

Submission to the Planning Inquiry
PROOF OF EVIDENCE – DELIVERY & CONSTRUCTION RISKS
[MATTERS 1, 2, 4, 5, 9, 12 & 14]
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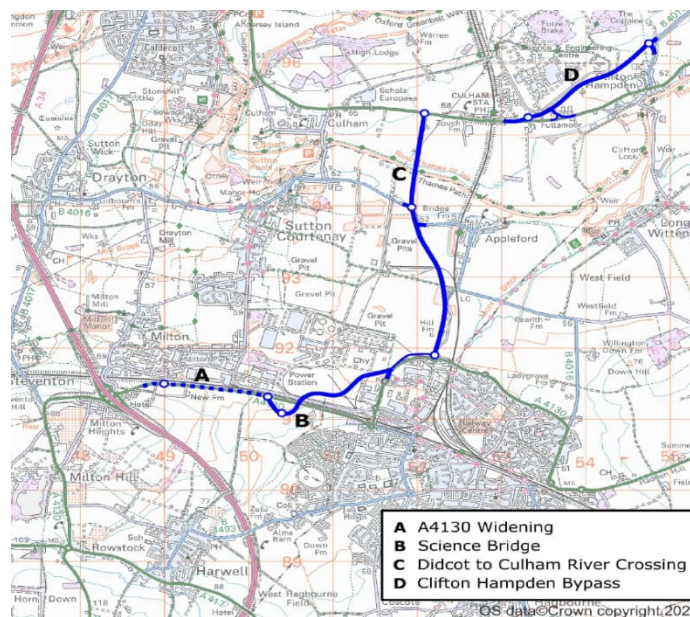
**Scheme: Application by Oxfordshire County Council : planning application number
R3.0138/21**

**Title: Dualling of the A4130 carriageway, construction of the Didcot Science Bridge, road
bridge over Appleford railways sidings and road bridge over the river Thames and
associated works between:**

A34 Milton Interchange and the B4015 north of Clifton Hampden Oxfordshire.*

CASE REF: APP/U3100/V/23/3326625.

Submitted by
Parish Councils of Appleford, Culham, Burcot & Clifton Hampden, Nuneham
Courtenay, Sutton Courtenay (NPC-JC)
January 2024



Plan of the route of the HIF1 road as shown in the planning application

Russell Harman CEng MCISBE

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Glossary

It is assumed within this document that:

- Oxfordshire County Council is the Applicant, Client a Financial Stakeholder.
- AECOM is the Client's Agent providing Engineering & Project Management Services.

1. Introduction

My name is Russell Harman and I'm an advisor to the NPC -JC. I am a Chartered Engineer and have over 40 years experience working in the Construction Industry with Tier 1 Civil Engineering Contractors such as Costain & Taylor Woodrow, Managing projects in very challenging Public Interfacing Environments, such as operational Airports and Railway Stations. My specialism is Infra-structure Systems & Infrastructure System Stakeholder Management.

I'm here as an expert witness to provide evidence on the feasibility & viability of the HIF Project.

I intend to provide evidence of:

- potential HIF1 Scope Gaps & Creep that if realised will impact on the Delivery Programme and an escalation in costs.
- on the financial risks of employing Professional Project Managing Companies and Designers.
- highlighting HIF1 Project Construction Risks that have the potential to increase the overall Project costs.
- highlight risk ownership strategies and how this can translate into further escalation of the HIF1 Costs.
- potential failings in HIF1 Traffic Modelling and that the data underpinning the HIF application is flawed, outdated, and fails to allow for induced traffic.

1.1. HIF Viability Summary

In Summary, the viability of the HIF is dependent upon a significant amount of challenges and risks that will need to be overcome. These will shape and determine the final end costs and schedule. These challenges and risks, in summary, are:

- Stakeholder Management Requirements and Mitigations – Project wide
- Construction Phase Plan coinciding with Network Rail Possession Schedule
- A4130 & Milton Road Closures – Science Bridge
- Geotec Information – Science Bridge & Culham River Crossing
- Flood Risks Management - Culham River Crossing
- Induced Traffic during Construction - Project wide
- Cost Recovery - Project wide

2. General Viability of the HIF Project

Assuming that OCC has obtained 2024 estimate update of the project costs associated with Materials and Labour, which I doubt, *[see Chien Xen POE on Inflation]*, then the commercial viability of the of the HIF Project will be determined by a number of external influencing Risk and Scope factors, which appear not to have been considered in the Planning Application. Whilst these are generally not relevant for Planning purposes, they will have a direct Commercial Viability impact on the Project and therefore should have been included and considered within the Application.

In my opinion and experience, this is why so many Governmental led projects appear to be over budget and run years late, which in reality is due to poor evaluations of the required Engineering and Delivery Constraints at the Planning stage. Crossrail being a good example, in my opinion. HS2 is going down the same path.

2.1. General Viability Risks

There are three main risks that will affect the viability of this project:

1. Design surety
2. Programme surety
3. Cost surety as a result of Design and Programme outcomes + any external influences (such as Inflation, and resolution of Stakeholder Challenges).

2.2. Design General Commentary

The designs presented within the proposed HIF Planning Application provides a good visual Conceptual assessment of Project. I have assessed the HIF proposal is somewhere between Concept and Scheme Design Stages.

Not to proceed with full Scheme Designs at the planning stage is a reasonable approach from the Clients perspective given that costs could be wasted if the project does not go ahead.

However, from the number of Objections to the HIF by utilities, established businesses, and landowners, it can be reasonably concluded that these key Stakeholders have not yet been consulted on their Requirements and needs. Adjustments and or enhancements to the designs following Stakeholder consultation is highly likely. I intend to discuss this further with several scenarios detailed below.

These Stakeholder challenges and issues will need to be addressed and closed out, which will have the potential to impact on the designs and overall scope. For example, SSE HV diversions with the associated Fibre Control Cabling are required along Milton Road to allow the construction of the Science Bridge foundations. The Planning Documentation does not consider the extent of the works, which the Applicant will need to design in accordance with SSE's requirements following consultation.

The Scheme Designs will be affected by Primary Stakeholders such as Network Rail, National Grid, Thames Water, UKAEA, Commercial Estates Group, LEDA Properties, RWE Generation. These Stakeholders will need to be consulted, which could be a lengthy process to achieve a final agreed HIF Scheme. These final agreements could and will influence the designs, costs and schedule.

[This is not to diminish the other Objectors, many of whom, are complaining about the lack of consultation through the Compulsory Order Process.] There are secondary Stakeholders too, whos' businesses will be affected by the Construction Activities, due to Road & Lane Closures.

2.3. Risk Apportionment

OCC may consider that the risks identified in this document are the "Contractors" responsibility and therefore do not need to be considered during the Planning Stage. This is a seriously risky assumption to make.

It is usual for the Client's Management Team to "score" a Contractors Bid submission something like:

- 30% Health & Safety Record and Project Specific Methodology
- 10% Technical Submission
- 60% Cost [Cheapest]

For a Contractor to provide the cheapest price [thereby achieving a high selection score], any Project Risks will need to re-apportioned to the Client if the risks cannot be mitigated in the Contractors Delivery Strategy.

