TRAM LINE TWO, WEST EDINBURGH

transport initiatives **edinburgh**

ROUTE DEVELOPMENT REPORT

PART A – DESIGN PAUSE

November 2003

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transport initiatives **edinburgh**

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PART A – DESIGN PAUSE

NOVEMBER 2003

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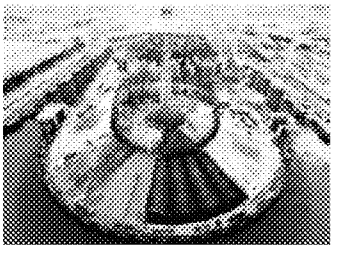
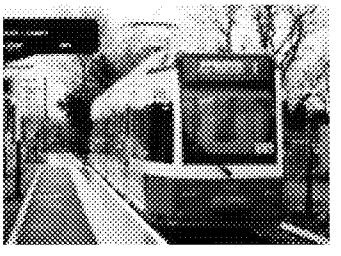
EXECUTIVE SUMMARY

Executive Summary

INTRODUCTION & BACKGROUND

The West Edinburgh Tram Line (Edinburgh Tram Line 2 or ETL2) is the second of a three line tram network currently being developed for the City of Edinburgh Council (CEC) by transport initiatives **edinburgh** (**tie**). This line is to connect St Andrew Square to West Edinburgh terminating at Edinburgh Park, the airport or Newbridge. Whilst the design aspiration is to run the tram as far west as possible it is essential that a robust business case be developed for the full route presented in the Parliamentary Bill. It is currently expected that public transport provision in this corridor will be improved through the West Edinburgh Busways (WEBS) project. Resulting from early project work it is anticipated that WEBS and Tram Line 2 share a common alignment in part, operation of the guideway section of WEBS will cease when tram construction starts on this section.

FaberMaunsell/Semaly (FM/S) has been commissioned by **tie** to investigate technical, operational and environmental aspects of Edinburgh Tram Line 2 (ETL2) and in February 2003 submitted their *Draft Preferred Route Corridor Report*. This detailed the work undertaken in assessment of over 30 route options to identify a single route corridor, still containing a number of sub-options for which further consideration and consultation would be required. Subsequent work has been reported to the **tie** board in advance of the public consultation presenting the preferred options at that stage and outlining those areas on which public comment was to be sought. These are shown on the following plan "Preferred Corridor of Route Options" (drawing 30894/MMH/C107) and detailed in an addendum to the above noted report.

Following this public consultation, along with stakeholder consultation, which has been ongoing throughout the assessment process, FM/S have now reached an alignment freeze. This provides a fixed basis for the development of:

- Vertical and horizontal alignment details;
- Engineering and Parliamentary Plans and sections;
- Design costs;
- Patronage and revenue models;

And the appraisal of these with respect to:

- The Environmental Assessment;
- The Scottish Transport Appraisal Guidance (STAG) analysis and;
- The Business case.

This has been termed the 'Design Pause' by the Client Body.

This Design Pause was confirmed on 23 July 2003 and is outlined in this document – *Route Development Report Part A Design Pause.*

This document sets out the options appraisal process up to the Design Pause and presents the preferred alignment, which is being recommended for progression into the Parliamentary Bill.

The Brief for ETL2 requires FM/S to prepare supporting documentation for a Parliamentary Bill covering an independent tram line from the city centre to its western terminus. Where ETL2 is coincident with other elements of the proposed tram network, the consultancies charged with their development are to provide FM/S with input as required. Similarly there is a separate commission to investigate the benefits of operating lines 1 and 2 as a network.

SCHEME OBJECTIVES

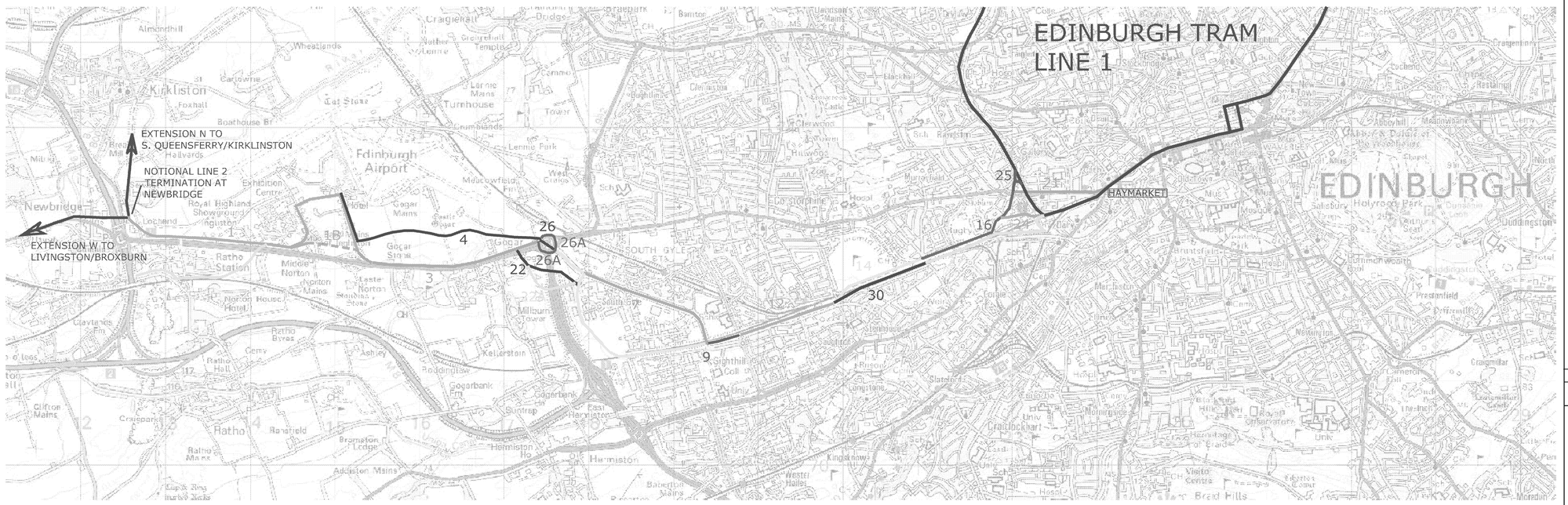
The objectives against which ETL2 has been assessed can be categorised as:

- Transport – Local Transport Strategy objectives;
- CEC Tram Aspirational Guidelines April 2003
- Planning Objectives included in the local and regional planning context;
- STAG covering;
    - Environment
    - Accessibility
    - Safety
    - Integration
    - Economy

Each of the options has been assessed against a range of adopted appraisal criteria such as traffic/transport, environmental impact and planning issues. This has been completed as a framework assessment against the desired objectives. Where several options existed they have been compared against the same criteria.

Drawing No. 30894 / MMH / C107

Revision A



A	ORIGINAL ISSUE	RM	AIC		30.01.03
Rev	Description of revision	Auth	Chkd	App	Date

Client

transport
initiatives
edinburgh

Project

EDINBURGH TRAM
LINE TWO

Designed	RM
Drawn	PJB
Checked	AIC
Reviewed	

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CAD filename: F:\30894\autocad\output\c107.dwg

Title

PREFERRED CORRIDOR
OF ROUTE OPTIONS

Size A1 Scale N.T.S. Date 30.01.03

Status INFORMATION

Drawing No. 30894 / MMH / C107 Revision A

OPTION EVALUATION PROCESS

The option evaluation process comprises three stages of work:

1. STAG 1 – a qualitative assessment against the five categories outlined above as well as a consideration of implementation, engineering and traffic and transportation aspects. This appraisal was completed on a seven point scale from major negative (minus three) to a major positive (plus three) with neutral scoring a zero.

2. Consultation – three aspects of consultation have been vital to the option evaluation process: public, stakeholder and client group. The client group consists of: **tie**; CEC Transport and Planning Divisions and the Scottish Executive (SE). Client Group consultations have allowed routes to be appraised against planning and transport objectives. Stakeholder consultation has enabled the design team to assess the potential impacts of an alignment on the operations of key facilities along the route. Similarly public consultation has been important in assessing those areas where the initial qualitative assessment has not necessarily shown a clear preference of one route over another. Additionally public input to issues such as stop location has been a valuable contribution to the scheme development.

3. STAG 2 – the quantitative assessment of routes along the preferred corridor and more particularly of the chosen alignment, measuring its rating in relation to each of the five areas in accordance with the Scottish Executive Guidance documentation.

PREFERRED CORRIDOR & OPTIONS ASSESSMENT

ST ANDREW SQUARE TO ROSEBURN

From the outset of the study it was clear that this tram line would likely have a section of track, which coincided with that of Line 1 of the network. As such FM/S undertook to minimise duplication of work by focusing their work on that section which does not include combined running. From the preferred corridor reporting it is clear that the merge between Lines One and Two will be at Roseburn. Hence for the purpose of this report it is assumed that the investigation of the shared route between St. Andrew Square and Roseburn section is assessed by others. It should be noted however that there has been an ongoing debate on whether the alignment should be routed along George Street or Princes Street, and subsequently what form it should take in relation to its interface with other traffic.

ROSEBURN TO CARRICK KNOWE

At Roseburn where the two lines merge the tram is located adjacent to and on the north of the main Edinburgh rail lines to Glasgow and Fife. At the western end of this section however, early work has located the route to the south of the rail line. To achieve this, the tram alignment must cross the rail line at least once. Three sub options have been developed along this length:

- Option A – a route along the south of the railway embankment
- Option B – a route along the north of the railway embankment
- Option C – a hybrid of the previous two. On the south of the railway between Russell Road and Balgreen Road where it crosses back to the north to utilise the reserve created for the CERT project west of Balgreen Road.

These three options were presented at the public exhibition as well as being reviewed with stakeholders. They were investigated in detail and appraised with respect to the STAG and other engineering issues.

Highlights of this process can be summarised as follows:

- Option A returned an overwhelming rejection on the grounds of social impact
- Option B has some impacts on the residents of Baird Drive however an alternative vertical alignment should provide mitigation by introducing an engineered cut. Additional focused consultation with affected residents and owners of properties is ongoing.
- Option C has significant physical constraints, which would add considerably to the cost of the scheme, and adversely impact the service provision (increasing journey time). Most notably there remains considerable concern amongst the design team about the alignment beneath the heavy rail corridor at Russell Road and Balgreen Road. These concerns revolve around the ability to construct an acceptable solution and its associated cost and risks. This relates to the requirements of Network Rail (NR) and Her Majesty's Railway Inspectorate (HMRI).

As a result it is proposed that Option B be taken forward as the preferred option with further consultation being carried out to define a solution that is acceptable to the residents of Baird Drive. Notwithstanding this, additional investigation into Options A and C is recommended.

WEBS / EDINBURGH PARK

From Carrick Knowe the preferred corridor assessment identified that the best route would be for the tram to supersede the WEBS guideway which is to be formed in the grass reserve between the railway line and Stenhouse, Broomhouse, and Bankhead Drives respectively. This decision has not been challenged through either public or stakeholder consultation and is acceptable to the Client Group. Thus it is carried forward to the preferred route alignment.

From the end of the WEBS guideway, the tram will continue past Edinburgh Park Railway Station before turning north to bridge over the railway. The alignment identified through Edinburgh Park utilises the corridor previously safeguarded for a transport corridor and detailed in the City of Edinburgh Rapid Transit (CERT) proposals.

GOGAR JUNCTION

Following early consideration of a number of options at Gogar Roundabout, stakeholder and Client Group consultation defined two to take forward to Public Consultation:

- Option A – directly across the roundabout with traffic signals providing priority for the tram;
- Option B – passing through the Gyle car park before crossing under Glasgow Road (the A8) east of Gogar Roundabout.

Consideration of these options has shown that despite having a higher capital cost Option B scores better against the majority of the assessment criteria. In addition both public and stakeholder consultations have identified a strong preference for option B. Hence this is the option to be taken forward.

GOGAR BURN

During the consultation period the route alignment around the proposed stop at Gogar Burn was brought into question by the identification of an archaeologically sensitive area. This led to a detailed review of potential route options (reconsidering those already discarded and looking at new alternatives). This review produced an alternative alignment further to the east. This however, reduced accessibility to the Royal Bank of Scotland (RBS) development, so a route passing close to the RBS access ramp but minimising the archaeological impact, is being developed as the preferred solution.

AIRPORT

Due to the forthcoming Government white paper on aviation, there is uncertainty over potential future expansion of Edinburgh Airport. Within this, there is scope for significant impact on the Royal Highland and Agricultural Society of Scotland (RHASS). This has given rise to consultation with both of these key stakeholders as well as government bodies involved in consideration of the expansion options – CEC and the Department for Transport. Each facility has differing preferences with respect to the tram alignment.

The British Airports Authority (BAA) at Edinburgh Airport have concerns about Traffic and emergency vehicle interfaces as well as parking control near the terminal building. To meet these concerns, a tram terminus adjacent to the arrival/departures hall has been proposed as part of a public transport hub linking with bus, taxi and potential future heavy rail. This would require a spur line from the proposed Park and Ride and hence has a significant operational impact on tram proposals. A range of through-route options have been presented to BAA however their preference remains, a single transport corridor leading to the terminal.

RHASS would welcome a through route but have requested that this pass to the north of the showground area (through existing car park area) forming a future boundary between the showground and expanded airport.

To ensure adequate access to each of these key facilities whilst minimising constraints on any expansion options it has been agreed that the preferred route option should be to run to a terminus at the airport with an additional line from the Ingliston Park and Ride to Newbridge.

NEWBRIDGE

Key features of the route at Newbridge are:

- to link to the two major development sites – Edinburgh Gate (formerly Continental Tyres) and the former Grampian Country Foods site.
- consideration of a potential for a Park & Ride site
- to provide an option for future extensions of the network towards Livingston and/or Kirkliston.

The route taken forward to the consultation phase of the alignment study consists of a loop round the village. This has been revised through more detailed stakeholder consultation and patronage studies.

DEPOT

Prior to the public consultation two depot options were being considered. One located on the site of the present CEC cleansing depot on Russell Road and the other adjacent to the RHASS grounds.

With the development of the preferred alignment between Roseburn and Carrick Knowe, Option B which stays to the north of the railway at Roseburn (whilst still considering options A and C), the Russell Road option is not attractive unless engineering issues on options A or C can be resolved. The option of a depot at Russell Road would be very expensive and operationally difficult. Whilst the RHASS option remains viable it is sub-optimal in operational terms being so near the end of the alignment. Also it puts significant constraints on the ability of the scheme to be built in phases. An alternative option adjacent to Gogar roundabout has been identified. This option has been developed including detailed consultation with CEC Transport and Planning. It is believed that this location provides the best option for Line 2 if developed in isolation (a separate study is investigating joint facilities for operation of all lines as a network).

CONCLUSIONS

The preferred route alignment for Edinburgh Tram Line 2 can be summarised as follows and is shown on drawing 30894/MMH/C108revA.

The preferred route runs jointly with Line 1 from St. Andrew Square through Haymarket to Roseburn. From Roseburn it continues off-street round the ScotRail depot past Murrayfield and along the back of Baird Drive in an engineered cutting (an area which is subject to further focused local consultation). Crossing over Balgreen Road the alignment continues along the north of the heavy rail corridor past Carrick Knowe golf course before bridging over the railway to join the WEBS alignment as far as Edinburgh Park station. A second major bridge of the railway will take the tram north where the alignment will follow the reserve identified for CERT through Edinburgh Park business park. North of Lochside Avenue the tram will then cross South Gyle Broadway at-grade entering the Gyle Centre. The alignment proceeds beneath the Glasgow Road to the east of Gogar roundabout, turning west to Gogar Burn. The exact alignment through Gogar Burn is subject to ongoing consultation with CEC and Royal Bank of Scotland. West of Gogar Burn the tram will follow the CERT reservation to the proposed park and ride on Eastfield Road before turning north to terminate at the airport. Additionally a spur line will extend from the Ingliston Park & Ride through to Newbridge passing through Ratho Station and under the motorway at Harvest Road.

It is anticipated a further report, will be required to detail the work and consultation needed for finalisation of the ETL2 route.

Revision

Drawing No. 30894 / C108

AIRPORT

INGLISTON PARK AND RIDE

GOGAR ROUNDABOUT OPTION

NEWBRIDGE

ROYAL HIGHLAND SHOWGROUND

ROYAL BANK OF SCOTLAND

THE GYLE

RATHO STATION

NEWBRIDGE SHUTTLE - CURRENTLY IN THE SCHEME BUT SUBJECT TO DEBATE ABOUT THE BUSINESS CASE

OPTION CURRENTLY BEING CONSIDERED AT THE REQUEST OF TIE

EDINBURGH PARK

CONT. ABOVE

CONT. BELOW

T

HE GYLE

MURRAYFIELD

WATER OF LEITH

BALGREEN ROAD

STENHOUSE DRIVE

SAUGHTON RD NORTH

EDINBURGH PARK

BROOMHOUSE ROAD

SOUTH GYLE ACCESS

EDINBURGH PARK STATION

KEY

PROPOSED ROUTE OF TRAM

STOP LOCATIONS CONSIDERED

ALTERNATIVE STOP LOCATIONS

SIGNALISED JUNCTIONS REQUIRED TO CONTROL TRAM AND ROAD VEHICLE MOVEMENTS

Rev	Description of revision	Draw	Chkd	App	Date
A	JUNCTIONS AND TRAMSTOPS REVISED	SJP	REM	GM	05.09.03

Client: tie — transport initiatives edinburgh

Project: EDINBURGH TRAM LINE TWO

Designed	REM
Drawn	AIC
Checked	REM
Reviewed	AIC

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Title: PREFERRED ROUTE AUGUST 2003

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Status INFO

Drawing No. 30894 / C108 | Revision A

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- Appendix B – Schedule of Meetings
- Appendix C – Murrayfield Flood Defence
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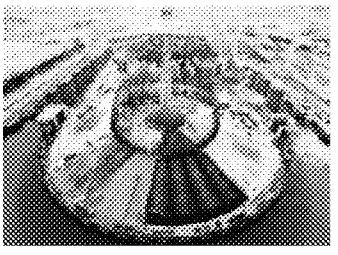
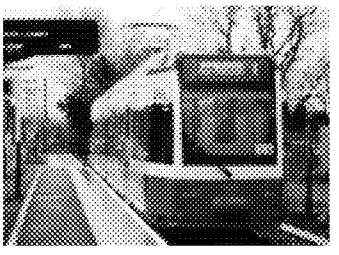
- Appendix E – Roseburn to Carrick Knowe Cross Sections
- Appendix F – Airport Report

INTRODUCTION

1 Introduction

1.1 REPORT INTRODUCTION

The City of Edinburgh Council (CEC) commissioned a study in December 2001 to examine the feasibility for a light rail network in Edinburgh. This study resulted in the *Edinburgh LRT Masterplan Feasibility Study* report. This report included an initial scoping of available alignments and a broad evaluation of LRT in each route corridor. It then produced a shortlist of routes for further assessment. A second phase examined in more detail the corridors for which LRT was considered most attractive including a more detailed evaluation and a preliminary environmental assessment.

Based upon this feasibility study undertaken, Transport Initiatives Edinburgh (**tie**) submitted a report on 30 September 2002 to the Scottish Executive that sought in principle to proceed with the Integrated Transport Initiative (ITI) for Edinburgh and South East Scotland. The report outlined that the achievement of the recommended ITI programme would require the early backing of the Scottish Executive. This has been achieved principally through agreement to provide £375 million of funding towards the development and construction of three tram lines, which form a key part of the improved transport infrastructure.

The West Edinburgh Tram Line (Edinburgh Tram Line 2 or ETL2) is the second of this three line tram network currently being developed for the CEC by **tie**. ETL2 is to connect St Andrews Square to West Edinburgh terminating at Edinburgh Park, the Airport or Newbridge. Whilst the design aspiration is to run the tram as far west as possible, it is essential that a robust business case be developed for the full route presented in the Parliamentary Bill. It is currently expected that prior to completion of the tram, public transport provision in this corridor will be improved through the West Edinburgh Busways (WEBS) project.

FaberMaunsell/Semaly (FM/S) has been commissioned by **tie** to investigate engineering and environmental aspects of ETL2 and in February 2003 submitted a draft *Preferred Route Corridor Report*. This detailed the work undertaken in assessment of over 30 route options to identify a single route corridor, still containing a number of sub-options for which further consideration and consultation would be required. Subsequent work was reported to the **tie** Board in advance of the public consultation, presenting the preferred options at that stage and outlining those areas on which public comment was to be sought. This work is outlined in the Addendum to *Preferred Route Corridor Report* and is summarised in section 2.

Following this public consultation, along with stakeholder consultation, which has been ongoing throughout the assessment process, FM/S have now reached an alignment freeze. This provides a fixed basis for the development of:

- Vertical and horizontal alignment details;
- Engineering and Parliamentary Plans and sections;
- Design costs;
- Patronage and revenue models;

And the appraisal of these with respect to:

- The Environmental Assessment;
- The Scottish Transport Appraisal Guidance (STAG) analysis and;
- The Business case.

This has been termed the 'Design Pause' by the Client Body.

This Design Pause was confirmed on 23 July 2003 and is outlined in this document – *Route Development Report Part A - Design Pause.*

The purpose of this report is to describe the process in developing and assessing options for the scheme up to the point where the alignment was 'frozen' to allow a final assessment. The aim of this report is to describe the rationale of the options that have been derived.

Any further work required will be reported separately.

1.2 REPORT LAYOUT

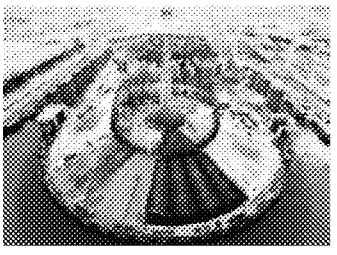
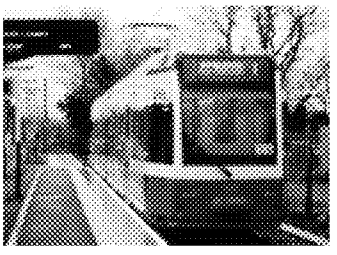
This report is presented in the following manner.

Firstly an Executive Summary is presented. Section 1 is the Introduction to the Report whilst Section 2 summarises the alignment work defined by previous work. Section 3 outlines the Scheme Objectives in terms of Transport, Planning and Appraisal Criteria that have been used in the assessment of options. Section 4 details that Option Evaluation Process, how STAG applies to this project and the consultation with the client group, public and stakeholders. Section 5 outlines the Preferred Corridor and the options assessment along each geographic section. Section 6 provides the conclusion of this Design Pause Report.

The appendices contained within this report are as follows:

- Appendix A – Property Impact Assessment
- Appendix B – Schedule of Meetings
- Appendix C – Murrayfield Flood Defence
- Appendix D – Russell Road and Balgreen Road Issues
- Appendix E – Roseburn to Carrick Knowe Cross Sections
- Appendix F – Airport Report

PREFERRED ROUTE CORRIDOR REPORT SUMMARY

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2 *Preferred Route Corridor Report* Summary

2.1 INTRODUCTION

This section summarises the alignment as detailed in the *Preferred Route Corridor Report*, including the subsequent work and consultation undertaken in developing certain sections so that an alignment and options could be presented in the public consultation process.

The resulting alignment from the *Preferred Route Corridor Report* and work detailed in the Addendum, is shown in drawing 30894/P002. This alignment was the basis for consultation.

2.2 ST ANDREW SQUARE TO ROSEBURN

From the outset of the study it was clear that this tram line would likely have a section of track, which coincided with that of Line 1 of the network. Having undertaken a full appraisal of route options and identified a merge between the two lines at Roseburn. To maximise operational flexibility between the two lines, an all-ways (full delta) junction would be preferable. FM/S have undertaken to minimise duplication of work by focusing their work on that section which does not include combined running. For the purpose of this addendum it is assumed that the investigation of the shared route between St. Andrew Square and Roseburn section is assessed by others. It should be noted that the alignment may be routed along George Street or Princes Street.

2.3 ROSEBURN TO CARRICK KNOWE

At Roseburn where the two lines merge the tram is located adjacent to and north of the main Edinburgh rail lines to Glasgow and Fife. At the western end of this section however, early work has located the route to the south of the rail line. To achieve this, the tram alignment must cross the rail line at least once. Three sub options have been developed along this length:

- Option A - a route along the south of the railway embankment
- Option B - a route along the north of the railway embankment
- Option C - a hybrid of the previous two. On the south of the railway between Russell Road and Balgreen Road where it crosses back to the north to utilise the reserve created for the CERT project west of Balgreen Road.

These three options are proposed for public consultation.

2.4 CARRICK KNOWE TO EDINBURGH PARK

From Carrick Knowe the preferred corridor assessment has identified that the best route would be for the tram to supersede the WEBS guideway which is to be formed in the grass reserve between the railway line and Stenhouse, Broomhouse, and Bankhead Drives respectively.

From the end of the WEBS guideway, the tram will continue past Edinburgh Park Railway Station before turning north to bridge over the railway. The alignment identified through Edinburgh Park utilises the corridor previously safeguarded for a transport corridor and detailed in the City of Edinburgh Rapid Transit (CERT) proposals.

2.5 GOGAR JUNCTION

Following early consideration of a number of options at Gogar Roundabout, stakeholder and Client Group consultation defined two to take forward to Public Consultation:

- Option A - directly across the roundabout with traffic signals providing priority for the tram;
- Option B - passing through the Gyle car park before crossing under Glasgow Road (the A8) east of Gogar Roundabout.

2.6 GOGAR TO AIRPORT

The alignment from Gogar Roundabout west has been defined as a hybrid of the originally identified routes (3 & 4) This provides good public visibility of the tram alongside the A8 between the Roundabout and Gogarburn where a stop will be provided to access the Royal Bank of Scotland (RBS) development. From here it will strike north to rejoin the CERT alignment.

2.7 AIRPORT / ROYAL HIGHLAND SHOWGROUND

The design team are cognisant of the forthcoming Government white paper on aviation, and the uncertainty over potential future expansion of Edinburgh Airport. Early consultation has been carried out with British Airports Authority (BAA) at Edinburgh Airport and the Royal Highland and Agricultural Society of Scotland (RHASS). Arising from these discussions two routes have emerged to be taken forward to public consultation. Both access the Park & Ride on Eastfield road before heading north to the Airport terminal. Passing the front of the terminal building (where a stop would be located) the two routes diverge as the turn south again. Option A continues west passing the RHASS site on its northern side whilst Option B would progress south to rejoin the A8 corridor to pass the RHASS to the south.

2.8 NEWBRIDGE ACCESS

Key features of the route at Newbridge are:

- to link to the two major development sites - Edinburgh Gate (formerly Continental Tyres) and the former Grampian Country Foods site.
- to provide an option for future extensions of the network towards Livingston and/or Kirkliston.
- The route taken forward to the consultation phase of the alignment study consists of a loop round the village. In the first instance a stop has been located adjacent to the existing Public Transport node, the bus terminus outside Edinburgh Gate.

2.9 DEPOT

Two potential depot locations have been identified as suitable for ETL2. These have been generated on the basis of ensuring that the line could function on its own as well as providing sufficient flexibility for expansion to accommodate provision for other parts of the network or extension to this line. The sites located are:

- Russell Road Cleansing depot
- Newbridge

Revision D

Drawing No. 30894 / P002

AIRPORT

ROYAL HIGHLAND SHOWGROUND

NORTH SHOWGROUND OPTION

INGLISTON PARK AND RIDE

GOGAR ROUNDABOUT OPTION

ROYAL BANK OF SCOTLAND

NEWBRIDGE

ROYAL HIGHLAND SHOWGROUND

THE GYLE

RATHO STATION

EDINBURGH PARK

CONT. ABOVE

CONT. BELOW

LINE 1

NORTH OPTION

MURRAYFIELD

WATER OF LEITH

BALGREEN ROAD

BALGREEN ROAD

SOUTH OPTION

HE GYLE

STENHOUSE DRIVE

SAUGHTON RD NORTH

EDINBURGH PARK

BROOMHOUSE ROAD

SOUTH GYLE ACCESS

EDINBURGH PARK STATION

KEY

- PROPOSED ROUTE OF TRAM
- POSSIBLE FUTURE ROUTE OF TRAM
- STOP LOCATIONS CONSIDERED
- ALTERNATIVE STOP LOCATIONS

Rev	Description of revision	Draw	Chkd	App	Date
D	HAYMARKET STOP REMOVED. BALGREEN ROAD STOP MOVED	AIC	REM	GM	11.11.03
C	PUBLIC CONSULTATION SET	API	REM	GM	07.05.03
B	MINOR MODIFICATIONS	AIC	REM	GM	29.04.03
A	ORIGINAL ISSUE	AIC	REM	GM	08.04.03

Client: tie — transport initiatives edinburgh

Project: EDINBURGH TRAM LINE TWO

Designed	REM
Drawn	AIC
Checked	REM
Reviewed	AIC

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CAD filename: F:\30894\autocad\output\PublicCons\P002.dwg

Title: ROUTE ALTERNATIVES ON OS MAPPING BACKGROUND

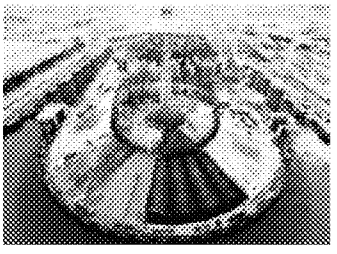
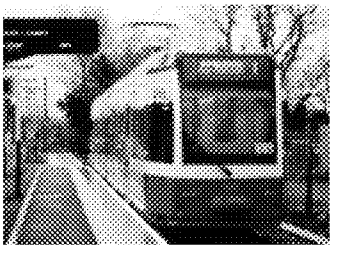
Size A1 | Scale 1:10 000 | Date 08.04.03

Status INFO

Drawing No. 30894 / P002 | Revision D

CEC01702137_0017

SCHEME OBJECTIVES

3 Scheme Objectives

3.1 INTRODUCTION

Objectives for transport initiatives usually derive from national, regional and local sources. ETL2 is no exception to this generality.

