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OXFORD CITY COUNCIL

To Members of the City Executive Board

07 February 2013
Our ref:
Your ref:

Dear Councillor

**CITY EXECUTIVE BOARD - WEDNESDAY 13 FEBRUARY 2013**

Background papers for item 13 attached – Aristotle Lane, closure of footpath over railway

Yours sincerely

*William Reed*

William Reed, Democratic Services Manager
Encs

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# *Aristotle Lane Crossing*
# *Option Selection Report – GRIP Stage 3*

| | |
|---|---|
| Project Name: | **CP5 Oxford Corridor** |
| OP Reference: | **122151** |
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# Oxford Area Re-Signalling (OARS) 122267

## ARISTOTLE LANE CROSSING

### GRIP 3: Option Selection Report

**DCL: 64 miles 34 chains**

5109279-ATK-ALC-RPT-001
Issue: A01
September 2012

Plan Design Enable

# Aristotle Lane Crossing

# GRIP 3 Option Selection Report

# DCL: 64 miles 34 chains

## September 2012

### Notice

This report was produced by Atkins Limited for Network Rail for the specific purpose of summarising details of existing infrastructure improvement proposals in the Oxford area and providing information on the options available at GRIP 3 for Aristotle Lane Level Crossing, DCL: 64m 34ch as a consequence of the proposals.

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# Executive Summary

Due to Network Rail and the Department for Transports (DfT) significant investment in a number of nationwide rail freight & passenger schemes affecting the Oxford corridor, foot crossing arrangements at Aristotle Lane Crossing require review.

This report details the existing 3 track arrangement at the crossing which is to change with the introduction of an additional rail line, line speed changes, bi-directional working, additional passenger and freight trains per hour and revised signalling & track crossover locations. The result of these changes required a review of the foot crossing risk assessment and consideration of methods to improve the safety of the crossing.

Investigation into foot crossing improvement options identified that unacceptable risk to user safety would remain and no crossing improvement options are available to mitigate against these risks within the limits of existing design standards. As a result alternative crossing options via either a jacked or reconstructed Willow Walk Footbridge were considered. Also included in the proposals are alterations to the footbridge to accommodate future electrification of the railway.

It is understood that allotment owners for whom the crossing is maintained will hold concerns regarding the permanent use of the footbridge as an alternative method of crossing the railway. Previous concerns were raised during the Transport & Works Act (TWA) application for the Evergreen 3 (EG3) project. The proposed solution to close the level crossing, jack the footbridge to a clear height of 4780mm for electrification purposes and improve the approach ramps has attempted to address concerns that were raised.

In summary it is proposed to jack the existing footbridge structure to a clear height of 4780mm above rail level, modify the approach ramps accordingly to tie in with the raised structure position along with providing gradients, landings and surfacing that as far as practicable within the site constraints provide disabled compliant access (Equality Act 2010) across the railway. The proposed works also include a new allotment access ramp from the west approach ramp, raising the lower section of the west approach ramp, new car park area adjacent to the east approach ramp (based on a modified version of St Phillip & James School extension proposals) and new access steps from the car park up the north face of the east approach ramp.

Following completion of the above, Aristotle Lane crossing would be closed and secured from future use by removal and fence line modifications.

# 1. Project Scope & Requirements

Atkins have been commissioned by Network Rail (NR) to produce a GRIP 3 Options Report detailing proposed alteration works to Aristotle Lane Crossing and the adjacent Willow Walk Footbridge as a result of proposed track alterations impacting the crossing.

NR requested a report presenting the details of the proposed schemes which will affect the crossing and providing summary options to retain or divert the level crossing. The options were to take account of previous issues raised as part of the Evergreen 3 (EG3) project's TWA application. These schemes and the existing concerns raised by third parties regarding allotment access have been considered as part of Network Rail's responsibility to minimise risk and improve safety at level crossings. Options have been developed to allow continued access across the railway, mitigating concerns where reasonably practicable.

The need to review the safety of users and risks associated with this crossing has arisen due to NR and the Department for Transport's significant investment in a number of schemes nationwide, which affect the Oxford corridor, as announced by the Secretary of State in the High Level Output Statement (HLOS) for Control Period 5 (CP5) on Monday 16th July 2012. Improvement works around Aristotle Lane at Oxford Station, Oxford Sidings and Oxford North Junction are key to enhancing and improving the network's capacity for both freight and passenger trains.

This report gives details of the existing crossing arrangement, the background to the wider proposed schemes impacting upon the layout and safety of the crossing, concerns raised during the EG3 project TWA application and proposed solutions to mitigate and reduce the future concerns of users based upon record information, previous design development and historic site surveys. The changes in the crossing risk assessment and the consequences thereof, are considered. Possible improvements to the alternative access via the adjacent Willow Walk footbridge are also considered along with options to mitigate any disadvantages to the current foot crossing users.

# 2. Background

## 2.1 Existing Crossing Layout

Aristotle Lane private footpath crossing is an "Owner Accommodation" crossing, the rights belonging to Oxford City Council which provides access solely to allotments (also owned by Oxford City Council) across 3No tracks of the DCL line at 64m 34ch (OS Grid Ref: SP 5023 0788) located approximately 1450m north of Oxford station. There is an adjacent footbridge, Willow Walk, approximately 60m south of the level crossing. This is reached via earthwork embankment ramps running straight east-west.

The existing crossing is a footpath crossing with whistle boards. This type of crossing arrangement warns users of approaching trains by visual sighting from the crossing and an audible warning from train horns (whistle boards prompt the train driver). Whistle boards are required at this location as the sighting distance from the crossing alone is not sufficient to provide users with sufficient warning of approaching trains to cross the railway (see section 2.5).

The crossing surface between tracks is approximately 1500mm wide, with overall distance from crossing gate to allotment gate of 28m. The crossing is used by allotment users as a means of access from the hardstanding area adjacent to the crossing (used informally as a car park by allotment users) and two Network Rail access gates, accessed from Aristotle Lane. Many of the users do not park here but access the crossing on foot or by bike directly from their homes to the east. The crossing location is shown in Appendix A and the existing track layout is shown in Appendix B. Access to the allotments is via a locked gate with a coded keypad so that unauthorised use of the crossing is minimised

## 2.2 Existing Willow Walk Footbridge

Willow Walk Footbridge comprises 3No wrought iron half through lattice girder spans (owned by Network Rail), approximately 12m, 22m and 10m respectively from west to east, supported on brick piers and abutments. The eastern abutment is flanked by brick wingwalls aligned parallel with the track.

The spans have timber floors and sheet metal parapets inboard of the main lattice girder spans which vary in height. The east and west approach ramps are owned by Oxford City Council and have average gradients of 1:20 and 1:18 respectively with localised worst case gradients of 1:6 off the end of the bridge side spans. Ramp approach paths are approximately 2.5m wide although vegetation growth limits this in places throughout to between 1.3-1.5m. The paths are surfaced in loose gravel. The land at the west end of the western approach is subject to flooding from the adjacent low lying floodplain of the River Thames known as Port Meadow which is a Site of Special Scientific Interest (SSSI) and common land.

Details of the footbridge are summarised in table 2.1 below:

**Table 2-1 – Structure Description and Details**

| | | |
|---|---|---|
| **ELR** | DCL (Didcot and Chester Line) | |
| **Miles and chains** | 64 miles 32 chains | |
| **Bridge name** | Willow Walk Footbridge | |
| **Age and date of construction** | Constructed circa 1890 and reconstructed at an unknown later date. | |
| **Orientation** | Railway north to south, footbridge east to west | |
| **Railway alignment** | 4 track arrangement | Up Main – 90mph<br>Down Main – 90mph<br>Down Jericho – 25 mph<br>Down Passenger Loop – 25mph |
| **Construction type and details** | All spans consist of 2 main girders of modified double lattice truss construction with transverse I-beams supporting a timber deck and outer stiffeners at uprights at every third transverse beam. The end bay of all spans is solid plate and all connections are riveted. | |
| **Abutment type** | Brick abutments and 2 brick piers each with a single semi-circular 3 ring relieving arch | |
| **Parapet details/type** | Corrugated metallic sheets riveted to truss main girders.<br>Parapet height ranges from 1.547m to 1.570m. | |
| **Wingwall type** | Battered and sloping brick wingwalls | |
| **What is structure carrying** | Bridleway linking Aristotle Lane from easterly residential area to Port Meadow and Trap Ground Allotments. | |
| **What is the structure crossing** | East span: Access track<br>Centre span: 4 track railway<br>West span: Redundant railway cess | |
| **No. of spans** | 3 spans – centre span crossing all lines | |
| **Maximum span length (m)** | East span = 10.148m<br>Centre span = 22.108m<br>West span = 12.237m | |
| **Minimum clearance (m)** | 4.249m | |
| **Skew angle (° degrees)** | 0° | |
| **General topography** | At grade, approach ramps built up at the bridge location. | |

## 2.3 Summary of Existing Information / Designs

### 2.3.1 Topographical Survey

The proposed option sketches included in Appendix J are developed using an extract from existing aerial survey.

The aerial survey did not provide sufficiently accurate information to determine clearances to the Willow Walk footbridge therefore the aerial survey has been augmented by a second traditional topographic survey to provide more accurate gauge clearance information – details below.

### 2.3.2 Gauging Survey

A survey of Willow Walk Footbridge was undertaken by Severn Partnership during a T3 possession on 28th May 2011 to enable the completion of an option selection report as part of the GRIP 3 Great Western Mainline Electrification Project: Option Selection for Overline Structures. This has been used in conjunction with the aerial survey to develop the proposed options, specifically the existing structure clearances and ground profiles in the immediate vicinity of the structure.

### 2.3.3 Buried Services

Historic Buried Services information sourced by Network Rail from Statutory Undertakers indicates that utility equipment is present within the vicinity of Willow Walk Footbridge, summarised below:

- BT Openreach underground cable running through north side of bridge
- Previous site walkovers identified a cable tray affixed to the north (Country) face of the centre span and both piers. The cable tray contained multiple cables of an unknown origin that appeared to originate from the Down Main/Down Passenger Loop cess which were carried through the cable tray to the Down Jericho cess.

At track level:

- 2 No. cable trough routes in Down Jericho cess
- Cable trough route in Down Main/Down Passenger Loop cess
- Southern Electric cables in Down Main cess
- Wessex Electricity cables in Down Main cess
- 33kV underground HV cable in Down Main cess

Relevant extracts from Buried Services information received from Network Rail as part of previous investigations into the structure are included in Appendix C.

### 2.3.4 Consents

The Willow Walk Footbridge is not listed.

A Bronze and Iron Age settlement located to the northwest of the bridge in Port Meadow is a Scheduled Ancient Monument.

The drainage ditches running adjacent to the Down Jericho and under the west span of the bridge extending north are designated Sites of Special Scientific Interest (SSSI) due to rare nesting birds, as is the Port Meadow area to the west.

### 2.3.5 TWA Findings & Previous Chiltern Design Proposal

As part of Chiltern Railways TWA application for the Evergreen 3 Bi-Ox line project, the closure of Aristotle Lane Crossing was proposed on the basis that safety at the crossing would be compromised by changes in the frequency & speed of trains and the additional line.

During the consultation period, a number of objections to the proposed changes and closure of Aristotle Lane Crossing were submitted to the Department for Transport. The TWA application for

EG3 is still being processed, however, due to the concerns raised in the objections Chiltern Railways have agreed to remove plans to close the crossing as part of their works.

Refer to section 5.2 for details of the objections and issues raised during the EG3 TWA process.

### 2.3.6 Details of Ongoing Scheme Proposals Affecting the Crossing

Refer to Section 3: Proposed Schemes

## 2.4 Site Investigation Works

No intrusive site investigation works have been completed as part of the production of this report. However, a brief summary of previously commissioned site investigation work as part of the Great Western Mainline Electrification project is included in Appendix D along with site findings and record drawings.

Extract from a geological map for the area is included in Appendix K. This shows that the area is underlain by Alluvium which overlies Oxford Clay.

## 2.5 Level Crossing Risk Assessment Details – Existing Arrangement

### 2.5.1 Protection Arrangements

The existing crossing is over the Down Jericho (trains travelling northbound at 25mph), Up Main (trains travelling southbound at 70mph) and Down Main (trains travelling northbound at 70mph), plus trains crossing to/from the Down Passenger Loop north or southbound at 25mph.

The permissible speed over the Main Lines at the crossing is actually 90mph, but following a review of the risks with Office of Rail Regulation (ORR), Network Rail recently imposed a 70mph speed restriction which will remain until the crossing is closed.

The crossing is fully decked (surface to rail level) and the distance between decision points is 13.6m. ORR and Railway Group Standards would normally accept a walking speed of 1.2m/s but because this crossing includes regular pushing of bicycles, pushing of wheel barrows and carrying of large loads, a 50% ‘encumbered user’ allowance has been added to the assumptions as set out in Network Rail company guidance. The time taken to cross the railway is therefore assessed at 17.1 seconds and not the usual 11.4 seconds that would apply at un-encumbered user crossings.

For footpath crossings there are three allowable methods of protection. The first is purely passive, where safe operation relies on there being a sufficient view of approaching trains (known as sighting time) for users to cross from one side to the other (known as traverse time) before the train reaches the crossing.

Where sighting time falls short of traverse time at a passive crossing, it may be acceptable to supplement this protection by the second method, which is audible warning via the train sounding its horn at a lineside sign (known as a whistle board) on approach. Aristotle Lane is a passive crossing supplemented by whistle boards. Under current standards whistle boards should be placed no further than 400m from the crossing, but the boards approaching Aristotle Lane date back several years and are considerably further out (562m and 634m). Network Rail assesses that at this location train horns can still be heard and therefore do provide effective warning to users.

The third method (if closure, diversion or bridge cannot be achieved) is to provide active warning to users linked to the signalling system in the form of miniature stop lights (MSL). Network Rail has considered MSL for Aristotle Lane, but rejected that option because standards do not permit this system to be installed where there are more than two tracks – see section 3.6.

### 2.5.2 Sighting Distances

Four sighting distance measurements are taken at passive crossings; looking each way when standing at the 'decision point' on each side of the railway. At Aristotle Lane the standard decision point position for footpath crossings of 2m from nearest rail is used. Current figures are as follows:

| Direction | Train speed (mph) | Available sighting distance (m) | Required sighting distance (m) |
|---|---|---|---|
| City (East) side, looking north | 70 | 701 | 537 |
| City (east) side, looking south | 70 | 1057 | 537 |
| Allotment (West) side, looking North | 70 | 500 | 537 |
| Allotment (West) side, looking South | 70 | 424 | 537 |
| City (East) side, looking north Bicester Trains | 25 | 230 | 190 |

As sighting time falls short of the assessed 17.1 seconds traverse time by 3.2 seconds, whistle boards are in place to supplement sighting and improve overall warning time. At 562m from the crossing, train horns at 70mph provide nearly 18sec warning, thereby taking it above the traverse time.

### 2.5.3 Usage Survey

A motion-triggered surveillance camera was placed at the crossing to gather usage data between the 19th April and the 2nd May 2012. A peak usage of 112 was recorded on the 30th April, 29 of them involving bicycles or barrows. Network Rail's current risk assessment took account of this census and the company's risk model ALCRM assumes a daily usage total of 112.

Averages of 234 trains per day currently pass the crossing.

### 2.5.4 Train Speeds

Permissible speed over the Down and Up Main lines has been 90mph but in practice it was found that all but a very few trains are attaining more than 70mph and no train sampled exceeded 75mph. This was broadly as expected, because all passenger trains are booked to call at Oxford station nearby, while freight train maximum speed is 75mph anyway. As noted in 2.5.1 above, Network Rail has now imposed a speed restriction of 70mph on the Main Lines approaching the crossing, so that warning time for users stays within the traverse time. The restriction also controls the risk that occasional empty stock, special charter and other traffic not calling at Oxford 'undershoot' the warning time and catch users unawares.

All trains are fitted with on-board data recorders. Train operators routinely monitor activity so that the risk of speeding is minimal.

### 2.5.5 Risk Assessment

Network Rail maintains a live risk assessment for each level crossing in a database known as ALCRM. A number of inputs are required to ALCRM, the critical ones being:

- Crossing type
- Crossing length/ traverse time
- Sighting distances/ times
- User census
- Train speeds and quantum
- Misuse/ near miss/ accident history
- Any existing mitigations in place e.g. whistle boards

ALCRM then runs a calculation and produces an alphanumeric score in the range A1 (highest risk) to M13 (lowest risk). The letter represents the individual risk to a user while the number represents the collective risk within that type of crossing. Network Rail company standards regard any score within A, B and C and/or 1, 2 and 3 as particularly high risk, and local teams are encouraged to consider reasonably practicable risk reduction measures. ALCRM is subject to some imperfections (as with all statistical models) and therefore only an aid to decision-making. The model considers incident frequency (measured and calculated). This can provide risk frequency comparisons and can derive an acceptable spend/25 years to compare different improvements with their benefits.

Aristotle Lane current score is C2, which places it within the higher risk range. This is to be expected, given the high numbers of both trains and users, and the crossing length. Network Rail imposed a 70mph speed restriction in August 2012 to keep warning time within traverse time, and will shortly implement measures to control unauthorised access through an additional keypad and will discourage the taking of bicycles across.

# 3. Proposed Schemes

This section provides details of the various schemes impacting upon the crossing.

## 3.1 Intercity Express Programme (IEP) Super Express Trains

The IEP plan for deployment of Super Express Trains (from 2016/17) alters the pattern of operation of through Cotswold Line services (to Worcester, Great Malvern and Hereford) via Oxford with planned increases in service levels.

## 3.2 Gauge Enhancements

Completion of gauge-enhancement of the broader Soton-WCML corridor (in 2011) has permitted the passage of W10 gauge trains compared to the previous W8 restriction. The elimination of this restriction is stimulating the demand for more freight-train paths through the Oxford Corridor, with increasing train length requirements up to 775m. The creation of an enhanced element of three-track and four-track railway will give the segregation necessary to path more freight trains between the passenger train movements.

The Freight Route Utilisation Strategy (RUS) predicted a forecast increase in the number of train paths per day in each direction, required between Didcot and Oxford of 25 by 2019 and 39 by 2030.

## 3.3 Freight Train Lengthening

The CP4 Project for Freight Train Lengthening funded by the Strategic Freight Network was remitted to provide facilities for the accommodation of 775 metre long trains between Southampton and the West Midlands via Basingstoke, Oxford and Leamington Spa on a core route. The Didcot to Leamington Spa route was investigated in depth due to the need to ensure that passenger trains on this busy section of the line would not be delayed behind the half-mile long container trains. In essence, it is imperative for a freight train of this length to be looped somewhere in this area to allow following passenger services to pass. Several options were considered at Hinksey, Oxford, Banbury and Fenny Compton during the development stages of the project and it became evident that Oxford was not only the most important strategically, but also offered the best option for providing an infrastructure enhancement that would provide future proofing for growth. In consequence, proposals for Bi – directional signalling, a 90mph extension of the Down Passenger Loop from Oxford North to Wolvercot Junction and for a 90mph speed raising of the Up Passenger Loop are being developed for implementation in 2015. This will allow a freight train to be stopped on the Main lines while a passenger train passes on the extended and upgraded Passenger Loop lines.

## 3.4 East-West Rail

The complete East West Rail scheme comprises a strategic rail route that will link Ipswich, Norwich and Cambridge, with Letchworth, Bedford, Milton Keynes, Bicester and Oxford, allowing connections to Swindon, the Thames Valley, South West England and South Wales, together with a spur to Aylesbury.

The whole concept of East West Rail has some parallels with the M25, in that it provides an orbital route around London which both passenger and freight services will use for short, medium and long distances.

The Western section runs along the existing lines from Oxford, and then over the existing Bicester

Town branch line. This section will include the provision of a 50 mph double junction connection at Oxford North to support the East / West use of platforms at Oxford with parallel routes available to the Bicester line. This new double junction will be in the vicinity of Aristotle Lane crossing.

It is currently anticipated that these railway enhancements schemes will lead to an overall increase in rail traffic levels of 5.5 trains per hour in each direction.

## 3.5 Combined Proposed Track Layout

A summary diagram showing the additional Down Relief line, changes in line speed and bi-directional alterations to the existing lines is included in Appendix F.

In summary the proposed track layout changes will increase the crossing length, the time taken to traverse the crossing and the sighting distance required by users at the decision points. Therefore the completion of a predicted revised risk assessment for the crossing was considered necessary, the results of which are contained in the following section.

## 3.6 Future of the Level Crossing

### 3.6.1 Future Infrastructure Changes

The planned enhancement schemes for the area will increase the number of tracks from three to four. The four-track railway involves adding a new Down Relief line on the allotment (West) side of the crossing which will be laid on an existing track bed that was last used in the 1970s. The existing Down Jericho will become a reversibly signalled 40mph Up / Down Relief line. Timetable capacity for all four tracks will be based on 90mph and the signalling that will enable all lines to be used bi-directionally, with trains able to travel in either direction.

The crossing will become an exceptionally long 23.9m between decision points. This compares with the typical 9.5m over a double track railway.

The number of trains passing over the crossing will be in the order of 432/day. This is taken as the existing count, plus:

- a small increase in Cotswolds line passenger services
- an additional intermodal container train/hour in each direction
- an additional slower bulk freight train in some hours
- introduction of the Oxford-Bicester-London Marylebone service (2 trains per hour)
- introduction of the East-West Rail Oxford-Bicester-Bletchley service (2 trains per hour).

The planned infrastructure changes will allow 775m long freight trains to be stopped on the Down line north of the crossing and on the Up line to the south to enable faster passenger trains to overtake. The position of the signalling will result in the end of a freight train on the Up Main line coming to rest within 25m of the crossing. This will effectively completely obscure the sighting distance for the new Up Relief for users coming from the west side and will dramatically reduce the sighting distance on the Down lines for users coming from the west.

### 3.6.2 Passive Crossing Protection

The planned future increases in crossing length, train frequency and line speed will increase the required warning time to 29.85 seconds, compared to the existing 18 seconds of warning time currently afforded by the existing whistle boards. (This figure does not include the further restrictions caused by stationary freight trains). Sighting would become more inadequate at the foot crossing placing greater reliance on the whistle boards, but these would need to be placed at such a distance that the train horn would be inaudible from the crossing. Taking the above factors into account, Network Rail rejects the possibility of continuing Aristotle Lane as a passive crossing within an enhanced track layout. Whistle boards would have to be too far away for train horns to

give effective warning, the frequency and pattern of train movements on the reversibly signalled lines will make it unacceptably complex for users to decide whether it is safe to cross.

### 3.6.3 MSL Protection

Network Rail has considered the possibility of installing miniature stop lights (MSL) as outlined in section 2.5.1.

