

Stratford on Avon District Council  
**Stratford to Honeybourne  
Railway Reinstatement - Business  
Case Study**  
Final Report

Issue | 25 September 2012

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 224132-00

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## Abbreviations/Acronyms

AONB	Area of Outstanding Natural Beauty
AQMA	Air Quality Management Area
ATOC	Association of Train Operating Companies
BCR	Benefit: Cost Ratio
CA	Conservation Area
CRN	Calculation of Railway Noise
DfT	Department for Transport
DMU	Diesel Multiple Unit
GDP	Gross Domestic Product
GRIP	Governance for Railway Investment Projects
GWR	Gloucestershire and Warwickshire Railway
HS2	High Speed 2
IEP	Intercity Express Programme
LB	Listed Building
LPA	Local Planning Authority
NIRR	Noise Insulation (Railways and Other Guided Transport Systems) Regulations
NPV	Net Present Value
NR	Network Rail
OB	Optimism Bias
ORR	Office of Rail Regulation
OWW	Oxford, Worcester and Wolverhampton line
PDFH	Passenger Demand Forecasting Handbook
PPM	Public Performance Measure
RUS	Route Utilisation Strategy
SM	Scheduled Monument
TOC	Train Operating Company
TPH	Train Per Hour
WCML	West Coast Main Line

## Executive Summary

As well as being an internationally important tourist destination, Stratford-upon-Avon is an important regional centre with approximately 30,000 residents and businesses providing 22,000 jobs. Since the old line to Honeybourne junction was closed in 1976, the Town has suffered from the lack of a rail connection to the east-west Cotswold Line (providing rail links to Oxford and Worcester) and onward to Cheltenham, Gloucester and the South-West. A further impetus for consideration of the reinstatement of the Stratford-Honeybourne link has been the significant growth in Cotswold Line traffic following re-doubling works completed in 2010. In a climate of national rail passenger traffic growth exceeding 7% p.a.<sup>1</sup> and increasing awareness of the environmental sustainability arguments for rail, this Study was commissioned to examine the outline business case.

The Study brief sought to establish the feasibility of reinstating this link along the previous alignment and the associated environmental impact taking account of the residential development and other changes which have occurred since closure.

Taking account of current demand levels on the Cotswold line, the agreed output specification was that the new works should provide sufficient capacity for 2 passenger trains per hour in each direction. Taking account of physical constraints, especially in the built environment immediately to the south of Stratford station, various route development options were considered. A particular issue concerned the crossing at Evesham Place which, if at grade, would involve re-instatement of a level crossing. This would result in significant delays to road traffic – an issue known to be of considerable concern to local residents and the highway authority, Warwickshire County Council. The Office of Rail Regulation provided a strong steer that it would be unlikely to support any application to reinstate this level crossing. Route development work concluded that a grade separated solution, with the railway in a new dive-under structure, built to Network Rail Design Standards, would be the best technical solution for this section of route. The Study Steering Group took the view that, whilst the capital costs would be higher, it made most sense to adopt this grade separated solution as a basis for moving forward.

Another technical consideration concerned the required length of twin track on the new route. In order to reduce construction costs, the recommended solution is to install single track from Stratford station for 4.8 km to Milcote, twin track in the more easily constructible rural section (8.0km) from Milcote to Honeybourne junction and an additional single track alongside the existing Cotswold Line for 1.7km from Honeybourne junction to Honeybourne station. The exact length of twin track required to support the required service plan is subject to some uncertainty as it would depend on the ability to fit an attractive passenger service with the future timetable. Twin-tracking south of Milcote would require the removal of the “Greenway” cycle path; this has become an important element in Stratford’s recreational offer and it will be necessary to secure an appropriate alternative route.

This Report package includes design drawings of the preferred option to the equivalent of Network Rail GRIP Stage 3 status. Cost estimates have been built up from tendered unit rates for comparable works. In view of the greater complexity of works in the urban section and relative lack of comparable rates, an Optimism Bias (OB) factor of 40% has been applied to these works; whilst an OB factor of 15% was considered to be reasonable for the more straight forward (and better evidenced) rural section. The resultant cost estimate for the 14.5km scheme (works only, at 2012 prices) is £76.0 million.

As noted above, the rationale for the scheme would be to improve rail links, centred on Stratford, for local and regional demand, with potential to cater for longer distance movements. In this context, Worcester and Oxford were considered to be the natural destinations that would benefit from direct rail services to/from Stratford. There has been a

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<sup>1</sup> Source National Rail Trends (ORR). Figures relate to growth over the period 2010-2011.

long standing aspiration to improve the service between Stratford Upon Avon and Leamington Spa. Its provision as an extension to a Worcester to Stratford service was considered to have potential. On this basis, the demand for new rail services was estimated for two service options:

**Option 1** – An hourly Leamington Spa to Worcester service and an hourly Stratford-upon-Avon to Oxford service

**Option 2** – An hourly Stratford-upon-Avon to Worcester service and an hourly Stratford-upon-Avon to Oxford service

Demand was estimated using a bespoke “gravity” model taking account of the observed rail flows on the Cotswold line adjusted for distance between settlements and population size. Current flow levels were made available to the Consultant but, for reasons of confidentiality, could not be presented in this Report. There is estimated to be an increase in demand of nearly 250,000 trips in the scheme opening year (2019), over the nine market segments considered; this amounts to a 46% increase compared to “without Scheme” flows.

The economic appraisal<sup>2</sup> of the scheme compares costs (capital, operating and maintenance) with forecast revenue, passenger, other transport and environmental benefits. Benefits were calculated as changes in the costs of travel in transport networks with and without the Line reinstated. The majority of benefits (almost 90%) are passenger time savings arising as the new line would provide a faster means of travel for existing rail passengers and those transferring from car. Movements between Worcester-Stratford, Evesham-Stratford and Stratford-Oxford provide the main sources of these benefits with timing savings (including reduced waiting time) making up almost 90% of the total.

The “base case” appraisal results (assuming annual demand growth of 4%) show the economic performance of the Scheme to be modest with a Benefit:Cost Ratio (BCR) of just over 0.8:1. The results for both service options are very similar. However, the analysis shows that the forecast rate of traffic growth has a significant effect on economic performance: if the market grows at 6% (rather than 4%) per annum, the BCR increases from 0.84:1 to 1.33:1 and if there is 10% additional demand in the opening year and lower construction costs this ratio increases to between 1.94 and 2.03:1. Traffic on the Cotswold Line has grown at an average annual rate of 6.1% over the two years ending in March 2012, suggesting that market growth closer to 6% per annum is attainable.

Additionally, there would be important economic benefits arising from rail freight, additional tourist spend and improved rail network resilience which have not been quantified at this stage in the process.

Whilst the Cotswold Line is cleared only to rail freight gauge W6A, freight trains up to this gauge will have the opportunity to re-route, releasing capacity on other routes. This may be especially beneficial on the route through Oxford and Banbury to the north of England from the south coast ports. This benefit is not quantified as it is highly dependent on forecasts of freight demand and capacity looking some years ahead and the appetite of operators for daytime paths on the reinstated Stratford to Honeybourne line compared to movements during the night on other routes.

The new line will also contribute to improved network resilience especially when sections of the regional network are undergoing periodic maintenance.

Tourism is an important contributor to the economy of Stratford. To the extent that the new rail line generates more tourists, rather than a change in the choice of travel mode, it will contribute to economic growth (regional Gross Value Added) through additional indirect jobs.

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<sup>2</sup> The appraisal follows the procedures and assumptions set out in Department for Transport Rail scheme Guidance (“Webtag”)

Overall, the results of the economic appraisal indicate that the Line is a promising candidate for reinstatement. The costs and benefits of the scheme need now to be viewed in a wider regional and national context.

It is recommended that the supporters of the scheme seek to attract a rail industry sponsor, promote the project with a range of agencies including Local Enterprise Partnerships, and canvass further support from communities and businesses in the area along the route.

During construction there would be significant local environmental impacts. These have not been looked at in this Report and will require detailed study to inform a specification of appropriate construction methods, working arrangements and impact mitigation measures.

During operation, noise is likely to be the main environmental impact; nine properties have been identified as lying within the 55dB(A) noise contour which represents the threshold for annoyance.

## **Recommendations**

The preferred option to be taken forward would be constructed as a combination of twin track between Honeybourne East junction and Milcote Lane and single track from Milcote Lane to Stratford Station. This would incorporate a grade separated dive-under structure to the south of Stratford station alongside a realigned Seven Meadows Road. There would be a new station to the east of Long Marston village with the southern connection to Long Marston Depot maintained. The Greenway (cycle route) would be realigned. This solution would provide capacity for two trains per hour in each direction with capacity for occasional, daytime, freight trains. Current thinking is that the preferred service pattern would be Stratford–Worcester and Stratford–Oxford. Potential for through running services, beyond these end points, should be investigated.

The general recommendation of the Study is that we believe there is sufficient evidence to proceed with further work to demonstrate the case for the reinstatement of a heavy rail route between Stratford and Honeybourne. Other options such as terminating the reinstated line at Stratford racecourse or providing a light rail service should not be considered further.

The specific recommendations are as follows:

1. The results of the Study be taken to other bodies, notably Network Rail and the Department for Transport, to gauge the support for a scheme offering the level of economic benefit identified.
2. If there is a strong measure of support expressed by the rail industry, based on the findings of the Study, that consideration be given to carrying out further assessment of technical issues and economic performance.
3. Meanwhile, given the reasonable prospect of the line being reopened sometime in the future as identified in this Study, the route continues to be safeguarded against further development in the Development Plans for Stratford on Avon and Wychavon Districts.

# 1 Introduction

## 1.1 Background

This Report responds to a brief from Stratford-on-Avon District Council, on behalf of a Steering Group comprising a number of local authorities, rail companies and railway voluntary organisations, to undertake a business case study to investigate the feasibility of reinstating the railway from Stratford to Honeybourne.

The reinstated railway would allow passenger services and other occasional traffic to operate on the route, providing new services to and from Stratford and increasing service frequency on existing routes.

Since the line was closed to traffic in 1976, a number of developments have taken place along the route, such as residential units, business premises and new highway infrastructure. This has added a number of complications and constraints to reinstatement which have been assessed during this study in order to determine the viability of reinstating the line. The majority of the route from Stratford to Long Marston is currently used as a route for cyclists and walkers (known as the Greenway) and much of the old track formation is still in place.

Ultimately a reinstated railway will fall within Network Rail's Regulated Asset Base and will be subject to Office of Rail Regulation (ORR) oversight. Therefore the appropriate industry design standards and regulatory regime have been used as a basis of design, and early route development, to identify potential constraints and issues that may lead to some options being discounted and indeed others included for further development.

This report outlines the operational and functional requirements that the concept design seeks to address. The train service scenario has been further developed in partnership with the local Train Operating Companies (First Great Western and London Midland) and agreed with the project Steering Group.

This report includes the agreed high level train service scenario, which has been used as the basis for assumed infrastructure provision between Stratford and Honeybourne. This train service and infrastructure scenario has been used for the subsequent benefit/cost ratio (BCR) analysis.

## 1.2 Purpose of the Study

The Study was commissioned for the following key purposes:

- To consider the benefits of re-opening the railway between Stratford-upon-Avon and the Cotswold Line at Honeybourne Junction in terms of:
  1. providing a strategic link to the national rail network, in particular creating an alternative through route between Birmingham and Oxford; and
  2. benefiting the local economy, in particular the major tourist attraction of Stratford-upon-Avon.
- To identify the nature and level of potential passenger and freight services that train operators would wish to run along the line and quantify the revenue that would be generated.
- To assess the technical feasibility of re-instating the line and the likely construction, infrastructure and operating costs of doing so.
- To make recommendations as to whether the Benefit Cost Ratio (BCR) is likely to make the scheme an economically viable proposition that should be pursued further.

- To satisfy the requirements of the Local Transport Plans of Warwickshire County Council and Worcestershire County Council.

### 1.3 Objectives of the Study

The Study Brief outlines the objectives as:

- Examine the potential options for passenger train services, the potential for freight traffic and the use of the line as a diversionary route. The anticipated revenue income from such services should be quantified. The costs and benefits of providing services should be assessed and a preferred passenger service specification should be identified.
- Assess the feasibility of the proposals in terms of infrastructure and other physical factors, together with recommendations on solutions to the issues identified. A preferred solution should be specified to enable a capital cost estimate for reinstating the railway to be developed by the consultant.
- Identify the opportunities for delivery of the scheme and the risks/ constraints which could adversely affect its delivery. The opportunities and risks/constraints assessment must include consideration of delivery timescales, likely funding availability, economic, planning and transport policy and rail industry strategies.
- Identify an outline business case taking account of anticipated demand, revenue, capital costs, operating costs (including track access charges), impact on existing users and operators and wider economic benefits. This should take into account current Network Rail and Department for Transport practice and guidance.
- Investigate the potential for a new railway station at Long Marston [and Stratford Racecourse].
- If the reinstatement of a heavy rail track is not feasible, consider whether a light rail track would offer a viable option (not undertaken).
- Consider and comment on the potential for reinstating the line from Honeybourne to Cheltenham in its entirety as a through route (see Section 6.9.2).

### 1.4 Study Scope Definition

We note the comments made on the study scope by the Client in the introduction section and other sections of the invitation to tender document. We have taken these comments into account in our Interim Report. These comments include:

- A Steering Group, led by Stratford-on-Avon District Council, wishes the consultants to produce a fully worked up business case, based on Network Rail's Governance for Railway Investment Projects (GRIP) principles, for the restoration of passenger and freight rail services, between Stratford-upon Avon station and Honeybourne Junction on the Cotswold Line, as a heavy rail through route to form part of the national rail network.
- Particular attention is to be given to the reinstatement of a single track railway south of Stratford station headshunt to the existing Long Marston railhead and onto the Cotswold Line at Honeybourne Junction. The study will also cover the infrastructure works required at the junction with the Cotswold Line to facilitate a rail service from Stratford-upon-Avon to Oxford/London Paddington and to Evesham/Worcester.
- The consultants are required to produce a study to assist the Steering Group in evaluating the demand for and cost of providing a heavy rail route. The study should

primarily include an assessment of demand and revenues and estimation of the capital and operating costs. Consideration should also be given to the operational feasibility and provision of modified or new infrastructure.

- Patronage generated from developments in the study area, in particular at Stratford-upon-Avon and the former MoD Engineers Depot at Long Marston, must be taken into account, together with the potential demand arising from major leisure events in the area. Employment and economic regeneration effects resulting from the scheme should be estimated. The Study should also assess the latent demand for rail passenger access to and from Stratford-upon-Avon as a national and international tourist destination, recognising the importance of tourism as a major economic activity in the area.
- The study will also need to identify and quantify the strategic, regional and national benefits to the national rail network of reinstating the six mile 'missing link' between Stratford and Long Marston, in the context of creating an alternative through route between Birmingham and Oxford or Worcester.
- The analysis of all the relevant operational and technical issues should be brought together to assess the benefits and costs of reinstating the rail line in the form of a Benefit Cost Ratio (BCR).
- The study should also consider, although in less detail, the potential benefits of reinstating the Honeybourne to Cheltenham section for passenger and freight services (not undertaken).
- Network Rail has advised that a full risk assessment is required as part of the Study if the re-opening of any level crossings is proposed.
- A detailed assessment up to GRIP 3 Level (modified in invitation to tender) is sought in relation to the feasibility of reinstating the section of the line between Stratford Station and the northern end of the Greenway.
- The study must provide the Steering Group with a clear and fully justified recommendation on whether to proceed further with the scheme. If the recommendation is to proceed, an explanation of the risks associated with proceeding must be provided.
- [The consultant] should also highlight any limitations to the scope of the report that they would produce due to the budget available. In this respect, the Steering Group advises that **an assessment of operational matters** (set out in Stage 1 in the Brief) should be given greater emphasis at this stage in the process than infrastructure matters (Stage 2). However, the approach taken will need to be sufficient to allow a robust and reliable assessment of the Business Case (Stage 3) to be made.

## 1.5 Previous Work in the public domain

### 1.5.1 1996 Halcrow Fox Report – Stratford upon Avon Rail Study

This report was commissioned by Warwickshire County Council and Stratford on Avon District Council. The report was delivered in October 1996 and included a wide ranging remit to understand the demand, economic benefits and costs of reinstating the Route between Stratford and Honeybourne.

The report concluded that it would be physically feasible to reinstate the route, subject to overcoming constraints at Long Marston Depot, where an industrial estate has been constructed on the route and in Stratford in the area of Seven Meadows Road and Evesham



Place, where highway works present constraints that didn't exist when the original railway was in use.

However the report also concludes in the traffic issues section that the reinstated Evesham Place level crossing would cause:

- “extensive local queuing and diversionary effects at the peak periods” and
- “there would be considerable implications for sensitive road traffic routes in Stratford upon Avon in the peak periods”.

The report then goes on to say that:

- “measures to overcome these [issues] would be costly and unacceptable physically”
- “the running of commercial services would have a considerable further effect on delays, although the running of occasional, off peak services would be unlikely to have significant additional effect on traffic”.

The Halcrow Fox report recommended that at a 1996 estimated cost of £5.88M to reinstate the line that there was insufficient case for reinstatement at that time, but that the route should continue to be safeguarded.

### **1.5.2 1999 Halcrow Fox Report – Long Marston Deviation**

Titled “Rail Links South of Stratford”, this report looked at the deviation at Long Marston Depot and the Honeybourne Line. The recommendation was for a deviation to the west of the original route in the area of the industrial estate.

### **1.5.3 Reports by Others**

We understand that there have been studies carried out to support the Eco Town proposal at Long Marston Depot (known as Middle Quinton) which looked into the reinstatement of the Honeybourne to Stratford route. This included provision of a new station at Long Marston and options for access through Stratford. We have not had official sight of these documents.

### **1.5.4 Shakespeare Line Promotion Group**

Report produced in 2011 focussing on the potential reopening and inclusion in the next Warwickshire Local Transport Plan (LTP-3).

### **1.5.5 Local Action Group**

We understand that a local action group “No Avon Line” has been formed to campaign against the reopening of the railway. This group is producing leaflets against the scheme.



## 1.6 Study Approach

### 1.6.1 Vertical Alignment and Grade Separation

This Report provides a high level review of the civil and structural requirements of the scheme and considers the suitability of reusing existing structures as well as the requirement for new structures to be constructed. At each key location options have been considered:

- Option A or ‘Do minimum’ considered the minimum requirements to reinstate the line, such as the use of level crossings for road crossings and accommodation/footpath crossings. There will be impacts to road traffic and pedestrian movements upon the opening of the railway, and during the construction period when appropriate traffic control measures will be required.
- Option B provided for a fully grade separated scheme. This will have a higher capital cost but will enable a higher utilisation of the route, due to removing the constraints of level crossings and associated barrier down-time issues. This option will also provide an optimum solution with regards to minimising impacts on the surrounding road network, safety considerations for at-grade level crossings and take note of the Office of Rail Regulation (ORR) and Network Rail’s positions on new level crossings.

For the purposes of this study, a simplified approach was initially adopted where the two at-grade and grade separation philosophies were applied separately throughout the route. However following clear guidance from the ORR, the Steering Group decided following the submission of the Interim report to remove any at-grade options from further development. The study therefore focussed entirely on a grade-separated philosophy in line with Option B above.

### 1.6.2 Horizontal Alignment

The horizontal alignment of the reinstated railway will effectively follow the original railway corridor for the majority of the route. Areas where minor deviations occur will be around the Long Marston Depot site and within Stratford, adjacent to a re-aligned Seven Meadows Road.

Six track configuration options between Honeybourne and Stratford were developed as examples of what might be envisaged prior to undertaking high-level timetable analysis work.

These options were:

Option 1 – Single Track from Stratford Station to Honeybourne Station

Option 2 – Double track dynamic loop from Stratford Racecourse Station to Long Marston Station

Option 2a – Double Track from Milcote Road Chainage 9500 to Chainage 2000

Option 3 – Double track from Stratford Station to Long Marston Station

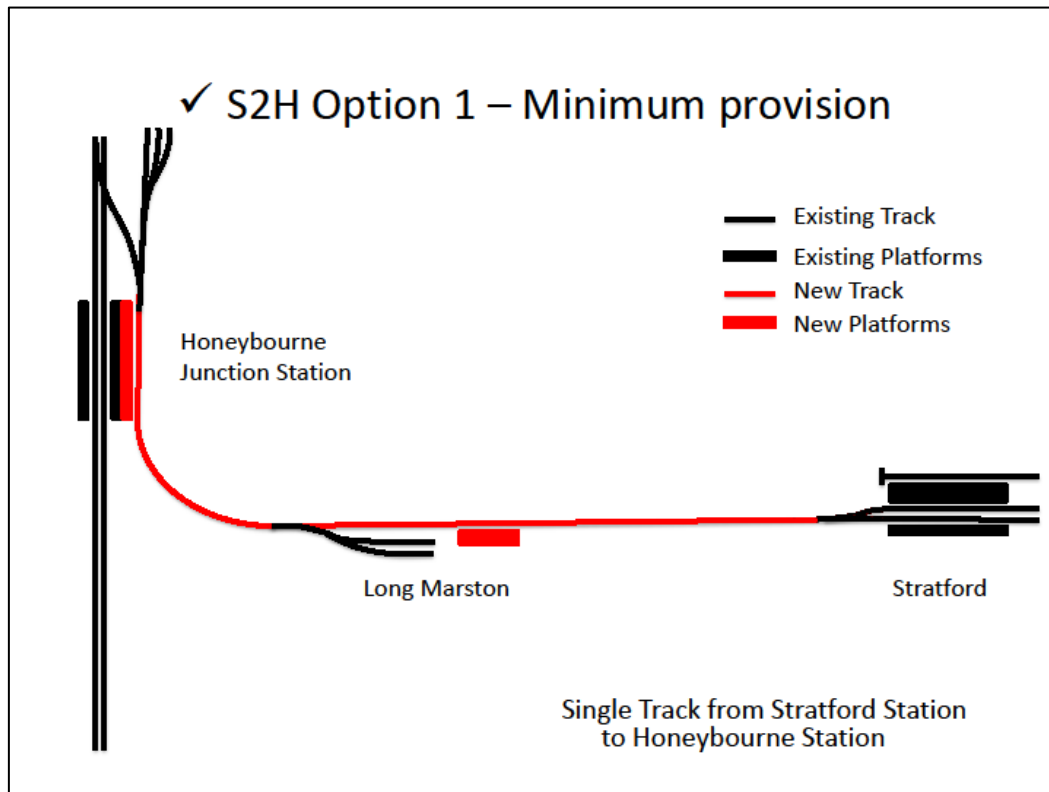
Option 4 – Double Track from Stratford Station with Single track junction east of Honeybourne Station Chainage 2000

Option 5 – Double Track from Stratford Station with Single track junction west of Honeybourne Station

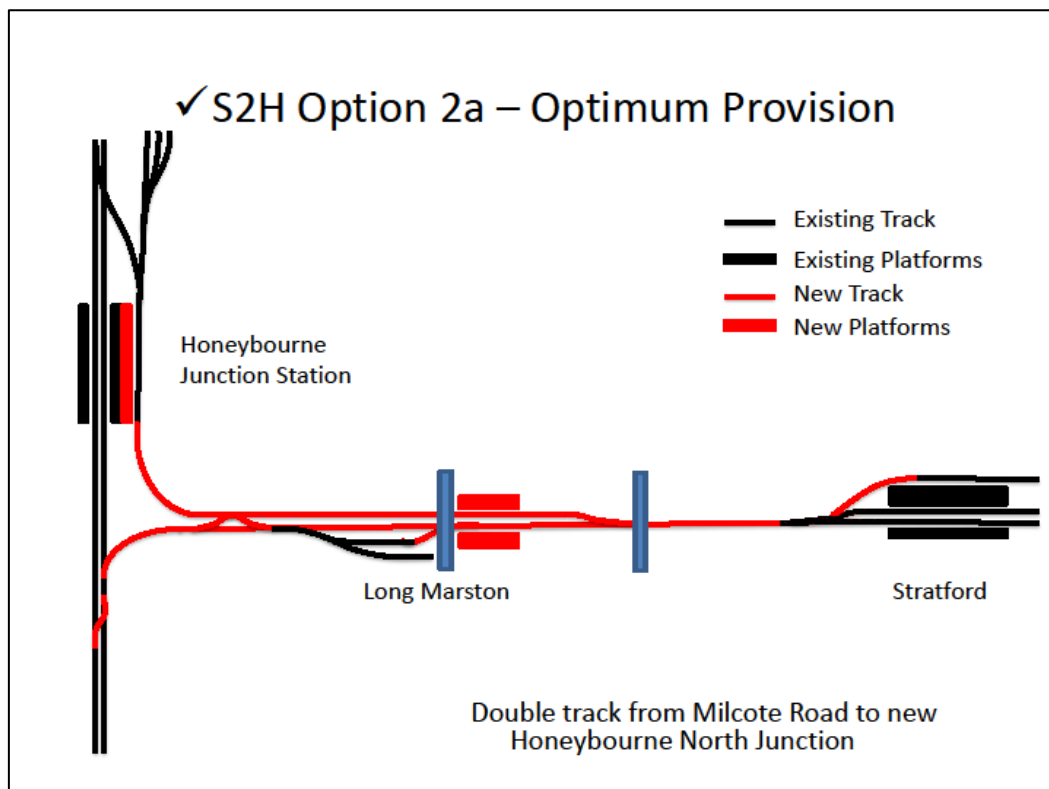
Option 6 – Double Track from Stratford Station to Honeybourne west junction

The two options that were presented for the business case analysis following high-level timetabling analysis were:

Option 1 – Do-minimum (single track from Stratford Station to Honeybourne Station)



Option 2a – Optimum (maximum) Provision



Following the high-level timetable analysis work, the preferred 'optimised' track configuration scheme was further developed to ensure that the reinstated railway could support the required train service scenario, and deliver a reliable timetable in line with industry expectations of around 92% punctuality.

This optimised option includes a section of double track from Honeybourne east junction to Milcote Road. The track then becomes singled through a high-speed junction, running along the left (western) side of the Greenway through to Stratford Station, where it joins the existing main line.

The Honeybourne to Stratford route is served by new services from Oxford and Worcester. To enable these services to operate efficiently a rebuilt southern junction and 'avoiding' chord at Honeybourne from the Cotswold Line is to be provided and the recently reinstated northern junction (August 2011) to the Stratford branch is upgraded to passenger status with a new platform 3 provided at Honeybourne Station.

It should be noted that until the full operational modelling is completed, the exact extent of double track is subject to change. It is likely that the actual extent of double track will be between the do minimum arrangement (single track throughout, with southern chord to Oxford) and the optimised maximum arrangement (double track between Honeybourne East junction and Milcote Lane). To this end the costs and associated BCRs feature a range between minimum and optimised maximum, within which the ultimate solution will likely fit.

## 2 Outline Project Operational and Functional Requirements

### 2.1 Line Speed Requirements

The recently installed crossover and turnout at Honeybourne West Junction is fit for 25mph. The design linespeed profile assumed for the route from Honeybourne Station to Stratford Station is:

50mph from the southern end of Honeybourne Station to Chainage 2000 (Honeybourne North Junction)

70mph from Chainage 2000 (Honeybourne North Junction) to Chainage 12400 (Stannals River Bridge)

50mph from Chainage 12400 (Stannals River Bridge) to Chainage 14000 (Evesham Place)

30mph from Chainage 14000 (Evesham Place) to Chainage 14500 (the southern end of Stratford Station).

### 2.2 Gauge Requirements

The current gauge profiles for existing adjacent routes are:

W7 Gauge (Rural Route) from Stratford to Tyseley. RA7-8 at 60mph with minimum 3-5 min headway. Leamington to Tyseley is 3 minutes. Tyseley to Whitlocks End is 6 minutes, Hatton West to Bearley Junction 12 mins and Bearley to Stratford is 5 minutes. All routes controlled by the new West Midlands Signalling Centre.

W6A Gauge Cotswold Line (Secondary Route) from Oxford to Worcester via Honeybourne RA 7 at 90mph. Trains timed in line with absolute block principles – utilise Sectional Running Times (between departure and arrival times) plus 2 minutes timing after arrival before next departure. Headways therefore vary with stock type.

W8 Gauge (Primary Route) from Bristol to Birmingham New Street RA7-9 it is RA10 at 100mph with 4 min headways.

W10 Gauge from Didcot/Oxford to Birch Coppice via Banbury.

At this development phase of the study stage the current Network Rail gauge standards: NR gauge (W10/W12) + OLE capability have been assumed.

### 2.3 Axle Loading Requirements

Axle loading requirements have been assumed to meet Network Rail standard RA10.

### 2.4 Stations

There are existing railway stations at:

Stratford Station (London Midland operated)

Honeybourne Station (First Great Western operated).

There is a new railway station proposed at Long Marston (for Long Marston Village, the large Depot and adjacent Airfield).

## 2.5 Theoretical Capacity (TPH)

The capacity requirements of the core section of the route from Honeybourne to Stratford dictate the provision of infrastructure. The minimum service requirement is likely to be 1 train per hour (TPH) in each direction, and will be provided by a bi-directionally operated single track. A greater service requirement of 4 TPH in each direction would require a majority of double track throughout. The route capacity would reduce from 4TPH in each direction depending upon which sub-option is selected for further development.

Following redoubling of the Cotswold Line from Evesham West to Charlbury, the route capacity from Honeybourne to Worcester is assumed to be 2 trains per hour in each direction, with the introduction of an hourly standard pattern Intercity Express Programme (IEP) timetable.

The theoretical capacity of the reinstated route from Honeybourne to Stratford will be for 2 TPH in each direction with some additional capacity to allow for occasional freight trains, engineering or charter trains as well as a performance buffer. Performance for the route will aim to be maintained at or above 92% PPM.

Full computer based (RailSys or similar) operational modelling should be used as part of further work to confirm these findings and to optimise infrastructure provision further. The current 'optimised maximum' infrastructure provision may be a cautious approach; however, there may be opportunities to further refine the infrastructure provision with detailed operational analysis.

## 2.6 Proposed train service provision (TPH)

The proposed train service provision on the core route from Stratford to the new Honeybourne east Junction is 2 TPH Passenger train service (one Worcester to Leamington Spa; one Oxford to Stratford) in each direction.

## 2.7 Existing Train Service Performance (by TOC Routes)

Examples of recent TOC performance (PPM) in 2011:

London Midland	89.8%
First Great Western	90.1%
Chiltern Railways	94.7%

## 2.8 Level Crossing and Grade separation requirements

The previous Halcrow Fox study (1996) suggested that a level crossing of the existing Evesham Place/Seven Meadows Road junction was feasible. At grade crossings included:

- road/rail level crossings between Honeybourne Station and Stratford Station, including Station Road, Milcote Lane, and Evesham Place.
- Other crossings of the route comprised of User Worked Crossings and Public Footpath Crossings.

Two separate approaches were initially used for this study for the interim report. These were an 'at-grade' philosophy and a 'grade-separated' philosophy. If the project required the reinstatement of one or more level crossings, due regard would have to be made of the significant changes in the local area regarding a greatly increased population, new and different road alignments (including the new Seven Meadows Road) and significantly higher volumes and weight loads of traffic levels since the original railway was proposed.

It should be noted that current ORR and NR guidance is for no new level crossings, except in exceptional circumstances. The original enabling Act of Parliament circa November 1853 does not appear to have been repealed, indicating that reinstatement of the railway within the original limits of deviation may be permitted. However, the project team sought early clarification from ORR on their position due to the significance of level crossing issues for this project.

Confirmation has since been received from the ORR regarding its policy on new level crossings. ORR has advised Arup that a fully grade separated approach is expected throughout the reinstated section of the railway. Ref: Arup/ ORR communication April/May 2012. See ORR comments in Appendix E.

**We recommend a fully grade-separated approach to the construction of the reinstated railway**

## 2.9 Utilities

All statutory utilities affected by the scheme will require diversion, protection or removal.

Key utilities/services are:

- Water supplies
- Sewers (surface water and foul)
- Strategic gas pipeline at Long Marston
- Electricity
- Communications
- Railway services

A full utilities diversion and protection strategy will be required for the next stage of the project.

## 2.10 Safety

Whilst for the majority of the route the reinstated railway will utilise the historic trackbed, it will nevertheless be expected to adhere to modern expectations in terms of railway standards and guidance, highway standards and general Health and Safety law (as well as other legislation such as disabled access provisions and environmental protection requirements etc).

Likely requirements considered by this study include:

- The grade separation of pedestrian/road/rail moves and line-wide route segregation (fencing) of the railway from the general public.
- Stations to be designed to maximise access for people with limited mobility and to reduce opportunities for public trespass onto the route.
- Effective access for railway staff, carrying out operational duties and inspection & maintenance activities etc.

## 2.11 Noise and Vibration

The report identifies where noise mitigation measures will be required. In general terms, this is close to existing residential properties in Stratford, and Long Marston Villages – together with a small number of remote dwellings close to the route.

Noise issues are covered in Chapter 7.

## 2.12 Environment

A wide range of environmental factors have been considered in broad terms at this stage (see Chapter 8).

- River Avon Flood plain (including River Stour)
- Protected species flora/fauna
- Noise
- Vibration
- Visual intrusion
- Construction issues – run off/dust etc.
- Heritage
- Greenway pedestrian and cycle route.
- River Avon Flood plain (including River Stour)
- Protected species flora/fauna
- Visual intrusion
- Construction issues – run off/dust etc.
- Heritage
- Greenway pedestrian and cycle route.

## 3 Train Service Options

### 3.1 Medium term (with no additional infrastructure)

A schematic route map is shown in Figure 3.1. Services that could be supported by the reopening of the Stratford to Honeybourne line include:

Worcester all stations stopping to Stratford/Leamington Spa (via the recently opened Honeybourne North/Cotswold Line junction) possibly extending to Birmingham.

Oxford direct to Stratford (perhaps only 2-3 stops on Cotswold Line) (via a reinstated Honeybourne South Junction chord). Possible extensions of this service would be fast (limited stop) services to Birmingham and London Paddington.

Subject to priority pathing requirements of passenger services and single line constraints, the Stratford to Honeybourne line could accommodate freight trains to gauge W6. If such trains were to transfer from alternative routes (such as Oxford/Birmingham route) there would be increased potential for growth of W10 gauge freight traffic on these alternatives.

Freight: by adding a north facing access to Long Marston Depot it will be possible to access the depot from the north<sup>3</sup>. This would free up some capacity on the Cotswold Line and in the Worcester area.

### 3.2 Longer term (with additional infrastructure)

Additional potential new services, requiring additional infrastructure investment include linking to the existing Gloucestershire and Warwickshire Steam Railway to provide a service via Broadway and Toddington to Cheltenham.

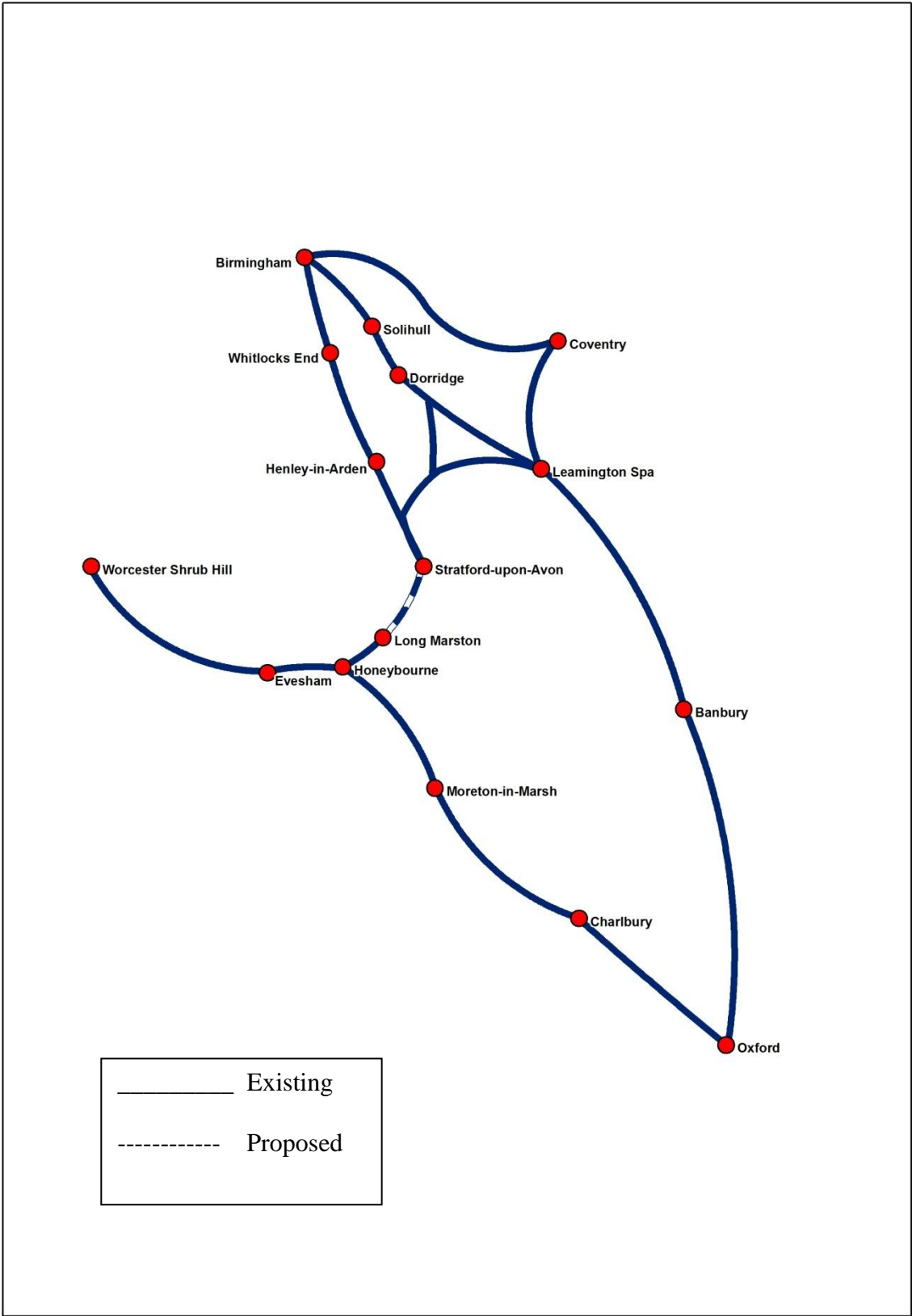
### 3.3 Service options

A number of alternative service options, requiring different levels of infrastructure investment were considered (see Appendix D). The preferred option for appraisal was option 2, requiring a mix of single and twin track providing sufficient capacity for two trains per hour in each direction and the occasional freight or charter service.

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<sup>3</sup> The Depot can be accessed only from the south, currently.





**Figure 3.1 Regional Rail Network**

## 4 Design Issues and Construction Options

### 4.1 Introduction

The opportunity was taken during the pre-tender phase to visit the route from Stratford Station to Honeybourne Station. A number of constraints and questions that arise from reinstating the heavy rail route were identified (see Appendix B). These included:

- Stratford Station – how would passengers transfer between terminating and through running services?
- Stratford Station to Evesham Place to Stratford Racecourse – what will be the impacts of the reinstated railway on the existing roads, structures, cycle and pedestrian routes, how to prevent severance of the communities, maintain road functionality and ensure operational noise and environmental issues during construction are adequately mitigated. What would be the road and pedestrian safety implications of the proposed scheme?
- Stratford Racecourse – what would be the case for a new station at this location?
- Stratford Racecourse to Stannals Bridge over the River Avon – the impacts of the reinstated railway on earthworks and structures, what strengthening or renewals will be required to accommodate the railway.
- Stannals Bridge to Long Marston Depot – Impacts on the Green Way cycle route to be addressed.
- The Long Marston Station site will be selected with a view to maximising the catchment area, both from a walk/cycle and car accessibility point of view.
- Long Marston Depot to Honeybourne Junction – assessment of the works required to convert the freight line to passenger operation, whilst maintaining freight access to Long Marston Depot.
- At Honeybourne Station, there may be opportunities to seek a do-minimum approach, building upon the works recently completed.

### 4.2 Structural Assessment

A high-level structural assessment has been carried out from Stratford to Honeybourne, identifying the structures along the route and options to be considered to enable the reinstatement of the railway. This report also mentions likely future structural options, such as a dive under of Evesham Place. This report is attached in Appendix B.

### 4.3 Route Option Development

The works undertaken previously have formed the basis of our initial evaluation of possible options to reinstate the railway from Honeybourne to Stratford. We have applied current Network Rail standards and ORR requirements to our design philosophy and then aimed to get an optimum fit alignment throughout the route.

There are a number of route configuration options that respond to the operational requirements set out in section 3. These options (shown in Appendix A) start at a single track throughout, and build incrementally up to a double track throughout. Ultimately the route configuration will be driven by the required train service pattern, and other key drivers, such as reliability, flexibility and capability to operate under disruption and out of course running of trains.

If this study is subsequently taken forward for further development, detailed operational modelling using RailSys or similar software will be required to identify accurately the exact nature and combination of route configuration options.

Areas where there were further geometric options considered are deviations in horizontal alignment from the route centreline at Long Marston Depot and deviations from the original horizontal and vertical alignment in Stratford, along the section of route where Seven Meadows Road has been built upon the original GWR Railway alignment between Evesham Place and Wetherby Way.

A summary of our findings is set out below.

### 4.3.1 Stratford Station to Stratford Racecourse

The section of route between Wetherby Way and Evesham Place has been used for a new inner relief road called Seven Meadows Road. The road occupies the majority of the old railway formation, with the remaining width occupied by grass verges, pavements/cycleways and environmental bunding.

The earlier Halcrow Fox report indicated that an at-grade single track railway may be able to be located to the west of Seven Meadows Road, in the area of the verge and environmental bund. This option included the level crossing of Evesham Place.

We have investigated how such alignments could fit in this area, utilising the current Network Rail design Standards. Options investigated include:

- Option S1a – a best-fit southern dive structure (maximum gradient profile of 0.9% and with the northern dive structure gradient of 2.5%) fully grade separated double track railway in tunnel passing beneath Wetherby Way and Evesham Place, running beneath Seven Meadows Road. Dive structures situated north and south of the tunnel to effect the required circa 7.8m grade separation.
- Option S1b - a shortest southern dive structure (maximum 2.5% gradient profile throughout) fully grade separated double track railway in tunnel passing beneath Wetherby Way and Evesham Place, running beneath Seven Meadows Road. Dive structures situated north and south of the tunnel to effect the required circa 7.8m grade separation.
- Option S1c – as S1b but a single track dive structure and open topped trench alongside a re-aligned Seven Meadows Road.
- Option S2a – a single track railway with a southern dive structure to effect the required circa 7.8m grade separation, passing beneath Wetherby Way overbridge, (maximum dive structure gradient profile of 2.7%) running alongside the western boundary of a realigned Seven Meadows Road, in dive structure returning to grade with a level crossing at Evesham Place.
- Option S2b - a single track railway with an at grade level crossing of Wetherby Way, running alongside the western boundary of a realigned Seven Meadows Road in a dive structure to effect the required circa 7.8m grade separation, passing beneath Evesham Place overbridge (maximum gradient profile of 3.1%) and a northern dive structure to return to grade at Stratford Station.
- Option S3 – Provides for Stratford Racecourse (within the southern dive structure) combines Option 1b short dive structure (maximum 2.5% gradient profile throughout) with the tunnel option to provide a fully grade separated double track railway, passing beneath Wetherby Way and Evesham Place, running beneath Seven Meadows Road.

- Option S4 - a single track railway with an at grade level crossing of Wetherby Way, running alongside Seven Meadows Road, with an at grade level crossing at Evesham Place.

**We recommend Option S1c – the shortest dive structure with an open topped trench adjacent to a realigned Seven Meadows Road.**

#### 4.3.2 Stratford Racecourse to Milcote Lane

The railway will be reinstated at grade, and will effectively be referenced to the centreline of the original two track alignment. The railway will be bi-directionally signalled single track throughout this section, running along the western side of the old railway corridor, and the Greenway sympathetically reinstated adjacent to the track, but fenced for safety and security reasons.

Flood protection measures will be required in this area to protect the southern dive structure from inundation by the River Avon during extreme weather events.

The railway will cross the River Avon over a rebuilt Stannals Bridge which will be reinstated as a two track capable structure, the eastern track bed carrying the Greenway.

#### 4.3.3 Milcote Lane to Long Marston

The railway will be reinstated at grade, and will effectively be referenced to the centreline of the original two track alignment. There will be a 70mph junction at Milcote where the single track from Stratford forms a double track bi-directionally signalled route. The eastern track will serve Oxford and the Western track will serve Worcester.

As the route approaches Long Marston there is the need to deviate from the original route due to the construction of an industrial estate on the alignment for a distance of some 300 metres. A previous 1996 Halcrow Fox study recommended a route deviation to the west of the industrial estate, but reference an eastern alignment through the middle of Long Marston Depot.

We have investigated how such alignments could fit in this area, utilising the current Network Rail design Standards. Options investigated include:

- Option LM1 – Deviation to the west of the industrial estate as identified in the 1996 Halcrow Fox study. This option requires the acquisition of around 1000 metres of route length through five adjacent fields.
- Option LM2 – Deviation to the east, not through the Depot, but running between the industrial estate and Long Marston Depot. This option minimises the acquisition of green field land, reducing the 1000m to around 400m, at the corner of one field. A significant part of this deviation through a vacant office and adjacent yard site is currently for sale. This site would require the demolition of two buildings and the clearing of the yard prior to construction commencing.