The Applicant's Management Team will advise on their preferred Contractor selection with supporting evidence. [eg in Budget, Contractors Delivery Schedule/Methodology etc] with a "costed" Risk Pot. If all the bidding Contractors are outside of the Budget Allowance, OCC will need to go back to the Government and or other contributing Stakeholders for additional funding, thereby delaying the contract award further. It is highly likely that OCC will also have to make additional financial contributions with further long-term borrowing, thereby placing an additional burden on local taxpayers and potentially putting the council's solvency at risk. I would not be surprised if the final outturn cost of the Project exceeds £400million, possibly circa £500million. So, there is a lot at stake, and this is a big gamble on Applicant's part if approved.

2.4. AECOM Commercial AIM

It is likely that AECOM will be awarded a Professional Services Contract, which essentially means they get paid, even if AECOM make mistakes or errors.

AECOM will be awarded further commissions to manage risks, to provide additional resources and to develop optioneering/alternative designs to meet and address primary Stakeholders Requirements, which should have been considered and detailed and costed at the Planning Stage.

2.5. The Contractors Commercial Aim

The Contractor will likely be contracted on an NEC Option 3 Contract [Target Price].

With a low Target Price, the Contractor's aim is to capitalise on poor scope and to re-allocate risks to the Client. The Contractor will then be able to capitalise on changes in scope and designs should the Client change the Scope of Works. This is highly likely given the lack of detail particular for all three bridges. This is a very attractive Project for any Contractor as there will be many opportunities to make money.

2.6. HIF Recovery Viability

The Government will face a number of challenges to recover money from House Developers, with continual rise in inflation and the impact on labour and material costs. But a further Challenge on the horizon, is the Government is proposing that all new homes and non-domestic buildings are built "zero carbon ready".

Comment: *In my view this should have been mandated years ago in conjunction with the Country wide Housing Plan enforced on Councils.*

Hydrogen-ready boilers ruled out in new buildings

Future Homes and Buildings Standard supports heat pumps and heat networks

The UK government is proposing that all new homes and non-domestic buildings in England are built 'zero carbon ready' from 2025.

In its consultation on the Future Homes and Buildings Standards, published last month, the government says the proposals will mean no further work to buildings would be needed to meet zero carbon emissions 'once the electricity Grid has fully decarbonised'.

The proposals focus on improvements to the minimum standards for fixed building services. These include banning gas and hydrogen-ready boilers in favour of air source heat pumps or connection to a 4th-generation heat network. District heat networks will also 'likely be the preferred way of providing heating and hot water to blocks of flats'.

Existing building fabric standards will be

retained, but the airtightness of new homes, warehouses and sports halls will be improved. The government is also looking to toughen up standards for homes created from buildings that have undergone a material change of use. There is also a proposal to replace the Standard Assessment Procedure with the Home Energy Model to calculate compliance (see below).

The proposals do not include the carbon embodied in building materials and construction processes, which the government says it will consult on 'in due course'.

Feedback from the consultation will be published as new regulations in 2024, with the new standards coming into force from 2025 with a one year transition period.

The UK Green Building Council has criticised the proposals for lacking ambition and for failing to make the installation of photovoltaics mandatory, address embodied carbon, or tackle flood risk. (See page 26.)

Ref CIBSE Journal January 2024 Page 6.

This legislation will increase the build costs, which could be passed on to purchasers making the housing more expensive thereby defeating the objective for more affordable housing.

3. Viability of the Science Bridge

3.1. Science Bridge - Viability Summary

In summary, the HIF Science Bridge Budget and Schedule is at risk due to poor planning and lack of a Science Bridge Construction Phase Plan.

3.2. Science Bridge – Design & Delivery Risks

Ref AECOM Drawing: DSB_PD ACM SBR SW_ZZ_ZZ_Zz-DR-T-001 P01 - East Elevation A-A

The East Elevation shows:

- 30m long Steel I Beams spanning A4130
- 37m long Steel I Beams spanning Great Western Railway
- 22m long Steel I Beams spanning Milton Road

The Concrete Piles to support the Science Bridge are 1.2m in diameter for the North & South Abutments, but the dimensions of the Piles to support the Great Western Mainline section of the Bridge are not dimensioned. The GWML Piles are located within the Network Rail boundary. The fact that the GWML Piles are not dimensioned suggests this part of the design has not been finalised for some reason *[possibly for Geotech reasons &/or AECOM suspect the Bridge design may change as a result of discussions with NR]*, which could be a huge potential risk and could lead to scope creep.

From J.01 Objection 1 - submitted by Network Rail on 3 February 2023, it suggests that Network Rail has not been consulted on the scheme and how the works will be implemented.

Network Rail will restrict and determine where, when and how the works are to be undertaken. AECOM and or the Contractor will need to provide Safety, Engineering, Safety and Project/Possession document and Management support to allow:

- Identification of Safe Methods of Working.
- Construction Site Boundaries onto Network Rail property.
- Identification of Network Rail Service diversions that may be required to form the Piles.
- Erection of Interim Fencelines to segregate the Construction Operations from the Operational Railway.
- Ground Clearance and Levelling to accommodate the Piling Rig(s), with any Interim Drainage diversions.

- Any required Modifications to the OHLE [Overhead Line Equipment] to accommodate the Science Bridge. This may include additional OHLE supports/restraints and Earth Bonding.
- Isolation of OHLE [Overhead Line Equipment] to allow Piling to be undertaken.
- Isolation & Possessions of GWML for the installation of the GRC Permanent Formwork and Steel I Beams.
- Network Rail dictating when possessions will be granted to the Science Bridge Contractor to undertake the works.

The Contractor will need to attend extensive Network Rail [NR] Possession, Planning & Management Meetings for these works. NR will require for their acceptance and approval documentation as follows:

- Safe Method of Working Statements & Risk Assessments for each and every operation.
- Site Boundary Plans.
- Engineering Designs and Information that NR will approve.
- Isolation Plans
- Possession Plans
- Piling Plans.
- Lifting Plans.
- Contingency Plans

3.3. Science Bridge Construction Plan: A4130 – Lane & Road Closures

Ref AECOM Drawing: DSB_PD ACM SBR SW_ZZ_ZZ_Zz-DR-T-001 P01 - East Elevation A-A

[See Drawings R3-01238-21-DATOM-001 & 002.]

Whilst the A4130 Construction Plans show the phasing of how the dual carriageway is to be constructed, it does not consider the specific site compound with associated lane closure(s) for the construction of the Science Bridge Piles, Ground Beams and support Columns.

I would have expected the Planning Application to include a Science Bridge Construction Phased Plan detailing:

- A4130 Lane Closure – Ground Clearance and Interim Boundary realignment onto NR Property Compound [night shift].
- A4130 Lane Closure – Establish Localised NR Site Compound [day shift]. *[See Drawing R3-01238-21-DATOM-001]*
- A4130 Lane Closure – Piling of South Bridge Abutment [day shift].
- A4130 Lane Closure – GWRL South Piling – Bridge Pier [night shift#]
- A4130 Full Road Closures – Heavy Lifts – positioning of the Steel I Beams and the GRC Permanent Formwork. *[Probably over a GWML Easter Possession Holiday Period].*

- The Contractor may be able to demonstrate to NR that the GWML Piling Operations can be undertaken safely without the need for the OHLE to be isolated thereby allowing the piling works to be undertaken during the dayshift. But, spoil from the piling will need to be taken away, capability to receive deliveries of pre-constructed steel reinforcement with laydown areas allocated, and to manage concrete Truck-mixer deliveries. To limit impact of construction traffic on the A4130 & Milton Road, the Contractor may conclude the most efficient method is to form the piles at night with muck away operations, to take delivery of reinforcement steelwork at 6am which will be placed immediately into the formed piled hole, then to take concrete deliveries during the day. Generally speaking, Civil Engineers plan concrete pours on Friday allowing for the initial setting/curing to occur over the weekend.