The UK and Scottish Governments have adopted five key objective areas:

- Environment
- Accessibility
- Safety
- Integration
- Economy

These are also reflected in National Planning Policy Guidelines, which relate land use planning to transport initiatives.

Scottish Transport Appraisal Guidance (STAG) objectives link transport development with other policies including those for the environment, economic development, public health and safety, social exclusion and land use planning.

3.2 PLANNING OBJECTIVES

The local and regional planning context is set within national guidance and particularly reflects priorities for sustainability and integration. The Scottish Executive has prepared the *West Edinburgh Planning Framework*. This provides policy guidance on planning, development and growth in West Edinburgh. A key element is that adequate transport provision, in the form of a fixed rapid transit, is essential to enable any additional development in the area.

Similarly, the emerging Edinburgh and Lothians Structure Plan presents the challenge to ensure that a sustainable future can be built in West Edinburgh and the wider area using the proposed tram corridor as a key artery of business and community activity.

Key principles related to regeneration and social inclusion in line with general objectives include:

- Combating social exclusion by ensuring access between disadvantaged local communities and subsequent new employment opportunities situated in or adjacent to the proposed tram corridor
- The need to ensure access to affordable transportation networks for all parts of the local community and particularly those in disadvantaged areas, such as West Edinburgh and West Lothian; and
- Support for controlled development and re-use of existing buildings and vacant, derelict and brownfield sites where regeneration potential will be maximised through integration with the proposed tram line.

3.3 LOCAL TRANSPORT STRATEGY

The local transport strategy in Edinburgh mirrors the policies of national government in setting out accessibility, safety, quality of life and economy as key objectives. Edinburgh City's Local Transport Strategy (LTS) states:

"Edinburgh aspires to be a city with a transport system that is accessible to all and serves all. Edinburgh's transport system should contribute to better health, safety and quality of life, with particular consideration for vulnerable people such as children, and elderly and disabled people: it should be a true Citizen's Network. The transport system should support a strong, sustainable economy.

The Council will seek to maximise people's ability to meet their day-to-day needs within short distances that can easily be undertaken without the need to use a car. The city should develop and grow in a form that reduces the need to travel longer distances, especially by car. Choice should be available for all journeys within the city."

In addition to this general policy statement City of Edinburgh Council has set out more specifically its LTS, which identifies a range of objectives including:

- To improve safety for all road and transport users;
- To reduce the environmental impacts of travel;
- To support the local economy;
- To promote better health and fitness;

- To reduce social exclusion; and
- To maximise the role of streets as the focal point of our local communities, where people can meet, shop, and, in appropriate circumstances, children can play.

Within the area of public transport the LTS sets out the following objective:

"A public transport system of the highest quality which conveniently meets all major medium and longer distance movement demands to and around Edinburgh, and which is the main means of medium and long distance travel. It will offer competitive journey times, integrated ticketing and reasonable prices, comfortable and accessible vehicles, high quality and accessible stations, stops and interchanges and comprehensive information for both visitors and residents."

The LTS specifically makes reference to promotion of light rapid transit measures for Edinburgh and ETL2 is a direct response to these objectives. It also meets a further objective relating to improvement of interchange in that there are potential connections with other transport modes at Edinburgh Airport, the proposed stop at Edinburgh Park and at Haymarket.

One aim of the local transport strategy is the reduction in car usage. The tram scheme will encourage positive mode transfer through improved public transport provision and connection to park-and-ride facilities.

3.4 TRAM ASPIRATIONAL OBJECTIVES

The LTS objectives inform the development of Edinburgh's transport system at the highest level. To clarify the requirements for a tram system within Edinburgh - tram system aspirational objectives or SAO's have been defined in a document titled *CEC Tram Aspirational Objectives* (April 2003). This is a broad list of objectives, where a distinction is made highlighting high priority objectives to avoid conflict with other elements.

These SAO's have been considered throughout the development of the scheme and the final design is to be measured against these along with other objectives outlined above.

3.5 ADOPTED APPRAISAL CRITERIA

Following a review of the national and local objectives of the scheme and in the context of the STAG process, the corridor options have been compared in seven criteria, developed in response to those objectives, namely:

- Implementation / Engineering
- Traffic and Transport
- Safety
- Environment
- Economy
- Accessibility
- Integration

Within these criteria, a number of sub-criteria have been derived. These are listed below, together with an indication of those factors to be considered under each criterion. Judgement has been exercised in derivation and allocation of the criteria in order to avoid over-emphasis on any particular factor or double-counting.

At this stage of the appraisal, no attempt has been made to give weighting to criteria, but the resulting recommendation will be reviewed to ensure this is not unduly influenced by factors that might be deemed as less important than others.

The assessment categories and criteria adopted are listed here and are an example of what has been considered:

3.5.1 IMPLEMENTATION / ENGINEERING

- Alignment
  Horizontal alignment (Tight radii necessitated by existing buildings, structures or road alignments)
  Vertical alignment (Headroom at existing bridges; clearance over railways; gradient and sharp level differences, flight envelope issues)

- Structures
  Need for bridges for grade separation, major road/rail/river crossings, retaining walls in constrained locations

- Public utilities
  Presence or need to divert or protect major services or equipment

- Construction impact
  Ease of construction, extent of traffic management, possible nuisance, frontage access, scope for mitigating adverse impacts

- Drainage
  Ability to provide drainage and ensure SEPA requirements can be met

- Work space availability
  Off-line work space, site access, need for Compulsory Purchase Orders

- Geotechnical risks
  Potential foundation or slope stability, material availability and or ground disposal sites, ground condition

- Depot site
  Availability of suitable site: location, size, and operational efficiency

3.5.2 TRAFFIC AND TRANSPORTATION ASPECTS

- Reduction in car use
  Potential for mode transfer; connections to Park-and-Ride

- Congestion
  Potential to improve/risk of exacerbating existing congestion

- Improve access : City to West Edinburgh and beyond
  Provide fast alternative to bus services, serve new routes

- Improve capacity : City to West Edinburgh and beyond
  Enhancement of existing public transport provision, increased passenger capacity per vehicle, improved frequency

- Provide mode choice
  Provision of public transport as alternative to private car

- Impact on junctions
  Potential adverse impact on junction operations on corridor

- Public transport provision
  Improves quality, reliability, frequency, comfort, information

3.5.3 SAFETY

- Accidents
  Potential for accident reduction (severity and number) : pedestrians, cyclists, passengers, other road users

- Personal Security
  Passenger safety in stop environment, on-vehicles, at interchange

3.5.4 ENVIRONMENT

- Noise
  Impact on potential receptors from tram and/or road noise

- Air Quality
  Impact on local air quality resulting from changes in levels of pollutants.

- Water Quality, Drainage and Flood Defence
  Impact on watercourses, run-off control

- Biodiversity
  Impact on sites supporting flora and fauna

- Agriculture
  Impact on or loss of current agricultural land

- Geology and Contamination
  Use of brown field sites

- Landscape / Townscape
  Impact from loss of existing landscape features and introduction of new infrastructure. Opportunities for enhancement, avoidance of adverse impact

- Visual Amenity
  Impacts on sensitive receptors resulting from introduction of new infrastructure

- Cultural Heritage
  Impact on historic sites or structures and archaeological resources

- Construction Impact
  Construction noise and dust nuisance.

3.5.5 ECONOMY

- Employment / Job Opportunities
  Indirect and direct from business activities in corridor and from system operation

- Regeneration
  Ability to support regeneration in corridor

- Business Impact
  Effect on frontage businesses; attraction for new business

- Developer Contributions
  Likelihood of attracting developer funding

- Patronage and Demand
  Access to major trip generators: retail, business, residential

- Capital Costs
  Unit rates for on-street, off-street, structures, systems, etc

- Operating Costs
  Dependent upon route length, frequency, fleet size, journey-times

3.5.6 ACCESSIBILITY

- Social Inclusion
  Access for low-car ownership public; disadvantaged or disabled

- Catchment
  Access to large population centres, major retail or businesses

- Journey times
  Route length, congestion levels, route segregation

3.5.7 INTEGRATION

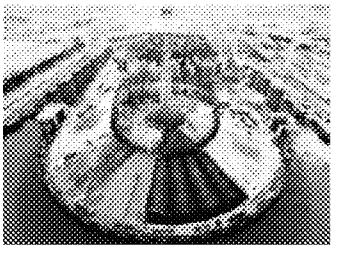
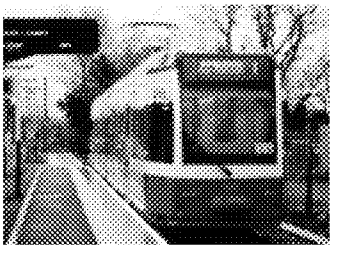
- Interchanges
  Facility to interchange with other transport modes

- Policy Integration
  Integration with other policies such as Planning, Health, etc.

- Integrated ticketing
  Facility for inter-mode ticketing

- Public Acceptability
  Likelihood of public support for route

OPTION EVALUATION PROCESS

4 Option Evaluation Process

4.1 STAG1 ASSESSMENT

The major deliverable of the STAG1 process was a Preferred Route Corridor Report (STAG1 Report). This report presented the number of options and combinations that were considered based on qualitative assessment of each option to meet objectives of the scheme using STAG principles. This process looked at over thirty route options, which were grouped together and evaluated in three corridors – North, Central and South.

The three corridors and some hybrids were assessed on criteria derived from scheme objectives. As a result the central corridor consisting of route options that generally follow the CERT and/or railway corridor from the west of Edinburgh to the City Centre, was determined as being the preferred corridor. Within this corridor some sections had a number of different options taken forward to detailed investigation.

Between Roseburn and Carrick Knowe, three options were presented:
- South Option A along the railway corridor
- North option B along the railway corridor
- Hybrid Option C of north and south options

The STAG1 report recommended a single route option between Carrick Knowe footbridge and South Gyle Access, namely an off-street route following the WEBS alignment. From the end of the WEBS alignment the proposed tram route will proceed west to interchange with Edinburgh Park Station (under construction) before crossing the railway to travel north through Edinburgh Park.

At Gogar, two options were developed for the route in proximity of Gogar roundabout:
- Option A crossing Gogar roundabout
- Option B under the A8 and to the east of the roundabout

At Ingliston two options for the route between the airport and Ratho station were defined:
- Option A between the airport and Royal Highland Showground
- Option B travelling south from the airport with a stop to the east of the showgrounds near the A8

From RHASS, the alignment sweeps south through Ratho station to cross under the motorway entering Newbridge on Harvest Road.

4.2 DEPOT STRATEGY

The design team have developed a strategy in consideration of the main factors that need to be addressed in the operational needs of a Depot for Line 2. The resulting Strategy report was the basis for a specific document on the recommended location for the ETL2 depot and is referred as *Depot Location Report* (November 2003).

4.3 CONSULTATION

Extensive consultation has taken place between FM/S and the Client Group, the Public and Stakeholders.

A summary of key consultations is described in the following sections, however further reference can be made to the documents below:

- *Weber Shandwick Consultation Programme for Tram Lines 1 & 2* (January 2003)
- *Weber Shandwick Post Consultation Report* (September 2003)

4.3.1 CLIENT GROUP

The Client Group is the City of Edinburgh Council (CEC) Transport and Planning divisions and transport initiatives **edinburgh** (**tie**).

CEC established **tie** as a separate entity from the council charged with responsibility for delivery of Integrated Transport Initiative (ITI). **tie** is responsible for the implementation of council's policies and delivery of projects, however CEC still maintains responsibility for policy development.

Regular meetings and communication with the client group has been undertaken. Meetings have included Steering Group consultations and monthly progress meetings with **tie**. Further meetings with CEC Transport and Planning divisions and the Scottish Executive on "as required" basis have been held.

4.3.2 PUBLIC CONSULTATION

tie engaged Weber Shandwick to manage the public consultation process with technical assistance from FM / S where required. The main public consultation activities ran from 14 May to 10 July 2003. The methodology of consultation included:

- A leaflet drop of 125,000 circulars (lines 1 and 2)
- Targeted third party consultation
- Exhibitions in major community amenities
- Community Council presentations
- Public meetings
- Press coverage
- website campaign www.tramtime.com

The main output from the public consultation is referenced in the Weber Shandwick report titled *Trams Public Consultation Reports* September 2003. In addition FM/S carried out targeted consultation meetings with tenants and owners of each business property expected to be directly impacted by the tram alignment. The results of this are documented in Appendix A – Property Impact Assessment. This document is a register of all communication with residents or businesses, noting dates of visit, issue/solution, including some photos. This document referenced in the appendix remains a live document being updated as further consultation takes place.

4.3.3 STAKEHOLDER CONSULTATION

Numerous stakeholder consultations have taken place with various parties that are affected directly or indirectly by the proposed tramline. Comments and views of the various key stakeholders are summarised below. Appendix B – Schedule of Meetings is a record outlining the meetings that have been held in regarding Stakeholder Consultation. Whilst every effort has been made to include all meetings, this is not guaranteed.

4.3.4 NETWORK RAIL

FM/S have been holding regular meetings with Network Rail (NR) throughout development of the project. NR generally approves of the principle of ETL2, however NR have a few concerns that will need to be addressed and are summarised here.

- Haymarket Station – as part of the Line 1 development, independent consultation has been carried out to consider development opportunities creating an interchange facility
- Haymarket Depot – Line 2 proposals will restrict access from Russell Road and Roseburn Street and affect diesel tanks at Roseburn St
- Bridge construction – at Russell Road and Balgreen Road:
    - bridges under the railway will always require “disruptive” possessions, which need to be booked several years in advance (approximately 3 years at present). They are expensive to arrange, and speed restrictions are required on the lines affected following a “disruptive” possession, requiring compensation payments to the Train Operating companies. Thus the costs associated are substantial.
    - Bridges over the railway can normally be constructed using “rules of the route” possessions, which are inexpensive and can be arranged at short notice.
- Immunisation issues - with the OHLE and tram corridor in close proximity definitive areas need to be agreed

Discussions with NR are ongoing.

4.3.5 MURRAYFIELD

Scottish Rugby Union (SRU)

The SRU expressed positive views for the introduction of the tram system. However, they indicated that tram movements will have an impact on crowds during major events at Murrayfield Stadium.

The SRU pointed out that tram movements would only affect crowds about a quarter of an hour before kick-off and half an hour after the match ends. There are approximately 14 major events annually.

If the SRU back pitches are required for the Line 2 route, any losses in land area would need to be recovered elsewhere. It was noted that the pitches are liable to flooding. The SRU indicated that flood protection walls are proposed by CEC.

CEC Murrayfield Flood Defence

FM/S met with CEC that outlined that the north option would run over a flood retention area of approximately 300m in length. The tram route would need to be designed to ensure that flood capacity of this retention area is not reduced.

Cross sections of the tram in this area have been presented to CEC for consideration.

Two drawings showing the flood prevention wall are shown in Appendix C – Murrayfield Flood Defence.

4.3.6 EDINBURGH PARK LIMITED / NEW EDINBURGH LIMITED

The overall view from Edinburgh Park was positive. The representatives indicated that the tram should follow the corridor previously developed and set aside for CERT to allow for landscaping to be provided between the tram and Edinburgh Park buildings. The stop location in the middle of Edinburgh Park would be required to be of a high quality architecturally and in keeping with the surroundings.

Scottish Equitable

Generally, there was positive feedback from Scottish Equitable on the introduction of trams, as Edinburgh Park is currently lacking public transport. Much of Scottish Equitable business is located in the south east, so a link between Edinburgh Park and the airport would be beneficial.

About 50% of their staff use public transport to get to work.

Scottish Equitable mentioned that their only concern regarding the introduction of a tram system is the visual impact.

British Telecom (BT)

BT expressed positive views for the introduction of the tram as Edinburgh Park lacks public transport at present.

Main concerns from BT were over the depth of construction and thus the likely impact on buried services, plus the visual impact of the tram on Edinburgh Park.

4.3.7 THE GYLE CENTRE

The Gyle Management Company Ltd (GMC) expressed very positive views, as the tram stop at the Gyle Centre would facilitate access for both staff and customers.

The option which crosses South Gyle Broadway and passes through the Gyle Centre would have an impact on the Gyle car park. Although the stop location could be adjusted to minimise impacts on vehicle movements, it is clear that no option could completely avoid impacting parking provisions. Any options running through the Gyle Centre would also create traffic management issues in the vicinity.

GMC pointed out that the Gyle Centre area is already very congested, and it may be preferable to reconfigure bus movements instead of trying to bring the tram to the current bus interchange. The Gyle Centre is already looking to reconfigure the public transport hub, and this could be structured to suit the introduction of the tram. GMC would be very keen to work closely with the tram team to develop a mutually beneficial solution.

4.3.8 GOGAR BURN

Royal Bank of Scotland (RBS)

RBS welcomed the opportunity to be involved in the options appraisal stage. There are two issues of concern to RBS: broad-brush route alignment issues and specific issues in relation to the bridge over A8. It was suggested that discussion should proceed on a high level between **tie** Board Chair and top bank officials, between Alex Macaulay and John Reade in relation to Network issues and at project level between site design engineers and Tram consultants.

4.3.9 AIRPORT AREA

New Ingliston Ltd

FM / S met with New Ingliston Ltd and they are positive about a possible introduction of a tram in the west of Edinburgh to ensure a high quality transport link between the city and airport. NIL had undertaken considerable work in development of the CERT proposals and were keen to see this utilised.

British Airports Authority (BAA)

In essence, BAA generally approves of the principle of Edinburgh Line 2 but has some specific concerns.

The proposed tram route running to and from Newbridge on a loop via the airport terminal raises a general concern over the interface between two-way tram movements and other traffic. Also, if a through-route for the tram is to be pursued, the alignment of the tram could affect the very likely future expansion of the terminal building and the ensuing rearrangement of the airport forecourt and parking.

BAA pointed out that airport expansion details are still being developed as part of their long term development strategy. The extent of expansion will likely not be finalised within the timescale of the preparation of the Parliamentary Bill for ETL2. A government White Paper detailing the preferred expansion option will only be published late 2003 / early 2004.

BAA's development plans include a transport corridor that has allowed for a terminus for the tram and indicated that FM's preference for a through-route would be difficult to accommodate. BAA mentioned that the likely future boundary between the airport and the Royal Highland Showground will rely on the White Paper findings.

BAA added that they would reject any proposal for the tram that results in OHLE infringing the flight envelope and any route that precludes their expansion plans (in the absence of a Government white paper).

Royal Highland and Agricultural Society of Scotland (RHASS)

The Showground receives 1.2 million visitors each year and the RHASS is keen to see the introduction of the tram scheme to enhance access and reduce the need for parking facilities (that are required for events) by transporting customers to and from the city centre. RHASS also noted that their preference is for the North option, however, they would like to see it moved further north to what is presently the central access along the car park, which they felt could form a boundary between the airport and showground and a potential western access road for the airport.

4.3.10 NEWBRIDGE

Edinburgh Gate

Edinburgh Gate is a development site in Newbridge, formerly Continental Tyres. Although the proposed tram route does not impact the development of new offices proposed on this site, which covers 61 acres of land next to the Newbridge bus interchange, a consultation session had been held.

A representative from Edinburgh Gate expressed positive support for the introduction of trams. It was felt that the route via Ratho station could serve the Edinburgh Gate development. It was also suggested that due to space restrictions in certain locations and the fact that the tram would have to run shared on street, a one-way system for the Newbridge loop could be considered.

4.3.11 IMPACTED PROPERTY REPORT

As part of the community and business consultation process, FM / S embarked on identifying businesses that may be affected in some way by the preferred corridor. Once identified, each property was visited and consultation began with tenants and/or landowners. These visits and communication by other means such as phone or email were registered in the 'Impacted Property Report'. This is referenced in Appendix B.

4.4 STAG2 APPRAISAL

The main deliverable of the second stage of the STAG process is detailed appraisal of the project against the Government's objectives seen under the following headings

- Environment
- Safety
- Economy
- Integration
- Accessibility

This detailed appraisal includes analysis of the positive and negative impacts, capital and operating costs and the risks involved in implementation and operation.

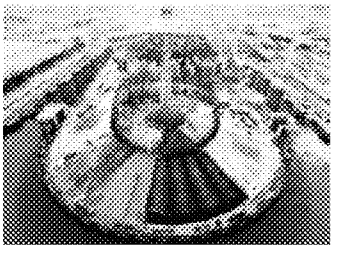
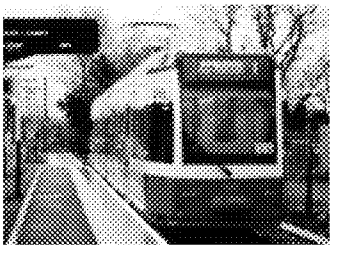
There are a number of elements that are carried forward from Part 1 appraisal, most notable being an updated assessment of the proposals performance against each planning objective and implementability and/or feasibility assessments. Each option identified in STAG1 in the central corridor has been assessed

using the five objectives and detailed criteria specified. This is presented in the text of section 5 where each option is evaluated against these objectives.

It should be noted that the other deliverables that FM/S are submitting with the STAG2 document within WP2 are:

- Geotechnical Desk Study
- Major Structures Report
- Patronage and Revenue Report (covering Traffic modelling)
- Traffic Management Report
- Cost Report including Cost Estimate

PREFERRED CORRIDOR & OPTIONS ASSESSMENT

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5 Preferred Corridor & Options Assessment

5.1 SECTION DEFINITION

The preferred corridor and various options contained within the corridor have been assessed in a number of localised geographic sections. These sections are as follows:

1. **St Andrew Square to Roseburn** - Section of route that coincides with Line 1. This will form part of the Line 2 Bill but is being developed by the Line 1 team and is not considered in this report.

2. **Roseburn to Carrick Knowe** - Starting from the interface with Line 1, heading generally parallel with railway corridor to the Carrick Knowe golf course.

3. **WEBS / Edinburgh Park** - From the Carrick Knowe footbridge to the Lochside Avenue/South Gyle Broadway Junction along the WEBS route and reserved CERT route

4. **Gogar Junction** - Heading north from Edinburgh Park passing the Gogar roundabout

5. **Gogar Burn** - Running parallel with the A8 from Gogar Roundabout to the RBS access road, then striking north to join the CERT route to Ingliston Park & Ride

6. **Airport** - From Ingliston Park & Ride, the airport and the Royal Highland Showground

7. **Newbridge** - Covering Ratho station to Newbridge

These sections are shown on the following drawing 30894/C130.

The Preferred Route Corridor Report Addendum sets out the specific alignment segments that make up the various sections and options as shown in the following table.

	Route Description	Option Numbers
1	From a termination at Saint Andrews Square the line would be coincident with line 1 as far as Roseburn adjacent to Russell Road.	
2	Options north and south of the railway line as far as Carrick Knowe Golf course;	North: **24;16;14** South: **27;30** Hybrid: **27; 14**
3	Alignment running to the south of the railway line coincident with the WEBS alignment requiring the conversion of that facility into a tramway;	**12; 9; 6**
4	Interfacing with Edinburgh Park Station, bridging over the railway and passing through Edinburgh Park on the CERT alignment;	**6**
5	Two options through Gogar Roundabout one on the CERT alignment and the other being considered to enhance interface with the Gyle Shopping Centre;	**26; 23A**
6	Following the A8 corridor to a stop adjacent to the Gogarburn site of the Royal Bank of Scotland;	**3**
7	Link north to the CERT alignment to the Proposed CEC park and Ride site on Eastfield Road;	**3A; 4**
8	Options skirting the northern and southern boundaries of the Royal Highland Showground;	**2A; 1B**
9	A southerly link to Newbridge village.	**31**

Revision B

Drawing No. 30894 / C130

AIRPORT

ROYAL HIGHLAND SHOWGROUND

NORTH SHOWGROUND OPTION

INGLISTON PARK AND RIDE

ROYAL HIGHLAND SHOWGROUND

5. GOGAR BURN

4. GOGAR JUNCTION

ROYAL BANK OF SCOTLAND

GOGAR ROUNDABOUT OPTION

THE GYLE

EDINBURGH P

NEWBRIDGE

RATHO STATION

6. AIRPORT

7. NEWBRIDGE

3. WEBS / EDINBURGH PARK (CONT)

CONT. ABOVE

CONT. BELOW

2. ROSEBURN TO CARRICKNOWE

LINE 1

NORTH OPTION

MURRAYFIELD

WATER OF LEITH

BALGREEN ROAD

BALGREEN ROAD

SOUTH OPTION

1. ST ANDREWS SQUARE TO ROSEBURN

3. WEBS / EDINBURGH PARK

HE GYLE

STENHOUSE DRIVE

SAUGHTON RD NORTH

EDINBURGH PARK

BROOMHOUSE ROAD

SOUTH GYLE ACCESS

EDINBURGH PARK STATION

KEY

PROPOSED ROUTE OF TRAM

POSSIBLE FUTURE ROUTE OF TRAM

STOP LOCATIONS CONSIDERED

ALTERNATIVE STOP LOCATIONS

Rev	Description of revision	Draw	Chkd	App	Date
B	SECTION DEFINITIONS UPDATED	AIC	DM	GM	11.11.03
A	ORIGINAL ISSUE	AIC	DM	GM	03.10.03

Client: tie — transport initiatives edinburgh

Project: EDINBURGH TRAM LINE TWO

Designed	DM
Drawn	AIC
Checked	REM
Reviewed	AIC

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CAD filename: F:\30894\autocad\output\PublicCons\P001.dwg

Title: GEOGRAPHIC SECTION DEFINITIONS ON OS LANDRANGER IMAGE BACKGROUND

Size A1 | Scale 1:10 000 | Date 03.10.03

Status INFO

Drawing No. 30894 / C130 | Revision B

CEC01702137_0031

5.2 ROSEBURN TO CARRICK KNOWE

5.2.1 OUTLINE

This section runs for 3 km between the tram junction with Line 1 in the Roseburn area and Saughton Mains Road, west of the Carrick Knowe Golf Course. The alignment is adjacent to the Edinburgh-Glasgow mainline railway and includes junctions with three main roads.

The preferred route corridor commences at the city centre where the tram line would be on the north of the railway corridor at Haymarket. The tram line will need to be on the south of the railway when it reaches Stenhouse Drive where it will join the WEBS alignment with the bus guideway being superseded. Thus at least one crossing will be required by the tram alignment.

In this segment, three alignment options are considered: an alignment south of the railway; an alignment north of the railway; and a hybrid, which runs partially north and partially south of the railway.

A drawing of the three options, including the associated proposed stop locations is shown in drawing 30894/P300 over.

A factor that would impact all three options is the ownership of the railway embankment by NR. Each of the route options impacts the NR embankment, which will be a major factor in the assessment of options. Additionally it should be noted that NR may undertake changes to this area of land at any time. Changes may include pruning or clearing of vegetation, which is primarily a protection against leaves falling on the railway line. This would impact the visual amenity and noise levels for nearby properties. It is also noted that future NR expansion plans could include construction of additional rail lines along the northern side of the embankment where the Corstorphine-Edinburgh line previously ran. Again this would impact the existing visual amenity and noise levels of nearby properties.

These issues are noted here, as they would have an impact on properties. The risk of such an impact would be significantly mitigated for Baird Drive residents if option B were implemented.

5.2.2 OPTION A: SOUTH ALIGNMENT

After crossing under the mainline railway using the existing bridge at Russell Road, the south alignment runs entirely south of the railway tracks between Russell Road and Saughton Mains Road also passing alongside the existing City of Edinburgh cleansing depot. From Russell Road to Roseburn Street, the tracks run between the potential depot site D (Russell Road) and the West Approach Road, before passing into the designated CERT corridor west of Roseburn Street. From here, the tram alignment runs adjacent to the mainline railway across the Water of Leith and behind Whitson Road, Stenhouse Avenue West and Stenhouse Drive until Saughton Mains Road.

The south alignment includes two principal proposed stops on the West Approach Road and at Balgreen Road. The West Approach Road stop would serve Murrayfield Stadium from an elevated position. An alternate stop at the Water of Leith could replace the West Approach Road stop to serve Murrayfield Stadium.

A series of typical cross section drawings have been prepared and were circulated at Public Consultation. An example copy is shown in Appendix E – Roseburn to Carrick Knowe Cross Sections and drawing 30894/P325 Stenhouse Drive (Cross Section I-I).