For both options we have allowed provision for a new Long Marston Station to the north of the industrial estate. We have also allowed for the grade separation of Station Road, which also maintains access to the industrial park, however Option 1 - the western deviation would make the grade separation more challenging due to the closer proximity of the Long Marston Road Junction, and the provision of a north-facing connection with Long Marston Depot more complex.

**We recommend the eastern deviation of the route alignment at Long Marston.**

#### 4.3.4 Long Marston to Honeybourne East Junction

The route from Long Marston to Honeybourne West Junction contains a single track operational freight only railway line. Any works in this area will be to enhance the existing system to support the reintroduction of passenger trains and freight trains at the design linespeed of up to 70mph. This will likely require the renewal of the existing track and improvements to the geometry as necessary. The upgrade and/or closure/diversion of existing user worked crossings and footpath crossings will be required. These are highlighted in the accompanying scheme drawing.

The currently used direct connection to Long Marston Depot will be replaced with a south facing junction off the Stratford to Honeybourne Mainline. Consideration should be made regarding the reinstatement of a north-facing access to the Depot if required by the Depot operator. This scenario is possible by the eastern deviation option at Long Marston.

Honeybourne East Junction will enable the direct connection of services from Stratford to Oxford and beyond. These services will bypass Honeybourne, the first station stop being Moreton-in-Marsh. The junction will also enable the continuation of services to Honeybourne and onwards to Evesham and Worcester. This junction will be a double track bi-directional arrangement, splitting to form two, single track bi-directional sections to Oxford and Worcester.

#### 4.3.5 Honeybourne East Junction to Honeybourne Station

The western chord will maintain the current connection to the OWW Cotswold Line at Honeybourne West Junction. This section will include an enhanced Honeybourne Station, with one or two additional platforms, depending upon operational requirements.

The new sidings at Honeybourne could be considered for ad-hoc rolling stock stabling if required.

There will be key interfaces at Honeybourne with the Gloucestershire and Warwickshire Railway (GWR) which has plans to extend their heritage railway services north to form a direct connection with the national railway network at Honeybourne Station.

#### 4.3.6 Honeybourne East Junction to Honeybourne South Junction

This southern chord and junction will support direct connection to the OWW Cotswold Line. It will be a single track, signalled for bi-directional operations. A recently diverted accommodation access would be required to be rebuilt (probably using a new underpass) if this chord were to be reinstated.

#### 4.3.7 Impact on adjacent routes

There will be a need to further assess adjacent routes for the operational impacts of additional services operating north of Stratford, west of Honeybourne and east from Honeybourne to Moreton-in-Marsh and beyond.

The route from Stratford to Leamington Spa will require further timetable analysis to ensure all through services are able to operate with the proposed hourly Stratford to Leamington Spa services.

The initial train service proposals (please refer to the timetabling study in Appendix D) indicates that with a standard pattern IEP timetable on the North Cotswold Line (OWW) an hourly service from Stratford to Worcester and Oxford may be feasible (certainly along the OWW). To confirm these findings, further operational timetabling analysis would be required.

## 5 Demand and Revenue Forecasts

### 5.1 Introduction

This chapter sets out the basis of the passenger demand and revenue forecasts which have been developed as inputs to economic and financial appraisal.

### 5.2 Service Options

The demand and revenue forecasts have been undertaken on the basis of the following options:

***Option 1:***

Hourly Stratford to Oxford Service

Hourly Leamington Spa to Worcester Service via Stratford

***Option 2:***

Hourly Stratford to Oxford Service

Hourly Stratford to Worcester Service

It should be noted that, based on the high level timetabling analysis (Appendix D to this Report) there is considered to be a reasonable possibility that these service options could be delivered without additional service changes elsewhere on the rail network. During the first phase of the Study a simple Stratford to Honeybourne shuttle service was considered. This service option was rejected as, whilst it would be relatively straight forward to deliver, it would require through passengers to change trains at both ends of the their journey and, therefore, would be unlikely to generate significant traffic.

The detailed results of the demand forecast are shown for Option 1, although overall demand and economic appraisal outputs have been provided for both options.

### 5.3 The Market for the Proposed Services

The demand forecast is predicated on an understanding of the potential market for the proposed services and the transport movements (origins and destinations) for which the new services represent an improvement in transport provision. A scoping exercise has been undertaken whereby rail travel times between key stations are compared with and without the additional services.

This exercise was based on a simple rail travel time comparison. However, the demand forecast and user benefits calculation is based on *generalised* journey times and costs. The generalised journey time or cost of a rail trip include allowance for fares, waiting time, the inconvenience of interchange and the frequency of trains.

Most directly, the new services allow for travel between Stratford and the stations on Cotswold Line between (and including) Oxford and Worcester. At present, the rail service between Stratford and these stations is very poor and, in some cases, could be considered to be practically unfeasible given the requirement to travel via Birmingham (for example, for travel between Worcester and Stratford) or via Leamington (for travel between Oxford and Stratford). Option 1 also provides a direct service between Leamington and Worcester as well as strengthening the service pattern between Leamington and Stratford.

Furthermore, by providing an additional hourly service on the Cotswold Line between Evesham and Worcester, and Honeybourne and Oxford, the frequency of service between

many of these stations is effectively doubled. This frequency improvement is expected to lead to higher demand.

The benefits of the new services extend significantly beyond Stratford and the terminating stations of Oxford and Worcester. Firstly, extending the existing Leamington Spa to Stratford service to Worcester provides a much quicker and direct route between Leamington, Warwick (and other Stations of the Leamington to Stratford line) to Worcester.

Secondly, the service provides the opportunity for indirect (single change) trips between Kidderminster line stations (beyond Worcester) to Stratford, Warwick and Leamington. Beyond Kidderminster, it is likely that services via Birmingham will continue to provide a quicker route between the stations on this line and Leamington or Stratford.

By providing a service between Stratford and Oxford, the new line also creates new opportunities for rail travel between Stratford (and to a less extent stations to the north of Stratford on the Shakespeare line) and London by creating a new rail route to London (Paddington) via the Cotswold Line, involving a single change at Oxford<sup>4</sup>. It is considered that this would represent a moderate improvement in services given that the additional 14 trains per day between Stratford and Oxford on the new line would be in addition to the current service pattern which includes approximately 6 direct services from Stratford to London (on a typical weekday) and around 7 indirect services via Leamington Spa.

In addition to the above rail journey opportunities, it is important that the study takes into account the significant potential of the tourism market for Stratford. Stratford attracts around 3.5 million visitors every year. At present, survey data suggests that rail accounts for just 6% of mode share for tourists visiting Stratford. This is well below comparative rail shares for other towns attracting large numbers of tourists.

Finally, a new rail market is created as a result of the opening of a new station at Long Marston. Significant housing and leisure related development together with existing employment uses, is expected at Long Marston, and the new station would be ideally located to attract a high level of demand, particularly given the possible demographic profile of a new housing development and potential influx of working people.

The rail passenger market described above has been divided into a number of market 'segments', each representing a particular movement or set of movements or a particular rail market.

**Table 5.1: Market Segments 1 to 6**

Segment	Movement (includes trips in each direction)
Segment 1	Oxford to Stratford
Segment 2	Worcester to Stratford
Segment 3	Cotswold Line Stations to Stratford
Segment 4 (Option 1 only)	Cotswold Line Stations to Leamington & Warwick
Segment 5	Trips between Cotswold Line Stations
Segment 6	Shakespeare/Leamington Spa line to Kidderminster Line
Segment 7	London –Stratford
Segment 8	Additional Tourism Mode Shift Effects
Segment 9	New Long Marston Station Demand
Segment 10 (Option 1 only)	Leamington and intermediate stations to Stratford

<sup>4</sup> The current rail route from Stratford to London is via the Chiltern Line to Marylebone.



## 5.4 Existing Passenger Flows

The base year demand and revenue data for Cotswold line and London Midlands line has been obtained from the respective operators. These data indicated that the existing Cotswold Line caters for over 400,000 (one way) trips per annum with the vast majority of trips beginning or ending in Worcester or Oxford<sup>5</sup>.

The lack of feasible or desirable links between Stratford and Oxford/Worcester is reflected in the demand data. Despite their geographic proximity, there are just 3,300 journeys between Stratford and Worcester.

Table 5.2 shows the main movements to and from Stratford. These strongly reflect the existing services from Stratford, although the patterns of travel are also reflective of commuter routes and Stratford's position as a satellite town for greater Birmingham. In total, there are approaching 700,000 'entries and exits' to Stratford.

**Table 5.2: 2011/12 Journeys to and from Stratford**

Station/ Station Group	Journeys to and from Stratford
Birmingham BR	115,881
London BR	64,862
W Mids All Zones I421	48,891
Birmingham Moor Street	41,137
Other Centro station	69,016
Shirley	25,940
Earlswood	24,473
Leamington Spa	23,855
Marylebone London	19,212
Birmingham Snow Hill	18,707
Henley-In-Arden	14,994
Yardley Wood	13,178
Oxford	10,335
Wilmcote	9,916
<b>Top 15 Station Total</b>	<b>500,396</b>
<b>Grand Total</b>	<b>699,431</b>

## 5.5 Demand Forecasting Approach

A typical approach to demand forecasting for rail service improvements is to compare before (do minimum) and after (do something) generalised journey times, and apply an elasticity or uplift in demand based on empirical evidence on the response of demand to generalised journey time. Often this is undertaken by applying automated rail planning software – i.e. MOIRA.

The above approach is appropriate where the proposed project offers an incremental improvement in the rail service being offered, either because the new service is faster or because it offers a more frequent or direct service. This is the case for a number of rail

<sup>5</sup> The data is confidential; the flows by segment were made available to Arup but cannot be shown in this report.



movements identified above and a simple (manually calculated) application of this approach has been applied for many of the market segments.

However, as noted above, the new line provides a direct link between stations for which rail journeys are relatively tortuous. For example, the proposed service between Stratford and Worcester would have a journey time of approximately 44 minutes and would leave every hour. At the present time, a journey between Stratford and Worcester takes 2 hours 10 minutes and on average involves 2 changes. Hence, existing demand between Worcester and Stratford is just 3715 trips per annum.

In such circumstances, an alternative approach to demand forecasting is required given that existing rail demand will be 'artificially low'. Therefore the approach to forecasting demand differs according to whether the Stratford to Honeybourne connection is considered to provide an *incremental* improvement to existing services or effectively a *new* rail travel connection.

There are a number of ways in which demand can be estimated for entirely new train lines and stations. Given the lack of readily available data, this study uses a simple gravity model formulation to predict the number of new movements to and from Stratford. This is complemented with a 'trip rate model' approach for the new station at Long Marston. A separate approach has also been taken for tourism demand.

The approach to forecasting is set out in Table 5.3. Forecasts of trips in market segments 1 to 4 were developed on the basis that the scheme would provide a totally new service. This set of forecasts was derived from information on existing rail flows between Worcester, Evesham and Oxford. The flows between these places were considered to provide a good indicator of the flows that could be expected between Worcester and Stratford and Oxford and Stratford (suitably weighted to take account of distances and the relative attractiveness of each location, measured by population and employment).

For segments 5, 6, 7 and 10 it is considered that there is currently a feasible rail connection and that the service represents an incremental improvement. For example, the new services result in a frequency enhancement on the Cotswold line. In these circumstances it is considered that the level of existing demand should be the starting point for the analysis. An uplift to existing demand is made by applying an *elasticity* of demand to the change in generalised journey times (based on frequency, journey time and interchange penalties). The response of demand to journey time (the elasticity) is sourced from the Passenger Demand Forecasting Handbook (PDFH).

Segment 8 relates to tourism demand and has been calculated based on the assumption of an increase in mode share.

Segment 9 relates to the new station at Long Marston. A trip rate approach has been taken based on the number of trips that would be expected to and from a station per head of population within the catchment area for the station.

**Table 5.3: Forecasting Approach Market Segments 1 to 10**

Segment	Movement (includes trips in each direction)	Approach
Segment 1	Oxford to Stratford	<i>Effectively a new service</i> – simple gravity model approach
Segment 2	Worcester to Stratford	<i>Effectively a new service</i> – simple gravity model approach
Segment 3	Cotswold line stations to Stratford	<i>Effectively a new service</i> – simple gravity model approach
Segment 4	Cotswold line stations to Leamington & Warwick	<i>Effectively a new service</i> – simple gravity model approach
Segment 5	Trips between Cotswold Line Stations	<i>Incremental service improvement</i> – demand response to change in generalised costs of travel
Segment 6	Shakespeare/Leamington Spa line to Kidderminster Line	<i>Incremental service improvement</i> – demand response to change in generalised costs of travel
Segment 7	London –Stratford	<i>Incremental service improvement</i> – demand response to change in generalised costs of travel
Segment 8	Additional Tourism Mode Shift Effects	<i>Increased rail mode share for selected tourism movements</i>
Segment 9	New Long Marston Station Demand	<i>New station demand</i> – trip rate approach
Segment 10	Leamington and intermediate stations to Stratford	<i>Incremental service improvement</i> – demand response to change in generalised costs of travel

### 5.5.1 Gross and Net Additional Demand

The approach to the demand forecast is to target the ‘net additional’ demand. This is the measure which is of primary interest for the purposes of the economic appraisal. The vast majority of users of the new service represent additional demand for rail and therefore additional revenue. This is because the improvement in services results in people making more journeys by rail, switching mode from bus or car to rail, or making altogether new journeys. However, there will be instances (for example for travel between Stratford and London, or between stations on the Cotswold line) where passengers will transfer from alternative services to the new services because they represent an enhancement of frequency or provide an alternative route through the rail network.

Such abstracted demand has been excluded for the demand and revenue forecast and as such only in increase in overall demand has been modelled. A high level analysis suggests that abstracted demand is likely to be a relatively small proportion of total demand.

### 5.5.2 Demand for ‘New’ Rail Services

#### *Approach*

A simple gravity model approach has been used to predict passenger flows where the proposed services create effectively new opportunities to travel to and from Stratford. A gravity model assumes that the number of trips ‘produced’ by or ‘attracted’ to an area is roughly proportional to the size of the settlement in question. In simple terms, a doubling of population will lead to a doubling of trip productions and a doubling of employment will lead to a doubling of trip attractions. In the gravity model approach, the level of demand is adjusted by the distance between settlements as measured by the generalised travel time (in this case by rail). Therefore, as the effective distance between two areas increases, the demand for travel decreases.

The gravity model has been applied to a wider area than the town of Stratford itself and includes the population and employment within the north-eastern part of Stratford District which includes Stratford itself as well as surrounding villages and towns including a number with stations on the Shakespeare Line. This is to ensure that the passenger forecasts accounts for the wider catchment area for Stratford-upon-Avon station as well as the catchment areas of other stations within the District for which the new services will provide improved access to Worcester, Oxford and the Cotswold Line. Areas to the far east (for example, Southam), the west and south of the district have been excluded either because they are in relatively close proximity to Worcester or Oxford and the Cotswolds (with the potential that rail travel via Stratford is a poor substitute for other forms of transport) or because they are in close proximity to stations on other parts of the rail network.

Existing demand between Oxford and Worcester and for all flows between these stations and the intermediate stations on the Cotswold line is already known. This demand (which is also for a roughly hourly service) is therefore used as the basis for the gravity model. The demand for travel between Evesham and Worcester was used as a basis for estimating demand between Evesham and Stratford. This demand was adjusted based on the *relative* size of Worcester and Stratford (as measured by population and employment). A power of 1.5 was applied to the distance weighting to reflect the view that distance (in this case measured by rail travel time) is likely to have a disproportionate effect on travel demand.

$$\text{Demand (Eve to Strat)} = \text{Demand (Eve to Worc)} * \frac{\text{POP Strat}}{\text{POP Worc}} * \frac{1}{(\text{Distance to Stratford} | \text{Distance to Worcester})^{1.5}}$$

Whilst this method is imprecise, it provided a reasonable high level approach to estimating demand. Encouragingly, whether Worcester or Oxford was used as the comparator station, the results were similar suggesting that the approach is reasonable.

## Results

Flows to and from Oxford and flows to and from Worcester have been used separately as comparators for demand to and from Stratford. The results are similar which suggests that the method is sound. The average of the two estimates has been used in the demand forecast.

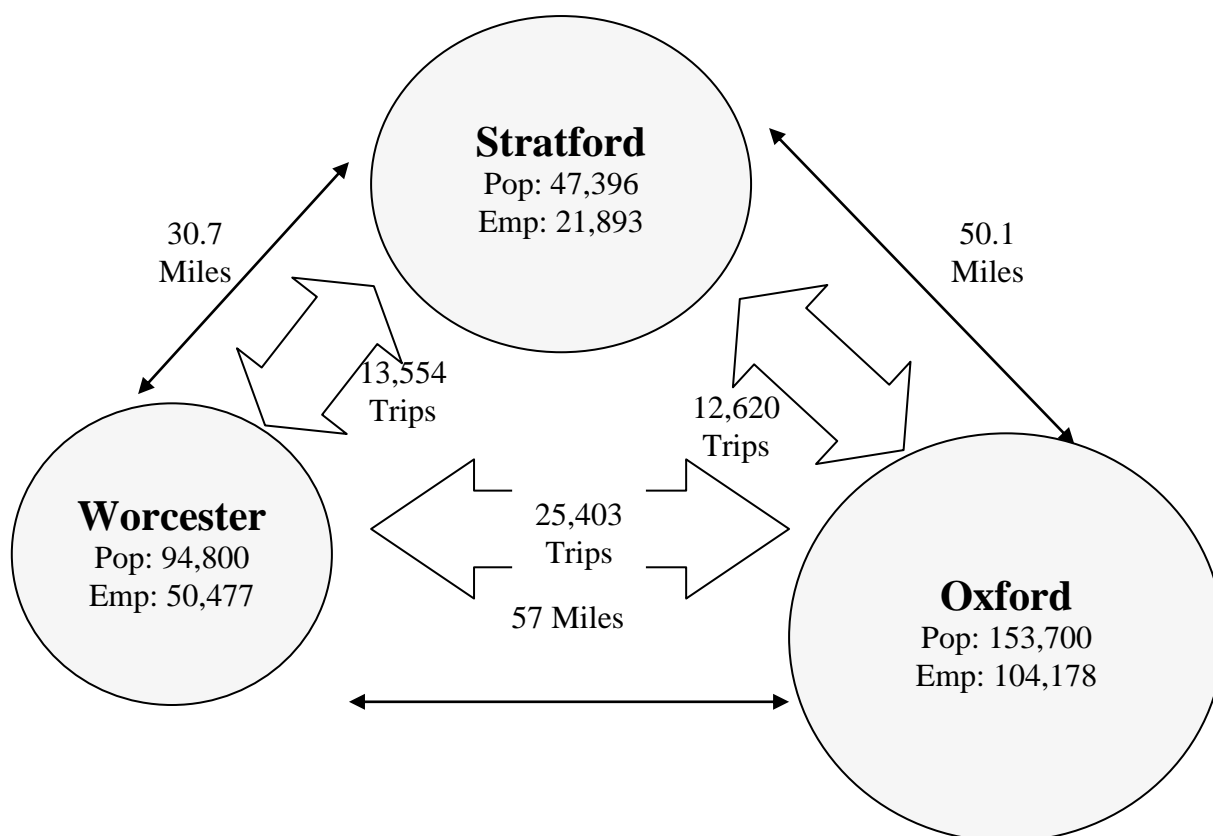
Total additional demand from these three market segments is nearly 100,000 trips per annum. Of these around 26,000 relate to movements between Stratford and Oxford or Worcester and the remainder are trips between other Cotswold Line Stations and Stratford, notably Evesham (given its size and proximity to Stratford).

**Table 5.4: Total Demand for New Services (Segments 1, 2 and 3)**

	Leamington & Warwick	Stratford
Pershore	800	3,429
Evesham	2,093	22,837
Honeybourne	650	9,177
Moreton-in-Marsh	NA	17,993
Kingham	NA	5,503
Shipton	NA	428
Ascott-under-Wychwood	NA	235
Charlbury	NA	3,764
Finstock	NA	61
Combe	NA	34
Hanborough	NA	1,040
Oxford	NA	12,620
Worcester	4,537	13,554
<b>Total</b>	<b>8,080</b>	<b>90,674</b>

N.A. = not available

There are forecast to be around 13,000 trips between Oxford and Stratford and 13,500 trips are forecast between Stratford and Worcester. This compares to 25,403 trips between Oxford and Worcester at present on the Cotswold line.

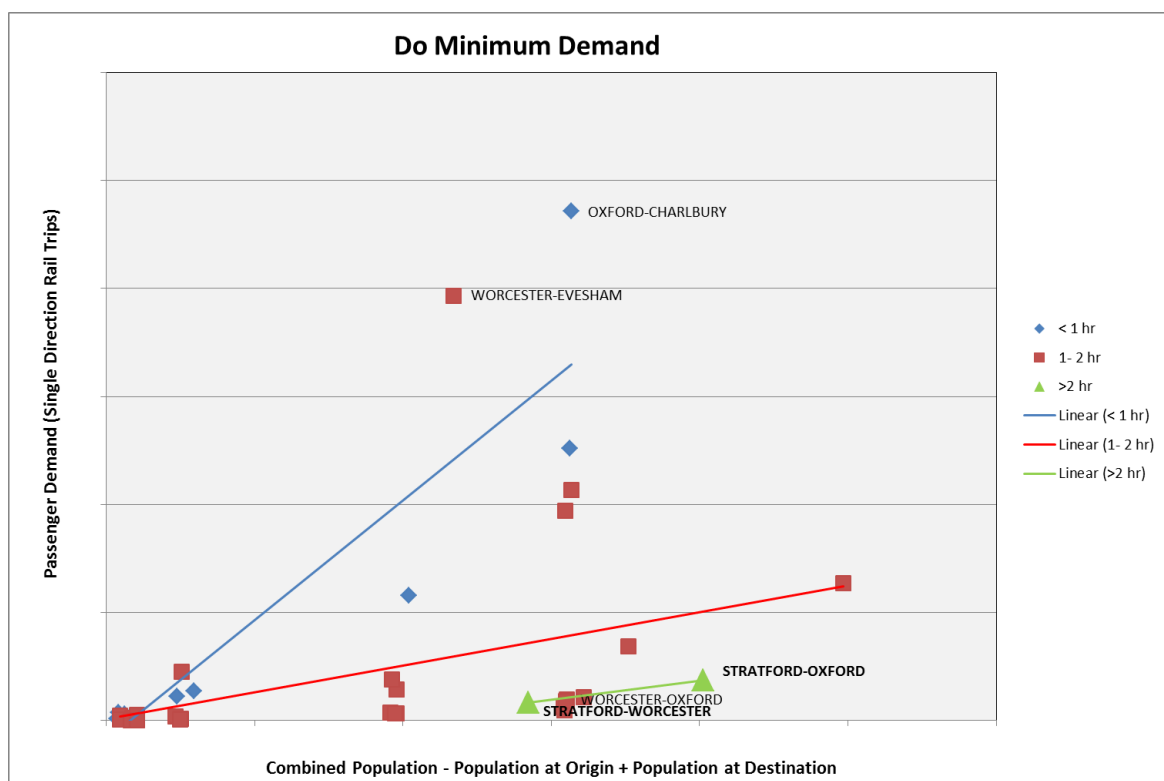


### Figure 5.1: Total with-scheme demand (including abstracted demand)

The principle behind this approach to demand forecasting and the credibility of the results are further illustrated in the figures provided below. The graphs show a plot of passenger demand between selected pairs of stations (Cotswold Line and other relevant stations for which data is readily available) and combined size of the settlements served by the stations in question.

The graph is intended to illustrate the relationship between the demand for rail travel between two stations and the size of settlements which they serve. It is also intended to illustrate the influence of the distance or travel time (in this case measured in terms of the generalised travel time – including wait time, service frequency and interchange penalties) on this relationship. To achieve this, the sample of stations has been grouped into three categories according to the generalised cost of travel (less than 1 hour, between 1 and 2 hours and 2 or more hours).

Figure 5.2 – Illustration of the Gravity Model Principle – Do Minimum<sup>6</sup>



The upward sloping trend lines demonstrate that there is a positive correlation between population and demand. For movements with a generalised journey time of less than an hour, demand is approximately proportional to population. Demand is, in general, significantly lower at higher levels of generalised journey time which supports the view that proximity is important as well as size. Notably, whilst Stratford and Oxford have the highest combined populations of all the stations in the sample, (as a consequence of a generalised journey time of over 2 hours) demand is very small.

Clearly the relationship is only approximate. Some station pairs are 'above or below the line' suggesting higher or lower demand than this model would predict. There are also some movements which could be seen as outliers and for which the relationship between population and demand is weak (for example, Worcester and Evesham).

There are many reasons why this is the case. Firstly, population is only a rough indicator of the relative pull of a settlement. A wide range of other factors – the level of employment, the

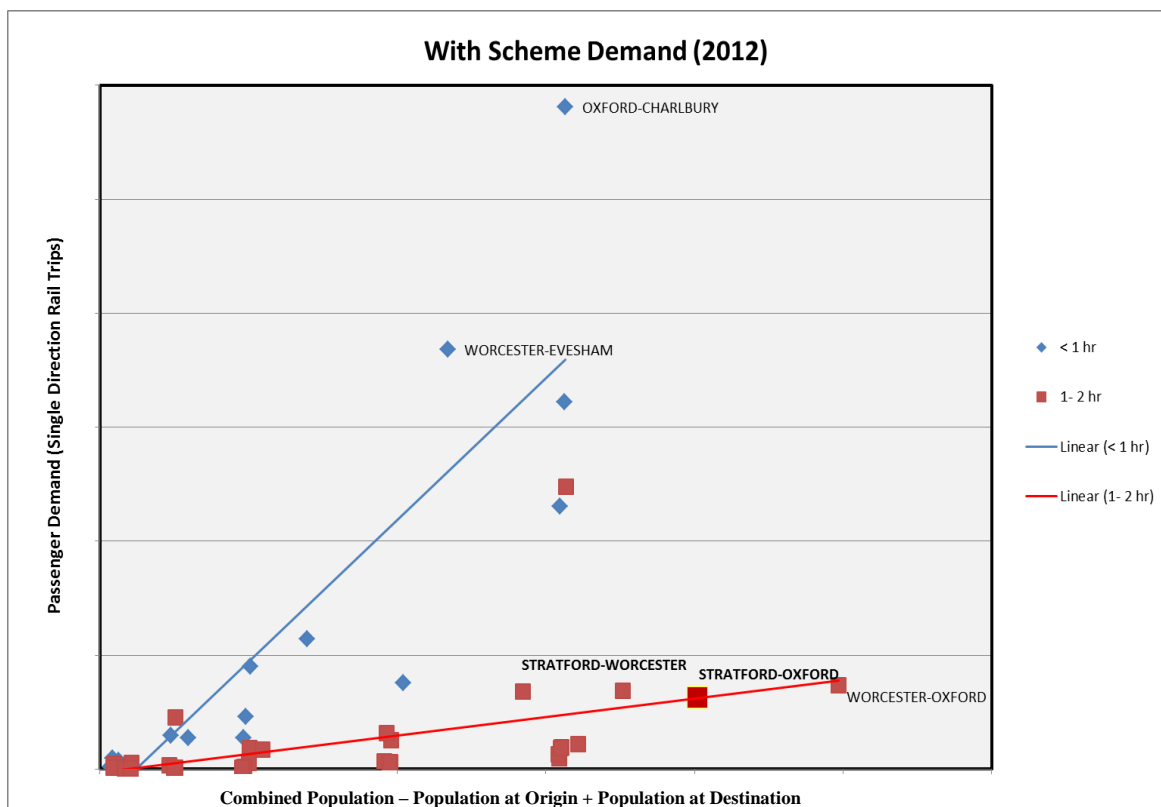
<sup>6</sup> Due to confidentiality, the values on each axis in Figures 5.2 and 5.3 cannot be shown.

profile of the population, the presence of other attractors, historical factors – will be important alongside population. Secondly, the proximity between stations (whether measured by distance, travel time or travel cost) will differ within the broad categories used in Figure 5.2 which will explain some of the variation in demand. Thirdly, the relationship between proximity or population and demand is complex and unlikely to be linear. For example, it could be that demand decreases rapidly with distance. This might explain high demand between Worcester and Evesham or Oxford and Charlbury which are relatively short commuter routes.

Despite these factors, it is considered that the data supports the approach taken to the demand forecast at this stage of the scheme's development.

The illustration has been recreated for the 'do something' situation with the scheme in place. In Figure 5.3 the level of demand is taken from the forecasts undertaken to inform this appraisal. Notably, demand for movements between Stratford and Worcester / Oxford (which are now within the 1 to 2 hour generalised journey time category) are broadly in line with the suggested relationship between demand and population.

**Figure 5.3 – Illustration of the Gravity Model Principle – With Scheme**



### 5.5.3 Demand for Incremental Service Improvements

#### Approach

As noted, demand for incremental service enhancements can be estimated by applying an empirically based elasticity (or demand response) to an improvement in travel time. For rail travel, passengers are interested not only in the travel time between stations but also the frequency of services (which impacts on convenience and wait times) and whether or not they have to change trains (interchanges act to deter passengers). Therefore, the generalised journey time has been calculated manually under the current 'do minimum' situation and for a 'do something' situation in which the new services operate.

Generalised journey time (GJT) is defined as follows:

$$GJT = J + S + I$$

Where:

- J is the total station-to-station journey time (including interchange time);
- S is the service interval penalty (which reflects the number of services per hour);
- I is the sum of the interchange penalties for any interchanges required.

The method used to estimate the change in demand resulting from the new services is therefore as follows:

$$I_j = \left( \frac{GJT_{new}}{GJT_{base}} \right)^g$$

where:

- $I_j$  is the index for the change in volume due to journey time related factors
- $g$  is the generalised journey time elasticity
- $GJT_{base}$  and  $GJT_{new}$  are the 'do minimum' and 'do something' generalised journey times.

An example application of this approach is shown in Table 5.5 for demand between Stratford and London.

**Table 5.5: Incremental Service Improvement (Segment 7)**

OD Pair	DM GJT (hr:min)	DS GJT (hr:min)	DM Demand	DS Demand	% Change in Demand
London to Stratford	03:48	03:37	34,090	35,638	5%
Stratford to London	03:52	03:32	30,772	33,373	8%

## Results

Demand was estimated using the mathematical framework above for Segments 5, 6, 7 and 10. The results, in terms of % increase in demand, are shown in Table 5.6. There is a significant net increase in demand on the Cotswold line of around 16% because of improved frequencies (a doubling of frequency) between Moreton-in-Marsh and Oxford (and intermediate stations) and between Honeybourne and Worcester.

The increase in demand for Segments 6 is modest with a 1% increase in demand. Stratford-London traffic is forecast to increase by 9%. This estimate is based on the assumption that the reinstatement of the Stratford-Honeybourne connection would enable a one train per hour Stratford-Oxford service offering an alternative route from Stratford to London Paddington albeit with a change at Oxford. First Great Western has indicated that it may be possible to provide for this service to run through to Paddington on selected train paths during the inter-peak. Given the uncertainty concerning this possibility from the assumed scheme opening year (2019), the analysis assumes that passengers travelling from Stratford to Paddington would be required to change at Oxford but allows for 10% additional opening year demand in a sensitivity test.

**Table 5.6: Market Segments 5 -7 and 10 Forecast change in demand<sup>7</sup>**

Segment	Movement (includes trips in each direction)	% Change
Segment 5	Trips between Cotswold Line Stations	25%
Segment 6	Shakespeare/Leamington Spa line to Kidderminster Line	1%
Segment 7	London –Stratford	9%
Segment 10	Leamington and intermediate stations to Stratford	18%

As noted, the above flows are defined as the predicted *net* additional demand that results from the new service. For each of the above segments there may be additional users of the new services which are *abstracted* from existing services and therefore do not add to the total revenue resulting from the new service.

### 5.5.4 Tourism traffic (Segment 8)

#### *Approach*

Tourism is an important element of the Stratford economy with around 3.5 million visitors to the town each year. Therefore, although it is important to avoid double counting, it is considered that the above approaches will underestimate demand from tourists and visitors. It is considered that the tourism market for rail is not being fully exploited with the existing rail links. Survey data suggests that rail accounts for just 6% of visits to Stratford. This compares to an average for the UK of 13%. Therefore, it would be reasonable to assume that there is scope to increase this share by around 100%.

Based on the rail movements which the new services provide for, this uplift in demand has been applied to all of the tourist movements from Oxfordshire and Worcestershire to Stratford. Beyond this it is considered that the additional services will have a minor impact on rail market share – given that leisure travellers are less influenced by service frequency than commuters for example.

#### *Results*

The results of this method are given in Table 5.7 below. It should be noted that these are very rough estimates given that the visitor survey is based on a small sample. However, it is considered that this is a reasonable amount of additional demand given that the forecasts for Segments 1 to 7 do not specifically exclude tourism demand.

**Table 5.7: Estimated Tourism trip to Stratford**

Origin of Visitors	Total Visits to Stratford	Increase in Rail Market Share	Potential New Rail Trips to Stratford (Two Way Trips)	Potential New Rail Trips to Stratford (Single Direction Trips)
Oxfordshire	147,000	7%	10,290	20,580
Worcestershire	294,000	7%	20,580	41,160
<b>Total</b>	<b>441,000</b>	<b>-</b>	<b>30,870</b>	<b>61,740</b>

<sup>7</sup> Absolute numbers are confidential



### 5.5.5 Long Marston Station (Segment 9)

It is important that demand for a station at Long Marston takes into account the proposed housing development and other uses at Long Marston Depot. A trip rate method was used to estimate the demand for the new station. Typical trip rates for rail trips with an origin in the new station catchment area were used for calculation are shown in Table 5.8 below. It is considered that Long Marston best fits with the 'village area surrounding an urban centre'.

Trip rates are a highly indicative approach and further analysis would be required before the final decision on the station is taken.

**Table 5.8: Typical Trip Rates for New Stations**

	Daily Trips per thousand population		% from beyond 2km
	0-800m	800m-2km	
Prime commuter belt on outskirts of urban centre	100	10	1
<b>Village areas surrounding urban centre</b>	<b>25</b>	<b>6</b>	<b>20</b>
Built-up areas close to urban centre	12	3	10
Free-standing town	10	3	40

#### Results

The populations in the 0-800 metre, 800 metre to 2 kilometre and 2 to 3 kilometre catchment areas were calculated and adjusted to take account of a new development of 500 residential units at Long Marston Depot.

Considering Long Marston as a village area surrounding urban centre the resulting annualised numbers of trips are shown in Table 5.9. A total of 30,062 single direction passengers are estimated to travel from the new station at Long Marston annually.

**Table 5.9: Estimated Trip generated at Long Marston Station**

	0-800m	800m-2km	% from beyond 2km	TOTAL
Adjusted Long Marston Population	1,605	66	NA	-
Trip rate (Daily Trips per thousand pop)	25	6	20	-
Long Marston Annual Two-Way Rail Trips	14,642	240	149	15,031
<b>Long Marston Annual One Way Rail Trips</b>	<b>29,284</b>	<b>480</b>	<b>298</b>	<b>30,062</b>

## 5.6 Total Demand and Revenue

Based on current passenger numbers, the total change in demand resulting from the scheme is forecast to be 256,282 trips per annum. This represents the net additional demand resulting from the scheme and excludes abstracted demand.

#### Option 1

The results show that with the new line there will be an increase of 46% in demand (256,282 additional trips) and an increase in revenue of £1.73 million. The breakdown of segmental demand and revenue for the year 2012 is shown in the Table 5.10.

**Table 5.10: Estimated 2012 Demand with the Stratford-upon-Avon to Honeybourne reinstatement (Option 1)**

Segment	Name	Net Additional Demand	Additional Revenue (£)
Segment 1	Oxford to Stratford	5,176	26,517
Segment 2	Worcester to Stratford	10,254	85,002
Segment 3	Cotswold line stations to Stratford	64,472	322,017
Segment 4	Cotswold line stations to Leamington & Warwick	4,363	38,250
Segment 5	Trips between Cotswold Line Stations	69,586	427,815
Segment 6	Shakespeare/Leamington Spa line to Kidderminster Line	1,131	9,045
Segment 7	London –Stratford	3,062	156,161
Segment 8	Additional Tourism Mode Shift Effects	61,740	493,920
Segment 9	New Long Marston Station Demand	30,062	150,310
Segment 10	Leamington and intermediate stations to Stratford	6,437	21,563
TOTAL		256,282	1,730,599

**Option 2**

Under Option 2, with services from Worcester terminating at Stratford rather than Leamington Spa the increase in demand is slightly lower at 245,198 with an overall increase in revenue of £1.67m.

**Table 5.11: Estimated 2012 Demand with the Stratford-upon-Avon to Honeybourne reinstatement (Option 2)**

Segment	Name	Net Additional Demand	Additional Revenue (£)
Segment 1	Oxford to Stratford	5,176	26,517
Segment 2	Worcester to Stratford	10,254	85,002
Segment 3	Cotswold line stations to Stratford	64,472	322,017
Segment 4	Cotswold line stations to Leamington & Warwick	0	
Segment 5	Trips between Cotswold Line Stations	69,586	427,815
Segment 6	Shakespeare/Leamington Spa line to Kidderminster Line	846	6,769
Segment 7	London –Stratford	3,062	156,161
Segment 8	Additional Tourism Mode Shift Effects	61,740	493,920
Segment 9	New Long Marston Station Demand	30,062	150,310
Segment 10	Leamington and intermediate stations to Stratford	0	0
TOTAL		245,198	1,668,510

### 5.6.1 Demand growth

Three alternative demand growth scenarios have been applied: low, medium and high. This reflects uncertainty over levels of demand growth and illustrates the importance of growth in determining the strength of the economic case for the scheme. For the low growth scenario, demand growth of 2.2% per annum has been assumed in line with the Network Rail RUS. The medium growth forecast uses a growth rate of 4% which reflects growth in passenger demand in the UK over recent years. A high growth forecast of 6% has been used to illustrate the impact of very high demand growth and the uncertainty in the demand forecast presented above, although it is acknowledged that this is unlikely to be achieved consistently over a 20 year period. In line with DfT guidance, demand growth is capped at 2032.

**Table 5.12 – Opening and Future Year Demand Growth (Option 1)**

	2012	2019
Net Additional Demand – 2.2% growth	256,282	298,452
Net Additional Demand – 4% growth	256,282	337,250
Net Additional Demand – 6% growth	256,282	385,354

### 5.6.2 Total Demand

The demand forecast is based on the net additional demand that would be expected as a result of the new services. It is considered that this underestimates the total number of users of the new service because it excludes abstracted demand – users who have transferred from an existing rail service to the new services. Whilst transferring passengers benefit from the new service (through a lower generalised journey time), this does not result in an overall increase in revenue.

This is of particular relevance for movements between Cotswold line stations for which the new services provide a frequency enhancement. For example, for passengers travelling between Evesham and Worcester the new service will increase frequency from around one train per hour to around 2 trains per hour. On this basis, it would be reasonable to assume that around half of passengers making this trip will use the new Leamington to Worcester train. However, the net increase in demand (based on the generalised journey time approach set out in Section 5.5.3) is only expected to amount to around 16% of current demand.

Abstracted demand has been estimated in order to move from net to total demand for the new service. Where relevant this has been achieved by estimating the approximate percentage of demand that would be expected to transfer to the new services. In other cases (for example Segments 1-4), the total do minimum demand is considered to be abstracted. For segments 3, 8 and 9 demand is close to zero at present and therefore all demand is considered to be additional.

**Table 5.13 - Total Demand (if Scheme opened in 2012) – Option 1**

Segment	Name	Net Additional Demand	Abstracted / Transferring Demand	Total Demand
Segment 1	Oxford to Stratford	5,176	7,444	12,620
Segment 2	Worcester to Stratford	10,254	3,300	13,554
Segment 3	Cotswold line stations to Stratford	64,472	28	64,500
Segment 4	Cotswold line stations to Leamington & Warwick	4,363	3,717	8,080
Segment 5	Trips between Cotswold Line Stations	69,586	155,820	225,406
Segment 6	Shakespeare/Leamington Spa line to Kidderminster Line	1,131	5,061	6,192
Segment 7	London –Stratford	3,062	16,981	20,043
Segment 8	Additional Tourism Mode Shift Effects	61,740	-	61,740
Segment 9	New Long Marston Station Demand	30,062	-	30,062
Segment 10	Leamington and intermediate stations to Stratford	6,437	14,422	20,858
<b>TOTAL</b>		<b>256,282</b>	<b>206,773</b>	<b>463,056</b>

**Table 5.14 - Total Demand (if Scheme opened in 2012) – Option 2**

Segment	Name	Net Additional Demand	Abstracted / Transferring Demand	Total Demand
Segment 1	Oxford to Stratford	5,176	7,444	12,620
Segment 2	Worcester to Stratford	10,254	3,300	13,554
Segment 3	Cotswold line stations to Stratford	64,472	28	64,500
Segment 4	Cotswold line stations to Leamington & Warwick	-	-	-
Segment 5	Trips between Cotswold Line Stations	69,586	155,820	225,406
Segment 6	Shakespeare/Leamington Spa line to Kidderminster Line	846	1,241	2,087
Segment 7	London –Stratford	3,062	16,981	20,043
Segment 8	Additional Tourism Mode Shift Effects	61,740	-	61,740
Segment 9	New Long Marston Station Demand	30,062	-	30,062
Segment 10	Leamington and intermediate stations to Stratford	0	0	0
<b>TOTAL</b>		<b>245,198</b>	<b>184,814</b>	<b>430,012</b>

### 5.6.3 Demand Versus Capacity

An indicative assessment has been undertaken of the level of crowding that might be expected on the new services in the first year of operation. This is intended to inform the decision as to whether single or two car trains might be appropriate for the services. Crowding is difficult to model accurately because of the need to establish (from a high level annual demand forecast) the number of passengers on a train at any one time. To overcome this, a simple total demand

versus total capacity calculation has been made to establish a *maximum average load factor* over a period of time during the day.

The load factor is defined as the level of demand as a percentage of capacity. The load factor is an *average* because it is measured as the average for a number of trains during a period of time. Finally, it is a maximum because it effectively assumes that all passengers using a particular service are on the train at the same time. The latter assumption can be reasonable for a commuter train arriving at a dominant town or city centre station, but is less accurate in a situation where there are a high proportion of journeys between intermediate stations.

The key assumptions in the analysis are as follows:

- 6 out of 7 passengers travel on a weekday;
- 36% of rail journeys take place in the morning peak, 36% in the afternoon peak and the remainder are off peak (based DfT's rail trends data);
- Peak time is assumed to be a 2 hour period (two trains in each direction).
- The total (seated and standing) capacity of a Class 153 train is approximately 75 passengers.
- The total capacity of a 2-car Class 158 train is approximately 150 passengers.

**Table 5.15 – Crowding Analysis (2019) – Option 1 (Medium Growth of 4%)**

		Peak Time Demand (including allowance for abstracted demand)	Number of Services Per Time Period	Total Capacity (2-Car Train)	Total Capacity (1-Car Train)	Maximum Average Load Factor (2-Car Train)	Maximum Average Load Factor (1-Car Train)
2019 Total Demand	AM Peak	721	8	1200	60%	600	120%
	Off-Peak	561	40	6000	9%	3,000	19%
	PM Peak	721	8	1200	60%	600	120%

**Table 5.16 – Crowding Analysis (2032) – Option 1 (Medium Growth of 4%)**

		Peak Time Demand (including allowance for abstracted demand)	Number of Services Per Time Period	Total Capacity (2-Car Train)	Total Capacity (1-Car Train)	Maximum Average Load Factor	Maximum Average Load Factor
2032 Total Demand	AM Peak	1,201	8	1200	100%	600	200%
	Off-Peak	934	40	6000	16%	3,000	31%
	PM Peak	1,201	8	1200	100%	600	200%

An initial analysis suggests that the forecast demand (at 4% growth per annum) would require a 2-car train unit, possibly at commencement of operations in 2019.

## 5.7 Refining the Demand Forecast

Recent research has demonstrated the difficulties and risks associated with predicting demand for new lines and stations. As noted, this is the first attempt to forecast demand for services on a re-instated line between Stratford and Honeybourne. If it is considered that there is merit in further developing the scheme, it would be appropriate to consider a range of refinements to the demand forecast. Such refinements are likely to be required by DfT for a funding decision is required. The DfT and other stakeholders would need to be consulted on the approach to demand forecasting.

The following approaches or refinements might be considered:

- Further refinement of the gravity model approach to improve the empirical basis for the forecast (a large sample) and inclusion of additional variables beyond population and employment;
- Collection and application of vehicle and bus passenger count and/or survey data;
- The application of a demand model based on a comparison of generalised journey times and costs across different modes of travel;
- Application of the MOIRA model to estimate demand impacts of ‘incremental’ service improvements resulting from the scheme;
- Use of a bespoke demand growth forecast based on specific population, employment and GDP forecasts;
- Refinement of the trip rate approach used to forecast demand for the new station at Long Marston.

## 6 Economic Appraisal

### 6.1 Costs

#### 6.1.1 Capital Costs and Optimism Bias

Capital costs (2012 prices) for the preferred option are shown in Table 6.1. Further details are given in Appendix E. The total capital cost of the project is £76.0m.

The costing of the southern end of the scheme (to the south of Milcote) is based on unit rates taken from recent tender offers for similar works. For this section, whilst some further design work is required, an optimism bias uplift of 15% (the recommended level of Optimism Bias for schemes at level 4/5) is considered to be reasonable. The scope of works for the northern half of the scheme is considered to be at a stage of design equivalent to GRIP level 3. On that basis, in line with DfT Guidance, an optimism bias uplift of 40% has been applied to the PV Cost estimate. In the Base Case Cost estimate the two sectors are assumed to be equal in length so that 50% of the capital costs are subject to 40% Optimism Bias and 50% are subject to 15%.