For the A4130 30m Steel I Beams to be located into position, it is likely the Contractor may choose to locate the Heavy Lift Crane to the south of the A4130 within the Contractors Worksite. *[See Drawing R3-01238-21-DATOM-002.]* The A4130 will need to be closed during the lifting and positioning of the 30m Steel I Beams I would estimate this would take 3No nightshift closures, 2No nightshift closures for the placement of Permanent Formwork and further 4No nightshift closures for the placement of the pre-constructed Parapets. These may not be consecutive closures.

Ref AECOM Drawing: DSB_PD ACM SBR SW_ZZ_ZZ_Zz-DR-T-001 P01: The distance from the A4130 GWML South Piles to the Network Rail OLHE is 11.035m, which may be considered to be a safe distance from the OLHE to undertake the Piling and to place the A4130 Science Bridge Beams.

These A4130 Lane and Road Closures will affect secondary Major Stakeholders such as Air Products, ASDA, Tesco & Oka, as well as the general Public who are all probably unaware of the impact of the works and disruption it will cause to their businesses and operations. The Applicant and or the Contractor will need to manage Stakeholders, which will also include local Public Transport Companies and Authorities.

NR will also need to be consulted as the Lifting Operations will be “over sailing” their property. NR may even suggest this is a possession, which AECOM & or the Contractor will need to manage.

3.4. Science Bridge Construction Plan: Milton Road – Lane & Road Closures

Ref AECOM Drawing: DSB_PD ACM SBR SW_ZZ_ZZ_Zz-DR-T-001 P01 - East Elevation A-A

[See Drawings R3-01238-21-DATOM-001, 002 & 003.]

In the same way as the A4130, the Planning Application Construction Phase Plan does not cover Milton Road Lane and Full Road Closures, which are expected to be:

- Milton Road Lane Closure – Ground Clearance and Interim Boundary realignment onto NR Property Compound [night shift].
- Milton Road Lane Closure – Establish Localised NR Site Compound [day shift].
[See Drawing R3-01238-21-DATOM-001.]
- Milton Road Lane Closures – Piling of North Bridge Abutment [day shift].
- Milton Road Lane Closures – GWRL North Piling – Bridge Pier [night shift#].
- Milton Road Full Road Closures – Heavy Lifts – positioning of the Milton Road Steel I Beams and the GRC Permanent Formwork.
- Milton Road Full Road Closures – Heavy Lifts – positioning of the GWML Steel I Beams and the GRC Permanent Formwork. *[Probably over a GWML Easter Possession Holiday Period].*

For the Milton Road 22m Steel I Beams to be located into position, it is likely the Contractor will choose to locate the Heavy Lift Crane to the north of the Milton Road within the Contractors Worksite. *[See Drawing R3-01238-21-DATOM-002.]* Milton Road will need to be closed during the lifting operations of the 22m Steel I Beams. I would estimate this would take 3No nightshift closures, 2No nightshift closures for the placement of Permanent Formwork and further 4No nightshift closures for the placement of the pre-constructed Parapets. These may not be consecutive closures.

For Milton Road Lane and full Road Closures, Secondary Stakeholder Management will be required with companies such as Simon Hegele and ASAD Didcot Distribution Centre, DHL and other Milton Park companies.

Again, NR will need to be consulted as the Lifting Operations will be “over sailing” their property. NR may even suggest this is a possession, which AECOM & or the Contractor will need to manage.

Ref AECOM Drawing: DSB_PD ACM SBR SW_ZZ_ZZ_Zz-DR-T-001 P01: The distance from the Milton Road GWML North Piles to the Network Rail OLHE is 9.663m which may be considered by AECOM to be a safe distance from the OLHE to undertake the Piling and to place the Milton Road Science Bridge Beams.

For the GWML 37m Steel I Beams to be located into position, the Contractor will need to locate the Heavy Lift Crane as near as possible to the GWML. The optimum location is Milton

Road to the east side of the Science Bridge. [\[See Drawing R3-01238-21-DATOM-002.\]](#) Milton Road will need to be closed during the lifting operations. I would estimate this would take 4 No 24 hour shift closures, 2 No nightshift closures for the placement of Permanent Formwork and further 4 No nightshift closures for the placement of the pre-constructed Parapets. These may not be consecutive closures.

3.5. Science Bridge – Spoil Lorry Deliveries

Assuming that the Science Bridge North Bank is circa 500m long by an average width of 12m and a final height of 12m above existing ground level, the volume of spoil that will be needed will be in the order of 36,000 cubic metres. This would equate to 3,000 deliveries of Spoil assuming that each Lorry has a 12 cubic metre capacity.

Using the same approach of the Science Bridge South Bank, assuming bank length of circa 240m long by an average width of 12m and a final height of 12m above existing ground level, the volume of spoil that will be needed will be in the order of 24,480 cubic metres. This would equate to 2,400 deliveries of Spoil.

In Total, this would equate to 60,480 cubic metres of Spoil with 5,040 Lorry Deliveries.

The above rough calculations are to provide an idea, to enable the Inspector to visualise the scale of the works, to gauge the Environmental & Sustainable impact of the Science Bridge. Whilst these figures are very rough estimate, it is highly likely the actual volume of Spoil needed will be much higher [possibly double], which could be verified by AECOM at the Inquiry.

3.6. Science Bridge - Induced Traffic

From my experience at Hobby Horse Lane Inquiry[§], the Traffic Model used out of data [2017 Census]. This is particularly so since the Pandemic and the sea change in working and living practices. One would assume that this would lead to a reduction of Traffic.

From my Hobbyhorse Lane experience, it is likely that the Traffic Model used to support the HIF does not consider the scenarios listed below. This is because the Traffic Model only considers the final arrangement. *[To be fair the Traffic Modeller Expert, this is probably due to the extent of their commission]*

- HIF Construction Traffic and other Construction developments in progress and impact on the local communities. Estimated 5,400 lorry journeys for the Science Bridge alone.
- Traffic Diversions as a result of A4130 Lane and Road Closures.
- Traffic Diversions as a result of Milton Road Lane and Road Closures.
- Induced “Rat Runs” as a result of the A4130 and Milton Road Lane and Road Closures.
- Inclusion of Housing developments completed since 2017.
- Everyday Commercial Vehicle Movements from major distribution centres such as ASDA, Tesco and Simon Hegele that are likely not to be included within the Traffic Model.

For the Inspector to make an informed decision, the Applicant should provide this evidence at the Planning Stage.