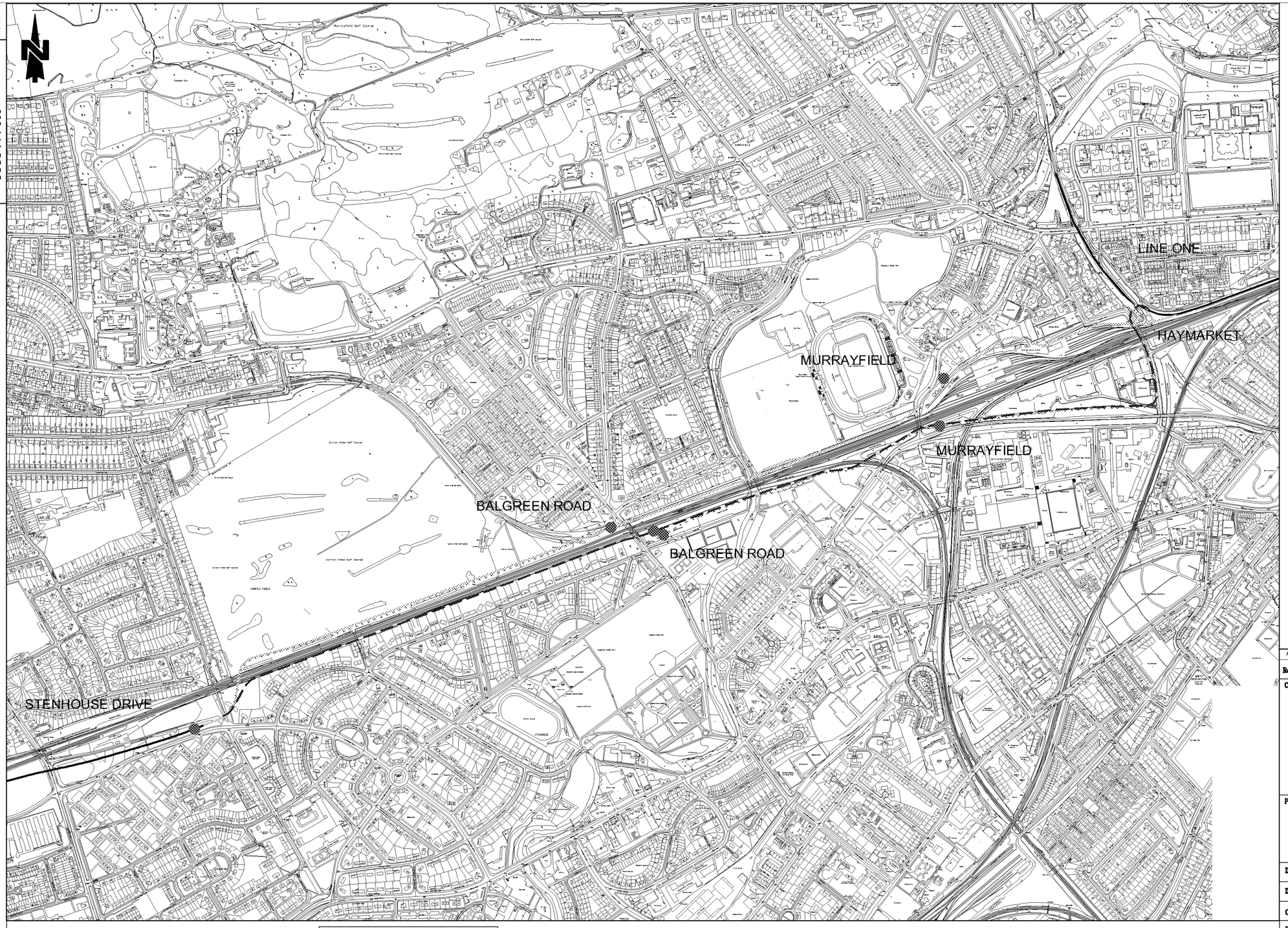
The following indicates key assessment factors.

Implementation & Engineering

- The alignment would have a tight curve (25 m) and steep gradient (6%) from the junction with Line 1. The curve would be required to access the Russell Road bridge under the mainline railway. Tram vehicles would have slow speeds (15 km/h) through this section.
- Russell Road has restricted headroom under the mainline railway bridge. To accommodate the tram, the road level would need to be lowered by up to 1.40m. This would require special clearances dispensation from HMRI and approval from NR to modify the support zone to the abutments. The engineering constraints of this bridge are detailed in Appendix D – Russell Road and Balgreen Road Issues.
- Combined horizontal and vertical alignments preclude an all-ways junction with the proposed Line 1 scheme.
- Requires three rail crossings – the main Glasgow line and two sections of the south suburban line. This presents considerable construction and operational constraints, most notably at Russell Road.
- The Russell Road carriageway would have to be shifted eastward over a length of 150 m
- The alignment would serve depot site D (Russell Road) well.

Revision A

Drawing No. 30894 / P300



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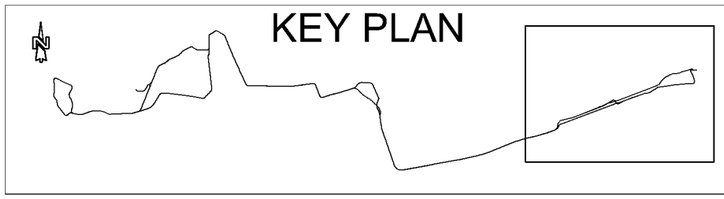
KEY PLAN



KEY

Option A - South

Option B - North

Option C - Hybrid

Tramstops — MURRAYFIELD

Rev	Description of revision	Draw	Chkd	App	Date
A	ORIGINAL ISSUE	AIC	DM	GM	27/10/2

Client: tie — transport initiatives edinburgh

Project: EDINBURGH TRAM LINE TWO

Designed	DM
Drawn	AIC
Checked	DM
Reviewed	GM

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CAD filename: F:\30894\autocad\output\Public_Consultation\p300.dwg

Title: ROSEBURN TO CARRICK KNOWE ALIGNMENT OPTIONS

Size A3 Scale 1:10 000 Date 27 October 2003

Status INFO

Drawing No. 30894 / P300 Revision A

CEC01702137_0033

- Along the north side of the West Approach Road, the alignment would start against the toe of the embankment, and would have to climb adjacent to it, which could require modifications to the embankment.
- A new structure would be required over the South Suburban railway line east of Roseburn Street.
- A bridge would be required to cross Roseburn Street. A stop would be located on the access branch of this structure.
- Some land take would be required on Westfield Road.
- A new underbridge would be required under the railway at Westfield Road.
- The alignment would run on the designated CERT alignment from Westfield Road to Balgreen Road.
- A new structure would be required over the Water of Leith.
- The alignment would pass directly behind 148 properties on Whitson Road and Stenhouse Avenue West. Land from a number of affected properties would be needed for the alignment.
- One building would be demolished for the alignment on Stenhouse Avenue West.
- Behind Whitson Road, Stenhouse Avenue West and Stenhouse Drive, the tram alignment would run along the mainline railway, meaning that modifications to the railway embankment would be needed.
- The alignment would have a moderate back-to-back curve on the approach to Saughton Mains Road.

Traffic & Transport

- A new signalised junction would be required on Russell Road. Traffic demand modelling indicates that traffic volumes are low and suggests that junction operation would be acceptable.
- Russell Road may need to be converted to a shuttle working road under the mainline railway in order to fit the tram alignment under the bridge. Traffic demand modelling indicates that traffic volumes are low and suggests that this configuration would work satisfactorily.
- An elevated structure over Roseburn Street would separate tram operations from general traffic movements. Thus, new signals would not be required on Roseburn Street.
- A new signalised junction would be required at the tram crossing of Balgreen Road. Traffic demand modelling indicates that traffic volumes are moderate, but the traffic assessment suggests the new junction would operate adequately.
- The existing pedestrian access, bridged over the railway line on Carrick Knowe Avenue, would cross the track at grade. The proximity of a stop at Stenhouse Drive could lower the tram speed and enable a safe crossing.
- There would be no scope for pedestrian cycle facility associated with this alignment

Safety

- Pedestrians, cyclists, and cars would cross the tram tracks along Russell Road. This crossing would be signalised to facilitate movements.
- An elevated structure over Roseburn Street would separate tram operations from car traffic and pedestrian activity. No at-grade tram crossing would be implemented.
- Pedestrians, cyclists, and cars would cross the tram tracks along Balgreen Road. This crossing would be signalised to facilitate movements.
- Pedestrians and cyclists would cross the tram tracks on the walkway approach to Saughton Mains Road and from the pedestrian bridge at Carrick Knowe Avenue.

Environment

- The tram would result in the loss of gardens from properties on Whitson Road and Stenhouse Avenue and the partial demolition of a block of flats at Stenhouse Avenue West. The route would run close to over 250 residential properties along Whitson Road and Stenhouse Avenue West and the construction and operation of the tram would be likely to result in significant noise and visual impacts (depending on the effectiveness of mitigation measures).
- The rail embankment is a local wildlife corridor and this option would result in the loss of part of this corridor and mature trees.
- The Water of Leith is a designated Urban Wildlife Site, but permanent effects are likely to be negligible.

Economy

- Commercial properties on Russell Road would require to be relocated including specialist foundry facilities.
- Commercial properties in Westfield Road (west of Roseburn Street) near the Haymarket Depot may be affected by the tram alignment.
- Capital costs of the alignment would be increased by the elevated alignment and stop at Roseburn Street, and some important structures over West Approach Road, Roseburn Street, Water of Leith, and under the railway line at Westfield road. Likewise, excavation for the alignment in Russell Road and beneath the south suburban rail line would increase capital costs.

Accessibility

- The estimated journey time between Haymarket station and Stenhouse Drive stop is 7.4 minutes.
- The stop at the West Approach Road would provide moderate access to Murrayfield Stadium, although this is not ideally located for this purpose.
- The stop at Balgreen Road meets demand in the surrounding residential neighbourhoods.

Integration / Public acceptability

- Residents along Whitson Road are extremely distressed by the impacts of the tram alignment to their gardens. They are also concerned about noise and visual impacts from the tram.

5.2.3 OPTION B: NORTH ALIGNMENT

This option has the tram alignment along the northern edge of the Edinburgh to Fife and Glasgow mainline railway the entire distance between the Roseburn Junction and Saughton Mains Road. Heading west from the all ways junction with Line 1, the Line 2 alignment bridges over Russell Road, passing through built-up sites near the ScotRail Haymarket Depot site before rising to cross Roseburn Street on an elevated track. The alignment runs next to Murrayfield Stadium at the existing railway level before passing over the Water of Leith, behind the houses on Baird Drive, cross Balgreen Road, and along the Carrick Knowe Golf Course. East of Carrick Knowe avenue the track would cross over the railway line on a new bridge, the single crossing required for this alignment.

Stops are proposed at Roseburn Street (to serve Murrayfield Stadium) and Balgreen Road. A stop at Roseburn Street would be located on the elevated track, whereas the stop at Balgreen Road would be at ground level. A stop adjacent to the Water of Leith has been considered as an alternative to serve Murrayfield Stadium.

A typical example of the cross sections, which were prepared and circulated at the public consultation, is shown in Appendix E – Roseburn to Carrick Knowe Cross Sections in drawing 30894/P313 Baird Drive (cross section C-C). This shows the interface between properties, the railway embankment and proposed tram alignment.

The following indicates key assessment factors.

Implementation & Engineering

- Full east and north access to the Line 1 loop could be provided.
- The alignment would be relatively straight on the mild-to-steep gradient from the junction with Line 1. Tram speeds would be relatively moderate speed (21 km/h) between Russell Road and Roseburn Street because of tight radii and then could accelerate to higher speeds between Roseburn Street and Carrick Knowe Golf Course.
- The alignment would affect about 10 properties with a direct impact on 3 buildings in the area around the Haymarket Depot between Russell Road and Roseburn Street.
- Between Russell Road and Roseburn Street, portions of the alignment would be built onto the embankment, which would require modifications to the railway embankment.
- An elevated structure would be required along the west entrance of Haymarket Depot and across Roseburn Street at Murrayfield Stadium. A stop to serve Murrayfield would be located in this area.
- A retaining structure would be required along Murrayfield Stadium and the rugby practice pitches.
- A new structure would be required over the Water of Leith and pedestrian footway near the rugby pitches.

- Behind Baird Drive, the tram alignment would be at a high level on top of the railway embankment. Modifications to the railway embankment would be needed in order to increase its width.
- The alignment would pass directly behind the gardens of 52 properties on Baird Drive; however, no residential property would be required for the construction.
- An extension of the existing railway bridge over Balgreen Road would be required.
- The alignment would run on the designated CERT alignment from Balgreen Road to Saughton Mains Road.
- A single rail crossing is required for this option, a bridge over the Edinburgh-Glasgow mainline railway at Saughton Mains Road. It offers considerable travel time and operational cost benefits and would eliminate the need for special agreements from HMRI and NR.
- A property would be impacted on Stenhouse Drive (Royal Air Cadets).
- A property immediately adjacent to the railbridge over Balgreen Road would be impacted.
- To access the bridge structure over the railway, the tram alignment would include a back-to-back curve; tram vehicles could maintain moderate speeds (20 km/h) through this section. Cant could be applied to increase the speed.
- The implementation of depot site D (Russell Road) is greatly compromised by this option. The depot location report contains further analysis of this issue.
- This option provides the most direct link between Roseburn and Carrick Knowe.

Traffic & Transport

- A new signalised junction would be required at the tram crossing of Russell Road. Traffic demand modelling indicates that traffic volumes are low and suggests that junction operation would be good [*].
- Part of Russell Road would be shared between the tram and the traffic. This is limited to a section of 100 m of length [*].
- Elevated structures over Roseburn Street and Balgreen Road would separate tram operations from general traffic movements. Thus, new signals would not be required on these streets.
- A pedestrian cycle facility can be located adjacent to the tram line between Balgreen Road and Carrick Knowe pedestrian bridge.

Safety

- Pedestrians, cyclists, and cars would cross the tram tracks along Russell Road. This crossing would be signalised to facilitate movements [*].
- Adequate signalisation and traffic improvement would enable safe track sharing.
- An elevated track over Roseburn Street and Balgreen Road would separate tram operations from car traffic and pedestrian activity. No at-grade tram crossing would be implemented.
- Pedestrians and cyclists would cross the tram tracks on the walkway approach to Saughton Mains Road.
- Pedestrian access to stop platforms will require at grade crossing of the track within the stop area.

Environment

- The tram would pass close to residences north of Russell Road and on Baird Drive.
- The tram would ***not*** result in any loss of gardens of Baird Drive properties. However, the route would run close to 52 residential properties at Baird Drive and the construction and operation of the tram could result in significant noise and visual impacts (depending on the effectiveness of mitigation measures).
- The rail embankment is a local wildlife corridor and this option would result in the loss of part of this corridor and mature trees.
- The Water of Leith is a designated Urban Wildlife Site, but permanent effects are likely to be negligible. The route also passes through an Area of Importance for Flood Control. The retaining structure over the rugby pitches could ensure no significant reduction in the volume of the flood retaining plain.

Economy

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[*] Note: It is anticipated that the tram could bridge over Russell Road removing these impacts. Further investigation of this will be detailed in a subsequent report.

- Commercial properties near the Haymarket Depot would be affected by the tram alignment.
- Capital costs of the alignment would be increased by the elevated alignment and stop at Roseburn Street and by major structures over Roseburn Street, Balgreen Road, Water of Leith and the Edinburgh-Glasgow mainline railway at Saughton Mains Road.

Accessibility

- The estimated journey time between Haymarket Station and Stenhouse Drive stop is 6.8 minutes. The journey time is increased by speed reductions needed to pass over the mainline railway to meet Saughton Mains Road and by speed reductions on Russell Road.
- The stop at Roseburn Street provides good access to Murrayfield Stadium and residences north on Roseburn Street.
- The stop at Balgreen Road captures the passengers in the surrounding residential neighbourhoods.

Integration / Public acceptability

- Residents along Baird Drive are concerned about noise and visual impacts from the tram. (No property-take is required in this section)
- Significant impact on Roseburn Street properties.

5.2.4 OPTION C: HYBRID NORTH-SOUTH ALIGNMENT

The third alignment option is a hybrid of options A and B. The hybrid alignment includes the eastern sections of the south alignment (Option A) and the western sections of the north alignment (Option B). Leaving the tram junction with Line 1, the alignment passes under the mainline railway on Russell Road and runs along the West Approach Road. As with Option A, it runs in the CERT corridor over the Water of Leith, but at Balgreen Road, the alignment passes under the mainline railway again using the existing bridge to join the alignment outlined in Option B. The alignment runs west from Balgreen Road between the mainline railway and the Carrick Knowe Golf Course, after which it crosses the mainline for a third time bridging over to join Saughton Mains Road south of the tracks.

The stop placement in the hybrid north-south option is generally the same as the other two options. An elevated stop at the West Approach Road will serve Murrayfield Stadium, and an at-grade stop would be constructed near Balgreen Road. An optional stop at the Water of Leith could be considered as an alternate to the West Approach Road stop, providing access for Murrayfield Stadium.

The following indicates key assessment factors.

Implementation & Engineering

- The alignment would have a tight curve (25 m) and steep gradient (6%) from the junction with Line 1. The curve would be required to access the Russell Road bridge under the mainline railway restricting access to Line 1. Tram vehicles would have slow speeds (15 km/h) through this section.
- Russell Road has restricted headroom under the mainline railway bridge. To accommodate the tram, the road level would need to be lowered by up to 1.40 m. The engineering constraints of this bridge are detailed in Appendix E: Russell Road and Balgreen Road issues.
- The Russell Road carriageway would have to be shifted eastward over a length of 150 m
- The alignment would serve depot site D (Russell Road) well.
- Along the north side of the West Approach Road, the alignment would start against the toe of the embankment, and would have to climb adjacent to it, which would require modifications to the embankment.
- A new structure would be required over the South Suburban railway line east of Roseburn Street.
- A bridge would be required to cross Roseburn Street. A stop would be located on the access branch of this structure.
- Some land take would be required on Westfield Road.
- A new underbridge would be required under the railway at Westfield Road.
- The alignment would run on the designated CERT alignment from Westfield Road to Balgreen Road.
- A new structure would be required over the Water of Leith.
- The Balgreen Road bridge under the mainline railway has restricted headroom. To accommodate the tram, the road level would need to be lowered by up to 1.15 m. The engineering constraints of this bridge are detailed in Appendix E: Russell Road and Balgreen Road issues.

- The tram alignment under the mainline railway would include a back-to-back curve. Tram speeds would be slow (16 km/h) through this section.
- The alignment would run on the designated CERT alignment from Balgreen Road to Saughton Mains Road.
- A bridge over the Edinburgh-Glasgow mainline railway would be required at Saughton Mains Road.
- In total, five rail crossings are required requiring special dispensations from HMRI for clearances at Balgreen Road as the only solution identified to pass through the existing railway bridge still fails to achieve the required 5.8m headroom. Additional interfaces with NR add concern about necessary approvals.
- A property would be impacted on Stenhouse Drive (Royal Air Cadets).
- To access the bridge structure over the railway, the tram alignment would include a back-to-back curve; tram vehicles could maintain moderate speeds (20 km/h) through this section. Cant could be applied to increase the speed.

Traffic & Transport

- A new signalised junction would be required at the tram crossing of Russell Road. Traffic demand modelling indicates that traffic volumes are low and suggests that junction operation would be good.
- Russell Road may need to be converted to a one-way street under the mainline railway in order to fit the tram alignment under the bridge. Traffic demand modelling indicates that traffic volumes are low and suggests that this configuration would work satisfactorily.
- An elevated structure over Roseburn Street would separate tram operations from general traffic movements. Thus, new signals would not be required on Roseburn Street.
- New signalised junctions would be required at the Balgreen Road underpass to allow the tram to pass under the mainline railway. Traffic demand modelling indicates that traffic volumes are moderate, but the traffic assessment suggests the new junctions would operate adequately.
- A pedestrian cycle facility can be located adjacent to the tram line between Balgreen Road and Carrick Knowe pedestrian bridge.

Safety

- Pedestrians, cyclists, and cars would cross the tram tracks along Russell Road. This crossing would be signalised to facilitate movements.
- An elevated track over Roseburn Street would separate tram operations from car traffic and pedestrian activity. No at-grade tram crossing would be implemented.
- Pedestrians, cyclists, and autos would cross the tram tracks on both sides of the Balgreen Road underpass. This crossing would be signalised to facilitate movements.
- Pedestrians and cyclists would cross the tram tracks on the walkway approach to Saughton Mains Road.

Environment

- The tram alignment would not run adjacent to residential properties. Thus, noise and visual impacts of the tram would be significantly less than for Options A and B.
- This option would result in the demolition of a building associated with the Jenners Depository off Balgreen Road.
- The alignment to the south of the rail embankment would result in the loss of vegetation and matures trees, which are part of a local wildlife corridor.

Economy

- Commercial properties in Westfield Road (west of Roseburn Street) and the Jenners Depository may be affected by the tram alignment.
- Capital costs of the alignment would be increased by the elevated alignment and stop at Roseburn Street, and some important bridging structures over West Approach Road, Roseburn Street, Water of Leith the Edinburgh-Glasgow mainline railway at Saughton Mains Road, and under the railway line at Westfield Road. Likewise, excavation for the alignment in Russell Road and Balgreen Road would increase capital costs.
- A property would be impacted on Stenhouse Drive (Royal Air Cadets).
- Revenue will be reduced and operating cost will be increased due to the poor performance of the tram on this section.

Accessibility

- The estimated journey time between Haymarket Station and Stenhouse Drive stop is 8.0 minutes. The journey time is increased by speed reductions needed to pass under the mainline railway at Russell Road, Balgreen Road, and to pass over the railway line at Saughton Mains Road.

Integration / Public acceptability

- The tram alignment would not run adjacent to residential properties minimising social impacts. Thus, public objections by residents are limited.
- With the five rail crossings a reduction of the quality in service provision (including journey time) to the extent that a loss of patronage is anticipated.

5.2.5 FINDINGS – ROSEBURN TO CARRICK KNOWE

The south option (Option A) performs poorly in the evaluation. It does run within the CERT alignment east of Balgreen Road and avoids impacts to Baird Drive residences, but the impacts are transferred (with a higher degree of severity) to properties on Whitson Road and Stenhouse Avenue West. The south alignment is also subject to the alignment constraints at Russell Road under the mainline railway and includes several structural elements to bridge the railway lines around Westfield Road. Appraisal of this route, including public consultation resulted in an overwhelming rejection of the grounds of social impact.

The hybrid north-south option C alignment avoids some of the problems of each the north option B and south option A alignments. It runs within a long portion of the CERT alignment from Westfield Road to Saughton Mains Road and does not pass behind residential properties (such as Baird Drive or Whitson Road). However, costs are increased by the numerous alignment constraints, with the tram needing to pass under the railway at Russell Road and Balgreen Road, as well as the structural elements under the railways near Westfield Road.

Additionally, travel times would be longer for the hybrid option C because of the alignment constraints and would lead to a loss in patronage and an increase of the operating cost. Although certain challenges of the north option are reduced by the hybrid option – namely, the impacts to Baird Drive residences and the increased amount of CERT reserved right-of-way used – the problems associated with the structural railway elements and the increased travel time more than offset the advantages.

The north option B provides the most direct link between the junction with Line 1 and Saughton Mains Road and eliminates the alignment constraints of running under the Russell Road and/or Balgreen Road underbridges. Thus, travel times and costs would be lower and traffic impacts on Russell and Balgreen Roads would be reduced. This option does not, however, make full use of the CERT alignment (only following it to the west of Balgreen Road) and does run behind residential properties on Baird Drive. This option would remove the opportunity of using depot site D (Russell Road). A major disbenefit of Option B is the environmental impact on the residences in Baird Drive.

The evaluation of the three options between Roseburn to Carrick Knowe favours Option B – North alignment. Key factors in this decision include:

- A single railway crossing
- Minimised impact on NR infrastructure, resulting in significant capital cost savings and fewer safety issues
- Avoidance of on –street running through railway underbridges with substandard clearances
- Improved operational characteristics (journey times and ride quality)
- Integration with line 1 though a full delta junction

The following table summarises the Appraisal process against the seven STAG criteria.

	Option A – South Of Railway	Option B – North Of Railway	Option C - Hybrid	Preferred Option
Implementation & Engineering				
• Connection with Line 1	• Restricted – only East / West movement possible	• Full Delta junction – all ways movement possible	• Restricted – Only East / West movement possible	
• Railway crossings	• Three Rail crossings required, • Restricted headroom under Russell Road Bridge • Two structures required to cross South Suburban Rail lines	• Single railway crossing • New structure over Railway at Saughton Mains Road	• Five Rail crossings required • Restricted headroom under Russell Road bridge & Balgreen Road bridge requiring significant structural modifications • Two structures required to cross South Suburban Rail lines • New Structure over railway at Saughton Mains Road with tight curvatures	**Option B**
• Property impact	• Commercial property impacts adjacent to Russell Road • Land Take and property impacts on Whitson Road and Stenhouse Avenue West	• Commercial property impacts adjacent to Roseburn Street	• Commercial property impacts adjacent to Russell Road	
• Others	• Russell Road alignment difficult • Bridge over Roseburn Street required	• Restricted construction area along rail embankment behind Baird Drive • Structural solution required for alignment to bridge west entrance to Haymarket depot and Roseburn Street • Structure over Murrayfield back-pitches required	• Russell Road alignment difficult • Balgreen Road alignment difficult	
sport				
• Traffic interface	• Signalised intersection and joint running on Russell Road (possible need for shuttle traffic) • Signalised crossing of Balgreen Road	• Structures over Roseburn Street and Balgreen Road • Eliminate traffic impacts at these locations	• Signalised intersection and joint running on Russell Road (possible need for shuttle traffic) • Signalised intersection and joint running on Balgreen Road	**Option B**
• Tram travel time	• Poor due to Russell Road alignment	• Good with relatively straight alignment	• Very poor due to Russell Road and Balgreen Road alignments	
Safety				
• Traffic & Pedestrian interface	• Interface on Russell Road, • Interface on Balgreen Road • Crosses footpath route to Balgreen Primary School	• Dedicated tram alignment minimises traffic and pedestrian interface enhancing safety	• Interface on Russell Road • Interface on Balgreen Road • Crosses footpath route to Balgreen Primary School	**Option B**

	Option A – South Of Railway	Option B – North Of Railway	Option C - Hybrid	Preferred Option
Environment	• Loss of gardens on Whitson Road and Stenhouse Avenue West • Noise and visual impact to over 250 residential properties • Loss of mature trees on rail embankment • Impact to local wildlife corridor of rail embankment	• No loss of gardens • Noise and Visual impact to over 52 residential properties • Potential impact on proposed Water of Leith flood plain • Loss of mature trees on rail embankment • Impact to local wildlife corridor of rail embankment	• Minimised Noise and visual impact on residential properties, • Loss of mature trees on rail embankment • Impact to local wildlife corridor of rail embankment. • Impact on Jenners Depository (B listed building)	**Option C**
Economy	• Commercial properties between Russell Road and Water of Leith impacted with some requiring relocation • Additional capital cost of structures between Russell Road and Water of Leith • Intermediate Capital Cost	• Commercial properties along Roseburn Street impacted, with some requiring relocation • Capital costs associated with elevated structure • Lowest Capital Cost	• Commercial properties, between Russell Road and Water of Leith impacted, with some requiring relocation • Additional capital cost of structures between Russell Road and Water of Leith • Significant additional capital costs for disruption / compensation issues relating to Network Rail • Impact on Jenners Depository (B listed building) • Highest Capital Cost	**Option B**
Accessibility				
• Local & Network wide	• Russell Road alignment increases journey time	• Direct alignment enhances journey time	• Russell Road alignment increases journey time • Balgreen Road alignment increases journey time	
• Stop Location	• Murrayfield stop elevated and south of railway • Balgreen stop located adjacent to Primary school	• Roseburn Street stop enhances Murrayfield access • Balgreen stop North of railway well positioned for residential area but away from primary school	• Murrayfield Stop elevated and south of railway, • Balgreen Stop located adjacent to Primary school	**Option B**
Integration and Public Acceptability	• Large impact on Whitson Road requiring land purchase and loss of amenity • Potential impact on property value	• Baird Drive residents concerned about impacts • Potential impact on Roseburn Street businesses	• Concern over proximity to Balgreen Primary School • Impact on Jenners Depository (B listed building)	**Option B or C**

The following table presents a scored summary of the evaluation for the three options considered in section 2 of the corridor.

Criterion	Option A South alignment	Option B North alignment	Option C Hybrid alignment
Implementation / engineering	--	+	---
Traffic / transport	-	+	--
Safety	--	0	---
Environment	---	--	-
Economy	-	0	-
Accessibility	+	+	-
Integration	---	+	++
Aggregate Score	**-11**	**+2**	**-9**

5.3 WEBS / EDINBURGH PARK

This section of the route runs between Carrick Knowe footbridge and Lochside Avenue / South Gyle Broadway junction. Between Carrick Knowe footbridge and South Gyle Access, only one route option emerged from the STAG1 process.

From the STAG1 process, it was decided that Line 2 would utilise infrastructure being constructed for the WEBS project. This bus scheme will have dedicated bus guideways running west of the city. It is anticipated that this scheme will be up and running by 2006. It has been agreed with CEC and **tie** that Line 2 will replace WEBS making use of its structures. Subsequent consultations have confirmed that this, the WEBS route, is the most appropriate solution.

From the western end of the WEBS alignment the tram will continue along the alignment defined by CERT and protected as a transport corridor in the city planning framework.

5.4 GOGAR JUNCTION

Two options were identified at Gogar Junction, the first (Option A) which followed the CERT alignment. The alternative, option B served the Gyle Centre directly.