At the next stage of design, further work, based on detailed site surveys and detailed design (with early contractor involvement for constructability assessment) will be required.

On this basis, the Present Value Costs for the economic appraisal are £43.3 (2002 prices and values).

**Table 6.1 - Capital Costs**

Cost Item	£m (2012 prices unless indicated)
Design	£4.0
Preliminaries	£3.2
Signalling	£5.0
Electrification and plant	£2.0
Track	£17.9
Telecoms	£3.0
Civils	£33.5
Operational Property	£4.5
Other Costs	£2.9
<b>TOTAL</b>	<b>£76.0</b>
<b>TOTAL Including Optimism Bias</b>	<b>£96.9</b>
<b>Present Value Costs in 2002 Prices and Values</b>	<b>£43.3m</b>

Further details of these cost estimates are given in Appendix E

## 6.2 Train Operating Costs

### 6.2.1 Approach

Operating costs have been estimated on a 'per unit' 'per mile' basis. The cost estimates are informed by data provided by operators, but are not based on 'quoted' costs to operate the services. Given that the services would, in practice, commence under a future franchise period, it is only possible to provide indicative costs at this stage.

The following cost items have been included:

- fuel costs;
- staff costs;
- vehicle leasing costs;
- train maintenance costs; and
- variable track access charge.

No allowance has been made for operator profit (although for the purposes of an economic appraisal this would be 'cancelled out' in that profit represents a cost to the taxpayer but a benefit to private operators). It should also be noted that ongoing track maintenance costs and resultant fixed track access charges are not included in this assessment.

For the purposes of the economic appraisal, costs have been forecast over a 60 year evaluation period with costs discounted to 2002 and stated in 2002 prices in accordance with WebTAG guidance<sup>8</sup>.

Operating costs have been modelled based on two options:

**Option 1** – An hourly Leamington Spa to Worcester service and an hourly Stratford-upon-Avon to Oxford service

**Option 2** – An hourly Stratford-upon-Avon to Worcester service and an hourly Stratford-upon-Avon to Oxford service

### 6.2.2 Single versus Two Car Trains

The operating costs have been calculated based on all new services being operated by using a typical 2-car diesel vehicle. Cost savings could be made on lease costs, fuel and variable track access charges if 1-car trains were used, although the demand analysis finds that 2-car trains are likely to be required.

### 6.2.3 Key Assumptions

A number of high level assumptions have been made which are shown in Table 6.2. Given the stage of development of the project, many of the assumptions made are subject to a high degree of uncertainty. A key uncertainty relates to the number of train units required to operate the services. High level analysis concludes that it may be possible to operate each service with 2 units though further analysis using specialist software, such as Rail Sys, would be required to increase confidence in this finding.

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<sup>8</sup> WebTAG Unit 3.5 - <http://www.dft.gov.uk/webtag/documents/expert/unit3.5.php>



**Table 6.2 – Key Assumptions**

<b>Opening Year</b>	New services to commence 2019/20
<b>Rolling Stock Leasing Costs</b>	Total lease costs of approximately £110,000 per vehicle per calendar year.
<b>Fuel Cost</b>	Per train vehicle fuel consumption of around 0.7 litres per mile. Diesel costs of £0.67 per litre in line with UK train operator average. Diesel costs are assumed to increase in line with Department for Energy and Climate Change forecasts.
<b>Staff Costs</b>	Costs for drivers (£45k & overhead) and conductors (£27k & overhead) on a Full Time Equivalent basis have been included, on the basis of 2 train crews per unit for a 14 hour operation, with allowance made to reflect leave (assuming a 240 day working year).
<b>Running Maintenance</b>	Train running maintenance costs at 60 pence per vehicle mile.
<b>Variable Track Access Charge</b>	Calculated based on £0.06 per vehicle mile (Network Rail CP4 Price List)

### ***Rolling Stock***

In practice, the type of train unit used would depend on the operator providing the service and the profile of their fleet. If a more modern diesel unit were to be used, it would be expected that capital lease costs would be higher than quoted above. As recently highlighted by ATOC<sup>9</sup>, there is likely to be a ‘surplus of shorter distance DMUs by the end of CP5’. This would suggest that suitable rolling stock could be secured at competitive rates, at least for the initial years of operation.

Operators have suggested that there is capacity within existing fleets to operate one or both new services without a net increase in the fleet requirement for the franchise. Whilst this contributes to the deliverability of the project, it should be noted that the services would be introduced under a future franchise and as such the *opportunity cost* of the units would need to be reflected<sup>10</sup>.

### ***Unit Requirement***

Based on a desktop calculation, it is considered that it may be possible to operate the Stratford-upon-Avon to Oxford service and the Stratford-upon-Avon to Worcester Shrub Hill with just 2 train units for each service. It has also been calculated the Leamington Spa to Worcester Shrub Hill service would require 3 train units.

It has been assumed that each unit would require 2 staff shifts (consisting of a driver and a conductor) to operate 14 hourly services per day. Additional staff requirements to factor in leave have been taken into account.

However, a more detailed operational and timetabling analysis would be required to determine this and, depending on the exact running times and train pathing, it may not be possible to operate a service between Oxford and Stratford with just 2 units.

<sup>9</sup> Rolling Stock Requirements 2014-2019 (Association of Train Operating Companies)

<sup>10</sup> Under a future franchise, there would be flexibility over the fleet leased by the operator and therefore no requirement to continue leasing ‘surplus’ units.

## Services and Mileage

Train and vehicle miles have been calculated based on simple service assumptions and track length between start and end stations. It has been assumed that 14 hourly services are operated each day (Monday to Saturday; 7 on Sundays). This is a conservative assumption given that it may be more economical to run a reduced 'off-peak' service.

For each option the following train service assumptions were made:

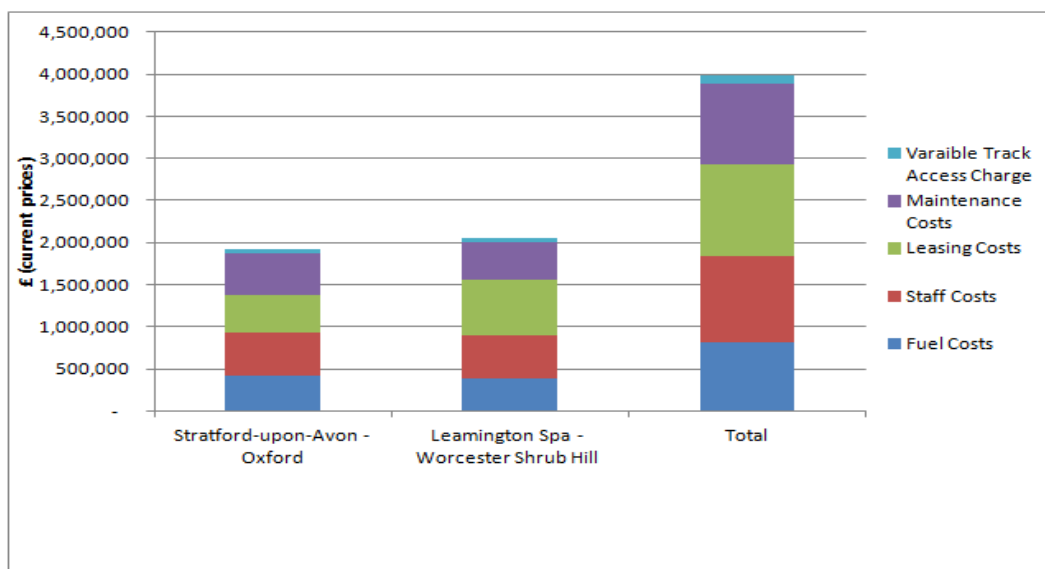
**Table 6.3 – Service Assumptions**

	Leamington Spa – Worcester Shrub Hill	Stratford-upon-Avon – Worcester Shrub Hill	Stratford-upon-Avon – Oxford
Services per day	14	14	14
Train units required to operate hourly service	3	2	2
Staff shifts per day required operate hourly service	2	2	2
Round Trip Mileage	80	49	88
Total Daily Train Mileage	1,123	692	1,235
<b>Total Annual Train Mileage</b>	<b>379,506</b>	<b>233,761</b>	<b>417,362</b>

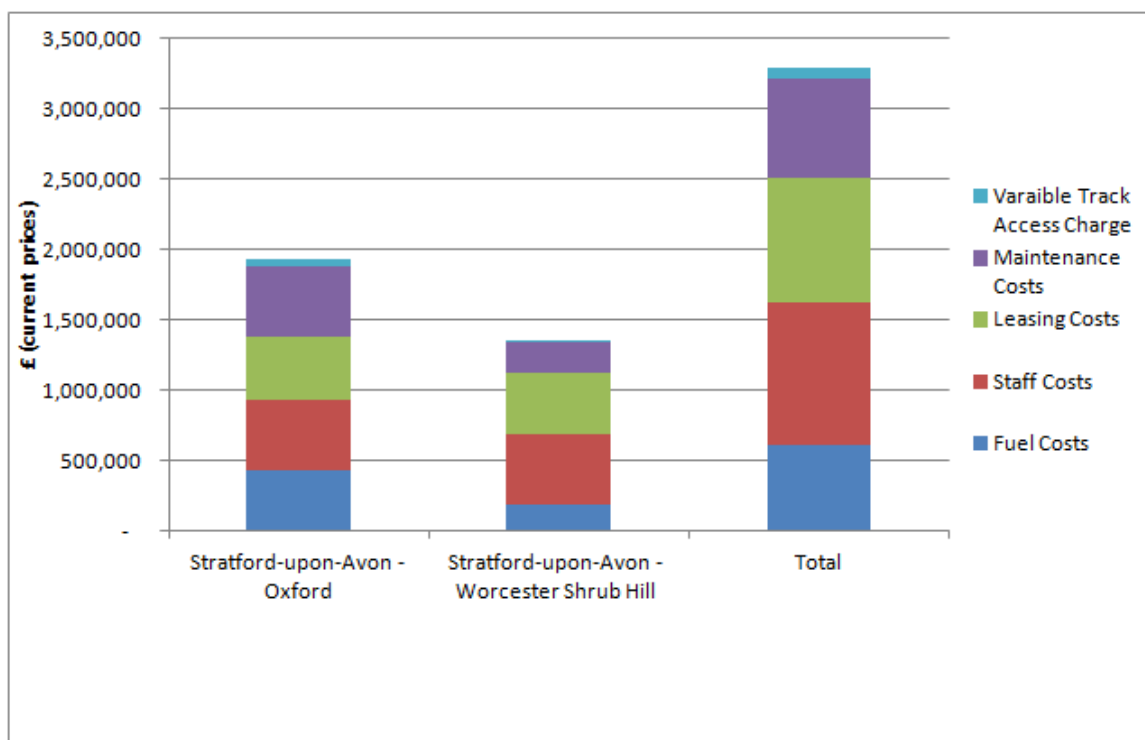
## 6.2.4 Operating cost: estimates

Figure 6.1 and 6.2 show a breakdown of the operating costs in 2018/19. The distinction is that, as Option 2 includes the Stratford to Worcester service which is less distance than the Leamington Spa to Worcester service, the operating costs for this service is £0.7m lower.

**Figure 6.1 – Breakdown of Operating Costs of Option 1**



*For the Option 1 the total operating cost for year 1 of operation is £4.2m. This is made up of a cost of £2.0m for the Stratford-upon-Avon to Oxford service and £2.1m for the Leamington Spa to Worcester Shrub Hill.*

**Figure 6.2 – Breakdown of Operating Costs of Option 2**

*For the Option 2 the total operating cost for year 1 of operation is £3.5m. This is made up of a cost of £2.0m for the Stratford-upon-Avon to Oxford service and £1.4m for the Stratford-upon-Avon to Worcester Shrub Hill.*

### 6.3 Track and Signal Maintenance

Additional costs need to be included to account for the maintenance of the infrastructure itself. Such costs are additional to the allowance made for track wear caused by an incremental change in train miles. The current version of the economic appraisal excludes such costs. However, it is considered that these costs are likely to be small relative to train maintenance costs.

### 6.4 Subsidy Requirement

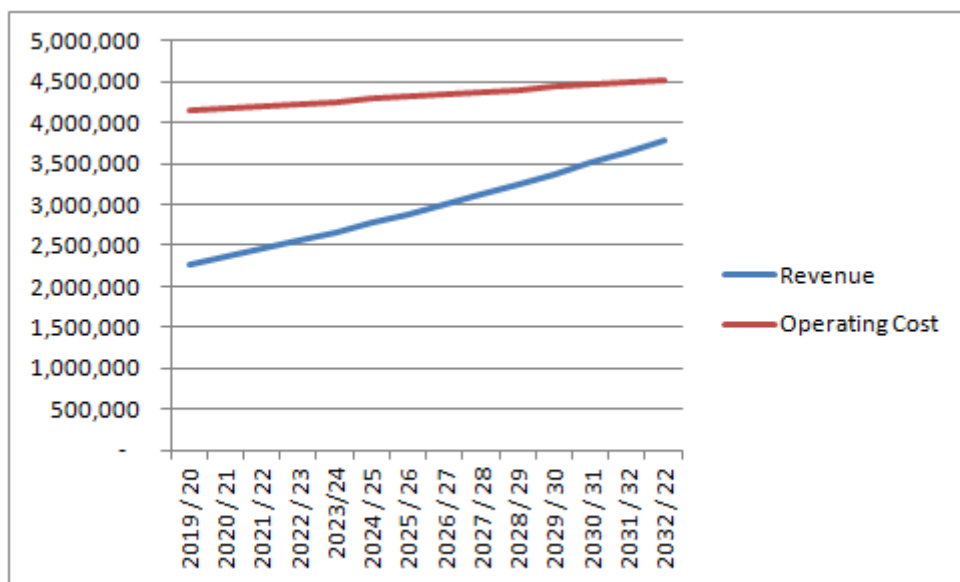
Table 6.4 shows for both Option 1 and Option 2 that the operating costs would exceed the revenue from the services. However, the subsidy requirement for Option 2 would be lower than Option 1 by around £600,000 per annum which is largely due to lower operating costs.

**Table 6.4 – Service Subsidy Requirement (2012 prices)**

	Option 1			Option 2		
	2019 / 20	2025 / 26	2032 / 22	2019 / 20	2025 / 26	2032 / 22
Revenue	£2,277,350	£2,881,575	£3,791,956	£2,195,645	£2,778,192	£3,655,911
Operating Cost	£4,152,025	£4,315,710	£4,527,274	£3,453,302	£3,606,734	£3,807,490
Subsidy Requirement	£-1,874,675	£-1,434,135	£-735,318	£-1,257,657	£-828,542	£-151,579

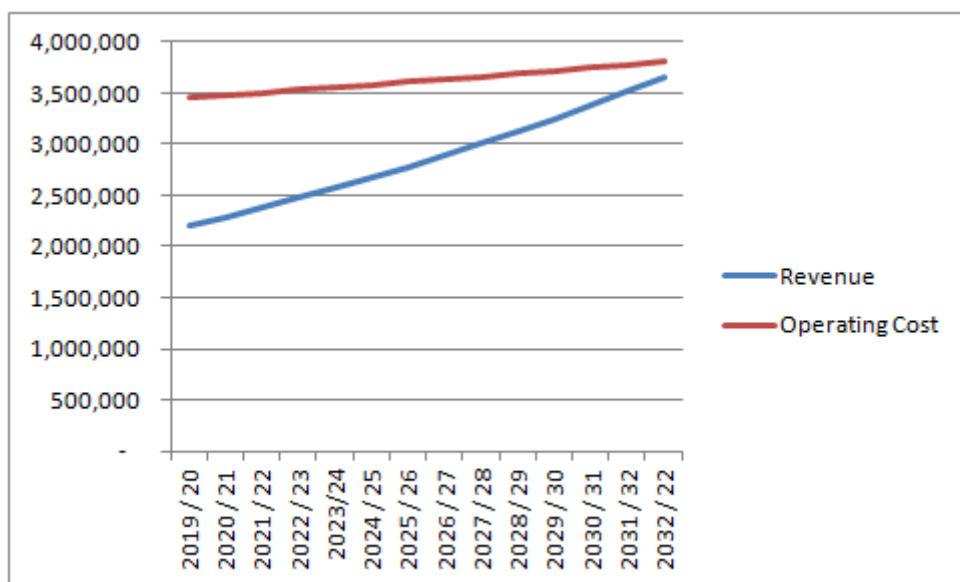
Figure 6.3 shows that the subsidy requirement of Option 1 falls as revenues rise faster than operating costs due to passenger growth. The subsidy requirement, shown in Table 6.4, falls from £1.9m in 2019/20, the first year of operation, to £735k in 2032/33, the last year for which passenger growth is assumed.

**Figure 6.3 – Option 1 Revenue and Operating Cost Profile**



For Option 2, the subsidy requirement, shown in Table 6.4, falls from £1.3m in 2019/20, the first year of operation, to £152k in 2032/33. Thus, as stated above, the subsidy requirement for Option 2 is lower than Option 1.

**Figure 6.4 – Option 2 Revenue and Operating Cost Profile**



## 6.5 Costs for Economic Appraisal

Table 6.5 and 6.6 show the total operating costs for a 60 year evaluation period where the costs shown are discounted to 2002 and in 2002 prices, including allowance for optimism bias at 1.6% per annum. ***The total discounted operating cost for the 60 year appraisal period is £70.0m for Option 1 and £59.7m for Option 2.***

**Table 6.5 – Operating Costs of Option 1 over 60 Year Evaluation Period (Discounted to 2002, 2002 market prices)**

	<b>Stratford-upon-Avon - Oxford</b>	<b>Leamington Spa – Worcester Shrub Hill</b>	<b>Total Cost</b>
Operating Costs	34,095,174	35,946,875	70,042,049

**Table 6.6 – Operating Costs of Option 2 over 60 Year Evaluation Period (Discounted to 2002, 2002 market prices)**

	<b>Stratford-upon-Avon - Oxford</b>	<b>Stratford-upon- Avon – Worcester Shrub Hill</b>	<b>Total Cost</b>
Operating Costs	34,095,174	25,616,202	59,711,376

## 6.6 Economic Appraisal

### 6.6.1 Introduction

We have undertaken a WebTAG-compliant 60 year economic appraisal of the proposed scheme. Capital and operating costs have been compared to forecast revenue, passenger benefits, non-user benefits and environmental benefits.

Economic Benefits are calculated as the change relative to the base scenario. The appraisal has been undertaken over a 60 year period from 2019, with demand capped at 2032. All values are in 2002 market prices. Benefits and costs accruing over the appraisal period are discounted to 2002 using the social discount rate outline in the Green Book: 3.5% for the first 30 years of the appraisal period and 3.0% thereafter.

Key assumptions are listed in Table 6.7.

**Table 6.7: key assumptions used in the economic appraisal**

Input parameter	Values & data sources
Price Base	2002 (DfT standard appraisal Price Base)
Discount rate	3.5% for first 30 years 3.0% for years 31 to 60.
Construction period	2017-2018 (years of construction costs)
Opening year	2019
Real terms fares growth	1% per annum from appraisal year (2011) to 2031. Capped from 2032 onwards.
Exogenous demand growth	Based on methodology in PDFHv5 Section B1 from 2011 to 2026; capped thereafter.
Values of Time (£/hour)	<i>Existing</i> Rail users (2002 Resource Costs): Working Time (business trips): £30.57 Non-Working Time (commuting trips): £4.17 Non-Working Time (Leisure trips): £3.68 <i>New</i> rail users (2002 Resource Costs): Working Time (business trips): £18.78 <sup>3</sup> Non-Working Time (commuting trips): £4.17 Non-Working Time (Leisure trips): £3.68 (The above values were growthed using factors in Webtag unit 3.5.6 Table 3a)
Accident benefits for existing & new users	Accident rates per <i>passenger</i> km for rail, car, bus and cycle modes derived from 'Passenger casualty rates by mode 2000-2009, Department for Transport statistics RAS53001' The number of passenger km by each mode derived from standard mode switching proportions by km from Webtag 3.13.2. Average Values of prevention per casualty by severity From Webtag Unit 3.4.1 Annex A, Table 1 (updated April 2011).
External costs of car use Decongestion benefits Non-user accident benefits Local Air Quality GHG emissions Infrastructure benefits	Webtag 3.13.2 compliant assessment using standard congestion factors for Rural A roads and Urban A roads. Benefits calculated for three forecast years: 2015, 2026 & 2074 and interpolated for intervening years.

## Notes

1: Source: Network Rail Grip 3 Option Selection Report, June 2011

2: Weighted average of Working Values of Time (from Webtag unit 3.5.6 Table 1) by mode - weighted using National Average Diversion Factors (km switch to rail by mode) from the National Transport Model (Webtag unit 3.13.2 Table 1).

## 6.7 Revenue and User Benefits

Economic Benefits are calculated as the change relative to the base scenario. The appraisal has been undertaken over a 60 year period from 2019, with demand capped at 2032. All values are in 2002 market prices. Benefits and costs accruing over the appraisal period are discounted to 2002 using the social discount rate outline in the Green Book: 3.5% for the first 30 years of the appraisal period and 3.0% thereafter.

Total benefits to all users are shown in Table 6.8. Time savings (68%) and vehicle operating cost savings (19%) represent the most significant shares of benefits.

The estimated benefits to commuters, business trips and other journey purposes are shown in Table 6.9. The estimation method has followed DfT Webtag Guidance on Rail appraisal (Unit 3.13). Points to note are:

- i. Time savings are enjoyed both by existing rail travellers and those transferring from car. Time savings to existing rail travellers are estimated by comparison of rail journey times taking account of waiting time improvements arising from increased frequency. Time savings to new travellers take account of road distances and typical speeds by road;
- ii. Savings in car vehicle operating costs, highway decongestion and air quality and accidents arise only in connection with those trips transferring from road to rail. Webtag Unit 3.13 provides guidance on the estimation of these benefits.
- iii. The proposed scheme would be grade separated at all road crossings. DfT statistics (fatal and serious accidents per million passenger km) show that rail travel is safer than travel by road. Accident benefits have not taken account of the rail accident rates and are thus a slight over estimate.
- iv. Net revenue has been estimated based on typical average fares and forecast passenger station to station movements.

**Table 6.8: Present Value: Economic benefits: all users (2002 Values and Market Prices, £M) – Option 1 (Medium Growth)**

	£ million	% total
User Time Savings	59.2	89%
Vehicle operating costs	4.1	6%
Benefits of reduced car use (decongestion, emissions etc)	2.3	4%
Accident benefits	0.6	1%
<b>Total</b>	<b>66.2</b>	<b>100%</b>

User benefits approximate to £3 per passenger (total demand) in 2002 prices.

**Table 6.9 - Economic Benefits and revenue Summary: (2002 Values and Market Prices, £M):**

	£ million
User Time Savings	11.78
Vehicle operating costs	1.58
Highway decongestion and AQ*	0.84
Accident benefits	0.21
<b>a. Subtotal Commuting</b>	<b>14.41</b>
Business	
User Time Savings	27.11
Vehicle operating costs	0.25
Highway decongestion benefits	0.16
Accident benefits	0.04
<b>b. Subtotal Business</b>	<b>27.57</b>
Other	
User Time Savings	20.30
Vehicle operating costs	2.27
Highway decongestion benefits	1.31
Accident benefits	0.33
<b>c. Sub total Other</b>	<b>24.21</b>
<b>d. Present Value Benefits (a+b+c)</b>	<b>66.19</b>
<b>e. Revenue</b>	<b>48.65</b>

## 6.8 Economic Appraisal Summary

### 6.8.1 Base Case

The resultant benefit:cost ratios are shown for service option 1 in Table 6.10 and service option 2 in Table 6.11 .

#### *Service Option 1*

**Table 6.10 – WebTAG Appraisal Summary – Service Option 1 (2002 Values and Market Prices, £M):**

	Low Demand Growth	Medium Demand Growth	High Demand Growth
<b>d. Present Value Benefits (a+b+c)</b>	<b>48.94</b>	<b>66.19</b>	<b>92.82</b>
e. Revenue	35.83	48.65	68.29
f. Operating Costs	71.16	71.16	81.92
g. Capital Costs	56.40	56.40	56.40
<b>h. Present Value Costs (f+g-e)</b>	<b>91.73</b>	<b>78.91</b>	<b>70.03</b>
<b>i. Net Present Value (d-h)</b>	<b>-42.79</b>	<b>-12.74</b>	<b>22.80</b>
<b>j. Benefit Cost Ratio (d-h)</b>	<b>0.53</b>	<b>0.84</b>	<b>1.33</b>
<b>k. Net Operating Cost ( f-e)</b>	<b>35.33</b>	<b>22.51</b>	<b>13.63</b>



l. NPV (operating cost only) ( d-k)	<b>13.61</b>	<b>43.68</b>	<b>79.20</b>
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Notes: Service Option 1: (in each direction) hourly Leamington Spa to Worcester service and an hourly Stratford-upon-Avon to Oxford service. (two car trains from day one on both services). New station at Long Marston. In the case of high demand growth 3 car trains are introduced in 2027.

The results show the Net Present Value (NPV) in line i and the Benefit Cost Ratio (BCR) in line j. The NPV, in operating terms, with capital costs excluded, is shown in line l.

The appraisal of Option 1 shows that the NPV and BCR are highly sensitive to traffic growth, with the BCR ranging from 0.53: 1 (2.2% growth) to 1.33:1 (6% growth per annum). The results for medium growth (4%) give, in our view a “most likely” estimate with a small negative NPV -£12.7 million and a BCR of 0.84:1.

In the central (4% case), excluding capital costs, option 1 makes a financial shortfall (NPV revenue less operating costs is – £ 22.51 million) implying that an annual subsidy would be required. The scale of this shortfall is significantly less than the Present Value of Benefits (PVB) giving an overall positive NPV in operating terms alone.

Including capital costs, it can be concluded that the BCR (0.84:1) under the conditions of the central case is modest but it should be pointed out that this changes dramatically under conditions of higher traffic growth and, additionally, there are a number of other potential upside factors demonstrated in the results of the sensitivity tests and the discussion of wider economic benefits, set out below.

### *Service Option 2*

**Table 6.11 – WebTAG Appraisal Summary – Service Option 2 (2002 Values and Market Prices, £M):**

	<b>Low Demand Growth</b>	<b>Medium Demand Growth</b>	<b>High Demand Growth</b>
<b>d. Present Value Benefits (a+b+c)</b>	<b>42.58</b>	<b>57.44</b>	<b>80.38</b>
e. Revenue	34.55	46.91	65.84
f. Operating Costs	60.67	60.67	70.06
g. Capital Costs	56.40	56.40	56.40
<b>h. Present Value Costs (f+g-e)</b>	<b>82.52</b>	<b>70.16</b>	<b>60.62</b>
<b>i. Net Present Value (d-h)</b>	<b>-39.94</b>	<b>-12.72</b>	<b>19.76</b>
<b>j. Benefit Cost Ratio (d-h)</b>	<b>0.52</b>	<b>0.82</b>	<b>1.33</b>
k. Net Operating Cost ( f-e)	<b>26.12</b>	<b>13.76</b>	<b>4.22</b>
l. NPV (operating cost only) ( d-k)	<b>16.46</b>	<b>43.78</b>	<b>76.16</b>

Note: Service Option 2: (in each direction): hourly Stratford-upon-Avon to Worcester service and an hourly Stratford-upon-Avon to Oxford service. (two car trains from day one on both services). New station at Long Marston. In the case of high demand growth, 3 car trains are introduced in 2027.

Although both user benefits and revenue are lower for service Option 2 than for service Option 1, lower operating costs determine that the results of the economic appraisal are very similar to those for Option 1. It can be concluded that the opportunity to extend ex Worcester services to Leamington Spa is unlikely to have an important effect on the case for re-instating the line from Stratford to Honeybourne. However the effect on the BCR is neutral and both service options should remain under consideration.

## 6.8.2 Sensitivity Tests

It is accepted that, in addition to the rate of traffic growth, there is a significant degree of uncertainty attached to the values of some of the input variables which will influence the results of the economic appraisal. A number of sensitivity tests have been undertaken to investigate the effects on the NPV and BCR of changes in these variables

A range of sensitivity tests is required to highlight the potential implications if key variables were to change or if alternative assumptions are applied. In particular, it is considered that there is some caution built into the capital cost estimate and therefore it is sensible to consider how the economic case might change if the capital costs can be reduced. Furthermore, there are significant risks attached to forecasting demand for new rail lines and stations and given that there is scope to refine the demand forecast it is also appropriate to consider the implication of higher or lower demand and demand growth.

### Test 1: Reduction in construction costs

Uncertainty regarding the accuracy of the quantities and unit rates used to estimate construction costs is reflected in the optimism bias factors described in section 6.1.1. However, there is a possibility, depending on the outcome 2019 train timetable across a wider network, that it will be possible to provide 2 trains/hour on the core section Stratford-Honeybourne with a shorter length of twin track line than allowed for in the base cost estimate.

The construction cost of this “twin track length reduced by 3km” option is estimated at £61.7 million (2012 prices) compared to the base cost estimate of £76.0 million (further details are given in Appendix E).

The effects of this change on the NPV and BCR of service option 1 are shown in Table 6.12 and service option 2 in Table 6.13. The present values of benefits, revenue and operating costs are unchanged. The present value of construction costs falls from £56.4 million to £45.8 million. This change generates a small positive NPV (BCR just under 1.0) in the medium demand growth case and a higher, positive NPV of £33.4 million (BCR 1.56:1) under high demand growth.

**Table 6.12: Capital Cost Sensitivity Test - Service Option 1– reduced length of twin track (£61.7m Capital Costs)**

	Low Demand Growth	Medium Demand Growth	High Demand Growth
<b>d. Present Value Benefits (a+b+c)</b>	<b>48.9</b>	<b>66.2</b>	<b>92.8</b>
e. Revenue	35.8	48.7	68.3
f. Operating Costs	71.2	71.2	81.9
g. Capital Costs	45.8	45.8	45.8
<b>h. Present Value Costs (f+g-e)</b>	<b>81.2</b>	<b>68.4</b>	<b>59.5</b>
<b>i. Net Present Value (d-h)</b>	<b>-32.2</b>	<b>-2.2</b>	<b>33.4</b>
<b>j. Benefit Cost Ratio (d:h)</b>	<b>0.60</b>	<b>0.97</b>	<b>1.56</b>
k. Net Operating Cost ( f-e)	35.3	22.5	13.6
l. NPV (operating cost only) ( d-k)	13.6	43.7	79.2

**Table 6.13: Capital Cost Sensitivity Test - Service Option 2– reduced length of twin track (£61.7m Capital Costs)**

	<b>Low Demand Growth</b>	<b>Medium Demand Growth</b>	<b>High Demand Growth</b>
<b>d. Present Value Benefits (a+b+c)</b>	<b>42.6</b>	<b>57.4</b>	<b>80.4</b>
e. Revenue	34.5	46.9	65.8
f. Operating Costs	60.7	60.7	70.1
g. Capital Costs	45.8	45.8	45.8
<b>h. Present Value Costs (f+g-e)</b>	<b>72</b>	<b>59.6</b>	<b>50.1</b>
<b>i. Net Present Value (d-h)</b>	<b>-29.4</b>	<b>-2.2</b>	<b>50.3</b>
<b>j. Benefit Cost Ratio (d:h)</b>	<b>0.59</b>	<b>0.96</b>	<b>1.61</b>
k. Net Operating Cost ( f-e)	26.1	13.8	1.2
l. NPV (operating cost only) ( d-k)	16.5	43.7	76.2

## Test 2: Additional opening year demand

Whilst the base demand forecasts are considered to provide realistic estimates, as noted in previous discussion they do not take account of all passenger movements that could benefit from the reinstated line. These could include:

- 1 In particular, by interchanging at Stratford, it is possible that there could be additional demand to/from stations between Stratford and Birmingham Moor Street to/from stations to Worcester or Oxford; and/or
- 2 If through running of services to the north of Stratford or beyond Oxford to London Paddington (with no associated withdrawal of other services) is possible, this too might generate some additional demand.

To take account of this potential upside impact, a 10% increase<sup>11</sup> in demand has been allowed for in the scheme opening year. The results of this exercise are shown in Table 6.13. Operating and construction costs are unchanged. Benefits and revenue increase by 10%. The resultant BCRs increase from just over 0.8:1 in the base to just under 1.0:1.

<sup>11</sup> 10% is considered to be a sufficient increase to take account of those elements of demand which may have been excluded; it is believed that all the main elements are captured in the demand forecast.

**Table 6.14: Sensitivity Test 2; Opening Year Demand +10% (Including Optimism Bias) (4% traffic growth)**

	Opening Year Demand - +10%	
	Option 1 (2-Car Trains)	Option 2 (2-Car Trains)
<b>d. Present Value Benefits (a+b+c)</b>	<b>72.8</b>	<b>63.2</b>
e. Revenue	53.5	51.6
f. Operating Costs	71.2	60.7
g. Capital Costs	56.4	56.4
<b>h. Present Value Costs (f+g-e)</b>	<b>74</b>	<b>65.5</b>
<b>i. Net Present Value (d-h)</b>	<b>-1.2</b>	<b>-2.3</b>
<b>j. Benefit Cost Ratio (d:h)</b>	<b>0.98</b>	<b>0.97</b>
k. Net Operating Cost ( f-e)	17.64	9.07
l. NPV (operating cost only) ( d-k)	55.16	54.11

### Test 3: Combined Test 1and Test 2: Reduced capital costs and additional opening year demand

The factors driving tests 1 and 2 are totally independent. It is therefore legitimate to combine these two effects into Test 3. Two variants of this test, with medium and high demand growth are shown. The results of Test 3A (medium growth) are shown in Table 6.15. In the case of both service options, the benefit cost ratios are 1.15:1

**Table 6.15: Sensitivity Test 3A: reduced capital cost (3km less twin track) and with additional 10% demand in opening year (with medium demand growth)**

	Medium Demand Growth (4%) with additional +10% demand and £61.7m Capital Costs	
	Service Option 1 (2-Car Trains)	Service Option 2 (2-Car Trains)
<b>d. Present Value Benefits (a+b+c)</b>	<b>72.8</b>	<b>63.2</b>
e. Revenue	53.5	51.6
f. Operating Costs	71.2	60.7
g. Capital Costs	45.8	45.8
<b>h. Present Value Costs (f+g-e)</b>	<b>63.5</b>	<b>54.9</b>
<b>i. Net Present Value (d-h)</b>	<b>9.3</b>	<b>8.3</b>
<b>j. Benefit Cost Ratio (d:h)</b>	<b>1.15</b>	<b>1.15</b>
k. Net Operating Cost ( f-e)	17.6	9.1
l. NPV (operating cost only) ( d-k)	55.2	54.1

This combination of factors is repeated in sensitivity test 3B with results as shown in Table 6.16. Benefit:Cost ratios increase to the range 1.94 - 2.03:1

**Table 6.16: Sensitivity Test 3B: reduced capital cost (3km less twin track) and with additional 10% demand in opening year (with high demand growth)**

	High Demand Growth (6%) with additional +10% demand and £61.7m Capital Costs	
	Service Option 1 (2-Car Trains)	Service Option 2 (2-Car Trains)
<b>d. Present Value Benefits (a+b+c)</b>	<b>102.1</b>	<b>88.4</b>
e. Revenue	75.1	72.4
f. Operating Costs	81.9	70.1
g. Capital Costs	45.8	45.8
<b>h. Present Value Costs (f+g-e)</b>	<b>52.6</b>	<b>43.5</b>
<b>i. Net Present Value (d-h)</b>	<b>49.5</b>	<b>44.9</b>
<b>j. Benefit Cost Ratio (d:h)</b>	<b>1.94</b>	<b>2.03</b>
k. Net Operating Cost ( f-e)	6.8	2.4
l. NPV (operating cost only) ( d-k)	95.3	90.8

## 6.9 Economic Appraisal: Non quantified economic benefits

### 6.9.1 Freight

The scheme could generate benefits associated with the movement of freight traffic in the following circumstances:

- Demand for rail freight movement continues to grow in line with the most recent forecasts<sup>12</sup>;
- Alternative freight routes reach capacity;
- Rail freight operators choose to use available daytime freight paths on the Stratford to Honeybourne section when these alternative routes reach day time capacity rather than day time capacity on other routes or spare night time capacity on the Heyford route.

As part of the Stakeholder Consultation, Motor Rail Logistics provided a response in relation to their Long Marston Depot. They stated that their business has benefitted from the increased capacity of the Cotswold line and that there would be a positive benefit to them of a passing service. They commented that it would give potential for the industrial part of the site to make much greater use of its rail connections to enhance the role of the site as a road rail interface for the region, particularly for the transshipment of perishable goods and produce which currently travel by road in to and out of the Vale of Evesham (see Appendix F9 for full comments).

Owing to gauge restrictions elsewhere, the Stratford to Honeybourne route could accommodate freight trains up to gauge W6A. The main traffic type which this would accommodate is automotive (car) trains. Reference to the Working timetable<sup>13</sup> indicated that daytime paths are reserved for 3 automotive trains per day in each direction on the Heyford section.

<sup>12</sup> Rail Freight demand forecasts to 2030. MDS Transmodal October 2011.

<sup>13</sup> Working Timetable Freight and departmental services: Section CY11: Heyford to Landor street Junction: 14 May to 8 December 2012

It is possible that the Heyford (Banbury) route could reach daytime freight capacity at about the time of scheme opening in 2019. Benefits were estimated using DfT modal shift values on the basis that three automotive trains would transfer to the Stratford to Honeybourne route releasing capacity for three additional container trains on the Heyford route. These additional container trains were assumed to carry containers moving between the Port of Southampton and the inland container terminal at Trafford Park in Manchester – a movement which, in the absence of the Stratford to Honeybourne reinstatement, would be made by road using some of the most congested motorways in the national network.

Whilst the Heyford route would soon again reach daytime freight capacity, these environmental benefits of the transfer from road to rail were estimated on the basis that three additional container train loads could be moved over the rail network throughout the appraisal period as a consequence of the Stratford to Honeybourne Reinstatement.

This analysis generated a sizeable (greater than £80 million) Net Present Value of freight traffic related environmental benefits. However it is highly sensitive to operator disinterest in night time freight paths, the release of freight capacity on other routes (such as WCML post Oxford to Cambridge reinstatement and HS2) and the value attributed to modal transfer and relief of congestion on the most highly congested motorways. DfT Guidance<sup>14</sup> states that “DfT does not at present endorse the use of freight user benefits for transport appraisal other than those delivered through operating cost savings (and those operating cost savings should include the wage costs of freight train drivers, guards and other staff)”. This aspect could be worked through as part of further work.

## Honeybourne Airfield

The Terms of Reference requested a comment on the potential that the Honeybourne Airfield site may offer for development as an inter-modal freight terminal.

The DfT Strategic Rail Freight Interchange Policy Guidance (2011) suggests the following as important requirements for such a facility:

- Large land area (up to 60ha)
- Capable of handling at least 4 freight trains per day
- Alongside main freight trunk routes (ideally the Strategic Freight Network)
- Capability to handle 775m freight trains
- Gauge capability of at least W8
- Close to motorway and trunk road network

The High Level Output Statement (June 2011) indicates that location on the electrified rail network can also be beneficial. Against these criteria, The Honeybourne Airfield site does not score well. Major limitations are that it is not on the Strategic Freight Network, the line does not offer at least W8 gauge and is not close to a motorway or trunk road. For these reasons, we regard this site as having low potential for development as an intermodal freight terminal.

### 6.9.2 Possible Reopening of the Line South of Honeybourne to Cheltenham

The original Stratford to Honeybourne Line was closed to passenger traffic in 1969 and all traffic in 1976. Before closure it was the main line for express services from Birmingham to

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<sup>14</sup> TAG Unit 3.13.1 draft May 2012.

Cheltenham, Gloucester, Bristol, West Country, the South-West, Cardiff, Swansea and South Wales. After closure, the track was lifted and most buildings demolished.

Gloucestershire and Warwickshire Steam Railways (GWR) purchased the track bed and formation of the railway from just south of Cheltenham Race Course station to just north of Broadway Station. GWR currently operate 12 miles of track between Cheltenham Race Course and Laverton (with stations re-established at Cheltenham Race Course, Gotherington, Winchcombe and Toddington) and are rebuilding Broadway station. It is hoped to extend the line by a further two miles and operate services to Broadway within the next three years.

Due to changes in land use on the section to the south of GWR ownership, there are constraints to reaching Cheltenham town. Cheltenham Borough Council owns the alignment into Cheltenham and Gloucestershire County Council's LTP3 states that the route should be protected from development. Gloucestershire University, in collaboration with Cheltenham Chamber of Commerce, produced a proposal for an ultra-light rail link between Cheltenham Spa and Cheltenham Racecourse.

These factors suggest that it would be difficult to re-establish the complete line from Stratford to Cheltenham on a commercial basis. GWR operate for tourism purposes and include some weekday services for much of the year. Operating a heritage railway alongside a commercial service would represent a challenge and a very unusual situation. Even if the line could be connected from Honeybourne through to Cheltenham Race Course using the GWR owned section, there would remain difficulties in re-establishing heavy rail into Cheltenham Spa on this alignment. If the potential ultra-light rail between Cheltenham Race Course and Cheltenham Spa were built this would allow a connection into the Town. However, for through passengers from Stratford this would involve an interchange which would add to the journey time and also prevent the through running of trains beyond Cheltenham to Wales and the South West.

### 6.9.3 Tourism

The benefits arising from tourist traffic are estimated on the basis that, with improved connectivity to the south and west, an increased share of the tourists visiting Stratford will travel by rail. Tourism has vital economic benefits for Stratford. A further potential benefit could arise if it could be demonstrated that there would be an increase in the total number of tourists as a result of the improved rail connectivity which the scheme would offer. However such socio economic benefits would be very subjective to estimate and, in line with DfT guidance, would not be eligible for inclusion in the formal benefit:cost ratio.

### 6.9.4 Network Resilience benefits

The reinstated line, by providing a new through route between Oxford and Birmingham and Worcester and Birmingham, would, in principle, improve the resilience in response to closures of adjacent sections of route.

Planned closures for routine and periodic maintenance are likely to offer the more significant opportunity for these benefits. There is likely to be a limited role in providing an alternative to the North East South West Route (Cheltenham Spa to Birmingham New Street) as the line via Stourbridge Junction provides a better alternative and trains from the South West must reverse in order to join the Cotswold Line to the east of Worcester. The Stratford to Honeybourne line could provide an alternative route for trains between Oxford and Birmingham via Banbury. The planned maintenance possessions programme for the period after 2019 could provide an indication of these benefits.

It should be noted that The Cotswold Line is not currently open for night time use west of Wolvercote Junction. Arrangements, with some additional cost, would have to be put in place in order to realise these resilience benefits.

The Stratford to Honeybourne scheme is not expected to improve network resilience in response to unplanned events. Train crew are unlikely to be equipped with sufficient quotas of route knowledge to enable services to transfer to the Stratford route, even if sufficient capacity were available. More likely, in these circumstances is the diversion of passengers (rather than trains) to the Stratford route.



## 7 Noise Assessment

### 7.1 Introduction

The potential impact of airborne noise generated by the operation of existing or proposed railways in the UK is usually predicted using the procedures in the statutory document Calculation of Railway Noise (1995) (CRN). The level of detail to which the scheme is assessed will depend on the planning /design stage of the project, but the same general methodology is used in all stages.

A detailed assessment of environmental impact may be required for this scheme at a later stage of the project. This would normally be undertaken at the end of GRIP 3 or during GRIP 4. A detailed assessment would involve comparing predicted noise levels from the railway to existing noise levels at sensitive receptors (such as dwellings), and examining where significant noise increases are predicted and hence indicate where the population close to a scheme may be affected by noise. Noise mitigation could be employed, if practicable, to reduce significant effects if they are identified.

At the GRIP 2 feasibility stage the detailed information required to undertake noise predictions at individual sensitive receptors is not available nor are existing ambient noise measurements against which to make an assessment of noise change. For this reason a strategic level assessment appropriate for GRIP 2 has been undertaken to estimate the extent and magnitude of noise impacts which could arise from the proposed scheme.

The assessment considers the change in noise emission level due to the scheme, and identifies the population exposed to this change in emission level.

A daytime façade noise level of 55dB  $L_{Aeq, 18hr}$  is commonly used as the threshold for assessment of noise at sensitive properties. For example, if a property is predicted to be exposed to noise levels below this threshold, no assessment of impact will be undertaken. Hence if the population likely to be exposed to noise levels above 55dB  $L_{Aeq, 18hr}$  (equivalent continuous sound level 0600 – 2400hrs) is estimated then this will provide an indication of the extent and magnitude of noise impacts that may result from the scheme. This has been achieved by identifying buildings that lie within a defined ‘buffer’ of the proposed route. The buffer width is equal to the estimated distance that the 55dB(A) noise contour will extend from the railway and has been predicted using the CRN methodology described above.

Additionally, at a later design stage of the project, an assessment of noise may be required by law under the requirements of The Noise Insulation (Railways and Other Guided Transport Systems) Regulations (NIRR). Unlike a noise impact assessment, which examines noise change, an NIRR assessment compares predicted noise levels to an absolute threshold value of 68dB  $L_{Aeq, 18hr}$ . Where predicted noise levels at the facades of dwellings close to a scheme equal or exceed this level, these dwellings may become eligible for additional noise insulation works such as secondary glazing. Hence the identification of properties which may be eligible for noise insulation has been carried out by predicting the distance that the 68dB(A) noise contour will extend from the railway and identifying properties within this buffer.