§ I was an advisor into Sutton Courtenay Parish Council opposing the Hobbyhorse Lane Planning Application P21-V2682 for 175 Dwellings. I was an expert witness at the Inquiry providing evidence stating that Hobbyhorse Lane was a non-compliant safe road, and 2,300 lorry deliveries providing 27,000 cubic meters of spoil would be required to travel down Hobbyhorse Lane provide the required Drainage Scheme [0.7m above existing ground level]. The Traffic Model used to demonstrate that the inclusion of the 175 Dwellings did not impact on Road Safety, used out of date information from the 2017 National Survey. At the Inquiry, this was confirmed by Stantec’s Traffic Expert, who also admitted that the Model did not take account of recent developments, nor did it take account of the Construction Traffic + the additional 2,300 lorries to make up the ground level to prevent flooding.

3.7. Science Bridge - Traffic Management Plan

It is likely the full road closures will occur over Easter and or Christmas 2025 to coincide with the Network Rail Possession Schedule. This could have a detrimental effect on ASDA and DHL activities, which may be their busiest time of the year. It is considered that Easter will be the optimum time to lift the Science Bridge Pre-Cast Beams into position (weather permitting) which will need extensive planning with OCC Council and Network Rail.

3.8. Science Bridge - Services Diversions

At this stage, it is unclear how the Milton Road SSE 11kv HV diversions and corresponding Fibre Communications/SCADA Control cabling will impact on the Secondary Stakeholders and whether 3-5 overnight isolations will be sufficient.

There is a small possibility these diversions may have a direct or indirect consequence on Network Rail given that there is an OHLE Isolation Station point by the Science Bridge along the Milton Road which will require power to operate.

This could be a substantial cost and programme risk to the Science Bridge Programme should the risk materialise.

For Scheme and Planning purposes, I would have expected that the Applicant provide a Services Diversion Plan which could be costed by SSE and for this risk to be mitigated.

4. Viability of the Appleford Sidings Bridge

The Primary Stakeholders at the Appleford Sidings Bridge are Network Rail, Heidelberg and OCC Waste/Recycling.

Like the Science Bridge, the Appleford Sidings Bridge will be subject to Network Rail Possessions. But, unlike the Great Western Mainline, the Appleford Sidings and GWML to Oxford are not electrified [no OHLE].

Nonetheless, a similar amount of documentation and management will still be required to undertake the construction of the Appleford Sidings Bridge as detailed below:

- Safe Method of Working Statements & Risk Assessments for each and every operation.
- Site Boundary Plans.
- Engineering Designs and Information that NR will approve.
- Possession Plans
- Piling Plans.
- Lifting Plans.
- Contingency Plans.

The reason why the Appleford Sidings Bridge exists in the scheme is because Railway Level Crossings are a major safety concern for Network Rail who do not sanction new Level Crossings without firstly considering all other possible avenues.

Given that Landfill Site Waste Licence expires in 2030, it is possible that Network Rail could tolerate a Railway Level Cross at Appleford Sidings from 2026 to 2030 as an alternative to the Appleford Bridge, after which it could be decommissioned [*Possible VE and Risk Mitigation reducing costs*].

4.1. Appleford Sidings Bridge - Traffic Management Plan

Heidelberg's operations will be disrupted due to the HIF Road Construction at the Collett Road Junction, Appleford Level Crossing, and by Possessions of the Appleford Sidings. Both Network Rail, Heidelberg & OCC will need to be consulted to ensure that the impact of their operations by the HIF is minimal.

5. Viability of the Sutton Courtenay Road Bridge

5.1. Sutton Courtenay Bridge – Geotech Data

The viability of the Sutton Courtenay Road Bridge will most likely be determined by Geotech Data, which may result in AECOM having to change the Foundation Designs and HIF Road Elevations.

Comment: It would appear that Heidelberg have created flood defences north of the B4016 to prevent flooding from the River Thames tracking to Appleford, particularly protecting Network Rail Appleford Station and surrounding properties.

It is not clear from the plans presented whether AECOM has considered:

- Geotech Ground Data.
- Flood Risk of the B4016 Sutton Courtenay Roundabout.
- Flood Risk and Ground conditions to the south of B4016 to the Appleford Sidings Bridge.

Potential Mitigation Measures could be:

- Raised elevation of the B4016 Sutton Courtenay Roundabout as Flood Risk mitigation.
- Raised elevation of the HIF from Appleford Sidings to B4016.
- Change to Foundation Strategies and Designs as a result of changes to the HIF Road Elevations.
- Inclusion of new permanent Flood Defences.

5.2. Viability of B4016 Sutton Courtenay Roundabout

I understand that the B4016 Sutton Courtenay Roundabout was not included within the original HIF Scheme. It's probable that the B4016 Sutton Courtenay Roundabout came into existence as a Value Engineered solution by the Applicant.

There is a concern that the B4016 Sutton Courtenay Roundabout will provide better access to reach the northside of the Thames for those living in Steventon and South Abingdon thereby increasing Traffic through Sutton Courtenay Village. This would be particularly the case should there be an incident on the A34 between Hinksley Hill Interchange and the A34 Abingdon north & south Junctions. As a Sutton Courtenay Resident, I can confirm this is how people behave, and Sutton Courtenay is used a Ratrun, particularly for HGV's. I have witnessed two Traffic Accidents [both 2023] adjacent to the Church due to this issue.

Appleford is not subjected to HGV Traffic due to the width and weight restrictions of the bridge over the Network Rail Mainline to Oxford.

The risk is there will be an increase in Traffic Safety related incidents in Sutton Courtenay.

It is unclear whether the Applicant's Traffic Consultant has undertaken a study to assess if there will be Induced Traffic through Sutton Courtenay and whether the Traffic has been assessed during Construction and Final HIF Arrangements.

Mitigation Measures to prevent induced Traffic through Sutton Courtenay could include:

- The Applicant to undertake further Traffic Modelling to be presented to OCC for acceptance prior to finalising the HIF Road Scheme.
- Develop a revised HIF Road arrangement.
- Include Traffic Calming through Sutton Courtenay.
- Make Culham Bridge a pedestrian walkway.
- The Applicant under write the safety assessment allowing the Public to sue should there be an incident as a result of the HIF.

6. HIF Scheme Primary Design Risks

HIF will suffer a significant increase in Delivery Costs due to poor Primary Stakeholder Engagement resulting in major Scheme Design Changes.

6.1. HIF Primary Design Changes Risks

The HIF Scheme will be subjected to Primary Design Changes to accommodate Key Stakeholders. This is evident from their Objections to the HIF Scheme.

- Network Rail Requirements - **Science Bridge design amendments** *J.01 Objection 1 - submitted by Network Rail on 3 February 2023.*
- Thames Water Land Retention – **Changes to the HIF alignment** to accommodate new TW Infrastructure for the proposed Housing Developments. *J.10 Objection 11 - submitted by Thames Water on 17 March 2023.*
- UKAEA Requirements – **Changes to the HIF alignment** to accommodate their Fusion Research Expansion Programme. *J.12 Objection 13 - submitted by Carter Jonas on behalf of UKAEA on 20 March 2023.*
- LEDA Properties Limited Requirements - **Changes to the HIF alignment** to accommodate their Commercial Development aspirations. *J.23 Objection 26 - submitted by Carter Jonas on behalf of Leda Properties Limited on 21 March 2023.*
- RWE Generation UK Requirements – **Design needs to Stakeholder Assets.** *J.28 Objection 31 - submitted by RWE Generation UK plc on 22 March 2023.*
- National Grid Electricity Transmission Plc – **Design needs to Stakeholder Assets.** *J.30 Objection 33 - submitted by Ardent on 12 October 2023 on behalf of National Grid Electricity Transmission plc.*

6.2. HIF Scheme Design Changes

The HIF Scheme Design will likely change at Culham/Clifton Hampden to accommodate UKAEA's and LEDA's Requirements, which will be subject to another round of Planning Applications.