Between the new Down Relief and the existing Down Main tracks there will be a wider-than-usual interval at the crossing site, due to nearby structures. Network Rail has considered the possibility of splitting the crossing into two distinct portions with separate MSL systems, using this interval as a fenced refuge/ waiting area. Users would cross three tracks as now, wait at the refuge then if safe cross the fourth track. This has been rejected due to:

- the system not being permitted under current railway standards, this arrangement is not allowed with a longer crossing time as the user could receive a green indicator which turns red after the decision has been made to cross. The alternative of putting the red on earlier would encourage misuse as users see a red for a lengthy period of time before a train approaches
- limited length of the refuge, the inward-opening sprung gates that would be necessary at either end (further restricting useable length) and the potential for confusion/overcrowding/dithering at peak user times, particularly when barrows/ bicycles are taken across
- the increase in traffic and speed through the layout would change the character of the existing three-track portion of the crossing
- high risk of user impatience/ non-compliance with the lights, as they are likely to be held on red for a considerable time during peak periods. Users will tend to make their own assumptions about which trains are holding the lights on red and the hazard of a second train approaching is particularly significant.

MSL over three or more tracks is not permitted. Space does not allow Network Rail to overcome this particular issue by splitting the crossing into a 1+2+1 track MSL layout, and in any case will further increase the risk of user impatience/ confusion. Any application for non-compliance in the circumstances appertaining to Aristotle Lane would certainly be rejected.

### 3.6.4 Risks with MSL in Complex Situations

Network Rail believes that the risk of user non-compliance/ impatience at Aristotle Lane with MSL would be unacceptably high, especially at peak periods when a sequence of two or more approaching trains will hold the red lights on for a considerable time.

The enhanced track layout will be designed specifically to facilitate the overtaking of trains in the Oxford area. This significantly increases the likelihood of parallel movements being made, or of long (up to 775m) freight trains standing or slowly moving in the vicinity of the crossing. Both these conditions will involve one train masking the user's view of another for what might be a considerable time. One particular risk with MSL at other than straightforward locations is that users make their own assumptions about why the red lights are staying on after a train passes, decide to 'chance it', then step into the path of a train on another line that they have not seen or heard.

### 3.6.5 Fully controlled (barrier) method considered

Network Rail has also considered the possibility of installing an on-demand mini-barrier system. The crossing would be under the supervision of the signalling centre with the barriers normally down, i.e. closed to path users, similar to the private road crossing at Appleford. Each user requiring to cross would press a plunger to alert the signaller. When an adequate margin between trains is available, the signaller sets protecting signals to stop and raises the barriers. When the signaller sees the crossing to be clear again via CCTV, the signaller lowers the barriers and can then clear signals again.

This option was rejected for the following reasons:

- The method is currently recognised only for vehicular crossings. Its use would require type approval, both internally and externally from the Office of the Rail Regulator (ORR) via a change in legislation and to Railway Group Standards
- Even if the method can be shown as technically safe, signallers would not be able, at peak train times, to respond to the likely number of demands from path users
- At times there will not be adequate margins to keep protecting signals at stop, especially given the crossing's length and proportion of users with barrows/ bicycles resulting in long waiting times for crossing users
- As with MSL, the risk of non-compliance/ misuse would be unacceptably high

### 3.6.6 Risk Assessment

As no acceptable arrangement is available, detailed risk assessments have not been carried out for the crossing within an enhanced track layout.

### 3.6.7 Summary

Network Rail believes that safety risks at Aristotle Lane within an enhanced track layout cannot be controlled to acceptable levels. Continuing a passive crossing is not an option. MSL and 'mini-barrier' options have been considered but rejected for reasons described above. There are also significant network performance risks attached to maintaining a crossing within an enhanced layout.

Retaining Aristotle Lane crossing would effectively prevent the Department of Transport enhancement plans for Oxford North area from going ahead, failing to deliver the full benefits of the investment to stakeholders in the region and nationally.

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# 4. High Level Options Considered

## 4.1 Site Constraints

Table 4-1 details the site constraints that have been identified as part of the works; a site constraints sketch can be seen in Appendix H. Additional constraints identified as a result of the Chiltern Railways EG3 TWA application are discussed in more detail in section 5.2.

**Table 4-1 – Site Constraints Summary**

| Constraint | Description | Impact |
|---|---|---|
| Down Relief line extension at Aristotle Lane Crossing | The additional down relief line over the level crossing increases the distance users are required to travel to cross the railway. | Additional time exposed to live operational railway and associated risks. |
| Restricted sighting at level crossing | The existing Willow Walk Footbridge west pier may obscure the sighting distance of users of the crossing.<br>Increased frequency freight trains may mask approaching high speed passenger trains from users of the crossing.<br>The existing vegetation growth on the rail corridor approaches to the level crossing are such that sighting distances at the future decision points for users of the crossing with the additional line could be obscured. | Vegetation growth and sighting distance with specific attention to the bridge piers should be assessed if a level crossing solution is progressed.<br>Impact on sighting and introduction of obscuration risk by freight trains to be assessed as part of option considerations. |
| Up Relief line speed increase | The line speed of the Up Relief is increasing from 25mph to 90mph. | Additional potential risk to crossing users.<br>Potential for regular users to be complacent about train speeds based on past experience. |
| Bi-directional working | Bi-directional working arrangements are being implemented on all four lines and high speed crossovers installed. | Additional potential risk to crossing users.<br>Potential for regular users to be complacent about train direction based on past experience. |
| Whistle boards | The current whistle board locations (>400m from the level crossing) are non-compliant with current guidance from the Office of Rail Regulation (ORR), *Level Crossings: A guide for managers, designers and operators, Publication 7 December 2011*. Changes to track arrangements will require increased sighting distance and subsequently increased whistle board distance. | As the whistle boards are already significantly non-compliant, continued reliance on whistle boards with proposed additional tracks would not be possible as they would not be an effective safety warning system |

| Constraint | Description | Impact |
|---|---|---|
| Miniature Stop Light (MSL) crossing option | Consideration may be given to improving the level crossing equipment to mitigate against proposed changes and constraints such as the introduction of MSLs.<br><br>However, at this busy location north of Oxford station (and with an additional 1.5 train per hour short term, 5.5 trains per hour long term) a MSL system would give a red – do not cross – indication for a large proportion of the time.<br><br>Also, MSL systems are not to be installed at locations of more than 2 tracks, NR/L2/SIG/11201/Mod X40, section 1.1.2. | Potential for misuse by users given expected duration of red light indication.<br><br>System not intended or approved for installation at a four track crossing, see section 3.6.3. |
| Switches and Crossings (S&C) | The Down Passenger Loop connects to the Down Main through a right hand turnout directly under the bridge. There are also a number of crossovers both north and south of the footbridge location.<br><br>Equipment associated with the S&C such as long bearers, points heating and power packs is present at trackside in the vicinity of the bridge. | The presence of S&C results in additional clearance requirements to any future overhead line equipment. Therefore if passive provision is to be made for future electrification, the presence of S&C requires the maximum possible clearance be provided below the structure to avoid future complications.<br><br>The position of the crossing within the junction also leads to multiple train approach directions and constrains maintenance access. |
| Signalling and Tele-communication (S&T) Equipment | One full LOC case approximately 50m south of the bridge and a two LOC suite approximately 55m north of the footbridge, both located in the Down Main cess. Two 220mm wide cable trough routes are located in the Down Jericho cess and one cable trough route is located in the Down Main cess. | S&T equipment will require protection during the site works. |
| Services – running through the bridge deck | Services to be diverted or protected during works to the bridge deck. Multiple cables supported by cable tray on outer face of central bridge span. | Diversion or protection of services could potentially significantly increase the scheme costs.<br><br>Liaison with statutory undertakers is required, which may have programme implications. |
| Track drainage<br><br>(Oxford Line Ditch – SSSI) | There appears to be no sub-surface track drainage, however there are shallow drainage ditches present in the cess of the Down Main and Down Jericho lines. These ditches are identified in the hazard directory as SSSI, accordingly vegetation clearance restrictions are in place. | If required, vegetation clearance works should be carried out in a time frame sensitive to the nesting habits of the species involved. |

| Constraint | Description | Impact |
|---|---|---|
| Flooding | The area surrounding the bridge is identified by the Environment Agency as having a "significant" risk of flooding. | Alterations at low level should give due consideration to flood risks.<br>Ditches should not be altered without a clear understanding of the hydrology and confirmation that flood risk will not be adversely affected. |
| Existing approach ramp gradient | Bridleway route across bridge, average existing gradients are (*worst case*):<br>- East approach: 1:20 (*1:6 at the bridge*)<br>- West approach: 1:18 (*1:6 at the bridge*)<br>• For an equestrian route the maximum gradient is 1:5 (DMRB, Volume 6, Section 3 Part 5 TA 90/05, clause 5.7).<br>• For a pedestrian route the maximum gradient is 1:12.5. For gradients steeper than 1:10 provision of a handrail is recommended. (DMRB, Volume 7, Section 2 Part 5 HD 39/01, Table 2.3)<br>• BD29/04 states desired ramp gradient as no steeper than 1:20. However 1:12 is acceptable subject to overseeing organisation approval. | Re-profiling of approach ramps required to tie increased height of bridge deck into existing alignment, increasing costs.<br>Consideration needs to be given to access for construction, damage to environment and limitations on ramp footprint when developing proposed gradient.<br>Proposed new gradient and landing arrangement to be discussed and reviewed as part of detailed design with stakeholders. |
| Willow Walk Footbridge in use | The bridge is a well used crossing route between the residential area and Port Meadow. Other than Aristotle Crossing 60m north of the bridge, the nearest diversion route is approximately 500m to the south. | Increased use of the private foot crossing should not be considered as part of any diversionary route during bridge reconstruction works due to its private nature and significantly increased safety risk. |
| Residential properties and SS Phillip & James CE School | Residential properties <50m southeast of Bridge. SS Phillip and James C of E Primary school <100m northeast of bridge.<br>The school have expressed an interest in purchasing land bordering the access track to Aristotle Lane Crossing, proposed plan enclosed in Appendix I. | Noise, dust and road access during construction to be considered.<br>Potential conflict between stakeholders regarding use of land – further NR discussion with stakeholders is required. Current school proposals require some adjustment to allow access step construction on east approach ramp. |
| Non-trackside access | Limited width throughout approach ramps. | No access for HGV's or road based cranes from bridge deck level. |
| Existing footbridge parapet & decking | Existing footbridge parapet and decking are not suitable to comply with requirements for footbridge structures located over OLE. | Modifications to the structure could be designed to provide suitable parapets and decking surface. This will require structure assessment. Alternatively a replacement structure could be designed to meet requirements. |
| Proposed Down Relief line at Willow Walk Footbridge | Proposed preliminary alignment results in reduced lateral clearance to the west bridge pier. | Reduced clearance to be agreed at detailed design stage and consideration given to permanent way alignment modifications. |

## 4.2 High Level Optioneering

Considering the proposed permanent way changes and the history of the site, high level optioneering was undertaken prior to further development of the preferred option. The options considered are shown in table 4.2 & 4.3 which detail a brief description of possible crossing upgrades / alterations and why each option was rejected or developed further.

**Table 4-2 – High Level Optioneering Summary – Crossing Upgrade Options**

| No. | Option | Advantage | Disadvantage | Comments |
|---|---|---|---|---|
| 1 | Footpath Crossing Upgrade:<br>- Additional Signage<br>- Repositioned Whistle Boards | • Existing access route to allotments is maintained. | • Safety risk assessment rating will be increased by the additional line (resulting in longer crossing), increased line speeds and bi-directional working (both resulting in increased sighting distance requirements)<br>• Whistle boards are already in non-compliant locations and would not be suitable given increased line speeds. | Option not considered safe based on NRs Level Crossing Risk Assessment.<br><br>*Refer to discussion in section 3.6.* |
| 2 | Footpath Crossing Upgrade with new Miniature Stop Lights | • Existing access route to allotments is maintained. | • Miniature stop lights should only be used on 2 track railways (ref: module X40 of signalling design handbook).<br>• Due to high traffic levels in area, miniature stop lights would be on a red indication for a significant period of time leading to potential misuse of crossing. | Option not considered safe due to non-compliance with standards.<br><br>*Refer to discussion in section 3.6.* |
| 3 | Impose Speed Restrictions at Level Crossing | • Existing access route to allotments is maintained.<br>• Crossing would be safer for users | • Significant impact on train operations – unacceptable for this primary rail corridor and busy Oxford Station. Estimate a 25mph restriction necessary. | Option not considered based on detrimental effect to development and improvement of the railway. |
| 4 | Do Nothing | • Existing access route to allotments is maintained. | • The national infrastructure projects described in sections 1 and 3 would not be possible.<br>• Unacceptable long term as any service increase would be prevented | Option not considered based on detrimental effect to development and improvement of the railway. |

**Table 4-3 – High Level Optioneering Summary – Alternative Diversionary Options**

| No. | Option | Advantage | Disadvantage | Comments |
|---|---|---|---|---|
| 5 | Closure and diversion via existing adjacent Willow Walk Footbridge (refurbished and jacked to meet electrification requirements) | • 4780mm clearance can be achieved. *Note: OLE 'Normal Clearance with Full Tolerance' may not be achievable at 4780mm due to S&C located beneath structure. This clear height may result in either 'normal clearance with close tolerances' or 'reduced clearance'. This is subject to future OLE wire design.*<br>• Reuses existing structure, reducing construction time and impact to local residents (anticipated footbridge diversion time of 12 weeks, note this is subject to detailed design and construction programming based on client requirements)<br>• Construction access is difficult, therefore reuse of existing is favoured | • Potential disruption to services carried by bridge<br>• Low residual life<br>• Substantial temporary works required<br>• Ancillary works required to increase height of abutments and piers<br>• The latest structural assessment has not been reviewed – strengthening works may be required<br>• Parapet height is sufficient for pedestrian usage (1.5m required), however for equestrian usage, 1.8m is required.<br>• The timber deck of the footbridge will require replacing with a steel deck plate to meet future electrification requirements<br>• Increase in footway level will require approach regrading works and possibly earthwork retention walls<br>• Permanent forces increased on abutments and piers through addition of new cill units and approach regrading<br>• To avoid further deterioration, bridge repairs may be identified during jacking and refurbishment operations increasing programme and costs. Detailed inspection should be completed at design stage.<br>• Existing clear width of 2489mm exceeds minimum requirement of 2.0m for an un-segregated footpath and cycleway as stated in DMRB Volume 2, Section 2 Part 8 BD 29/04, clause 12.8. However as the footbridge is <3.5m wide, consideration should be given to providing mounting blocks for users to dismount and lead horses across (subject to current equestrian use of the footbridge)<br>• Closure of the Down Passenger Loop & Down Main line will be required as a minimum during jacking operations. | Span over railway can achieve 4780mm for all lines. Reduced cost, construction time and disruption compared to reconstruction option.<br><br>However, no assessment reports have been reviewed; strengthening works of an unknown extent may be required to the substructure - residual life of structure not extended.<br><br>Due to site access constraints for complete replacement, reuse of existing is the preferred option. |

| No. | Option | Advantage | Disadvantage | Comments |
|---|---|---|---|---|
| 5A | As above without jacking the structure (i.e. excluding future proofing the structure for electrification of the railway) | • Reduced costs.<br>• Reduced disruption to users.<br>• No refurbishment works required to structure. | • Constructing the spur ramp, east approach steps and raising the lower section of the west approach ramp separately from preparing the bridge for electrification would result in a second period of significant disruption and increased difficulty to achieve tie in with revised ramp levels. | Considered more efficient to undertake allotment access/ramp improvement works and preparation of the bridge for electrification simultaneously – option not taken forward. |
| 6 | Closure and diversion via adjacent Willow Walk Footbridge, (reconstructed to improve accessibility and meet electrification requirements) | • 4780mm clearance can be achieved, allowing OLE Normal Clearance with Full Tolerance<br>• 120 year design life<br>• 25 Year maintenance free (painting) | • Disruption to services carried by bridge<br>• Disruption to local residents as longer bridge closure required (anticipated footbridge diversion time of 14 weeks, note this is subject to detailed design and construction programming based on client requirements)<br>• Higher costs than those associated with jacking<br>• Ancillary works required to increase height and width of substructure in addition to providing a new superstructure<br>• Permanent forces increased on abutments and piers through addition of new cill units, approach regrading and proposed structure<br>• The latest structural assessment has not been reviewed – substructure strengthening may be required at significant expense to programme and budget<br>• Possibly long lead-in times for materials associated with a reconstruction<br>• Construction access from footpath level will be difficult, access from redundant rail corridor to east (used as access track) will be necessary.<br>• Potential requirement for earth retention | Span can achieve 4780mm clearance for all lines. Bridge reconstruction will provide a structure with longer life, reduced maintenance and lower life cycle costs than jacking the existing structure.<br>However, no assessment reports have been reviewed and strengthening works of an unknown extent may be required to the substructure.<br>Due to site access constraints for complete replacement, reuse of existing (option 5) is the preferred option. |

# 5. Proposed Option for Development

## 5.1 Option 5: Closure and diversion via Refurbished & Jacked Willow Walk Footbridge

| | | |
|---|---|---|
| Option Sketches: | 5109279-RLS-ALC-CST-001 | - Existing Surveys |
| | 5109279-RLS-ALC-CST-002 | - Existing GAs |
| | 5109279-RLS-ALC-CST-003 | - Existing Sections |
| | 5109279-RLS-ALC-CST-004 | - Proposed GA |
| | 5109279-RLS-ALC-CST-005 | - Proposed Sections |
| | 5109279-RLS-ALC-CST-006 | - Proposed Details |
| | 5109279-RLS-ALC-CST-007 | - Travel Distances |
| | 5109279-RLS-ALC-CST-010 | - Level Crossing Existing GA |
| | 5109279-RLS-ALC-CST-011 | - Level Crossing Proposed GA |

The proposals for this option are outlined on the above listed option sketches contained in Appendix J. A summary of proposed requirements is listed below.

Existing Crossing Closure

The existing foot crossing shall be closed (effected via a Deed of Release) with associated lineside infrastructure removed and the boundary fence modified to prevent access across the railway at this point.

The adjacent area used for car parking by allotment users will be relocated adjacent to the footbridge, although this may be subject to change as part of the school extension proposals.

The existing access into the east side of the allotment shall be permanently closed. A new access shall be created at the south end of the central path running along the allotment. Access to this gate shall be from the new allotment connection ramp, see below.

Willow Walk Footbridge Superstructure Jacking

The 3no main spans are to be raised by jacking to provide additional clearance to accommodate future planned electrification of the railway below. Given that track crossovers will potentially be located below the footbridge, a minimum clear height of 5100mm is desired however due to site constraints 4780mm has been selected to minimise the amount of embankment fill works required. Jacking the bridge to 4780mm cannot guarantee that a future OLE design would be able to achieve *normal clearance with full tolerances* given the presence of S&C below the structure; however it may result in either *normal clearance with close tolerances* or *reduced clearance.* This is considered acceptable in order to minimise the impact of increasing the approach ramp heights on the sensitive surrounding environment and the adjacent approach walls.

The height of the piers will be increased to achieve 4780mm clearance through installation of new pre-cast cill units, attached directly to the existing bedstones with dowel and resin anchor fixing.

It should be noted that the proposed trackside jacking locations would be in close proximity to the Down Passenger Loop and Down Main running edges, which would require the jacking equipment to sit within the track support zone and the gauge of trains using the Down Passenger Loop running edge. This would require closure of these lines for the duration of the jacking operation.

The proposed bridge permanent forces will vary from existing, however it must be noted that no structural assessments have been made available for review as part of producing this report, therefore strengthening works of an unknown extent may be required to the substructure.

Willow Walk Footbridge Superstructure Refurbishment

The timber bridge deck will require replacement under electrification requirements. Replacement with a steel deck is proposed.

Earthwork Ramp Approaches - General

The existing average gradients for the approach ramps are 1:20 to the east of the structure and 1:18 to the west of the structure. The maximum gradient for an equestrian route is 1:5 (DMRB, Volume 6, Section 3 Part 5 TA 90/05, clause 5.7) and the maximum gradient for a pedestrian route is 1:12, or in some cases a steeper gradient may be required where provision of a handrail is recommended for gradients steeper than 1:10 (DMRB, Volume 7, Section 2 Part 5 HD 39/01, Table 2.3).

Within these limitations the existing approaches will be modified to provide resting places in the form of 2m long landings every 0.65m rise and regraded to a gradient of 1:13. Due to site constraints limiting the length of ramps it is not possible to achieve a significantly shallower gradient or a change in direction at landings.

In addition to the regrading, resurfacing and devegetation will be undertaken to achieve a minimum 2m clear width allowing users to pass easily. New signage will be provided.

Earthwork Ramp Approaches – Eastern Approach

The access point to the eastern approach ramp will remain in its existing location just off Aristotle Lane.

An additional hardstanding area adjacent to the approach ramp would be constructed for use by allotment users as a car park closer than the current car park to the east approach ramp access whilst still accommodating the adjacent school expansion proposals. Note this is subject to the development of the school expansion proposals.

New access steps from the new hardstanding up the north side of the east approach slope shall be constructed to minimise travelling distance for non-laden allotment users.

Earthwork Ramp Approaches – Western Approach

In addition to the general points, the lower entrance section of the western approach ramp (62m long section) shall be raised and reconstructed with suitable large diameter cross flow drainage to reduce the low point of the path which is susceptible to flooding. To remove the need to install handrailing and minimise the impact on the Port Meadow site, the raised section is proposed to be constructed with sloped banks. These would be seeded with vegetation local to the area.

Earthwork Ramp Approaches – New Allotment Connection Ramp

A new steel ramp will be provided from the 5$^{th}$ landing of the proposed west approach ramp, approximately 25m long including landings and will include simply supported spans on concrete foundations.

The steel ramp will comprise rectangular hollow section stringers supporting parapets and steel plate flooring. The parapets are 1275mm vertical height above adjacent walkway and consist of hollow section posts / rails and vertical infill bars.

## 5.2 Previous TWA Issues Mitigation

Section 2.3.5 briefly discusses the TWA application submitted by Chiltern Railways for the Evergreen 3 Bi-Ox line. Below are the objections and issues raised during the application process along with details of how the proposed option mitigates against these issues.

**a. Increase in Travel distance**

(refer to Appendix J, Option Sketch 5109279-RLS-ALC-CST-007)

**Existing Travel Distance:**

Route A, from the existing hardstanding car park area to an arbitrary point a short distance inside and along the central allotment path via the level crossing, is 113m.

Route B, from the entry point off Aristotle Lane to the same point within the allotment via the level crossing, is 240m

**Proposed Travel Distance:**

Route C, from the proposed new car park area via the new east staircase and new west connection ramp, is 207m

Route D, from the entry point off Aristotle Lane to the same point within the allotment via the new west connection ramp, is 283m

The increase in travel distance between Route A & C is 94m.

The increase in travel distance between Route B & D is 43m.