Because of the strategic nature of the assessment, a reasonably foreseeable worst case assessment has been undertaken and no incorporated mitigation, such as noise barriers, has been included in the assessment. In practice, many of the potential impacts identified by this study may be mitigated with measures such as noise barriers, earth bunds or rail dampers. Usually these would undergo detailed quantitative assessment and design during, and after, the detailed environmental impact assessment stage of the project. Here, only a qualitative assessment of the benefits of mitigation has been undertaken.

## 7.2 Input assumptions

### Options considered

A number of options for the proposed scheme have been described in the engineering report. The option which re-instates the railway within a cutting and covered tunnel through Stratford Old Town (grade separated option) has been assessed here.

### Operational assumptions

The noise generated by a railway is highly dependent on the rolling stock, train frequency, train speed and track type. The following assumptions have been used to estimate the noise emission from the railway.

**Table 7.1 : Noise Assessment Key Assumptions**

<b>Operational information – at grade separated re-instatement</b>
Passenger trains consisting of Class 165 DMU rolling stock, or similar Freight trains consisting of Class 66 Locos towing 20 freight wagons
2 passenger trains per hour in each direction 3 freight trains per day in each direction
Varying line speed – 70mph from ch2000 to ch12400, 50mph from Honeybourne to ch2000 and ch12400 to ch14000, 30mph from ch14000 to ch14500
Ballast track supporting good quality Continuously Welded Rail (CWR) throughout.

Other factors that affect noise propagation from railways are local screening effects, such as cuttings or noise barriers, and ground absorption over large distances. The proposals have been split into sections depending upon the railway support structure type along the corridor, to include:

- At grade;
- In tunnel – between approximate chainage 13900 and 1400 ;
- In cutting (typical depth 2m to 8m) – between approximate chainage 13080 to 13400 and 13600 to 13900; 14000-14580;

## 7.3 Assessment

Using the operational assumptions described above, the extent of the 55dB  $L_{Aeq, 18hr}$  (the threshold for annoyance) and 68dB  $L_{Aeq}$  (threshold for noise insulation) noise contours resulting from the scheme have been calculated. The noise contours have been overlaid on OS mapping of the scheme to allow buildings which could be impacted by the proposed scheme to be identified.

Table 7.2 below illustrates the combinations of input parameters used to create the noise contours and the results of those calculations. The estimated noise contours are shown in Figure 7.1.

**Table 7.2 : Results of rail noise contour calculations , showing the varying input parameters along the route**

Chainage	Speed	Alignment	55dB Contour distance	68dB Contour distance
Honeybourne – 2000m	50mph	At grade	48m	2.8m
2000m - 12400	70mph	At grade	82.7m	5.5m
12400-13080	50mph	At grade	48m	2.8m
13080 - 13900	50mph	In cutting	6.3m	n/a
13900 - 14000	50mph	In tunnel	n/a	n/a
14000 - 14580	30mph	In cutting	n/a	n/a

The 55dB(A) noise contour is estimated to extend 82.7m from the proposed scheme when trains are travelling at 70mph. This means that sensitive properties within 82.7m of the scheme could be exposed to operational noise impacts.

Considering the scheme in the direction from Honeybourne Junction in the south to Stratford Station in the north, approximately 13km of the 15km scheme is located in a rural area with very few properties located within 82.7m of the proposed route. In total nine buildings have been identified which lie within the 55dB(A) noise contour (the threshold for annoyance) between chainage 0 and 13000. These are:

- Railway cottage on Wyre Lane – approximate chainage 6400; and
- Milcote Manor Cottages (6 buildings) to the north west of the scheme – approximate chainage 9500
- two buildings to the north west of the scheme at Chambers Crossing – approximate chainage 10525

All of these buildings are situated a large distance from other major noise sources, such as roads, hence the increase in ambient noise level that could result from the scheme could be high. The impact could practicably be reduced at these properties with the use of noise barriers. However due to the proximity of some of the buildings to the route it may be impracticable to provide screening of the upper floors of the buildings from the railway. The cost-effectiveness of mitigation at these isolated buildings will need to be assessed in the context of the overall benefits of the scheme at a later design stage of the project.

Between chainage 13080 and 13900 the route will be in cutting 2m to 8m below ground level on the approach to the proposed tunnel. The cutting will provide screening of noise from the scheme. Along this section the 55dB(A) noise contour is expected to extend 6.3m from the route. No properties lie within this distance of the scheme.

Between chainage 13900 and 14000, the route is in a tunnel resulting in no potential operational noise impacts along this section.

Between chainage 14000 and 14580 the route is again in cutting on the approach to Stratford Station. As a result of the low train speed on this section the 55dB(A) contour does not

extend from the railway, hence no potential operational noise impacts have been identified along this section.

#### Noise insulation

On at grade sections of route the 68dB(A) noise contour is expected to extend a maximum of 5.5m from the route. No properties have been identified as potentially qualifying for noise insulation.

## **7.4 Summary and conclusions**

A strategic operational noise assessment has been carried out for the proposed scheme. Nine buildings which could be exposed to operational noise impacts without noise mitigation have been identified.

Without undertaking a detailed noise assessment, which includes consideration of the existing noise climate along the route, it is not possible to determine with more certainty if the identified properties will be impacted or if the noise effects of the scheme would be significant. As described in the introduction, reasonably foreseeable worst case assessment has been undertaken and no incorporated mitigation has been included. A more detailed assessment would include, in outline, the design of mitigation measures which could reduce noise impacts, such as noise barriers, earth bunds or rail dampers. It is entirely possible that many of the potential impacts identified above could be mitigated with such measures.

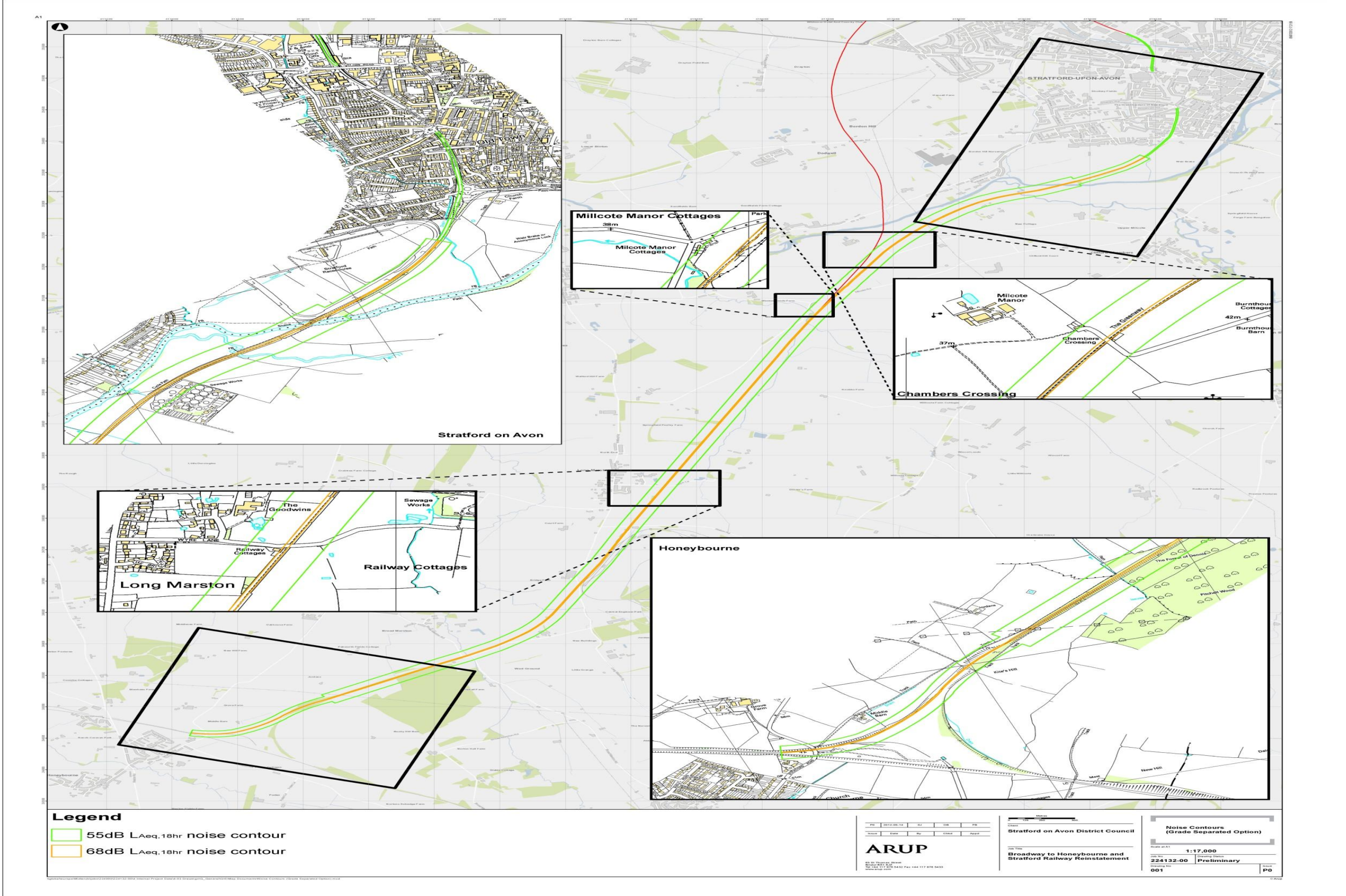
## **7.5 Further Work**

The study has been limited to assessing the effects of operational airborne noise which may arise from the scheme. If a detailed environmental impact assessment is undertaken at a later stage of the project the following noise impacts would need to be considered in addition to operational airborne noise:

- Temporary effects, such as noise during the construction of the scheme.
- Indirect effects, such as changes in the noise environment which may result from changes to existing infrastructure.
- Other noise sources – such as traction noise from rail vehicles or curving noise (noise generated by wheel-rail interaction on small radius curves)
- Operational groundborne noise and vibration which may be generated by trains in the tunnelled sections of the scheme and perceived inside occupied buildings.
- Cumulative effects such as the increase in train flows at Honeybourne Junction



Figure 7.1 : Estimated Noise Contours



## 8 Environmental Assessment

### 8.1 Introduction

This Environmental Appraisal has been undertaken as high level environmental review to identify potential key environmental constraints to the development. It is understood at this stage that the development is within the existing rail corridor boundary.

### 8.2 Appraisal Methodology

#### 8.2.1 Desk Study

A desk study limited to the identification of environmental assets and constraints within the immediate vicinity of the land ownership and which may receive impact from the proposed works, was undertaken. The following information sources, held within the public domain, were consulted during the study:

- Department for Environment, Food and Rural Affairs, Air Quality. <http://aqma.defra.gov.uk/list.php>
- Multi Agency Geographic Information for the Countryside; [www.magic.gov.uk](http://www.magic.gov.uk)
- Natural England; <http://www.naturalengland.org.uk/>
- Listed Buildings Online; <http://lbonline.english-heritage.org.uk>
- Images of England; [www.imagesofengland.org.uk](http://www.imagesofengland.org.uk)
- Environment Agency website; <http://www.environment-agency.gov.uk/>

### 8.3 Walkover

A site walkover covering the extent of the route was undertaken by an experienced ecologist; the results of this walkover are reported in Section 8.6.2 below.

### 8.4 Assumptions and Limitations

This appraisal has been undertaken using readily available information held within the public domain. A single site walkover was carried out. No specialist studies have been undertaken. It is assumed that the information available was both current and accurate. No third parties have been contacted regarding further sources of information on the environmental constraints affecting the proposed development.

It is assumed that the works subject to this environmental appraisal will be limited within the existing railway corridor and may therefore be considered to be a 'permitted development'. Only the potential constraints in the immediate vicinity of the development have been considered.

Stratford District Council should satisfy itself that the proposed development is 'Permitted Development' under The Town and Country Planning (General Permitted Development) Order 1995 prior to submitting any planning application.



## 8.5 Environmental Appraisal

### 8.5.1 Air Quality

Stratford District Council declared an Air Quality Management Area (AQMA) covering the whole of the town in 2010. The District Council also declared an AQMA in Studley, but it is not relevant to this study.

As a local railway corridor, the proposed scheme is not expected to generate any notable emissions to air during operation.

The nature of the proposed construction works are not considered likely to have any impact on air quality, provided appropriate techniques and procedures are employed under a suitable Code of Construction Practice (CoCP).

### 8.5.2 Water Resources

The proposed works are not located within a Groundwater Protection Zone (GPZ). The construction works are not expected to have any direct impact on groundwater; however, the possible presence of contaminated materials is discussed below.

The northern section of the route at Stratford is designated a Secondary A aquifer regarding superficial deposits and a Secondary B bedrock aquifer; this area is also designated as a Minor Aquifer with intermediate to high groundwater vulnerability.

To the south of Stratford the route runs through the River Avon flood plain and crosses both the River Avon and the River Stour. Further assessment of the potential impact of the proposed works on existing flood conditions may be required. Both rivers are designated as a Main River, such that consideration should be given to the potential impact of any works in the vicinity of the water course. Approval to undertake such works may be required from the Environment Agency, and where discharges to the rivers are proposed, discharge consent may be required. The route also crosses water courses further to the south at approximately 9240 and 3280m.

### 8.5.3 Land Contamination and Ground Conditions

A Landmark Envirocheck report was not available for this stage of appraisal. There is an historic landfill site located adjacent to the alignment on the southern edge of Stratford near the race course. This was reclaimed in 1990 and is now the Wetherby Way residential estate. However, as the works are to be limited to the fence line boundary the proposed works are not expected to impact upon this site.

The proposed area of works are within the existing rail corridor and as such the ground in this area could be expected to be potentially contaminated with hydrocarbons including polyaromatic hydrocarbons (PAH), lubricating and fuel oils, herbicides, and asbestos. The presence of contamination should be ascertained and appropriate handling and management of potentially contaminated materials should be in line with current health and safety, and environmental legislation/regulation.

## 8.6 Ecology and Habitats

### 8.6.1 Desk Study

A desk study was undertaken using the relevant sources listed in Section 8.2.1. The results from this study are provided below:

#### 8.6.1.1 Statutory Designated Sites

There was one statutory designated site within 2km of the route corridor. Racecourse Meadow is situated to the north of the route, and is designated as a Site of Special Scientific Interest (SSSI). It has been given the status of unfavourable, declining and is connected to the proposed area of works by hedgerows.

#### 8.6.1.2 Other Sites

Information provided by Stratford District Council shows that there are some Local Wildlife Sites and/or Sites of Importance for Nature Conservation (SINCs) located along the route. These are non-statutorily protected sites of noted habitat value. There are 4 areas where these designated sites are adjacent to the corridor boundary; they are located at approximately:

- 12300 – 12500 near the racecourse;
- 9300 – 9400 near Milcote Manor Cottages;
- 7700 – 7800; and,
- 4700 – 5700 within the sidings.

Although the proposed works are within the railway corridor, as proposals develop further assessment of the potential impact on these sites and associated species may be required and encroachment into the sites should be avoided if possible.

#### 8.6.1.3 Protected and Notable Species

The following protected species records were checked on the National Biodiversity Network (NBN) Gateway and had records of being present within 2km of the route corridor:

Adder, *Vipera berus*

Badger, *Meles meles*;

Barbastelle bat, *Barbastella barbastellus*;

Brandt's bat, *Myotis brandtii*;

Brown long-eared bat, *Plecotus auritus*;

Common lizard, *Zootoca vivipara*;

Daubenton's bat, *Myotis daubentonii*;

European otter, *Lutra lutra*;

European water vole; *Arvicola amphibious*;

Great crested newt, *Triturus cristatus*;

Leisler's bat, *Nyctalus leisleri*;

Lesser horseshoe bat, *Rhinolophus hipposideros*;



Natterer's bat, *Myotis nattereri*;

Noctule, *Nyctalus noctula*;

Serotine, *Eptesicus serotinus*;

Soprano pipistrelle, *Pipistrellus pygmaeus*;

It should be noted, that absence of a species from this list does not imply that this species is not present in the area

## 8.6.2 Site Walkover

Vegetation present along the majority of the route corridor forms two linear bands of tree and shrub either side of the cycle path. The age of this vegetation and its height results in suitable features to support commuting and foraging bat species. The route corridor provides a prominent linear feature within the local landscape which is likely to be used by bats to aid commuting between roosts and foraging grounds. It is also likely that this habitat supports invertebrate populations which will be utilised by commuting bats as a transient foraging resource. In addition to this a number of trees were identified both along the route corridor and within close proximity to it as having features suitable for roosting bats.

Large, linear areas of thick shrub and trees present along the majority of the route corridor provide suitable habitat for nesting bird species. When considering the extent of this habitat it could be assumed that this habitat is of significant importance to bird populations during the nesting season.

Grassland areas are present along the route corridor. Areas absent of thick shrub contain pockets of grassland which comprises tall ruderal herb away from the cycle path, with shorter, mown grass species closer towards the cycle path. In addition to this, some areas of grassland are present on low south-facing slopes. This provides potentially suitable habitat for reptile species, with shelter provided by the taller herbs, and adjoining scrub and shrub habitat, and areas for basking on the shorter, mown grassland. In addition to reptiles, this habitat is likely to be utilised by a diverse array of invertebrate species.

Open woodland along the route corridor provides suitable habitat for badgers. Evidence of badger activity was identified at the Stratford-upon-Avon end of the route. Tracks, sett entrances, push-unders and snuffle holes were identified in the banks opposite Stratford race course. Evidence of digging was also identified on the steep banks by the sewage treatment works.

The proximity of the River Avon and its tributaries to the route corridor means that less disturbed areas in the corridor could potentially be used by otter. However much of the route experiences disturbance from cyclists, walkers and dogs, so it is likely that otters will be using the river to commute along to less disturbed habitats in the surrounding area for laying up or holting. However further checks are recommended. Surrounding waterways may also be suitable for water vole (*Arvicola terrestris*) especially in the areas of the watercourses close to the route corridor with less disturbance. An assessment on bank suitability could not take place during this survey as due to excessive rain in the days before, watercourse had risen to almost bursting their banks.

A number of ponds are present within 500m of the route corridor, and may be suitable for amphibians. However the majority of these could not be assessed due to lack of access to these areas. Two ponds adjacent to the route corridor were identified close to Long Marston which were considered to have potential for amphibian species.

The route corridor was inspected for invasive species of plant such as Japanese knotweed (*Fallopia japonica*). No evidence of invasive plant species were identified during the survey.

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It should, however, be noted that this does not indicate absence of any invasive plant species from the route corridor. Due to the nature of these plant species, they may colonise areas, spreading very quickly and may consequently become present in the near future. In addition to this some parts of the proposed area of works were not accessible to surveyors and therefore could not be surveyed for invasive plant species. The majority of these areas were inaccessible due to their current use as active railway tracks. Japanese knotweed is often found along active railways and so the presence of invasive plants from the route corridor cannot be ruled out.

### 8.6.3 Potential Impacts

Impacts may include disturbance and temporary or permanent loss of tall ruderal herb and grassland, trees and dense shrub habitats along the route corridor. This may have consequential effects on the status of the Racecourse Meadows SSSI which is already in a declining state<sup>15</sup>. A list of potential impacts is provided below:

- Movement of plant species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended);
- Loss of or impacts to habitat used by bat species for roosting (mature and ivy-clad trees in numerous locations);
- Loss of or disturbance to breeding bird habitat resulting in impacts to bird species;
- Loss of suitable reptile habitat resulting in impacts to reptile species (if present);
- Loss of suitable amphibian habitat resulting in impacts to amphibian species (if present, the pond was not accessible during the site walkover);
- Temporary or permanent loss of invertebrate habitat;
- Loss of protected or rare plant species;
- Provided suitable protection measures are put in place for works over or adjacent to the river and its tributaries, the potential for indirect impacts to various species through pollution or mobilisation of pollutants during works to bridges should be minimised;
- If there impacts to habitats within 50m of the river bank or areas of dense scrub the potential for disturbance impacts to otter should be investigated;
- If works are to be undertaken on river banks or areas with wet ditches connected to the river the potential impacts to water vole should be investigated;
- Disturbance of badger setts and loss of habitat used by badgers.

### 8.6.4 Recommendations for Later Project Stages

Consult with the local council ecologist and biodiversity officer on the River Avon and its tributaries in this location, to identify any issues not raised in this document and to clarify any further potential issues.

Conduct desk study exercise for the areas subject to potential impacts, and immediate environs (500m for all species, except bats which should be supplied up to 2km from the proposed works) by requesting historic records.

Extended Phase 1 Habitat Survey including detailed botanical survey and invasive plant species survey in areas likely to be disturbed during proposed works.

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<sup>15</sup> [www.magic.gov.uk](http://www.magic.gov.uk)

Bat survey of the route corridor to assess activity, and of trees further identified from the extended Phase 1 Habitat Survey for roost potential.

If the areas are likely to be disturbed during the works it is recommended that reptile surveys of suitable habitats within the route corridor are carried out.

Check if the ponds identified on mapping along the route are present. Conduct amphibian survey of ponds if there is a risk of impacts to amphibians, specifically great crested newts, from any proposed works or the species may encroach onto the works footprint.

Conduct surveys of the two ponds found adjacent to the route corridor near Long Marston for amphibians if there is a risk of impacts to amphibians, specifically great crested newts, from any proposed works or the species may encroach onto the works footprint.

Invertebrate Survey of designated sites if impacts from the works is likely.

More detailed botanical surveys of the route corridor to identify whether any protected or rare plant species are present on site.

Survey the route corridor for nesting birds if works are likely to take place close to or during the nesting bird season.

## **8.7 Cultural Heritage and Archaeology**

A search of readily accessible data regarding Scheduled Monuments (SM), Listed Buildings (LB) and Conservation Areas (CA) was undertaken. There are no SMs within the vicinity of the route likely to be impacted upon by the proposed works.

There are many listed buildings in Stratford however there are none located directly adjacent to the alignment that would be directly impacted upon by the proposed works. There are also listed buildings located in Long Marston and Broad Marston. These building will not be directly impacted upon by the proposed works and limited impact on setting is expected.

The centre of Stratford is designated as a CA. Although the route does not pass through this CA it does run adjacent to the boundary for part of the alignment. As the proposed scheme is within the existing railway corridor it is not expected to directly impact on the CA however further consideration of the potential impact on the setting of the CA may be required as further details of the proposed works in that area are defined.

As the works are restricted to the existing rail corridor it is likely that anything of archaeological value will have already been impacted upon. However, there may be archaeological assets within the rail corridor, including old railway infrastructure, which could potentially be affected by the proposed works depending on what has been left in the area.

Further assessment is recommended when the exact extent of the works is understood. During that assessment, in consultation with the planning authority, further requirements could be addressed such as the need for consent or watching brief during construction.

## **8.8 Noise and Vibration**

Noise and vibration assessment is described in Chapter 7.

## **8.9 Landscape and Visual Impact**

The proposed works are limited to within the existing rail corridor. There are areas where the line will be raised however it is assumed that the proposed works will be broadly in line with the levels associated with the existing and previous railway infrastructure. Therefore the

proposed scheme is not expected to impact substantially on the visual amenity of the local area.

It should also be noted that the route of proposed works may be visible from the Cotswolds Area of Outstanding Natural Beauty (AONB); however, the proposed extent of the works is not expected to impact notably.

## 8.10 Other Issues

From the south of Stratford to Long Marston the current corridor, known as The Greenway and Monarch's Way, is designated as several types of public access including:

- Other routes with public access (local authority controlled);
- Recreational Route;
- Traffic free, National Cycle Route Number 5;
- Permissive bridleway.

Consideration of this designated public access should be given during design stages so as to maintain access during construction and operation of the Scheme. Consultation with LPA should be undertaken and consent to temporarily close or divert this access may be required.

## 9 Conclusions and Recommendations

### 9.1 Technical Assessment: Conclusions

#### 9.1.1 Railway Operations

The reinstated railway will be able to support passenger services catering for local residents, longer distance passengers and tourists from Oxford and Worcester in the south and Leamington Spa in the north. Further freight services may be supported, either diversionary from the Oxford/Birmingham route or to/from Long Marston Depot. Heritage services will be able to operate on the route as well as ad-hoc engineering trains. There may also be scope to extend services to London Paddington and Birmingham.

The route will provide a key strategic link to the national network, as well as an efficient link to the more local residents of the northern Cotswolds and West Midlands.

#### 9.1.2 Clearances

The current Network W10/W12 gauge clearances dictate the achievable vertical alignment and gradients for the route, especially for dive structures and grade separation of crossings (road over rail option).

It appears that the required width of the route (6.4m for a single track railway and up to 12m for a two track railway) challenge some of the assumptions from earlier studies and additional enabling works will be required to enable the construction of a single track railway than originally envisaged. This provides safe means of access for railway maintenance and operations staff, future provision for electrification and the use of mechanised track renewals equipment.

**A route with the prescribed functionality and revised clearances is technically feasible.**

#### 9.1.3 Gradients and vertical alignment

The gradients required to achieve a grade separated route through Stratford at around 2.5% (best case) are significantly steeper than that designed for the original railway of around 0.5% (1:200). However, due to the nature of operations in the area, with speeds around 50mph achievable, the relatively short distance should be acceptable to operators. Signalling provision that ensured trains did not stop within the dive structure/ tunnel area would seek to mitigate the effects of the gradients. Indeed, south of Stratford Station, the gradients will actually assist efficient passenger train operations, with acceleration and braking efforts improved and engine noise reduced with the favourable gradients.

**The revised gradients in Stratford, whilst steeper than would be wished for, will be fit for the required heavy rail operations.**

#### 9.1.4 Horizontal Alignments

The horizontal alignments have been optimised throughout to maximise linespeed in the country section between Stratford and Honeybourne, and to minimise land take requirements in the urban Stratford area.

Nevertheless, in the area along Seven Meadows Road, the proposed grade separated railway alignment will likely require the complete reconstruction and realignment of Seven Meadows Road to the east, which in turn requires some of the land currently occupied by footpaths,

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grass verges and environmental bunding. The Sanctus Road overbridge will also require reconstruction as the location of both piers will be compromised by rail and road alignments.

The existing Greenway could be reinstated to the east of the single track railway upon completion of construction between Stratford and Milcote Lane. However it should be noted that during construction it is unlikely that the Greenway could be used due to construction access requirements.

A diverted Greenway, adjacent to the railway corridor, may be required for the duration of construction activities. Between Milcote Road and Long Marston, the existing cycle route would need to be realigned away from the railway corridor, for the length of the double track section. Milcote Lane would seem a suitable alternative route to the southern end of the Greenway together with the C class road through Long Marston Village and Station Road.

**The horizontal alignments will be fit for efficient heavy rail operations**

## 9.2 Regulatory Requirements

Following consultation with the Office of Rail Regulation (ORR) regarding at grade options for reinstatement; the ORR has clarified their position. ORR will not support new level crossings as part of the reinstated railway. This advice is also in line with Network Rail's position.

**The route has therefore been developed with a fully grade-separated philosophy for the reinstated railway between Long Marston and Stratford that we believe will be acceptable to ORR/NR.**

## 9.3 Preferred construction option

### 9.3.1 Description

The recommended preferred option is to provide a single track solution in a dive structure commencing immediately to the south of Stratford station. The single track would continue to Milcote at which point there would be double track to Honeybourne where an additional curve would be provided enabling a connection from the Oxford direction.

At the time of Scheme opening it is likely that the new (IEP) timetable would be in operation on the Cotswold Line. This could provide the opportunity for flighting trains (one train very soon after the other) on the Honeybourne-Stratford section, increasing effective capacity, and reducing the required length of the more expensive double track section.

## 9.4 Train service pattern

This scheme would support two trains per hour in each direction and would provide additional capacity for occasional freight trains and passenger charter services.

## 9.5 Economic Appraisal

### 9.5.1 Conclusions of economic appraisal

The economic appraisal of the scheme has followed DfT Guidance considering two sets of benefits: (i) quantified economic costs and benefits including capital and operating costs, time savings road decongestion and accident benefits; revenue is set against rail operating costs to estimate net operator surplus. Secondly, non quantifiable benefits including benefits arising

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from rail freight, additional tourist spend and improved rail network resilience have been considered.

## Quantified economic benefits

The economic appraisal has investigated two service options across a range of scenarios concerning base year demand, demand growth and a construction cost reduction arising as a shorter length of twin track may be sufficient to support the same service offer.

The “base case” results (assuming 4% growth in demand per annum from 2012 to 2032) show the economic performance to be modest with a benefit:cost ratios of just over 0.8:1. The results for both service options are very similar.

Reduced construction costs increase these ratios to just under 1.0:1 and the effect of a 10% allowance for additional opening year traffic is similar. Since these factors are entirely independent it is legitimate to combine them; Test 3A shows BCRs (under the conditions of 4% traffic growth which we consider most likely as a long run average) for the two options of 1.15:1.

However, by far the most significant effect on economic performance is traffic growth. If it is considered realistic, to consider a rate of 6% per annum, the economic performance of the scheme improves significantly. In the Base Case (Table 6.10) the BCR increases from 0.84:1 to 1.33:1; in test 3B (with lower construction costs and 10% additional demand in the opening year) (to show the maximum attainable across the range of assumptions considered) it increases, depending on the service option, to between 1.94:1 and 2.03:1.

## Non-Quantified economic benefits

There will be additional economic benefits of the scheme which have not been quantified. Potentially the line will offer a new route for rail freight traffic. Whilst the Cotswold line is cleared only to freight gauge W6A, freight trains up to this gauge will have the opportunity to transfer, releasing capacity on other routes. This may be especially beneficial on the route through Oxford and Banbury from the south coast ports. This benefit is not quantified as it is highly dependent on forecasts of freight demand and capacity looking some years ahead and the appetite of operators for daytime paths on the reinstated Stratford to Honeybourne line compared to movements during the night on other routes.

The new line will also contribute to improved network resilience; this will be of benefit during planned maintenance. It is more likely to provide an opportunity for passengers rather than trains to re-route.

Tourism is an important contributor to the economy of Stratford. To the extent that the new rail line generates more tourists, rather than a change in the choice of travel mode, it will contribute to additional indirect jobs. It will also provide a choice in travel mode for day visitors to the town, particularly those who live close to a station.

A reopened Stratford-Long Marston-Honeybourne line could also attract heritage steam train services and visitors to/from the Gloucestershire Warwickshire Steam Railway when the planned extension northwards from Broadway reaches Honeybourne.

The Global Gathering music festival takes place at Long Marston Airfield and via Long Marston station, many of the 40,000 attendees would be able to utilise train services to and from this summer weekend gathering. Participants in other events at the Airfield could also use the train service. This would relieve traffic congestion on local roads.

In addition, with the new line completed, it will be possible for travellers to make a round trip following the Snow Hill-Stratford on Avon-Worcester-Snow Hill route.

## 9.6 Environmental Impact

During operation, noise is likely to be the main environmental impact but, on the basis of the assumed train service pattern and the analysis undertaken this is considered to be not that significant. Nine properties have been identified as lying within the 55dB(A) noise contour which represents the threshold for annoyance. The noise impact at these properties could be reduced by the use of noise barriers. The 68 dB(A) noise contour, which identifies properties qualifying for noise insulation, is expected to extend 5.5 m from the route. There are no properties within this contour.

## 9.7 Conclusion

The results of this appraisal indicate that the Line is a promising candidate for reinstatement. The economic appraisal shows a benefit: cost ratio (BCR) which is highly dependent on the assumed rate of passenger traffic growth. In the context of recent developments in the national rail passenger market, this Report takes a relatively cautious view, adopting growth of 4% per annum as a Base Case. For the two service options considered, this generates BCRs of approximately 0.8:1. Whilst these ratios are not strong, the analysis shows that they are highly sensitive to the level of opening year traffic and, most importantly, the rate of traffic growth. Construction costs may also be reduced if further work can show that a reduced length of twin track will be sufficient to support the proposed service timetable. Combining these effects, and incorporating annual traffic growth closer to 6% per year (compared to 4% per year in the Base) increase the BCR to around 2.0:1. Additional to these quantified economic benefits, wider non quantified benefits including, additional tourist spend, improved regional rail network resilience and benefits to rail freight traffic should be added.

The costs and benefits of the scheme need now to be viewed in a wider regional and national context.

It is recommended that the supporters of the scheme seek to attract a rail industry sponsor, promote the project with a range of agencies including Local Enterprise Partnerships, and canvass further support from communities and businesses in the area along the route.

## 9.8 Recommendation

### 9.8.1 Technical specification

It is recommended that the route be reinstated on the following basis:

- An hourly passenger train service from Worcester to Leamington Spa is provided,
- An hourly passenger train service from Oxford to Stratford is provided,
- The route is constructed as a combination of double track between Honeybourne East junction and Milcote Lane and single track from Milcote Lane to Stratford Station, with connections as required to support the train service requirements,
- The linespeed is maximised throughout to minimise journey times,
- A grade separated dive structure is provided in Stratford, alongside a realigned Seven Meadows Road.



- The eastern deviation at Long Marston is provided and the southern connection to Long Marston Depot is maintained. Provision for an additional connection from the depot to the North can be accommodated in the scheme.
- The Greenway is protected from Stratford to Milcote Lane, realigned to run alongside the reinstated railway, and from Milcote Lane to Long Marston is diverted to Long Marston Village along Milcote Lane.
- A new station is provided to the east of Long Marston Village.
- The works to include appropriate mitigation of adverse environmental impacts.

## 9.8.2 General recommendations

The terms of reference for the Study require a clear recommendation on the way forward indicating whether (A): there is likely to be a sufficiently strong business case to proceed further with the proposals to reinstate the railway between Stratford and Honeybourne or, if not, (B) whether reinstatement of a heavy rail track between Honeybourne and Stratford Racecourse only should be pursued or (C) whether provision of a light rail track between Honeybourne and Stratford Racecourse or Stratford Station should be investigated further or (D) whether there is unlikely to be a sufficiently strong business case to proceed with any of these options.

Based on the conclusions above, our general recommendation is the way forward should be based on Option A above: we believe there is sufficient evidence to proceed with further work to demonstrate the case for the reinstatement of the railway between Honeybourne and Stratford.

Options B and C above are not considered to be serious contenders as possible ways forward; Option B: a heavy rail track between Honeybourne and Stratford Racecourse only (and presumably a bus shuttle service to Stratford station and town centre) would not be an attractive option for through travellers so that a large part of the estimated demand would not occur. Option C (light rail) would introduce a different technology with no opportunities for through running which again would not provide an attractive service offer.

It is recommended that:

1. The results of the Study be taken to other bodies, notably Network Rail, the Department for Transport and appropriate Train Operating Companies, to gauge the support for a scheme offering the level of economic identified.
2. If there is a strong measure of support expressed by the rail industry, based on the findings of the Study, that consideration be given to carrying out further assessment of technical issues and economic performance.
3. Meanwhile, given the reasonable prospect of the line being reopened sometime in the future as identified in this Study, the route continues to be safeguarded against further development in the Development Plans for Stratford-on-Avon and Wychavon Districts.

## Appendix A

### Operational Requirements

**A1      Infrastructure Configuration Options**

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# Appendix A1

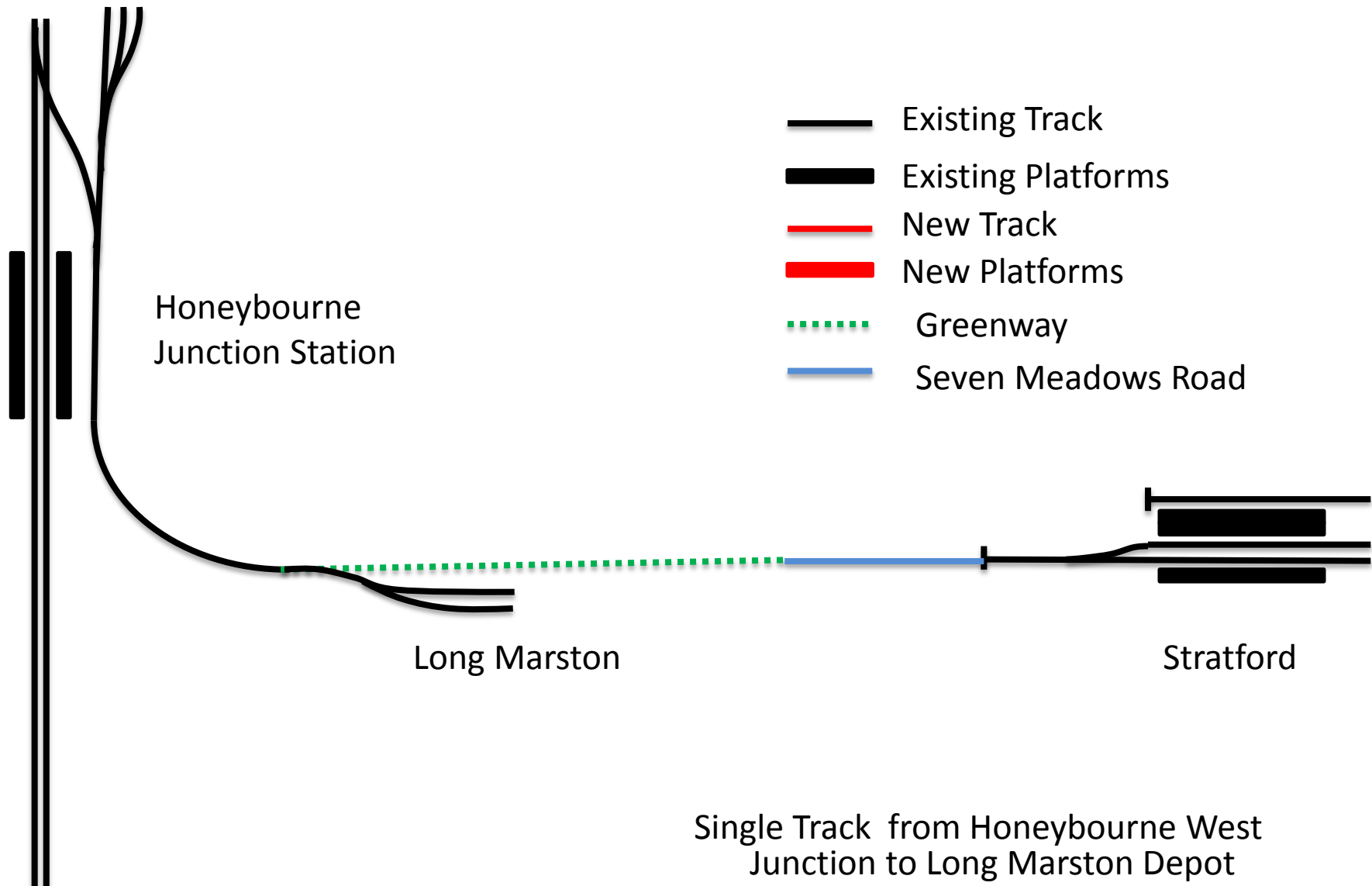
## S2H operational requirements

Configuration options

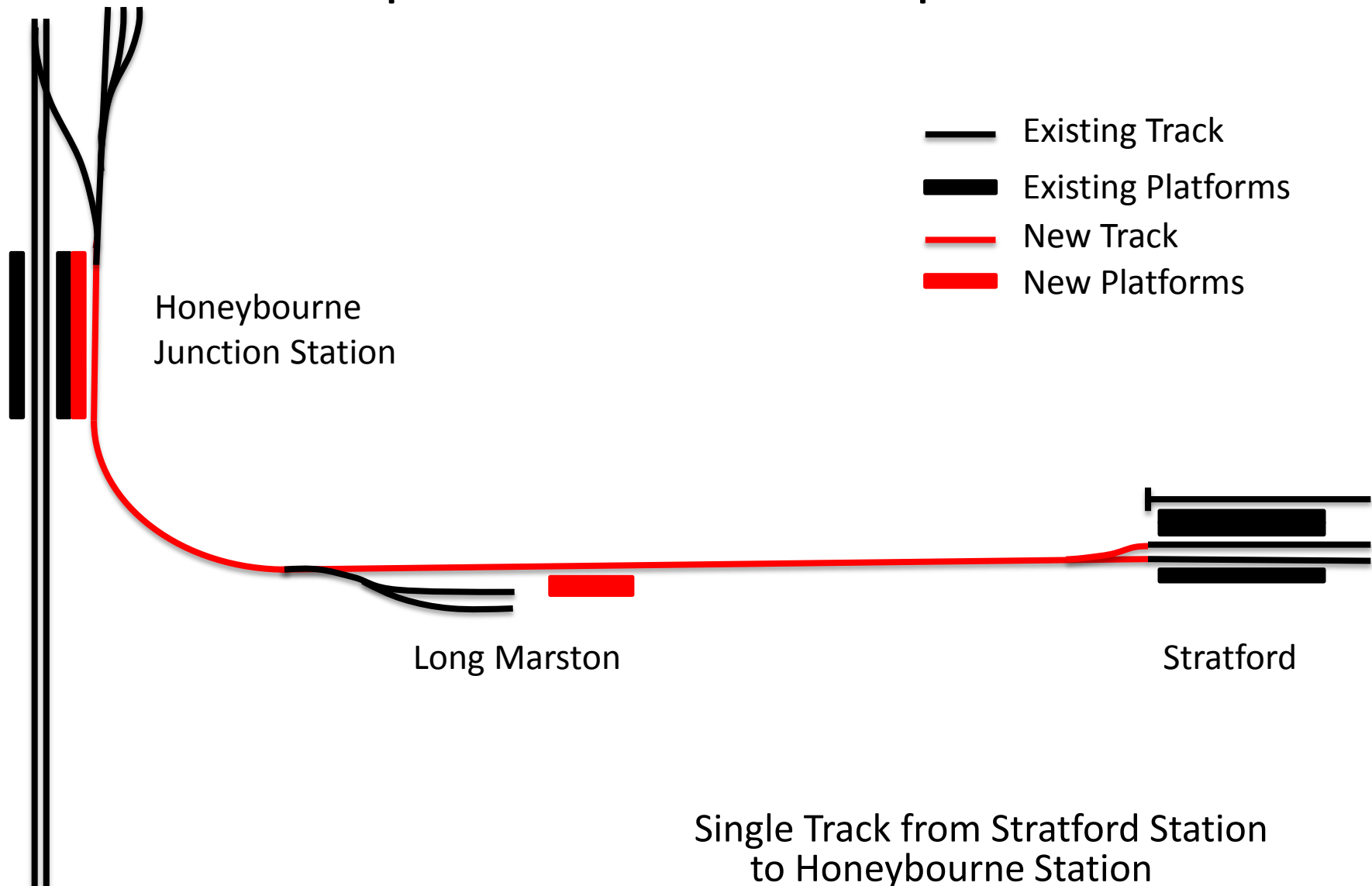
# S2H – Options for BCR analysis

- ✓ Option 1 – Single Track from Stratford Station to Honeybourne Station
- Option 2 – Double track dynamic loop from Stratford Racecourse Station to Long Marston Station
- ✓ Option 2a – Double Track from Milcote Road Chainage 9500 to Chainage 2000
- Option 3 – Double track from Stratford Station to Long Marston Station
- Option 4 – Double Track from Stratford Station with Single track junction east of Honeybourne Station Chainage 2000
- Option 5 – Double Track from Stratford Station with Single track junction west of Honeybourne Station
- Option 6 – Double Track from Stratford Station to Honeybourne west junction