It is highly likely that AECOM will be commissioned by OCC to provide new HIF Designs at Culham to acquire Planning consent before this part can be awarded to a Contractor.

As a result, OCC may choose to split the HIF into separate contracts. This would mean that AECOM & OCC would need more people to administer the works.

6.3. HIF Utilities Design Additions

OCC will need to commission AECOM to engage with Thames Water to future proof the Water and Foul Water Systems to support the HIF Didcot House Scheme aspirations.

AECOM will also need to be commissioned by OCC to engage with RWE & National Grid to incorporate changes to the Utilities Infrastructure to accommodate the HIF Scheme. These will be small sub-projects, which again the OCC and or AECOM will need to manage.

Vodafone and Scottish & Southern Electricity requirements will also need to be incorporated into the overall HIF Scheme.

7. HIF Scheduling Risks

Given the amount of Engineering and Scope challenges, it is my opinion that if the Inspector recommends the approval of the HIF Scheme, the Project Schedule will be sub-divided into manageable Contracts by OCC.

- i. A4130 Widening and Science Bridge – *[Detailed Design Risks + Utility Scheme Design Risks]*
- ii. Didcot to Culham River Crossing – *[Detailed Design Risks]*
- iii. Clifton Hampden Bypass – *[HIF Scheme Realignment Design Risks]*

In my opinion, this will be the order OCC will award the contracts.

But by sub-dividing the Project into separate contracts, this attracts inter contract co-ordination issues that will need to be managed either by OCC and or AECOM.

A good example of this will be the co-ordination of the HIF Network Rail Possessions associated with the Science Bridge and Appleford Sidings Bridge.

7.1. A4130 Widening and Science Bridge Programme Dates

I would estimate the HIF Contract 1 Programme Milestones would be:

- i. Award Contract – Jan 2025
- ii. Science Bridge – Network Rail Site Compounds – Easter 2025
- iii. Science Bridge – Piling & Column Construction – Summer/Autumn 2025
- iv. Science Bridge – GWML affected System/Utilities Diversions Xmas 2025
- v. Science Bridge – A4130 Road Closure – positioning of A4130 Bridge Beams Xmas 2025
- vi. Science Bridge – Milton Road Closure – positioning of NR GWML Bridge Beams Easter 2026
- vii. Science Bridge – Milton Road Closure – positioning of Milton Road Bridge Beams May Bank Holiday 2026
- viii. HIF Contract 1 Completion 2027.

7.2. Didcot to Culham River Crossing

I would estimate the HIF Contract 2 Programme Milestones would be:

- i. Award Contract – Jan 2025
 - ii. Appleford Bridge – Network Rail Site Compounds – Easter 2025
 - iii. Appleford Bridge – Piling & Column Construction – Summer/Autumn 2025
 - iv. Appleford Bridge – Appleford Sidings positioning of Bridge Beams Xmas 2025
 - v. Appleford Bridge – Completion 2026
-
- a) Culham Bridge – Construct Temp Access Road(s) to undertake Piling Spring 2025
 - b) Culham Bridge - Piling & Column Construction – Spring - Autumn 2025
 - c) Culham Bridge – Bridge Beam placement and construction – Autumn 2025 – Summer 2026
 - d) Culham Bridge – Completion late 2026

7.3. Clifton Hampden Bypass

I would estimate the HIF Contract 3 Programme would be delayed between 18-24 Months as a result of consultations with the Primary Stakeholders, amending the HIF Alignment and then making a revised Planning Application for approval by OCC.

- i. Award Contract – Jan 2027
- ii. Contract Completion – early 2029

8. Conclusion

There is a high probability that all the risks identified within this document will materialise. It is therefore questionable whether the HIF Project is Commercially Viable given that the final outturn cost could be somewhere between £400m & £500m.

8.1. HIF Costs Escalation

HIF Costs will escalate as a result of:

- Continued Inflation Costs of Materials and People. (see POE Chien Xen)
- Design Changes (see Sections 3 & 7 above)
- Stakeholder Management – Network Rail
- Stakeholder Management – Science Bridge A4130 Road Closures
- Stakeholder Management – Science Bridge Milton Road Closures
- Stakeholder Management – UKEAE and LEDA at Clifton Hampden
- Stakeholder Management – Thames Water, RWE & National Grid
- Impact of any potential GeoTech issues and redesigns – Culham River Crossing
- Impact of potential B4016 Flood Risk mitigations – Culham River Crossing
- Thames Water New Infrastructure – to support the additional Didcot Population
- RWE Service Diversions & New Infrastructure
- National Grid Service Diversions & New Infrastructure

8.2. HIF Recovery Scheme

It is highly likely the HIF Recovery Scheme will be not be fruitful as OCC may have calculated putting additional pressure on the HIF Commercial Viability. This is because:

- Inflationary Costs on Materials and Labour affecting the Developers Profit Margins.
- The introduction of Legislation in 2025 requiring new homes to be Zero Carbon ready.
- Possible downturn in the market due to Inflation, Global Instability and a Glut of unsold Properties.

8.3. HIF Schedule Prolongation

HIF Schedule will be prolonged possibly by a further 2 years as a result of the Primary Design Changes at Clifton Hampden and Budget constraints.

Estimate HIF Scheme Duration: (4 years. See Section 7 above)

8.4. The Winner is AECOM

It will be a **win win scenario for AECOM** with the additional Engineering and Project Management to support the HIF 1, 2 & 3 Contracts.

8.5. The Contract is a Winner

The successful Contractor will be able to capitalise on scope changes to increase earnings and shareholder value, possibly increasing the final contract value by 30% to 40%.

8.6. The Losers Are

The OCC will be a loser who will potentially facing **Finance Deficits** as a result of the Risk Mitigations identified within this Report as well additional Professional People to manage the works. OCC will come under fire from the General Public if services are cut as a result.

The General Public will be subjected to **4 years (2025 to 2029)** of Road and Lane Closures and Traffic disruption throughout the Didcot wider area.

9. Value Engineering Considerations

In the event that the Inspector recommends the approval of the HIF Project, notwithstanding the design flaws, risks and any of the points raised by NPC-JC, Stakeholders and the Public have made, then I would recommend the following Value Engineering Solutions are considered.

9.1. Science Bridge VE Considerations

In my view, the Science will be an expensive bridge to construct.

Therefore, I would suggest the Science Bridge is removed from the scope.

A proposed alternative could be to widen the existing A4130 Bridge over GWML to dual lanes with a filter lane. Increase the flow capacity of the A4130/B4493 Roundabout. This will be less logistically challenging than constructing the Science Bridge.

Propose to increase the flow capacity of the Milton Road/A4130/Basil Hill Roundabout.

Propose to widen the Foxhall Road Bridge.

Advantages:

- Negating the need for Full Road Closures.
- Reduced disruption to Stakeholders.
- Reduced impact on Network Rail.
- Reduced Construction Traffic.
- Reduced Piling and Construction Scope & Works.
- Resulting in reduced costs.