Given the increase in risk to users of the level crossing under the proposed track layout, these increases in additional travel distance are not considered an unreasonable addition for a significant safety benefit.

**b. Lower West Approach Flooding and Water Flows**

An original objection to the diversion route over the bridge raised the issue that the existing path beyond the west ramp is very close to the flood plain level and then rises up slightly as it joins the 'roadway track' near the south west corner of the allotments. This low section can therefore flood and become unusable.

The Chiltern TWA proposal included raising this section by 400mm and providing cross path drainage channels thereby rendering this section of path useable during low level flooding until such time as the whole area floods including the allotments entrance gateway area. However an objection was then raised regarding the cross path drainage pipes, which would block over time and therefore impede water movement. The proposed design presented here uses larger precast concrete sections to provide a flow route below the path.

It is also believed that flood water will level out via the network of streams/ditches in the area and raising this section of the path should not impact the ground water flow in the area. Further study should be undertaken during detailed design.

**c. Dog Fouling by Public Users Affecting Allotment Users**

It is understood that the allotment users are accustomed to a 'private' access and concerns were raised over having to share a public footpath regularly used by dog walkers and therefore potentially subject to dog fouling.

The proposed solution includes the addition of dog bins and signage at either end of the path to help minimise the impact. However this will be subject to agreement with the Oxford City Council due to requirement to maintain and empty the dog bin facilities.

**d. Proposed Allotment Connection Ramp Restricting Cow Movements**

The Chiltern Railways proposed position of the allotment connection ramp spanned a

lower section of grass and bushes, which includes a stream when the area is flooded. It is now understood that in sunny weather, the Port Meadow cows move to this area as it is one of the few shaded areas in the meadow.

The Chiltern ramp proposal across the shaded grassland would have provided a clearance of approximately 1.2m and would therefore have prevented cows from accessing the majority of the shade (there are two clear well used animal tracks in this area).

The revised proposal presented here moves the position of the allotment connection ramp, revises the gradient and provides between 1.6m and 1.8m clearance over a 7m wide section below the centre of the span, allowing animals to pass beneath to find shade.

**e. Surfacing standards and gradient –**

The existing path over the bridge is mud/consolidated fill, on a relatively constant gradient, but currently has a 'step' onto the concrete edge to the bridge timbers, with a steeper ramp up to the level central bridge deck.

The path width on the bridge is 2.45m. The east approach ramp path is 2.9m fence to wall (but with grass/vegetation reducing the actual path width to about 1.5m) and on the west side approach ramp path the width is 2.6m fence to wall (but with grass/vegetation reducing the actual path width to about 1.3m).

A clear width of 2m in accordance with BD29/04 is easily achievable and required to allow wheelbarrow users to pass on the route but the reduction in vegetation (to achieve the 2.0m width) may make the route appear less rural.

The main objection related to elderly people being capable of pushing loaded wheel barrows over the level crossing but not being capable of pushing them over the bridge. Although the bridge is obviously harder work, these are allotment users (so undertaking physical work) and should therefore be capable of using a DDA compliant bridge. If not, their safety using a 90mph railway crossing has to be further questioned.

The proposed option shows the existing approaches regraded and resurfaced with a well graded compacted fill. The detailed design development should consult the interested parties if the surfacing of the path should be upgraded to a bitumen surface on the east approach (it is assumed this would not be desirable on the west approach due to its rural surroundings within the Port Meadow area). Increasing the clearance below the main span by jacking for electrification purposes will result in the east and west approach gradients becoming 1:13, therefore in accordance with BD29/04 regrading is to include 2m long landings every 0.65m rise.

The structure is not currently DDA access compliant and any achieved DDA access to Port Meadow should be considered as a fringe benefit rather than a requirement. Therefore at outline and detailed design, NR may wish to debate with local disability access groups the appropriate solution in terms of landings and allowable gradient versus extent of earthworks. For access to the allotments wheelbarrows and 'pushed' bikes will not roll back or run away, so there may be a case (with user and local authority agreement) that a constant gradient with no/fewer landings is better than the steeper/level/steeper/level 1:13 ramps proposed.

Provision of the change in direction of the ramps (at least 30°) every 3.5m rise required by BD29/04 is not possible due to site constraints limiting earthwork embankment widening this would require. This would also require significant removal of existing vegetation. This requirement can be waived if agreed with the local access groups.

## 5.3 Construction Methodology

The following is an indicative method of construction. Following detailed design the contractor will be responsible for proposing a detailed method subject to approval.

1. Impose bridleway closure either side of bridge and diversionary route (Walton Well Road). Level Crossing to remain open for allotment user access only, it is not suitable as the public diversionary route.

<u>During Possession(s)</u>

2. Remove existing timber deck and protect existing services running in the cable tray
3. Install steel plates to bridge / additional stiffeners to jack location as required
4. Install hydraulic jacks
5. Erect temporary works to reduce the risk of catastrophic collapse in event of hydraulic pump failing
6. Hydraulically jack the structure to the required height to install new cill unit
7. Erect scaffolding around piers and abutments
8. Prepare surface for installation of cill units, including laying mortar bed
9. Install new precast concrete cill units onto existing bedstones with combination of dowels and resin anchor fixings
10. Remove scaffolding and temporary works and lower the deck / superstructure onto new cill units
11. Install new steel plate deck
12. Reinstate services
13. Remove diversionary route

<u>Outside Possession Works</u>

14. Install deck end drainage
15. Undertake works to approach ramps
    - Vegetation removal to achieve design width
    - Regrade and resurface with installation of landing areas
    - Alignment and tie in with bridge deck
    - Improvements to low section at west end
16. Construct allotment connection ramp foundations using small plant. *Construction to be carried out from ramp and allotment area to minimise impact on Port Meadow SSSI site*
17. Open bridge to the public (main route only) & remove diversionary route
18. Erect steel ramps sections of allotment connection ramp by crane
19. Install new allotment access gate at new allotment connection ramp
20. Open bridge to the public (main route & new allotment access)
21. Close Aristotle Lane Crossing

The extent of works to the footbridge undertaken during possession will depend on detailed methodology. However the works to the approaches and two side spans (over disused sections of railway) will largely be carried out without possessions.

Access for erection of the steel ramp is possible via a temporary crossing of the DCL lines and allotments or via access track across Port Meadow from Walton Well Road. The actual size of plant required will depend on the largest element to be lifted and will be subject to further development at detailed design.

The access track via Port Meadow will be used extensively for the works to the west approach ramp. The contractor will be responsible or ensuring strict control of emissions, storage of materials and undertaking the works in a manner sensitive to the surrounding SSSI site, specifically, the hydrology, grass species and ecology of the site.

## 5.4 Programme

The following programme is indicative only and subject to ongoing development and agreement with stakeholders, including Network Rail:

| | |
|---|---|
| **Consultation** meeting with Oxford City Council | 22nd August 2012 |
| **Further Consultation** with Aristotle Crossing User Groups | September – November 2012 |
| **GRIP3 Option Finalised** | December 2012 |
| **GRIP4 Outline Design Development** (Form 1 including GI & topographic survey for detailed design) | January 2013 – April 2013 |
| **GRIP5 Detailed Design** (Form 2 Completed) | Sept – December 2013 |
| **Construction** | April - July 2014 |

# 6. Risks and Assumptions

The risks associated with the proposed option are listed in table 6.1.

**Table 6-1 – Risks**

| No. | Risk | Impact | Control Measure |
|---|---|---|---|
| 1 | Potentially unstable brickwork boundary wall to southeast of footbridge | May affect proposed ramp approach earthworks. | To be investigated further at GRIP4 stage. |
| 2 | NR does not have ownership of the footbridge approach ramps; agreement with local authority will be required for permanent and temporary works. | Potential to impact entire scheme approval. | Discussions to be held with local authority throughout and agreement sought on overall solution. |
| 3 | Existing Aristotle crossing may continue to be used by allotment users | The increased safety risk associated with the proposed track modifications and the removal of the crossing infrastructure would result in the crossing location becoming extremely dangerous. Potential for injury/mortality. | Existing crossing to be securely sealed and access prevented as part of closure. |
| 4 | Substructure – unknown if suitable for change in loading due to jacking and introduction of cill units | Possible additional cost to strengthen sub structure piers | Investigate and assess during next GRIP stage to determine suitability of substructure for reuse. |
| 5 | Topographic survey is a mixture of historic aerial and local detailed survey. | Design development is limited in accuracy. | At next GRIP stage a detailed track and non-trackside traditional land survey is required to provide designers with accurate topography, gauge and structure details. |
| 6 | Constrained parking arrangements | The school extension and parking arrangement changes result in more constrained parking, potentially blocking NR access. | Space to be left as turning area at new NR access gate and signage added indicating area to remain clear at all times. |
| 7 | Use of steps from car park | Injury to user | Steps to be designed in accordance with BD29/04 and provided with handrail. |

| No. | Risk | Impact | Control Measure |
|---|---|---|---|
| 8 | Use of barrows & bikes across the footbridge | Injury to user through loss of control of barrow or bike | 2m landings to be provided every 0.65m rise to provide area for all users to rest.<br>Consider erecting signage encouraging bike users to dismount. |
| 9 | Use of horses on the bridge, and horse encountering other users. | The bridge width (2.5m) is less than that required in current standards (3.5m), potentially leading to injury if horses and other users have to pass on the bridge. | Consideration to be given to providing mounting blocks at the foot of each approach and signage to encourage riders to dismount and lead the horse across the structure. |
| 10 | Construction works damaging environment | Construction waste entering watercourses<br>Site access across Port Meadow leading to damage of grassland | Contractor to develop safe method of working that will protect the surrounding watercourses and access track. |
| 11 | Devegetation works | Devegetation works damaging wildlife and environment | Devegetation to be planned and undertaken at suitable times to avoid animal nesting times. |

The assumptions associated with the proposed option are listed in table 6.2.

**Table 6-2 – Assumptions**

| No. | Assumption | Mitigation |
|---|---|---|
| 1 | Ground conditions allow for use of spread footings at shallow depth. No site investigation has been completed only a review of geological maps - refer to Appendix K for extract at site. | To be confirmed by additional ground investigation at detailed design stage. |
| 2 | Existing spans are in fair condition and do not require structural strengthening or major repair | To be confirmed by inspection as part of GRIP4 and/or demolition plan depending on chosen option to be taken forward. |
| 3 | Groundwater in Oxford Clay is likely to contain high concentrations of sulphates (BRE Special Digest 1 Fig 1-4a) and it is assumed that concrete of chemical class DC-4 will be required. | This is to be confirmed by boreholes and testing prior to detailed design |
| 4 | It is believed that flood water will level out via the network of streams/ditches/ground water flows in the area around the west approach ramp and raising this section of the path should not impact significantly the ground water and surface flood water flow in the area. | Further study should be undertaken during detailed design.<br>Cross path drainage to be installed in the new path sections. |
| 5 | The proposed ramp gradient and layout solution has been developed to meet the requirements of BD29/04 as far as reasonably practicable without impacting heavily on the surrounding environment and requiring significant embankment works. However detailed development and discussions with third parties may provide opportunity to provide a ramp access solution that better meets the requirements of primary users rather than arbitrarily adhering to design codes. | Further consultation & design development should be undertaken during detailed design. |
| 6 | Agreement with local authority will be gained (and discussion with users) regarding the proposal, specifically adoption of non-preferred slope gradients, lack of change in direction every 3.5m rise on the approach ramps and the continued use of the existing footbridge with its 2.5m width (3.5m preferred) for potential horse users. | Network Rail to discuss proposals and seek agreement with local authority and DDA user groups at all stages of the project. |
| 7 | Permission to close the level crossing is granted. | Demonstration of the increase in risk to users associated with the proposed railway improvements whilst offering a viable alternative which mitigates user concerns as far as reasonably practicable. |

# 7. Environment and Ecology

Aristotle Lane Crossing and Willow Walk Footbridge are located in the vicinity of four conservation areas / SSSIs (as noted below). The crossing and bridge are located adjacent to Port Meadow SSSI and within the Line Ditch SSSI, however it should be noted that water courses and ecology are likely to be closely linked between all of these sites. Figure 7.1 below is an extract from the DEFRA MAGIC map tool showing the extents of the Port Meadow SSSI, also refer to Appendix K containing relevant environmental desk study and ecological walkover maps from the Oxford Area Signalling Renewals project undertaken in April 2012.

- DCL 64m 0110yds to 64m 0770yds – Site of Special Scientific Interest (SSSI): Port Meadow/Wolvercote Common/Green. Weed spray restrictions – Garlon, Timbrel or other treatments containing tricopyr should not be sprayed onto the scrub area. SP495083.
- DCL 64m 0770yds to 65m 0220yds – Site of Special Scientific Interest (SSSI): Line Ditch. No scrub & GLY only. SP500087.
- DCL 64m 0770yds to 65m 1320yds – Site of Special Scientific Interest (SSSI): Port Meadow/Wolvercote Common. Rare Birds nesting in ditch alongside Down Main. Harrison weed spray restrictions, GLY only. SP495083.
- 64m 971yds to 65m 311yds – Conservation Area: Oxford Line Ditch. Conservation Area Site of local importance for nature conservation. Ref: letter dated 11 Aug 2000 from Berks, Bucks & Oxon Wildlife Trust.


**Figure 7-1 – MAGIC Maps Extract Showing Extent of Port Meadow SSSI**

The site is located in the vicinity of the River Thames and River Cherwell and is subject to a "significant" risk of flooding, as shown on the Environment Agency Flood Map in Figure 7-2 below.


**Figure 7-2 - Environment Agency Flood Map extract for Willow Walk Footbridge**

The site has established trees and vegetation, especially adjacent to both approach ramps of the footbridge and along both cesses at track level that are likely to require reduction in size or clearance prior to the construction works. Willow Walk Footbridge is located adjacent to the protected area of Port Meadow, consisting of open, grassy plains, numerous water courses and patches of woodland. It is therefore likely that this area is an established habitat for numerous species of wildlife and vegetation clearance works/maintenance around the structure should take into account the ecology within the area and should be undertaken at a time sensitive to the nesting and behavioural habits of any species encountered.

An environmental & ecological site walkover has not been undertaken as part of producing this report. It is recommended that a full ecological and environmental survey within 200m of the footbridge and its approach ramps is undertaken during GRIP4 outline design of the selected scheme. In addition to the bridge and the approach ramps, the survey should be carried out in the areas likely to be used for construction access and storage but not the adjacent allotment plots. The construction contractor's temporary site boundaries are to be clearly limited to this surveyed area.

Access for construction traffic to the east side should be possible via the NR access track adjacent to the Down Jericho line. Access for construction equipment and storage on the west side will require planning sensitive to the surroundings as any vehicle access will be via the Port Meadow access track to the south, through the SSSI and works must be carried out to minimise impact on the meadow.

# 8. Conclusions

The increased safety risks associated with the enhanced railway layout following completion of the future projects affecting Aristotle Lane level crossing cannot be reduced sufficiently with modifications or improvements to the level crossing. Accordingly a closure and permanent diversion via the adjacent Willow Walk Footbridge is the proposed option.

It is proposed that to avoid subsequent disruption to the public, the footbridge is made ready for electrification by jacking the structure and improving the approach ramps as one project.

It is understood that allotment owners for whom the crossing is maintained will hold concerns regarding the permanent use of the footbridge as an alternative method of crossing the railway. Previous concerns were raised during the Transport & Works Act (TWA) application for the Evergreen 3 (EG3) project. The proposed solution has attempted to address concerns that were raised.

In summary it is proposed to jack the existing footbridge structure to a clear height of 4780mm above rail level, modify the approach ramps accordingly to tie in with the raised structure position along with providing gradients, landings and surfacing that as far as practicable within the site constraints, provide disabled compliant access across the railway. The proposed works also include a new allotment access ramp from the west approach ramp, raising the lower section of the west approach ramp, new car park area adjacent to the east approach ramp (based on a modified version of St Phillip & James School extension proposals) and new access steps from the car park up the north face of the east approach ramp.

Following completion of the above, Aristotle Lane crossing would be closed and secured from future use by removal and fence line modifications.

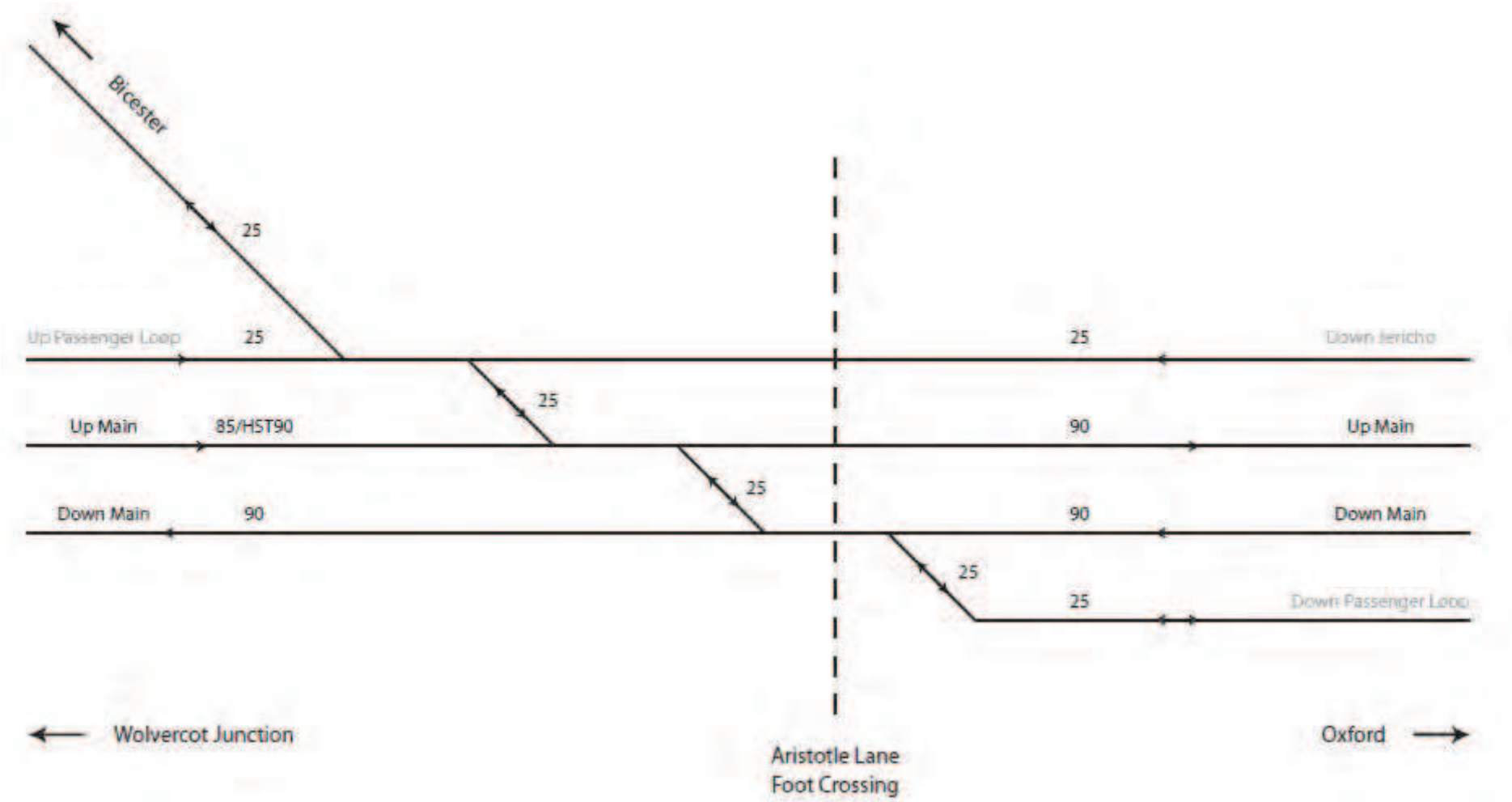
# Appendix A
# Location Plan


## Appendix A1: Location Plan


## Appendix A2: Location View

# Appendix B
# Existing Track Arrangement

(Refer to Appendix F for Proposed Track Arrangement)




## Appendix B: Existing Track Arrangement

(showing direction & linespeed)