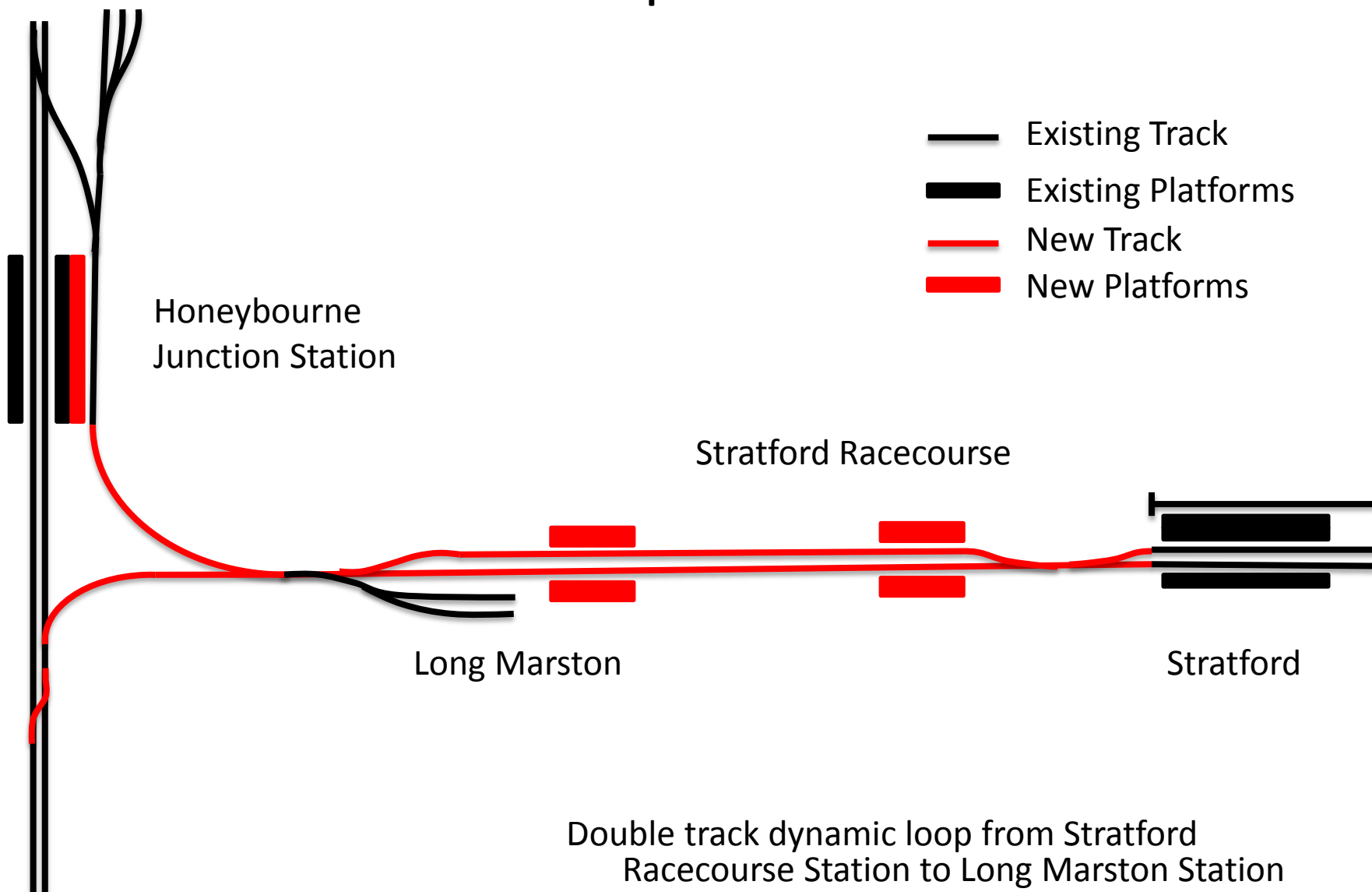
# Base Case



## ✓ S2H Option 1 – Minimum provision

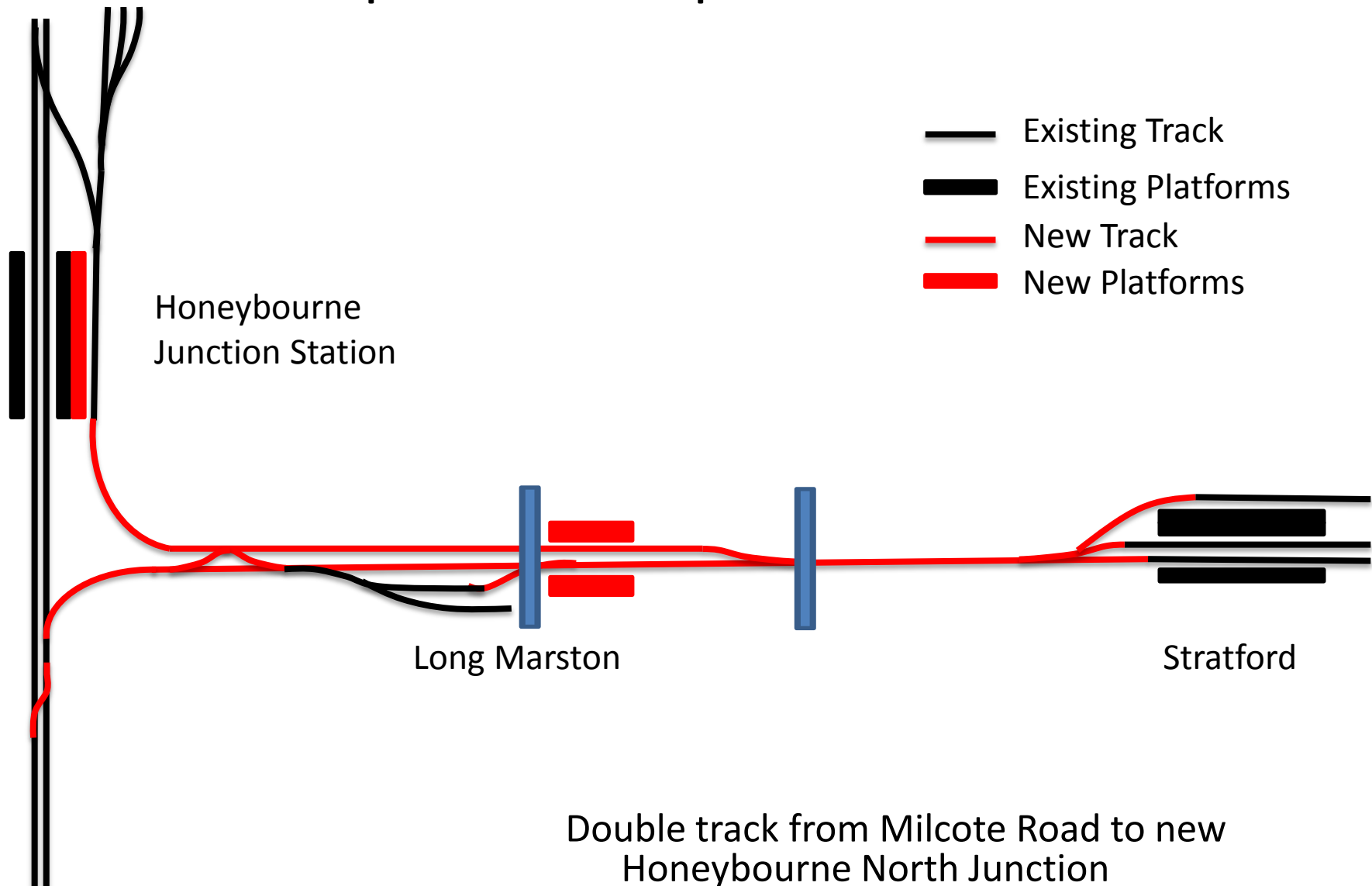


# S2H Option 2

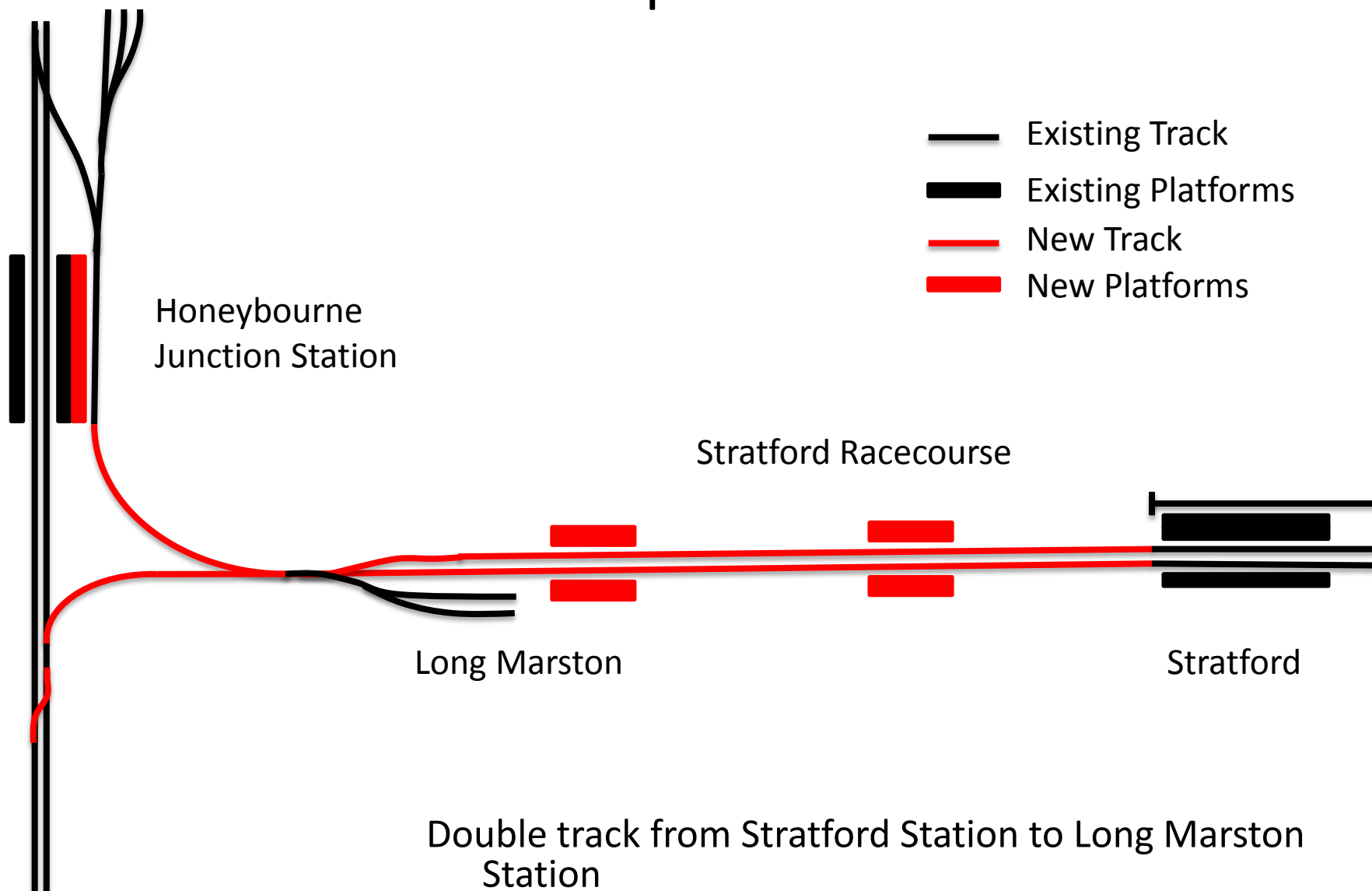




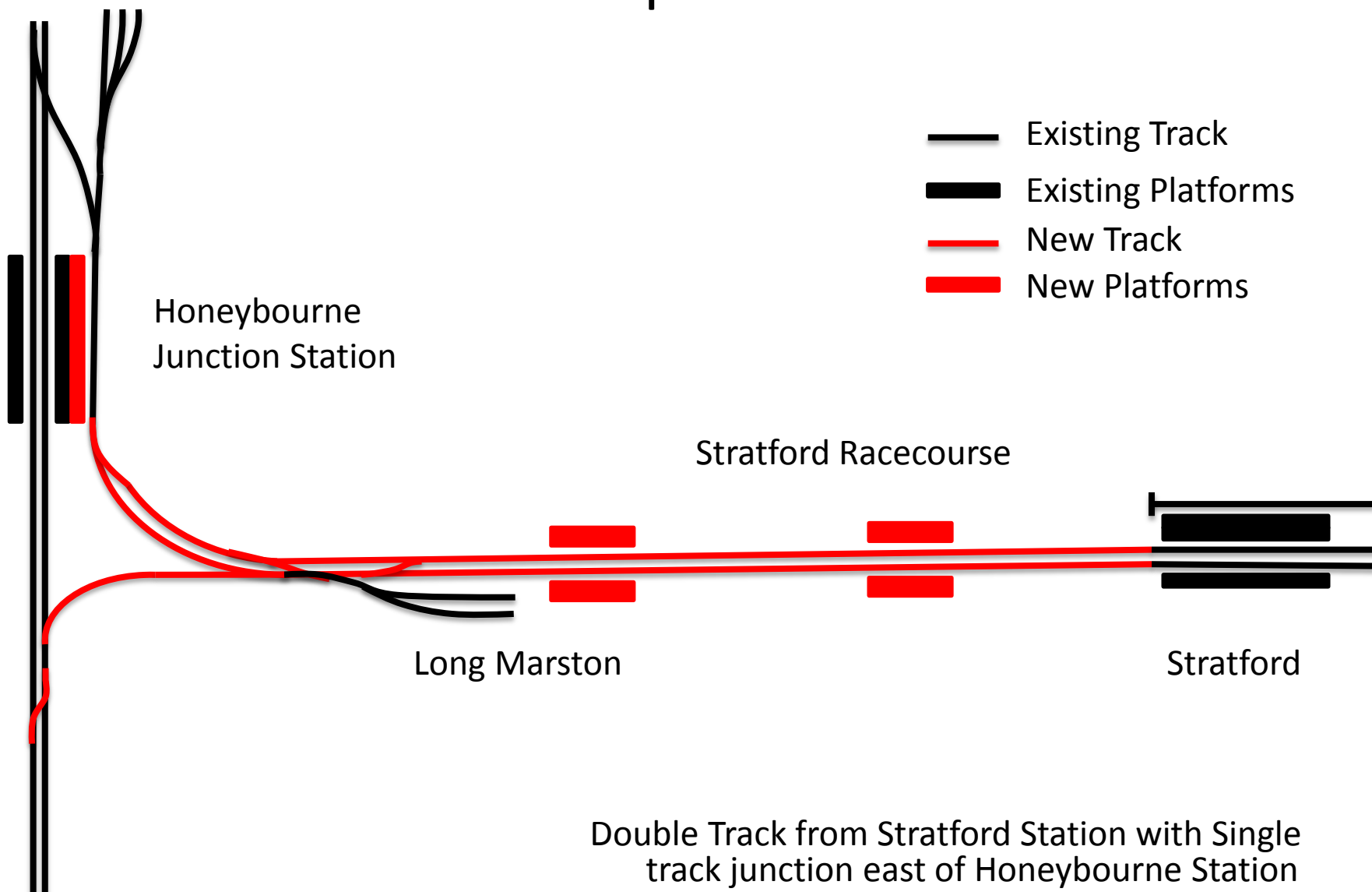
# ✓ S2H Option 2a – Optimum Provision



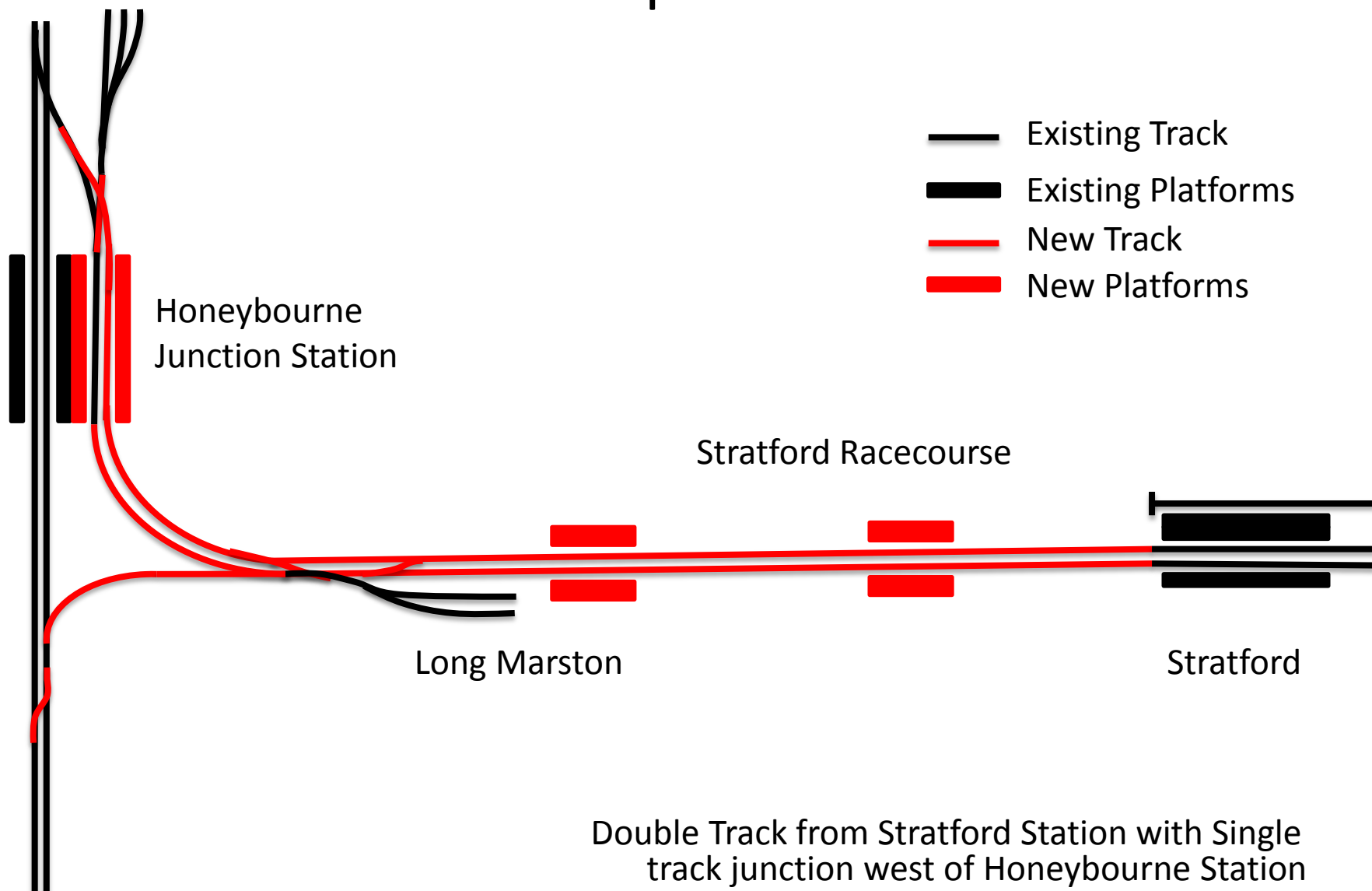
# ~~S2H Option 3~~



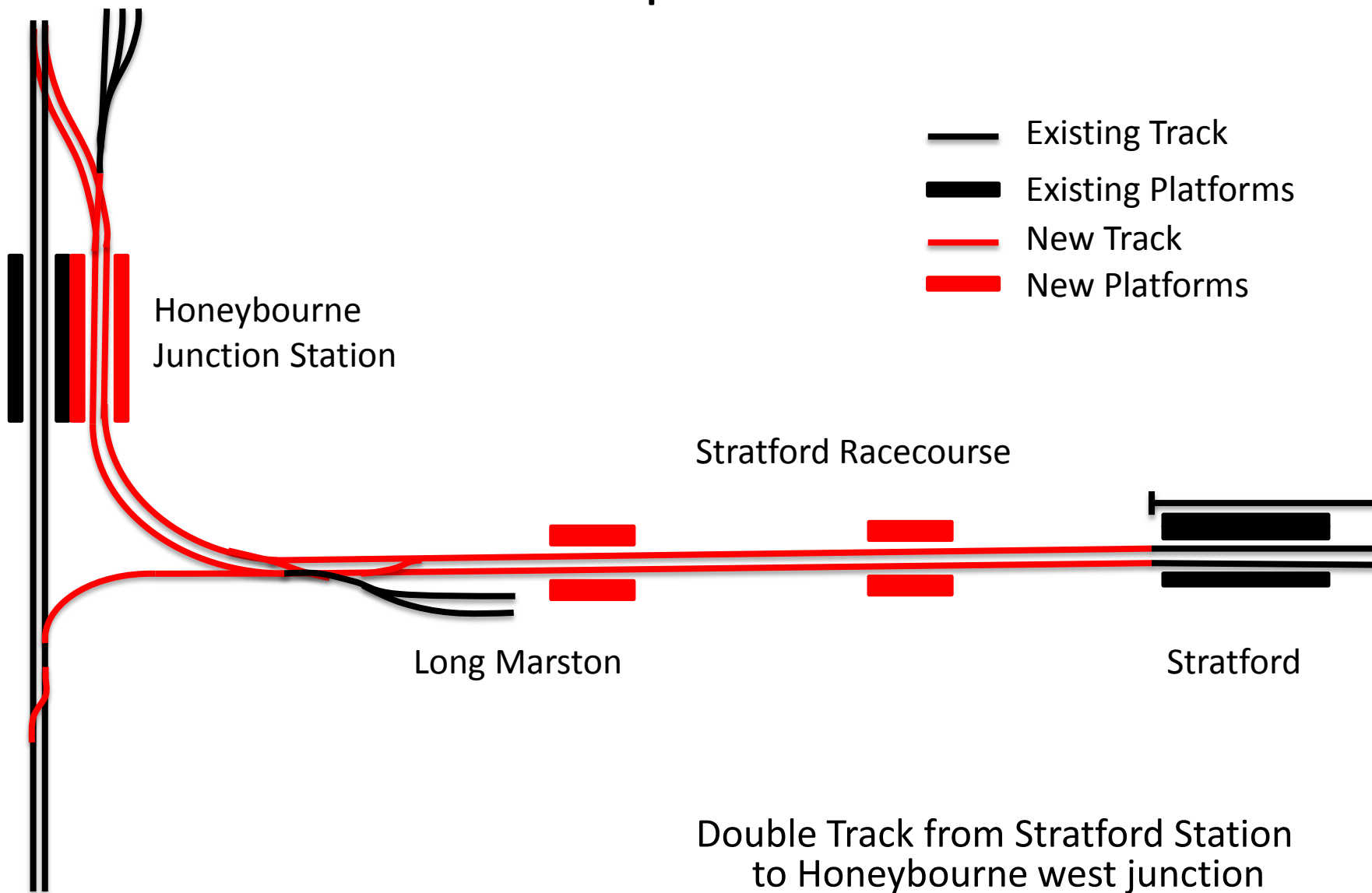
# S2H Option 4



# ~~S2H Option 5~~



# S2H Option 6



## Appendix B

### Structures Report




Stratford District Council

**Stratford-Honeybourne Railway  
Reinstatement**

**Structural Assessment**

Issue 4 | 21 June 2012



This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 224132-00

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**ARUP**

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## Appendices



## **Appendix A**

### **Location Plans**

# 1 Introduction

This Draft Report responds to a brief from Stratford District Council, to investigate the feasibility of reinstating the railway from Stratford through Long Marston to Honeybourne. The reinstated railway would allow passenger services and potentially freight traffic to operate on the route, providing new services to and from Stratford, relieving existing routes that are approaching capacity.

Since the line was closed in 1976, a number of developments have taken place along the route, such as residential and new highway infrastructure. This has added a number of complications and constraints which will need to be assessed in order to determine the viability of reinstating the line. The majority of the route is currently used as a Greenway for cyclists and walkers and much of the old track beds are still in place.

This report provides a high level review of the civil and structural requirements of the scheme and will consider the suitability of reusing existing structures as well as the requirement for new structures to be constructed. At each key location options have been considered –

- Option 1 or ‘Do minimum’ considers the minimum requirements to reinstate the line, such as the use of level crossings.
- Option 2 will provide a fully grade separated scheme. This will have a higher capital cost but will allow an uninterrupted service hence a higher utilisation of the route. This option will also provide a safer solution with less impact on the surrounding road network as it will not involve the introduction of level crossings.

For the purposes of this study, a simplified approach has been adopted where just two options have been considered throughout the route. In reality there may be a number of intermediate options or the option to have full grade separation at a major interface combined with alternative solutions such as closure of existing minor crossings.

**Note: It should be noted that since the inspections were carried out and this report was drafted, advice has been received from the ORR which discards all at grade crossing options. This will rule out a number of the options proposed in this report.**

## 2 Structures Summary

During a site walkover on Tuesday 17<sup>th</sup> April 2012, 26 No. structures were identified between Stratford and Honeybourne Station. The locations of these structures are shown on the plans in Appendix A of this report.

The following table lists the structures –

Ref	Structure Name	Type (existing)
S1	Alcester Road Bridge	Highway Overbridge
S2	Summerton Way	Footpath Level Crossing
S3	Footpath (SD44) Crossing	Footpath Level Crossing
S4	Seven Meadows North	Roundabout
S5	Seven Meadows Road (A4390)	Highway
S6	Seven Meadows South / Wetherby Way	Roundabout
S7	Stratford Racecourse Bridge	2 span steel Underbridge
S8	Stannals Bridge North Approach	4 span brick arch Underbridge
S9	Stannals Bridge	Steel Truss Underbridge
S10	Stannals Bridge South Approach	4 span brick arch Underbridge
S11	Cattle creep	Underbridge
S12	River Stour Bridge	2 span brick arch and steel Underbridge
S13	Farm Access	Unclassified Level Crossing
S14	Pearce Crossing	Unclassified Level Crossing
S15	Milcote Road	Highway Level Crossing
S16	Marchfront Brook Crossing	Underbridge
S17	Knobbs Farm Crossing	Unclassified Level Crossing

END

GREENWAY

S18	Farm Access	Unclassified Level Crossing
S19	Ditch Crossing	Culvert
S20	Airfield Crossing	Unclassified Level Crossing
S21	Wyre Lane Crossing	Unclassified Level Crossing
S22	Station Road Crossing	Highway Level Crossing
S23	Long Marston Road	Single Span Overbridge
S24	Footpath Crossing	Footpath Level Crossing
S25	Farm Access	Level Crossing
S26	Farm Access	Level Crossing
S27	Broad Marston Road	Underbridge
S28	Farm Access	Level Crossing
S29	Stratford Road	Underbridge
S30	Station Road	Overbridge
S31	Honeybourne Station	Footbridge

GREENWAY  
↓  
END

All of the structures were briefly inspected to allow a high level optioneering exercise to be undertaken. Further detailed inspections and assessments will be required at a later stage to determine Route Availability (RA) ratings for each structure and to propose strengthening works if required.

The structures are briefly summarised with outline options identified in the following sections.

## 2.1 Alcester Road Bridge

The existing highway overbridge would be largely unaffected by the scheme.



## 2.2 Summerton Way

The proposed route crosses through an existing footpath. Options are as follows –

- Option 1 – Construct a level crossing or sever access right to the footpath and use an alternative route.
- Option 2 – Provide full grade separation by constructing a new footbridge or underpass.

## 2.3 Footpath (SD44) Crossing

The proposed route crosses through an existing footpath. Options are as follows –

- Option 1 – Construct a level crossing or sever access right to the footpath and use an alternative route.
- Option 2 – Provide full grade separation by constructing a new footbridge or underpass.

## 2.4 Seven Meadows North

The proposed route needs to cross through a busy highway roundabout and interchange.



- Option 1 – realign the highway, removing or relocating the roundabout. This option could consist of signal controlled junctions and the introduction of a level crossing.
- Option 2 – Construct a dive-under or partial dive-under with the highway partially raised. This option would provide full grade separation, but may require some temporary land purchase during construction.

## 2.5 Seven Meadows Road (A4390)

The proposed rail corridor now contains a busy highway with full width carriageway lanes.



- Option 1 – A single track at grade solution would require the realignment of Seven Meadows Road to the southeast and the loss of the associated footpaths and environmental bunds. The existing carriageway widths may need to be reduced. There is a potential constraint at an existing overbridge which carries Sanctus Road over the A4390. At this location the bridge may need to be reconstructed to allow room for both a highway and railway line. This option would not allow a twin track arrangement and would have a significant impact on adjacent properties.
- Option 2 – Construct a single track railway line in an open trench, providing full grade separation from the highway.



## 2.6 Seven Meadows South / Wetherby Way

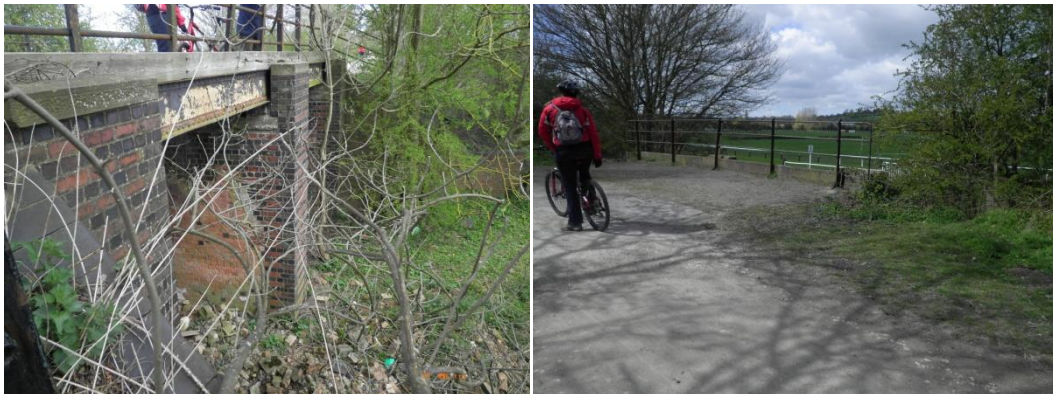
The proposed route would either cross through a roundabout to the south of the Seven Meadows Road or to the West of the roundabout through Wetherby Way. The highway and roundabout is approximately 3 – 4m higher than the adjacent ground and the start of the Greenway at this location.



- Option 1 – The railway line would be constructed in a dive-under which may require some temporary land purchase during construction.
- Option 2 – The railway line would continue in a cut and cover tunnel under the existing roundabout. This would minimise impact on the existing highway and would minimise land take.

## 2.7 Stratford Racecourse Bridge

Stratford Racecourse Bridge provides access under the railway line, but no longer appears to be in use. The structure consists of 2 steel spans with a masonry abutments and a central pier.



- Option 1 and 2 – The underbridge could be infilled or strengthened as required depending on rights under the bridge.

## 2.8 Stannals Bridge North Approach

On the north approach to Stannals Bridge is a pair of masonry arch 4 span bridges. The south eastern bridge is in poor condition with spalling and damaged brickwork particularly to the underside. The north eastern bridge is in fair condition.



- Option 1 and 2 – In order to reinstate the line masonry repairs will need to be carried out to the approaches, particularly on the older south eastern bridge.



## 2.9 Stannals Bridge

The steel truss bridge would carry the railway line over the River Avon. The bridge consists of two side by side decks. The south eastern deck currently carries the Greenway and the north eastern deck has been removed.



- Options 1 and 2 – The girders of the bridge have loss of section in a number of locations and would need to be strengthened / repaired to carry railway traffic. A whole life cost analysis should be carried out at a later stage to determine whether repair is feasible or whether the deck should be replaced with a new structure. Both bridge decks could be reinstated as required to carry a single or twin track arrangement.

## 2.10 Stannals Bridge South Approach

On the south approach to Stannals Bridge is a pair of masonry arch 4 span bridges. The south eastern bridge is in poor condition with spalling and damaged brickwork particularly to the underside. The north eastern bridge is in fair condition, however both bridges have suffered scour erosion at the piers as a result of flood flows of the River Avon.



- Option 1 and 2 – In order to reinstate the line, masonry repairs will need to be carried out the approaches. Scour erosion protection should also be considered.

## 2.11 Cattle Creep

Cattle creep underbridge provides access from farmland to the south of the Greenway to a section of farmland which is locked by the Greenway, the River Avon and the River Stour.



- Option 1 and 2 – In order to reinstate the line, the bridge may need to be strengthened to provide a sufficient RA rating. An alternative option could be to infill the bridge and provide an alternative means of accessing the landlocked area of land, which could involve a lightweight structure over the River Stour.

## 2.12 River Stour Bridge

River Stour bridge is a 2 span underbridge which currently carries the Greenway over a river and farm track. The main span is a brick arch structure which spans the River Stour and the back span is a steel deck which spans a farm access track. There was evidence of significant repairs to the parapet wall on the south east side of the bridge. Patress plates were present on the outside of the parapet wall which appear to be tying the parapet to a concrete block which has been cast on the inside of the parapet wall along the deck.



- Option 1 – In order to reinstate the line for a single track arrangement, the bridge may need to be strengthened to provide a sufficient RA rating.
- Option 2 – In order to reinstate the line for a twin track arrangement, the bridge may need to be strengthened to provide a sufficient RA rating and the clearances to the concrete parapet repair will need to be checked. It



may be necessary to reconstruct the south east parapet to allow room for two tracks, particularly if the Greenway will also still be maintained.

## 2.13 Farm Access

Farm access crossing is one of a number of unclassified level crossings providing access across the Greenway.



- Option 1 – Sever access rights and close the crossing as there are adjacent crossings which could be utilised.
- Option 2 – Construct a level crossing (with automatic barriers or a phone to the signal box). If this is not desirable a fully grade separated crossing could be constructed with a road over rail bridge, however this would likely require a CPO of an adjacent property. If a grade separated solution is required this is more likely to be constructed at Milcote Road crossing as this is likely to be an acceptable diversion.

## 2.14 Pearce Crossing

Pearce Crossing is one of a number of unclassified level crossings providing access across the Greenway.



- Option 1 – Sever access rights and close the crossing as there are adjacent crossings which could be utilised.
- Option 2 – Construct a level crossing (with automatic barriers or a phone to the signal box). If this is not desirable a fully grade separated crossing

could be constructed with a road over rail bridge. If a grade separated solution is required this is more likely to be constructed at Milcote Road crossing as this is likely to be an acceptable diversion.

## 2.15 Milcote Road

Milcote Road Crossing is a level crossing providing access across the Greenway. Milcote Road is a small road which links the villages of Welford and Weston-On-Avon with Clifford Chambers and Atherstone-On-Stour. On the north approach to the crossing, a former station platform is still visible.



- Option 1 – Although there are alternative routes which could be used it is unlikely that severing access rights will be permitted due to the length of any diversions, therefore a level crossing could be constructed (with automatic barriers or a phone to the signal box).
- Option 2 – A fully grade separated crossing could be constructed with a road over rail bridge.

## 2.16 Marchfront Brook Crossing

River Crossing carries the Greenway over Marchfront Brook. The existing bridge is showing signs of deterioration and the eastern masonry parapet is likely to require rebuilding.



- Option 1 and 2 – The underbridge may need to be strengthened as required to provide a sufficient RA rating.



## 2.17 Knobbs Farm Crossing

Knobbs Farm Crossing is a small farm crossing providing access across the Greenway from an unclassified track into farmland. The crossing provides a link between a number of farm outbuildings.



- Option 1 – Sever access rights and close the crossing as there are adjacent crossings which could be utilised.
- Option 2 – Construct a level crossing (with automatic barriers or a phone to the signal box). If this is not desirable a fully grade separated crossing could be constructed with a road over rail bridge. If a grade separated solution is required this is more likely to be constructed at Milcote Road or Station Road subject to the diversion being acceptable.

## 2.18 Farm Access

Farm access provides a crossing through the Greenway between farmers fields.



- Option 1 – Sever access rights and close the crossing as there are adjacent crossings which could be utilised.

- Option 2 – Construct a level crossing (with automatic barriers or a phone to the signal box). If this is not desirable a fully grade separated crossing could be constructed with a road over rail bridge. If a grade separated solution is required this is more likely to be constructed at Milcote Road or Station Road subject to the diversion being acceptable.

## 2.19 Ditch Crossing

The crossing provides a culverted route under the Greenway for an unclassified watercourse or drainage ditch, which was dry during the site visit. The culvert consists of a circular drainage pipe with stone headwall.



- Option 1 and 2 – The culvert looks like it has been sleeved in recent years and it is likely that this will not have been designed to withstand rail loadings. A new culvert will need to be constructed to Network Rail Standard Designs and Details.

## 2.20 Airfield Crossing

Airfield Crossing provides access across the Greenway from Long Marston Airfield through to Long Marston Village. It is not clear whether this is an access route which will need to be maintained as an emergency rear access to the airfield as the only other entrance to the airfield is from the B4632.



It is recommended that a new access track to the Airfield is constructed along the eastern side of the route from the proposed new Long Marston Station access road. This would allow access rights to the existing crossing to be severed.



## 2.21 Wyre Lane

Wyre Lane provides access across the Greenway from Long Marston Village to a small sewage treatment works. This is the only access route to the sewage treatment works.



It is recommended that a new access track to the sewerage treatment works is constructed along the eastern side of the route from the proposed new Long Marston Station access road. This would be incorporated into the new Airfield access track and would allow existing access rights to the crossing to be severed.

## 2.22 Station Road Crossing

Station Road is located at the end of the Greenway and links the B4632 with Long Marston Road. The road provides access to an industrial estate and would be a suitable location for a new station.



- Option 1 – Construct a level crossing (with automatic barriers or a phone to the signal box) so that Station Road can cross the proposed railway line.
- Option 2 – A fully grade separated crossing could be constructed with a road over rail bridge. This option has a number of different arrangements which could be followed, some of which may require land purchase and changes to access to businesses in the industrial estate.

## 2.23 Long Marston Road

Long Marston Road Bridge is a single span road bridge which carries a C Road over the railway line. The bridge provides adequate containment to the highway, however the approach barriers are sub-standard and the highway authority (Warwickshire County Council) may need to improve this to enable the scheme to take place. The bridge would be largely unaffected by the scheme assuming that clearances are sufficient.



- Option 1 and 2 upgrade approach parapets to bridge.

## 2.24 Footpath Crossing

The proposed route crosses through an existing footpath. Options are as follows –

- Option 1 – Currently the crossing is a pedestrian level crossing which could be maintained.
- Option 2 – Divert the footpath over Long Marston Road Overbridge.

## 2.25 Farm Access

The farm access track provides access across the track from a small farm to adjacent land. The crossing was not viewed on site but from examining aerial photos, it would be possible to use an alternative route if access rights were severed and the route was closed.

- Option 1 – Sever access rights and close the crossing as Broad Marston Road Underbridge could be utilised.
- Option 2 – Construct a level crossing (with automatic barriers or a phone to the signal box). If this is not desirable a fully grade separated crossing could be constructed with a road over rail bridge.



## 2.26 Farm Access

The farm access crossing provides access across the track from Broad Marston Road. The crossing was not viewed on site but from examining aerial photos and street views, it would be possible to use an alternative route if access rights were severed and the route was closed.



- Option 1 – Sever access rights and close the crossing as Broad Marston Road Underbridge could be utilised.
- Option 2 – Construct a level crossing (with automatic barriers or a phone to the signal box). If this is not desirable a fully grade separated crossing could be constructed with a road over rail bridge.

## 2.27 Broad Marston Road

Broad Marston Road Underbridge provides a crossing under the railway line. The bridge appears to have been re-decked since its original construction and consists of precast concrete deck sections which are transversely stressed together. Subject to clearances under and over the bridge it is assumed that the bridge would be suitable to carry an upgraded railway line, since it is already carrying freight. The RA rating of the bridge should be checked at a future stage.



## 2.28 Farm Access

There is a farm level crossing which provides access between farmer's fields on either side of the railway line.

- Option 1 – Sever access rights and close the crossing as Broad Marston Road Underbridge could be utilised.
- Option 2 – Construct a level crossing (with automatic barriers or a phone to the signal box). If this is not desirable a fully grade separated crossing could be constructed with a road over rail bridge.

## 2.29 Stratford Road

Stratford Road Overbridge carries the railway line over Stratford Road. The bridge is a masonry arch structure which is currently carrying rail traffic so it is assumed that the bridge would be able to carry an upgraded route subject to checking the RA rating of the structure and available clearances over the bridge. The clearance under the bridge is limited to 11'6" so it may be necessary to consider installing Collision Protection Beams if the route is upgraded. It should be noted that the parapet may need to be checked for compliance with current standards at a later stage.



## 2.30 Station Road

Station Road Bridge is a two span bridge consisting of a masonry arch and a steel span. The bridge carries Station Road over the railway line adjacent to Honeybourne Station. The bridge will be largely unaffected by the works subject to clearances being checked, however the parapets and highway approaches will need to be assessed at a later stage as they are sub-standard and may need to be improved by the highway authority (Warwickshire County Council) if the line is upgraded.



## 2.31 Honeybourne Station Footbridge

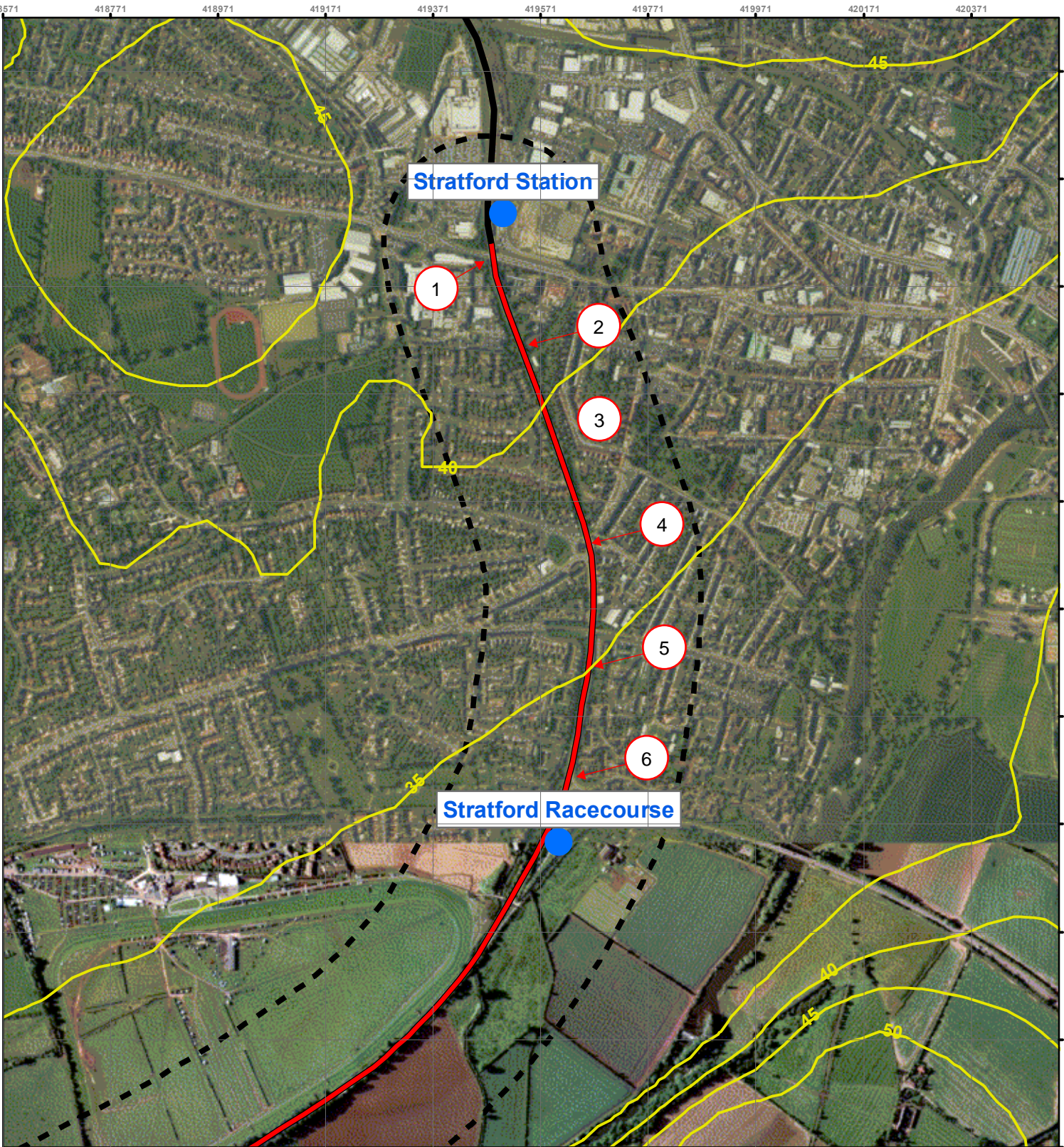
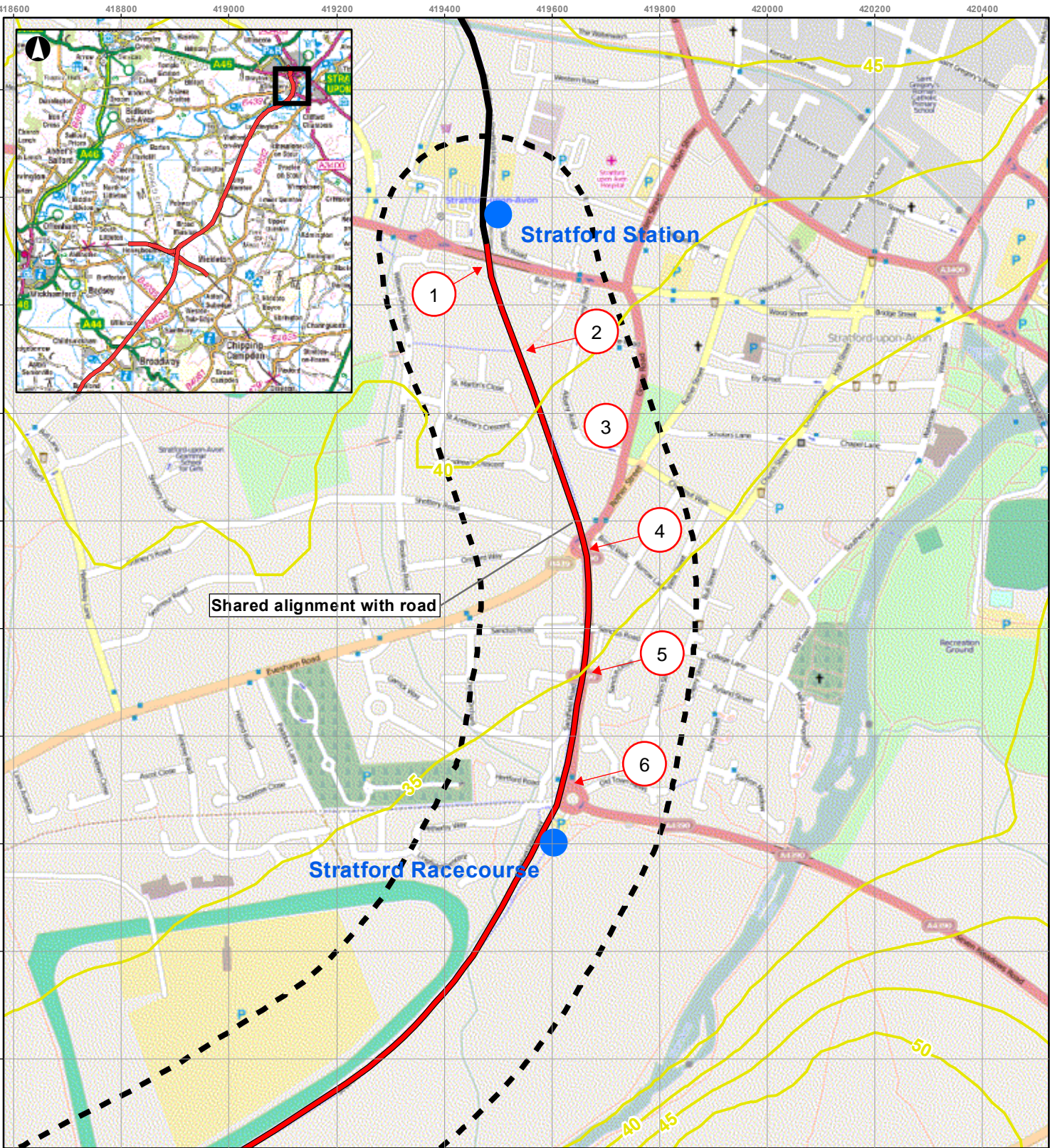
Honeybourne Station Footbridge provides access to the central platform. The bridge is relatively new and will have been constructed to current standards and clearances therefore will not be affected by the proposed reinstatement of the line.