9.2. Appleford Sidings Bridge VE Considerations

In my view, the Appleford Sidings Bridge is not necessary and is an expensive solution to avoid conflict with Network Rail, Heidelberg & FCC.

It feels like OCC are fearful of being challenged by:

- Network Rail resisting the introduction of a Level Crossing.
- Heidelberg resisting as it will disrupt their operations.
- FCC resisting as any realignment will impact on their Radcott Green plans which will cost them more money to reassess and reapply.

The cheapest solution would be to adopt and adapt the existing Heidelberg Haulage Roads.

If it is not possible to adopt and adapt the existing Heidelberg Haulage Roads, then I would propose:

- Reject/Withdraw FCC Landfill Waste Licence Application Extension from 2030 - 2050. This would have a significant reduction of Heavy Rail Traffic in/out of the Appleford Sidings.
- Deletion of the Appleford Sidings Bridge from the HIF Scheme.
- Slew the HIF west such that it passes just to the east of where the Appleford Sidings fan out into dual tracks.
- Introduce an Interim bi-directional [Single Track] Level Crossing, which would be decommissioned after the closure of Appleford Sidings.

Advantages:

- Reduced visual impact.
- Reduced Construction Traffic.
- Reduced Piling and Construction Scope & Works.
- Resulting in reduced costs.

9.3. Appleford Sidings Bridge – Historical Alternative Information

During the design development stage of the road the NPC-JC prepared alternative alignments across the rails of Appleford Sidings to reduce noise and air pollution to dwellings close to the Appleford level crossing. R3-01238-21-DATOM-006 shows the last suggestion that was made to OCC to move the road bridge away from Appleford dwellings.

In truth a realignment of the HIF1 is even simpler. Since OCC always needed to provide an HGV capable road along the south and west edges of the pond (see plan) to serve Hansons and FCC's industrial activities, a realigned bridge could simply be a continuation of the western part of that road.

There is a strong possibility that any bridge is likely to become redundant. FCC have incipient plans to develop much of their surrounding site as Radcot Green, housing and a business park. Hanson (owned by Heidelberg Cement) will be surrounded by this development. Their continued industrial use of their site would be unwelcome and the lucrative opportunity to seek development value could be decisive in the closure of the sidings.

As Hanson currently express a need to continue with their activities. OCC's chosen road alignment necessitated a bridge. That decision lacks foresight.

RPC-JC's first suggested realignment, running around the west of the landfill site and along the spine road from Didcot power station, would have avoided these dilemmas.

9.4. Culham Bridge VE Considerations

The current proposed elevation of the Culham Bridge and its construction will be “hideous blot on the Landscape” and will not be “in keeping” with the area and ambience that Didcot Garden Town is endeavouring to promote.

My recommendation would be to change the current proposed Culham Bridge design to have a similar appearance to the existing Culham & Clifton Hampden Bridges, thereby being “in keeping” with the surrounding area.

The proposal would be to adjust the HIF Elevation to just above an acceptable Flood Mitigation level. (circa 3m above the current B4016 Level).

Detailed below are 4 photographs showing possible alternative design examples that could be implemented making the scheme more aesthetically pleasing and in keeping with the surroundings.

Advantages:

- Reduced visual impact.
- Reduced Construction Traffic.
- Reduced Piling and Construction Scope & Works.
- Resulting in reduced costs.