# Appendix C
# Historic Buried Services Information Extracts

**National Hazard Directory**

**Extract for Site of Work**

Search Criteria: ELR = DCL; Mileage From = 63.0000; Mileage To = 65.0000
Date: 01/07/2011

| ELR/ELR Name | START | END | DESCRIPTION | LOCAL NAME | Track | Freetext |
|---|---|---|---|---|---|---|
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 53.0000 | 75.0000 | Buried Telecommunication Cables | | All/Multiple Tracks | @Note: There could be buried telecoms cables throughout this ELR. If details of cable location are known this cable MUST be identified first before any ground penetration work is carried out.@ |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 62.0000 | 63.0000 | Buried S&T Cable | | All/Multiple Tracks | SP511052-164 Railtrack S & T cables in upcess side of track S&T Cable - RAR Code: HBS - HAZARD V.10 |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 62.1716 | 63.0044 | Buried Electrical Cables | Oxford | All/Multiple Tracks | M102448 Southern Electricity 11kv Cable attached to bridge overline. |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0000 | 63.0550 | Buried S&T Cable | | All/Multiple Tracks | SP507060-164 Railtrack Cables under/in up cess from before start mileage to c63.02 and cross under line between toes & nose of points from up loop to South Yard. Cables then run under/in down cess to beyond finish mileage. S&T Cable - RAR Code: HBS - HAZA |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0440 | 63.0440 | Authorised Access Point - Vehicle | Oxford | All/Multiple Tracks | SP506061-164 Railtrack From Oxford Station, turn left out of car park onto Botley Rd, turn first right into Becket St which leads to Osney Lane. Access through Royal Mail car park and remains of Oxford South Yard, to upside <vehicle>. Demarcation Site Acc |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0440 | 63.0440 | Buried Foul Water Service | Oxford | All/Multiple Tracks | SP506061-164 Not Known 2x sewers under Becket Street, approx depth shown. Sewage - RAR Code: HBF - HAZARD V.10 |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0440 | 63.0440 | Buried Telecommunication Cables | Oxford | All/Multiple Tracks | SP506061-164 Not Known Cables under each side of Becket Street with SW spur into rail yard <ending off plan>. Telecom Cable - RAR Code: HOT or HBT - HAZARD V.10 |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0440 | 63.0440 | Buried Gas Pipe | Oxford | All/Multiple Tracks | SP506061-164 Not Known Pipe on E side of Becket Street to premises S of church. High Pressure Gas - RAR Code: HBG - HAZARD V.10 |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & | 63.0440 | 63.0440 | Buried Gas Pipe | Oxford | All/Multiple Tracks | SP506061-164 Not Known Plan available pipes crossing trackat Oxford station High Pressure Gas - RAR Code: HBG - HAZARD V.10 |

| ELR/ELR Name | START | END | DESCRIPTION | LOCAL NAME | Track | Freetext |
|---|---|---|---|---|---|---|
| CHESTER LINE) | | | | | | |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0440 | 63.0440 | Buried Telecommunication Cables | Oxford | All/Multiple Tracks | SP506061-164 Not Known Plan available cables underground alongside track Telecom Cable - RAR Code: HOT or HBT - HAZARD V.10 |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0440 | 63.0440 | Buried Telecommunication Cables | Oxford | All/Multiple Tracks | SP506061-164 Not Known Plan available Telecom Cable - RAR Code: HOT or HBT - HAZARD V.10 |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0440 | 63.0440 | Buried Electrical Cables | Oxford | All/Multiple Tracks | SP506061-164 Not Known Plan available Cables High Voltage Cable - RAR Code: HOE or HBE - HAZARD V.10 |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0462 | 63.0528 | Buried Electrical Cables | | All/Multiple Tracks | SP506061-1-164 Southern Electric Cables run from N side of Osney lane into W side of RT land to run N serving buildings. High Voltage Cable - RAR Code: HOE or HBE - HAZARD V.10 |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0682 | 63.0682 | Authorised Access Point - Vehicle | Oxford | All/Multiple Tracks | SP505063-164 Railtrack Oxford Station LC: Access from Botley Rd. Padlocked gates operated by station staff for vehicles too high to pass beneath Botley Rd UB <vehicle> Access Point - HAZARD V.10 |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0682 | 63.0682 | Buried Water Main | Oxford | All/Multiple Tracks | SP506062-164 Not Known Main passing W to E under centre of road at Level Crossing 63.31 with spur to boundary side of Cripley Road to run 200m N before veering away, Spur also running south under centre of Becket Street. Spur into Rwley Road site. High Pr |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0682 | 63.0682 | Buried Foul Water Service | Oxford | All/Multiple Tracks | SP506062-164 Not Known 700mm x 450mm sewer under centre of approaches and across line at level crossing @ 63.31 with spurs to Cripley Road, bondary side, and Becket Street. Sewage - RAR Code: HBF - HAZARD V.10 |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0682 | 63.0682 | Buried Telecommunication Cables | Oxford | All/Multiple Tracks | SP506062-164 Not Known Cables under S side of level crossing and under each path of Botley Road UBr, also these approaches. Spur to Cripley Road north, adjacent to boundary also spurs to station area and Rewley Road. Telecom Cable - RAR Code: HOT or HBT - |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0682 | 63.0682 | Buried Gas Pipe | Oxford | All/Multiple Tracks | SP506062-164 Not Known 10" main under E & W approach and N side path of Botley Road UBr, 6" ditto under S side path. 6" spur under E side of Becket Street serving premises N of church. Spur at station entrance @ E end of Botley Rd UBr approach from 10" ma |

| ELR/ELR Name | START | END | DESCRIPTION | LOCAL NAME | Track | Freetext |
|---|---|---|---|---|---|---|
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0682 | 63.0726 | Buried Electrical Cables | Oxford | All/Multiple Tracks | SP506062-164 Not Known Cables cross under S side of LC, including S side approaches, also under S side path of Botley Road UBr 63.31, approaches ditto. Cable supply also passes from S side LC to station supply point in front of main bldg. <see SElec plan |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0693 | 63.0726 | Buried Lighting Cable | Oxford | All/Multiple Tracks | SP504062-164 Agreements 99142 & 101970 re lighting cables, signs & lamps on either side of UBr at station. |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0748 | 63.0748 | Buried Water Main | Oxford | All/Multiple Tracks | SP505062-164 Oxford Corporation Agreement 54864 re water main under road at Botley Road LC. High Pressure Water - RAR Code: HBW - HAZARD V.10 |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0748 | 63.0748 | Hazard Associated With Culvert | Oxford | All/Multiple Tracks | SP506062-164 Railtrack 2 x 3" conc pipes Culverts <confined space> - RAR Code: BBUC or HSL - HAZARD V.10 |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0748 | 63.1100 | Red Zone Working Prohibited | OXFORD STATION | All/Multiple Tracks | station platforms and area upto and including sheepwash bridge banned only. |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0880 | 63.0880 | Buried Electrical Cables | Oxford | All/Multiple Tracks | SP506063-164 Railtrack From Southern Electric supply point in Station Bldg <see note for 63.31> to the Railtrack switchboard to buried supplies to lighting on both platforms, ancillary buildings and subway. Spurs to lburied supplies to lighting in Diesel |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0880 | 63.0880 | Authorised Access Point - Pedestrian | Oxford Station to Oxford Panel Box | All/Multiple Tracks | SP506063-164 Railtrack Leave Down Platform via exit to the left of signal box. Enter via ground level door in West Approach Road. Access Point |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0902 | 63.0902 | Authorised Access Point - Vehicle | Oxford | All/Multiple Tracks | SP504063-164 Railtrack Oxford Station: Entrance off Park End Street. Access to numerous gates and entrances at Platform level <upside> and at rail level adjacent to bay sidings <vehicle> Access Point - HAZARD V.10 |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0902 | 63.0902 | Authorised Access Point - Vehicle | Oxford | All/Multiple Tracks | SP505063-164 Railtrack Oxford Station: Entrance off Botley Rd <Cripley Rd>. Access to numerous gates and entrances at platform level <dnside>, and at rail level at the far end of the road to the former diesel depot sidings on the dnside <vehicle> Access P |
| **DCL**: DIDCOT - BEYOND CANNOCK | 63.0902 | 63.0902 | Authorised Access Point - Pedestrian | Oxford SOP to Rewley Road Stabling Sidings. | All/Multiple Tracks | SP505068-164 Railtrack Via Up platform to north end, cross Platform 3 bay line, left over river |

| ELR/ELR Name | START | END | DESCRIPTION | LOCAL NAME | Track | Freetext |
|---|---|---|---|---|---|---|
| ROAD JN. (DIDCOT & CHESTER LINE) | | | | | | bridge,down steps and left alongside Rewley Road Sidings and entrance line. Access Point - HAZARD V.10 |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0902 | 63.0902 | Authorised Access Point - Pedestrian | Oxford SOP to Downside Carriage Sidings | All/Multiple Tracks | SP505068-164 Railtrack Via footbridge, gate at north end of Down platform, diesel stabling point and No.6 road. Access Point - HAZARD V.10 |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0902 | 63.0902 | Asbestos Hazard | Oxford Station Rapid response | | Amey Vectra Survey 14/6/00- No samples found- status incomplete |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0946 | 63.0946 | Authorised Access Point - Pedestrian | Oxford SOP to Rewley Road Stabling Sidings | All/Multiple Tracks | SP504071-164 Railtrack Via up platform to north end, cross Platform 3 bay line, left over river bridge, down steps and left alongside Rewley Road Sidings and entrance line. Access Point |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0946 | 63.1056 | Buried Electrical Cables | | All/Multiple Tracks | SP504071-1-164 Southern Electric Cables along top of earthworks or W boundary also passing under branch of River Thames c5m W of W parapet of River UBr. High Voltage Cable - RAR Code: HOE or HBE - HAZARD V.10 |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0946 | 64.0066 | Authorised Access Point - Pedestrian | Oxford SOP to Downside Carriage Sidings | All/Multiple Tracks | SP504071-164 Railtrack Via footbridge, gate at north end of Down platform, diesel stabling point and Number 6 road Access Point |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.0968 | 63.0968 | Asbestos Hazard | Oxford Panel SB | | SP504064-Green -low risk refer to site survey at SB |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.1056 | 63.1056 | Buried Electrical Cables | | All/Multiple Tracks | SP503072-1-164 Southern Electric Cables attached to S abutment of River Thames UBr. High Voltage Cable - RAR Code: HOE or HBE - HAZARD V.10 |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.1056 | 63.1056 | Buried Electrical Cables | | All/Multiple Tracks | SP503072-1-164 Southern Electric Cables under line along N abutment of River Thames UBr. Actual position not described on SElec plan. High Voltage Cable - RAR Code: HOE or HBE - HAZARD V.10 |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.1056 | 63.1254 | Buried Electrical Cables | | All/Multiple Tracks | SP503072-1-164 Southern Electric Cables under E edge of RT land. High Voltage Cable - RAR Code: HOE or HBE - HAZARD V.10 |

| ELR/ELR Name | START | END | DESCRIPTION | LOCAL NAME | Track | Freetext |
|---|---|---|---|---|---|---|
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.1056 | 63.1254 | Buried Electrical Cables | | All/Multiple Tracks | SP503072-1-164 Southern Electric Cables from route under n side of River Thames UBr < NW quadrant runs N c22m then along SW edge of RT land c115m then indirect route to Mercury sub station on RT land. High Voltage Cable - RAR Code: HOE or HBE - HAZARD V.1 |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.1078 | 63.1078 | Buried Telecommunication Cables | Oxford | All/Multiple Tracks | M91911 Viewline<Oxford> Ltd TV relay cable in road under bridge. |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.1122 | 63.1122 | Buried Foul Water Service | Oxford | All/Multiple Tracks | SP503065-164 Agreement 96043 & BR RM&EE drg no 170055 shows effluent interceptor pumped discharge to sewer N W of station on N side of channel connecting Ox Canal with R Isis. |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.1122 | 64.0044 | Buried Lighting Cable | Oxford Up Carriage Sidings | All/Multiple Tracks | SP503065-1-164 Railtrack BR BESS drg no W2024 ed A shows lighting cable routes under up sidings area from supply point to lamp standards. Drg no W2025 is distribution diagram. Lighting Cable - RAR Code: HBL - HAZARD V.10 |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.1166 | 64.0330 | Site Contamination | WALTON WELL ROAD ALLOTMENTS | Down Main/Fast | TYPE OF WASTE UNKNOWN |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.1254 | 64.0330 | Site Contamination | EAGLE IRON WORKS | Up Main/Fast | DIFFICULT AND GENERAL WASTE |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.1254 | 65.0616 | Buried Electrical Cables | | All/Multiple Tracks | SP503072-1-164 Southern Electric Cables on or adjacent to RT land along W side running beyond finish mileage. High Voltage Cable - RAR Code: HOE or HBE - HAZARD V.10 |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 63.1650 | 64.0616 | Site Contamination | WALTON WELL ROAD | Up Main/Fast | INERT, GENERAL PUTRESCIBLE AND GENERAL DIFFICULT WASTE |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 64.0110 | 64.0770 | Site of Special Scientific Interest (SSSI) | Port Meadow/Wolvercote Common/Green | All/Multiple Tracks | SP495083-weedspray restictions-No Scrub-indicates that Garlon,Timbrel or other treatments containing tricopyr should not be sprayed onto the scrub area.New in 2000. |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & | 64.0154 | 64.0154 | Authorised Access Point - Pedestrian | Oxford | All/Multiple Tracks | SP503073-164 Railtrack Walton Well Rd/Port Meadow OB. Off A34, along Botley Rd leading into Park End St. Then left into Worcester St leading into Walton St, left into |

| ELR/ELR Name | START | END | DESCRIPTION | LOCAL NAME | Track | Freetext |
|---|---|---|---|---|---|---|
| CHESTER LINE) | | | | | | Walton Well Rd, almost opposite St Bernards Rd. Cross OB, access via old yard to gate dn |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 64.0440 | 64.1452 | Landfill Gases | ST JOHN"S COLLEGE, OXFORD | Up Main/Fast | LANDFILL GAS. This stretch of railway has been identified as being at risk from the migration of landfill gasses. Appropriate precautions should be taken. For further information please contact NST Mining 01332 262716. |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 64.0704 | 64.0704 | Buried Electrical Cables | Nr Oxford | Down Main/Fast | SP502077-164 M62498 Wessex Electricity refersU/G 33KV cablerunder downside of track under footbridge and RT land.See attached plan. |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 64.0726 | 65.0770 | Landfill Gases | PORT MEADOW | Down Main/Fast | LANDFILL GAS. This stretch of railway has been identified as being at risk from the migration of landfill gasses. Appropriate precautions should be taken. For further information please contact NST Mining 01332 262716. |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 64.0770 | 64.0770 | Authorised Access Point - Vehicle | Oxford | All/Multiple Tracks | SP503079-164 Railtrack Aristotle Lane. Off Woodstock Rd <A4144> along Polstead Rd. Aristotle Lane almost opposite. Access via narrow bridge over canal then right to upside - road south to Thames Turbo Depot <vehicle> Access Point - HAZARD V.10 |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 64.0770 | 65.0220 | Site of Special Scientific Interest (SSSI) | Line Ditch | All/Multiple Tracks | SP500087-SSSI-No scrub & GLY only. |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 64.0770 | 65.1320 | Site of Special Scientific Interest (SSSI) | Port Meadow/Wolvercote Common | Down Main/Fast | SP495083-Rare Birds nesting in ditch alongside Down main.N Harrison-weedspray restrictions GLY only. |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 64.0880 | 64.0880 | Buried Foul Water Service | Oxford | All/Multiple Tracks | M19404/0151 Thames Water Utilities. 225mm Sewer. |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 64.0946 | 66.0704 | Ground Water Protection Zone | Oxford Down Goods Loop-Wolvercot Jcn | Down Main/Fast | Ground Water Protection Zone (On Rly)<br>Thames Water-weedspray restricted site-GLY only |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 64.0946 | 66.0704 | Water Protection Zone | Oxford North | Down Main/Fast | Railtrack land-Rare birds nesting in ditch on downside, restriction on DOWN only-weedspray restriction-GLY only |

| ELR/ELR Name | START | END | DESCRIPTION | LOCAL NAME | Track | Freetext |
|---|---|---|---|---|---|---|
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 64.0971 | 65.0311 | Conservation Area | Oxford Line Ditch | Down Main/Fast | Conservation Area<br>Site of local importance for nature conservation. Ref: letter dated 11 Aug 2000 from Berks, Bucks & Oxon Wildlife Trust |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 64.0990 | 64.0990 | Buried S&T Cable | Oxford | All/Multiple Tracks | SP502081-164 Railtrack S&T equipment for Banbury Road Junction with OXD. Plan filed with OXD wallet under same ref. number 1984. S&T Cable - RAR Code: HBS - HAZARD V.10 |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 64.1078 | 64.1078 | Buried Electrical Cables | | All/Multiple Tracks | SP497094-1-164 Southern Electric Cables under line also adjacent OXD 30.05. High Voltage Cable - RAR Code: HOE or HBE - HAZARD V.10. M93294 refers. |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 64.1320 | 65.0880 | Site of Special Scientific Interest (SSSI) | Hook Meadow | All/Multiple Tracks | SP496092-SP502087-weedspray restrictions-No scrub -GLY only-indicates that Garlon,Timbrel or other treatments containing tricopyr should not be sprayed onto the scrub area.New in 2000 |
| **DCL**: DIDCOT - BEYOND CANNOCK ROAD JN. (DIDCOT & CHESTER LINE) | 64.1320 | 65.0880 | Water Protection Zone | Hook Meadow | Unknown | SSSI with no known agency-weedspray restriction- NO SCRUB |


Company Ownership
- Bridge (Rail over River)
- Bridge (Rail over Road)
- Bridge (Road over Rail)
- Bridge (Rail over Rail)
- Level Crossing
- Tunnel
- Contracted for Sale

- Leasehold Ownership
- Freehold Ownership
- Prohibitive Interest
- Historic Cable Route
- Junction
- Station
- Tunnel
- Rail Other

- Route
- Motorway Junctions
- Motorways
- Roundabouts
- A Roads
- Primary Route
- Main Route
- B Roads

- Unclassified Roads
- River (Primary)
- River (Secondary)
- River (Tertiary)
- Canal
- Lake
- Coastline (Detailed)
- Lighthouse

Settlement Names
- Urban Areas
- Woodland Areas

**WES40834**
Oxford

| | |
|---|---|
| Plot Scale | 1:14468 |
| Plot Date | 30/11/2009 |

Network Rail


Centre of Map Window (E,N): 450422 , 207388

Output Created from the GI Portal – A3 Portrait


Company Ownership

- Bridge (Rail over River)
- Bridge (Rail over Road)
- Bridge (Road over Rail)
- Bridge (Rail over Rail)
- Level Crossing
- Tunnel
- Contracted for Sale
- Leasehold Ownership
- Freehold Ownership
- Prohibitive Interest
- Historic Cable Route
- MAP (Utilities)
- Easements Manager (Utilities)

**WES40834**
Oxford

| Plot Scale | 1:2500 |
|---|---|
| Plot Date | 30/11/2009 |

Network Rail

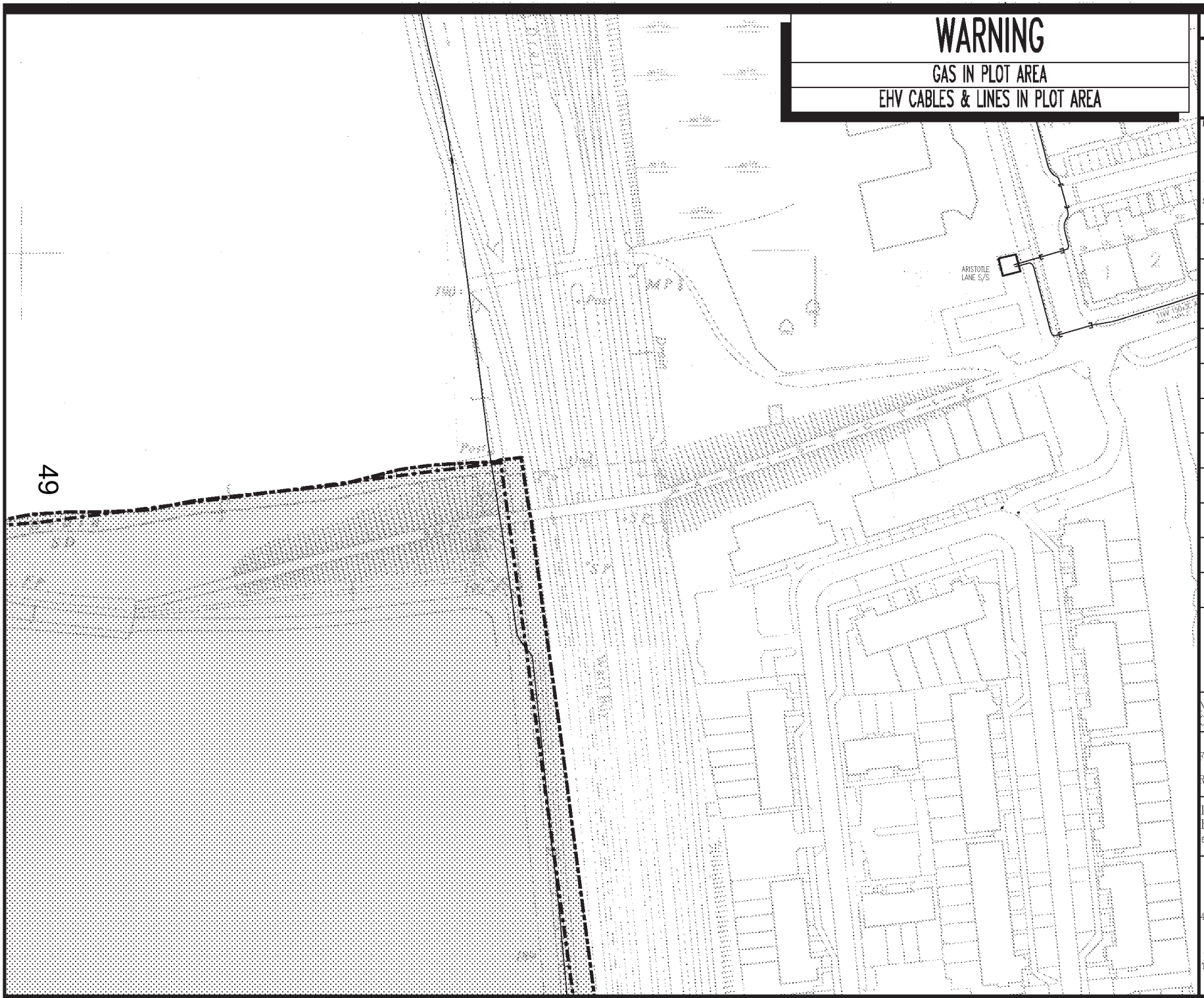

Centre of Map Window (E,N): 450286 , 207672

Output Created from the GI Portal – A3 Portrait

# WARNING

GAS IN PLOT AREA

EHV CABLES & LINES IN PLOT AREA




Scottish and Southern Energy

N



WES40834

OXFORD

01865-845800

H.V. MAINS RECORD

Scale 1:1250

Date: 30/11/2009

Grid Ref:SP50240783

Icleve

NET

Plot 1 of 3

UNCONTROLLED COPY

Subject to Revision without Notice

Template: SIAS NRSWA BW A4 plot3

NORMAL DEPTH TO THE TOP OF THE CABLE WHEN LAID.