## Appendix A

### Location Plans

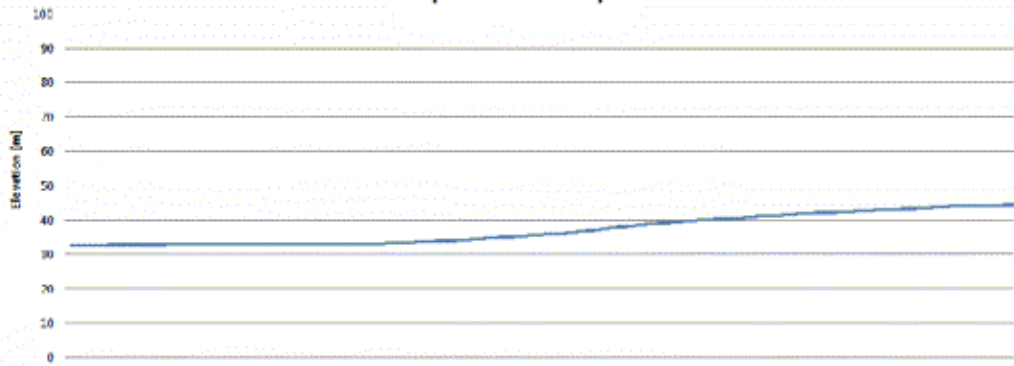




**Legend**

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  - Operational
  - - - 200m Buffer
  - Station

Map 10 Profile Graph

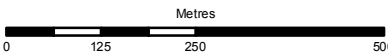


PO	2012-02-15	SJ	SJ	SJ
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Issue	Date	By	Chkd	Appd
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Client

Job Title

**Broadway to Honeybourne and Stratford  
Railway Reinstatement**

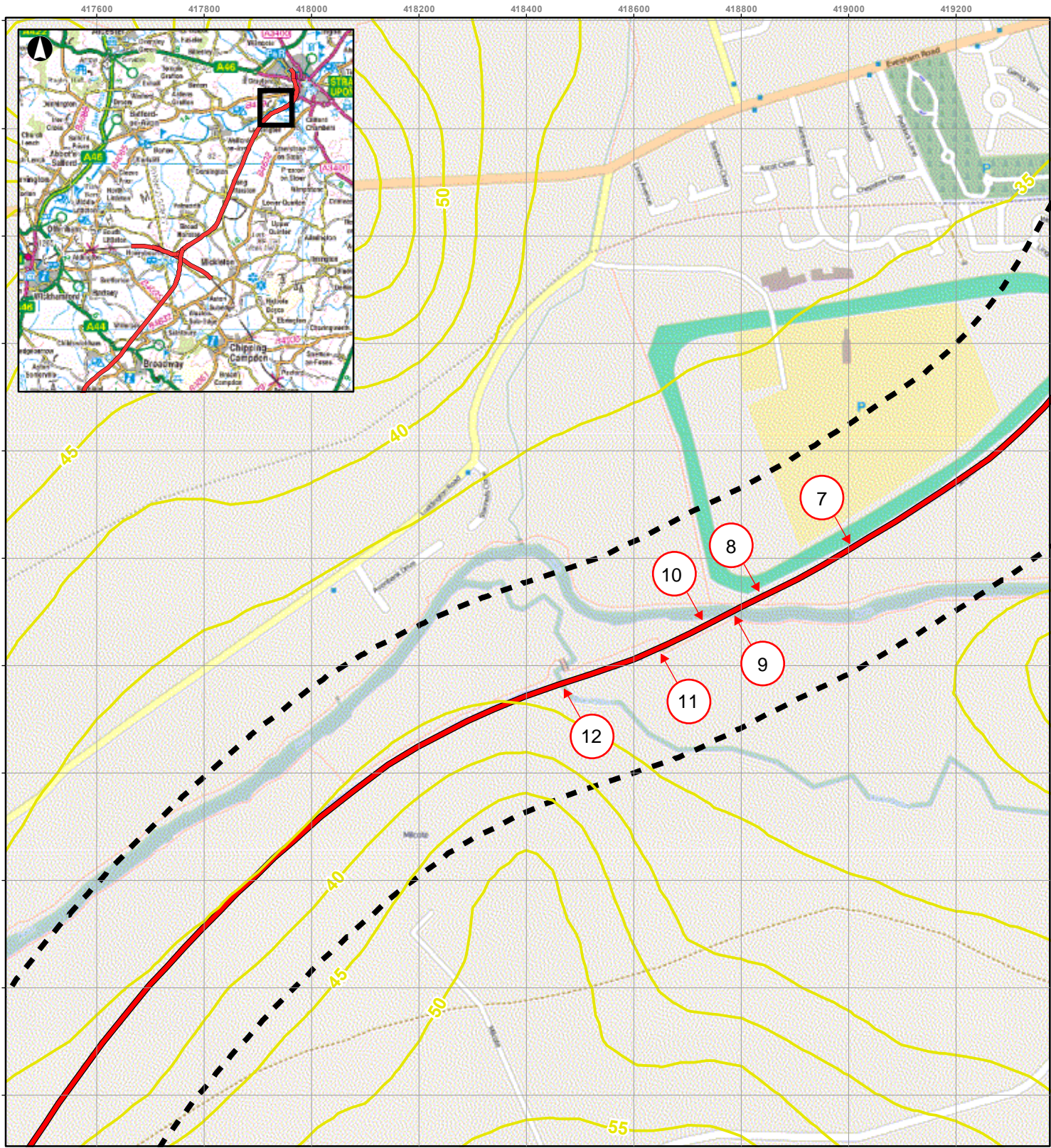
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Map 10**

Scale at A3  
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Job No <b>000000-00</b>	Drawing Status <b>Preliminary</b>
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Drawing No <b>010</b>	Issue <b>P0</b>
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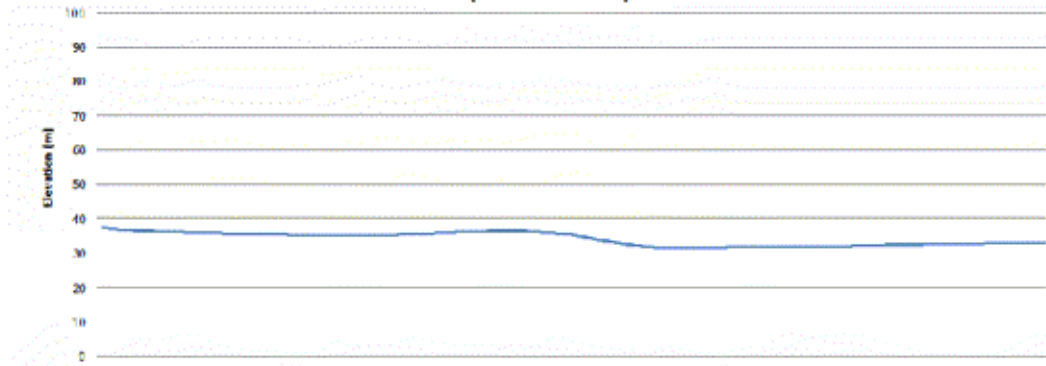




Legend

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Map 9 Profile Graph

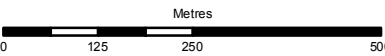


PO	2012-02-15	SJ	SJ	SJ
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Issue	Date	By	Chkd	Appd
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Job Title

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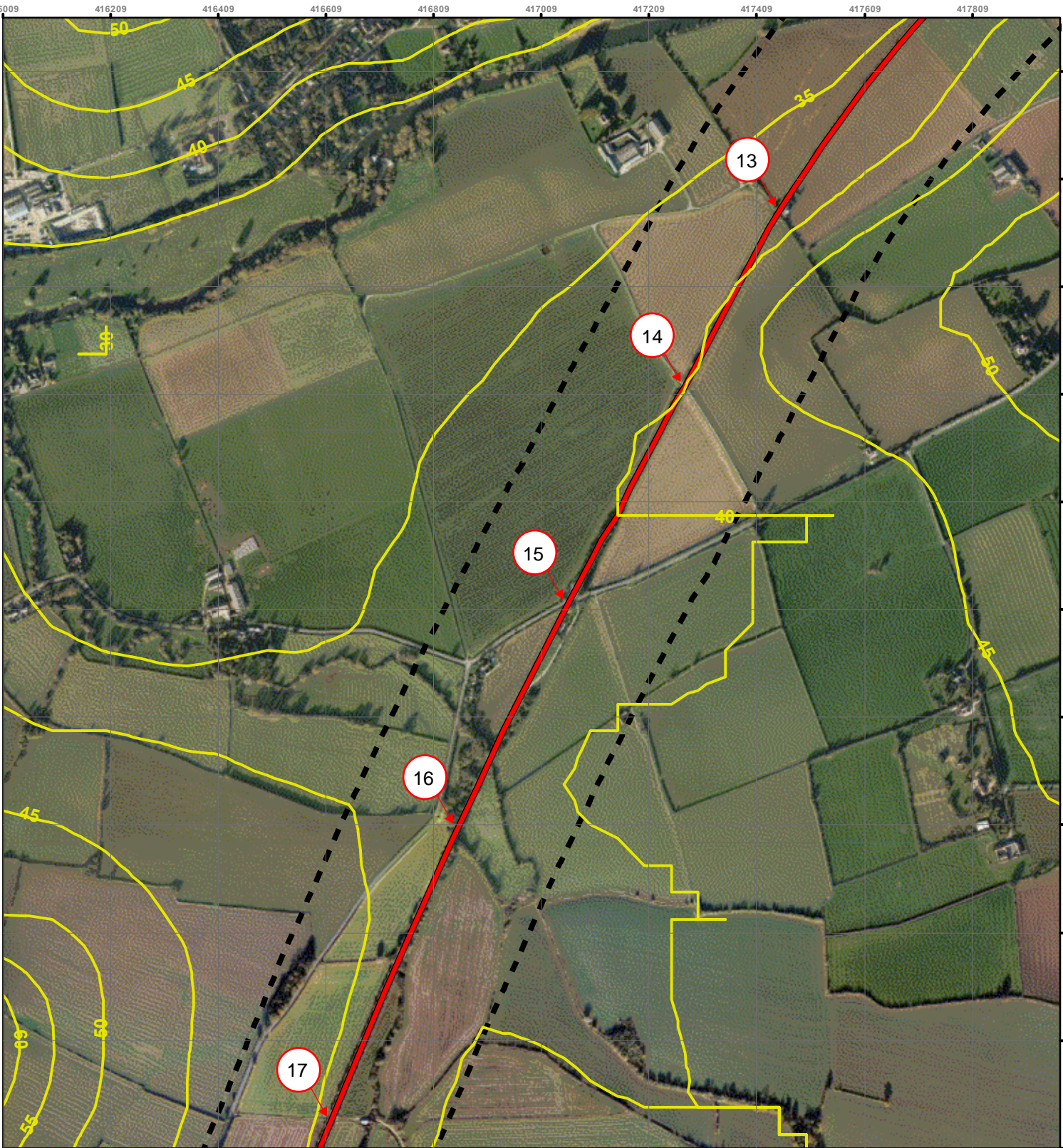
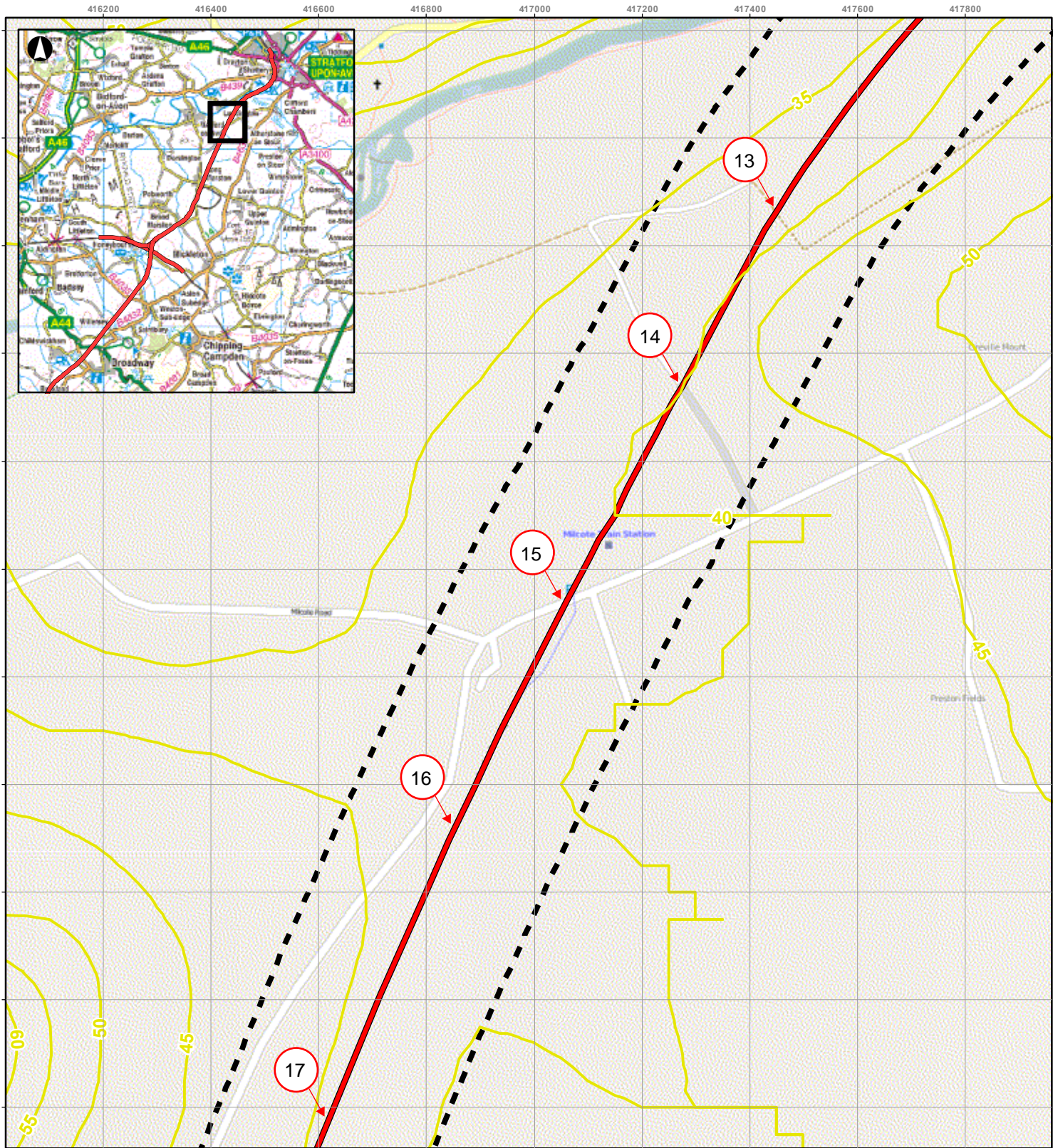
Site Walkover  
Map 9

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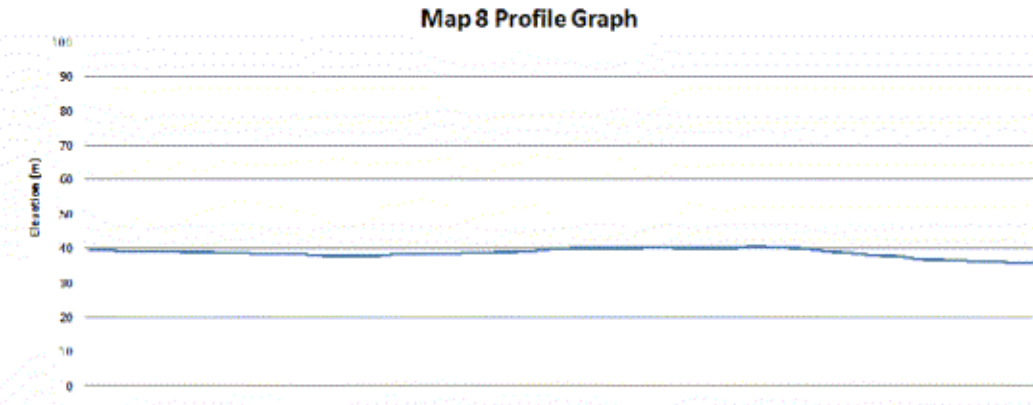
Job No 000000-00	Drawing Status Preliminary
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Drawing No 009	Issue P0
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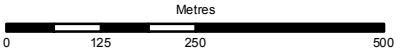
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PO	2012-02-15	SJ	SJ	SJ
Issue	Date	By	Chkd	Appd

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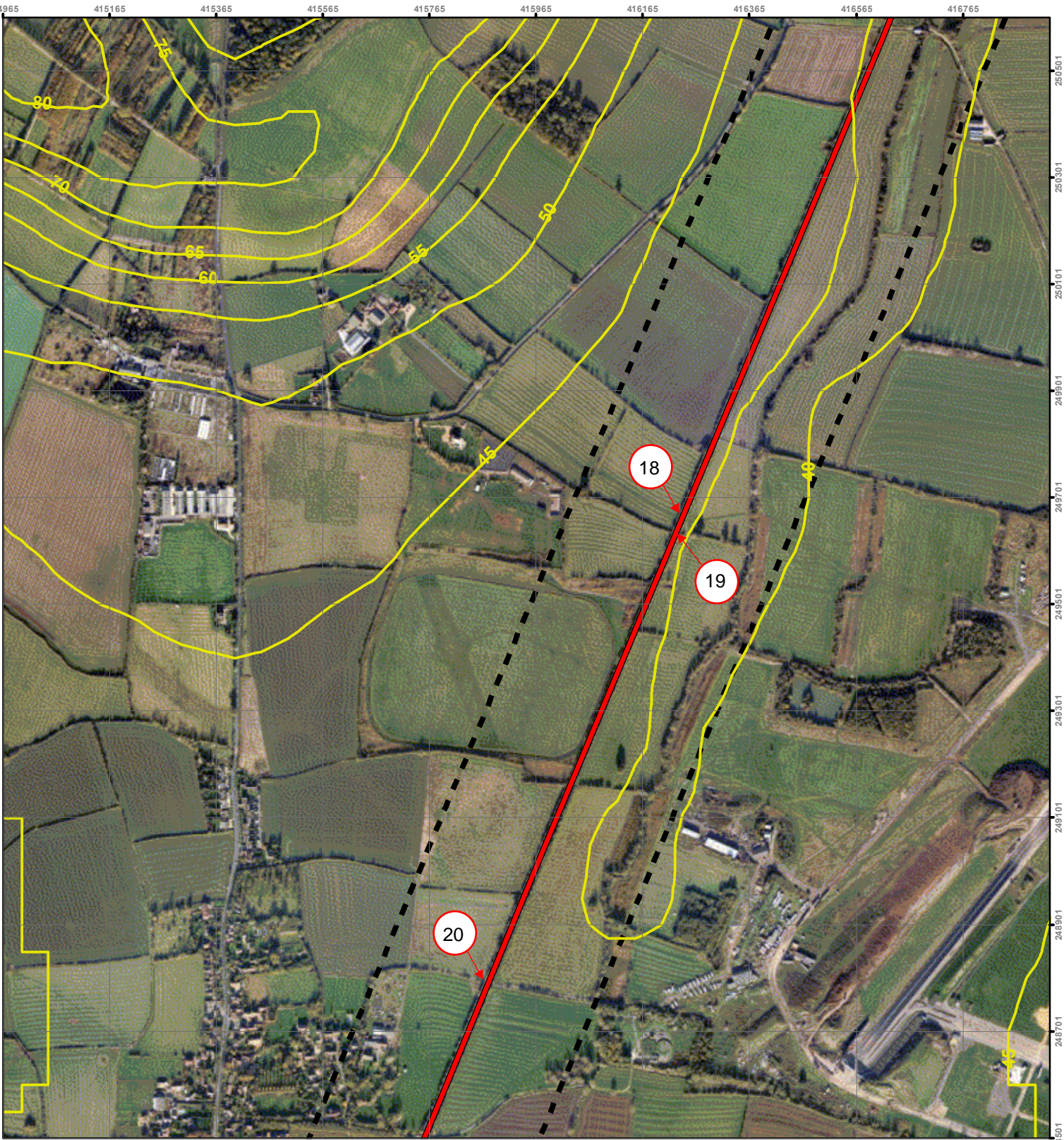
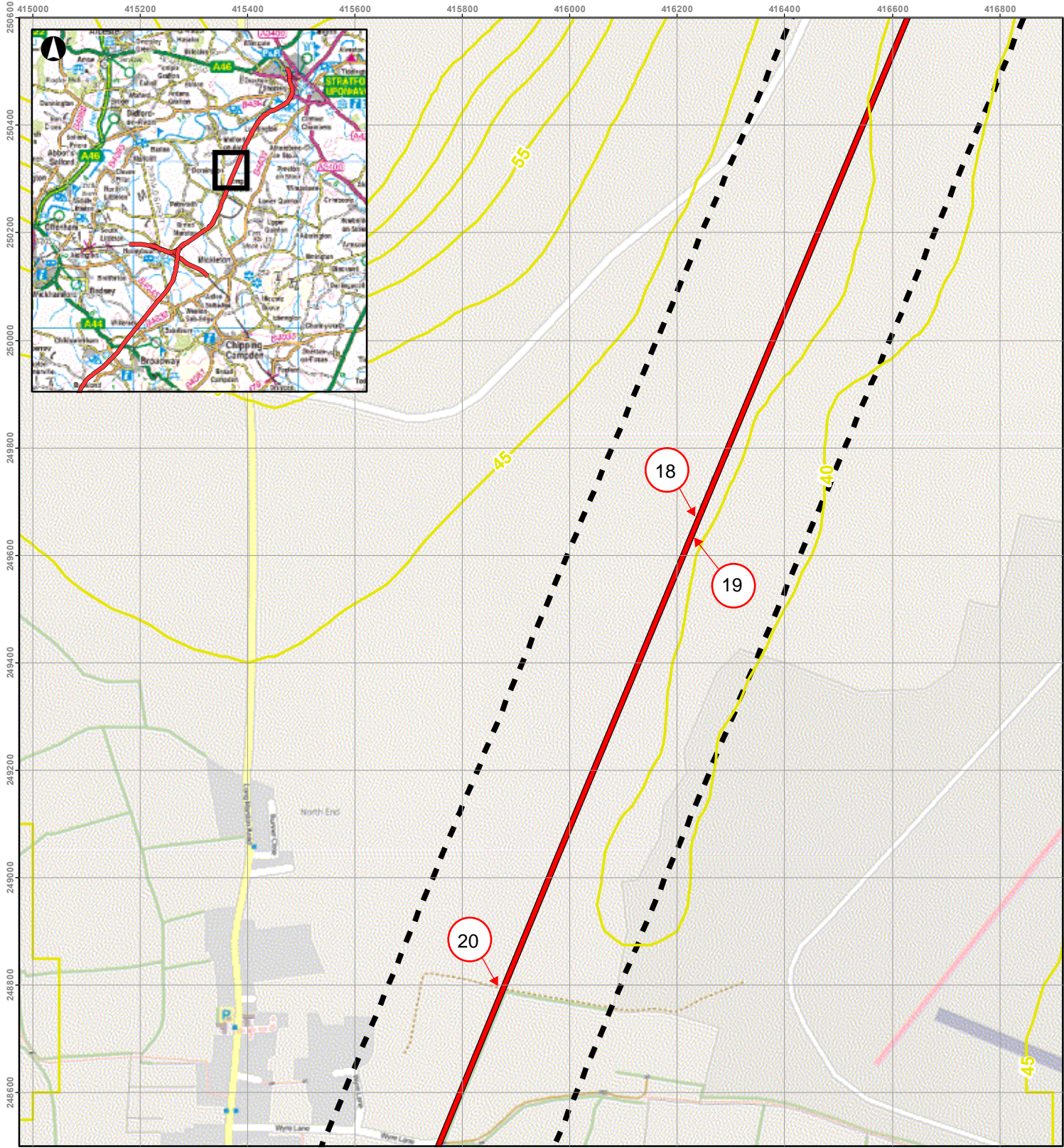
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Map 8**

Scale at A3

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Drawing No	Issue
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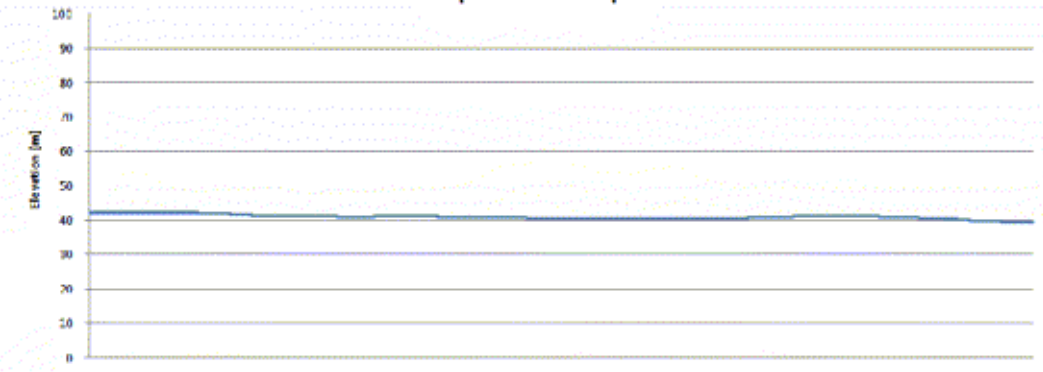




Legend

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Map 7 Profile Graph

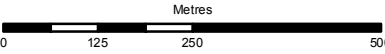


P0	2012-02-15	SJ	SJ	SJ
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Issue	Date	By	Chkd	Appd
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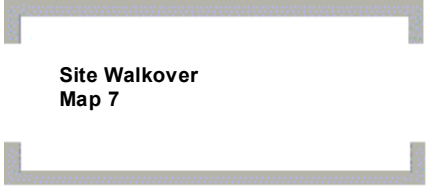
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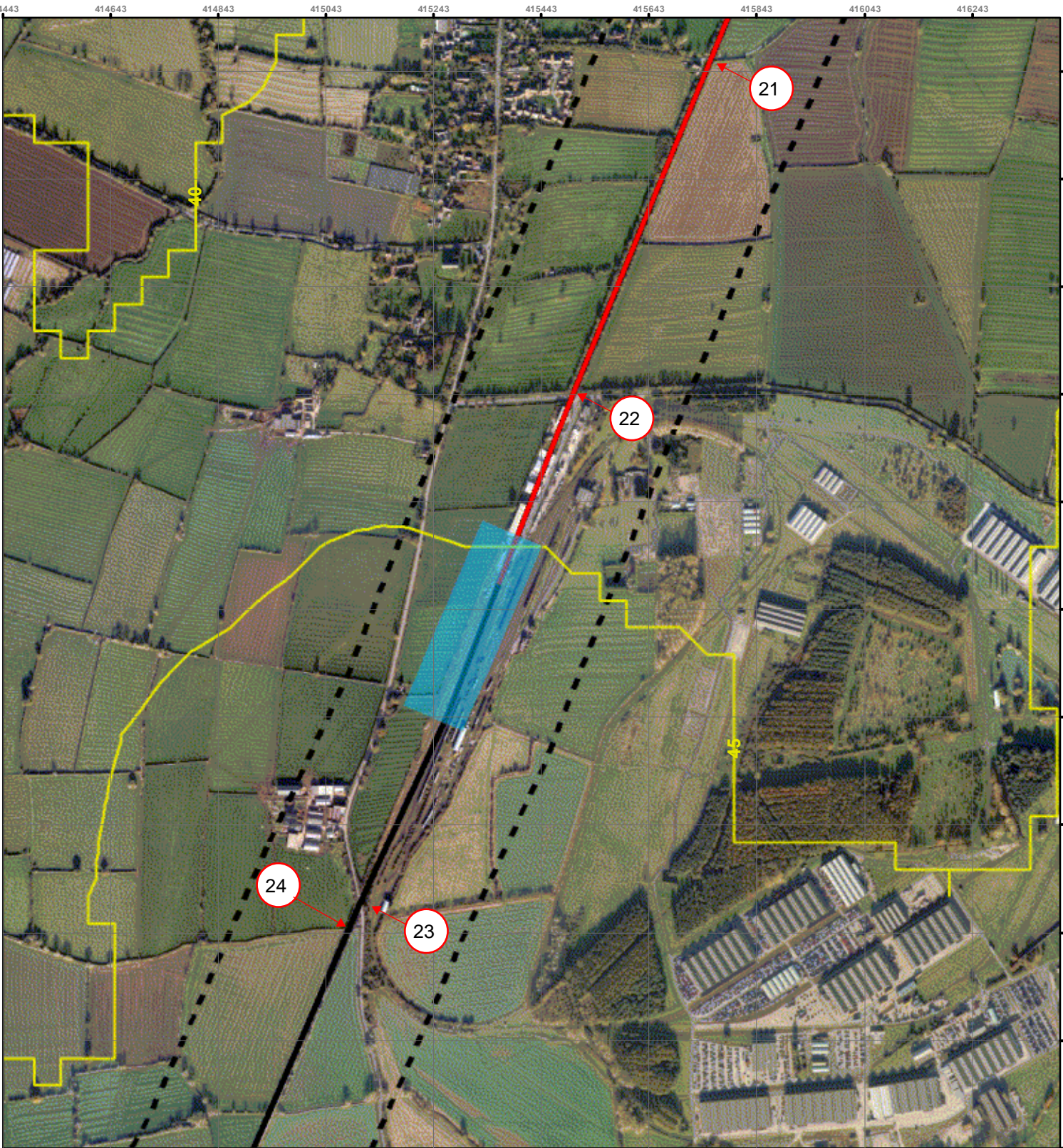
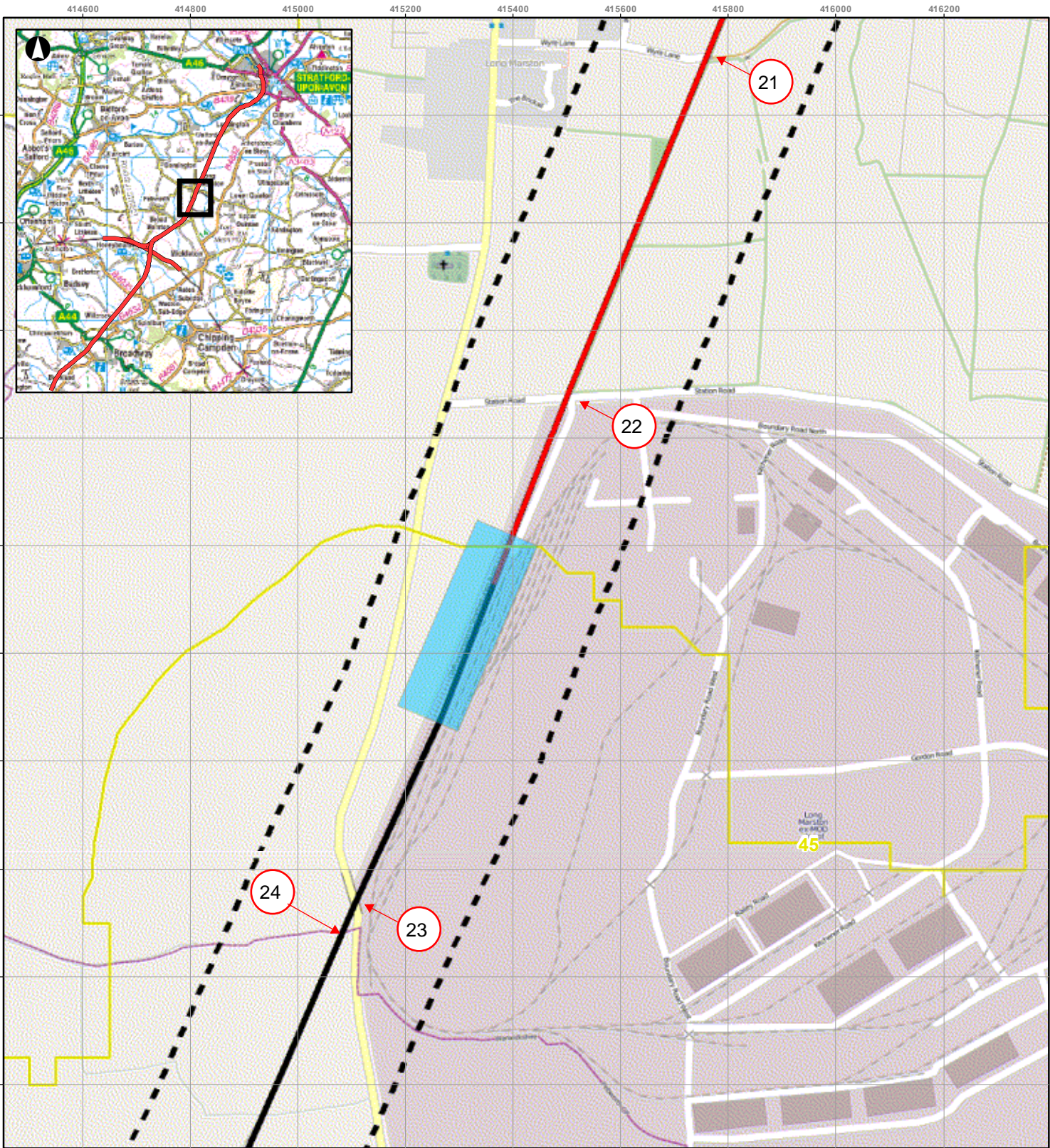
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Job Title  
**Broadway to Honeybourne and Stratford  
Railway Reinstatement**



Scale at A3 <b>1:10,000</b>	
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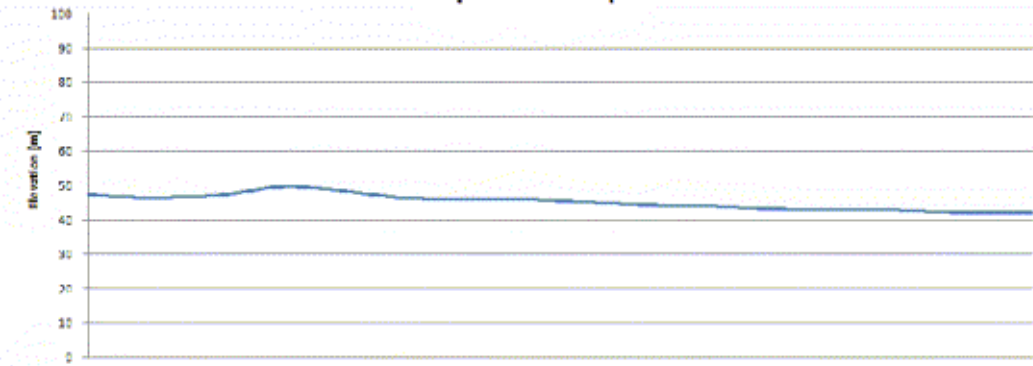




Legend

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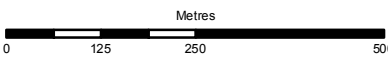
Map 6 Profile Graph



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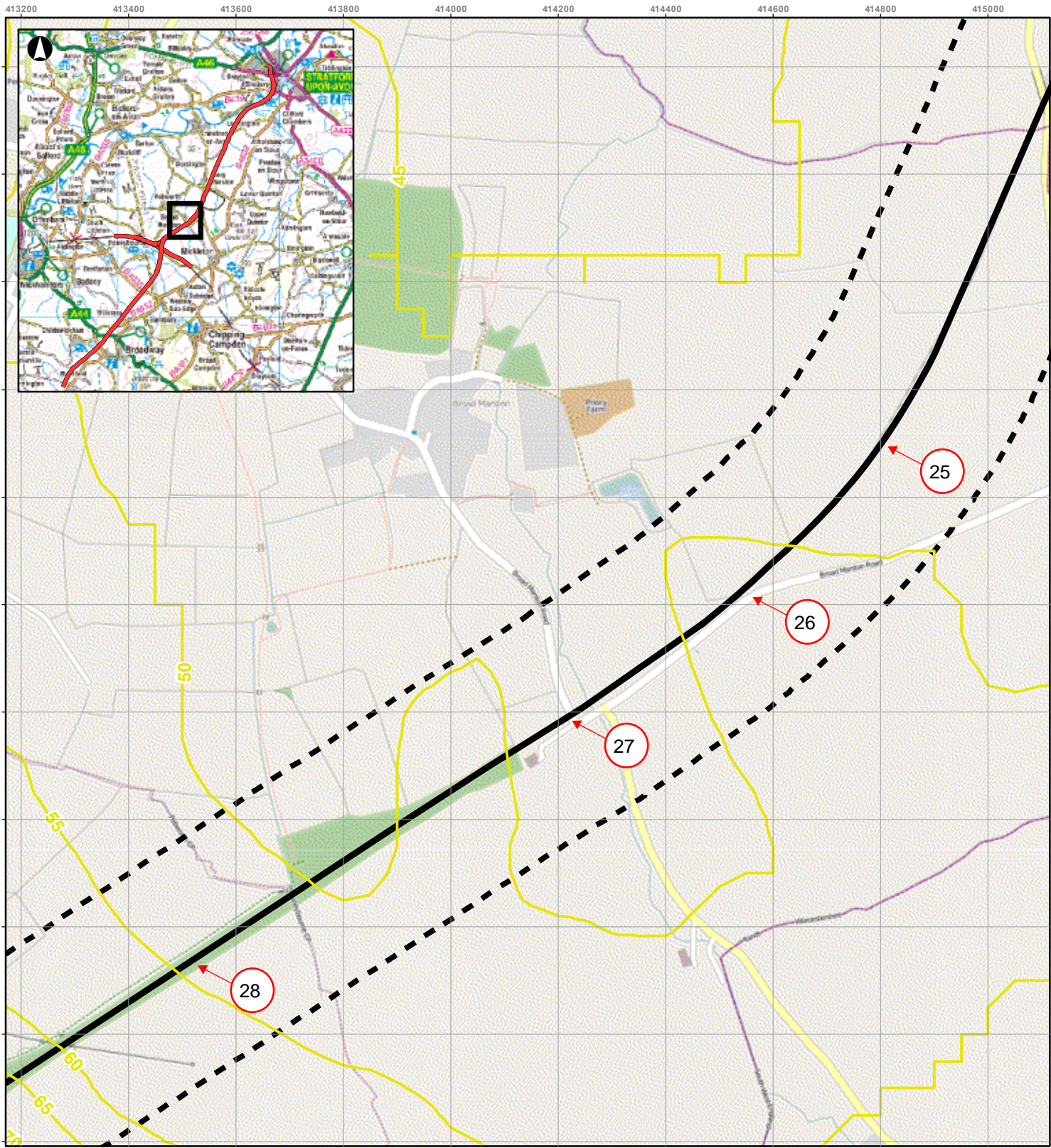
Job Title  
**Broadway to Honeybourne and Stratford  
Railway Reinstatement**

Site Walkover  
Map 6

Scale at A3  
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Job No <b>000000-00</b>	Drawing Status <b>Preliminary</b>
Drawing No <b>006</b>	Issue <b>P0</b>

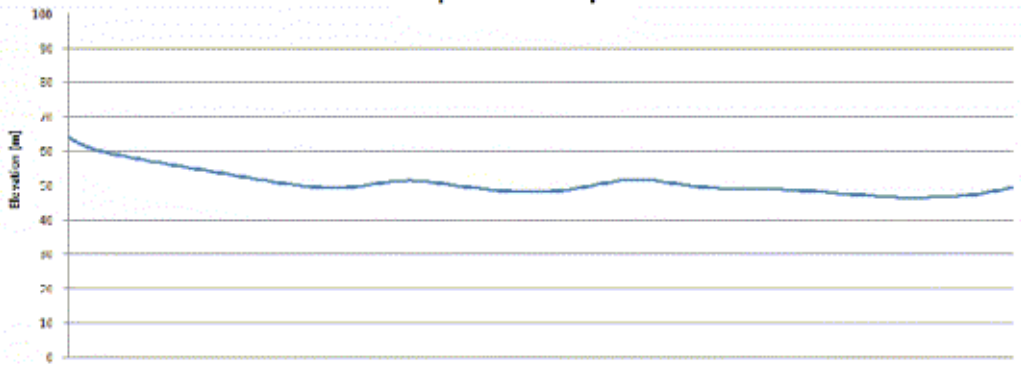




Legend

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Map 5 Profile Graph

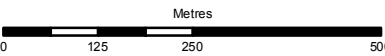


PO	2012-02-15	SJ	SJ	SJ
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Issue	Date	By	Chkd	Appd
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Job Title  
**Broadway to Honeybourne and Stratford  
Railway Reinstatement**

Site Walkover  
Map 5

Scale at A3  
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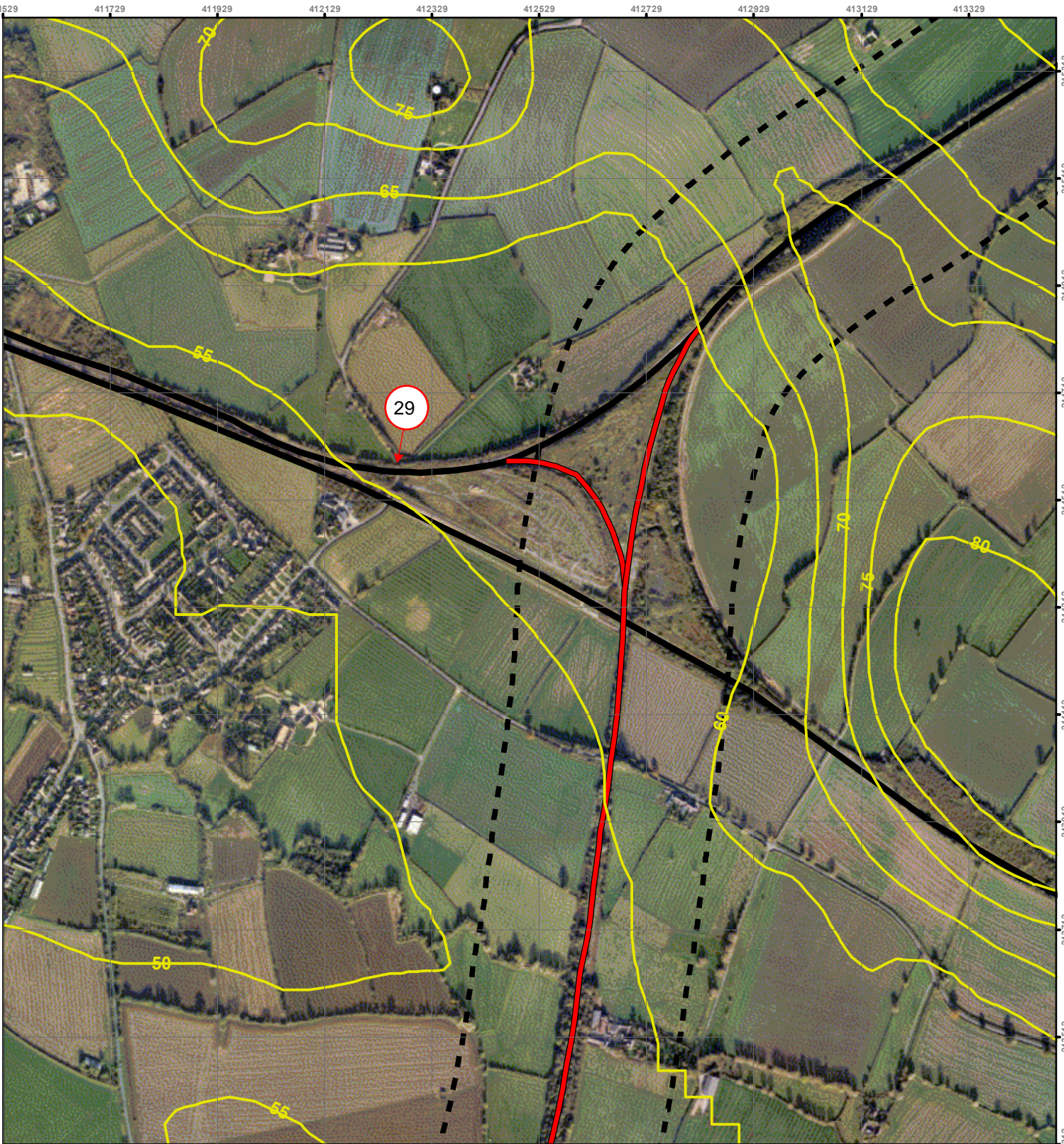
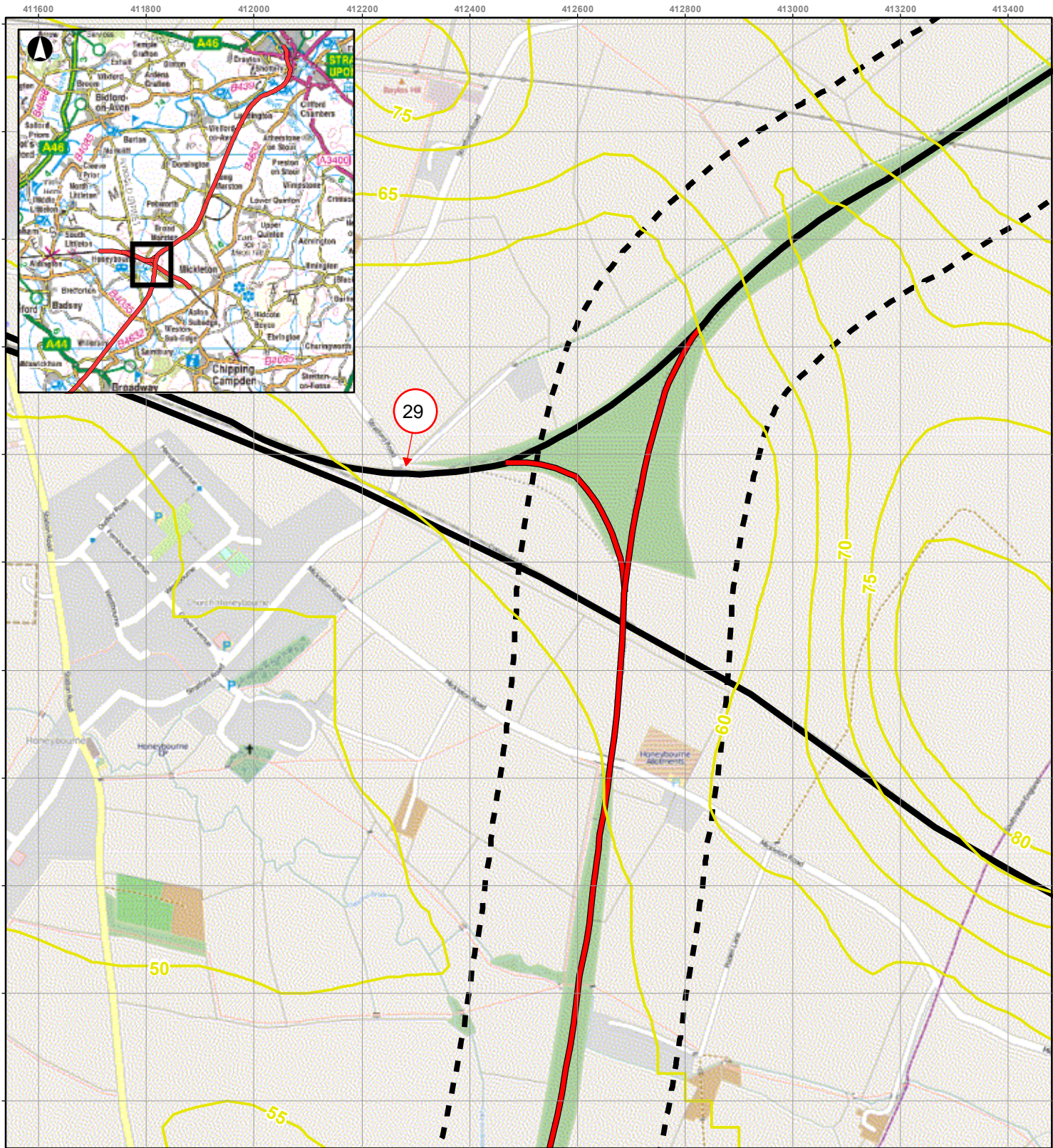
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Drawing Status  
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Drawing No  
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Issue  
**P0**