Alternative 1 - Culham Bridge Design



Alternative 2 - Culham Bridge Design



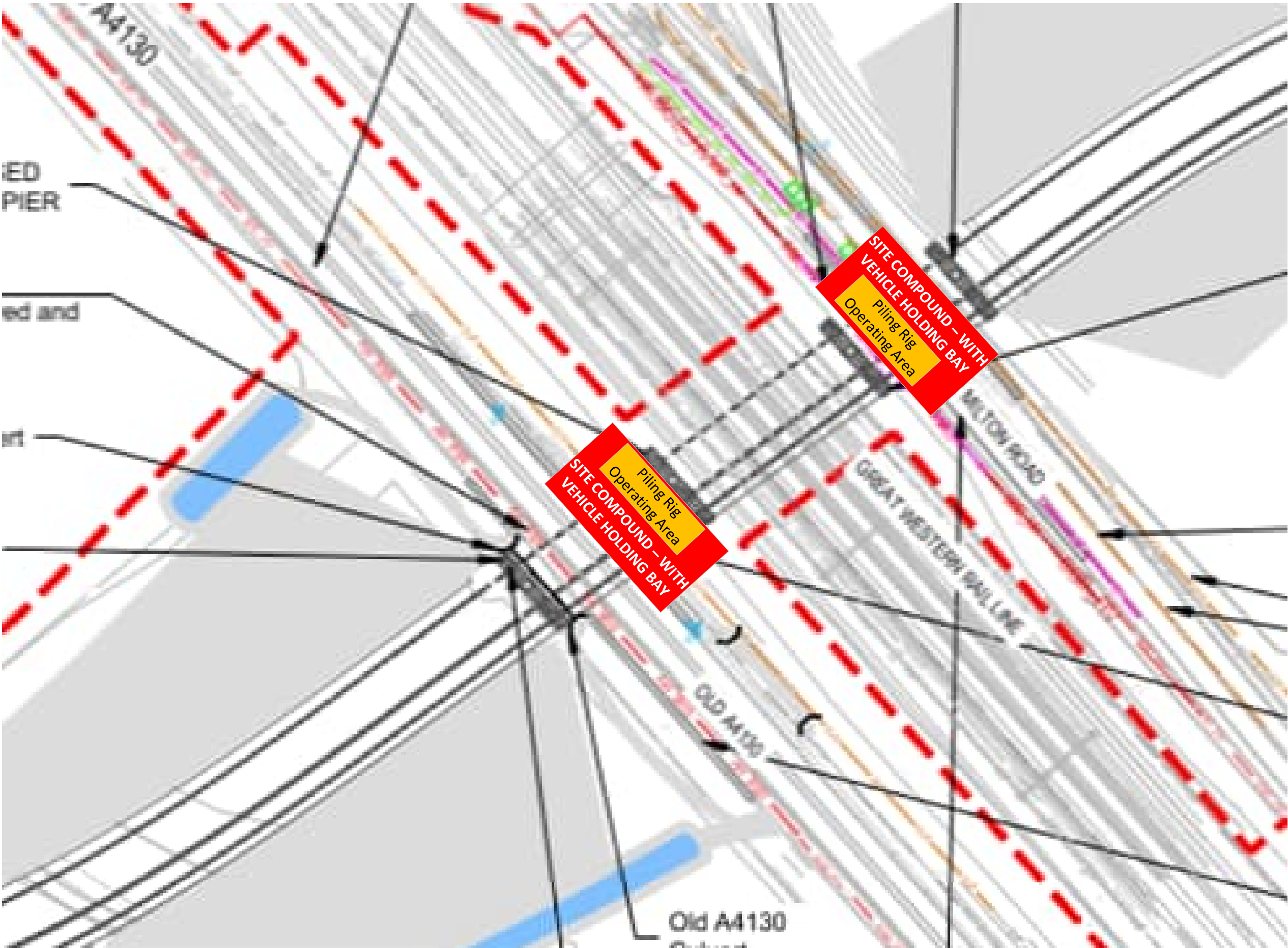
Alternative 3 - Culham Bridge Design



Alternative 4 - Culham Bridge Design

10. Appendix A – Science Bridge Compounds

Ref Drawing: R3-01238-21-DATOM-001

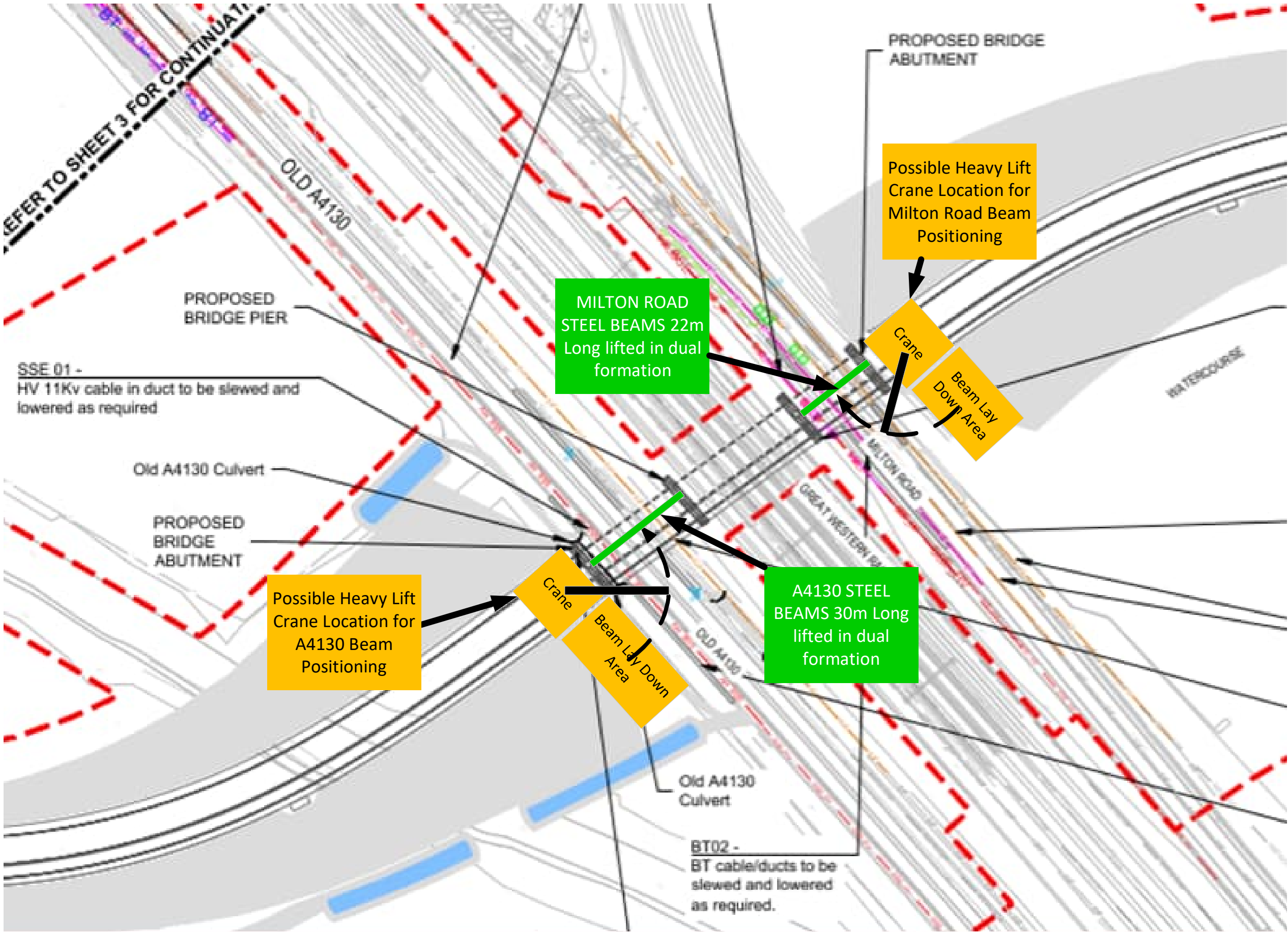


A4130 ROAD – SOUTH BOUND LANE CLOSURE – APPROX 13 WEEKS
MILTON ROAD – NORTH BOUND LANE CLOSURE – APPROX 13 WEEKS

Notes: 1.	
 Datom Engineering Ltd	
Legend:	Originator: RH Date of Issue: 12/01/24 SCIENCE BRIDGE – SATALITE PILING COMPOUNDS R3-01238-21-DATOM-001 P01

11. Appendix B – Science Bridge Lift Plan

Ref Drawing: R3-01238-21-DATOM-002



Notes:
1.

A4130 ROAD CLOSED FOR APPROX 7 NIGHT SHIFTS
MILTON ROAD CLOSED FOR APPROX 7 NIGHT SHIFTS



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Legend:

Originator: RH

Date of Issue:
12/01/24

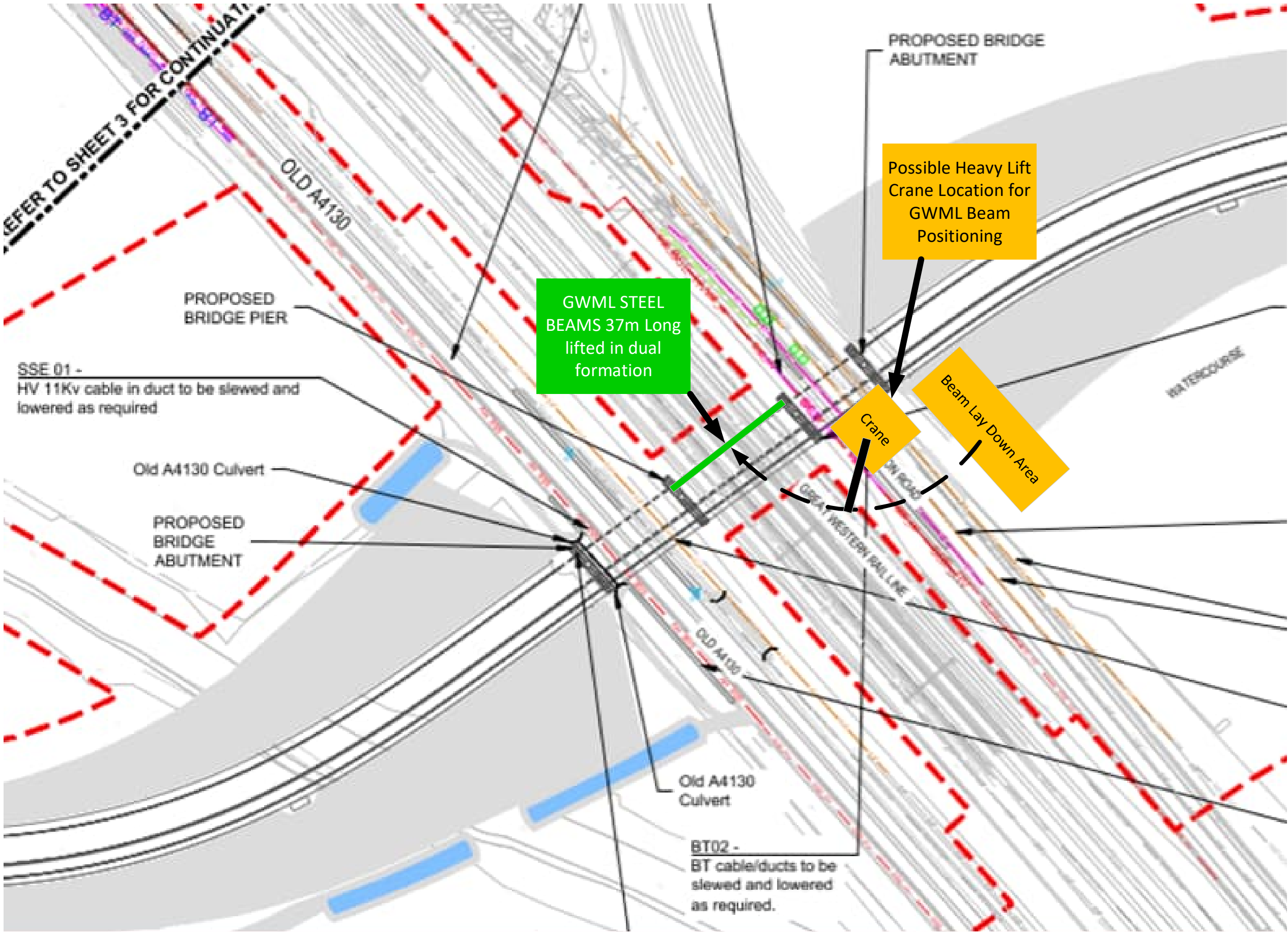
SCIENCE BRIDGE – POTENTIAL HEAVY LIFT PLAN
[A4130 & MILTON ROAD]