Client Group, Public and Stakeholder consultations have all favoured the route option that by-passes Gogar Roundabout to the east and north and serves the Gyle Centre directly (Option B). In terms of the STAG appraisal criteria, the two routes are compared below.

5.4.1 OPTION A: CERT OPTION

Implementation / Engineering

- The alignment for the CERT option would be relatively straightforward, with no tight curves or steep gradients involved.
- A new structure over the A8 underpass would be required, with associated utilities diversions.
- There will be construction impacts in terms of traffic management for the installation of the tram tracks on the roundabout.

Traffic and Transportation

- The CERT option could exacerbate congestion in the vicinity of Gogar Roundabout, which already experiences significant congestion at peak times.

Safety

- The CERT option has a major traffic interface at Gogar Roundabout.
- There is the potential for OHLE to foul the airport flight safety envelope.

Environment

- There may be a slight increase to noise and air quality impacts as a result of increased traffic congestion on Gogar Roundabout.

Economy

- This option would offer little scope for developer contributions or for attracting additional patronage, particularly when compared to option B.
- Capital costs would likely be lower than for option B, however operational costs would likely be higher.

Accessibility

- This option does not offer direct access to the Gyle, which is the major retail development in West Edinburgh.
- It will likely have increased journey times over option B.

Integration

- This option does not provide the opportunity to interchange with other transport modes.
- It does not integrate well with planning and transport policies as it fails to serve the Gyle directly and will likely exacerbate congestion on Gogar Roundabout.

5.4.2 OPTION B: GYLE OPTION

Implementation / Engineering

- This option would require a tight radius curve to the north of the A8.
- A new structure under the A8 would be required, which would increase capital costs over option A.
- It should be possible to slide in a new structure under the A8, thereby minimising construction impacts in terms of traffic management. This would introduce a geotechnical risk.
- This route option would provide the opportunity to use land between Gogar Roundabout and the Airport for locating the depot.

Traffic and Transportation

- Option B would avoid any direct negative impacts on traffic congestion on Gogar Roundabout.
- It would exacerbate traffic congestion where the route crosses South Gyle Broadway, however this location is less critical than Gogar Roundabout.
- There is increased scope for interchange with heavy rail at Gogar should station and stop be developed on the railway and tram respectively at some later date

Safety

- Option B avoids the traffic interface at Gogar Roundabout, but introduces a traffic and pedestrian interface within the Gyle car park.
- Vertical alignment is not constrained by roundabout carriageway levels, so there is scope to increase clearances between OHLE and the airport flight safety envelope.

Environment

- Potential to reduce congestion by directly serving the Gyle. Could slightly reduce noise and air quality impacts.

Economy

- Positive impact on retail business at the Gyle
- Potential for developer contributions through improving public transport provision for the Gyle
- Potential to increase patronage by directly serving major retail site.
- Capital costs would likely be higher than for option A, however operating costs should be lower.

Accessibility

- Better catchment than option A by serving major retail development
- Should achieve faster journey times than option A

Integration

- Potential for interchange with buses at the Gyle.
- Integrates well with planning and transport policies by serving the major retail site and avoiding further impacts on traffic congestion at Gogar Roundabout.
- Achieved a high level of public support during Public Consultation.

5.4.3 APPRAISAL SUMMARY

The following summarises the two options against these seven assessment criteria.

Criterion	Option A CERT Option	Option B Gyle Option
Engineering / Implementation	- -	- -
Traffic and Transportation	- -	-
Safety	- -	-
Environment	-	0
Economy	0	++
Accessibility	+	++
Integration	0	++
Aggregate Score	**-6**	**+2**

The appraisal of these two routes against the assessment criteria indicates a clear preference for option B, which is fully backed by the preferences indicated through the consultation process.

5.5 GOGAR BURN

At the previous stage of the project the Design Team believed that the preferred alignment had generally been identified in this area following numerous consultations with the various interested parties. However, two route options have emerged as possible solutions. These are:

Option A: To run parallel to the A8, within the north verge
Option B: To run parallel to the A8 as far as Gogar village, striking north then west to join the CERT route.

Key consultation on this section of the route included extensive discussions with RBS, CEC Transport, CEC Planning (including various representatives from Policy, Archaeology and Landscape), Gogar Church, Historic Scotland and Scottish Natural Heritage (SNH).

5.5.1 OPTION A – A8 NORTH VERGE

The viability of option A depends entirely on being able to find a workable solution to negotiate the RBS access road (which is elevated) and the entry / exit slips to this road (which are at-grade rising away from the surrounding ground level).

There are three possible sub-options for crossing the RBS access road to remain within the north verge of the A8. These are:

- A1:To cross under the access road (using the space provided within the A8 overbridge structure) and ramp up to bridge over the access slips
- A2:To cross the access road at-grade and the access slips via an overbridge
- A3:To cross under the access road (using the space provided within the A8 overbridge structure) and cross the access slips at-grade

Option A1 would offer safety benefits as all road crossings would be grade-separated, however there is a far more significant safety issue that would make this solution unachievable. In order to maintain the mandatory sight lines for users of the slip roads, the required span, height and depth of construction for the structure over the slip roads would make it impossible to route a tram as described. This solution is thus not feasible.

Option A2 offers the best solution in terms of access to the RBS site, as a stop can be located immediately adjacent to the access bridge, and at the same level. However, there are a number of issues that make this alternative unviable. The length of structure required would be in excess of 300 metres, as it would also need to span Gogar Burn and the access road to Gogar village. It would thus have a significant visual impact on the whole area, and in combination with the RBS access road and bridge would represent a considerable detriment to the overall setting. The capital costs and environmental impact are thus deemed too great for this to be a viable alternative.

Option A3 appears to be the only viable option for a route along the A8, and this is appraised below. Further studies are being carried out to confirm the viability of this option but also to look at modifying the RBS access arrangement further in order to best accommodate the tram. The findings of these further studies will be covered in a subsequent report.

5.5.2 OPTION A3

Implementation / Engineering
This option avoids the need for structures, except for a crossing of Gogar Burn. The vertical alignment required to negotiate the access slips is complex, and the superelevation of the entry and exit slips would need alteration. This would also lead to a lowering of track level relative to existing ground level beneath the RBS bridge, which may affect the bridge foundations. The need for a signal controlled crossing of the slips would require the exit slip to be significantly lengthened to accommodate queuing and safe stopping distances. There would thus be some disruption during construction to traffic using the RBS access road.

Traffic and Transport
Traffic signals would be required to manage tram and vehicle movements, impacting on the eastbound A8 and the access road slips. The alteration to the superelevation of the slip roads will affect traffic speeds and flows on the slip roads.

Safety
The addition of signal controls to the A8 / RBS access road junction is a necessary safety measure to reduce the risk of collisions between trams and road vehicles, although this risk is still higher than for a grade-separated crossing. This particular location is well best suited to signalisation due to the local topography and subsequent vertical alignment of the A8, hence the requirement for a lengthened exit slip to accommodate queuing and safe stopping distances. The alterations to the superelevation of the slip roads would have obvious safety implications, particularly to the on-slip. Additionally it may be necessary for City of Edinburgh Council to reduce the speed limit west to ensure safety for the RBS exit. It is likely that this extension would reach as far as Eastfield Road, which would then also need to be reconsidered by Council.

Environment
This option will have relatively low impact in terms of land take, setting, cultural heritage and landscaping when compared to Options A1 and A2, as no additional structures or major earthworks are required. However, there is the potential for minor impacts due to:

- the tram running closet to the Scheduled Ancient Monument (SAM),
- the location of the bridge over Gogar Burn (Site of Interest for Nature Conservation (SINC)) and
- associated highway works to accommodate the revised slip road.

Economy
The capital cost for this option would include elements for modifying the slip roads (including the extension of the exit slip), a signalised junction, earthworks and possibly retaining structures to the RBS access ramp. There may be significant costs associated with traffic management and temporary access arrangements during construction. In terms of operational costs, this option may cost slightly more, as the at-grade crossing of the RBS access slips together with the vertical alignment required to negotiate the access road will impact upon journey-times, which may in turn slightly impact on patronage.

Accessibility
Option A offers reasonable access to the RBS site. As mentioned above, this option may have a slightly increased journey-time over Options A1 and A2, due to the at-grade crossing of the RBS access slips that will require some or all eastbound A8 traffic to be stopped.

Integration
This option should offer good interchange opportunities with the A8 bus halt in this location. The need for a signal controlled junction at the A8 – RBS access junction may not suit planning policy, and is likely to draw an objection from RBS and possibly CEC Transport. This could also be marginally less acceptable to the public than Options A1 and A2.

5.5.3 OPTION B – A8 / CERT HYBRID

There are two possible solutions for an A8 corridor – CERT hybrid route. They both parallel the A8 between Gogar Roundabout and Gogar hamlet, turning north then west to follow the CERT corridor to Ingliston Park and Ride. The options differ in that one passes Gogar hamlet to the east (Option B1), and the other to the west passing between Gogar Church and Gogar Burn (Option B2).

Option B1 offers straightforward construction, negligible traffic impacts and minimal safety concerns as there are only very minor highways interfaces and no interface with the RBS access. By passing Gogar village to the east, this route also avoids the environmental issues surrounding Gogar Church and the medieval village, the SAM and Gogar Burn SINC. However, this option fails to deliver in terms of

accessibility and policy integration, as it locates the RBS stop at too great a distance from the RBS access bridge, so pedestrian access is impeded as is the potential for interchange with buses.

Option B2, though more environmentally contentious, offers accessibility to the RBS site comparable with the alternatives under Option A. It is thus appraised below.

5.5.4 OPTION B2

Implementation / Engineering
This option would be relatively straightforward to construct when compared to Option A. With only a short section paralleling the A8, there would be minimal disruption to the road during construction, and for that section from the A8 CERT part of the route, minimal utilities diversions would be required.

Traffic and Transport
There are no major highway interfaces with this option, so there would be little or no operational impact.

Safety
Being principally away from the A8 with only minor highway interfaces, this option offers the lowest risk in terms of accidents involving road users and pedestrians. The stops for this route, at RBS and the Ingliston Park and Ride, are similarly well located in terms of personal security as for Option A.

Environment
This option could potentially incur cultural heritage impacts on the Gogar Fort SAM and Gogar hamlet (impact on setting). It would have a direct environmental impact on Gogar Burn SINC. The CERT-based element of the route passes close to badger setts, although the route can be adjusted to ensure that the setts are not directly impacted by the trams. This route also runs across the Green Belt and open countryside and would affect the character of this landscape. However, the route largely follows the corridor reserved for CERT (for which full landscape mitigation proposals have been previously developed).

Economy
The structural works and major earthworks are minimised with this option, however this saving is balanced by the land purchase requirements. Utilities diversions are also minimised, which should represent a significant capital cost saving. Operationally, this route should not incur increased operational costs over the other options.

Accessibility
This option offers access to the RBS site comparable with Option A, as well as the potential to interchange with bus services on the A8. It should offer journey times at least as good as those for Option A.

Integration
This option should offer good interchange opportunities with the A8 bus halt in this location. In terms of planning policy, this route offers a similar level of service to the RBS site as Option A. However it would require the development of Green Belt land. Public support for this route is likely to be similar to that for the other options.

5.5.5 SUMMARY TABLE

Based on the above text, each of the two options can be scored on a seven-point scale for each of the seven criteria mentioned. This is summarised in the table below:

Criterion	**Option A (Sub-Option A3)**	**Option B (Sub-Option B2)**
Implementation / Engineering	0	+
Traffic and Transport	- -	+
Safety	- -	0
Environment	0	- - -
Economy	0	++
Accessibility	+	+
Integration	+	+
Aggregate Score	**-2**	**+3**

From the above summary table, there is a clear indication that Option B should be the preferred route, as it out-performs Option A in four of the seven criteria, and is equal in two of the remaining three. It is clearly less favourable in terms of environmental impact, however none of the options studied achieve negligible or positive environmental impacts.

5.6 AIRPORT

5.6.1 CONSULTATION AND ROUTE DEVELOPMENT

Following initial consultations with British Airport Authority (BAA) and Royal Highland and Agricultural Society of Scotland (RHASS), the two key stakeholders for this section of the route, a clear impasse was identified to a proposed tram route between the airport and Newbridge. This arose through the fact that BAA's long-term expansion plans for Edinburgh Airport encroach well into the showground property. Thus the study team developed several options for selecting a route past the Showground to Newbridge, the report for which is included in Appendix F – Airport Report. In summary, the report highlighted the following options:

- Option A Terminate Edinburgh Tram Line 2 at Edinburgh Airport / RHASS East Gate, with TIE/CEC commitment to extend once BAA expansion is confirmed.
- Option B Do not identify a specific tram alignment but include in the Parliamentary Bill powers over a wide corridor between the airport and Newbridge (through/past the showground), whilst developing side agreements with BAA and RHASS to enable the line to be fixed once the BAA White Paper has been issued.
- Option C Disregard BAA's full expansion aspirations, by selecting a route for the tram between the airport and the showground. This could be such that partial airport expansion is possible, but the onus would be on BAA to realign the tram within their expansion if required.
- Option D Identify a line through the Royal Highland Showground which allows for the airport expansion
- Option E Revise the alignment to run along the A8 to Ingliston Park & Ride with spur lines to Edinburgh Airport and Newbridge
- Option F Adjust the original FM Route Option A to avoid the showground and its listed wall, potentially crossing the A8 to join a southern link to Newbridge.

Of the above options, RHASS stated a clear preference for Option C, whereas BAA would object to Option C and stated a preference for an A8-based option, preferably based on a spur to the airport (Option A, E) rather than a loop (Options B, C, D, F). It was thus clear that a single preferred route could not be established prior to public consultation, so it was agreed through consultation with **tie** and CEC to promote two options through the Public Consultation (Options C and F). It was noted at this stage that options A and B could still be adopted.

During the period of public consultation, the Design Team had further stakeholder consultation expanding discussions to include the Department for Transport (DFT). DFT are tasked with preparing the white paper defining BAA Airport expansions, which is due for release early in 2004.

Responses to the Public Consultation have indicated no clear preference for either option, however BAA's formal response has stated more strongly their objection to a loop option. RHASS has formally responded that their preference is for a route approximating to Option C. As the preferences of the two key stakeholders are mutually exclusive, and in order to take this matter forward, a STAG-based appraisal of a loop (through-route) versus spur (terminus) to the airport are considered.

5.6.2 LOOP OPTION (THROUGH ROUTE)

Implementation / Engineering
There would be considerable disruption to the airport forecourt during construction. From an operational perspective, a loop would allow greater operational flexibility, as the capacity of a through-route would be higher than for a terminus.

Traffic and Transport
Traffic impact would be high, with a potential loss of car parking, pedestrians required to cross the track to access the airport and a number of signalised crossings to control road vehicle and tram movements.

Safety
There is a perceived to be safety concern over two-way tram movements through an area of one-way road vehicle movements. There would be a number of signalised crossings required for the tram to cross the airport road, increasing the risk for pedestrian or vehicular impact over a spur /terminus option.

Environment
No significant noise impact as there is high vehicular activity in this area already, and with aircraft movements the area is subject to fairly high ambient noise levels. There could be a negative visual impact, particularly from the OHLE equipment, due to the increased footprint of the tram when compared to the spur.

Economy
A loop solution would involve higher capital expenditure than a spur due to the increased route length, number of signalised crossings, and the traffic management measures required and disruption caused during construction. A larger area of land would need to be acquired from BAA. Tram revenue would likely be less than for a spur, as it would be unfeasible to apply a premium charge to airport services when the loop continues to Newbridge.

Accessibility
From the perspective of the airport, a loop service would provide better accessibility than a spur, as all services would serve the airport. There would be the opportunity with a loop to provide additional stops at the airport, which may allow the tram to better serve the airport post-expansion. However, a loop may impede access to the airport by other modes due to the number of signalised crossings of the access road and extra land take involved.

Integration
Good integration with services at the airport – taxis, buses, long and short term parking areas. Likely support from the public.

5.6.3 SPUR OPTION (TERMINUS)

Implementation / Engineering
Interfaces with other infrastructure elements would be minimised, so a spur would be comparatively easier to implement. A spur reduces operational flexibility, as the capacity of a terminus is less than that for a through-route.

Traffic and Transport
There would be minimal impact on traffic movements, as the spur would be almost entirely segregated from the main access road (Jubilee Road).

Safety
A spur would avoid the signalised crossings of the main access road associated with the loop option, thus would offer a significantly reduced risk of accidents involving trams and road vehicles. Additionally there is no requirement for pedestrians to cross the tram line between the carpark and airport terminal.

Environment
A spur would offer no further environmental detriment than a loop, and would in fact offer a reduced visual impact due to the reduced footprint of the tram.

Economy
Capital costs for a spur would be less, due to the shorter route length and reduced land acquisition requirement. The most significant economic benefit is that a spur option would present the opportunity to apply premium charges to airport customers, thus significantly benefiting revenue.

Accessibility
Accessibility to the airport would be slightly impeded due to the operational constraint that a spur imposes. However, a spur option could offer better accessibility between Newbridge and the City Centre, as services could by-pass the airport thus offering faster journey times. Only one area of the airport could be served, thus precluding the possibility of providing extra stops in the future to serve other areas of the airport post-expansion.

Integration
Strong integration with services at the airport – taxis, buses, long and short term parking areas. Likely support from the public.

5.6.4 SUMMARY TABLE

Based on the above text, both options can be scored on a seven-point scale for each of the seven criteria mentioned. This is summarised in the table below:

Criterion	Loop	Spur
Implementation / Engineering	- -	0
Traffic and Transport	-	+
Safety	-	+
Environment	-	0
Economy	0	+ +
Accessibility	+ +	+
Integration	+	+
Aggregate Score	**-2**	**+6**

It is thus concluded that the route serving the airport should be a terminus (spur) rather than a loop or through route.

Having the tram service terminating at the airport would allow a premium to be charged for passengers boarding or alighting at the airport. This will have significant revenue benefits for the overall business case.

If the route between Ingliston Park & Ride and Newbridge is included as a separate shuttle service, it can be easily separated from the city – airport service and hence staged construction can be implemented if shown to be necessary or even dropped from the Bill if it is deemed economically unfeasible.

It is thus recommended that the tram line should be promoted on the basis of a principal service operating between the city centre and the airport and a shuttle service between Ingliston Park & Ride and Newbridge.

5.7 NEWBRIDGE

A route serving Newbridge village is sought to achieve the following objectives:

- to link to the two major development sites – Edinburgh Gate and former the Grampians Foods site with the potential for a park and ride
- to provide and option for future extensions to the network

Starting from Ingliston Park and Ride, the route would cross Eastfield Road at-grade before reaching a stop at the RHASS. The route would then pass the Showground along its southern boundary, before progressing to Newbridge via Ratho station. A route via Ratho Station is seen as the only viable option.

However, this option would have a number of disbenefits that still require careful resolution before an entirely feasible route is defined. There would be a comparatively high construction cost associated with this section of the route, when compared to the density of population it would serve. It would thus be vital for the route to serve both development sites, however providing access to the Grampian Foods site could prove very awkward. In order to reach Ratho Station and Newbridge, the route would first have to cross the A8, for which it would appear that an at-grade crossing is the only feasible solution. Beyond this crossing, the route would then have to cross open Green Belt land, which it would also sever. Between Ratho Station and Newbridge, the route passes very close to a small group of private residences built on the old railway alignment. Additionally a structural solution would be required for the route to connect to Harvest Road. There would be insufficient space within Harvest Road, and through Newbridge in general, for the tram route to be fully segregated, so much of this section of the route would run on-street, shared with other road users. To minimise this impact, a single track loop has been developed. Within this loop there is potential for direct impact on one property Old Liston Road. A further constraint in Harvest Road is that gradients of up to 7 per cent may be required, which could impose a constraint on the selection of a tram vehicle.

5.7.1 Summary

At public consultation the alignment put forward included a single track loop through the village of Newbridge. No major objections were received to this route. However this alignment is to be reviewed with respect to its ability to achieve the two objections outlined for this Newbridge section (development site access and future expansion). Key elements of this review include patronage studies and further stakeholder consultation. The findings of these further studies will be covered in a subsequent report.

5.8 DEPOT

5.8.1 INTRODUCTION

A considerable package of work has been undertaken to investigate the Depot provision for ETL2. This has followed on from the work for which identified two location options for public consultation. Due to route development described in this report, it has emerged that neither of the consultation locations would serve ETL2 well, however a third option has subsequently been identified and developed.

The whole Depot identification and development is detailed in a separate report. This report sets out the process, which has led to **tie**'s recommendation that land at Gogar Roundabout be allocated as the Main Depot for Line 2. It describes the location and other requirements for a depot site, examines all of the potential sites, which were assessed, and explains why the Gogar site is recommended.

5.8.2 PROCESS

The process of depot site selection for Line 2 has followed a two-step approach. The first step involved testing a number of potential sites against the necessary requirements for, and characteristics of, a tram depot. Six sites were identified and are shown in the report. Two of these were selected for further assessment, the sites at Newbridge and Russell Road. During this further assessment a further site was identified at Gogar Roundabout and was added in to this second stage assessment. Plans showing these sites in detail are also contained in the report.

The second stage of the assessment involved subjecting all three sites to a comparative analysis using STAG criteria. Six categories were used in the depot evaluation – implementation/engineering, traffic/transport, safety, environment, economy, and integration – with several criteria within each category.

5.8.3 CONCLUSIONS OF STAG ANALYSIS

As noted above full details of the analysis are shown in the *Depot Location Report* (November 2003), which is issued separately. However, in summary the findings for each site were as follows.

5.8.4 GOGAR ROUNDABOUT

This site was favoured because of its position on the tram mainline (central and allowing phased implementation) and its impacts on the surrounding area (e.g., no nearby residences would be affected by noise). It would require, however, substantial civil works to excavate the site to a depth that would provide a level site and position the depot buildings and structures completely outside the flight envelope. This excavation would increase the capital costs significantly and would limit the ultimate capacity of this depot site.

5.8.5 NEWBRIDGE SITE

This site has the benefit of allowing significant expansion to accommodate trams from future extensions to the line. However, it is situated towards the western end of the scheme on the proposed spur line, which could be a later addition. The need to access a depot would mean that phased implementation of the tramline would not be possible. The depot could only be constructed in tandem with the complete alignment to Newbridge, as if the tram were only to be constructed to the airport, the depot would not be accessible. Even with the complete alignment constructed to Newbridge, depot access would be via a spur line which would cross the A8 to meet with the tram mainline in the central reserve of the highway.

5.8.6 RUSSELL ROAD

This site would provide flexibility for shared operations with Lines 1 and 3, and the site would not conflict with existing land use policy. However, the spur line under the Edinburgh-Glasgow heavy rail line (needed to access the site from the preferred route alignment) introduces significant construction and operational complexity and major safety issues, which would increase capital costs. Additionally, if a delta-junction between Lines 1 and 2 is to be constructed for network running, this access may not be feasible.

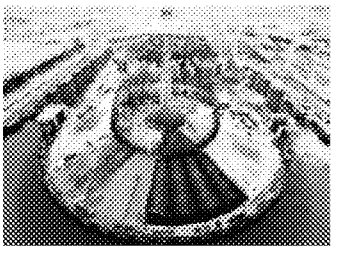
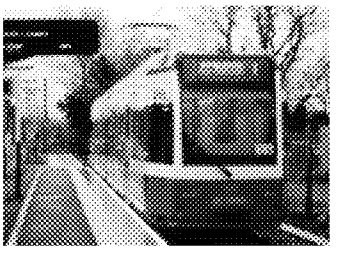
5.8.7 SUMMARY

The following table outlines the major points for each depot site and provides an overall rating.

Criterion	Option A Newbridge	Option D Russell Road	Option G Gogar Roundabout
Rating		**Least Preferred**	**Preferred**
Key elements	- Greenbelt - Remote position on the line and the network - Potential expansion - Long spur and A8 crossing	- Brownfield - Centrally located in the network - Difficult access under railway line - Complicated junction	- Edge of Greenbelt - Centrally located on the line. - Limited impacts. - Extensive excavation

On concluding that the Gogar site was the best option further discussions were held with City Council Planning and Transportation staff. As a result, consideration is being given to extending the Limits of Deviation to take account of the need for extensive landscaping. This is in recognition of the site's position at an important gateway into the city. Further details will be provided in the Environmental Statement.

ROUTE DEVELOPMENT REPORT PART A – DESIGN PAUSE SUMMARY

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6 *Route Development Report Part A - Design Pause* Summary

The preferred route alignment for ETL2 can be summarised as noted within the following sections.

St Andrew Square to Roseburn

The preferred route runs jointly with Line 1 from St. Andrew Square, along Princes Street and Shandwick Place through Haymarket to Roseburn.

Roseburn to Carrick Knowe

The favoured alignment (option B - north) leaves the interface with Line 1 heading west crossing Russell Road at grade*, passing through built-up sites near the ScotRail depot site before rising to cross Roseburn Street on an elevated track. The alignment continues along passing Murrayfield Stadium at the existing railway level before passing over the Water of Leith, behind Baird Drive, over Balgreen Road and along the Carrick Knowe Golf Course.

This option provides the most direct link between the junction with Line 1 and Saughton Mains Road with a single rail crossing. It avoids the constraints of running under Russell Road and/or Balgreen Road underbridges. This has advantages of reducing journey times and costs and has minimal traffic impact on Russell Road and Balgreen Roads.

Option B would run at railway level adjacent to properties at Baird Drive. While no land would be taken from these properties the construction and operation of the tram has the potential to result in noise and visual impacts on residents. Further detailed consideration is being given to the vertical and horizontal alignment in this location and a number alternative designs and mitigation proposals are being considered in an effort to minimise environmental impacts. These proposals include lowering the tram alignment in an effort to create an engineered cutting with space for planting and a noise barrier.

Stops are proposed to be located at Roseburn Street and Balgreen Road.

WEBS / Edinburgh Park

The alignment runs between Carrick Knowe footbridge and Lochside Avenue / South Gyle Broadway junction. Initially it follows (and would supersede) the WEBS guideway. From South Gyle Access it is routed along the corridor previously defined by CERT.

Within this section of the route, the alignment improves public transport interchange opportunities and the route would serve major employment centres. This alignment is off-street and avoids traffic interfaces and provides safer operations than the north option, which is predominately on street.

Stops are proposed at Stenhouse Drive or Saughton Road North, Broomhouse Road or South Gyle Access, Edinburgh Park Railway station and Edinburgh Park.

Gogar Junction

The fourth section of the route presented two options for consideration. Option A follows the CERT alignment and Option B serving the Gyle centre directly and by-passing Gogar roundabout to the east and north travelling under the A8. Consultation and assessment against the STAG objectives favours Option B.

The main factors differentiating Option B from Option A were Integration and Economy. This option serving the Gyle centre provides a positive impact on businesses and a potential to increase patronage. Also the opportunity for interchange with buses at the Gyle centre.

Option B was clearly favoured in client, stakeholder and public consultation processes.

The proposed stop in this section is located in the south-west area of the Gyle Shopping centre.

Gogar Burn

After extensive and ongoing consultation, this section of the route comprised two viable solutions each having a number of alternatives that had to be considered.

The favoured option was to run parallel with the A8 as far as Gogar village, striking north then west to join the CERT route. Further, this option had two alternatives – the one that scored considerably higher in the

* Note: It is anticipated that the tram could bridge over Russell Road. Further investigation of this will be detailed in a subsequent report.

assessment was an alignment that passed to the west of Gogar hamlet between Gogar church and Gogar Burn.

This option serves the RBS well with good pedestrian access and interchange opportunities with the A8 bus halt. The alignment scores well on Economic issues with minimal structural and earthworks required and a significant cost saving in minor utilities diversion. This alternative does pose environmental issues that would need to be addressed but no options considered achieved negligible or positive environmental impacts.

A stop is proposed at the Royal Bank of Scotland.

Airport

Stakeholder consultation and resulting feedback was the main driver of developing a viable and acceptable alignment through this section. Like the Gogar Burn section, this area underwent extensive consultation having numerous alternatives that were proposed for consideration.

From an initial six options that were presented, none provided an acceptable alignment to both the BAA and RHASS. To move forward on this section a STAG appraisal of a loop and a spur to the airport was considered. A loop option assumed an alignment from the airport to the RHASS, crossing over the A8 and then onto Ratho Station. A spur option means that the route becomes essentially a main line from the city to the airport with a shuttle service from Ingliston Park & Ride to Newbridge as a secondary line.

Performing equally well or better on all criteria, a spur option is the preferred option. Having a spur line to the airport there is the opportunity for a premium to be charged for passengers boarding or alighting at this location. This has significant revenue benefits for the overall business case.

The Ingliston Park & Ride to Newbridge shuttle can be easily separated from the city to airport service and constructed at a later date if scheme economics were to demand this or if this extension cannot be justified on economic grounds it could be dropped from the Bill.

A stop is proposed at Ingliston Park & Ride and at the Airport.

Newbridge

Forecast patronage levels for a route beyond the airport have been very low throughout the process. Thus, the selection of a viable route depended on being able to access the two new development sites at Newbridge.

A route to the south of the A8 reaching Newbridge via Ratho Station would not be without its own problems. The length of the route compared to the density of population served would make capital and operational costs relatively high, however this route would serve the village of Ratho Station as well as developments in Newbridge. Further study is being carried out to assess the overall viability of the Newbridge spur, as well as the potential to serve the Grampian Foods site and a possible Park & Ride in this location.

Stops would be provided at Royal Highland Showground, Ratho Station and Newbridge.