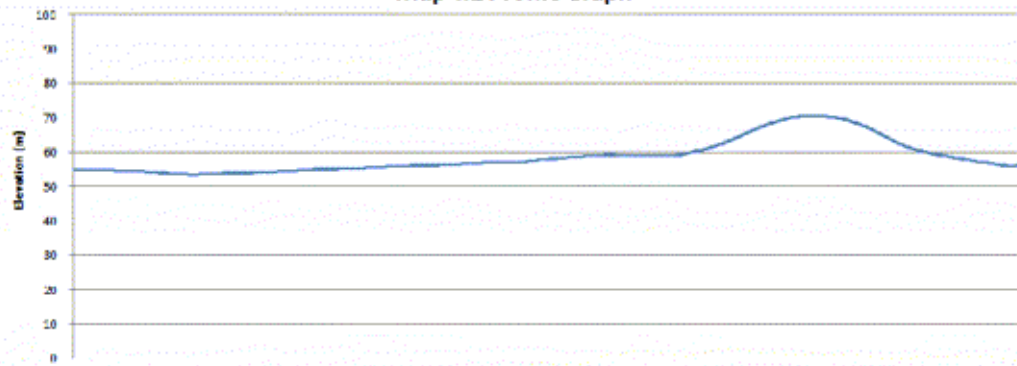




Legend

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- 200m Buffer

Map 4.2 Profile Graph

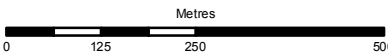


PO	2012-02-17	SJ	SJ	SJ
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Issue	Date	By	Chkd	Appd
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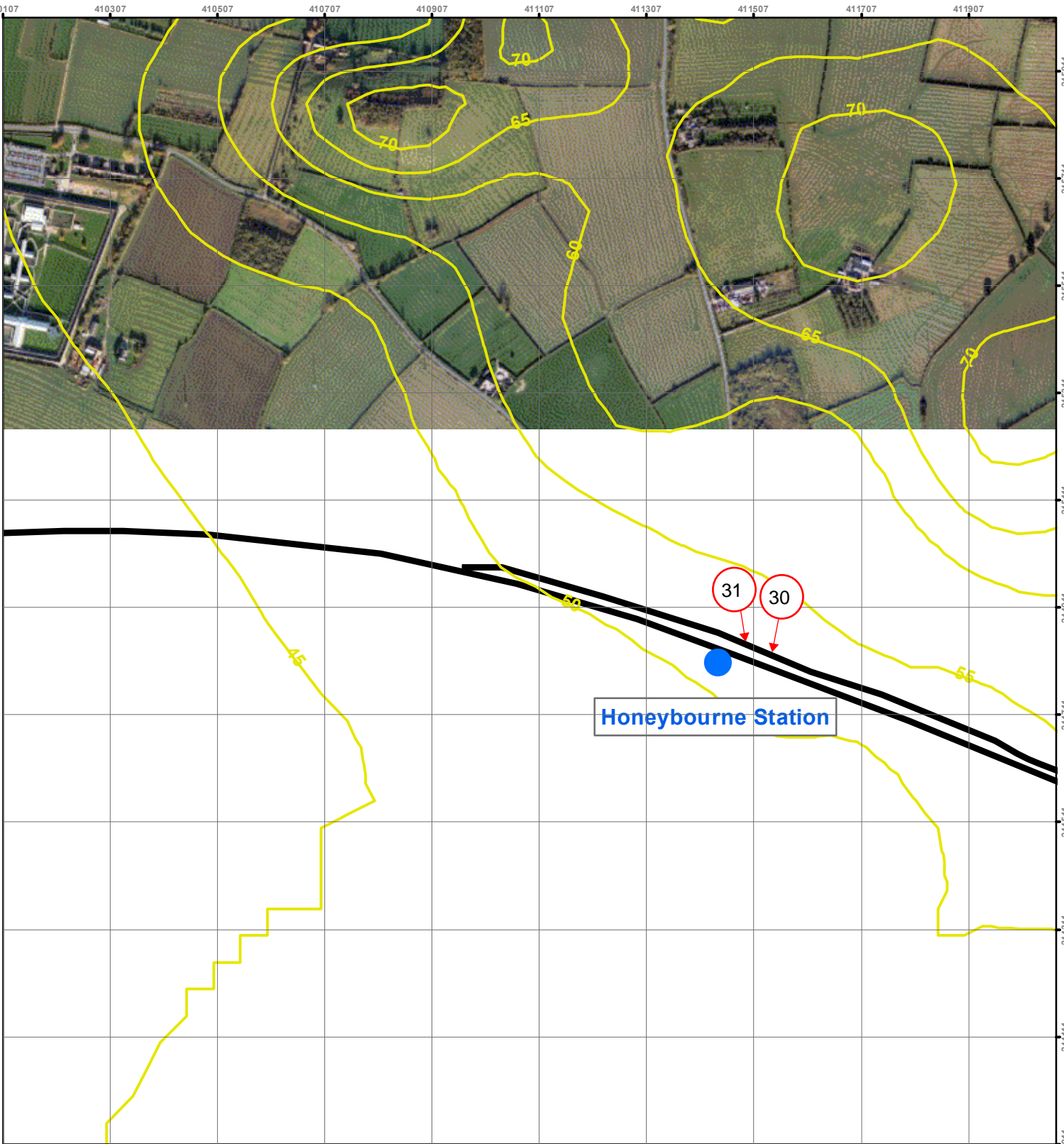
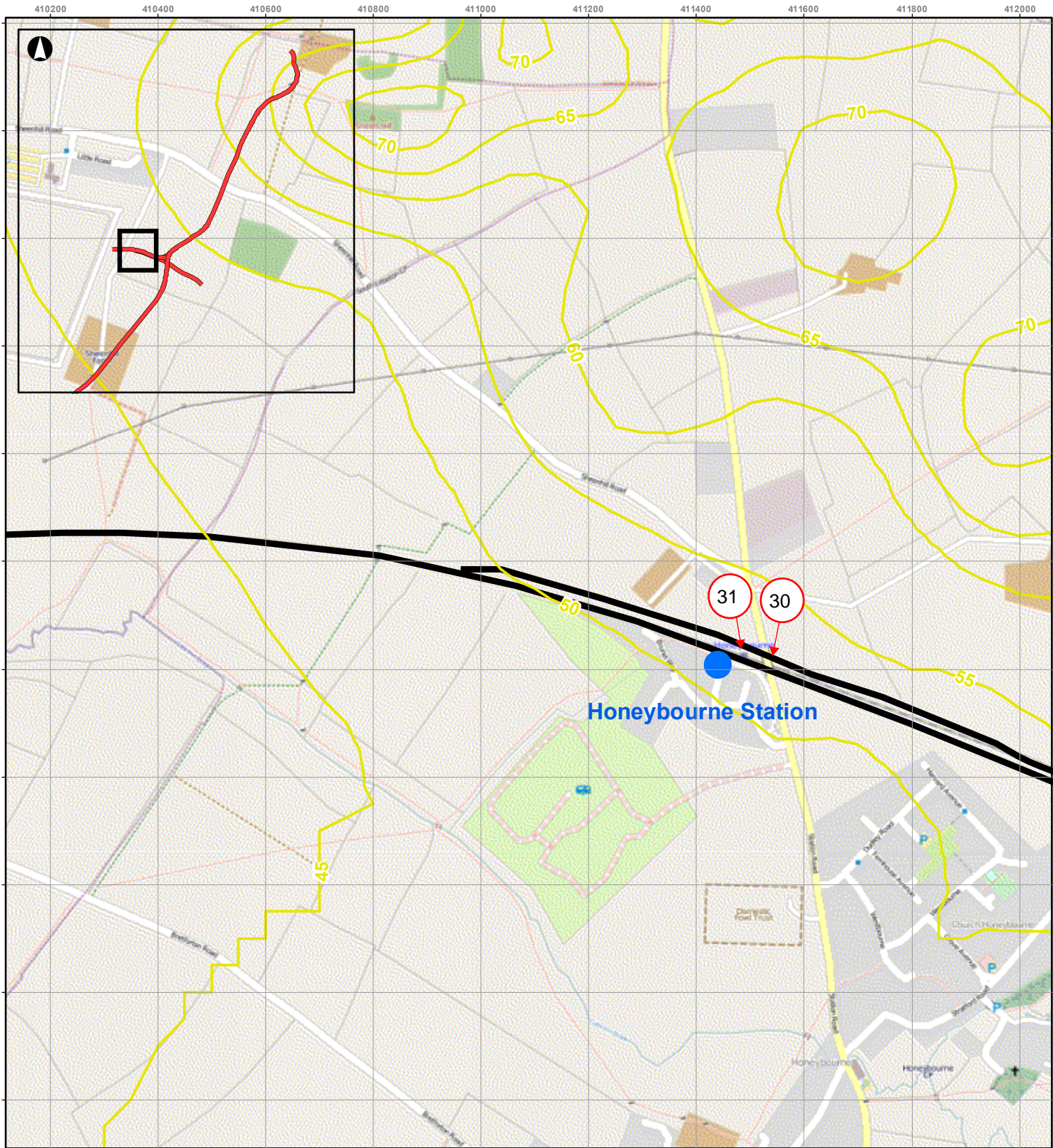
Site Walkover  
Map 4.2

Scale at A3  
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Job No <b>000000-00</b>	Drawing Status <b>Preliminary</b>
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Drawing No <b>012</b>	Issue <b>P0</b>
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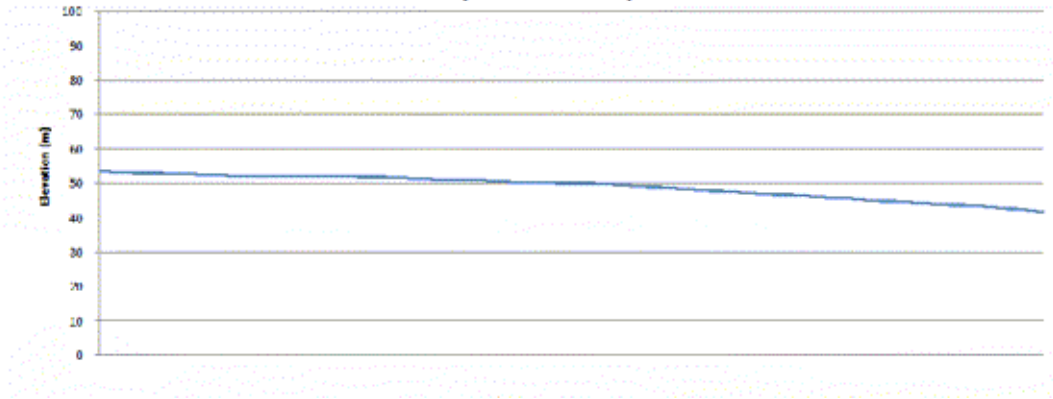




Legend

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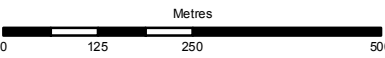
Map 4a Profile Graph



PO	2012-02-17	SJ	SJ	SJ
Issue	Date	By	Chkd	Appd

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Job Title  
**Broadway to Honeybourne and Stratford  
Railway Reinstatement**

Site Walkover  
Map 4a

Scale at A3  
**1:10,000**

Job No  
**000000-00**

Drawing Status  
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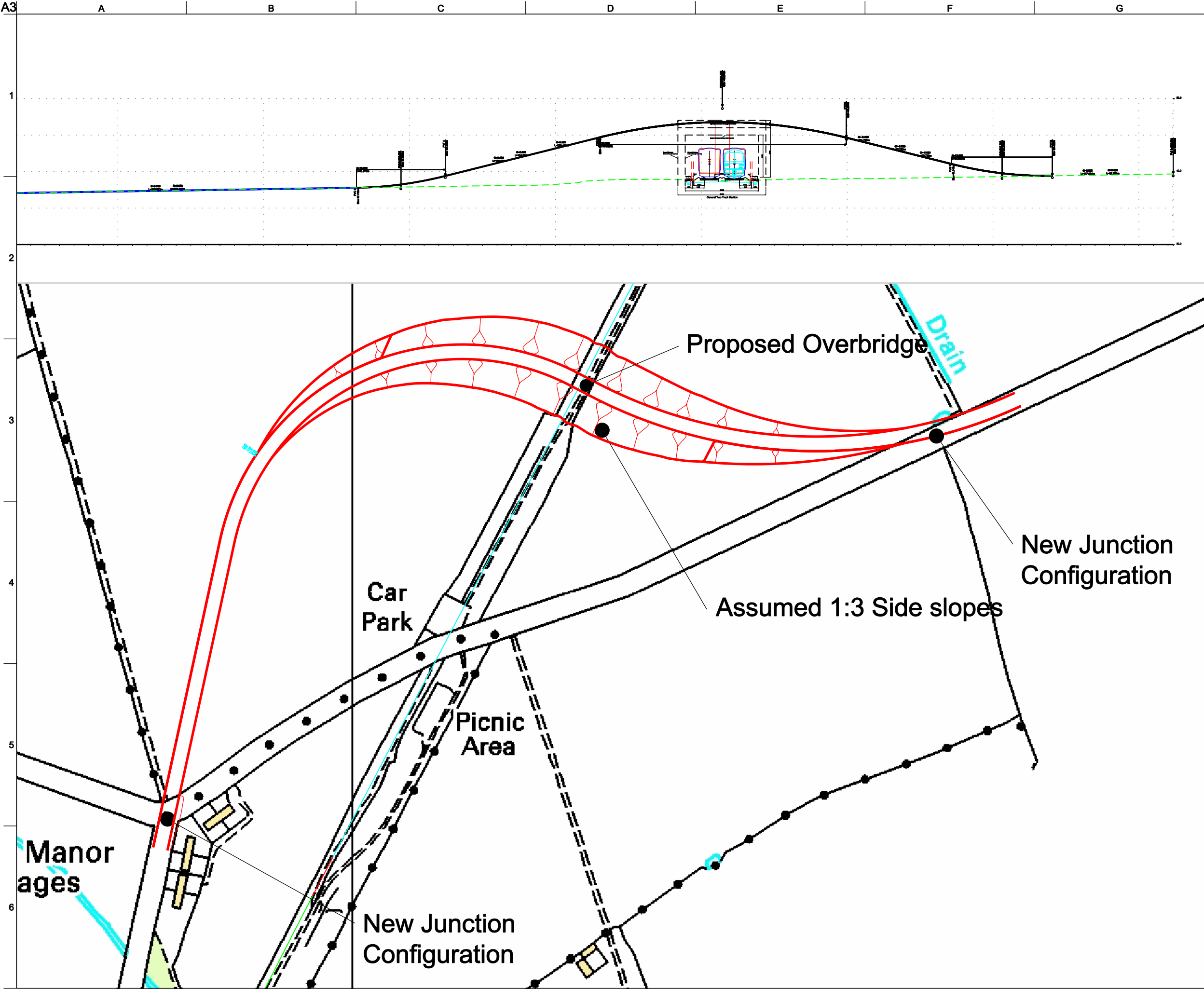
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**011**

Issue  
**P0**



## Appendix C

### Proposed Overbridges



Issue	Date	By	Chkd	Appd
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www.arup.com

Client  
**Stratford on Avon  
District Council**

Job Title  
**Stratford to Honeybourne**

**Milgate Overbridge  
Indicative Layout**

Scale at A3 1:2500

Discipline Civil Engineering

Job No <b>224132-00</b>	Drawing Status <b>Draft</b>
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Drawing No <b>CH-002</b>	Issue
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A3

A

B

C

D

E

F

G

1

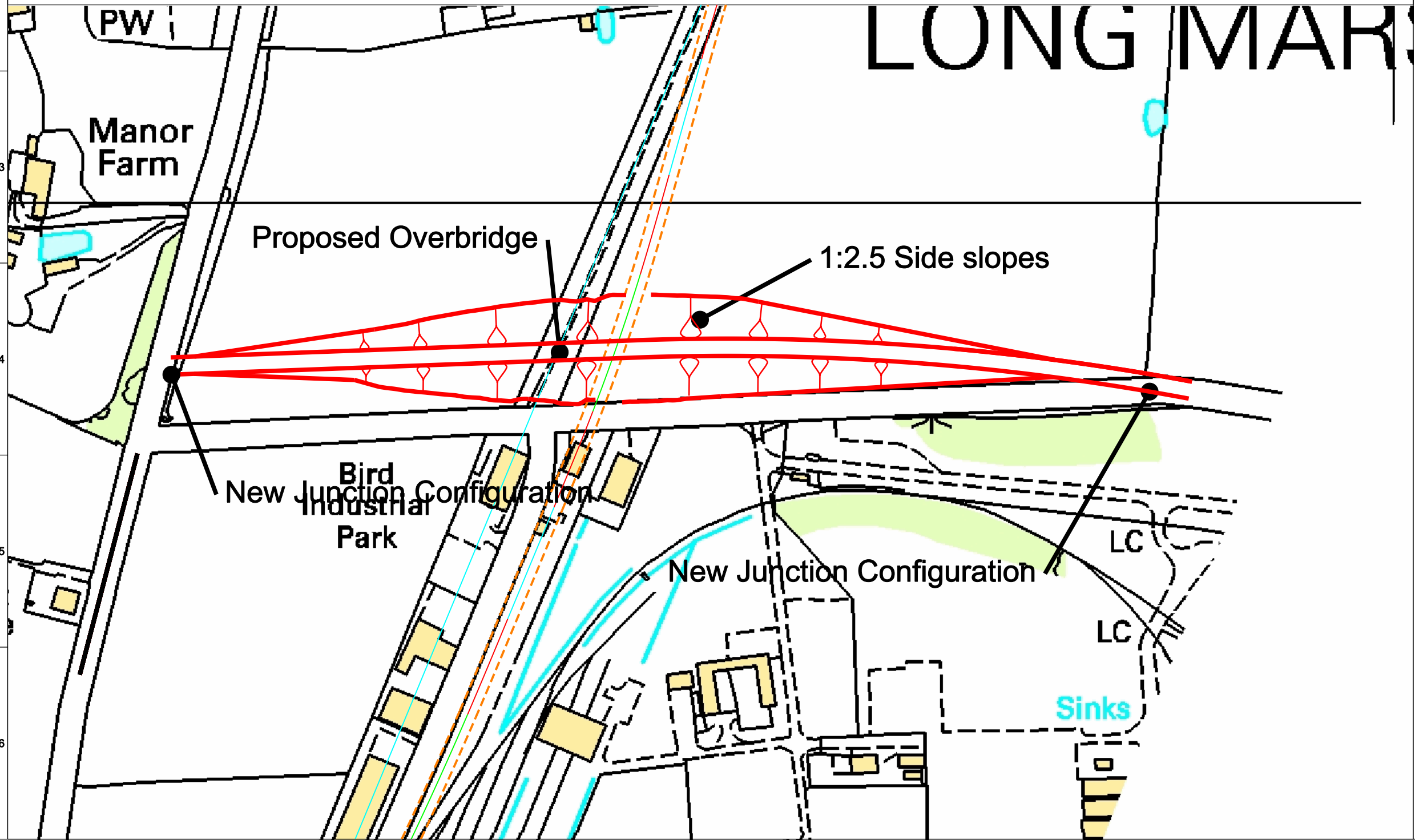
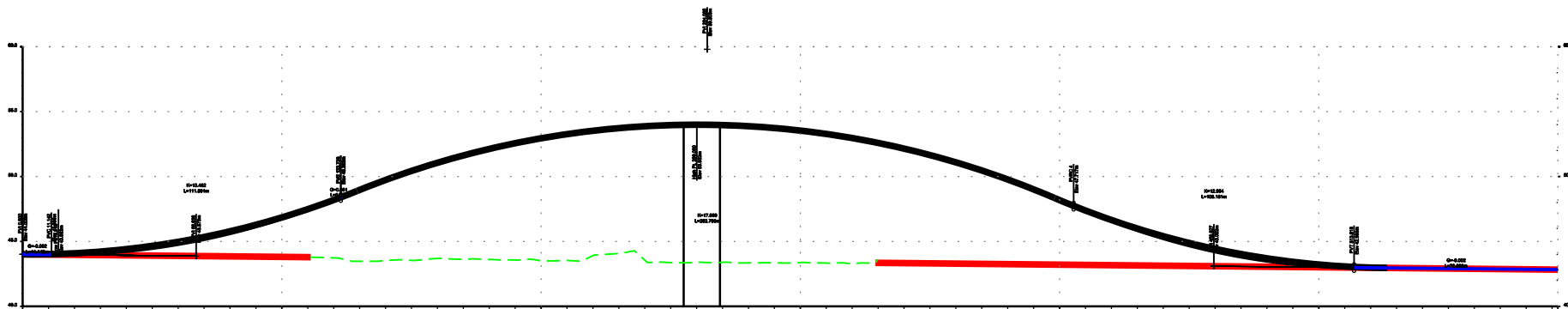
2

3

4

5

6



Do not scale

Issue	Date	By	Chkd	Appd
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Client  
**Stratford on Avon  
District Council**

Job Title  
**Stratford to Honeybourne**

**Bird Industrial Park Overbridge  
Indicative Layout**

Scale at A3  
1:2500

Discipline  
Civil Engineering

Job No  
**224132-00**

Drawing Status  
**Draft**

Drawing No  
**CH-002**

Issue

## Appendix D

### Timetabling Option



# **Stratford to Honeybourne Railway Reinstatement**

## **Train service proposals**

### **1. Objective**

The objective of this summary note is to consider a number of options for services between Stratford-upon-Avon and Honeybourne, and recommend a service pattern(s) to use for the development of a reinstated railway line between SuA and Honeybourne via Long Marston.

### **2. Train Service options**

A number of aspirational train service patterns have been identified early in this study, following consultation with Steering Group members. These services generally operate from either east or west of Honeybourne through Stratford to the West Midlands. At a high level we have investigated the viability of these services and the destinations that they might serve, also with a view to whether these new services can fit within the existing railway network infrastructure and current timetables.

Conclusions with regards to the most appropriate service patterns to consider for development of the infrastructure have been made.

This summary note is based on the current timetables in force at this date. Detailed computer based operational modelling will be required to confirm these assumptions and recommendations. Option 1 considers services west of Honeybourne; Option 2 considers services east of Honeybourne.

### **3. Option 1- Services west of Honeybourne**

#### **a. Option 1a: SuA – Honeybourne only**

The objective of this service is to connect with FGW services at Honeybourne, but the irregular pattern of services on the North Cotswold Line between Oxford and Worcester (OWW) does not lend itself to regular connections. This is illustrated in the Appendix below. As the journey time between SuA and Honeybourne is quite short (around 14 mins allowing for stops at Stratford Racecourse and Long Marston Stations and including recovery time) it is reasonably straightforward to provide trains at suitable times to connect into and out of most trains on the OWW route, and certainly all the most important trains.

Whilst the approximately 1 train per hour (1tph) service on the SuA – Honeybourne route would be irregular (to meet the key OWW services) it would be possible to resource it with one diagrammed unit. A service of two trains per hour (2tph) would be an alternative approach and connections at Honeybourne would more flexible. However, the stops at Stratford Racecourse and Long Marston would not be possible and the turnaround time at Honeybourne would have to be limited to no more than 4 minutes, which may not provide an acceptable level of reliability (even for an effectively separated operational route).

It should be noted that there are currently no planning rules for running round at Honeybourne station and arrangements for this will need to be incorporated in the scheme – either signals and crossovers (and possibly a stabling siding) or a bay platform.

An observation is that moving to a standard pattern hourly service on the North Cotswold Line would offer significant benefits from a passenger connectivity point of view, enabling other services to be overlaid more effectively, simplifying connections with other services and help to maximise the utilisation of available capacity.

### **b. Option 1b: SuA – Evesham**

Assuming the current OWW timetable continues, the journey time for a stopping train between SuA and Evesham (calling at Stratford Racecourse, Long Marston and Honeybourne) is likely to be approx. 22 mins and it is therefore just feasible to provide an hourly service utilising only one diagrammed unit, but only if infrastructure enhancements are undertaken at Evesham – see below. To achieve this performance, the service would have to be operated at a regular interval as far as possible. The following timetable indicates a possible scenario, although the gap from 17.07 until 18.30 is not ideal. This is necessary because of the departure from Honeybourne at 18.24 of the 17.32 Oxford - Great Malvern all stations train. After the 20.51 arrival at SuA any further trains would continue to be timed at irregular intervals.

Station							
Stratford-upon-Avon	d	0607	Same	1707	1830	1947	
Honeybourne	d	0621	times	1721	1844	2001	
Evesham	a	0629	until	1729	1852	2009	
Evesham	d	0640	Same	1756	1920	2030	
Honeybourne	d	0647	times	1803	1927	2037	
Stratford-upon-Avon	a	0701	until	1817	1941	2051	

The minimum turnround times at Evesham and SuA allowed by the Rules of the Plan (ROTP) are 15 and 6 minutes respectively. At SuA this assumes turnround in the same platform. For the above timetable to work it will be necessary to reduce the turnround time at Evesham to 11 minutes or less. This will require the train to terminate in either the Up or Down platform. In some hours arrival in the Up platform may have to be delayed by up to 5 minutes due to occupation of the platform, whereas use of the Down platform has fewer potential conflicting paths. Final timings are, however, subject to verification and the plan may be validated when they are confirmed. Nevertheless there will be a significant performance risk due to the tight turnrounds. There is a small degree of flexibility in the timings between Honeybourne and Evesham, but this is restrained by the need for absolute block (AB) timings between these two locations. Additional infrastructure (a new passenger service compatible crossover) and associated signalling will be probably required at Evesham to facilitate an efficient turnaround scenario for trains arriving from Honeybourne.

### **c. Option 1c: SuA – Evesham - Worcester**

The combination of the single line between Evesham and Norton Junction and the current irregular Cotswold Line service means that only a few of the above SuA – Evesham services can be readily extended to and from Worcester. Inevitably these services do not always balance in both directions and the associated resource implications could be costly.

If the Cotswold Line service could be made standard pattern, then it might be possible to provide an hourly service between SuA and Worcester, but it may be necessary to undertake further redoubling between Evesham and Norton Junction as necessary to provide sufficient capacity for a reliable service.

### **d. Option 1d: SuA – Worcester – Birmingham - SuA**

The existing Birmingham – SuA services mostly start from Stourbridge Junction whilst the Worcester – Birmingham services nearly all terminate at Whitlock's End. A proposal to extend one of the existing Dorridge terminating trains through to SuA (to create a 2tph service between Birmingham and SuA) is likely to involve trains which also start at Stourbridge Junction.

In order to create through Worcester to SuA services (via Birmingham) it will be necessary to recast either the Worcester or SuA services and either of these options would have implications for a number of other services using the same routes. Fairly realistic examples of possible timings from Worcester to SuA via Birmingham, assuming speeded-up sectional running times (SRTs) for Class 172 operation, would be Worcester Shrub Hill depart at 1100, arrive SuA at 1240 via Dorridge; or Shrub Hill depart at 1130, arrive SuA at 1320 via Whitlock's End.

Given some retiming of Cotswold Line services to a regular pattern service, departures from SuA towards Honeybourne at xx20-30 should be feasible, giving arrivals at Worcester Shrub Hill c.45 mins later at xx05-15. These times do not coincide with the expected departure times from Worcester Shrub Hill, although running the trains through to Foregate Street and reversing might, in theory, be possible.

However, it may be that this scenario would not be acceptable to either Network Rail or the TOC in terms of performance, as the only way to recover from delays would be to retain a spare unit diagram that could be dropped into the circuit to facilitate 'catch-up'.

Validating this option would involve a major computer based re-timetabling exercise beyond the scope of this paper.

#### **e. Option 1e: Connections north of SuA**

In principle, Honeybourne trains could link with the LM trains that terminate and start at SuA, but extending these services may not offer an efficient or timely connection with North Cotswold Line services at Honeybourne. Turnround times of LM services at SuA are tight and extending the services to Honeybourne would require additional rolling stock diagrams.

Perhaps more interesting would be the long term possibility of linking with the NUCKLE project by extending the proposed (Nuneaton) – Coventry – Kenilworth – Leamington service to SuA and beyond. However, the second phase of this project (Coventry – Leamington) may not be included in the next Control Period (CP5) for 2014-19 and possibly not the one after.

In practical terms there may be problems with reversing at Leamington and more particularly with the 5 mile single line section between Hatton and Bearley with its 12 minute headway. This section of line is almost certain to have, by December 2013 if not before, an hourly SuA – Birmingham service via Dorridge, plus the irregular Chiltern service, which will have been altered significantly in order to accommodate the new SuA – Dorridge – Birmingham service.

### **4. Option 2- Services east of Honeybourne**

#### **a. Option 2a: SuA – Oxford**

This option assumes that the existing Moreton-in-Marsh terminating services would be extended to become SuA terminating services, running direct via a reinstated eastern chord at Honeybourne.

The theoretical capacity of the Cotswold Line following the recent redoubling scheme is 2tph, however, the non-standard pattern of the current OWW timetable renders this capacity difficult to achieve throughout the day.

Assuming that the Cotswold Line service became a standard hourly pattern, then a SuA – Oxford service would be feasible. It is important to understand what if any additional infrastructure enhancements are necessary to support this service, so further operational analysis would be necessary.

Even if the Cotswold Line OWW timetable is changed to a standard hourly pattern, it is likely that it will be developed to optimise the Great Western Franchise Worcester to Paddington services on that

route and any new SuA services will have to fit in as efficiently as possible. For a SuA service to Oxford or Paddington, as well as a SuA to Honeybourne or Evesham/Worcester (giving 2tph south of SuA to Honeybourne North Junction) it will be likely that a section of double track will be necessary. Without a full computer-based timetabling exercise, it is difficult to accurately determine the location and extent of this doubling required on the SuA – Honeybourne line.

Fitting in services from SuA to both Oxford and Evesham with existing services on the Cotswold Line is going to be a complex exercise even with section(s) of double line available.

#### **b. Option 2b: SuA – Oxford - Paddington**

Once the Paddington – Oxford route (and not beyond) is electrified, the through services from Paddington to Worcester on to the Cotswold Line are likely to be provided by either hybrid IEP trains or the remaining HSTs. Based upon this strategy, only diesel powered trains will be able to travel from SuA to Oxford. Direct connection to Paddington may be possible if these trains are permitted to run beneath the wires from Oxford to Paddington.

#### **c. Option 2c: Birmingham - SuA – Oxford**

Whilst it is possible to extend SuA – Oxford trains to/from Birmingham, the paths available via the Whitlock's End route will be slow, as they will have to fit in between a frequent all stations service. Although the resignalling of this route has introduced track circuit block (TCB), the 2013 ROTP require trains to be timed as AB, and this will further restrict the availability of paths. Even if additional paths can be created they will still be relatively slow.

Additional through paths via the Bearley – Hatton single line and Dorridge will almost certainly require additional infrastructure enhancement as paths via this route are even more restricted than via Whitlock's End. Given additional capacity between Bearley and Hatton, paths via this route are almost certain to be faster than via Whitlock's End.

### **5. Options 3 and 4: Freight and spare paths**

Given the challenges presented in achieving the various services specified in Options 1 and 2, further paths can be created, but may require infrastructure enhancements. These enhancements may be required for the Cotswold Line, and lines serving SuA from the north. Timetables could also be modified at certain off peak times, enabling freight trains to utilise a peak hour passenger service path.

Additional intermediate signals on some of the single lines may be sufficient to create the necessary capacity, however any enhancements must ensure robust reliability is achieved.

Occasional access to Long Marston Depot and Honeybourne Airfield Distribution centre is unlikely to be problematic given either double track between Long Marston and Honeybourne and/or an hourly passenger service on a single line throughout.

### **6. Options 5: Other ideas for beneficial services**

If the preferred option to emerge from this study is a passenger shuttle service, operating an hourly service on a single line, then the prospect of running from Honeybourne to SuA Parkway is worth further consideration, as mentioned in Option 1e above. Additional infrastructure enhancements may be required to implement this service with the associated turn-back move.

Reopening the Honeybourne – Cheltenham route would also be necessary for diversion of South West (and potentially South Wales) – West Midlands traffic along the Honeybourne to Stratford route, unless run around moves were performed at Worcester, which would add to the journey time of freight

traffic. Other opportunities would be for long distance heavy freight traffic to avoid the Lickey Incline, with minimal journey time penalty, perhaps new passenger services to serve stations currently operated by the Gloucestershire and Warwickshire Steam Railway (GWSR) and for additional longer distance GWSR and other heritage services. A key aspect of the reinstated route would be diversionary capability if the existing Bristol/Birmingham mainline route is closed to traffic.

## **7. Conclusions**

### **a. Stratford on Avon to Honeybourne (Minimum Service Provision)**

It can be concluded that the most cost-effective operation would be a self-contained SuA – Honeybourne / Evesham shuttle. If this shuttle ran from Honeybourne only, then there is an opportunity of continuing the service north of SuA to a turn-back at SuA Parkway. This parkway station is likely to open within the next 5 years, and a frequent service between SuA Parkway and SuA is highly desirable. The SuA Parkway – Honeybourne service itself could not be more frequent than hourly (with single track throughout) but it would also stop at Long Marston and SuA Racecourse.

### **b. Leamington to Worcester**

If timetable improvements or infrastructure enhancements in adjacent areas are viable then a (Coventry) - Leamington – SuA - Worcester – (Hereford) service would seem to give good prospects for revenue growth. Infrastructure enhancements to the routes between Bearley and Hatton and between Evesham and Norton Junction may be required for this service to be operated reliably. This service would replace the SuA to Honeybourne Shuttle.

### **c. SuA to Oxford (use terminating MiM service pathway – extended to SuA)**

With a standard pattern timetable for existing FGW long-distance services, the existing FGW services that terminate at Moreton-in-Marsh might, with some adjustments, be extended through to SuA, although, as things stand, that would probably require an additional unit.

### **d. Freight Services**

It may be that the 2tph capacity for passenger services on the OWW is not required all day (especially off peak). If so, then the second (off peak) path on the SuA – Honeybourne line could also be allocated to freight services diverted from the Banbury route. However, this may require additional enhancements to the route and especially the Bearley – Hatton route. On the other hand it is unlikely that the freight requirement would be hourly, which would leave additional paths available for recovery, reliability and ad-hoc moves (ECS, Engineering and Charter trains etc).

**Appendix – December 2011 M-F Service at Honeybourne**

		Moreton-in-Marsh			Honeybourne		Evesham				
Destination	Origin								Origin	Destination	
(All PAD except :)											
		0547			0536	←	0529		WOS		
	MIM		0546	→	(0554)			0600		WOF	
		0609			(0600)	←	0554		GMV		
		0709			0658	←	0651		HFD		
OXF		0728			(0718)	←	0713		WOF		
			0730	→	0741			0748		WOF	
		0811			0759	←	0752		HFD		
			0838	→	0849			0856		GMV	
		0923			0911	←	0904		WOF		
			0958	→	1009			1017		HFD	
		1049			1037	←	1031		GMV		
			1059	→	(1108)			1114		WOF	
			1156	→	1207			1215		HFD	
		1250			1238	←	1225		WOF		
			1253	→	1304			1311		GMV	
			1355	→	1406			1412		GMV	
		1448			1437	←	1430		HFD		
		1524			1512	←	1506		GMV		
			1553	→	1604			1611		WOF	
DID		1614			(1605)	←	1559		GMV		
		1640			1628	←	1621		HFD		
			1727	→	1739			1746		WOS	
		1806			1754	←	1748		WOF		
	OXF		1813	→	1824			1831		GMV	
			1854	→	1906			1913		HFD	
		1931			1920	←	1912		WOF		
			1927	→	(1938)			1943		WOS	
			2000	→	2012			2019		HFD	
		2039			2027	←	2020		GMV		
			2056	→	2107			2115		HFD	
		2139			2128	←	2121		WOF		
			2154	→	2205			2213		GMV	
		2319			2308	←	2301		HFD		
			2332	→	2344			2350		WOS	

**N.B All times are advertised public times except passing times (in brackets), which have been estimated.**

**Appendix E**

**Construction Cost Estimate**



**High Level initial Estimate, for business case works only**

**Project**

**Stratford to Honeybourne Reinstatement  
Do minimum Track Option**

**Date:**

**26 July 2012**



# Stratford to Honeybourne

## DESIGN

### Bill of Quantities

Ref. No	Description	Quantity	UoM	Rate £	Item Total £
	<b>DESIGN</b>				<b>3,238,277.50</b>
	<b><u>GRIP 4 DESIGN</u></b>				
1	Signalling Design	5%	sum	3,000,000	135,000.00
2	Track Design	2%	sum	15,632,500	312,650.00
3	Civils Design	4%	sum	29,802,000	1,192,080.00
4	Telecoms Design	3%	sum	1,500,000	45,000.00
5	E&P Design	3%	sum	1,000,000	30,000.00
6	Operational Property Design	4%	sum	2,000,000	80,000.00
	<b><u>GRIP 5 Design</u></b>				
7	Signalling Design	3%	sum	3,000,000	90,000.00
8	Track Design	2%	sum	15,632,500	234,487.50
9	Civils Design	3%	sum	29,802,000	894,060.00
10	Telecoms Design	3%	sum	1,500,000	45,000.00
11	E&P Design	3%	sum	1,000,000	30,000.00
12	Operational Property Design	5%	sum	2,000,000	100,000.00
	<b><u>GRIP 6 Design</u></b>				
13	Allowance for As Built Drawings	1	sum	50,000	50,000.00
			<b>Total</b>		<b>3,238,277.50</b>

## PRELIMINARIES

Duration on Site: 104

Weeks

## Bill of Quantities

Ref. No	Description	Quantity	UoM	Rate £	Item Total £
	<b>PRELIMINARIES</b>	4	%		<b>2,750,000.00</b>
	<b><u>CONTRACTOR'S STAFFING</u></b>				
	<u>Project Management</u>				
1	Senior Project Manager		Hrs	74	0.00
2	Project Manager		Hrs	65	0.00
3	Assistant Project Manager		Hrs	47	0.00
	<u>Commercial Management</u>				
4	Senior Commercial Manager		Hrs	74	0.00
5	Commercial Manager / Q.S.		Hrs	52	0.00
6	Commerical Assistant		Hrs	37	0.00
	<u>Financial Management</u>				
7	Finance Manager		Hrs	59	0.00
8	Financial Assistant		Hrs	35	0.00
	<u>Administration</u>				
9	Document Controller		Hrs	31	0.00
10	Team Organiser		Hrs	20	0.00
	<u>Planning</u>				
11	Planning Manager		Hrs	60	0.00
12	Planner		Hrs	49	0.00
	<u>Engineering</u>				
13	Senior Project Engineer		Hrs	65	0.00
14	D&C Engineer - Signalling		Hrs	65	0.00
15	D&C Engineer - E&P		Hrs	52	0.00
16	D&C Engineer - P.Way		Hrs	52	0.00
17	D&C Engineer - Telecoms		Hrs	52	0.00
18	D&C Engineer - Civils		Hrs	52	0.00
19	Graduate Engineer		Hrs	22	0.00
	<u>Health, Safety, Quality &amp; Environment</u>				
20	Safety Manager		Hrs	47	0.00
21	Environmental Manager		Hrs	47	0.00
	<u>Construction Management</u>				
22	Construction Manager		Hrs	45	0.00
23	Foreman		Hrs	31	0.00
	<u>Expenses</u>				
24	Hotels		nr	90	0.00
	<b>CONTRACTOR'S STAFFING TOTAL</b>				<b>0.00</b>
	<b><u>SITE ESTABLISHMENT</u></b>				
	<u>Offices and Equipment</u>				
25	Mobilisation		item	20,000	0.00
26	Demobilisation		item	10,000	0.00
27	Offices/Cabins (20 staff)		Wks	200	0.00

## PRELIMINARIES

Duration on Site: 104

Weeks

## Bill of Quantities

Ref. No	Description	Quantity	UoM	Rate £	Item Total £
	<b>PRELIMINARIES</b>	4	%		<b>2,750,000.00</b>
28	Drying room		Wks	100	0.00
29	Toilets		Wks	150	0.00
30	Mess room/Canteen		Wks	200	0.00
31	Stores		Wks	100	0.00
32	Artificial lighting and power		Wks	150	0.00
33	Consumables		Wks	100	0.00
34	Phones, fax, copier etc.		Wks	150	0.00
35	Services connections (water/elec etc)		Wks	300	0.00
36	Administration		Wks	150	0.00
37	Combi Unit		Wks	200	0.00
38	Site transport (Vans etc)		Wks	550	0.00
39	Insurance		%	31,178,429	0.00
40	General plant		Wks	1,250	0.00
41	Security (guard and cabin)		Wks	1,000	0.00
	<b>SITE ESTABLISHMENT TOTAL</b>				<b>0.00</b>
	<b><u>SITE RENTAL / COMPENSATION</u></b>				
42	Land rental for 3 nr compounds		Wks	500	0.00
43	Land owner disturbance / compensation		Wks	2,000	0.00
44	Access costs (licence provision) to worksites 05U, 05D and 06 for 8 weeks		wks	500	0.00
45	Temporary occupation of above		wks	500	0.00
46	Access costs (licence provision) to worksite 08 for 12 weeks		wks	250	0.00
47	Temporary occupation of above		wks	500	0.00
48	Access costs (licence provision) to worksite 10 for 4 weeks		wks	250	0.00
49	Temporary occupation of above		wks	500	0.00
50	Access costs (licence provision) to worksites 11 & 12 for 5 weeks		wks	250	0.00
51	Temporary occupation of above		wks	500	0.00
52	Access costs (licence provision) to worksite 15 for 4 weeks		wks	250	0.00
53	Temporary occupation of above		wks	500	0.00
54	Access costs (licence provision) to worksite 16 for 8 weeks		wks	250	0.00
55	Temporary occupation of above		wks	500	0.00
56	Temporary occupation of worksite 18 for 4 weeks		wks	500	0.00
57	Access costs (licence provision) to worksite 20 & 21 for 4 weeks		wks	250	0.00
58	Temporary occupation of above		wks	500	0.00
59	Temporary occupation of worksite 22 for 8 weeks		wks	500	0.00
	<b>SITE RENTAL / COMPENSATION TOTAL</b>				<b>0.00</b>
	<b><u>METHOD RELATED PRELIMINARIES</u></b>				

## PRELIMINARIES

Duration on Site: 104

Weeks

## Bill of Quantities

Ref. No	Description	Quantity	UoM	Rate £	Item Total £
	<b>PRELIMINARIES</b>	4	%		<b>2,750,000.00</b>
60	Site Compound (400 m2) x 3		m2	10	0.00
61	Access ramp(s) to track		sum	5,000	0.00
62	Task lighting		Wks	450	0.00
63	Traffic/pedestrian management		Wks	500	0.00
64	Temp. fencing (erect & maintain)		m	50	0.00
65	Temp. hoarding (erect & maintain)		m	37	0.00
66	Attendance on other subcontractors		sum	50,000	0.00
67	Site Access / Haul Roads		m	50	0.00
	<b>METHOD RELATED PRELIMINARIES TOTAL</b>				<b>0.00</b>
	<b><u>POSSESSION MANAGEMENT</u></b>				
68	NR POSSESSION MANAGEMENT PROVISION		Shift	252	0.00
			Shift		0.00
69	PICOP £29hr min shift 12hrs			348	
			Shift		0.00
70	COSS £27/hr min shift 12hrs			324	
71	ES planning/attendance mtgs £20/hr, min shift 8hrs		Shift	160	0.00
72	ES £25/hour, min shift 12hrs		Shift	300	0.00
	<b>POSSESSION MANAGEMENT TOTAL</b>				<b>0.00</b>
			<b>Total</b>	<b>£</b>	<b>2,750,000.00</b>



