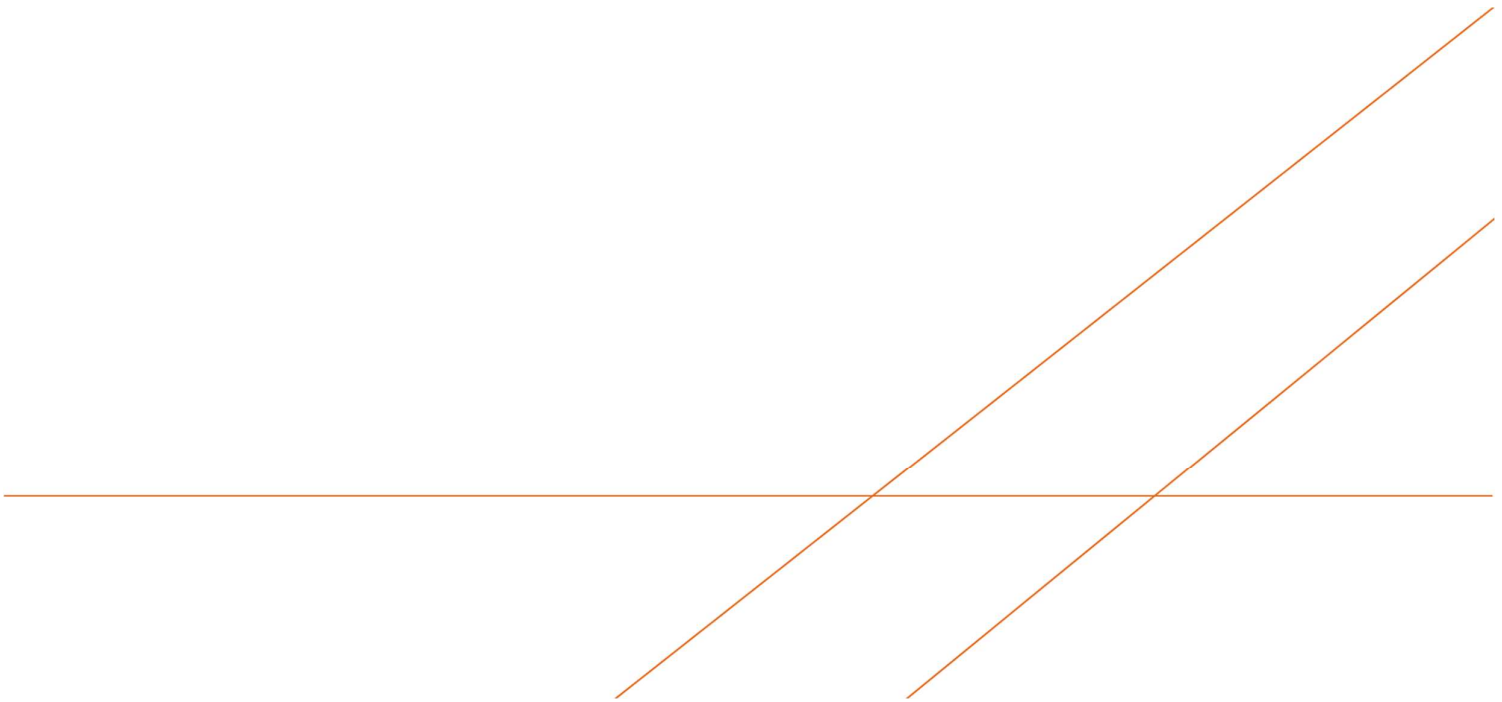
Drawing Title	Drawing Number	Revision
COSMESTON FARM UNDERPASS EXISTING DEFECTS AND CONDITION PHOTOS SHEET 3 OF 3	10056562-ARC-AT-DR-S-400003	A01
ADDITIONAL STRUCTURE 1 ST167681 EXISTING GENERAL ARRANGEMENT, DEFECTS AND CONDITION PHOTOS SHEET 1 OF 1	10056562-ARC-AT-DR-S-500001	A01
ADDITIONAL STRUCTURE 2 ST172683 EXISTING GENERAL ARRANGEMENT SHEET 1 OF 3	10056562-ARC-AT-DR-S-600001	A01
ADDITIONAL STRUCTURE 2 ST172683 EXISTING GENERAL ARRANGEMENT SHEET 2 OF 3	10056562-ARC-AT-DR-S-600002	A01
ADDITIONAL STRUCTURE 2 ST172683 EXISTING DEFECTS AND CONDITION PHOTOS SHEET 3 OF 3	10056562-ARC-AT-DR-S-600003	A01
ADDITIONAL STRUCTURE 3 ST180688 EXISTING GENERAL ARRANGEMENT SHEET 1 OF 3	10056562-ARC-AT-DR-S-700001	A01
ADDITIONAL STRUCTURE 3 ST180688 EXISTING GENERAL ARRANGEMENT SHEET 2 OF 3	10056562-ARC-AT-DR-S-700002	A01
ADDITIONAL STRUCTURE 3 ST180688 EXISTING DEFECTS AND CONDITION PHOTOS SHEET 3 OF 3	10056562-ARC-AT-DR-S-700003	A01