Depot

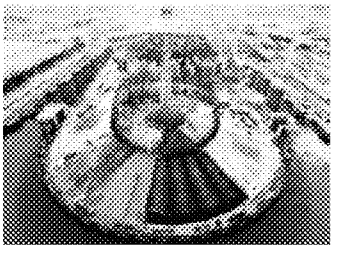
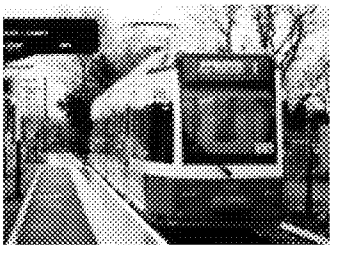
A full study of Depot options was carried out. Two options were taken to public consultation, one adjacent to Russell Road and the other west of RHASS. The first of these is ruled out by the preference for Options B alignment between Roseburn and Carrick Knowe. The second remains viable but is sub optimal given the preferred route to Newbridge. Hence a third option at Gogar Roundabout has been developed. Following extensive consultation this has been adopted as the preferred Depot location for ETL2.

Design Pause

As this shows whilst this stage of the project was expected to produce an alignment freeze (design pause) to facilitate the ongoing assessment (Environmental Impact Assessment and STAG) there remain a number of areas for further development. This additional work is being carried out and will be reported in a future report. This work covers the following alignment aspects:

- Russell Road crossing (grade separation) and full interface with Line 1
- Water of Leith flood plain
- Baird Drive mitigation alignment (with engineering cut)
- Gogar Burn
- Newbridge

APPENDICES

Appendix A – Property Impact Assessment

Potential Building Impacts

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1.0 EXECUTIVE SUMMARY

No executive summary has been generated at this stage

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2.0 INTRODUCTION

This working paper sets out the work undertaken by FaberMaunsell / Semaly in identifying the potential business properties which are likely to be affected by the various route options which have been developed to public Consultation level. This activity constitutes a part of the stakeholder consultation exercise which has been going on since early in the year. This stakeholder consultation process began with the identification of major employers or land owners who might hold vital information to the development of potential tram alignments. A variety of consultations have been held with such parties, including for example BAA / Edinburgh Airport, The Royal Highland and Agricultural Society of Scotland, The Gyle and Edinburgh Park. For the most part the alignments have been developed which do not directly impact properties, This however is not entirely the case and the design team have undertaken to identify all properties affected by the alignment options being taken to public consultation. It has then been the aim of the design team to approach the owners / occupiers of such properties to speak with them prior to the beginning of the public consultation process.

There are a number of properties likely to be affected by route options which are currently under consideration. This working paper attempts to set these out and annotate the action which has been undertaken to date, including contact details for those persons spoken with along the route. This consultation is understood to be an ongoing process, however this paper deals predominantly with those activities undertaken to ensure that property owners/ocupiers were contacted prior to the start of the public exhibition.

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3.0 OPTION 24 (NORTH OF HAYMARKET RAIL DEPOT - EAST TO WEST)

01 Clark Commercials

This property is located along Russell road. At this location it is assumed that the tram track would be shared running with road traffic, this need not however be the case and off-street running would take the tram through the sales yard.

FM/S met with the business manger **Mr Kenny MacLeod**

Clark Commercials
20/22 Russell Road
tel: 0131 [redacted]
fax: 0131 346 7722
Mobile [redacted]

The property is leased by the business unfortunately it was not possible on the day to obtain details of the ownership. Follow up telephone calls have failed to gather this information. In addition FM/S have attempted to contact Mr Graham Clark the business owner on [redacted]

02 Haymarket Rail Depot (main entrance)

Meetings with Network Rail have been undertaken and more are planned.

The tram would run on the existing parking places along the access road to the depot. This land would need to be purchased from Network Rail. Some space will have to be found to relocate the parking bays.

03 Royal Mail

This is an important building, in a very good condition. It should be possible to avoid major impact to the building as the tram would run along the South side of the building. It may be necessary to purchase the strip of land between the building and the fence for the construction of a retaining wall.

FM/S have spoken with **Paul Park** the depot manager (25th April 2003)
Royal Mail do not own the building but Lease it, Mr Park is to advise of the owners.
Mr. Park suggested discussions with Royal Mail Holdings who manage all properties.
Tel: 0131[redacted]

An exhibition leaflet has been sent to :
Royal Mail Group
Property Maintenance
10 Brunswick Road
Edinburgh,
EH7 5XX

04 Beechwood Bowling Green

This property would not be directly affected by the tram as its front boundary is on Roseburn Street and rear boundary is with Viking International.

FM/s Attempted to visit the bowling club on 2 May however were not able to obtain a response, further unsuccessful attempts were also made by phone and in person.

Tel: 0131 [redacted]

05 Partco Autostore

This building which fronts onto Roseburn would appear to have a back boundary defined by the Viking International Car tyres and parts business. Hence it is not anticipated that it would be impacted by the tram.

FM/S met with **Peter Clark** the branch manager who noted that Unipart own the property.

06 MRM coaches (not impacted)

As with Partco Autoparts it is unlikely that MRM will be directly impacted by the Tram as the rear boundary is defined by the Viking International Car tyres and parts business.

FM / S spoke to reception left a business card and were given the business card of the manager:

James Gibb
23 Roseburn Street
Edinburgh, EH12 5PE
Tel: 0131 [redacted]
Fax: 0131 337 5599
Email: [redacted]

An effort to speak with Mr Gibb by telephone was unsuccessful.

07 Viking International

This is a major car parts (tyres, exhaust etc) outlet which has a common boundary with the Railway Depot. The building is somewhat rundown and there is an outbuilding which may or may not be related.

FM/S spoke with the manager **Mr Peter Thompson** (2 May 2003), who noted that he would pass on the information to the property manager who is based in Glasgow. Mr Thompson was not certain about the building ownership.

Tel: 0131 [redacted]

08 JB McLean Interiors

This interiors showroom / salesroom and warehouse extends from a Roseburn Street frontage through to a rear boundary at the foot of the railway depot embankment. The whole of the building is utilised with the rear being used for storage of orders in transit.

FM/S spoke to the Owners of the business
Roddy & Jullie McLean
Tel: 0131 [redacted]
Email: [redacted]

Subsequently GRM had a telephone conversation with their lawyer Mr George Tait who rang requesting information. The McLeans are clearly concerned about their business and the potential impact such a scheme might have on their property and business.

09 Murrayfield Indoor Sports Club (Haymarket Bowling Club)
The Club is located on the first floor of the building including JB McClean and the Royal Lyceum Theatre Company. The back of this property would be impacted by the tram. Within the property is an indoor (10 pin) bowling alley. This is a club owned by its members.

FM/S spoke with the bar manager who noted that the club is run by a committee. It is understood that the property is owned by the club, however this has not been confirmed.
President **Jimmy Laidlaw** Tel: [redacted]

FM/S have on five separate occasions attempted to speak with Mr Laidlaw, leaving messages with contact details.

10 Royal Lyceum Theatre Company
Within the same complex as JB McLean and the Bowling Club there is a third property which houses the Royal Lycium Theatre Company costumes and scenic workshop.
FM/S spoke with the workshop manager **Jason Daily** who indicated that the property was owned by City of Edinburgh Council.

11 Ceramics Scotland ltd
This building is constituted of a large arch type building extending from Roseburn street to the Railway Depot embankment. It may be possible to avoid impacting the actual buildings but the strip of land between these buildings and the back fence would have to be purchased for the construction of a retaining wall.

FM/S had a meeting with the manager **Peter Campbell** on Thursday 15 May. The public exhibition/consultation leaflet was provided and explained, including process, timeline. Mr Campbell noted that the warehouse is owned by the business, Collinson Ceramics, and the adjacent sales room is owned by the company pension scheme.

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Mr Campbell noted that they have had various approaches regarding purchase for development and enquired about the possibility of selling up with the property being split between a developer and the tram. It was noted that this would likely require agreement of a number of properties along Roseburn Street. FM encouraged Mr Campbell to attend an exhibition and make a written response to the project team.

Collinson Ceramics (Scotland) Ltd.
31 Roseburn Street
Edinburgh, EH12 5EP
Tel: 0131 [redacted]
www.collinson-ceramics.co.uk

Store manager **Peter Cambell**

12 Roseburn Garage (Murrayfield Motors)
This is a small independent garage with three or four staff, a family run business with a number of cars for sale at the cheaper end of the market.

FM/S spoke with the business owner and he showed us to the rear of his property which abuts the Rail depot land. It would appear that they have been trying for some time to get the rail authority to reconstruct the boundary wall. A second wall has been constructed within the garage boundary.

The owner **Mr Mohammed Khalil** was not overly concerned about the proposals. No contact details were proffered. The following telephone number was taken from the noticeboard.
Tel: 0131 [redacted]

13 Rental Units
This next block contained a number of rental units for small industry
The owner of the units is a **Mr Kelly**.
Tel: 0131 [redacted]

FM/S met with Mr Kelly on 02 May 2003 and outlined the proposal noting that the alignment is likely to impact the back end of his property adjacent to the railway depot embankment. Mr. Kelly enquired about the likely impacts and compulsory purchase procedures (should they be necessary).

Tenancy of the units include:

Units 1&2	A and J motors	*Tel: 0131* [redacted]
Unit 3	R Paterson Bicycles	
Unit 4	Euro Distribution	
Unit 5	PD Labels	
Unit 6	The Ironing Company	*Tel: 0131* [redacted]

Unit 7&8	Greymill Coachworks	*Tel: 0131* [redacted]
Unit 9		
Unit 10	Scottish Thermals	*Tel: 0131* [redacted] *Fax: 0131* [redacted] *Mob:* [redacted] *Email:* [redacted]
Unit 11	Geoff Somerville (painter and Decorator)	
Unit 14	Foxy Flowers	
Unit 15	vacant	

FM / S spoke with My Brian Roland of Gray's Mill coachworks in their attempt to contact Mr Kelly. No other occupants were approached due to uncertainty about the need to speak with tenants and Mr Kelly's request that they not be spoken with. Further it would only appear that units 10 – 15 are likely to be impacted.

14 National car rental

Were an elevated tram stop to be constructed at this location this building would have to be demolished. However a more detailed assessment of the exact stop location may enable the line to be fit with minor modification to the building. Regardless of this however the business manager is concerned about the operational impacts of trying to fit a tram between his property and the railway, as they have numerous vehicles moving through the back yard and building.

FM/S met with **Mr. Fred Stuart** who asked if his property personnel (from head office could get back to the design team – no contact to date)
Tel: 0131 [redacted]

FM/S followed up their initial contact by telephone to be advised that the Line manager for property would like to attend the public meeting. FM/S have provided Mr Stuart with details of the public meetings.

15 Haymarket Rail depot Western access

In order to maintain the access of the depot, the tram track would be running on a bridge, over the road level and over the depot land in front of the fuel tanks shown on the location plan.
Some land would have to be purchased from Network rail for the foundations of the bridge. In addition there would be a need to relocate the fuel tanks so as not to cause operational difficulties for either the depot or tram, this option has been suggested to Network Rail who believe it could be achieved.

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Building ID	Street name	Property	Ownership	Potential Impact	Potential Land Take	Date of visit	Contact name	Contact phone	Notes of visit	Impact on properties
01	Russell Road	Clark Commercials	Tennant	Operational	No / Possible	25-Apr-03	Kenny MacCleod	0131 mobile:		No definite property impact.
02	Russell Road	Haymarket Rail Depot Main Entrance	Network Rail	On Car Park	Yes	06-Mar-03 16-May-03	Geoff Cook	0141	See meeting notes	Yet to be defined
03	Russell Road	Royal Mail	Tennant	No	Yes	25-Apr-03	Paul Park	0131	Royal Mail are not owners contact Property Maintenance 10 Brunswick Rd, Edinburgh	No expected property impact.
04	Roseburn Street	Beechwood Bowling Club	Not known	No	No	02-May-03	No contact made	0131	-	-
05	Roseburn Street	Partco Autostore	Unipaart	No	No	25-Apr-03	Peter Clark (Branch Manager)	0131	+ve response	No property impact.
06	Roseburn Street	MRM Coaches	Not known	No	No	25-Apr-03	James Gibb (Partner)	0131 mob :	No Direct contact	No property impact
07	Roseburn Street	Viking International	Owned (?)	Yes	Yes	02-May-03	Peter Thomson	0131	Info passed to Property manager in Glasgow	Impact likely on two buildings within property.
08	Roseburn Street	JB McClean	Owned	Yes	Yes	25-Apr-03	Roddy and Julie McClean	0131	Concerned – asked about CPO	Rear of building impacted.
09	Roseburn Street	Murrayfield Indoor Sportsclub	Owned by members	Potential	No	25-Apr-03	Jimmy Laidlaw (President)		Met with member of staff. Messages left for President.	
10	Roseburn Street	Royal Lyceum Theatre company	CEC owned	Yes	Yes	25-Apr-03	Jason Dailly	None provided	Met with workshop manager	Rear of building impacted.

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11	Roseburn Street	Caledonian Ceramics Scotland ltd	Caledonian Ceramics	Yes	Yes	25-Apr-03	Peter Campbell (Manager)	0131 [redacted]	Met with Store manager 15-05-03	Tram on South side. At High level
14	Roseburn street	Roseburn Garage	Family owned	Yes	Yes	25-Apr-03	Mohammed Khalil	0131 [redacted]	Met owner who showed us the back of his property.	Back of the building impacted
13	Roseburn street	Mr Kelly AJ Motors R Paterson Bicycles Euro Distribution PD Labels The Ironing Company Graysmill Coachworks Scottish Thermal Geoff Sommerville Paint & Decor Foxy Flowers	Owner Tennant Tennant Tennant Tennant Tennant Tennant Tennant Tennant Tennant	Yes Possible Yes Yes 	Yes	02 – May – 03	Mr. Kelly	0131 [redacted]	Met with one tenant and owner	Tram on South side. At High level. Potentail Land take may be required.
14	Roseburn street	National Car Rental	Owned	Yes	Yes	25-Apr-03	Fred Stuart	0131 [redacted]	Met depot manager property issues referred to head office	Tram on the property. Main building may be impacted.
15	Roseburn Street	Haymarket Rail Depot East Access	Network Rail (?)	Yes	Yes	See above	See above	See above	See above	See above
16	Roseburn Street	Murrayfield	Scottish Rugby Union	Yes	Yes	19-Mar-03	Graham Ireland	0131 [redacted]	Similar to CERT discussions	

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4.0 OPTION 27 (RUSSELL ROAD AND DEPOT)

The depot will be located in a densely constructed area, requiring demolition of Haymarket Cleansing depot, and potentially one Bowling green and a few business buildings.

01 BMW Eastern Motors garage
This garage looks quite new. If a full depot is to be constructed it will be significantly impacted and may have to be demolished.

FM/S Approached the staff and were advised that the business is managed from the nearby building on Glasgow Road and were asked to contact **Mr. Magnus Wang**.
Tel: 0131 [redacted]

A subsequent meeting was held with Mr Wang on Monday 28th April at which FM/S outlined the current options and proposal for public consultation. Mr Wang expressed concern that operation of the two showrooms depend on one another.

02 Apex Property Care Office building
This office building called the "Roseburn Business centre" appears to include a few companies :

- Stonetec
- Harkins
- Apex.

FM/S have been advised that it is managed by APEX Property Care and a meeting with representatives of APEX was held on 15 May (full minute has been prepared, see also note below). If a full depot is to be constructed it will be significantly impacted and may have to be demolished. The contact name is **Mr. John Robertson**.
Tel: 0131 [redacted]

FM/S approached Mr Robertson and on 15 May met with Mr. Robertson and Mr Stuart Dow. A copy of the exhibition brochure was tabled and talked through. APEX are concerned about access, and see a relocation as being difficult from the perspective of managing their operations with a need for easy access to various properties in the city centre.

03 Caley Bowling club
This bowling club is located along Russell road. If a full depot is to be constructed it will be significantly impacted and may have to be demolished.

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FM/S spoke with a member of staff and were provided with a copy of the fixture card identifying all the office bearers. President: **Alex Johnston**
Tel. 0131 [redacted]

04 Chas Henshaw and sons ltd
Located between the bowling club and the CEC cleansing depot there would be a number of buildings impacted. It is envisaged that this international trader (aluminium architectural structures manufacturer) would have to be relocated.

FM/S were advised that FM have previously worked for the group and requested to make an appointment with the Financial Director **Mr Ken Rammage**. This has been done and a meeting was held on May 13 (attended by Geoff Duke, TIE, and Gavin Murray, FM). An advance copy of the public exhibition leaflet was provided and talked through with Ken Ramage, Tom Lambie and John Lamb.

At this meeting Henshaws noted that whilst it would be possible to relocate it would not be viable as the relocation old equipment would be difficult and new / replacement is not reasonably available.

Charles Henshaw & Sons Ltd
Russell Road
Tel: 0131 [redacted]
Fax: 0131 313 2357

05 Haymarket Cleansing depot
FM/S and TIE attended a meeting with the CEC manager of Cleansing Mike Drewry and Ian Hunter on Friday 2 May.
Tel: 0131 [redacted] (Mike Drewry)

Whilst it was accepted that it would be possible to relocate, it was noted that there would be problems associated with this:

- finding a new site;
- Obtaining planning permission for the new site;
- Route changes;
- Staff access – staff finish work when their collection rounds are completed.

06 Fleet services
In addition FM/S and TIE met with the managers of CEC fleet services Jim Lambie and Pat Trayner in the afternoon of 2 May.
Tel: 0131 [redacted] (Jim Lambie)

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DRAFT

Building ID	Street name	Property	Ownership	Potential Impact	Potential Land Take	Date of visit	Contact name	Contact phone	Notes of visit	Impact on properties
01	Russell Road	BMW garage	BMW	Yes if depot is developed here otherwise minimal	Yes if depot is developed here otherwise minimal	25-Apr-03 and 28-Apr-03	Magnus Wang	0131 [redacted]	Magnus Wang is based on Corstorphine road. Is not opposed of selling the business if he can get another interesting place.	Depot Impacts
02	Russell Road	Office building (APEX)	Mrs Robertson (no relation)	Yes if depot is developed here otherwise minimal	Yes if depot is developed here otherwise minimal	15-May-03	John Robertson	0131 3[redacted]	*Met Mr Robertson 15/05/03* *See meeting notes*	Depot Impacts
03	Russell Road	Caledonian Bowling club	Caledonian Brewery(?)	Yes if depot is developed here otherwise minimal	Yes if depot is developed here otherwise minimal	25-Apr-03	Alex Johnston	0131 [redacted] mob : [redacted]		Depot Impacts
04	Russell Road	Chas Henshaw and Sons Ltd.	Chas Henshaw and Sons Ltd.	Yes if depot is developed here otherwise minimal	Yes if depot is developed here otherwise minimal	13-May-03	Ken Ramage (Financial Director)	0131 337 4204	Met with Mr Ramage 13 / 05 / 03	Depot Impacts
05	Russell Road	Haymarket Cleansing depot	CEC	Yes	Yes	02-May-03	Mike Drewery Ian Hunter	0131 469 5454	Met with Mr Drewery 02 / 05 / 03	Depot Impacts
06	Russell Road	CEC Fleet Services	CEC	Yes	Yes	02-May-03	Jim Lambie Pat Trayner	0131 657 0004	Met with Mr Lambie 02 / 05 / 03	

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5.0 WESTFIELD ROAD

Along Westfield road, the tram will run behind the following buildings :

Carnies Garage
MAZDA Garage
Residence building
Westfield House (offices)
Grant West Field

The land in this area was already reserved for the CERT alignment, so impact should be minimised and contact has been left till later in the programme.

07 Carnies Garage

This property immediately adjacent to the South Suburban (west bound link) would require to be demolished for the Southerly alignment where it drops to go under the South Suburban rail line. The business operates under the name Robertson and Shaw.

Mr Robertson was spoken to by FM/S

Tel: 0131 [redacted]

It was noted that the property is owned by the City Council and that it flooded in the heavy rain earlier in the week. Mr Robertson noted that he had been through the whole CERT process so was relatively open to the tram proposals.

08 McKay Mazda

FM/S briefed **Mr Peter Kinnon** of McKay Mazda, Westfield Road regarding the public consultation. Mr Kinnon noted that the owner is Mr Iain Dewar, and offered to brief him.

McKay Mazda
44 Westfield Road
Edinburgh
EH11 2QB
Tel: 0131 [redacted]
Fax 0131 337 6677

09 Residential properties No 36 & 38 Westfield Road

Property No 36 appears to be undergoing internal renovation.

10 Westfiled House

This new office block is up for lease, the developers are:

Montague and Evans *Tel: 0131* [redacted]
Jones Land Lasalle *Tel: 0131 2* [redacted]

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FM/S have met with **Mr Cameron Stott** of Jones Land Lasalle who are managing the property and its lease. It was noted that the impact was to be similar to what was proposed for CERT.

11 Grant Westfield
This is a factory unit which manufactures cubicles. It has frontage onto Westfield Avenue. There is considerable history attached to Grant Westfield in relation to the CERT project.

6.0 BALGREEN ROAD

There are two business properties which are likely to be impacted at Balgreen Raod
12 peedy Clearances - Second Hand shop adjacent to the pedestrian tunnel

FM/S met with the manager of this shop **Brian Gibbeson** who enquired if the possibility of taking the line along the foot of the embankment (going through the actual property).

The building is owned by Mr. Gibbesons sister Mrs Sylvia Croal. Mr Gibbeson was pleased to be consulted and visited the static exhibition in Cockburn Street the following day.

13 Jenners Depository out-building
This building may need to be purchased. Whereas the main building of Jenner's depository is listed, it is understood that this one is not. Some land purchase will also be necessary. The tram will be running at the existing levels.

FM / S met with **Mr Andrew Richardson** and explained the Tram Line 2 options to him noting the greatest impact from the hybrid option. It was noted that the option to buy out the out-building had been discussed during the development of the CERT proposals. Mr Richardson is to discuss the Tram proposals with his boss Mr Jim Canpbell.

Building Manager	Mr McCutcheon	0131 [redacted]
Service Manager	**Mr Jim Campbell**	[redacted]

7.0 STENHOUSE DRIVE

14 Royal Air Cadet Corp building
The main impact on non residential property at this location is the Air Cadets Training Corps building located on the proposed alignment of the tram, for both South and North option.

FM/S has contacted **Squadron Leader Campbell** and provided him with an exhibition brochure prior to organising a meeting to discuss the impact on the Royal Air Cadet Corp building.
Edinburgh & South Scotland Wing

FABER MAUNSELL

ATCHQ
301 Collington Road
Edinburgh
EH13 0LA

Subsequent consultation has been held with **Major Knox**, who attended one o f the exhibitions and viewed the consultation plans. A set of these plans was subsequently provided to him for further consideration and he queried if their building could be relocated along the route.

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Royal Air Cadets
60 Avenue Park Street
Glasgow
G20 8LW

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Building ID	Street name	Property	Ownership	Potential Impact	Potential Land Take	Date of visit	Contact name	Contact phone	Notes of visit	Impact on properties
07	Westfield Road	Cairnes Garage	CEC	Yes	Yes	02/05/03	Mr Robertson	0131 [redacted]		Potential Demolition
08	Westfield Road	Mckay Mazda	Mr Iain Dewar	Operational possible	No	15 May 03	Mr Peter Kinnon	0131 [redacted]	Mr Kinnon will brief owner	Likely as CERT
09	Westfield Road	Residential 34 & 36		No	No					
10	Westfield Road	Westfield House		No	No		Cameron Stott	0131 [redacted]		
11	Westfield Road	Grant Westfield		No	No					
12	Balgreen Road	Speedy Clearances	Mrs Sylvia Croal	Operational	No	20 May 03	Mr Brian Gibbeson	[redacted]	Mr Gibbeson interested in possibility of CPO	Route dependent
13	Balgreen Road	Jenners Depository	Jenners (?)	Yes	Yes		Mr McCutcheon Jim Campbell	0131 [redacted] 0131 [redacted]	Understood impacts from CERT proposal	Hybrid would require out building
14	Stenhouse Drive	Air Training Corp	?	Yes	Yes		Squadron Leader Campbell	?		

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8.0 RESIDENTIAL

In addition to business properties FM / S along with TIE / D&W undertook to speak with the residents in the properties which are likely to be affected

01 Setnhouse Avenue West
On the Southern route option (adjacent to the railway and Whitson Road there is potentially a major impact on the building adjacent to the railway line on Stenhouse Avenue West with the potential need to demolish part or all of the building nearest the railway.

It is understood that the ownership of most of this property remains with the Council and this is being investigated by Dundas & Wilson. As a courtesy to the tenants however each of the houses within the building was approached. Of the six doors knocked there was no response from two, the other four were not willing to engage in conversation. All six were provided with a copy of the exhibition leaflet.

02 1 Old Liston Road, Newbridge
At the Western extremity of the scheme the proposals cut across the edge of a private property in Newbridge village. The owner of this property was approached and a discussion was held with him.

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FABER MAUNSELL

Aegis Semaly Ltd
Public Transport Consultants & Engineers

CEC01702137_0075

Appendix B – Schedule of Meetings

EDINBURGH TRAM LINE 2
Schedule of Meetings Held

		am	pm
October			
	18	Inception Meeting	
	19		
	20		
	21		
	22		
	23		
	24		
	25	WEBS	BT - Site meeting Edinburgh Park
	26		
	27		
	28		
	29		
	30		
	31	Line 1	
November			
	1		
	2		
	3		
	4		Weber Shandwick
	5		
	6		
	7		**Steering Committee 1** Initial Modelling Meeting FM / SDG
	8		

SG - Sub Group

EDINBURGH TRAM LINE 2
Schedule of Meetings Held

November	am	pm
7		**Steering Committee 1**
8		
9		
10		
11		Route Options Workshop
12		Route Options Workshop
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		BAA - Edinburgh Airport
26		Babtie - Traffic
27		
28		Grant Thornton - Costing
29		
30		
December		
1		
2		
3		
4		
5	CERT (David Reid, Babtie)	**Steering Group 2**
6		
7		
8		
9		

SG - Sub Group

EDINBURGH TRAM LINE 2
Schedule of Meetings Held

December	am	pm
5	CERT (David Reid, Babtie)	**Steering Group 2**
6		Mott MacDonald (Cancelled)
7		
8		
9		
10	Mott MacDonald	
11	TIE Site Visit	
12	BAA	
13		Procurement?
14		
15		
16		TIE - Route Options
17		
18		
19		Line 1 interface
20	Environmental Assessment	Appraisal and Modelling (SG)
21		
22		
23		CEC Transport
24		
25	Christmas	
26		
27		
28		
29		
30		
31		
1	New Year	
2		
3		
4		
5		

SG - Sub Group

January		am	pm
	1		New Year
	2		
	3		
	4		
	5		
	6		
	7		
	8		
	9	TIE Board - Procurement	CEC Transportation
	10		
	11		
	12		
	13		
	14	Royal Bank of Scotland	HMRI (Line 1)
	15		
	16		**Steering Committee 3**
	17	Alignment Review (FM)	Network Rail Procurement workshop
	18		
	19		
	20		PR & Comms (SG)
	21		Grovernor
	22		
	23	Royal Bank of Scotland (MACE)	Appraisal and Modelling (SG)
	24		TIE - progress review
	25		
	26		
	27		
	28		
	29		
	30	Hybrid Route Options Appraisal	TIE - progress review
	31		4 Projects intro
February			
	1		
	2		
	3		PR & comms (SG)
	4		
	5		Planning (SG)
	6	TIE - progress review	Appraisal and Modelling (SG)
	7		Appraisal and Modelling (SG)
	8		
	9		
	10		WEBS Carl Bro / Balfour Beatty
	11		Line 1 John Byegate (SE) Heavy rail interface)
	12		
	13	Risk Workshop	**Steering Committee 4** Babtie - Traffic
	14	Procurement (SG)	TIE - progress review
	15		
	16		

SG - Sub Group

EDINBURGH TRAM LINE 2
Schedule of Meetings Held

		am	pm
February			
	13	Risk Workshop	**Steering Committee 4**
	14	Procurement	Programme (GRM /GD)
	15		
	16		
	17		PR & Comms (SG)
	18	Scottish Executive -WEPF	CEC Presentation prep
	19	Airport Rail Links Stakeholder Presentation	Traffic Management (SG)
	20		City of Edinburgh Council Planning presentation
	21	Light Rail Scotland	Programme (GRM /GD) CEC Traffic
	22		
	23		
	24		
	25	PR & Comms (SG) workshop	
	26	Public Utilities Workshop	
	27		Project Review (FM/TIE)
	28		
March			
	1		
	2		
	3		New Ingliston
	4	CEC Planning	
	5	Waverley Redevelopment Steering Gp	Scottish Executive (STAG 2)
	6	CEC Traffic	Programme (GRM /GD) Network Rail (Haymarket Depot)
	7		
	8		
	9		
	10		Planning (SG)
	11	Royal Highland Showground	
	12		New Edinburgh Ltd. / Edinburgh Park
	13		**Steering Committee 5**
	14		