# Stratford to Honeybourne

## SIGNALLING

### Bill of Materials

Ref. No	Description	Quantity	UoM	Rate £	Item Total £
	<b>SIGNALLING</b>		sum		<b>3,000,000.00</b>
	<b>Controls</b>				
1	Mods to Control System		No	50,000	0
2	Mods to Indication System		No	25,000	0
3	Mods to train describer		No	10,000	0
	<b>Interlockings</b>				
4	Mods to Interlocking Stratford		No	50,000	0
5	Mods to Interlocking with Honeybourne		No	25,000	0
	<b>Trackside</b>				
	<u>Cable Troughing</u>				
6	New Troughing C1/9 (assumed 50% of troughing route - 13,580m)		m	50	0
7	Lift and Shift existing Troughing and re-lid where required (assumed 50% of troughing route - 13,580m)		m	40	0
8	Delid and relid (13,580m - previous item = 13,580m - 6,790m)		m	14	0
	<u>Crossings</u>				
9	UTX		No	12,000	0
10	Turning Chambers		No	1,000	0
	<u>Cabling</u>				
11	Multicore cabling		m	15	0
12	Tail cables for trackside equipment (99 nr x 100m each)		m	10	0
	<b>Protection and Warning Systems</b>				
13	AWS		nr	4,413	0
14	TPWS (OSS+TSS)		nr	14,029	0
	<b>Signals</b>				
	<u>New Equipment</u>				
15	1 Aspect signal		No	7,061	0
16	2 Aspect signals		No	7,202	0
17	3 Aspect signals		No	7,202	0
18	Position Light Junction Indicator (PLJ1 postion 4)		No	6,522	0
19	Position Light Junction Indicator (PLJ1 postions 1 & 2)		No	8,886	0
20	Position light signal (PL1W)		No	4,067	0

# Stratford to Honeybourne

## SIGNALLING

### Bill of Quantities

Ref. No	Description	Quantity	UoM	Rate £	Item Total £
	<b>SIGNALLING</b>		sum		<b>3,000,000.00</b>
21	Independent 3 aperture position light signal (PL2RW)		No	4,800	0
22	Limit of shunt (PL1R)		No	4,525	0
23	Standard Alphanumeric Route Indicator (SARI)		No	5,983	0
24	Signal posts		No	15,000	0
25	Twin Track Cantilever		No	45,949	0
26	Point motors		No	25,000	0
27	Location cases - full		No	13,453	0
28	Location cases - half		No	10,704	0
29	Location cases - telecom		No	7,500	0
	<b><u>Recoveries</u></b>				
30	2 Aspect on std post		No	3,000	0
31	3 Aspect on std post		No	3,000	0
32	3 Aspect w / Position Light on std post		No	3,000	0
33	Independent Position light on std post		No	1,500	0
34	Level crossings		No	10,000	0
35	Location Cases - full		No	2,700	0
36	Location cases - half		No	2,700	0
37	Location cases - telecom		No	2,700	0
38	Signal Post Telephone		No	1,400	0
	<b>Train Detection</b>				
39	Alterations to existing track circuits outwith axle counter area		LS	25,000	0
	<b><u>New Equipment</u></b>				
40	Evaluators		No	27,660	0
	<b><u>Recoveries</u></b>				
41	Existing Train detection arrangements		LS	50,000	0

# Stratford to Honeybourne

## SIGNALLING

### Bill of Quantities

Ref. No	Description	Quantity	UoM	Rate £	Item Total £
	<b>SIGNALLING</b>		sum		<b>3,000,000.00</b>
65	Signalling Staging Work (10%)	10%		0	0
66	Testing & Commissioning	15%		0	0
			<b>Total</b>	<b>£</b>	<b>3,000,000.00</b>

Stratford to Honeybourne

ELECTRIFICATION & PLANT

Bill of Quantities

Ref. No	Description	Quantity	UoM	Rate £	Item Total £
	<b>E&amp;P</b>		sum		<b>1,000,000.00</b>
1	New external Power supply point		No	5,000	0
2	New Signalling Power Supplies		No	7,500	0
3	FSP (Functional Supply Point)		No	10,000	0
4	Supply and Install 650v Power supply Signalling cable		m	20	0
	<b><i>Points Heating</i></b>				
5	Power supply		nr	12,500	0
6	Control cabinet		nr	20,000	0
7	Heating		nr	5,000	0
8	Testing & Commissioning	10%		0	0
			<b>Total</b>	<b>£</b>	<b>1,000,000.00</b>



# Stratford to Honeybourne

## TRACK

### Bill of Quantities

Ref. No	Description	Quantity	UoM	Rate £	Item Total £
	<b>PERMANENT WAY</b>				<b>15,632,500.00</b>
	<b><u>Work to Existing Track</u></b>				
	<u>No work Required (For Information Only)</u>				
	minus 700 to 300	1,000	m	0	0
	<b><u>At Grade Enhancement of Existing</u></b>				
	<u>Skim with heavy spoil + install (250mm + G44 + 113A) + remove redundant p.way</u>				
	300 to 4800	4,500	m	575	2,587,500
	<b><u>At Grade New Construction</u></b>				
	<u>Skim with heavy spoil + install (250mm + G44 + 113A)</u>				
	4800 - 12700	7,900	m	475	3,752,500
	Second Line adjacent to existing 1700 - 6500	4,800	m	475	2,280,000
	New South- East Chord (Single Track)	1,500	m	475	712,500
	<b><u>Grade Separated New Construction</u></b>				
	<u>Dive Structures</u>				
	12700 - 13410	710	m	475	337,250
	14000 - 14440	440	m	475	209,000
	<u>Bridge</u>				
	13410 - 13480	70	m	475	33,250
	<u>Open top trench construction</u>				
	13480 - 13890	410	m	475	194,750
	<u>Tunnel</u>				
	13890 - 14000	110	m	475	52,250
	<u>Single line formation work</u>				
	6500 - 12700	6,200	m	150	930,000
	<u>Double line formation work</u>				
	2000 - 6500	4,500	m	250	1,125,000
	Southern Chord Formation work	1,500	m	150	225,000

Stratford to Honeybourne

TRACK

Bill of Quantities

Ref. No	Description	Quantity	UoM	Rate £	Item Total £
	<b>PERMANENT WAY</b>				<b>15,632,500.00</b>
	<u>Commissioning Works (changes and re-stressing)</u>				
		100	m	475	47,500
	<u>Lubricators</u>				
	Lubricators	2	nr	8,000	16,000
	<b><u>Track Drainage (Piped)</u></b>				
	Within Trench	1,000	m	135	135,000
	<b><u>Track Drainage (Ditching)</u></b>				
	Embankment toe Drainage	7,900	m	50	395,000
	<b><u>New Switches and Crossings</u></b>				
	25mph CV crossover	4	nr	300,000	1,200,000
	40mph CV crossover	2	nr	450,000	900,000
	70mph CV turnouts	1	nr	500,000	500,000
			<b>Total</b>	<b>£</b>	<b>15,632,500.00</b>

Stratford to Honeybourne

TELECOMMUNICATIONS

Bill of Quantities

Ref. No	Description	Quantity	UoM	Rate £	Item Total £
	<b>TELECOMMUNICATIONS</b>		sum		<b>1,500,000.00</b>
	<u>Small Concentrator</u>				
1	Telephone concentrator card		No	7,500	0
2	Data Changes @ Concentrators		No	1,000	0
	<u>Route Works and Cable Renewals</u>				
3	Supply and Install telecoms copper cable		m	14	0
4	Existing cabling - Lift and Shift		LS	100,000	0
	<u>Telephones</u>				
5	Signal Post Telephone. Including 8m Drivers		No	7,500	0
6	Points Zone Phones		no	3,500	0
7	Axle counter evaluator phone		no	3,500	0
8	Dial up unit for points heating		No	4,000	0
9	Testing & Commissioning	10%		0	0
			<b>Total</b>	<b>£</b>	<b>1,500,000.00</b>

# Stratford to Honeybourne

## CIVILS

### Bill of Quantities

Ref. No	Description	Quantity	UoM	Rate £	Item Total £
	<b>CIVILS</b>				<b>29,802,000.00</b>
	<b>EARTHWORKS</b>				
	<u>Cuttings</u>				
	Stabilisation Works				500,000
	<u>Embankments</u>				
	Stabilisation Works				500,000
	<b>STRUCTURES</b>				
	<u>Underbridges (9 in scheme)</u>				
	Stannals River Bridge Replacement	1		3,000,000	3,000,000
	Other bridge works				1,000,000
	<u>Culverts (1 in scheme)</u>				100,000
	<u>Overbridges - Road Rail Grade Separations</u>				
	Station Road Long Marston Bridge	1		1,000,000	1,000,000
	Milcote Bridge	1		1,000,000	1,000,000
	Wetherby Way bridge deck	1		750,000	750,000
	Sanctus Road bridge deck and piers	1		1,000,000	1,000,000
	Vehicle Incursion Works	2		200,000	400,000
	<u>Dive Structure (shortest) - South</u>	400	m	5,000	2,000,000
	<u>Retained Cutting alongside Seven Meadows Road</u>	410	m	15,000	6,150,000
	<u>Evesham Place cut and cover</u>	110	m	25,000	2,750,000
	<u>Dive Structure - North</u>	440	m	10,000	4,400,000
	<u>Flood Protection measures</u>	1,000	m	2,000	2,000,000
	<b>OTHER</b>				
	<u>Walking Routes</u>				
12	Safe Cess	14,580	m	25	364,500
13	Authorised walking routes for access to new S&C	200	m	25	5,000
14	Ballast retention structure (Grundmat piles)	100	m	850	85,000



# Stratford to Honeybourne

## CIVILS

### Bill of Quantities

Ref. No	Description	Quantity	UoM	Rate £	Item Total £
	<b>CIVILS</b>				<b>29,802,000.00</b>
	<u>Road Works</u>				
	Realign Seven Meadows Road	590	m	2,500	1,475,000
	Utilities diversions/protection	600	m	sum	1,000,000
	<u>Land Drainage</u>				
15	Ditching clearance / new	3,000	m	25	75,000

# Stratford to Honeybourne

## CIVILS

### Bill of Quantities

Ref. No	Description	Quantity	UoM	Rate £	Item Total £
	<b>CIVILS</b>				<b>29,802,000.00</b>
	<u>Vegetation Clearance</u>				
16	Allowance for vegetation clearance along route as necessary	10,000	m	15	150,000
	<u>Signalling Support Structures</u>				
17	Platforms for location cases / signals	10	nr	9,750	97,500
			<b>Total</b>	<b>£</b>	<b>29,802,000.00</b>

Stratford to Honeybourne

OPERATIONAL PROPERTY

Bill of Quantities

Ref. No	Description	Quantity	UoM	Rate £	Item Total £
	<b>OPERATIONAL PROPERTY</b>				<b>2,000,000.00</b>
	<u>Station</u>				
	Stratford Racecourse	0		1,500,000	0
	Long Marston	1		1,500,000	1,500,000
	Honeybourne	1		500,000	500,000
			<b>Total</b>	<b>£</b>	<b>2,000,000.00</b>

# Stratford to Honeybourne

## OTHER COSTS

### Bill of Quantities

Ref. No	Description	Quantity	UoM	Rate £	Item Total £
	<b>OTHER COSTS</b>				<b>2,830,000.00</b>
	<u>Environmental Costs</u>				
1	Noise mitigation	1	sum	500,000	500,000
2	flood/pollution control	1	sum	500,000	500,000
	<u>Land Purchase</u>				
3	Long Marston Deviation (field)	300	m^2	100	30,000
	Long Marston Deviation (Industrial)	300	m^2	2,500	750,000
	Legal Fees	1	sum	1,000,000	1,000,000
	<u>Training</u>				
4	Training for maintenance staff on new signalling equipment	1	nr	50,000	50,000
	<u>Advertising / Mail Drops</u>				
5	Advertising / Mail Drops to inform residents and other affected parties		sum	20,000	0
			<b>Total</b>	<b>£</b>	<b>2,830,000.00</b>



## MAIN SUMMARY

## Do Minimum Track Option

Ref. No	Description	Quantity	UoM	Rate £	Item Total £
	<b>MAIN SUMMARY</b>				<b>61,752,777.50</b>
	Design				3,238,277.50
	Preliminaries				2,750,000.00
	Signalling				3,000,000.00
	E&P				1,000,000.00
	Track				15,632,500.00
	Telecoms				1,500,000.00
	Civils				29,802,000.00
	Operational Property				2,000,000.00
	Other Costs				2,830,000.00
			<b>Total</b>	<b>£</b>	<b>61,752,777.50</b>

## Appendix F

### Consultation Responses

## **Appendix F**

### **Consultation Responses**

*In accordance with the Study Brief, a wide range of local authorities, organisations and companies were contacted inviting them to provide comments on a prospect of the railway line between Stratford-upon-Avon and Honeybourne being reinstated.*

*The standard invitation letter is provided, together with the text of all the comments received.*



Your ref  
Our ref 224132-00  
File ref

**ARUP**

By Email Only

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24 April 2012

For the attention of :

### Stratford to Honeybourne Railway Reinstatement Business Case Study

A Steering Group, led by Stratford District Council, has recently been established to look into the viability of reinstating a railway line between Stratford-upon Avon station and Honeybourne Junction on the Cotswold Line, as a heavy rail route to form part of the national rail network.

As part of this work, Ove Arup and Partners have been commissioned by the Steering Group to undertake a business case study into the feasibility of reinstating the railway line. The business case study will consider the potential benefits of re-opening the line, including the benefits of providing a strategic link to the national rail network from the line, particularly in relation to creating an alternative route between Birmingham and Oxford, and the benefits to the local economy in terms of tourism, in particular the major tourist attraction of Stratford-upon-Avon.

The study will also consider the nature and level of potential passenger and freight services that train operators would wish to run along the line and provide a feasibility assessment of the likely construction, infrastructure and operating costs of reinstating the line. The study will importantly assist the Steering Group in evaluating the costs and benefits of reinstating the railway line.

As part of the study we are consulting with and seeking the views of a number of local stakeholders in order to understand the level of potential support for the proposals, as well as relevant objections, issues and concerns. We are contacting Warwickshire County Council specifically in order to seek your comments and feedback on the proposed reinstatement of railway line. The feedback you provide will importantly help us to understand the views of key stakeholders and will also help to inform the business case study.

J:\224000\224132-00\4 INTERNAL PROJECT DATA\05 REPORTS\WARWICKSHIRE COUNTY  
COUNCIL LETTER.DOCX

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Registered Number: 1312453 | Registered Address: 13 Fitzroy Street, London, W1T 4BQ

224132-00  
24 April 2012

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If you would like to provide us with feedback on the proposed reinstatement of a railway line between Stratford-upon Avon station and Honeybourne Junction on the Cotswold Line, please email your feedback to Miriam Owen, at [Miriam.Owen@arup.com](mailto:Miriam.Owen@arup.com)  
Alternatively feedback can be posted to:

Miriam Owen [re: Stratford to Honeybourne Reinstatement business case study]

Blythe Gate

Blythe Valley Park

Solihull

B90 8AE

United Kingdom

The deadline for the receipt of all comments is 8<sup>th</sup> May 2012.

If this letter has not been sent to the appropriate person in your organisation, we would be grateful if you would pass it on.

Thank you in advance for your time and we look forward to hearing from you.

Yours sincerely

Miriam Owen



Associate

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## **F1      Bristol Port – Tom Carmichael, Major Projects Director**

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Whilst we would have no concerns or objections equally the reinstatement would convey no benefits to our operations therefore I would say that we are completely neutral on this proposal.



## **F2      Cotswold Conservation Board – Malcolm Watt, Planning Officer**

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Thank you for consulting the Cotswolds Conservation Board regarding the above.

The Board supports the reinstatement of this line in principle.

The Board notes and supports the response of Natural England regarding the matters to be assessed.

## **F3 DB Schenker – Stan Kitchin, Timetable Strategy Manager**

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DB Schenker Rail (UK) Limited ('DB Schenker') remains supportive of the re-opening of 'The Honeybourne Line'. In order to support the projected long-term growth of rail freight, it is essential that the re-opening of key routes such as the Honeybourne Line are promoted and implemented. The aspiration for re-opening of the route has been recognised by Network Rail in both the Great Western Route Utilisation Strategy (published March 2010) and the West Midlands & Chilterns Route Utilisation Strategy (published May 2011).

Rail has strong sustainable credentials; the emissions and carbon dioxide produced in the movement of freight by rail are up to fifteen times less than those produced by the equivalent road transport. The expansion of rail freight, therefore, can do much to reduce overall environmental impact.

The reinstatement has the potential to provide much needed additional capacity for through rail freight traffic, both for diversionary purposes when other routes are blocked by engineering work and by providing a route for regular freight as a relief to existing rail lines that are already approaching capacity.

- The route through Long Marston south to Cheltenham Spa (already partially reopened as a leisure railway) has potential to provide an alternative to the existing Birmingham – Bristol route via Ashchurch.
- The reinstatement of the former curve ('East Loop Junction – South Loop Junction') close to Honeybourne would allow access to/from the Cotswold rail route in the direction of Oxford. The Cotswold route between Oxford and Worcester has recently been upgraded by Network Rail and, in conjunction with a link to Stratford-on-Avon, would provide an alternative to the existing railway between the Midlands and the Thames Valley via Banbury.

The re-opening of this route can contribute positively to the future of rail freight, which is reinforced through the relevant railway industry processes.

## F4 Freightliner Group Limited – Lindsay Durham, Head of Rail Strategy

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Please see attached letter that we sent with regard to this scheme in 2009 which captures our main points.

In summary this is a potential alternative route for freight traffic from Southampton Port to the West Midlands, but this would be dependent on W10 gauge clearance, a new junction at Honeybourne and sufficient capacity on the route, including the onward route from Stratford.

Please contact me if you would like any further comment.

*(Letter dated 29 July 2009)*

### **STRATFORD UPON AVON TO HOLYBOURNE RAIL LINK**

Southampton Port is the second largest deep-sea container port in the UK and it is forecast to grow in size in the future with the trend of world-wide containerisation and movement of manufacturing to developing countries, the economy will also recover and grow. Moving goods by rail produces at least 3 times less carbon than by road. We therefore expect future demand for rail freight services out of Southampton to grow considerably.

We agree that the re-opening of the route from Stratford-upon-Avon to Honeybourne could open up a potential alternative route from the Port of Southampton to the West Midlands terminals, especially as the route to Honeybourne is now a committed scheme to be doubled. However this would only be of use if this route was also gauge cleared to W10, to allow 9'6" high containers to be loaded on standard flat wagons. We are unsure of what capacity exists on the existing part of this potential route, or whether this route is capable of handling a least 30 x 60ft wagon freight trains and this would have to be considered as part of any business case to re-open the route. In addition a new junction would be required at Honeybourne to allow direct access to and from the line from Oxford.

We are always keen to promote routes that shorten the distance we have to travel and journey times as this enables us as a rail freight operator to compete more effectively with road. We note that Long Marston is being developed as a potential rail freight terminal as your proposed re-opening may increase the attractiveness of this terminal, however we are unsure whether this terminal is in the right place to be attractive to the logistics industry.

Further assessment would be needed to consider whether the re-opening would offer an alternative from the Port of Southampton to the north-west and beyond, to way up the capacity and journey length/time via Birmingham versus joining the West Coast Main Line at Nuneaton, which is our current route.

Any scheme would of course have to be weighed up against other potential schemes that also increase capacity for freight in that area, though we assume there must be a demand for passenger traffic between Stratford-upon-Avon and Oxford.

We therefore support further work being undertaken to assess the potential business case for this route.

## F5 Freight on Rail – Philippa Edmunds, Manager

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### Stratford to Honeybourne Railway Re-instatement Business Case Study by Arup

1. Freight on Rail, a partnership of the rail freight industry, the transport trade unions and Campaign for Better Transport thanks you for the opportunity to comment on the business case study for Stratford to Honeybourne
2. Freight on Rail has consistency supported the safeguarding of this alignment for future possible use. As recently as March 2012, it stressed the need to protect the route in the Stratford on Avon District Local Development Framework.

### 3. Business case for reinstatement

Reinstatement of this route offers considerable potential for enhancing both freight and passenger services, to improve local, regional and national connectivity.

In terms of freight services:

- A. It would enhance any freight activities at Long Marston
- B. It could enhance connectivity for freight services across the region.

### 4. Economic, social and environmental benefits of rail freight

Road congestion is now costing around £24 billion per annum according to the Freight Transport Association based on Government figures; a single intermodal train can remove 60 HGVs from our roads and an aggregates train can remove a staggering 160 HGVs from our roads. Source Network Rail

Rail freight creates 70% less carbon dioxide than the equivalent road journey

*Source DfT Logistics Perspective Dec 2008 P8 section 10*

A gallon of diesel will carry a tonne of freight 246 miles by rail as opposed to 88 miles. *Source Network Rail Value of Freight July 2010*

Rail freight is safer than long-distance road freight using major roads, as HGVs are over 3 times more likely to be involved in fatal accidents than cars due to a combination of size, lack of proper enforcement of drivers hours, vehicle overloading and differing foreign operating standards. *Source: Road Statistics 2010 Traffic statistics table TRA0104, Accident statistics Table RAS 30017, both DfT*



## **F6      Freight Transport Association – Chris McRae, Manager – Rail Freight Policy**

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This has never featured in the Strategic Freight Network Steering Group deliberations, the current forum for deciding English rail freight investment.

## **F7 Gloucestershire and Warwickshire Steam Railways GWSR Plc. – Malcolm Temple, Chairman**

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### **GWSR Plc COMMENTS IN CONNECTION WITH THE 2012 STRATFORD TO HONEYBOURNE RAIL LINK REOPENING FEASIBILITY STUDY**

#### **Background**

The Gloucestershire Warwickshire Steam Railway Plc (the GWR) was formed in 1981 to promote and effect the return to use of as much of the closed line from Stratford upon Avon to Cheltenham. The line had been closed for some years, all of the track lifted and most buildings demolished.

The track bed and formation of the railway from just south of Cheltenham Race Course station to just north of Broadway Station was purchased from British Rail, a statutory operating order obtained and redevelopment commenced.

30 years later stations have been re-established at Cheltenham Race Course, Gotherington, Winchcombe and Toddington. Some 12 miles of track has been re-laid and the line re-opened from the Race Course to Laverton. This is two miles from Broadway where re-building of the station is in hand and subject to funds, it is hoped to extend the line within the next three years.

The Plc has a paid up share capital approaching £1.5 million and is amongst the major heritage rail museums in the UK. It has a fleet of restored steam and diesel locomotives and a volunteer operating workforce of over 600. In a normal year 70,000+ passengers are carried and a substantial increase is expected on opening to Broadway.

The GWR then has aspirations to acquire the trackbed from Broadway to Honeybourne to establish a main line link.

The Plc works closely with the Cotswold Line Promotion Group and is an active member of the Heritage Railways Association (HRA).

It was named as Heritage Railway of the Year in 2006 and 2011.

#### **Position in Relation to Re-opening Stratford to Honeybourne**

The Plc is entirely supportive of the concept of re-opening for commercial use and sees this as a potential source of tourist business once it itself reaches Honeybourne.

In realism it recognises that it is unlikely it will ever have the funding for such a venture, particularly in relation to line access into Stratford upon Avon itself.

It is however unclear as to the business/cost *raison d'être* for a re-opening. The line was built in the early 1900's and seems to have failed since it had insufficient passenger demand and fluctuating commercial need. This we understand is the purpose of the study but it hardly seems consistent with the travel times of the Cotswolds Line in relation to someone from Birmingham (or Stratford upon Avon) wishing to visit London (why would they wish to visit Oxford?).

Network Rail has made platform provision for the GWR at Honeybourne and the Plc would be anxious to secure operating access over any re-laid line to Stratford thereby offering a further tourism attraction.

It would also welcome a joint venture to re-open from Honeybourne to Broadway for tourism purposes.

Use of the line to reach Cheltenham can always be discussed but there are serious alternative land uses applying south of our track bed holdings on the way to Cheltenham town

Whilst the need is likely to be limited, the Plc would welcome the opportunity to contribute to the future in any way consistent with its experience.

For further background please visit [www.gwsr.com](http://www.gwsr.com).

April 2012

## F8 Gloucestershire University – Stephen Marston, Vice-Chancellor

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### **Stratford to Honeybourne Railway Reinstatement Business Case Study: Stakeholder Consultation**

Thank you for the opportunity to comment upon the proposal to reinstate a heavy rail line between Stratford-on-Avon and Honeybourne.

This of course forms the northern part of the 'Honeybourne' line, which ran between Cheltenham Spa and Stratford-on-Avon, and has in the past been considered for reinstatement as a strategic rail route between Cheltenham and Birmingham.

Part of the southern end of the line is owned and occupied by the Gloucestershire-Warwickshire Steam Railway, who operate services between Cheltenham Racecourse and Toddington, and who are re-laying heavy rail towards Broadway; GWSR has long held aspirations to restore services over the southern end of the line into Cheltenham, although in practical terms, heavy rail is unlikely to be accepted by the County on the current alignment, which is owned by Cheltenham Borough Council.

The university, in collaboration with Cheltenham Chamber of Commerce, has been involved in a proposal to introduce instead a 'Low-cost, Zero-carbon' ultra-light rail (ULR) link between Cheltenham Spa and Cheltenham Racecourse, over the disused southern end of the Honeybourne rail alignment, as the first part of a new, public transport ULR system. The proposal was submitted for the 2009 Low Carbon and Innovation Award, and came second nationally in that competition (see attachment). The university has also explored European Funding to develop the concept.

Subsequently, Gloucestershire's Local Transport Plan (LTP3) includes an undertaking to explore, with the university, the possibility of light rail as a potential transport solution to transport congestion. In line with this, a Masters student at the university undertook research, facilitated by information from the County, into powering the ULR system by 'green' hydrogen produced from the County's organic waste. This thesis, entitled *Fuelling Ultra-Light Rail Public Transport from a Gloucestershire Organic Waste Treatment Plant: a feasibility analysis*, was acclaimed by the External Examiner as the best MSc thesis he had seen. A pdf copy can be supplied.

The university recruits students both from the County and elsewhere. Staff live both in Gloucestershire and further afield. The university would welcome improvements to connectivity in the County and between the County and adjacent regions. It therefore is supportive of the proposed reinstatement between Stratford-on-Avon and Honeybourne. Given its position in Cheltenham and Gloucester and its involvement with the studies mentioned above, the university would have a more direct interest in exploring options for the southern end of the Honeybourne line, and would welcome opportunities to discuss these with the Arup team. Your contact would be Prof. Frank Chambers, School of Natural and Social Sciences.



## **F9      Motor Rail Logistics – Colin Flack, Owner**

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Many thanks for contacting us. As a rail based business we are clearly supportive of the case for re-opening this line beyond our site to Stratford upon Avon. Our business has benefitted from the work that has gone into increasing the capacity of the Cotswold line and we believe that there would be a positive benefit to us of a passing service, not least as it is very likely to be a popular freight route. Our own re-development plans will be enhanced by such a development and we believe that we could also accommodate train care facilities, overnight stabling etc along with the obvious potential for the industrial part of the site to make much greater use of its rail connection to enhance the role of the site as a road rail interface for this region (an obvious potential here would be for the transhipment of perishable goods and produce which currently travel by road in to and out of the Vale of Evesham. The redevelopment of the site is also going to see some 500 homes built here over the next 5 years or so, so there will be a level of interest no doubt in the ability to travel to and from Stratford/Birmingham by train rather than on the bus.

Our only real concern would be regarding the alignment of any proposed new track bed as the original route is now covered by an industrial estate! If I can be of any further assistance to Arup please do ask.

## **F10 Natural England – Alison Croft, Lead Advisor**

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### **Stratford to Honeybourne Railway Reinstatement Business Case Study**

Thank you for your consultation dated 25/04/12 which was received by Natural England on 25/05/12.

Natural England is a non-departmental public body. Our statutory purpose is to ensure that the natural environment is conserved, enhanced, and managed for the benefit of present and future generations, thereby contributing to sustainable development.

An assessment of the proposal should identify, describe and evaluate the likely significant effects on the environment of implementing the proposals, (along with any reasonable alternatives) taking into account the objectives and geographical scope of the development. The assessment should cover:

- The relevant aspects of the current state of the environment and the likely changes to this environment without implementation of the proposals
- The environmental characteristics of areas likely to be affected
- Any existing environmental problems or management plans which are relevant to the assessment
- The environmental protection objectives, established at international, national, regional or local level which are relevant to the assessment and the way those objectives and any other environmental considerations have been taken into account during its preparation
- The likely significant effects on the environment, including issues relating to fauna, flora, landscape, soil, water, air, climatic factors.
- All the impacts of construction (including access roads), operation and decommissioning.
- The measures envisaged to prevent, reduce and as fully as possible mitigate or compensate for any significant adverse effects on the environment of implementing the proposals

### **Designated Sites**

This includes any Special Areas of Conservation (SAC), Special Protection Areas (SPA), Ramsar sites, Sites of Special Scientific Interest (SSSI) and Areas of Outstanding Natural Beauty (AONB).

Comprehensive information about SSSIs can be obtained from our website ([www.naturalengland.org.uk](http://www.naturalengland.org.uk)).

Maps showing the extent of SSSIs and citations detailing why sites have been notified can be downloaded from the website. In addition, digital boundaries for SSSIs, other statutory designated sites and sites listed on Natural England's Ancient Woodland Inventory can also be obtained.

The MAGIC website ([www.magic.gov.uk](http://www.magic.gov.uk)) brings together information about various countryside designations and environmental schemes on an integrated map. The website allows creation of your own map showing specific countryside

designations and interrogation to find out what exists in a specified area of search. It includes all statutory nature conservation sites and information from most habitat inventories. It is also directly linked to Natural England's website for information relating to SSSIs ([www.natureonthemap.org.uk](http://www.natureonthemap.org.uk)). It should be noted however that it currently omits sites listed on Natural England's Ancient Woodland Inventory.

For information about Local Nature Reserves, non-statutory nature conservation sites ('Local Sites' previously known as Sites of Biological Importance in Staffordshire) BAP habitats and species and records of protected species within the vicinity, Natural England recommends that you contact the local records centre, as we do not hold this information.

### **Habitat Survey**

We recommend an extended Phase 1 habitat survey is undertaken at the site to provide baseline data to allow an assessment of the potential impacts of the development and also to identify the requirement for further protected species surveys (please see below). A phase one habitat survey marked up on maps of a suitable scale should be undertaken which will identify habitats of nature conservation interest. Where appropriate habitats of nature conservation interest, should be surveyed at a finer level using the appropriate phase two methodology (e.g. National Vegetation Classification (NVC)) so that the interest of these sites can be placed in context. Surveys should also record the vascular plants associated with these habitats and their relative abundance. The presence and specific locations of any rare and uncommon plant species should be recorded.

### **Protected Species**

We advise that appropriate surveys are carried out to establish if, and to what extent, a site is used by protected species. For example, surveys for protected species such as badgers, bats and great crested newts should be carried out at an early stage.

Issues which you will need to address in relation to these proposals include:

- Any direct habitat loss resulting from the scheme;
- Any impacts on protected or BAP species present in the vicinity;
- Mitigation and enhancement.

The assessment should provide a review of existing information, utilising literature searches and drawing upon local and, where appropriate, national expertise. If this information is not currently available for the area under consideration it will be necessary to design and implement surveys. Surveys, assessments and recommendations for mitigation and monitoring measures should be undertaken by suitably qualified and experienced persons holding any licences that may be required. Further information about survey methods and mitigation measures may be found on our web site at

<http://www.naturalengland.org.uk/conservation/wildlife-management-licensing/leaflets.htm>.

In relation to birds, your investigations should place emphasis on:

- Interest features of statutory protected sites;

- Species listed under Annex 1 of the Birds Directive 1979;
- Important concentrations of regularly occurring migratory species;
- Species listed under Schedule 1 (part 1) of the Wildlife and Countryside Act (as amended) 2000;
- Priority species listed under the UK Biodiversity Action Plan;
- Important concentrations (international, national, regional and local).

Relevant information may be available from the following sources: County birds reports; county avifaunas; county breeding bird atlases; special survey reports (for example, as part of Statutory Conservation Agency/RSPB Annual Breeding Bird Scheme (SCARABBS), The Breeding Bird Survey (BTO Research Reports); The Wetland Bird Survey (BTO, WWT, RSPB, JNCC); Rare Breeding Bird Reports in British Birds; and studies conducted as part of other environmental assessments. Local Biological Records Centre and local Bird Clubs may have useful local information.

### **Landscape and Visual Impact**

We require a detailed Landscape and Visual Impact Assessment to be undertaken. The methodology must be in line with the Institute of Environmental Management and Assessment's Guidelines for Landscape and Visual Impact Assessment 2nd Ed. Published 2002.

As a part of this, impacts of the proposal on landscape character should be assessed. For more information about landscape character see Natural England's website:

<http://www.naturalengland.org.uk/ourwork/landscape/englands/character/default.aspx>

### **Contributing to Biodiversity**

Natural England considers that the potential for the development to provide nature conservation enhancements should be clearly distinguished from measures to mitigate or compensate for harm to nature conservation interests. Natural England expect positive planning for all development, in line with the key principles of PPS 9 there should be no net loss of biodiversity through development and opportunities for enhancement should be pursued. Therefore the EIA should seek ways to enhance biodiversity and it should identify opportunities for the creation and restoration of habitats appropriate to the locality including plans to retain existing important landscape features such as mature trees and hedgerows. New landscaping and planting of trees should use native, locally-sourced species.

I hope this satisfies your enquiry. Please do not hesitate to contact me if you require any further information.

## **F11 PWH (Cheltenham) Limited – Hugh Roberts**

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To enable you to complete your interim report which I understand has a deadline of 9<sup>th</sup> May, I hope you will find helpful the attached copy of an email which I forwarded to the Editor of the local paper, The Gloucestershire Echo, on 25<sup>th</sup> February 2009. Since then, my views have not changed and in fact have become ever more pertinent.

I can elaborate in more detail upon each of the benefits which I have listed if you feel that a telephone conversation between us would be useful, in which case I can be contacted on either of the numbers below.

*Email dated 25 February 2009*

I should like to take this opportunity of expressing my thanks for the article which appeared in the Gloucestershire Echo on Monday 23<sup>rd</sup> February 2009 and to Steve Huckwell for its presentation. Clearly, I appreciate that with the confines for space which you have, not all of the points which I made during our meeting here on Friday 13<sup>th</sup> February 2009 could be included and, of course, in subsequent editions of the paper, some of these have been debated. However, for record purposes and for your future assistance, I list below the considerations which I consider to be salient.

### Benefits

1. Were the line (the old Great Western Railway route) to be reconnected from Lansdowne Station to Stratford-upon-Avon, one of its purposes would be as a route for freight between the south, southwest, midlands and northeast: when the route reaches the south of Birmingham there is an avoiding line to connect with those leading off to the north, east and south of the city.
2. This would free-up space on the existing main line between Cheltenham and Birmingham (the old Midland Railway route) so that passenger traffic could be added to the timetable. This would produce more revenue for the train operators and Network Rail, in addition to providing more jobs and removing traffic from the roads.
3. For a small percentage of the civil engineering costs in re-laying the line, the original stations could be reopened and, possibly, new ones built given that what were once villages prior to the line's closure have now increased in size. This would provide the residents of these communities with commuting availability to Cheltenham, Gloucester, Swindon and Bristol to the south (and all stations in between), together with Birmingham, Worcester, Kidderminster, Droitwich to the north via a spur linking the line with the Worcester to Oxford line (which is about to be re-laid to double track for fast running) via the interchange at Honeybourne. This would also facilitate commuting links to Oxford and all stations in between if a new connection were to be made at Honeybourne.
4. By reconnecting to Stratford-upon-Avon, through trains from anywhere in the country could reach Cheltenham and Cheltenham Racecourse Stations thus affording additional tourist income for the town. This would apply to



steam-hauled specials, many of which currently operate on the main network.

5. All of the above would have the dual benefits of, firstly, relieving the pressure upon road traffic and, in particular, motorways (for both cars and lorries) and, secondly, reducing environmental pollution.
6. It should be emphasised that even Dr Beeching recognised the line's benefit because he did not include it in his list of closures.
7. A section of the line is currently occupied by the Gloucestershire & Warwickshire Steam Railway Limited which has operating rights over it. Even it would benefit because most of the trains which would operate on the newly re-laid tracks would do so during the week and less so at weekends when, like most heritage lines, the GWR runs most of its traffic. Even so, sensible rostering could produce a timetable which would satisfy both the needs of the Heritage operator and the main line franchises plus Network Rail. This may be a first but then what's wrong with that? As I have said many times, what is required is a bold approach which the construction of a light railway or tram service would not represent. In fact, what that would represent is a tentative approach and a lost opportunity whereby it would be a waste of the track formation which, it must be remembered, was originally constructed for double track and fast running.

#### Possible Objections

1. I can think of only one. Those who live in houses adjoining the line might initially consider that the traffic could be a nuisance. However, since the article was published, I have met people and received telephone calls from others, all of whom support the proposal. Some have memories of living next to the line prior to its closure and they have enforced my view that, unlike a motorway which has a constant drone, a railway is less intrusive; in fact, it can become a friendly attribute. For example, long periods of silence are punctuated by no more than 20 seconds of action as a train passes. As one person who telephoned me mentioned who used to live backing on to the line in Bishops Cleeve, he found the passage of trains useful whereby he could set his watch to them and, indeed, use them for timing his departure for work!

Clearly, the scheme would not be without practical challenges but virtually all of these are of a civil engineering nature which could readily be overcome, as could the ancillary works including signalling. To iterate, one of the benefits would be a considerable increase in revenue from both operations on the newly re-laid line and increases in passenger traffic on the existing main line and, therefore, as a potentially viable and extremely useful venture, I believe that the money to make it feasible would find it.

Thanks again for your interest.

## **F12 Rail Freight Group – Robin Smith, West Midlands Representative**

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### **Stratford to Honeybourne Railway Reinstatement Business Case Study**

Rail Freight Group (RFG) wishes to thank ARUP for the opportunity to contribute to the study presently being undertaken to assess the business case for reopening this rail link.

RFG is the representative body for the UK rail freight industry. Our objective is to grow the volume of goods moved by rail in a cost effective way. We work to influence Government and transport policies in support of rail freight and to help our members to develop their rail freight services.

In recent years RFG has consistently supported moves to develop a viable business case for reopening the link between Stratford and Honeybourne and has urged inclusion of the scheme in a range of plans and strategy documents published by Network Rail and by the various Local Authorities through whose areas the line passes.

Despite having only become involved at a late stage with the development by Network Rail of the Great Western Route Utilisation Strategy (RUS), published in March 2010, RFG welcomed the positive references to the Stratford to Honeybourne Line in Section 9.9 specifically under the heading “Freight” and also in Appendix G. Subsequently, through membership of the Stakeholder Management Group for the West Midlands and Chilterns RUS, RFG argued strongly for parallel references to the reinstatement scheme in that RUS, despite a significant change of attitude within Network Rail. As a result, RFG was pleased at least to have secured inclusion of the scheme, eg in Appendix D as introduced in Section 7.3.4, when the final WM&C RUS was published in May 2011.

In the interim between publication of the two RUSs, RFG had responded critically to the consultations by Warwickshire (August 2010) and Worcestershire (December 2010) on their respective LTP3 Plans as neither included any reference to the line, both in its present incarnation as a freight-only branch from Honeybourne to Long Marston or as a potential through route for both freight and passenger services. Indeed, in both responses we pointed out that while passenger aspects were outwith RFG’s remit, a viable business case for reinstatement would most likely include provision for both passengers and freight.

Most recently, in our formal response to the consultation on the Stratford Local Development Framework (March 2012) we commented,

“RFG welcomes the support given (Chapter 11.2, Section D (c) Page 204) to the scheme to reopen the former railway line southwards from Stratford to Honeybourne “subject to the outcome of an up-to-date assessment”, which is currently being undertaken. RFG also welcomes the presumption in favour of safeguarding all the land required for such reopening to occur, including any alterations that would be needed at Evesham Place.

Reopening this line offers significant potential for improved local and national connectivity for both rail passengers and for freight. For freight the opportunities include

- providing (by means of an east facing connection at Honeybourne) an alternative route for intermodal trains between the South East / Southampton and the West Midlands / North West,
- offering access to any freight development on the Long Marston site,
- improving connectivity with any other freight developments in the Stratford-on-Avon District and adjacent areas,

all of which would also contribute to a reduction in the volumes of freight moving by road within the District.”

In summary, therefore, RFG welcomes the current work being undertaken by the Steering Group and gives its full support to the proposal to re-open the line between Stratford and Honeybourne (with connections towards both Worcester and Oxford at the latter) at an appropriate time and subject to the development of a viable business case.

From a freight perspective, the reopened line could provide a range of opportunities for rail freight developments both locally and in the context of its use as a diversionary route (assuming appropriate gauge clearance of the reopened stretch and of the lines with which it connects) between Oxford and Birmingham for the nationally important and increasingly used rail corridor between the South Coast and the West Midlands, North West and Scotland.

## **F13      Royal Shakespeare Company – Liz Thompson, Director of Communications**

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Thank you for the opportunity to comment on the study for reinstating the Honeybourne link to the Cotswold line (your letter to Vikki Heywood of 24 April).

We are supportive of any endeavours to improve public transport links to Stratford, but remain skeptical about the ability of a new branch line to provide suitable late night services back to London or Oxford (and stations in between) for RSC patrons. The last service back to London currently leaves Honeybourne at 23.08, which is too early to connect with a service from Stratford after a show finishes. Obviously times vary, but most shows finish at around 10.45pm which wouldn't give people enough time to get to the station and take a service to Honeybourne.

It's also worth adding that there would need to be a really robust effort to research actual demand for services. Our recent experience of running (and paying for) special late night services to London, in partnership with Chilterns, didn't suggest strong demand. Take up was limited on the summer special trains and we discontinued the programme after two years.

Our priorities remain improvements to the Chiltern services back to London and the London Midland services to Birmingham and Coventry. We are very pleased that there will be a new late night service from December 13 back to Birmingham and will be focusing our efforts on promoting that.

## **F14 Shakespeare Birthplace Trust – Diana Owen, Director**

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In principle the Shakespeare Birthplace Trust, which welcomes over 800,000 visitors to its properties in Stratford On Avon every year, would welcome any improvement to the rail services to Stratford. Over half of our visitors come from overseas and 50% arrive by coach currently. We know that many struggle to reach Stratford using the existing rail links. In addition, we have difficulty recruiting staff and volunteers due to the limited rail connections with Coventry, Birmingham and to the south of Stratford into Oxford and London.

I have not seen a detailed Environmental Impact Assessment for these proposals and therefore have to caveat my support. As a manager of heritage sites we would not be able to support any scheme that threatened the conservation areas of Stratford or indeed any of our properties.



## **F15      Warwickshire County Council – Peter Barnett, Team Leader Transport Planning**

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Further to the consultation letter in respect of the above.

The view of the County Council is set out in the Warwickshire Local Transport Plan 2011-2026 as follows:-

### ***"Reopening of the Stratford – Honeybourne line***

*Reopening of the Stratford-upon-Avon to Long Marston route as a six mile single line link between the Cotswolds and West Midlands rail network is an aspiration of local support groups. The advocates of reopening suggest that the scheme would enable a new direct Oxford-Moreton-Stratford service as well as local trains for Long Marston and Honeybourne.*

*The rail link is advocated by its proponents to boost tourist flows and to provide new rail journey opportunities to and from Long Marston and Stratford. A business case to demonstrate the viability of reopening the line will need to be produced by a scheme promoter if it is to be pursued.*

*The County Council will consider supporting a proposal for reopening the line if it is promoted by DfT, the rail industry or a third party provided the local benefits outweigh any local environmental disbenefits."*

Whilst not intended as an exhaustive list, I anticipate that the key impacts which the project would need to address are:-

- on the quiet enjoyment of adjacent properties and the wellbeing of nearby residents;
- on traffic flows and congestion within the town and the wider area as result of the installation of a level crossing at Evesham Place;
- on the Seven Meadows Road corridor in terms of accommodating an at-grade rail alignment or a rail tunnel;
- on the continued use of the Greenway as a key leisure corridor which is highly valued over a wide area;
- the scale of the disturbance during the construction period.

## **F16      Warwickshire County Council - Ciaran Power, Senior Planner**

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One consideration for any reopening of the line is the existing leisure walking / cycling / horse riding facility along the dismantled railway / greenway. This is a much valued asset and therefore part of the Honeybourne Railway Reinstatement scheme would need to address the loss of this amenity asset and potentially look at providing an alternative or acceptable mitigation/compensation.

The route also has some Ecological value and therefore regard would need to be had to the potential impacts and surveys.

Where the route passes residential, community or commercial facilities measures would be need to reduce the impact of noise, as well as adequate safety measures - fences, hoardings etc. If the line were elevated at any point this may impact upon privacy particularly for sensitive uses such as schools. Adequate assessment and mitigation would need to be considered.