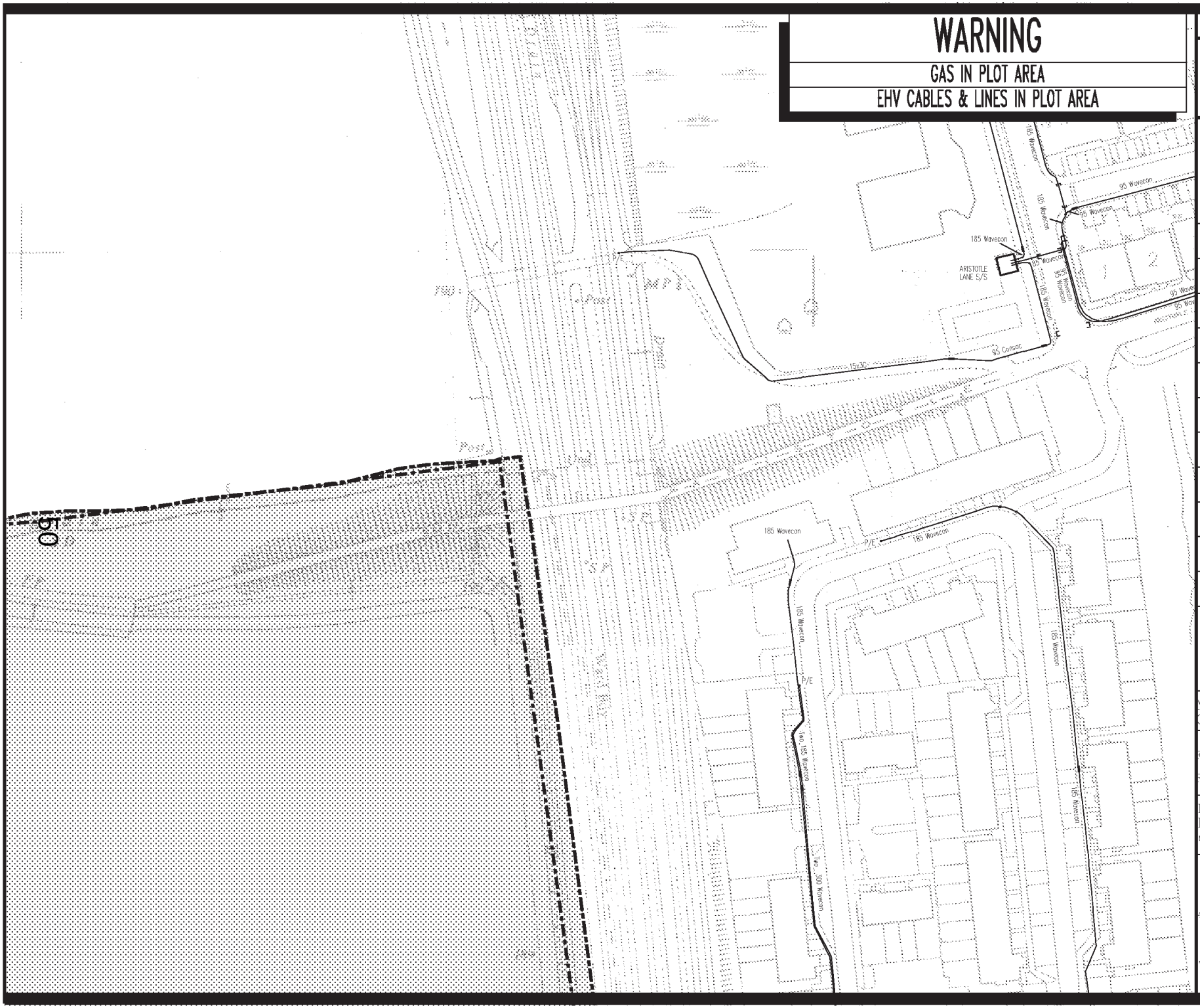
| | services | lv | hv | ehv |
|---|---|---|---|---|
| FOOTPATH | 0.40m | 0.45m | 0.60m | 0.75m |
| ROAD CROSSING | 0.65m | 0.60m | 0.75m | 0.90m |

l.v./services –up to 1000V
h.v. –over 1000V to 11,000V
e.h.v –22,000V and 132,000V

## WARNING

There may have been subsequent alterations to the surface levels. Trial holes must be taken to determine positions and depths of cables. HS (G) 47 Booklet from the Health and Safety Executive – Avoiding Danger from Buried Cables – should be consulted before commencing excavation work. (available from HMSO)

WHEN WORKING IN THE VICINITY OF OVERHEAD LINES THE HEALTH AND SAFTY GUIDANCE NOTE GS6 SHOULD BE CONSULTED. (AVAILABLE FROM HMSO)




Scottish and Southern Energy



WES40834

OXFORD

01865-845800

L.V. MAINS RECORD

Scale 1:1250

Date: 30/11/2009

Grid Ref:SP50240783

Icleve

NET

Plot 2 of 3

UNCONTROLLED COPY

Subject to Revision without Notice

Template: SIAS NRSWA BW A4 plot3

NORMAL DEPTH TO THE TOP OF THE CABLE WHEN LAID.

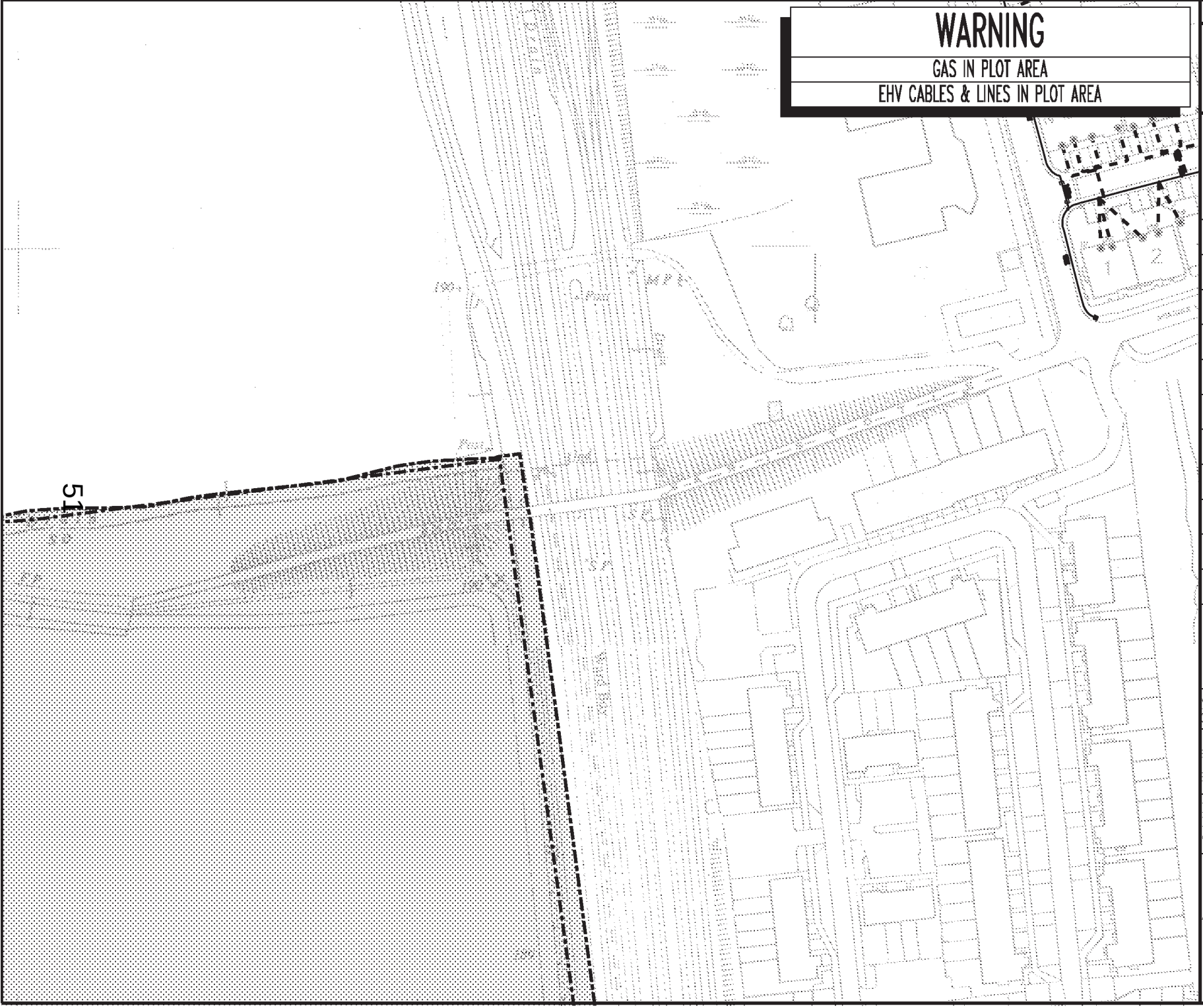
| | services | lv | hv | ehv |
|---|---|---|---|---|
| FOOTPATH | 0.40m | 0.45m | 0.60m | 0.75m |
| ROAD CROSSING | 0.65m | 0.60m | 0.75m | 0.90m |

l.v./services –up to 1000V
h.v. –over 1000V to 11,000V
e.h.v –22,000V and 132,000V

**WARNING**

There may have been subsequent alterations to the surface levels. Trial holes must be taken to determine positions and depths of cables. HS (G) 47 Booklet from the Health and Safety Executive – Avoiding Danger from Buried Cables – should be consulted before commencing excavation work. (available from HMSO)

WHEN WORKING IN THE VICINITY OF OVERHEAD LINES THE HEALTH AND SAFTY GUIDANCE NOTE GS6 SHOULD BE CONSULTED. (AVAILABLE FROM HMSO)




Scottish and Southern Energy

N



WES40834

OXFORD

01865-845800

GAS Record

Scale 1:1250

Date: 30/11/2009

Grid Ref: SP50240783

Icleve

NET

Plot 3 of 3

UNCONTROLLED COPY

Subject to Revision without Notice.

NORMAL DEPTH TO THE TOP OF THE GAS PIPE WHEN LAID.

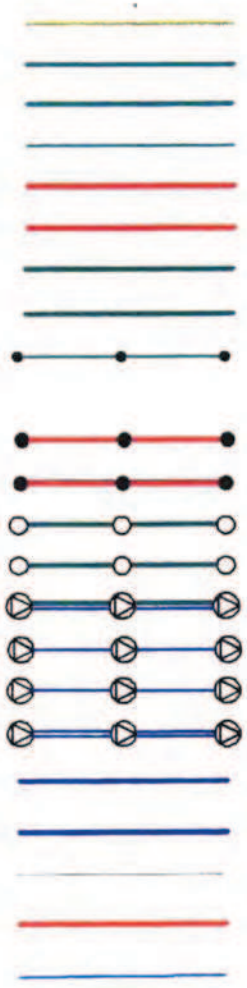
| | services | lv | hv | ehv |
|---|---|---|---|---|
| FOOTPATH | 0.40m | 0.45m | 0.60m | 0.75m |
| ROAD CROSSING | 0.65m | 0.60m | 0.75m | 0.90m |

l.v./services –up to 1000V
h.v. –over 1000V to 11,000V
e.h.v –22,000V and 132,000V

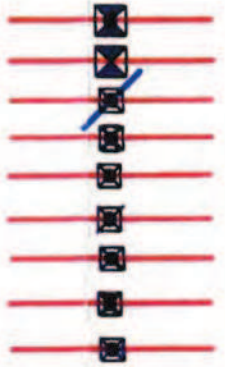
WARNING

There may have been subsequent alterations to the surface levels. Trial holes must be taken to determine positions and depths of cables. HS (G) 47 Booklet from the Health and Safety Executive – Avoiding Danger from Buried Cables – should be consulted before commencing excavation work. (available from HMSO)

WHEN WORKING IN THE VICINITY OF OVERHEAD LINES THE HEALTH AND SAFTY GUIDANCE NOTE GS6 SHOULD BE CONSULTED. (AVAILABLE FROM HMSO)



LV UNDERGROUND STREET LIGHTING CABLE
LV UNDERGROUND SERVICE CABLE
LV UNDERGROUND MAINS CABLE
LV UNDERGROUND DC CABLE
6.6KV UNDERGROUND CABLE
11KV UNDERGROUND CABLE
22KV UNDERGROUND CABLE
33KV UNDERGROUND CABLE
LV OVERHEAD LINE
11KV OVERHEAD LINE
11KV/LV DUAL CONSTRUCTION OVERHEAD LINE
22KV OVERHEAD LINE
33KV OVERHEAD LINE
33KV/132KV DUAL CONSTRUCTION OVERHEAD LINE
132KV OVERHEAD LINE
275KV OVERHEAD LINE
275KV DOUBLE CIRCUIT OVERHEAD LINE
132KV UNDERGROUND CABLE
275KV UNDERGROUND CABLE
AUXILIARY UNDERGROUND CABLE(Pilot/metering etc)
OUT OF SERVICE CABLE(O.O.S.–All voltages)
Telecoms Cable



O/H FLASHING LIGHT FAULT PASSAGE INDICATOR
U/G RELAY FAULT PASSAGE INDICATOR
AIR BREAK
FUSE/LINK
AUTO RECLOSER
IN LINE DISC
JUMPERS
REPEATER FUSES
SECTIONALISER
POLE BOX
POLE MOUNTED TRANSFORMER
SUBSTATION
FEEDER PILLAR
LINK BOX
RESTRICTED AREA(NNR)
RESTRICTED AREA(Ramsar)
RESTRICTED AREA(SAC)
RESTRICTED AREA(SPA)
RESTRICTED AREA(SSSI)

52



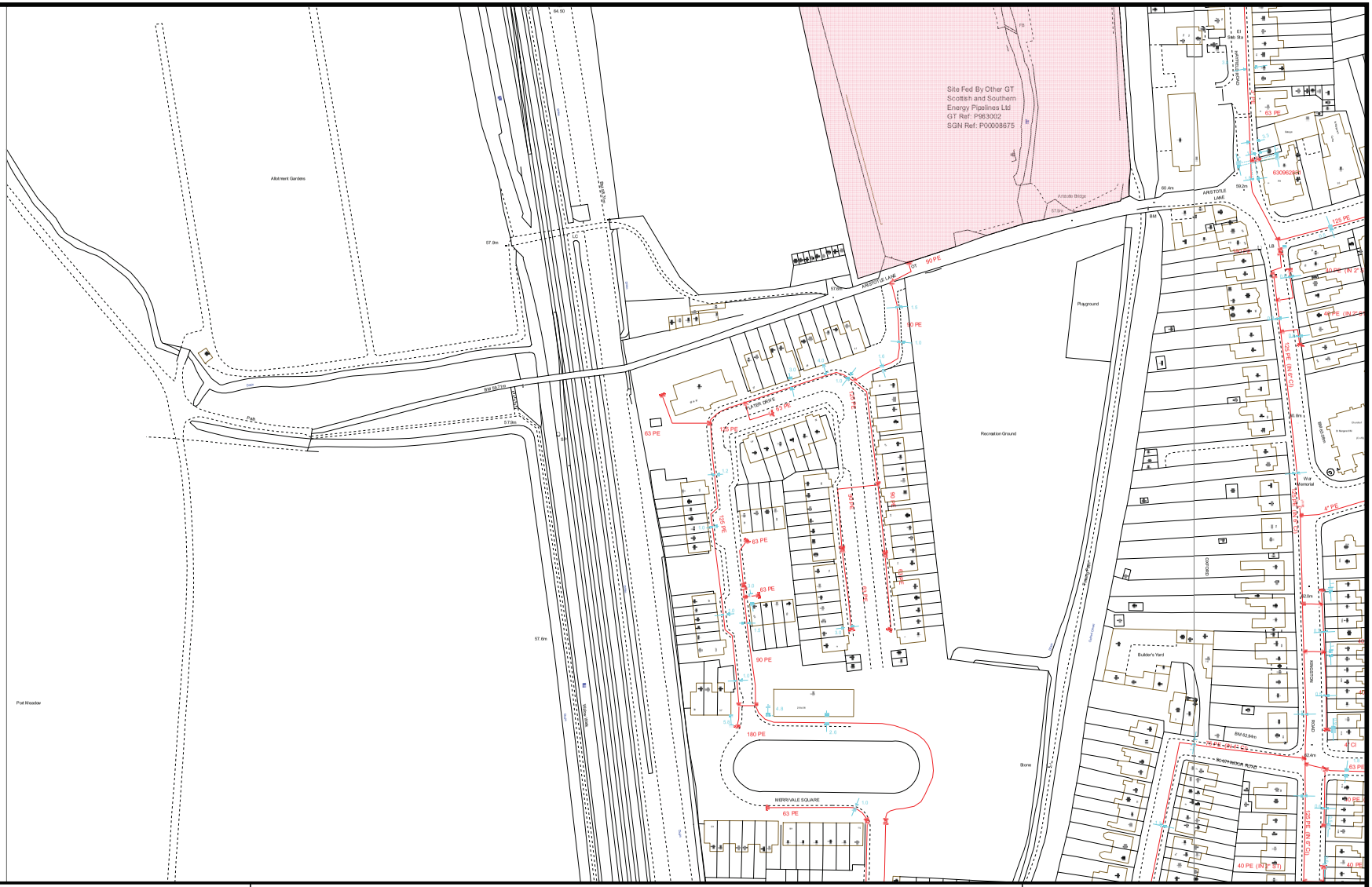
Date 29/11/2000
Scale: 1:7500
O.S. Ref: hp83se, hp93sw

North

Title:

Scottish and Southern Energy plc

53




USER ID: Icleverl
DATE: 23 Dec 2009
EXTRACT DATE: 28 Sep 2009
MAP REF: SP5007NW
CENTRE: 450225, 207806
SCALE: 1:2,500

- LP Mains
- MP Mains
- IP Mains
- LHP Mains
- NHP Mains

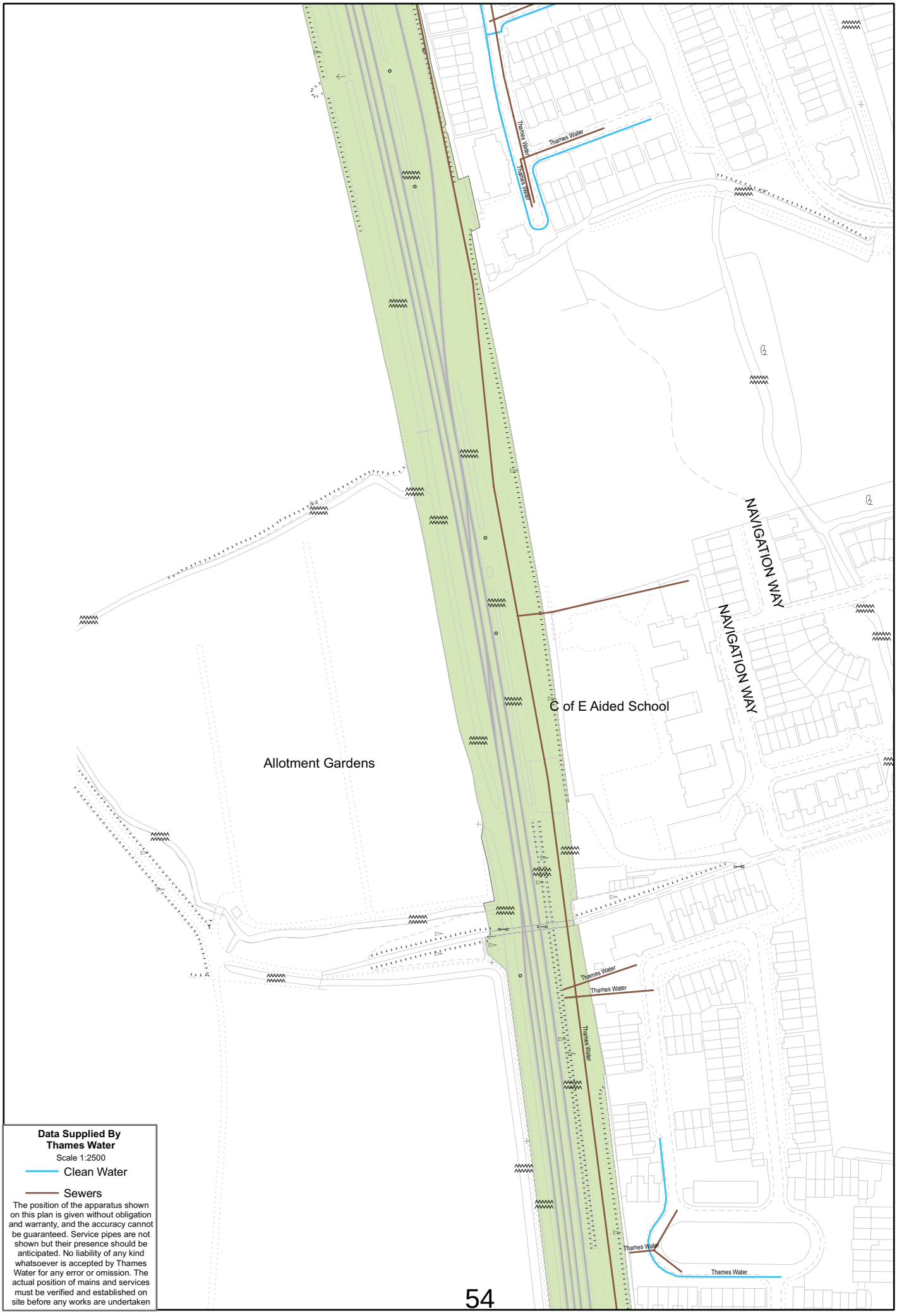
Valve | Depth of Cover | Syphon | Diameter Change | Material Change

This plan shows those pipes owned by Scotia Gas Networks plc in their role as a Licensed Gas Transporter (GT). Gas pipes owned by other GTs, or otherwise privately owned, may be present in this area. Information with regard to such pipes should be obtained from the relevant owners. The information shown on this plan is given without warranty, the accuracy thereof cannot be guaranteed. Service pipes, valves, syphons, stub connections, etc. are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Scotia Gas Networks plc or their agents, servants or contractors for any error or omission. Safe digging practices, in accordance with HS(G)47, must be used to verify and establish the actual position of mains, pipes, services and other apparatus on site before any mechanical plant is used. It is your responsibility to ensure that this information is provided to all persons (either direct labour or contractors) working for you on or near gas apparatus. The information included on this plan should not be referred to beyond a period of 28 days from the date of issue.

Product: UtilityMaps
Version: 1.4.0.0
Template: 'Scotia Gas Networks (A4 Landscape)'

N

Scotia Gas Networks
Delivering gas safely, reliably and efficiently




**Data Supplied By Thames Water**

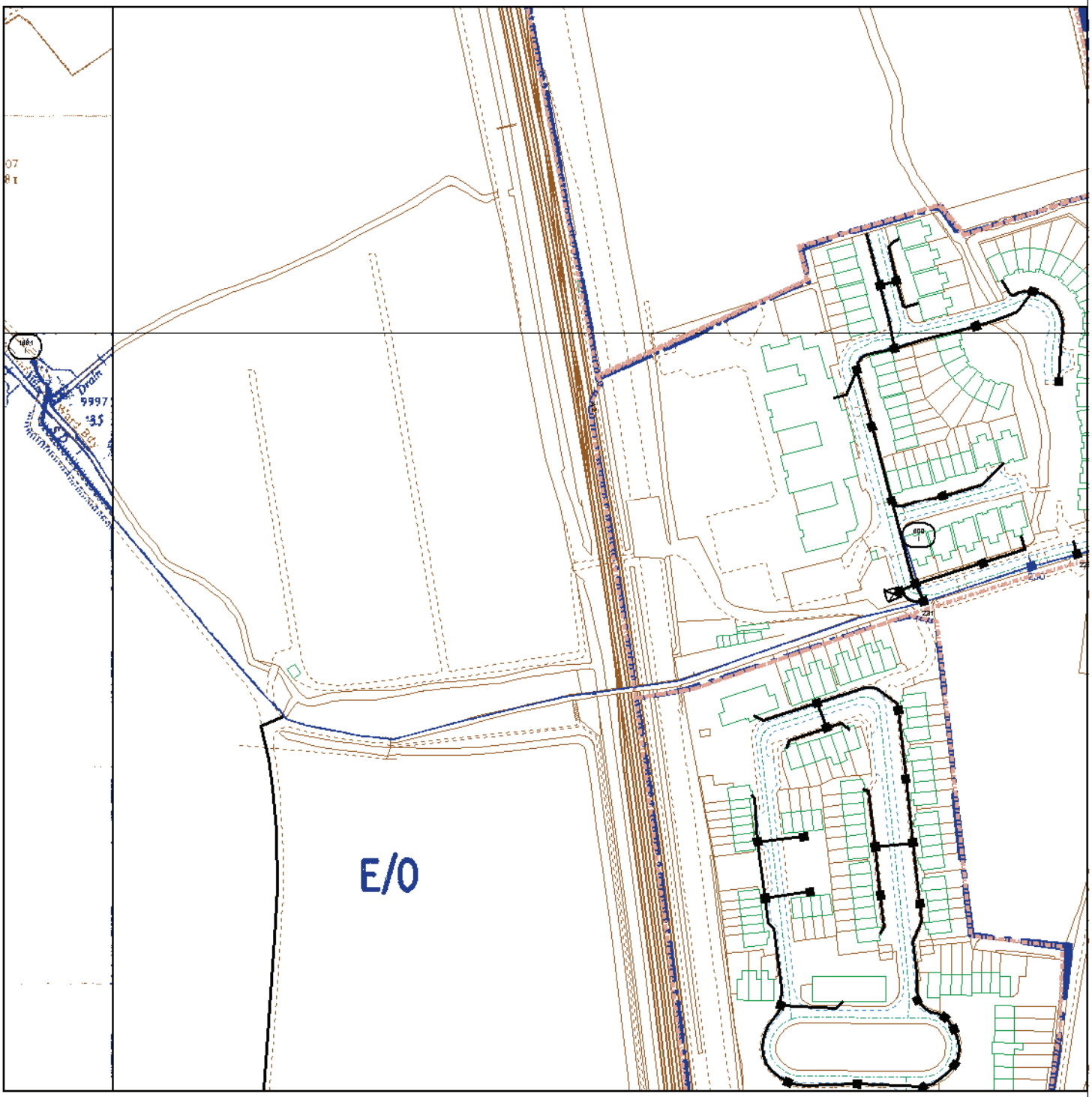
Scale 1:2500

Clean Water

Sewers

The position of the apparatus shown on this plan is given without obligation and warranty, and the accuracy cannot be guaranteed. Service pipes are not shown but their presence should be anticipated. No liability of any kind whatsoever is accepted by Thames Water for any error or omission. The actual position of mains and services must be verified and established on site before any works are undertaken

# Maps by email Plant Information Reply




## IMPORTANT WARNING

Information regarding the location of BT apparatus is given for your assistance and is intended for general guidance only. No guarantee is given of its accuracy. It should not be relied upon in the event of excavations or other works being made near to BT apparatus which may exist at various depths and may deviate from the marked route.