SG - Sub Group

EDINBURGH TRAM LINE 2
Schedule of Meetings Held

		am	pm
March			
	13	Environmental Stakeholders presentation	**Steering Committee 5**
	14		
	15		
	16		
	17	BAA (Edinburgh Airport)	
	18	Early Operator Involvement	
	19	SRU Murrayfield	TIE Alignment Review
		Carl Bro / Balfour Beatty / HMRI (WEBS)	
	20		CEC Planning Alignment Review
	21		The Gyle Centre
	22		
	23		
	24		PR & Comms (SG)
	25	Early operator Involvement	PR & Comms (SG) - Artists Impression
			BAA Presentation - Airport Expansion
	26	Project Review / Alignment options (FM)	SEDD (Damian Sharp
	27		**Project Review (FM/TIE)**
	28		
	29		
	30		
	31	Landscape Workshop	
April			
	1		Health & Safety (SG)
	2	Waverley Steering Group	Line 1 Interface
			CERT Review
	3	Cost Estimate (Grant Thornton)	Programme Review (FM/TIE)
			Ansaldo
	4	EIA interface meeting (SG)	
	5		
	6		
	7	CEC Transport	Edinburgh Gate
	8	Early operator Involvement	CEC alignment Update
		Cockburn Society et al	
	9		HMRI
		CEC Traffic	Transport Modelling and Appraisal (SG)
			SKM airport Tram Link Debrief
	10	Network Study Inception	**Steering Committee 6**
	11		Line 1 Route Options

SG - Sub Group

EDINBURGH TRAM LINE 2
Schedule of Meetings Held

		am	pm
April			
	10	Network Study Inception	**Steering Committee 6**
	11		Line 1 Route Options
	12		
	13		
	14	RFACfS presentation	
	15	Early Operator Involvement	PR & Comms (SG)
	16		
	17		
	18	Good Friday	
	19		
	20	Easter Sunday	
	21		
	22	Early operator Involvement (SG) British Telecom (Edin Park)	TIE Board
	23	Scottish Equitable	Project Review / Alignment options (FM)
	24		
	25	Stakeholder Consultation (Roseburn Street)	
	26		
	27		
	28		Eastern BMW (Magnus Wang)
	29	Cost Workshop	
	30	Haymarket Working Group	
		Early operator Involvement (SG)	Airport Rail link
May			
	1	Project Review (FM/TIE) Network Effects Project Review	Network Effects Line 1 Inception
	2	CEC Cleansing Department	CEC Fleet Services
	3		
	4		
	5		
	6	Early operator Involvement (SG)	
	7		CEC Transport Network Effects
	8	Non Executive Bills Unit	**Steering Committee 7**
	9		

SG - Sub Group

EDINBURGH TRAM LINE 2
Schedule of Meetings Held

		am	Noon	pm	evening
May					
	8	Non Exec Bills Unit (NEBU)		**Steering Committee 7**	
	9				
	10				
	11				
	12			Design Group	
	13			Stakeholder consultation Charles Henshaw	
	14				Councillor Briefing
	15	Stakeholder consultation Caledonian Ceramics APEX properties McKay Mazda		TIE Presentation Briefing	
	16	Network Rail		Royal Highland Showground	
	17				
	18				
	19				
	20	Presentation Briefing	City Center Exhibition		
	21	Safety SG	City Center Exhibition	Appraisal and Modelling Group (SG)	Stakeholder consultation
	22	TIE Project review	City Center Exhibition	Scottish Executive	Special interest Group
	23		City Center Exhibition Special interest Group		
	24		City Center Exhibition		
	25		City Center Exhibition		
	26		City Center Exhibition Stevenson College		Special interest Group
	27	Risk Workshop	City Center Exhibition Stevenson College		
	28		City Center Exhibition Stevenson College		
	29	Haymarket Working group Bridge Impacts Route options assessment	City Center Exhibition workshop		
	30		City Center Exhibition	CEC / MM Topo Survey requirements	
	31		City Center Exhibition		
June					
	1		City Center Exhibition		
	2		City Center Exhibition		
	3		City Center Exhibition Saughtonhall Church		Public Meeting
	4	MACE / Royal Bank of Scotland Utilities update (CEC)	City Center Exhibition Saughtonhall Church		Public Meeting
	5	Councillor Gilchrist CEC environment AQA	City Center Exhibition	Optimism Bias workshop preparation	Public Meeting
	6		City Center Exhibition	Public Meeting Review FM / TIE	
	7		City Center Exhibition		
	8		City Center Exhibition		
	9		City Center Exhibition Gorgie Church	CEC Environment (Noise)	Presentation West End CC
	10	Optimism Bias Workshop	City Center Exhibition Gorgie Church		Public Meeting
	11		City Center Exhibition Gorgie Church	British Airports Authority	
	12		City Center Exhibition	**Steering Committee 8**	
	13		City Center Exhibition		
	14				

SG - Sub Group

EDINBURGH TRAM LINE 2
Schedule of Meetings Held

		am	Noon	pm	evening
June					
	12		City Center Exhibition	**Steering Committee 8**	
	13		City Center Exhibition		
	14		City Center Exhibition		
	15		City Center Exhibition		
	16		City Center Exhibition		
	17	Environment meeting (FM / TIE)	City Center Exhibition		Parliamentary Briefing
	18	Health and Safety	City Center Exhibition		
	19		City Center Exhibition		
	20		City Center Exhibition Gyle Shopping Centre Exhibition	Councilor Milligan	
	21		City Center Exhibition Gyle Shopping Centre Exhibition		
	22		City Center Exhibition Gyle Shopping Centre Exhibition		
	23		City Center Exhibition Gyle Shopping Centre Exhibition	BAA Edinburgh Airport	
	24	Scottish Exec Site Visit	City Center Exhibition Gyle Shopping Centre Exhibition		
	25	Appraisal and Modelling Group (SG)	City Center Exhibition Gyle Shopping Centre Exhibition		Public Meeting (Balgreen Primary)
	26			Route Options Review	
	27				
	28				
	29				
	30		Planning SG		
July					
	1				
	2	Gogar Church			
	3	Scottish Exec Environment Briefing		Progress meeting	
	4				
	5				
	6				
	7				
	8				
	9	Design Workshop		WEBS review	
	10			**Steering Committee 9**	
	11	Planning review of LUTI Forecasts			
	12				
	13				
	14				
	15				
	16	Network Rail			

SG - Sub Group

July

9	Design Workshop	WEBS review
10		**Steering Committee 9** Planning review of LUTI Forecasts FM BDB - BAA Edinburgh Ariport discussion
11		
12		
13		
14		
15	Meeting with Sarah Boyack	
16	Network Rail	Architect Site visit
17	Haymarket Meeting	
18		Progress review
19		
20		
21		
22	DPOF	
23	Alignment Options Review	Meeting with Andrew Holmes
24	MACE (Royal Bank of Scotland Developer)	
25	TIE Programme meeting	
26		
27		
28		Princess Street workshop
29		Royal Bank of Scotland GI contract initiation
30	Teleconference with TIE	BAA Edinburgh Airport
31		GI contract CEC requirements

August

1		
2		
3		
4	OPEX Cost Workshop	
5	Development oportunities	STAG appraisal workshop
6	**Progress Meeting**	
7		
8		
9		
10		
11	Haymarket meeting	
12		
13	Lifecycle / CAPEX workshop	
14		**Steering Committee 10**
15		

SG - Sub Group

EDINBURGH TRAM LINE 2
Schedule of Meetings Held

		am	Noon	pm	evening
August					
	14			**Steering Committee 10**	
	15				
	16				
	17				
	18			TIE review	
	19				
	20	Network Rail		Emergency Services (Police Ambulance)	
	21	CAPEX Assumptions (TIE / GT)			
	22	Topographical Contract inception			
	23				
	24				
	25		TIE / CEC Alignment (Gogarburn)		
				Risk Review	
	26	BAA Edinburgh Airport	Site visits (TIE)		
	27	Emergency Services (Fire)			
		Environmental considerations (Legal)			
	28			Design Manual	
				Baird Drive Briefing (Clr Burns)	
	29	Modelling SG			
	30				
	31				
September					
	1				
	2	Land Referencing (int)			
	3	Land Costs			
		Risk Review (TIE / GT)		Cost Estimate review (TIE)	
	4	Land Referencing (BDB)			
	5				
	6				
	7				
	8				
	9			Line 1 Interface meeting	
				Programme (Business Case) - TIE / GT / Lines 1&2	
	10	WEBS			
		CEC Water of Leith Flood prevention			
		Design Manual			
	11			**Steering Committee 11**	
	12	Hazlemere Estates			
	13				
	14				

SG - Sub Group

September	am	Noon	pm	evening
10	CEC flood prevention			
11			**Steering Committee 11**	
12	Hazlemere Estates			
13				
14				
15				
16			Murrayfield	
17	Network Rail			
18	Scottish Executive		Powell Williams Ptns (tele)	
19	Roseburn Street Conslutations		Traffic meeting (TRO's)	Baird Drive Conslutation
20				
21				
22				
23				
24	Health & Safety			
		CEC Issues meeting		
			TIE Cost (Insurance & Optimisation)	
25			Gyle development	
			TIE / BDB	
26				
27	Gogar Church - Doors Open Day			
28				
29	Haymarket Steering Group			
30			HMRI	
October				
1	Gyle development			
2	TIE Cost (Insurance Workshop)		TIE Cost (Optimisation Workshop)	
			Conslutation	
3			TIE Progress	
4				
5				
6				
7				
8				
9			**Steering Committee 12**	
10				
11				
12				

Appendix C – Murrayfield Flood Defence

Revision C

Drawing No. 30894 / P340_C

WATER OF LEITH

ramped access to newbridge

Approximate wall height =1.6m above ground level

flood prevention wall

top of wall = 43.93

tram on top of existing embankment

Approximate wall height =1.6m above ground level

N

5.0 m wide flood gate

new structure required

extra track for stabling

flood prevention wall

1250 1200 1150 1100 1050 1000

RAILWAY LINE

N

Approximate wall height =1.6m above ground level

Rev	Description of revision	Auth	Chkd	App	Date
C	NEW ALIGNMENT UPDATED	MMO	MCR		26/11/03
B	NEW ALIGNMENT UPDATED	MMO	CBT		08/10/03
A	FIRST ISSUE	MMO	CBT		10/09/03

Client: tie transport initiatives edinburgh

Project: EDINBURGH TRAM LINE TWO

Designed	CBT
Drawn	MMO
Checked	
Reviewed	

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CAD filename:

Title: EDINBURGH TRAM LINE TWO RUGBY PITCHES PROJECT

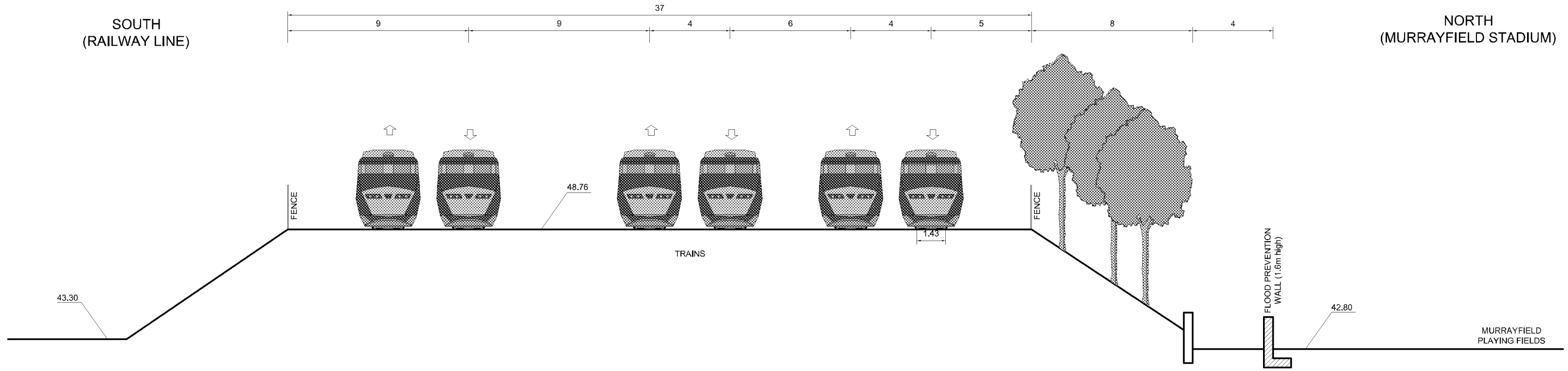
DRAFT, FOR INFORMATION ONLY

Size A1 Scale 1/500 Date 26/11/03

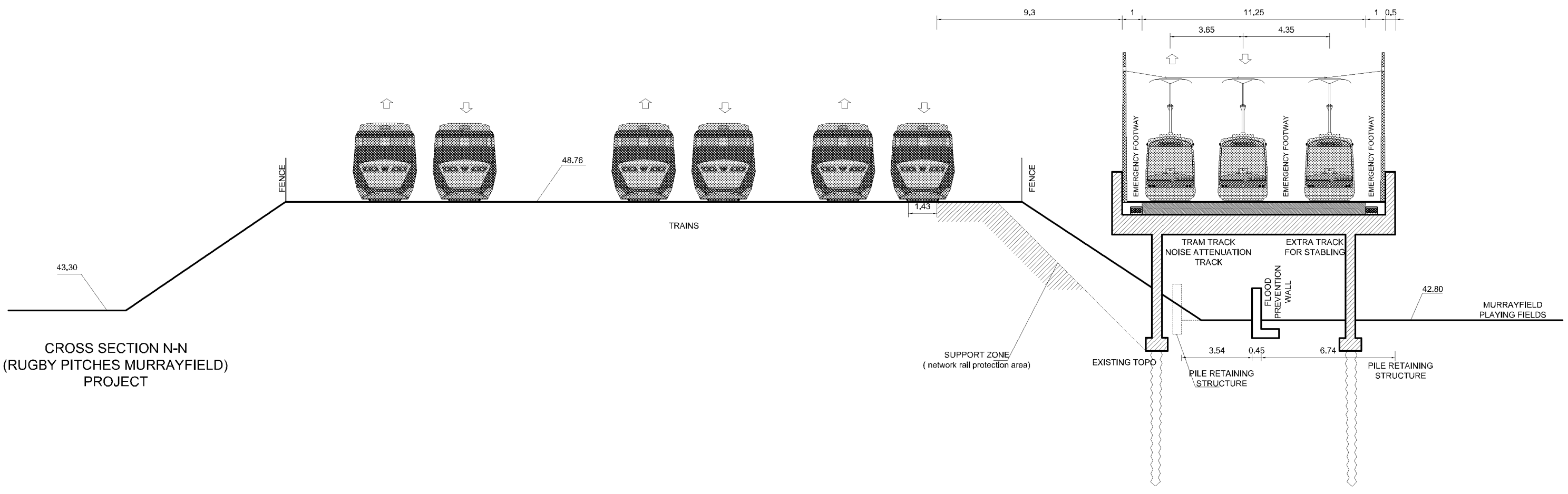
Status INFO

Drawing No. 30894 / P340 _C Revision C

CEC01702137_0090



CROSS SECTION N-N
(RUGBY PITCHES MURRAYFIELD)
EXISTING SITUATION



CROSS SECTION N-N
(RUGBY PITCHES MURRAYFIELD)
PROJECT

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Rev	Description of revision	Drawn	Chkd	App	Date
D	MINOR MODIFICATIONS	MMO	CBT		29/09/03
C	ALIGNMENT UPDATED	MMO	CBT	GMU	12/09/03
B	MINOR MODIFICATIONS	MMO	CTH	GMU	07/07/03
A	FIRST ISSUE	MMO	CTH	GMU	30/06/03

Drawing Title
EDINBURGH TRAM
LINE TWO
CROSS SECTION N-N
OPTION 2
RUGBY PITCHES

Drawing No. 30894 / P343 OPT 2

Designed	CBT
Drawn	MMO
Approved	
Scale	1 : 200 @ A3
Revision	D
Status	INFO

DRAFT, FOR INFORMATION ONLY

CEC01702137_0091

Appendix D – Russell Road and Balgreen Road Issues

FABER MAUNSELL

Egis Semaly Ltd
Public Transport Consultants & Engineers

Technical Note

Project:	**Edinburgh Tram Line 2**	Job No/Ref:	**30894MMH**
Subject :	**Russell Road – Balgreen Road bridges issues**	Date :	**04/07/03**
		Made by:	**Chris THATCHER**

Distribution :
David THORNTON (HMRI)

Copy :
Geoff DUKE (TIE)
John McCLEAN (FM)
Richard LLEWELLYN (FM)
Richard MANSFIELD (FM)
Gavin MURRAY (FM)
Kevin PERRY (SY)

1 Russell Road Bridge

1.1 Existing situation

Russell Road bridge is 12.50 m wide (minimum) and 4.12m high. The height restriction under the bridge is 4.00m for road users. There are presently 2 lanes of traffic under the bridge and a wide footway of 3.70m which is shared with cyclists.

A cross section of the existing situation is shown in the annexes.

1.2 Option 1 : Shuttle Working

In this solution, the tram will be segregated under the bridge and there will be only one lane for cars, buses and cyclists alongside it. No road users will be allowed on the tram track.

This option will require a shuttle working circulation on this traffic lane, which is compatible with the levels of traffic on this road according to our traffic management team.

The headroom under the bridge will be increased to 4.50m (distance between track and OHL cable of 4.20m) requiring a lowering of the existing carriageway level under the bridge by approximately 40cm at the permanent case.

At each end of the bridge, the OHL wire will climb progressively to reach the required clearance of 5.80m for other road users (HMRI Railway Safety Principles and Guidance part 2 section G). Where the OHLE wire height is below 5.80m, the track will not be accessible to other road users and pedestrians, and will be physically segregated. At the Northern end of the bridge, this constraint implies shifting the traffic lane Eastwards in order for it to cross the tram tracks at a sufficient distance from the bridge (more than 30m) for the OHLE wire to have achieved a minimum clearance to the carriageway of 5.80m..

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This option minimises the structural work required because it only involves lowering the carriageway level under the bridge by approximately 40cm at the permanent case.

A cross section shows the different distances and constraints of this option.

1.3 Option 2 : No Car Traffic

In this option, no car traffic will be allowed under the bridge, which means that Russell Road will no longer be a through-route. This would have an impact on the local residents and on the general traffic management in the area. The feasibility of this traffic impact is presently being looked at by our traffic management team.

The headroom under the bridge will be 4.50m allowing a clearance of 4.20m between the tram track and the OHLE wire and requiring the lowering of the existing road level under the bridge by approximately 40cm (as Option 1 above).

At each end of the bridge, the OHL wire will climb progressively to reach the required clearance of 5.80m for other road users (HMRI Railway Safety Principles and Guidance part 2 section G). Where the OHLE wire height is below 5.80m, the track will not be accessible to other road users and pedestrians, and will be physically segregated.

This option minimises the structural work required because it only involves lowering the carriageway level under the bridge by approximately 40cm at the permanent case.

A cross section shows the different distances and constraints of this option.

1.4 Option 3 : Shared Running

In this option, trams and cars would share the same traffic lanes under the bridge. The space under the bridge will be accessible to all road users, so the clearances between carriageway and OHLE equipment will need to be greater than for Options 1 and 2 above. A clearance of 5.20 m between the track and the OHL cable, requiring the lowering of the road level under the bridge by approximately 1.40m, could be achieved. This does not give the full clearance of 5.8 metres stipulated in the HMRI Guidance 2G, so there would be some restrictions on heights of vehicles that could use this crossing and special dispensation would have to be sought.

This option will imply sharing the track between the tram and the cars/buses, which is compatible with the levels of traffic on this road according to our traffic management team.

Pedestrians and cyclists will use the existing footways on each side of the Shared Running section. This space will be located at the existing levels (about 3.80m below the OHLE cable) but will be fenced from the shared running lanes to ensure segregation from the OHLE equipment.

At each end of the bridge, the OHL wire will climb progressively to reach the required clearance of 5.80m for other road users (HMRI Railway Safety Principles and Guidance part 2 section G).

This option requires more substantial structural work because it involves lowering the carriageway level under the bridge by approximately 1.40m at the permanent case. This would significantly affect the 3m wide “Support Zone” for the structure defined by Network Rail, however, this would be minimised by retaining 2m wide footways at their existing level adjacent to the bridge abutments.

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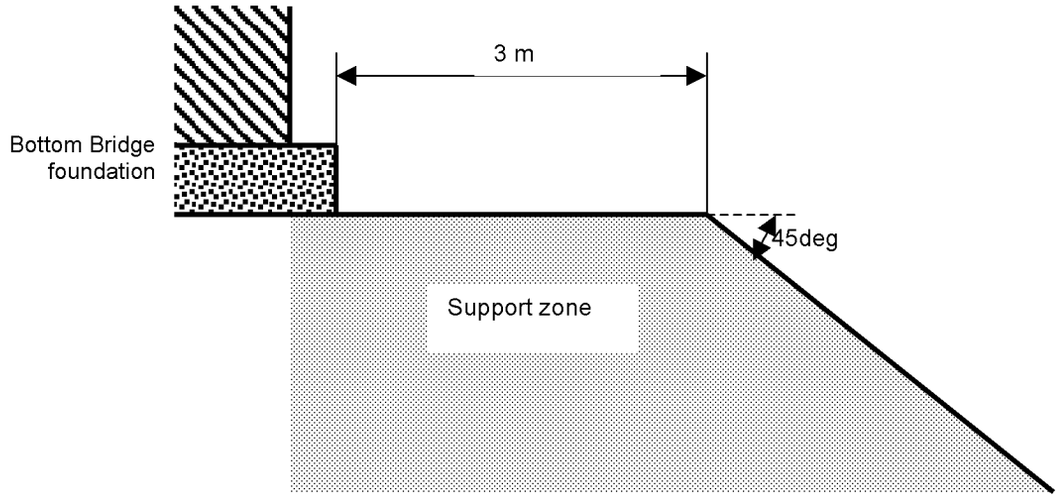
Support zone as defined in the document "Requirements for Constructional Work On or Near Railway Operational Land"



A cross section shows the different distances and constraints of this option.

2 Balgreen Road Bridge

2.1 Existing situation

Balgreen Road bridge is 7.49 m wide (minimum) and 4.35m high. The height restrictions under the bridge are 4.34m. There are presently 2 lanes of traffic under the bridge for cars, buses and cyclists but no footway. A tunnel with 3.35m of diameter is available for pedestrians on the East side of the bridge.
Bus services utilize this bridge.

A cross section of the existing situation is shown in the annexes.

2.2 Solution proposed

The solution proposed is to run the tram under the existing bridge, shared with cars and buses. The existing carriageway level would be lowered by approximately 1.15m in the permanent case to provide a clearance between carriageway and OHLE of 5.20m. This does not provide the full clearance of 5.8 metres stipulated in the HMRI Guidance 2G, so there would be some restrictions on heights of vehicles that could use this crossing and special dispensation would have to be sought.

At each end of the bridge, the OHL wire will climb progressively to reach the required clearance of 5.80m for other road users (HMRI Railway Safety Principles and Guidance part 2 section G).

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A second pedestrian tunnel will be built on the other (west) side of the bridge in order to relocate the utilities inside it and to improve pedestrian and cyclists access across the railway.

Several cross sections are shown on the annexes.

3 Annexes

Location Plan

Russell Road Bridge, Picture
Russell Road Bridge, Horizontal Plan, Scale 1/500
Russell Road Bridge, Cross Section of the Existing Situation
Russell Road Bridge, Cross Section of Option 1 (Shuttle Working)
Russell Road Bridge, Cross Section of Option 2 (No Car Traffic)
Russell Road Bridge, Cross Section of Option 3 (Shared Running)

Balgreen Road Bridge, Picture
Balgreen Road Bridge, Horizontal Plan, Scale 1/500
Balgreen Road Bridge, Cross Section of the Existing Situation (2 cross sections)
Balgreen Road Bridge, New bridges foundations
Balgreen Road Bridge, Cross Section of Proposed Solution (2 cross sections)

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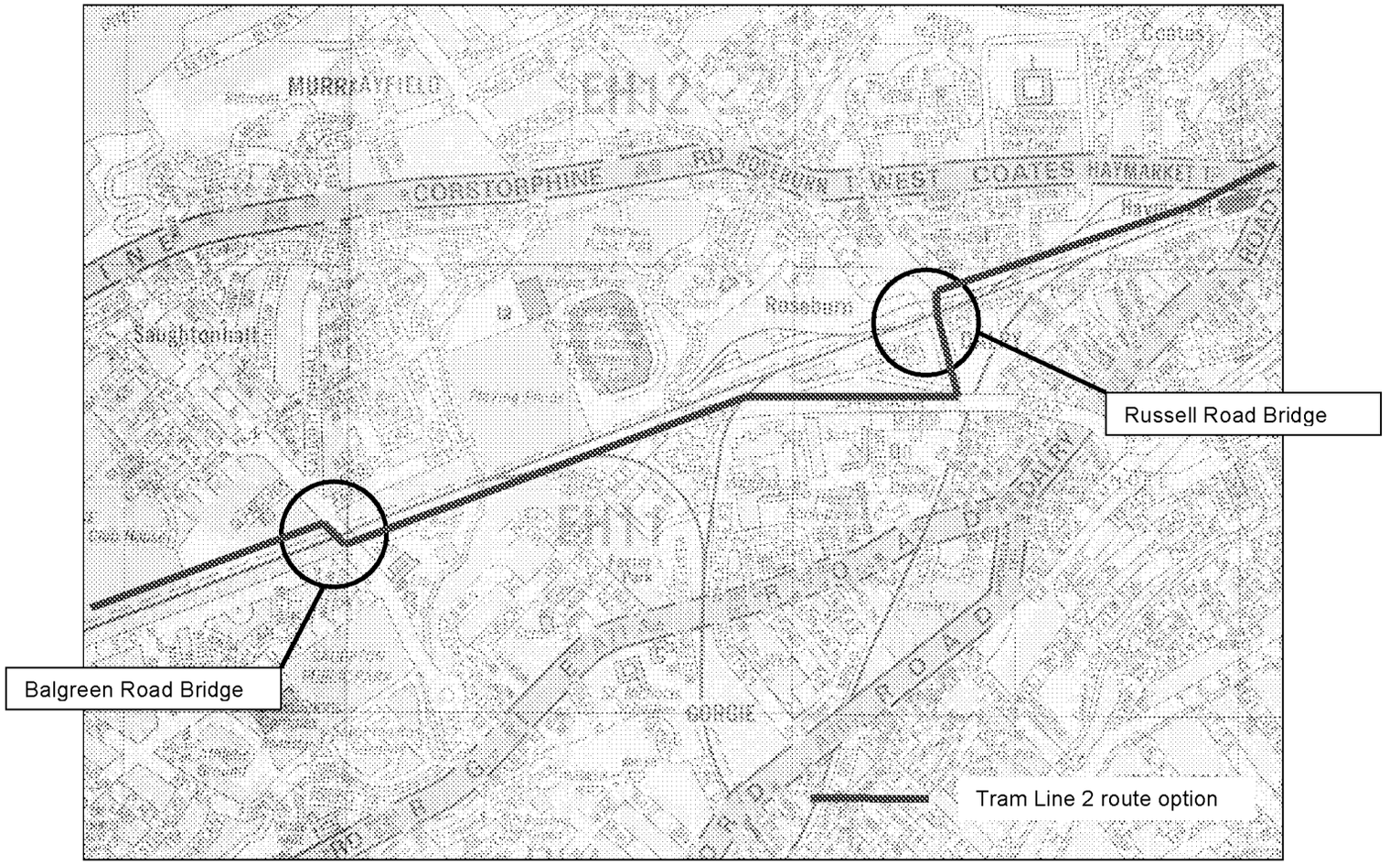
LOCATION PLAN



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RUSSELL ROAD PICTURE

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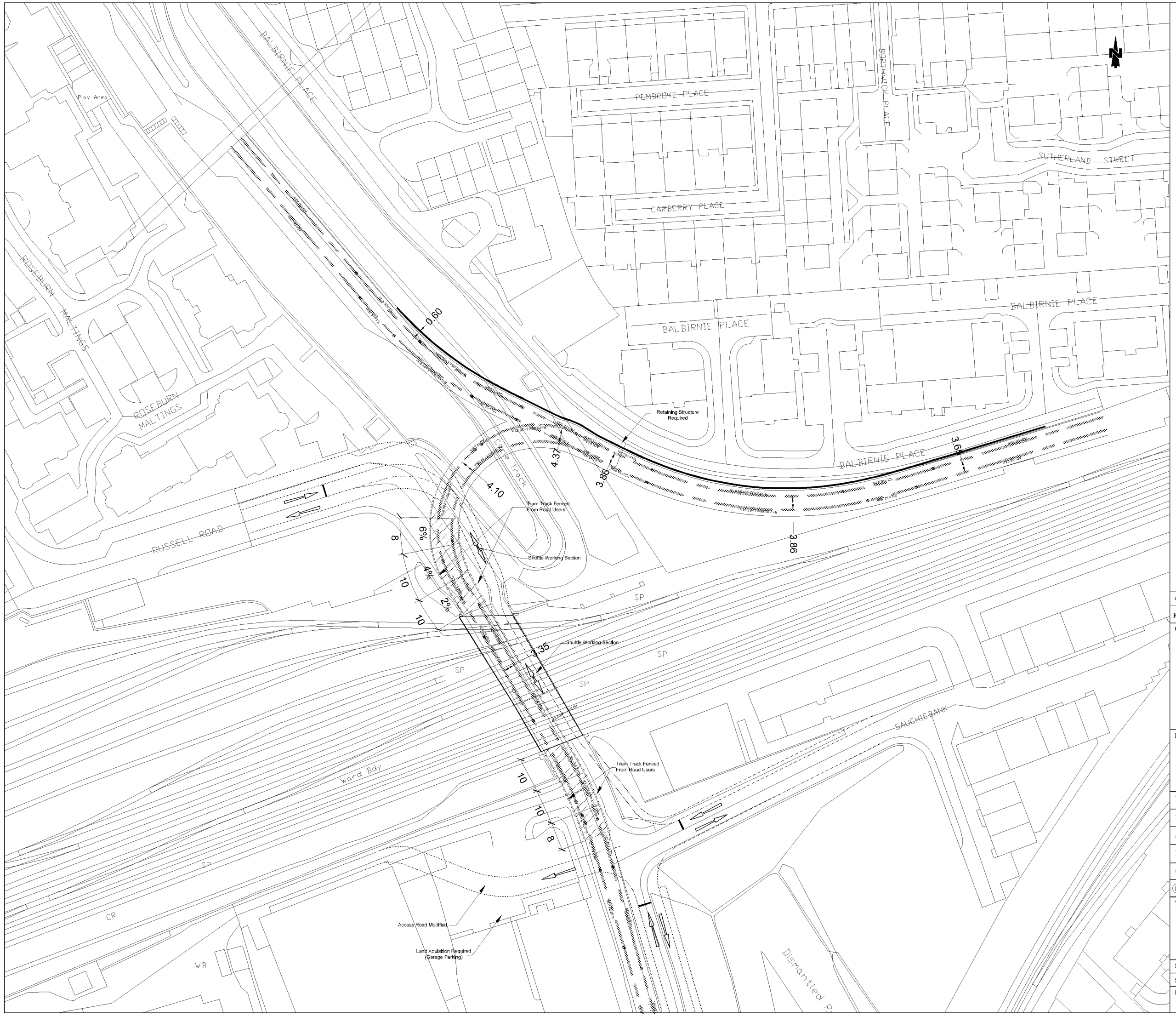