R3-01238-21-DATOM-002

P01

12. Appendix C – Science Bridge GWML Lift Plan

Ref Drawing: R3-01238-21-DATOM-003



Notes:
1.

MILTON ROAD CLOSED FOR APPROX 15DAYS
GWML – 4 X 24HR POSSESSIONS – NETWORK RAIL



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Legend:

Originator: RH

Date of Issue:
12/01/24

SCIENCE BRIDGE – POTENTIAL HEAVY LIFT PLAN
[GWML – BEAM POSITIONING]

R3-01238-21-DATOM-003

P01

13. Appendix D – A4130 Bridge VE

Ref Drawing: R3-01238-21-DATOM-004

Notes:
1.



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Legend:

Originator: RH

Date of Issue:
26/01/24

A4130 BRIDGE – VE WIDENING PROPOSAL
INCLUDING FILTER LANE

R3-01238-21-DATOM-004

P01

14. Appendix E – Appleford Bridge Realignment VE

Ref Drawing: R3-01238-21-DATOM-005



Notes: 1.	
 Datom Engineering Ltd	
R3-01238-21-DATOM-005	P01

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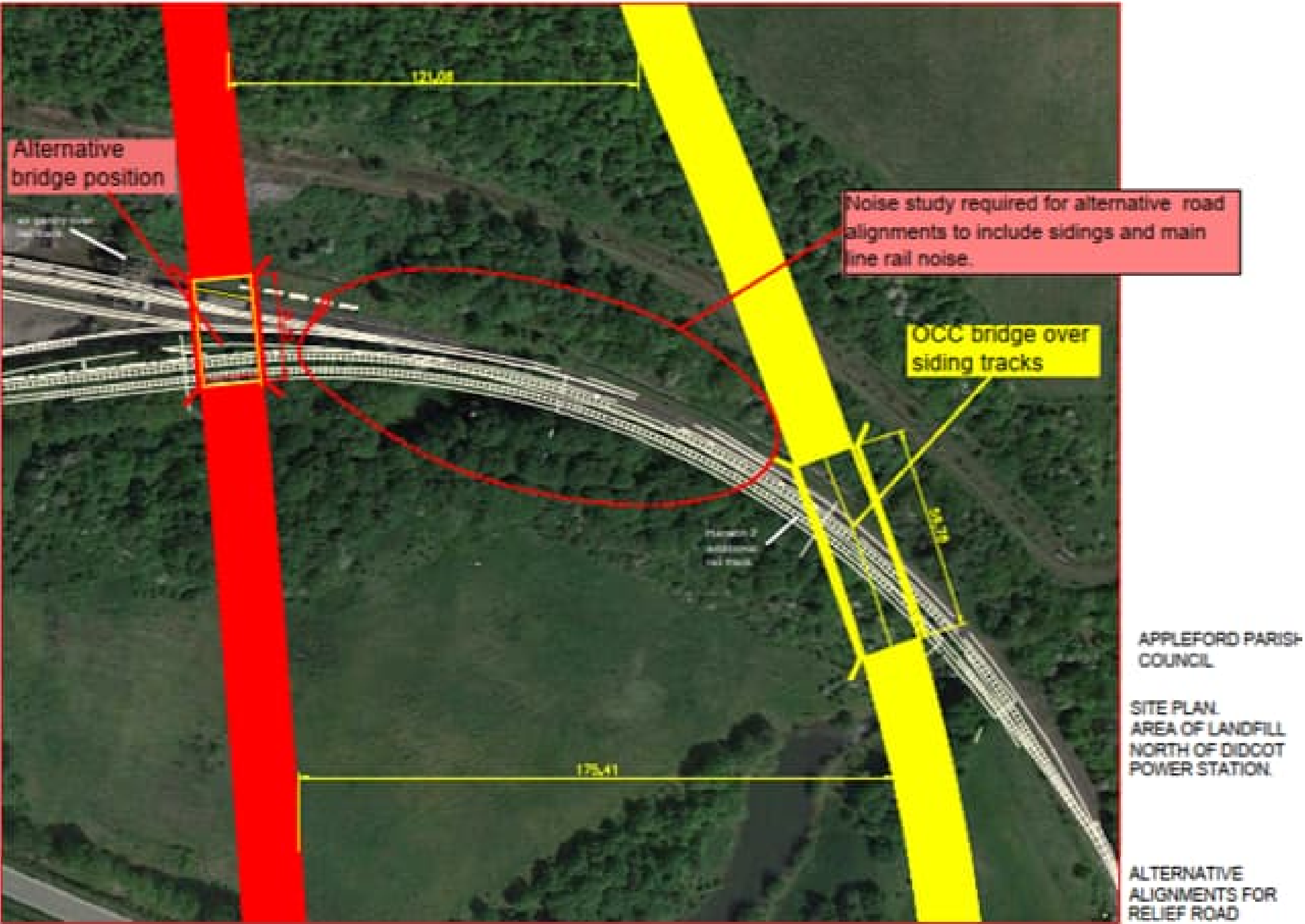
Originator: RH

Date of Issue:
26/01/24

APPLEFORD HIF REALIGNMENT PROPOSAL
INCLUDING INTERIM NR LEVEL CROSSING

15. Appendix F – Appleford Bridge Previous Realignment VE

Ref Drawing: R3-01238-21-DATOM-006



Notes:
1.



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Legend:

Originator: RH

Date of Issue:
26/01/24

APPLEFORD HIF REALIGNMENT PREVIOUS PROPOSAL

R3-01238-21-DATOM-006

P01