## DIAL BEFORE YOU DIG

FOR PROFESSIONAL ON SITE ASSISTANCE PRIOR TO COMMENCEMENT OF EXCAVATION WORKS

ADVANCE NOTICE REQUIRED
(Office hours: Monday-Friday 08.00 to 17.00)

Tel: 0800 9173993
E-mail: dbyd@openreach.co.uk
Website: www.dialbeforeyoudig.com



## KEY TO BT SYMBOLS

| | |
|---|---|
| UNDERGROUND PLANT | POLE |
| A/C, D/W or W OVERHEAD PLANT | CABINET |
| JOINT BOX | BURIED JOINT |
| 456 OR 456 DISTRIBUTION POINT | J JOINTING POST |
| OR 72 MANHOLE | PROPOSED U/G |
| DP BOUNDARY | A/C, D/W or W PROPOSED O/H |
| OR OTHER BT BOUNDARY | PROPOSED BOX |

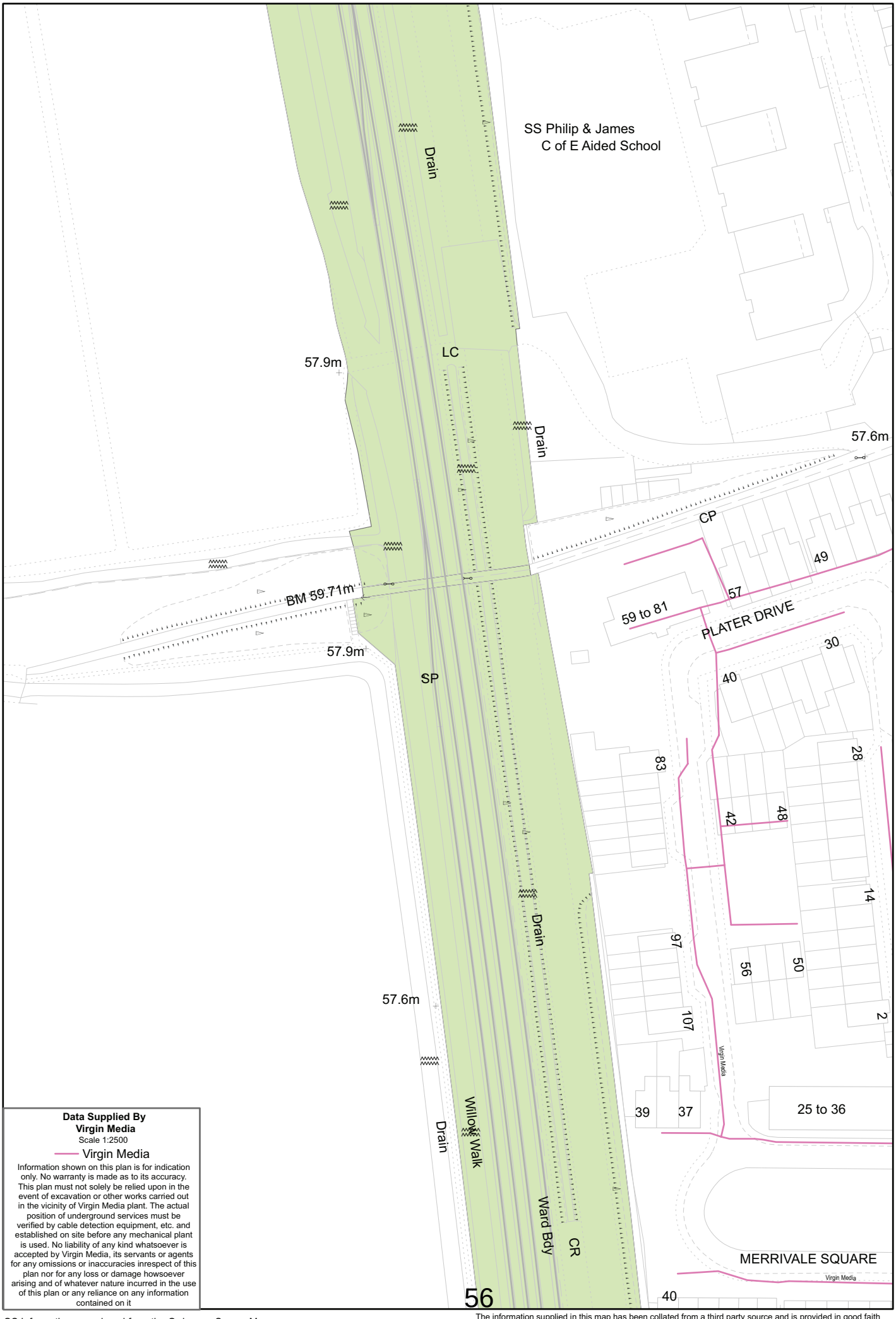
Other proposed plant is shown using dashed lines. BT symbols not listed above may be disregarded. Existing BT plant may not be recorded. Information valid at the time of preparation.

openreach a BT Group business

BT ref: YBL09406K

Map reference (centre): SP5020007900

Issued: 30/11/09 09:44:14




**Data Supplied By**
**Virgin Media**
Scale 1:2500

Virgin Media

Information shown on this plan is for indication only. No warranty is made as to its accuracy. This plan must not solely be relied upon in the event of excavation or other works carried out in the vicinity of Virgin Media plant. The actual position of underground services must be verified by cable detection equipment, etc. and established on site before any mechanical plant is used. No liability of any kind whatsoever is accepted by Virgin Media, its servants or agents for any omissions or inaccuracies inrespect of this plan nor for any loss or damage howsoever arising and of whatever nature incurred in the use of this plan or any reliance on any information contained on it



The information supplied in this map has been collated from a third party source and is provided in good faith to assist the user in identifying the general location of pipes and cables in the vicinity of the proposed worksite. It should not be relied upon in isolation as being accurate and free from errors or omissions and it does not detract from the need to use a CAT scan in every instance

# Appendix D
# Historic Site Investigation Results & Record Drawings

Appendix D1: Commentary on Site Investigations

Appendix D2: Record of Site Investigations

Appendix D3: Record Drawings

# Appendix D1: Commentary on Site Investigations

## General

As part of previous works at Willow Walk Footbridge, a site walkover was conducted during daylight hours on the 2nd June 2011 under Site Warden Protection to 200m either side of the structure. The purpose of the walkover was to identify infrastructure and signalling equipment, topographical and environmental items that may affect the options available to Network Rail to achieve OLE Clearance for Willow Walk Footbridge.

A highway level survey above the structure was also undertaken within 100m of the bridge to identify locations of junctions and interfaces with residential and commercial property.

### Civils

The previous Visual Examination of the structure (conducted on 15th December 2010 by Amey) was used on site to confirm the locations of defects and determine whether the condition of the asset had deteriorated further. The remedial works proposed by the report consisted of replacement of decayed deck timbers causing a trip hazard, within 1 year of the examination date.

The site walkover confirmed the recommended remedial works have been carried out through local replacement of numerous timbers. The site walkover also noted the presence of widespread superficial corrosion and pitting of the steelwork throughout the superstructure and localised lamination. It is recommended that the structure is cleaned, the section loss repaired and steelwork treated with a protective paint system to avoid further deterioration as a minimum.

Overall, the structure is generally in good condition, with minor defects that should be addressed to prevent further degradation and maintain serviceability of the structure.

### Permanent Way and Lineside Infrastructure

The Up Main (line speed 90mph) and Down Main (line speed 90mph) tracks consist of concrete sleepers with pandrol e-clip fixings and flat bottom continuous welded rail (CWR). The Down Jericho (line speed 25mph) and Down Passenger Loop (line speed 25mph) tracks consist of steel sleepers with pandrol fastclip fixings and flat bottom CWR.

No track drainage catchpits were noted during the site walkover. Drainage ditches were noted running in the Down Jericho cess adjacent to the access track and under the west span adjacent to Pier 2.

A culvert is located approximately 55m north of the bridge in close proximity to Aristotle Lane Crossing. Construction details and depth to the culvert soffit are unknown.

One full LOC case is present approximately 50m to the south of the bridge (London side) and a LOC suite with 2 full cases is located approximately 55m north of the bridge (Country side) in the Down Main cess. Two 220mm wide cable trough routes are located in the Down Jericho cess and one cable trough route is located in the Down Main cess.

The Down Passenger Loop connects to the Down Main under the bridge through a right hand turnout. There are several nearby S&C units both north and south (London and Country sides) of the bridge, with associated long bearers, IRJ's, points heating and power packs at the trackside.

## Trackside Intrusive Investigations

Atkins Limited provided Network Rail's NR4 Contractor AMCO with a trackside intrusive works specification as part of the Great Western Electrification project. The following specification was issued as listed below:

| Description | Quantity | Comments |
|---|---|---|
| Trial Pits | 4 | Trial pits required as follows:<br>• 1 x East abutment<br>• 1 x East pier<br>• 1 x West pier<br>• 1 x West abutment |
| Horizontal cores to abutment | 4 | 2 cores per abutment:<br>• 1 x L/2 (Mid-point of abutment)<br>• 1 x L/3 (Third-point of abutment) |
| Inclined cores to abutment | 2 | 1 core per abutment at ground level to establish foundation type, construction material and depth:<br>• 1 x L/2 (Mid-point of trial pit, 30° inclination) |
| Horizontal cores to piers | 0 | None required. |
| Inclined cores to piers | 2 | 1 core per pier at ground level to establish foundation type, construction material and depth:<br>• 1 x L/2 (Mid-point of trial pit, 30° inclination) |
| Paint samples | 0 | None required. |
| Ballast sampling | 0 | None required. |

Detailed findings from these investigations are included at the end of this appendix. The key findings are shown below:

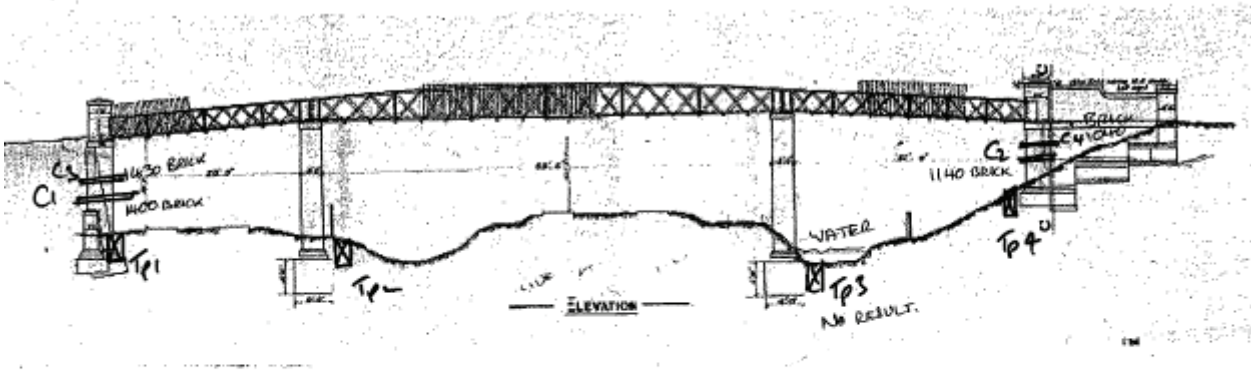
| Description | Summary of Findings |
|---|---|
| Foundations | • **East Abutment:** 160mm from ground level to top of foundation, 220mm deep brick followed by concrete foundation - underside of foundation not found.<br>• **East Pier:** 600mm from ground level to top of foundation, 950mm deep concrete foundation.<br>• **West Pier:** Foundation submerged, trial pit not conducted.<br>• **West Abutment:** 450mm from ground level to top of foundation, 700mm deep concrete foundation. |
| Abutments | • **East Abutment (L/2):** 1400mm thick solid brick.<br>• **East Abutment (L/3):** 1430mm thick solid brick.<br>• **West Abutment (L/2):** 1140mm thick solid brick.<br>• **West Abutment (L/3):** 1040mm thick solid brick. |

It must be noted that the intrusive investigations do not correlate with the record drawings attached in Appendix D3 and further investigation is required at GRIP 4.

## Roadside Intrusive Investigations

None required - open bridge soffit allows service confirmation.

## Appendix D2: Record of Site Investigations




C1 and C2 at L/2, C3 and C4 at L/3.
Measure ballast depth at Tp1.

AMCO

DATE: 1/6/11

### SURVEY RESULTS

| LOCATION: OXFORD | CHAINAGE: | ELR: |
|---|---|---|
| WILLOW WALK | 64m32c | DCL |

| CORE No. | DIST FROM WALL END | HEIGHT ABOVE RAIL | DEPTH mm | COMMENTS |
|---|---|---|---|---|
| C1 | 1.5 | 1.5 | 1400 | BRICK |
| C2 | 1.5 | 1.5 | 1140 | BRICK |
| C3 | 1.0 | 1.5 | 1430 | BRICK |
| C4 | 1.0 | 1.5 | 1040 | BRICK |
| C5 | | | | |
| C6 | | | | |
| C7 | | | | |
| C8 | | | | |
| C9 | | | | |
| C10 | | | | |

| PIT No. | DIST FROM WALL END | DEPTH TO FOUNDTN | FOUNDTN DEPTH | COMMENTS |
|---|---|---|---|---|
| TP1 | 1.5 | 160 | 380 | CONC |
| TP2 | 0.5 | 600 | 950 | CONC |
| TP3 | — | — | — | WATER LOGGED |
| TP4 | 1.5 | 450 | 700 | CONC |
| TP5 | | | | |
| TP6 | | | | |
| TP7 | | | | |
| TP8 | | | | |

: 64m 32c OXFORD WILLOW WALK FB PHOTO'S 94-112 145-156

HORIZONTAL CORE'S

(C1) - DEPTH = 1400mm ALL OF BRICK
PHOTO'S ~~#0, ##, ##~~ 107, 108, 109

(C2) - DEPTH = 1140mm ALL OF BRICK
PHOTO'S 150, 151, 152, 153

(C3) - DEPTH = 1430 ALL OF BRICK
PHOTO'S 110, 111, 112

(C4) - DEPTH = 1040mm ALL OF BRICK
PHOTO'S 154, 155, 156

TRIAL PIT'S

(T1) DEPTH TO FOUNDATION = 160mm BRICK STEPPING DOWN TO CONCRETE FOUNDATION @ 380mm
PHOTO'S 95, 96, 97 (GROUND MADE UP OF DIRT AND BALLAST)

(T2) DEPTH TO FOUNDATION = FROM TRACK ROUTE PARALLEL TO PICK IDENTIFIED BY WHITE LINE DEPTH TO BRICK = 600mm STEPPING DOWN TO 950mm CONCRETE. (GROUND MADE UP OF COAL THE FULL DEPTH)
PHOTO'S 98, 99, 100, 101, 102. 7m 100m FROM RUNNING RAIL

(T3) COULD NOT DO, DUE TO FOUNDATIONS BEING SUBMERGED IN WATER. PHOTO'S 103, 104, 105, 106

(T4) - DEPTH TO FOUNDATION FROM GROUND LEVEL = 450mm TO STEPPING DOWN TO 700mm CONCRETE. ALL GROUND MADE UP OF SOIL. PHOTO'S 146, 147, 148, 149

## Appendix D3: Record Drawings

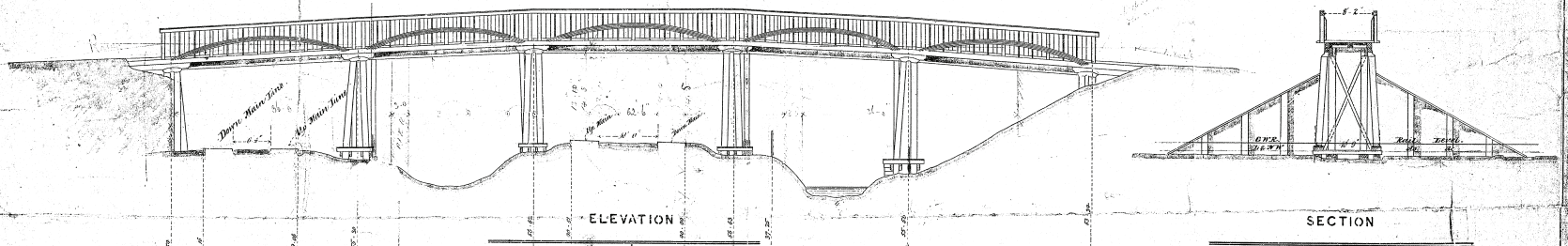
- 53438 – General Arrangement (original design, circa 1890)
- 53438 (No. 1) – General Arrangement (reconstruction, date unknown)
- 53438 (No. 2) – Steelwork details (reconstruction, date unknown)

# G.W.R. WILLOW WALK BRIDGE. No 29 NEAR OXFORD. AT 64 M. 32 CHS.

(.53438.)

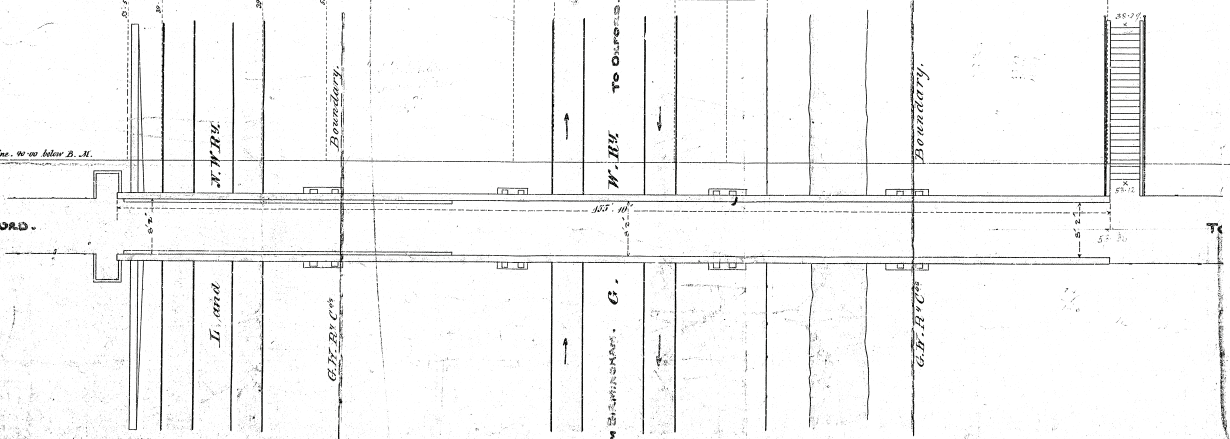
TO BE RETURNED TO ENGINEER'S PLAN OFFICE G.W.R. PADDINGTON.

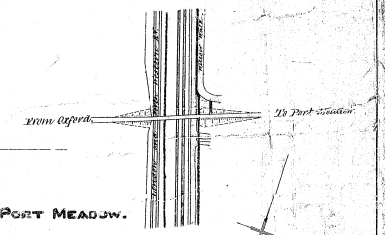
SCALE 8 FEET TO AN INCH










PLAN OF SITE.

Scale 22 Chains to an Inch.

TO BE RETURNED TO ENGINEER'S PLAN OFFICE G.W.R. PADDINGTON.

DIVISIONAL ENGINEER'S OFFICE G.W.R. 4 AUG 93

2

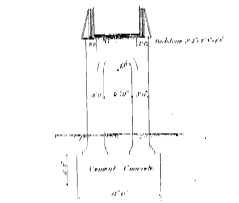
Drawn October 1892.

MT 24912.