Table 52 – Associated Drawings

Arcadis (UK) Limited

Suite 4D, Hodge House
114-116 St Mary Street
Cardiff
CF10 1DY
T: +44 (0)2920 225 327

[arcadis.com](https://www.arcadis.com)





NOTES

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KEY

- EXISTING BOUNDARY
- PROPOSED BOUNDARY
- LAND PARCEL - WA449001
- AREA OF LAND REQUIRED = 1.4344Ha

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Rev	Date	Description	Prod.	Chk.	Rev.	App.
P01.3	11/08/26	FIRST ISSUE	---	---	---	---

VALE of GLAMORGAN
BRQ MORGANNWGI

Project: Sully to Cosmeston ATR

Site: Sully to Cosmeston Cardiff

Client: Vale of Glamorgan Council
Cynfor Bro Morgannwg
Civic Offices, Holton Road
Barry - CF63 4RU
www.valeofglamorgan.gov.uk

ARCADIS

Registered office:
80 Fenchurch Street
London
EC3M 4BY

Coordinating office:
Arcadis Suite 4d,
4th Floor, Hodge House
144-166 St Mary St,
Cardiff CF10 1DY
Tel: 44 (0)29 2092 6700

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Drawing Title:

**WELSH GOVERNMENT
LAND OWNERSHIP BOUNDARY
SHEET 3**

Designed:	Signed:	Date:
D Doyle		12/08/26
Produced:	Signed:	Date:
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Checked:	Signed:	Date:
---	---	---
Reviewed:	Signed:	Date:
---	---	---
Approved:	Signed:	Date:
---	---	---

Design Stage: Detailed Design

Original Size:	Grid:	Datum:
A1	OS	AOD

Suitability Code:	Scale:	Project Number:
S0	AS SHOWN	10056562

Suitability Description:

Initial Status

Drawing Number:	Revision:
10056562 - ARC - AT - 010 - DR - C - 00020	P01.3

SCALE 1:500 (A1)
SCALE 1:1000 (A3)
METRES

Print Date: 2026-08-12 13:59:33

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Risk ID	Risk Description	Category	Likelihood	Impact	RAG Rating
R1	Delay in land acquisition	Land Acquisition	Low	High	Green
R2	Cost escalation due to inflation and material shortages	Funding & Budget	High	High	Red
R3	Utility diversions causing delays	Design & Engineering	Medium	Medium	Amber
R4	Community objections and reputational risk	Stakeholder & Community	Low	High	Green
R5	Weather delays during construction phases	Construction	Medium	Medium	Amber
R6	Health & safety incidents on site	Health & Safety	Low	High	Amber
R7	Programme delays due to dependency on third parties	Programme	Medium	High	Amber
R8	Procurement delays	Programme	Medium	High	Amber
R9	Adverse weather during construction and surveys	Construction	Medium	Medium	Amber

Mitigation	Owner	Probability (1-5)
Engage legal team early, negotiate agreement proactively	Project Manager	1
Secure fixed-price contracts, maintain contingency budget, include inflation allowance, early supplier engagement, value engineering gates	Budget Holder	5
Early utility surveys, coordinate with utility providers	Design Engineer	3
Transparent communication, public consultations	Stakeholder Manager	2
Plan works seasonally, include weather contingency	Construction Manager	3
Strict H&S protocols, regular audits	H&S Officer	1
Identify dependencies early, maintain regular progress reviews	Programme Manager	3
Agree procurement strategy early, prequalification, parallel tender prep, clear evaluation plan and timetable	Programme Manager	3
Seasonal scheduling, weather contingency, flexible work sequencing, protective measures for works	Construction Manager	3

Impact Score (1-5)	Risk Score (P×I)	Priority	Phase	Mitigation Start	Target Completion	Status
5	5	High	Pre-Construction	Immediate	Before Phase 1 start	Open
5	25	High	Pre-Construction	Immediate	Before tender award	Open
3	9	Low	Design	During concept design	Before construction start	Open
4	8	Medium	Pre-Construction	Early engagement	Ongoing	Open
3	9	Low	Delivery	Pre-construction planning	Weather windows built into programme	Open
5	5	Low	Delivery	Pre-start H&S planning	Continuous monitoring	Open
5	15	Medium	Pre-Construction	Pre construction planning	Prior to critical path activities	Open
5	15	Medium	Pre-Construction	Pre construction planning	Prior to critical path activities	Open
3	9	Low	Delivery	Pre-construction planning	Weather windows built into programme	Open

Field	Definition / Scale
Likelihood	Qualitative likelihood: Low, Medium, High
Impact	Qualitative impact on cost/time/quality/scope: Low, Medium, High
Probability (1-5)	Numeric mapping: Low=1, Medium=3, High=5
Impact Score (1-5)	Numeric mapping: Low=1, Medium=3, High=5
Risk Score (P×I)	Product of Probability × Impact (1–25)
Priority	High (≥20), Medium (10–19), Low (<10)
RAG Rating	Red: material risk; Amber: manageable; Green: under control
Phase	Phase 1 – Pre-Construction / Design; Phase 1 & Phase 2 – Delivery
Mitigation Start	Recommended start point
Target Completion	Recommended completion milestone
Status	Open, Mitigating, Closed