A	ORIGINAL LAYOUT	SLA	CTH	GMU	23/06/03
Rev	Description of revision	Auth	Chkd	App	Date

Client

transport initiatives edinburgh

Project

EDINBURGH TRAM
LINE TWO

Designed	CTH
Drawn	SLA
Checked	GMU
Reviewed	

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Public Transport Consultants & Engineers

CAD filename: P:\Contracts\5012\BD10 - Edinburgh Tram (Line 2)\CAD\Typical CS\Bigm-RSL Rd Cross

Title

EDINBURGH TRAM
LINE TWO - INITIAL ROUTE CORRIDOR
RUSSELL ROAD BRIDGE
OPTION 1: SHUTTLE WORKING

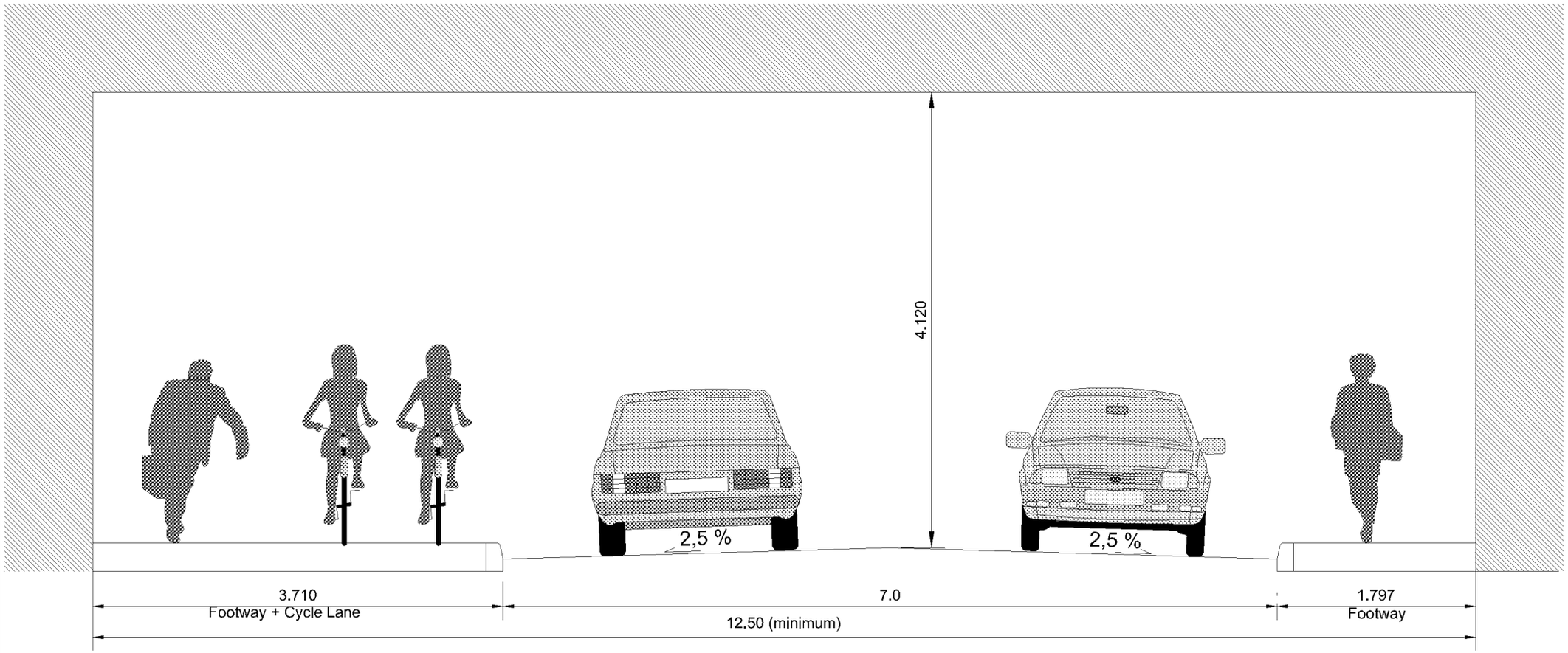
Size A1	Scale 500	Date	23/06/03
Status	INFO		
Drawing No.	30894 /	Revision	A

CEC01702137_0099

RUSSELL ROAD UNDERBRIDGE
EXISTING SITUATION
CROSS SECTION

EAST ABUTMENT

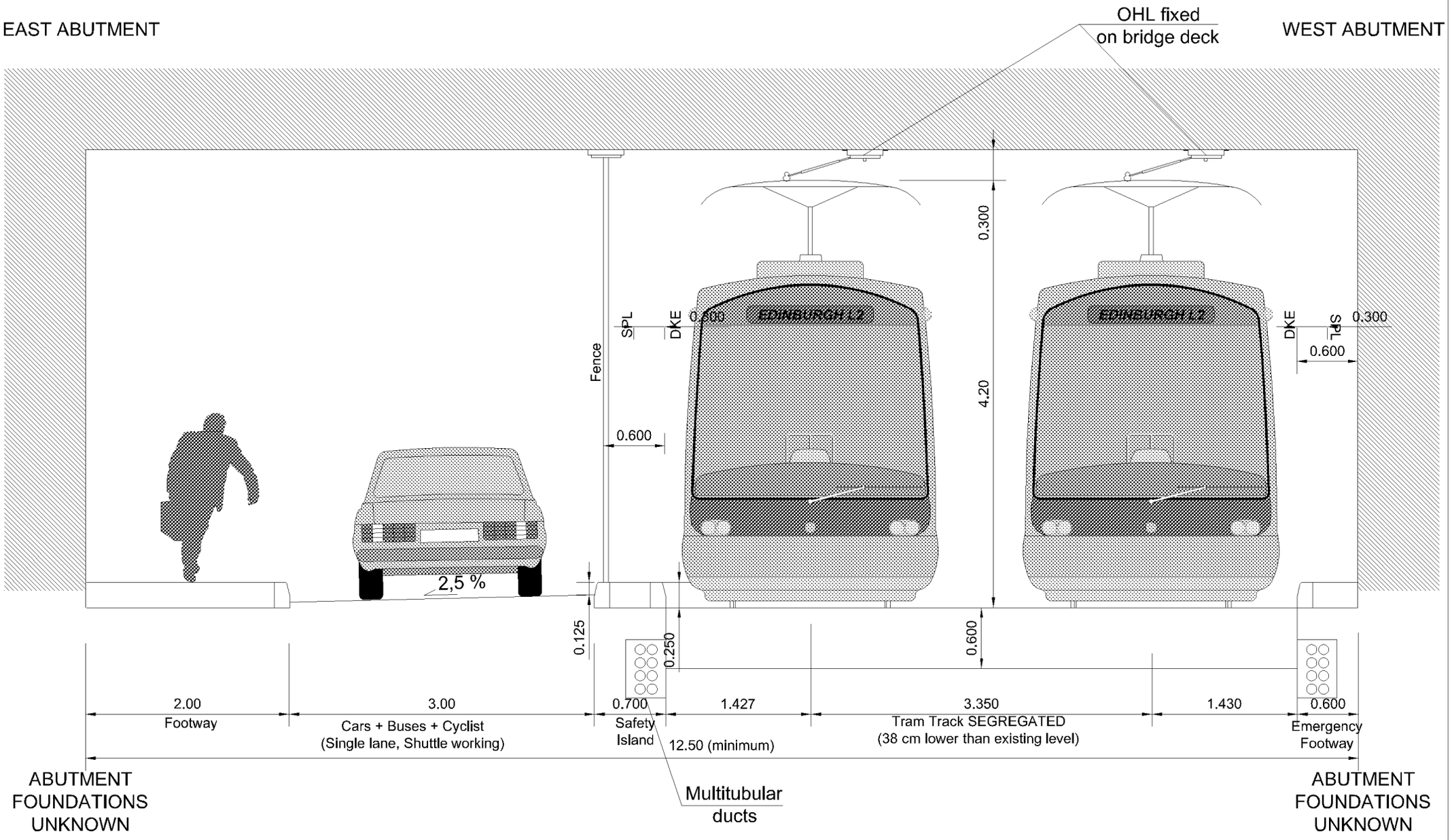
WEST ABUTMENT



SCALE : 1/50 @ A4

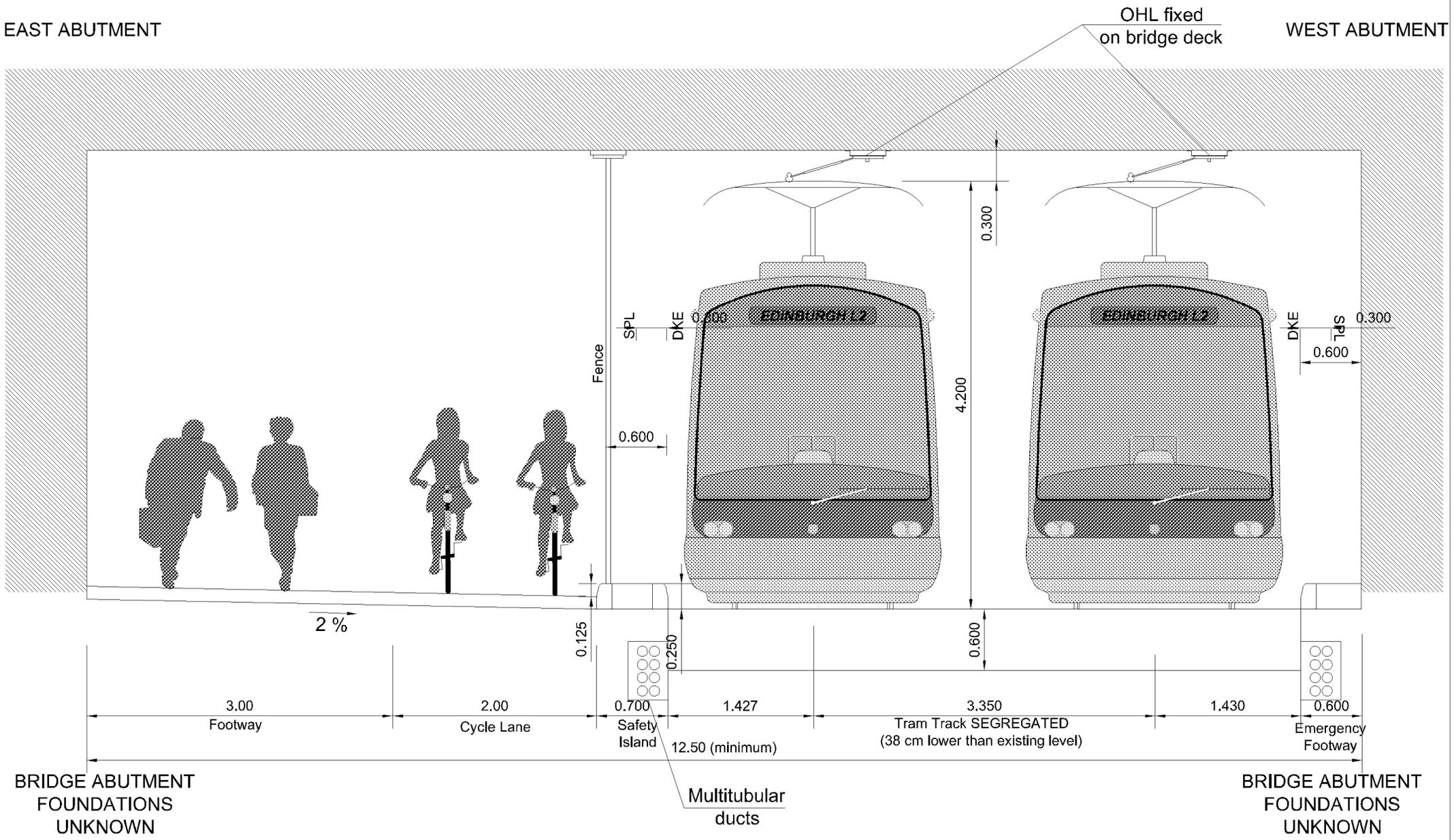
CEC01702137_0100

RUSSELL ROAD UNDERBRIDGE
OPTION 1 : SHUTTLE WORKING
CROSS SECTION



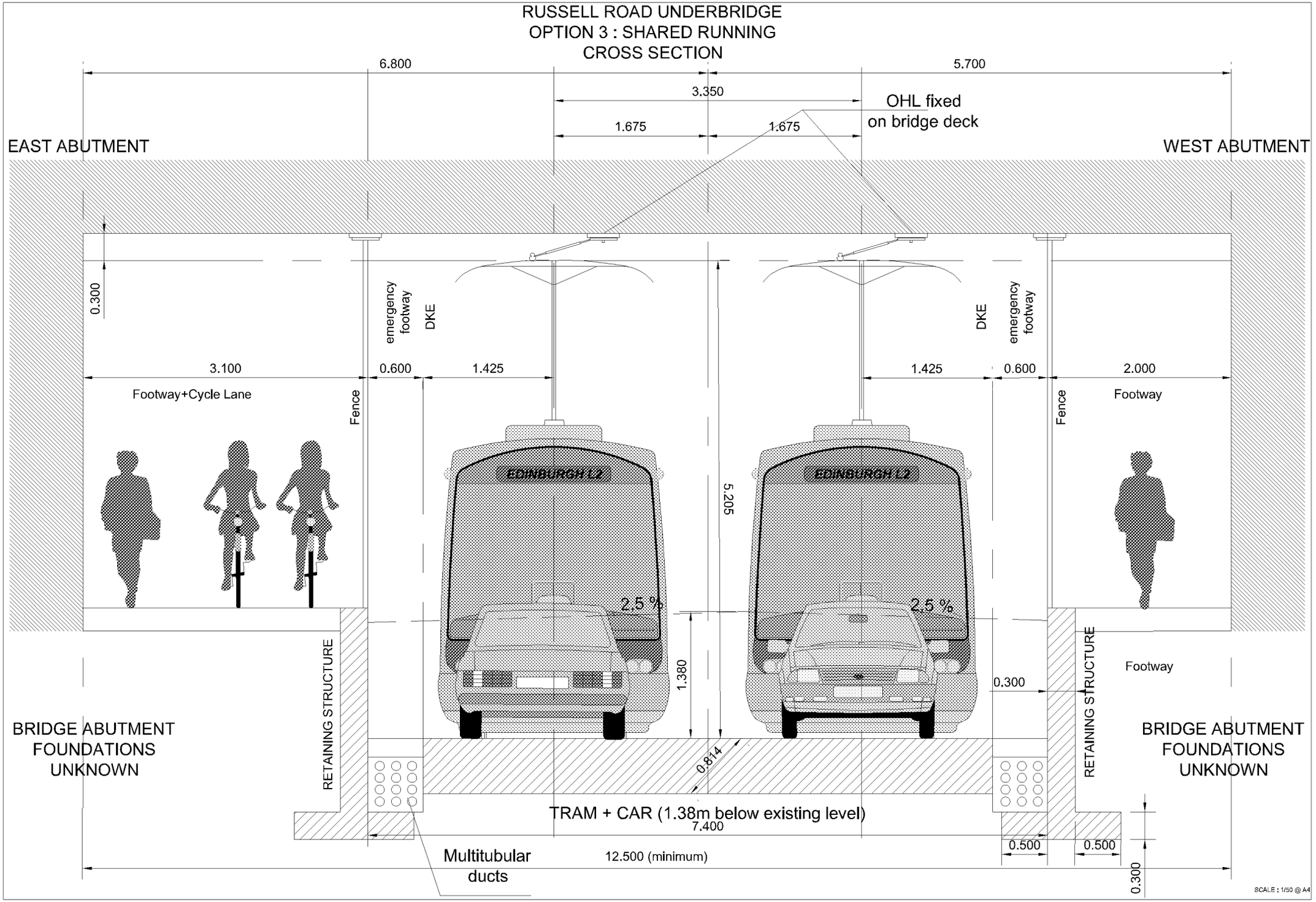
CEC01702137_0101

RUSSELL ROAD UNDERBRIDGE
OPTION 2 : NO CAR TRAFFIC
CROSS SECTION



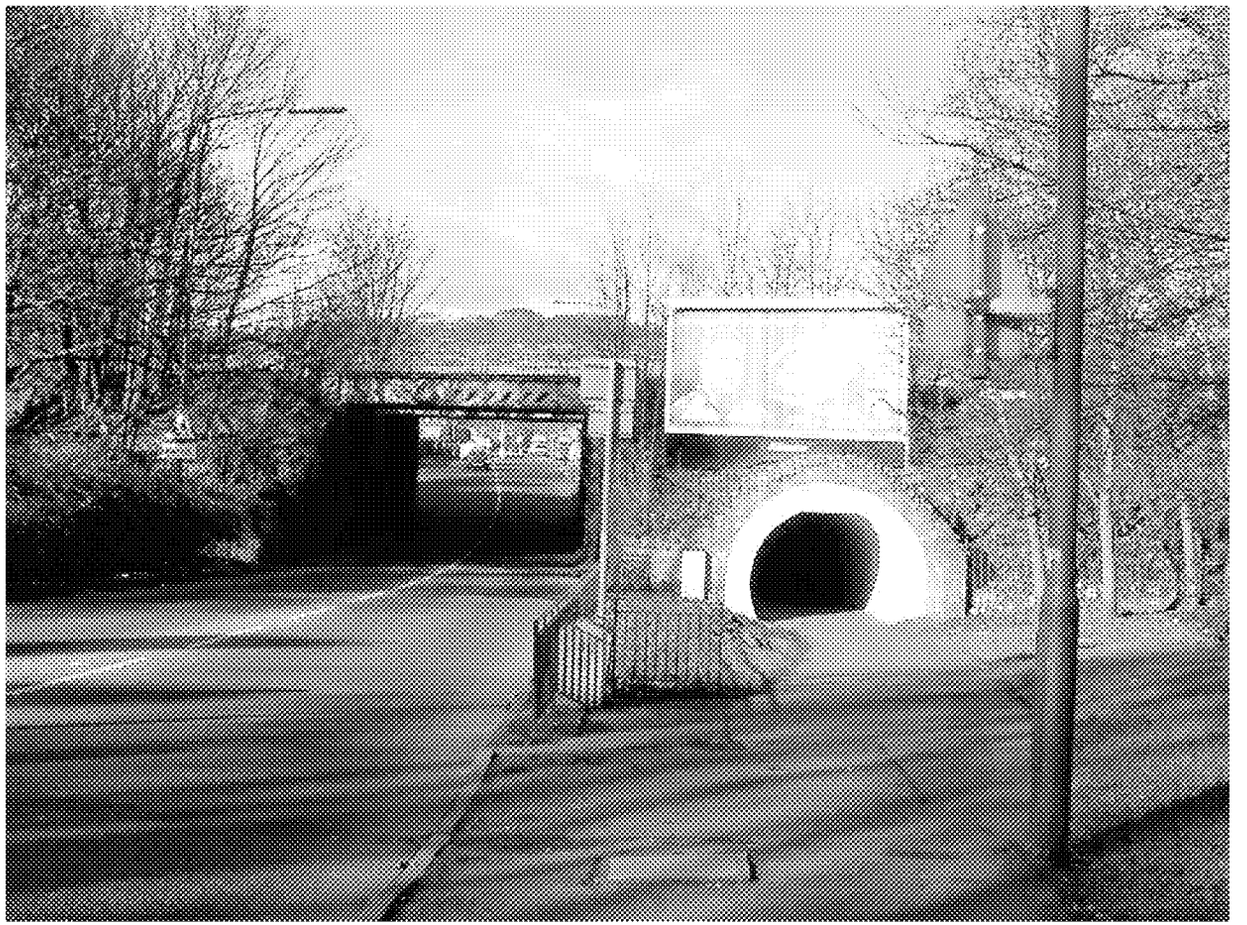
CEC01702137_0102

SCALE : 1/50 @ A4



CEC01702137_0103

BALGREEN ROAD PICTURE



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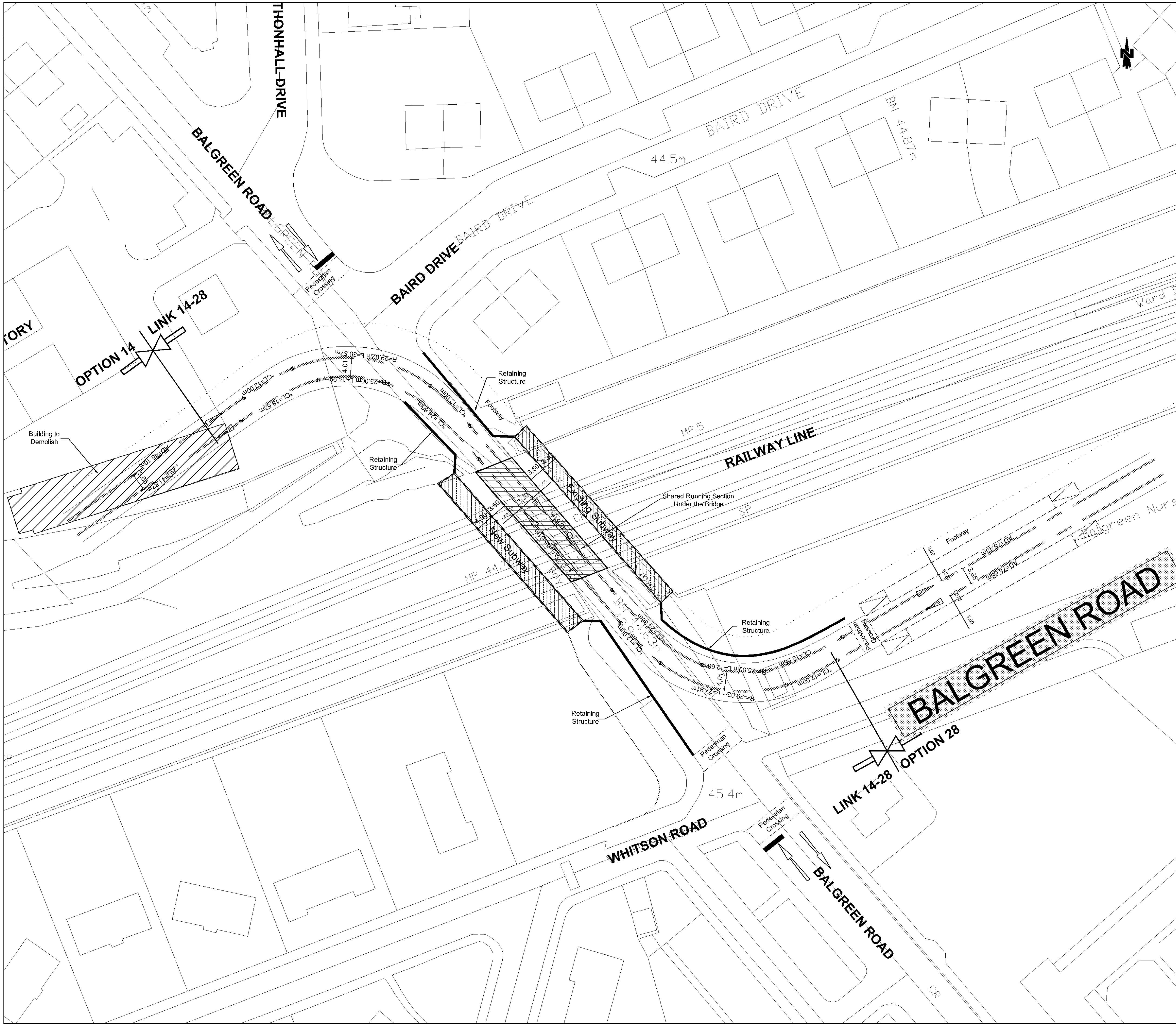


THONHALL DRIVE
BALGREEN ROAD
BAIRD DRIVE
BAIRD DRIVE
44.5m
BM 44.87m
Pedestrian Crossing
OPTION 14
LINK 14-28
Building to Demolish
Retaining Structure
Footway
Retaining Structure
MP 5
RAILWAY LINE
Shared Running Section Under the Bridge
Existing Subway
New Subway
SP
Footway
Retaining Structure
Pedestrian Crossing
BALGREEN ROAD
OPTION 28
LINK 14-28
Retaining Structure
Pedestrian Crossing
45.4m
WHITSON ROAD
Pedestrian Crossing
BALGREEN ROAD
CR

Rev	Description of revision	Auth	Chkd	App	Date
A	ORIGINAL LAYOUT	SLA	CTH	GMU	25/06/03

Client: tie — transport initiatives edinburgh

Project: EDINBURGH TRAM LINE TWO

Designed: CTH
Drawn: SLA
Checked: GMU
Reviewed:

FABER MAUNSELL — Dundas House, 20 Rawlinson Terrace, Edinburgh, EH10 5ST

Aegis Systemics Ltd — Public Transport Consultants & Engineers

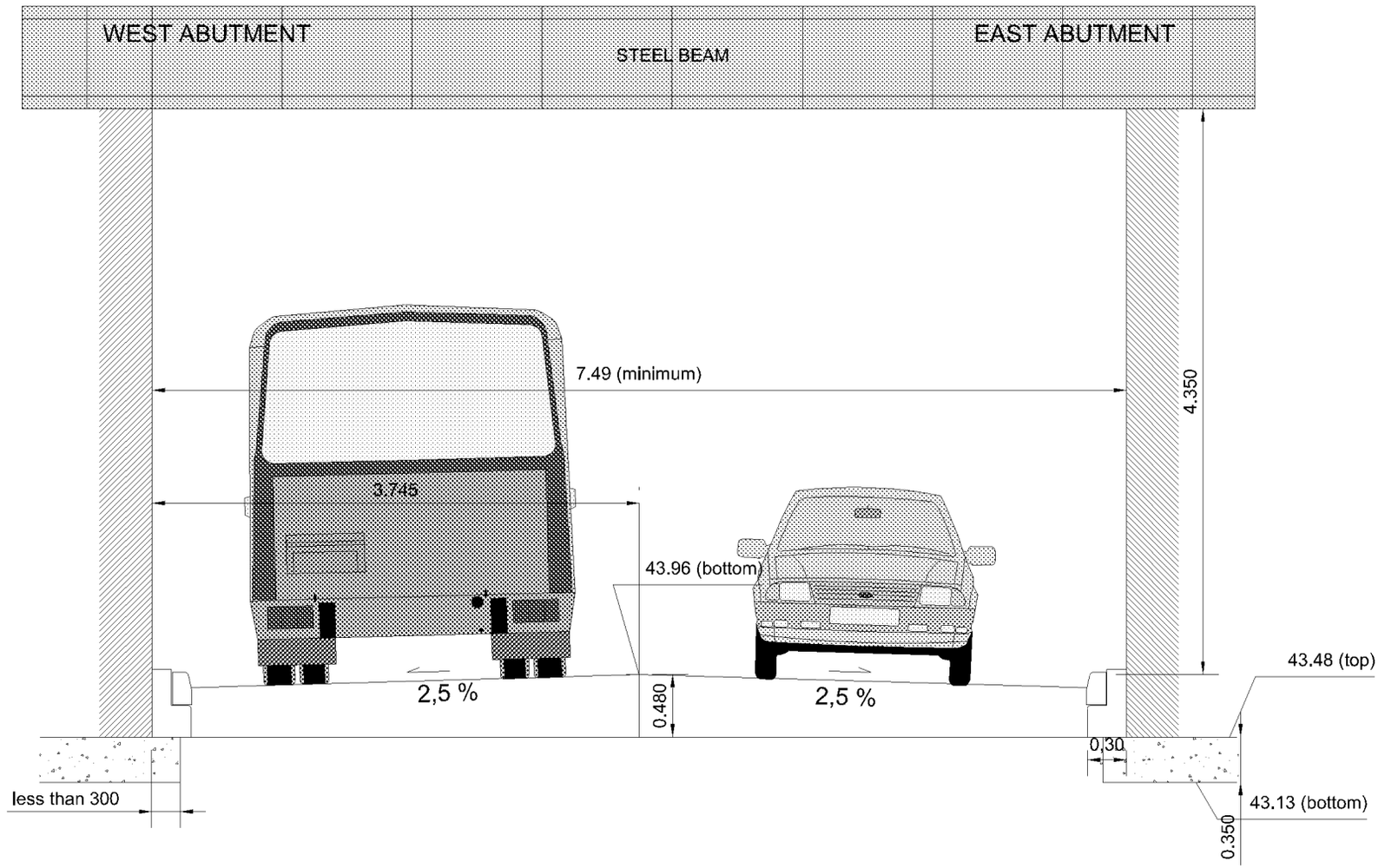
CAD filename: P:\Contracts\8012BD10 - Edinburgh Tram (Line 2)\CAD\Typical CS\Blgrn_Rd_Bridge