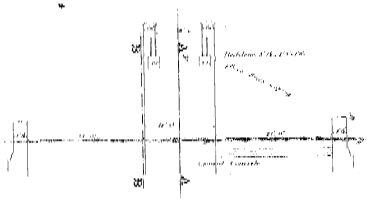
63

G. W. R. WILLOW WALK FOOTBRIDGE AT [illegible]

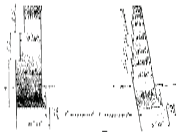
53438



ELEVATION OF PIER



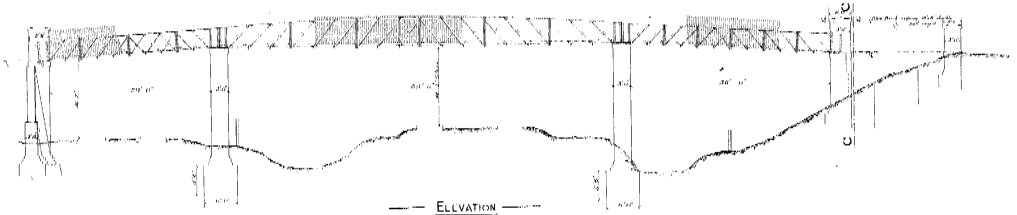
ELEVATION OF WING WALL



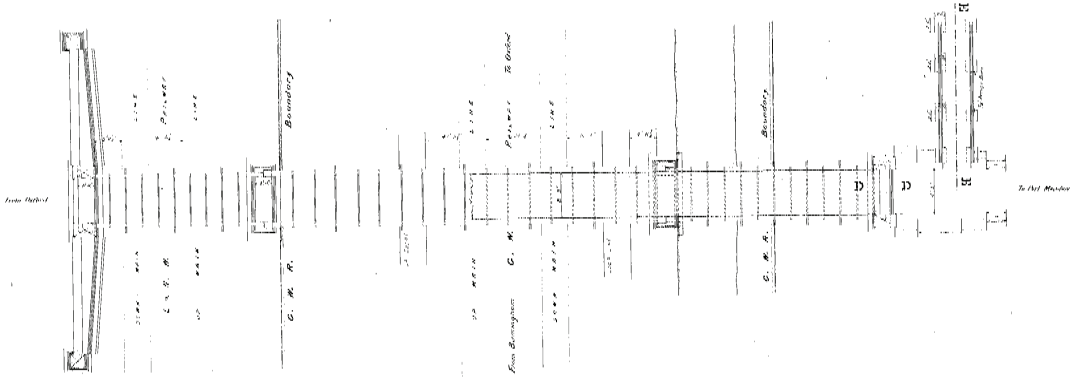
SECTION AT A A



SECTION AT B B



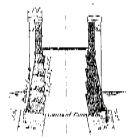
ELEVATION



PLAN

SCALE $\frac{1}{8}$ INCH TO A FOOT

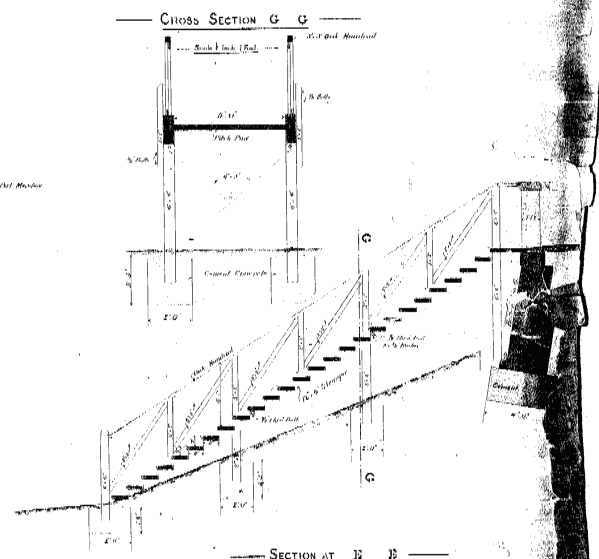
Note All Timber to be creosoted.



SECTION AT C C

SECTION AT D D

CROSS SECTION G G

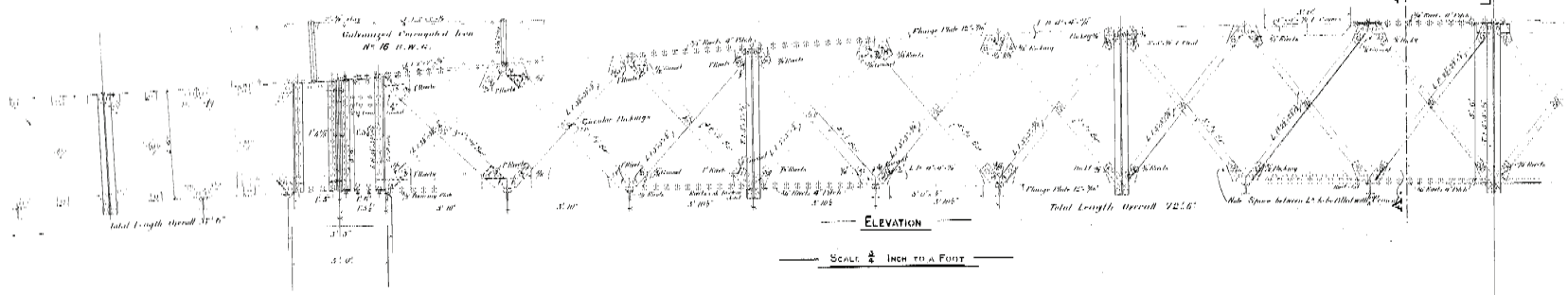


SECTION AT E E

SCALE $\frac{3}{8}$ INCH TO A FOOT

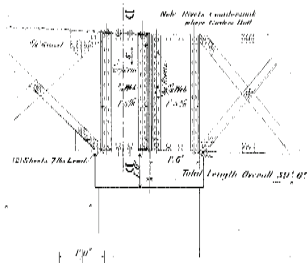
ENGINEERS

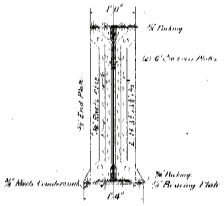
64



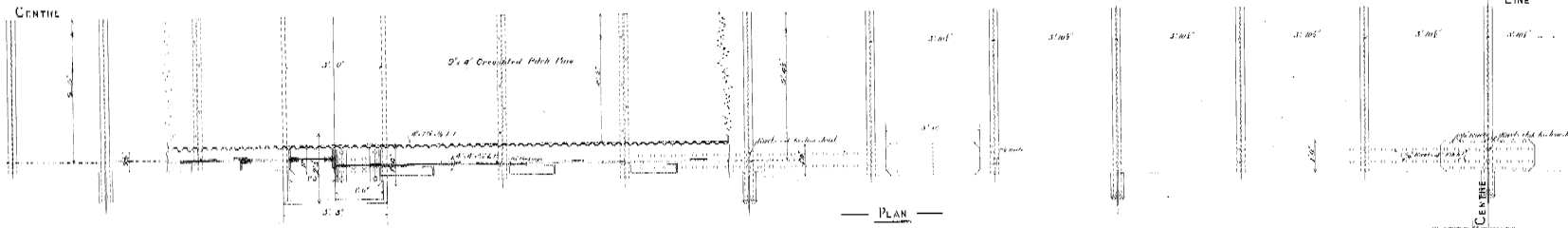

ELEVATION

SCALE ¾ INCH TO A FOOT

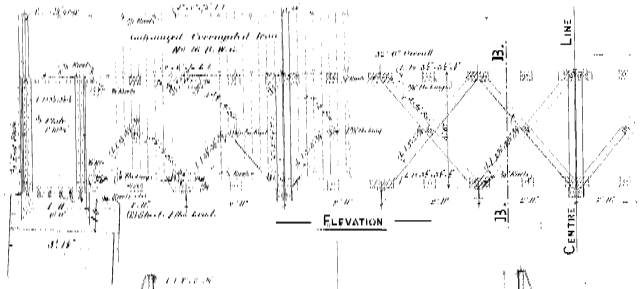


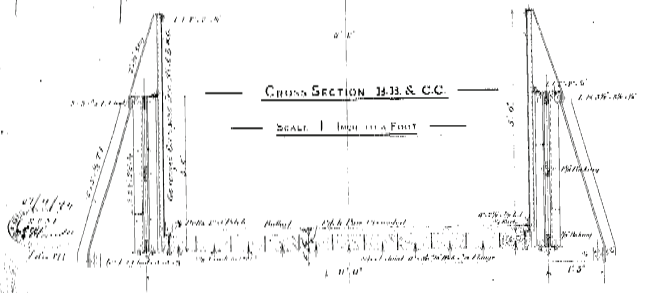

SECTION AT D D




PLAN

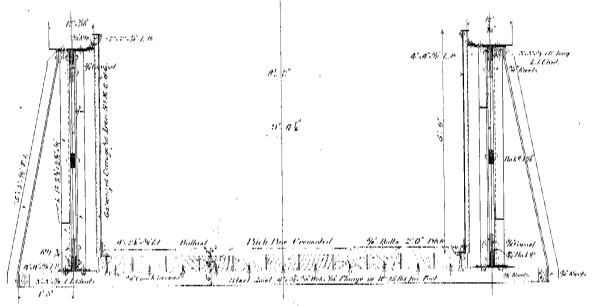



ELEVATION



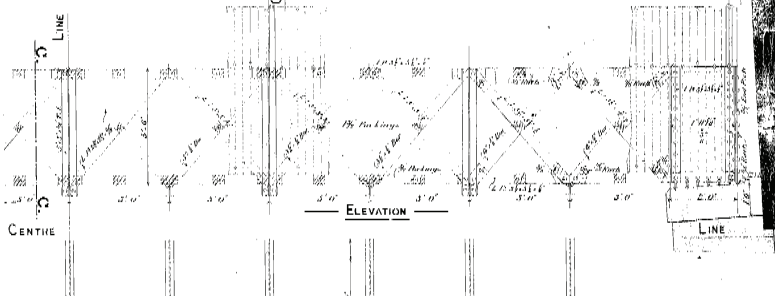
CROSS SECTION B.B. & C.C.

SCALE 1 INCH TO A FOOT




CROSS SECTION A. A.

SCALE 1 INCH TO A FOOT




ELEVATION

PLAN

SCALE ¾ INCH TO A FOOT

ENGINEERS OFFICE

# Appendix E
# Existing Level Crossing Risk Assessment

# Combined Risk Results

***Crossing Details***

| | |
|---|---|
| Crossing Name: | Aristotle Lane |
| Crossing Type: | FPW |
| Location Rail: | DCL |

***Usage***

| | |
|---|---|
| Vehicles | 0 per day |
| Pedestrians/Cyclists | 105 per day |
| Trains | 234 per day |

**Warning time is less than pedestrian traverse time by 3.19 seconds**

| | |
|---|---|
| Census 1 Type | quick |
| Census 1 Date | 20-Mar-2012 at 13:54 |

***Safety Risk***

| | |
|---|---|
| Individual Risk | C |
| Collective Risk | 2 |

| User Type | Ind Risk (Fraction) | Ind Risk (Numeric) | Collective Risk |
|---|---|---|---|
| Cyclist / Motorcyclist | 1 in 5814 | 1.72E-04 | 0.003813279 |
| Pedestrian | 1 in 5814 | 1.72E-04 | 0.00932135 |
| Passengers | | | 0 |
| Staff | | | 8.04E-05 |
| Total | | | **0.013215077** |

***Collision Frequencies***

| | Train / User | User Equipment | Other |
|---|---|---|---|
| Pedestrian: | 0.016089496 | 9.17E-04 | 0 |

***Collision Risk***

| | Train / User | User Equipment | Other |
|---|---|---|---|
| Pedestrian: | 0 | 0 | 0 |

***Key Risk Drivers***

Frequent Trains
Low Sighting Time
Large Numbers of users

***Operational Risk***

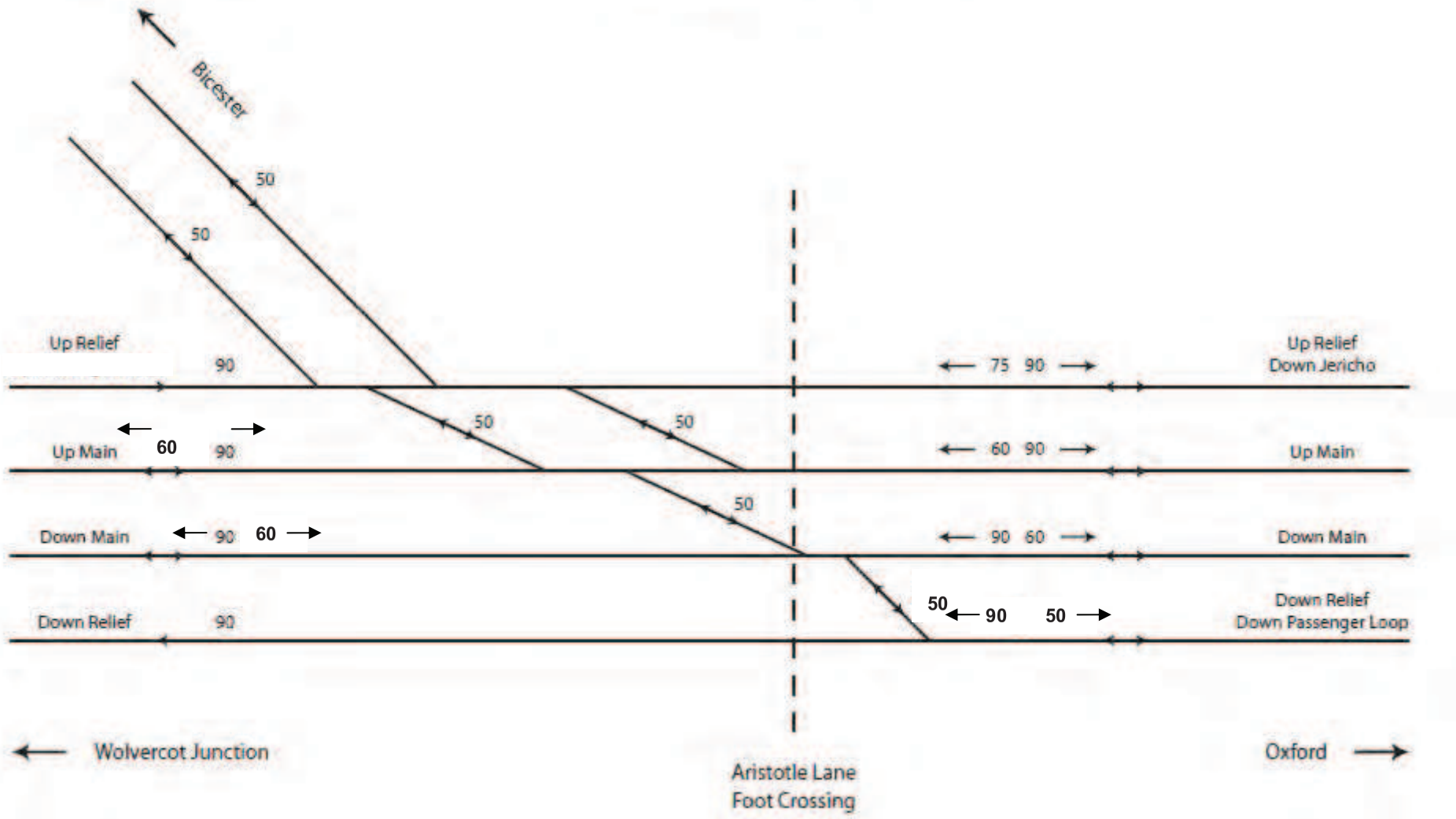
| | |
|---|---|
| £ per year | 159 |

***Safety Spend***

| | |
|---|---|
| 25 year | £158,779.54 |
| 50 year | £191,673.13 |

# Appendix F
# Proposed Track Arrangement

(Refer to Appendix B for Existing Track Arrangement)




## Appendix F: Proposed Track Arrangement

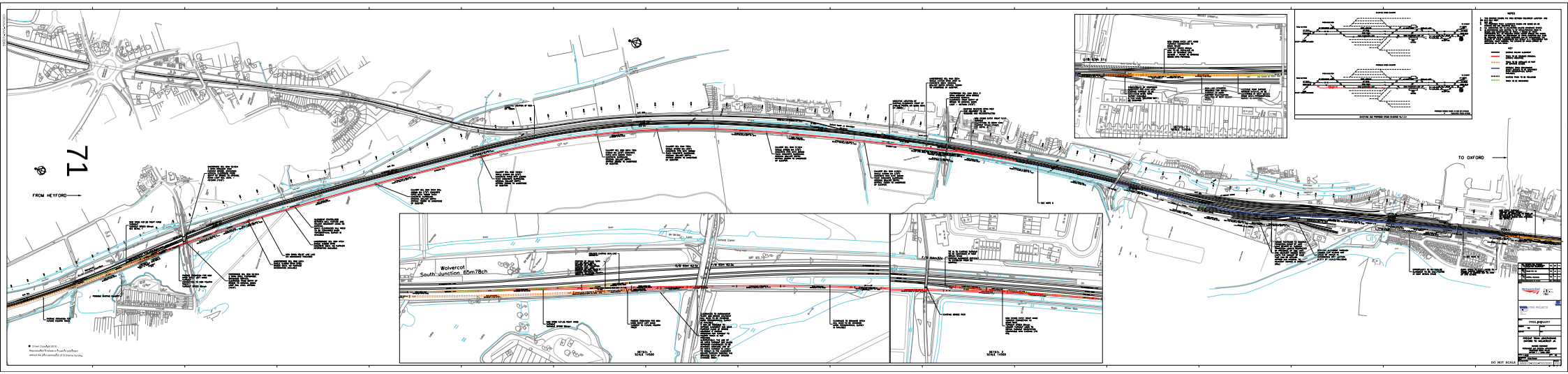
(showing direction & linespeed)

***Speeds subject to design development***

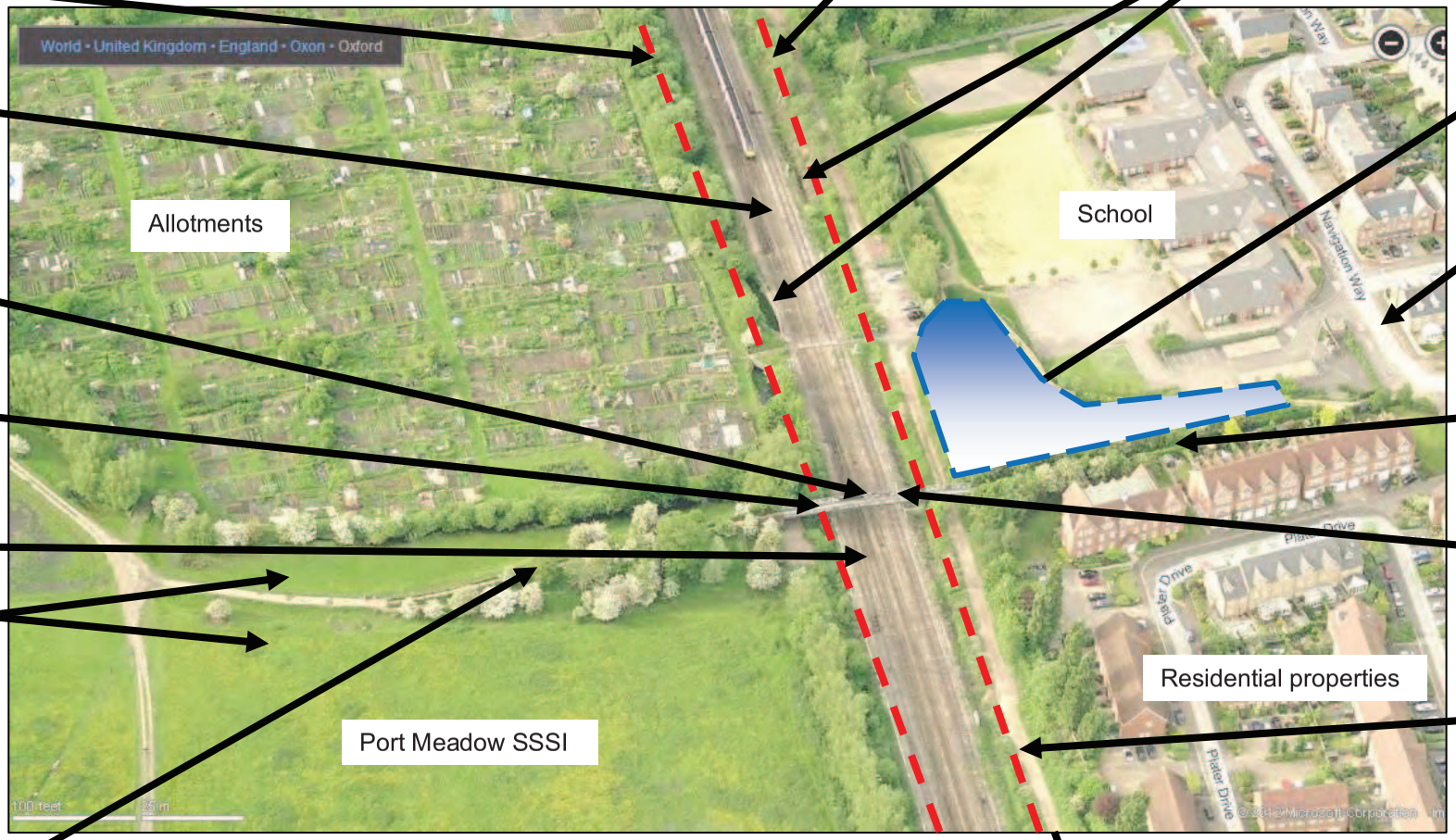
# Appendix G

# General Arrangement Drawing for Down Passenger Loop Extension

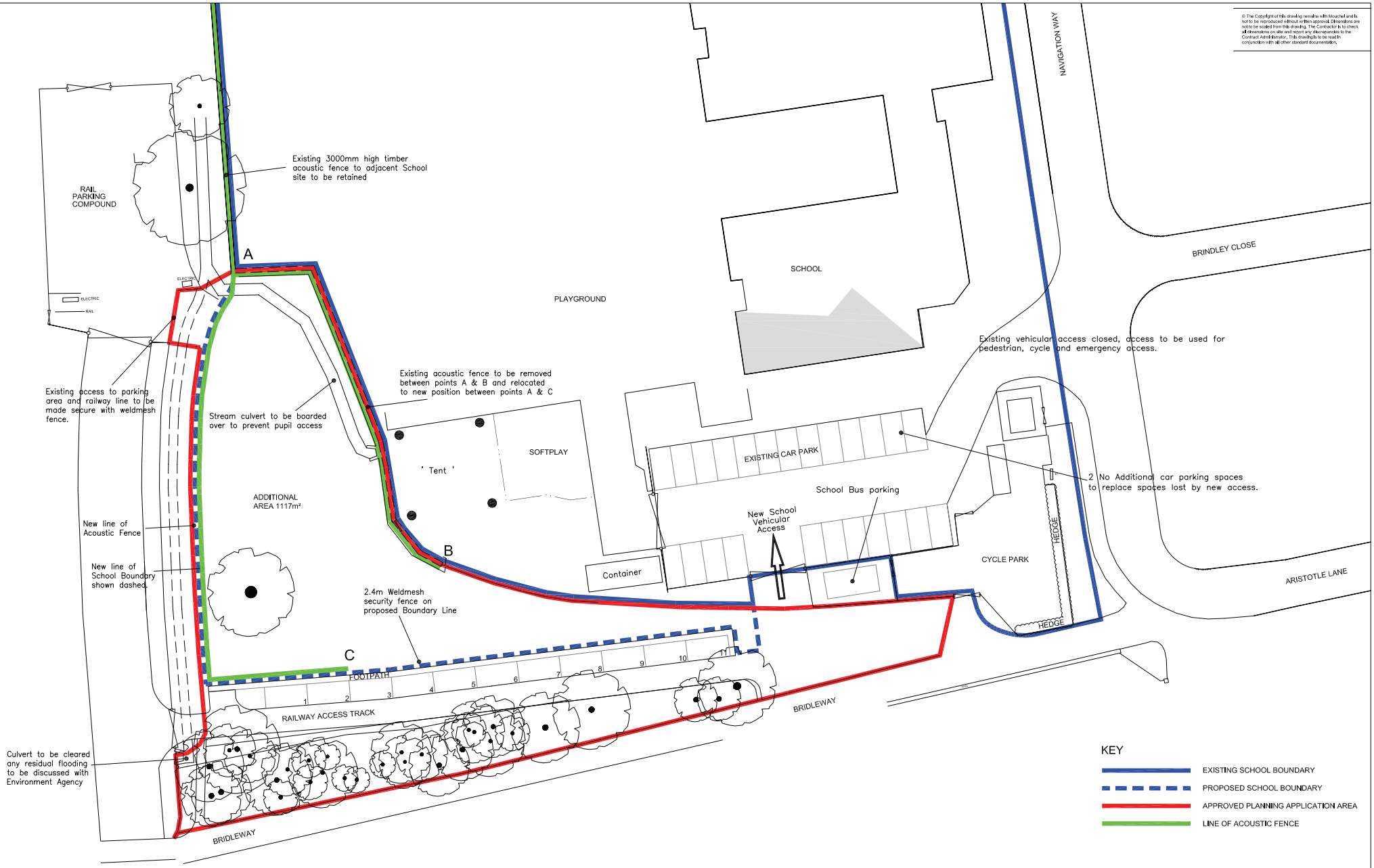
# (New Down Relief Line)


71
FROM HEYFORD
TO OXFORD
Wolvercot
South Junction 65m78ch
NOTES
KEY
DO NOT SCALE

# Appendix H
# Site Constraints


Tackley
Possible future Chilterns Track
Drainage ditches in both cess (SSSI)
Proposed Down Relief Line Extension
Linespeed increases & bi-directional working
Services across Willow Walk Footbridge
Restricted sighting at Level crossing due to pier
Existing & proposed S&C
Area prone to flooding
Approach ramp existing gradient approximately 1:18 (average), 1:6 (worst case at bridge).
Allotments
School
Port Meadow SSSI
Residential properties
School extension plans into this area
Limited access from approach roads
Approach ramp existing gradient approximately 1:20 (average), 1:6 (worst case at bridge).
Existing footbridge with frequent use. Decking not suitable for electrification
Network Rail vehicle accesses adjacent to Aristotle Lane crossing
RRV access point to south
Whistle board locations non-compliant
Oxford
World · United Kingdom · England · Oxon · Oxford

# Appendix I
# SS Philip & James CE School Extension Plan




KEY

- EXISTING SCHOOL BOUNDARY
- PROPOSED SCHOOL BOUNDARY
- APPROVED PLANNING APPLICATION AREA
- LINE OF ACOUSTIC FENCE

N

| Rev | By | Date | Drwn | Chkd |
|---|---|---|---|---|
| B | JA | 19.05.09 | Notes amended | DC |
| A | JA | 19.05.09 | Car Parking Amended | DC |

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Stratton Court 1 Kimber Road
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www.mouchel.com

Project
SS Philip & James CE School
Nastgatton Way
Oxford
Proposed Site Plan

Client
OXFORDSHIRE COUNTY COUNCIL

| Designed | Drawn | Drawn Date | Checked | Authorised | Authorised Date |
|---|---|---|---|---|---|
| DC | JMA | 19.05.09 | JEA | DC | 19.05.09 |

| Project No | Discipline | Drwg No | Revision | Scale |
|---|---|---|---|---|
| 783214 | A | 5359 | B | 1:200 @ A1 |

Mouchel Civil Plc. PROJECTS

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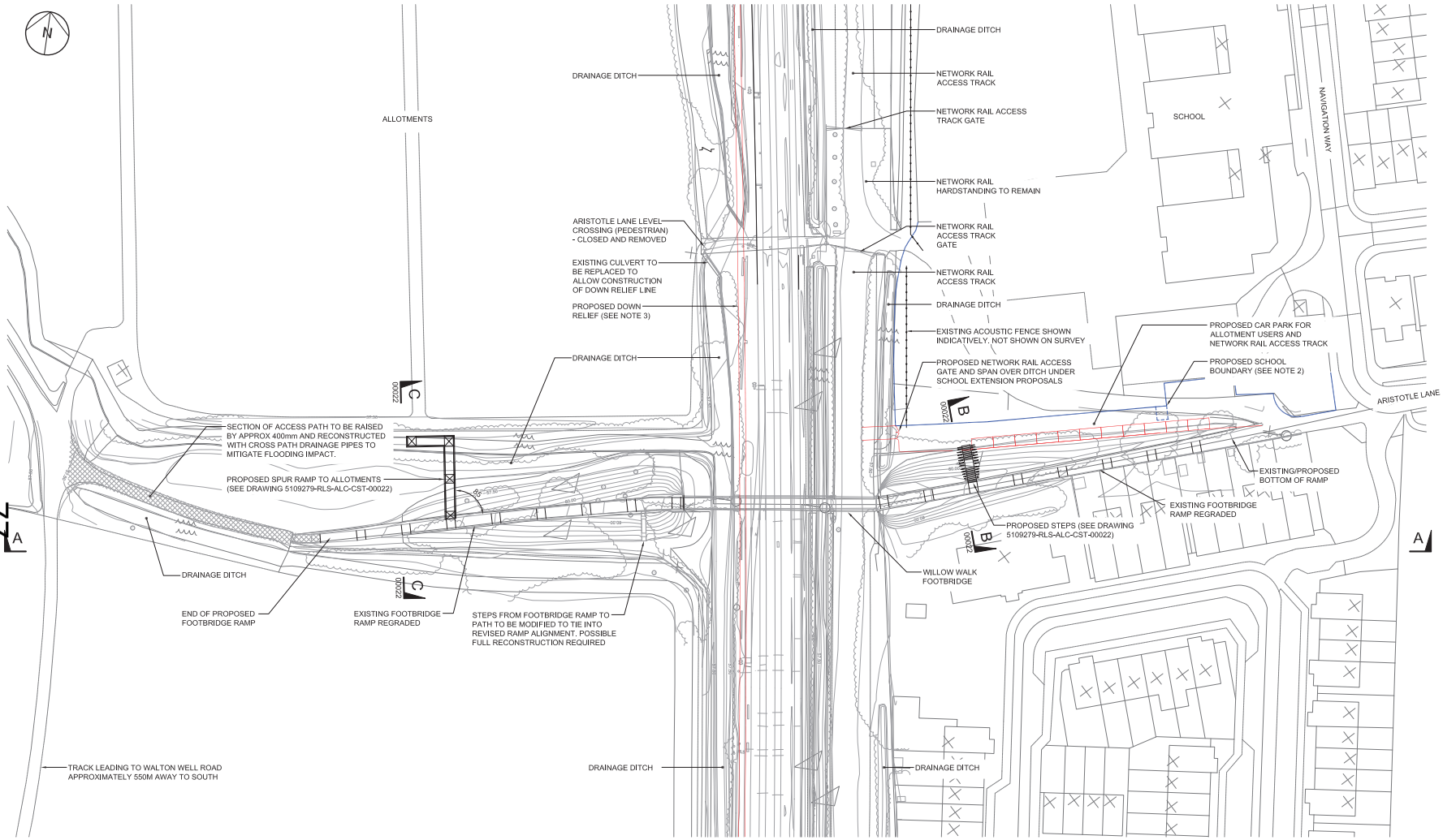
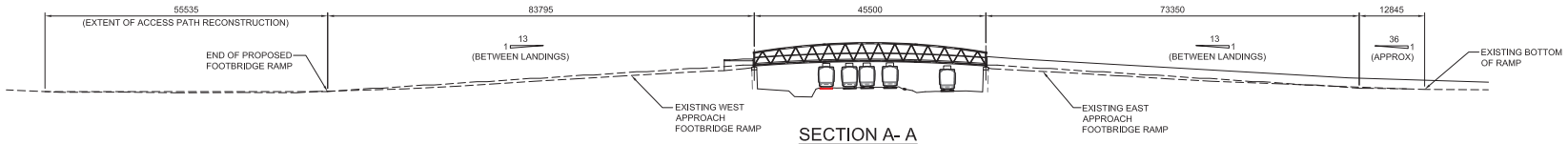



PLAN
1:500




SECTION A- A
RAMP FENCES & WALL OMITTED FOR CLARITY
(SEE DRAWING 00021 FOR ENLARGED SECTIONS)
1:500

ATKINS

NOTES

1. ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. SCHOOL BOUNDARY TAKEN FROM MOUCHEL DRAWING 5359 REV B PROVIDED BY NETWORK RAIL. NOTE SCHOOL BOUNDARY HAS BEEN MODIFIED (SHOWN BY DASHED LINE) AND PROPOSED ACCESS TRACK AND PROPOSED PARKING HAVE BEEN MODIFIED TO ACCOMMODATE PROPOSED STAIRS.
3. PROPOSED HORIZONTAL DOWN RELIEF PWAY POSITION IS SHOWN INDICATIVELY BASED ON 3188mm OFFSET FROM THE EXISTING DOWN MAIN. PROPOSED VERTICAL ALIGNMENT SHOWN AT EQUAL LEVEL TO THE EXISTING DOWN MAIN. NOTE: PWAY LAYOUT IS INDICATIVE AND IS TO BE CONFIRMED AT DETAILED DESIGN.

| Rev | Date | Issue History | Drawn | Chkd | Appd |
|---|---|---|---|---|---|
| P01 | 07.11.12 | PRELIMINARY | JH | BL | KS |

Description of Change

Drawing Status: PRELIMINARY

ATKINS
5th Floor
Milford House
1 Milford Street
Swindon
SN1 1DW
Tel: +44 (0)1793 538000
Fax: +44 (0)1793 516916

NetworkRail

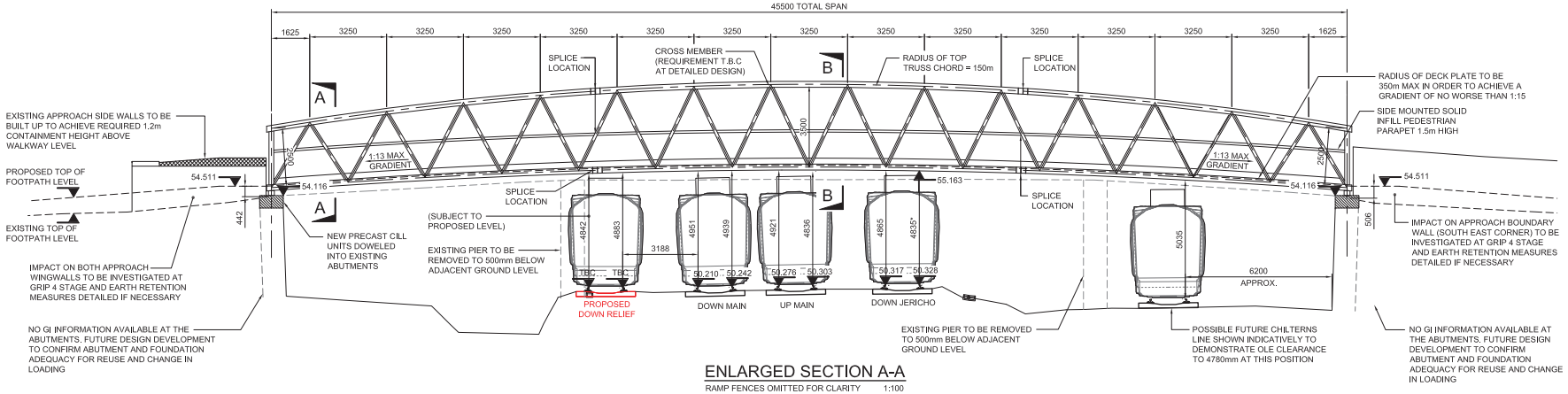
Project Title: WMSR LINE OF ROUTE OXFORD AREA RE-SIGNALLING

Drawing Title: ARISTOTLE LANE FOOTBRIDGE PROPOSED RECONSTRUCTION OPTION GENERAL ARRANGEMENT

| Drawn | Date | Designed | Date |
|---|---|---|---|
| P HACKETT | 07.11.12 | S SKIRROW | 07.11.12 |
| Checked | Date | Approved | Date |
| B LAU | 07.11.12 | K SWIFT | 07.11.12 |

| Size | Scale | Location |
|---|---|---|
| A1 | AS SHOWN | DCL 64M 34CH |

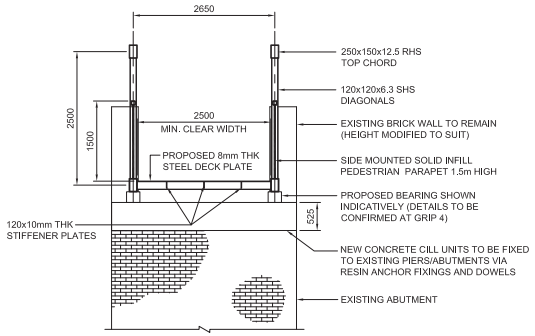
Drawing Number: 5109279-RLS-ALC-CST-00020 Revision: P 01




## ENLARGED SECTION A-A

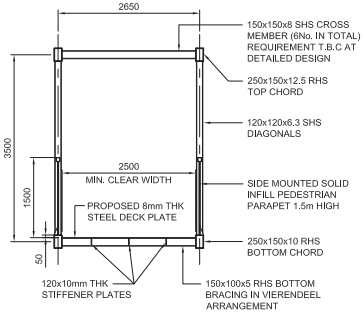
RAMP FENCES OMITTED FOR CLARITY 1:100

REF: 00020




## SECTION A-A THROUGH PROPOSED DECK

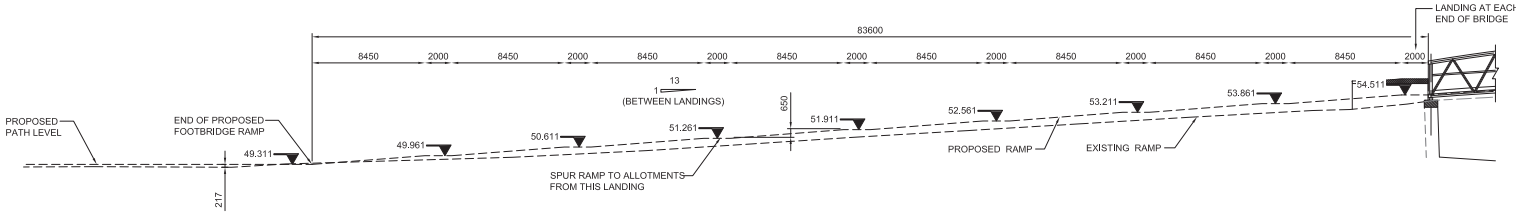
1:50




"DIMENSION BASED ON ACHIEVING 4780mm CLEARANCE + 55mm LIVE LOAD DEFELECTION ALLOWANCE

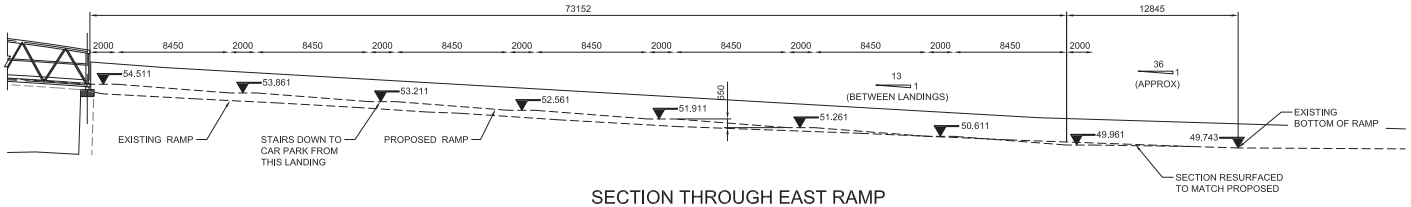
## SECTION B-B THROUGH PROPOSED DECK (MID SPAN)

1:50




## SECTION THROUGH WEST RAMP

RAMP FENCE OMITTED FOR CLARITY 1:200




## SECTION THROUGH EAST RAMP

RAMP FENCE & WALL OMITTED FOR CLARITY 1:200

78

NOTES

1. ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. FOR GENERAL NOTES REFER TO DRAWING 5109279-RLS-ALC-CST-00020.
3. ALL DIMENSIONS SHOWN FOR MEMBER SIZES ARE INDICATIVE AND TO BE REVIEWED AS PART OF THE OUTLINE & DETAILED DESIGN STAGES.
4. ESTIMATED WEIGHT OF STRUCTURE IS APPROXIMATELY:
   - SIDE ELEMENT: 11T
   - CENTRAL ELEMENT: 15T
   - SIDE ELEMENT: 11T
   - TOTAL WEIGHT: 37T

| Rev | Date | Issue History | Drawn | Chkd | Appd |
|---|---|---|---|---|---|
| P01 | 07.11.12 | PRELIMINARY | PH | BL | KS |

Description of Change

Drawing Status: PRELIMINARY

ATKINS
5th Floor
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Tel: +44 (0)1793 538000
Fax: +44 (0)1793 516916

NetworkRail

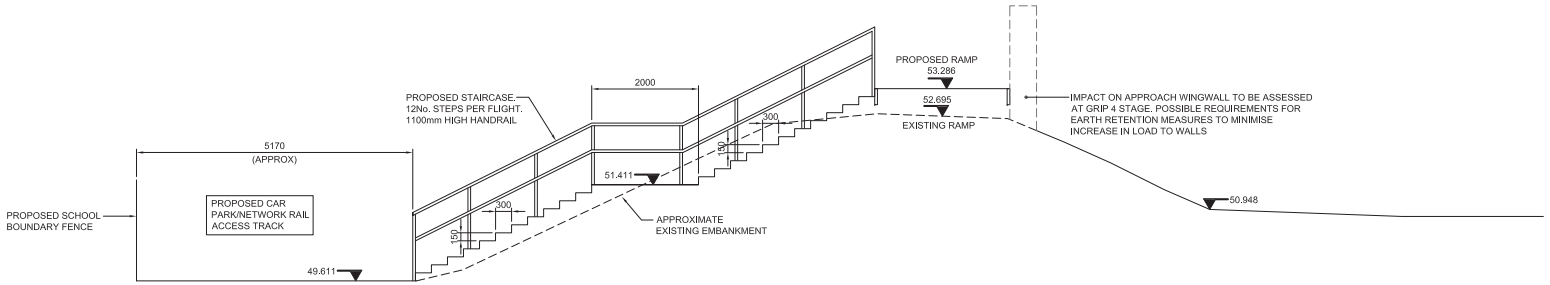
Project Title: WMSR LINE OF ROUTE OXFORD AREA RE-SIGNALLING

Drawing Title: ARISTOTLE LANE FOOTBRIDGE PROPOSED RECONSTRUCTION OPTION ENLARGED SECTIONS

| Drawn | Date | Designed | Date |
|---|---|---|---|
| P HACKETT | 07.11.12 | S SKIRROW | 07.11.12 |
| Checked | Date | Approved | Date |
| B LAU | 07.11.12 | K SWIFT | 07.11.12 |

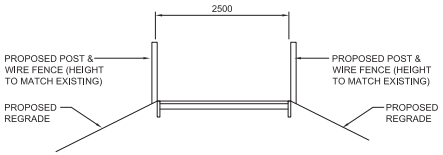
| Scale | Location |
|---|---|
| A1 AS SHOWN | DCL 64M 34CH |

Drawing Number: 5109279-RLS-ALC-CST-00021 Revision: P01



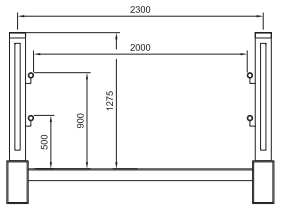

## SECTION B-B THROUGH PROPOSED CAR PARK STAIRCASE

REF: 00020 1:50



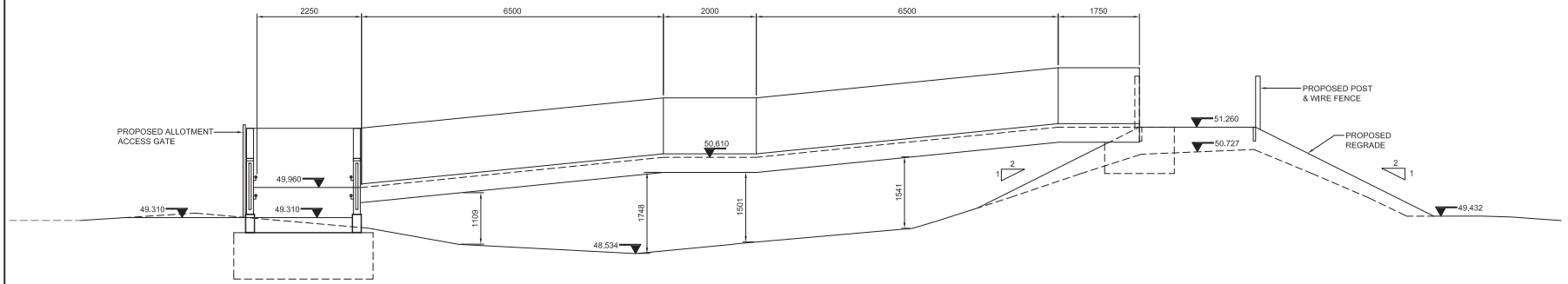

## TYPICAL SECTION THROUGH PROPOSED MAIN RAMPS

1:50




## SECTION THROUGH PROPOSED SPUR RAMP

1:25




## SECTION C-C THROUGH PROPOSED SPUR RAMP TO ALLOTMENTS

1:50

79

NOTES

1. ALL DIMENSIONS IN MILLIMETRES UNLESS NOTED OTHERWISE.
2. FOR GENERAL NOTES REFER TO DRAWING 5109279-RLS-ALC-CST-00020.

| Rev | Date | Issue History | Drawn | Chkd | Appd |
|---|---|---|---|---|---|
| P01 | 07.11.12 | PRELIMINARY | PH | BL | KS |

Description of Change

Drawing Status: PRELIMINARY

ATKINS
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Tel: +44 (0)1793 538000
Fax: +44 (0)1793 516916

NetworkRail

Project Title: WMSR LINE OF ROUTE OXFORD AREA RE-SIGNALLING

Drawing Title: ARISTOTLE LANE FOOTBRIDGE PROPOSED RECONSTRUCTION OPTION ALLOTMENT & CAR PARK ACCESS

| Drawn | Date | Designed | Date |
|---|---|---|---|
| P HACKETT | 07.11.12 | S SKIRROW | 07.11.12 |
| Checked | Date | Approved | Date |
| B LAU | 07.11.12 | K SWIFT | 07.11.12 |

| Size | Scale | Location |
|---|---|---|
| A1 | AS SHOWN | DCL 64M 34CH |

Drawing Number: 5109279-RLS-ALC-CST-00022 Revision: P 01

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