Title:
EDINBURGH TRAM
LINE TWO - INITIAL ROUTE CORRIDOR
BALGREEN ROAD BRIDGE
PROPOSED SOLUTION (SHARED RUNNING)

Size A1 | Scale 500 | Date 25/06/03
Status INFO
Drawing No. 30894 / | Revision A

CEC01702137_0105

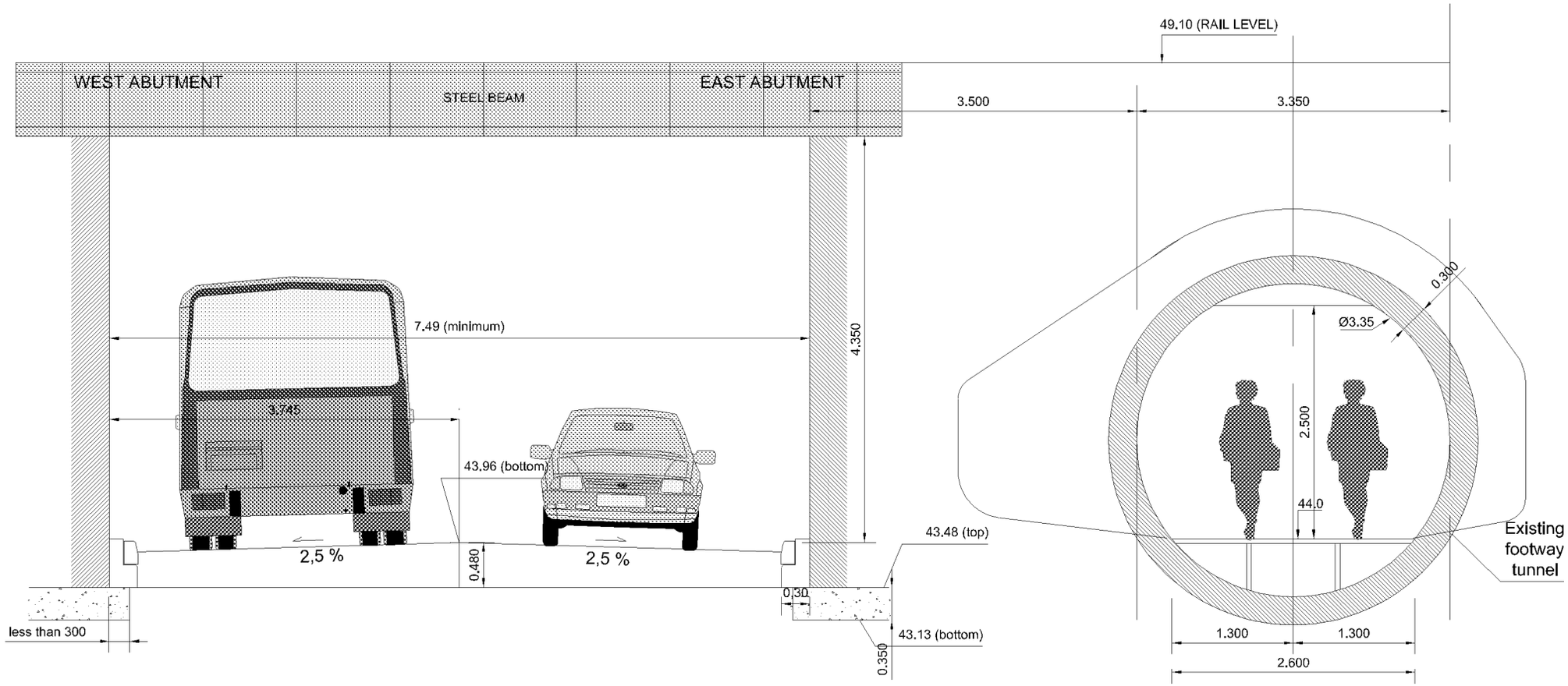
BALGREEN ROAD UNDERBRIDGE
EXISTING SITUATION
CROSS SECTION



CEC01702137_0106

SCALE : 1/50 @ A4

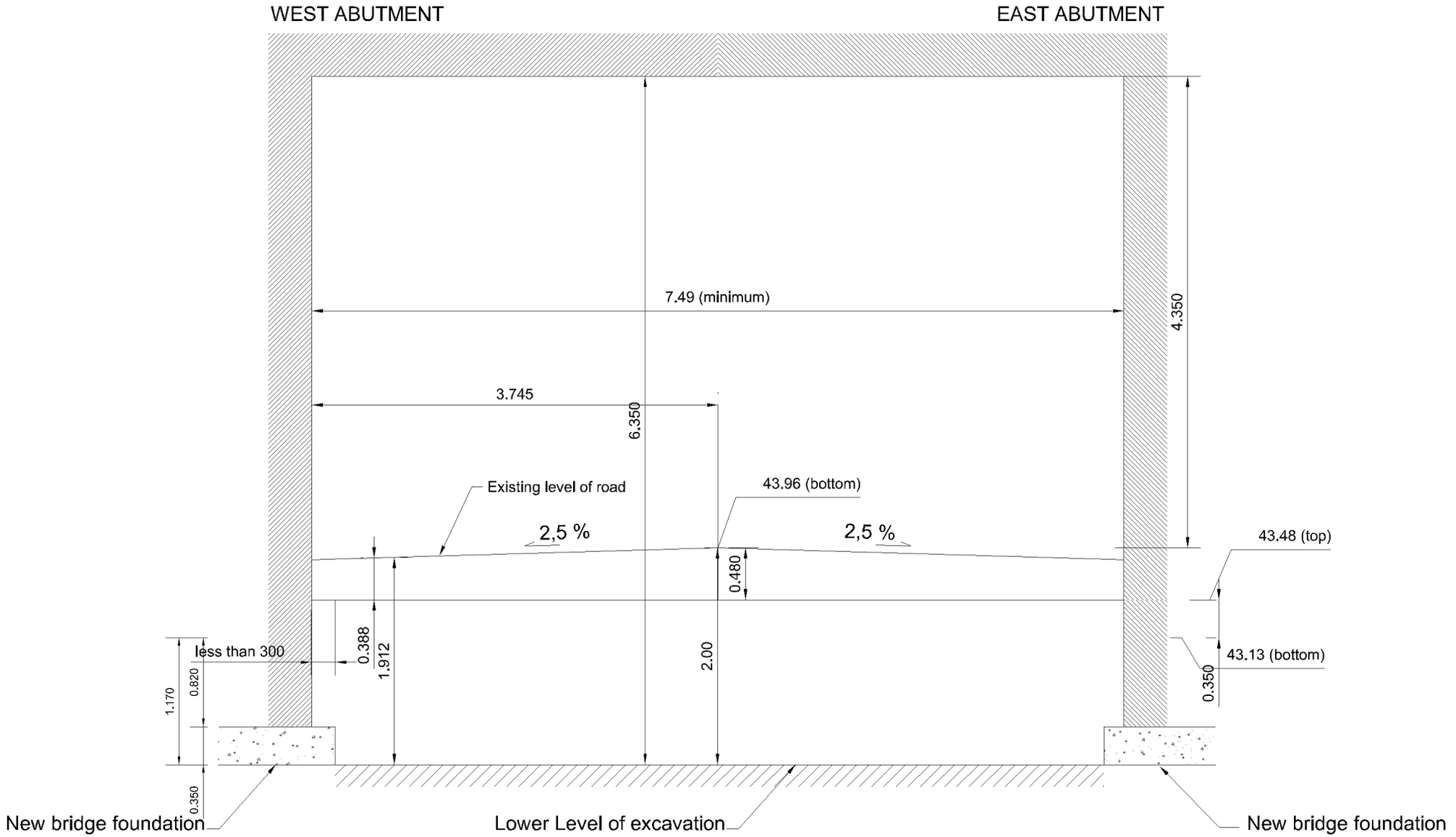
BALGREEN ROAD UNDERBRIDGE AND PEDESTRIAN UNDERPASS
EXISTING SITUATION
CROSS SECTION



SCALE : 1/62.5 @ A4

CEC01702137_0107

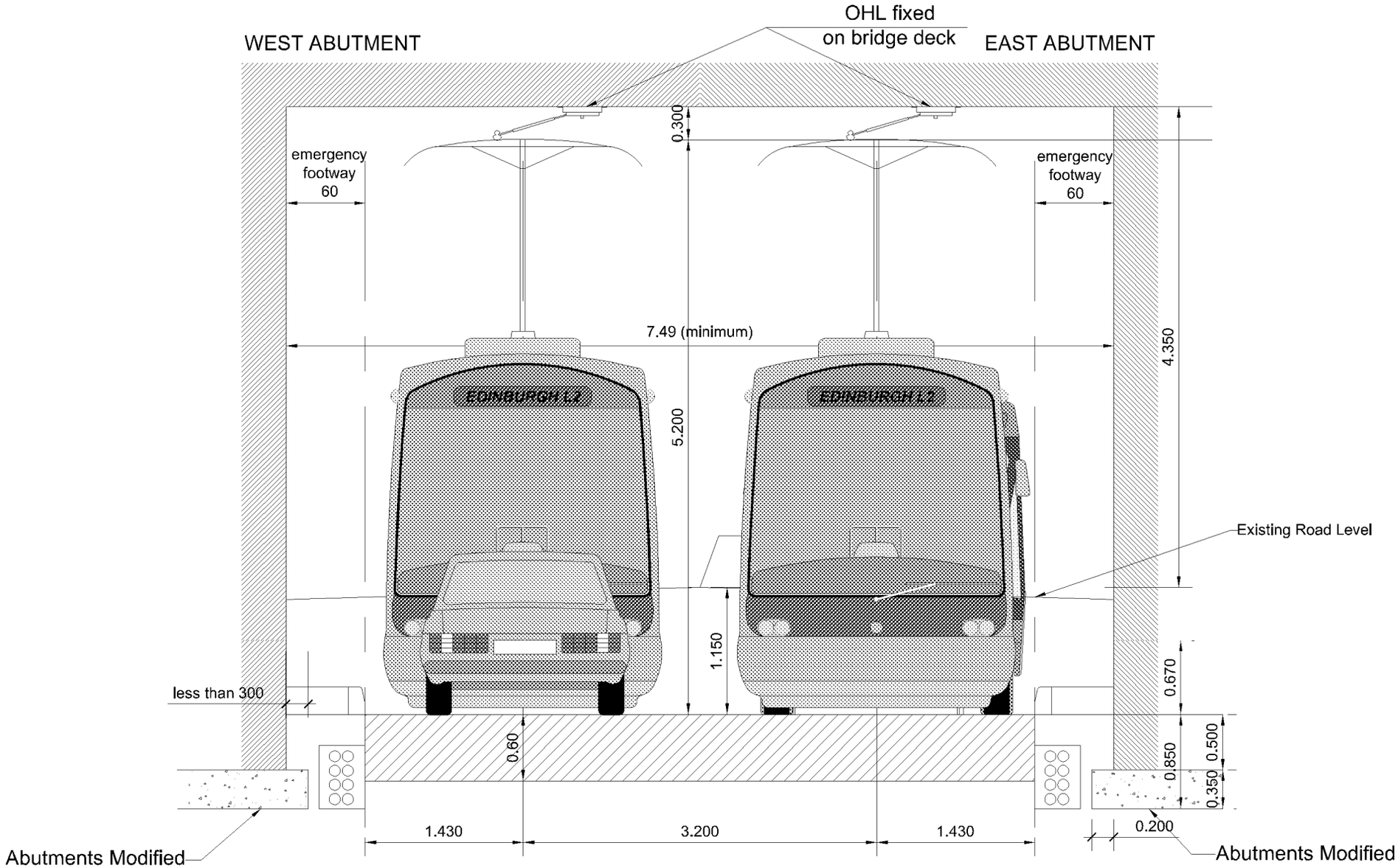
BALGREEN ROAD UNDERBRIDGE
New bridge Foundations
PROPOSED SOLUTION
CROSS SECTION



SCALE : 1/50 @ A4

CEC01702137_0108

BALGREEN ROAD UNDERBRIDGE
PROPOSED SOLUTION (SHARED RUNNING)
CROSS SECTION

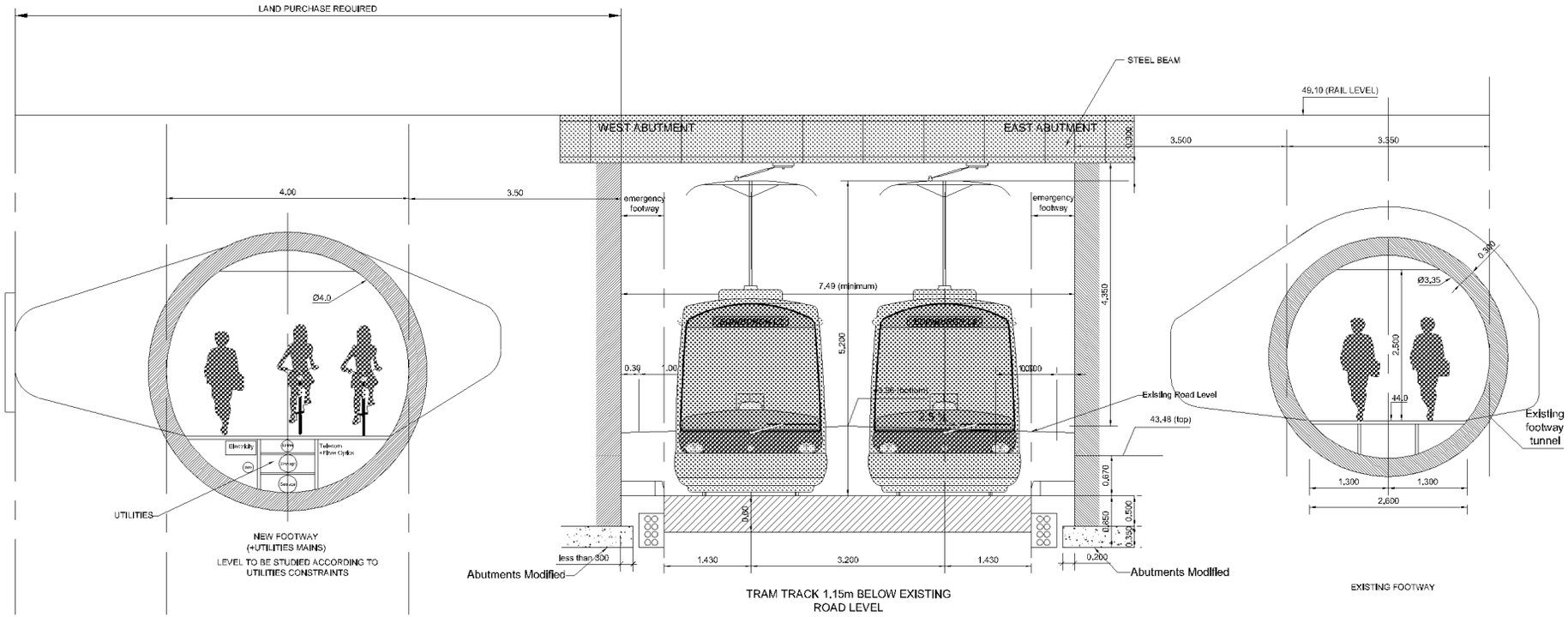


TRAM TRACK 1.15m BELOW EXISTING
ROAD LEVEL

SCALE : 1/50 @ A4

CEC01702137_0109

BALGREEN ROAD UNDERBRIDGE AND PEDESTRIAN UNDERPASSES
PROPOSED SOLUTION
ELEVATION WITH EXISTING AND NEW FOOTWAYS



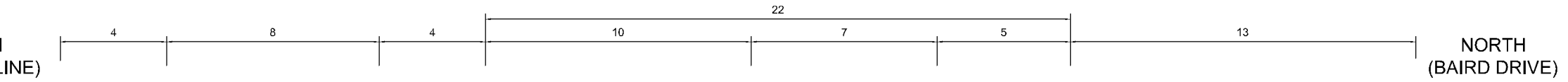
SCALE : 1/100 @ A4

CEC01702137_0110

Appendix E – Roseburn to Carrick Knowe Cross Sections

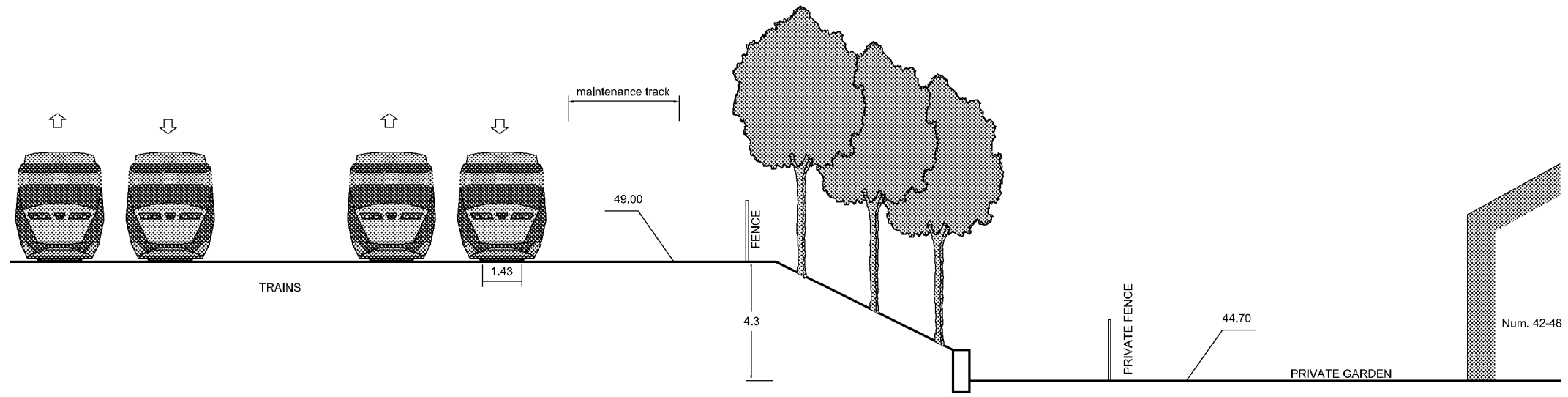
CEC01702137_0112

SOUTH (RAILWAY LINE)

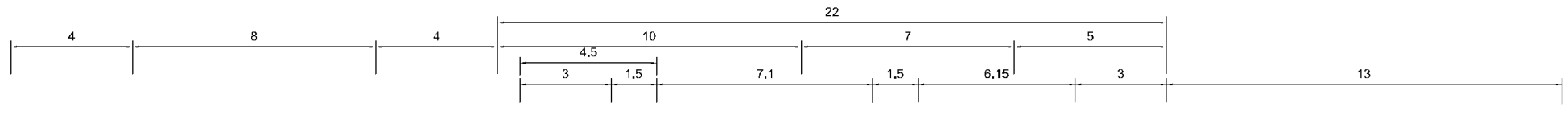


NORTH (BAIRD DRIVE)

CROSS SECTION C-C
(BAIRD DRIVE)
EXISTING SITUATION

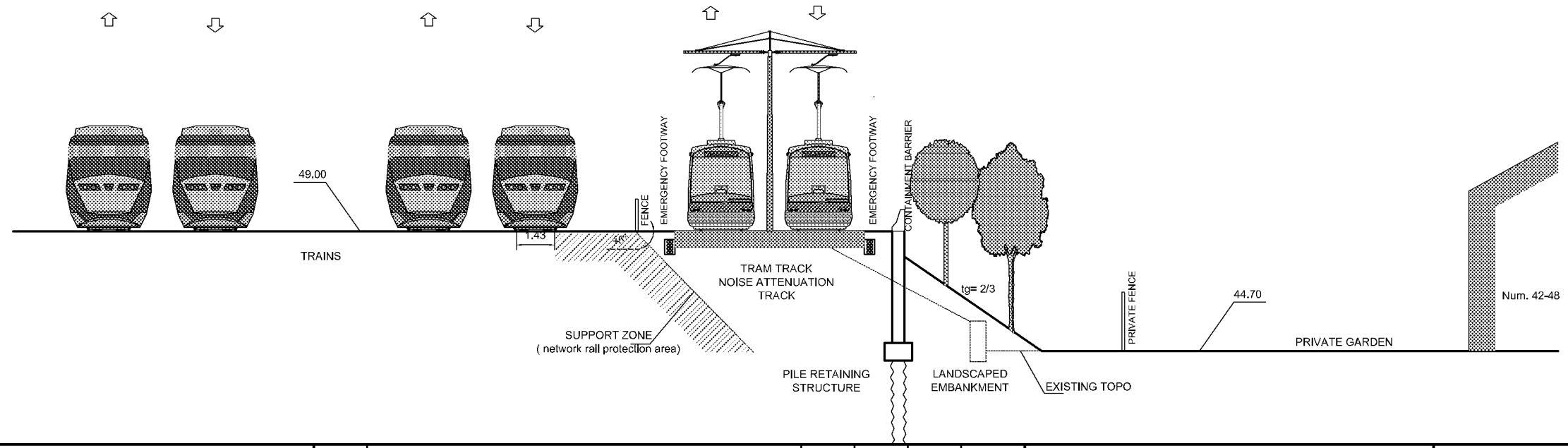


SOUTH (RAILWAY LINE)



NORTH (BAIRD DRIVE)

CROSS SECTION C-C
(BAIRD DRIVE)
PROJECT



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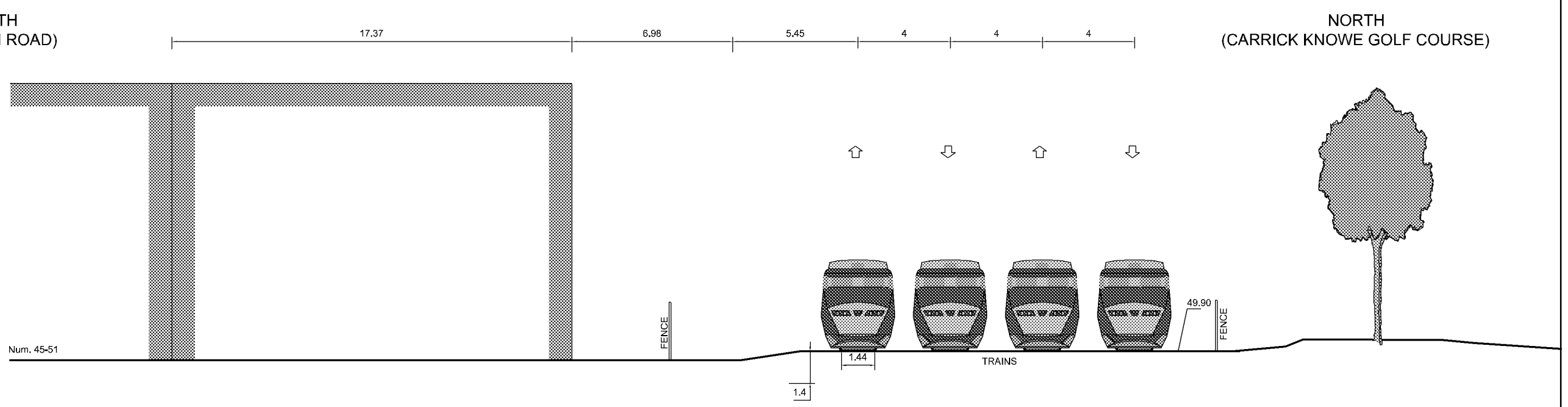
Rev	Description of revision	Drawn	Chkd	App	Date
B	UPDATE FOLLOWING TIE COMMENTS	MMO	CTH	GMU	11/06/03
A	FIRST ISSUE	MMO	CTH	GMU	05/06/03

Drawing Title
EDINBURGH TRAM
LINE TWO - NORTH OPTION
BAIRD DRIVE
CROSS SECTION C-C

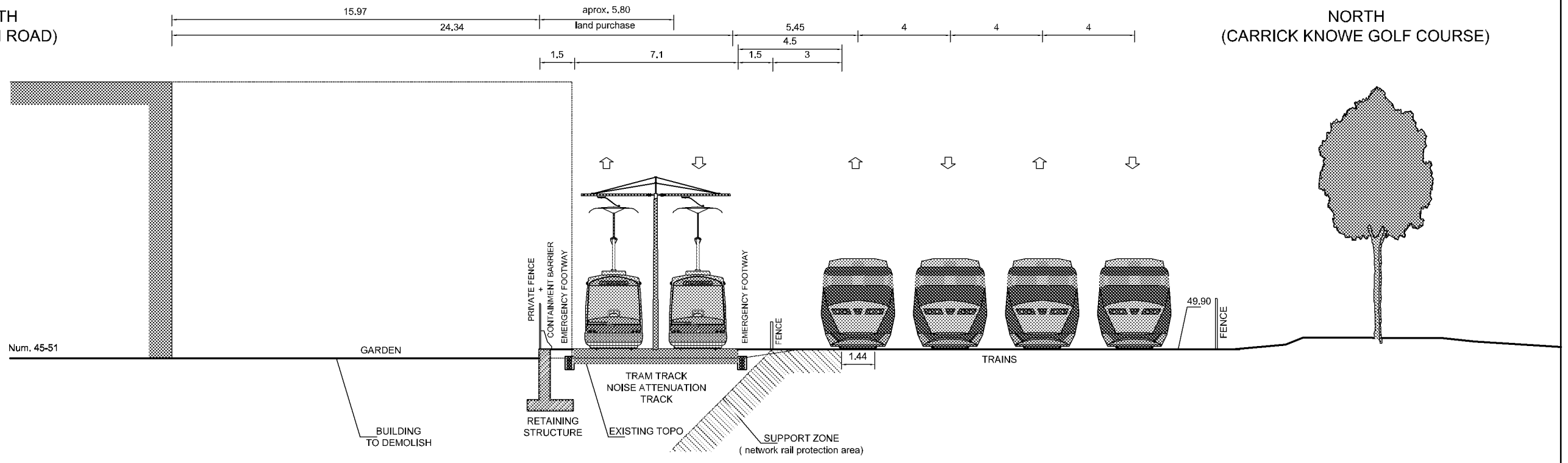
Drawing No. 30894 / P313

Designed	CTH
Drawn	MMO
Approved	GM
Scale	1 : 200 @ A3
Revision	B
Status	INFO

CROSS SECTION H-H
(STENHOUSE AVENUE)
EXISTING SITUATION



CROSS SECTION H-H
(STENHOUSE AVENUE)
PROJECT



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Rev	Description of revision	Drawn	Chkd	App	Date
A	FIRST ISSUE	MMO	CTH	GMU	11/06/03

Drawing Title
EDINBURGH TRAM
LINE TWO - SOUTH OPTION
STENHOUSE DRIVE
CROSS SECTION I-I

Drawing No. 30894 / P325

Designed	CTH
Drawn	MMO
Approved	GM
Scale	1 : 200 @ A3
Revision	A
Status	INFO

CEC01702137_0113

Appendix F – Airport Report

FABER MAUNSELL

Aegis Semaly Ltd
Public Transport Consultants & Engineers

Internal Working Paper

Project:	**Edinburgh Tram Line 2**	Job Number:	**30894**
Subject:	**Edinburgh Airport – Royal Highland Showground Interface**		
Author:	**Gavin Murray**	Date:	**08 April 2003**

Introduction

Through consultation with British Airport Authority (BAA) at Edinburgh Airport and the Royal Highland and Agricultural Society of Scotland (RHASS) showground at Ingliston a clear impasse has been identified to a proposed tram route between the airport and Newbridge. This arises through the fact that BAA long term expansion plans for Edinburgh Airport encroach well into the showground property. Hence a tram route which does not impact the airport expansion would pass through the heart of the showground's main exhibition area. The next main stage in the development of the Airport plans is not expected until a White Paper is issued on BAA's general airport expansion policy across Britain early in 2004.

Arising from this issue CEC planning have advised that Edinburgh Tram Line 2 should be terminated at the airport (with a strong direction from TIE regarding aspirations to extend the route to Newbridge and beyond once the land requirements for the airport expansion plans are more clearly defined.

Notes and Assumptions

A route South and East of the showground site would not provide as efficient a service and fail to access their main entrances (predominantly North) as well as having a significant impact on a Category B listed wall along the A8 boundary. Additionally if the Royal Highland Showground were to be redeveloped, say to provide conference centre facilities an A8 alignment may not be best suited to provide services to the focus of the new development.

In March the Scottish Executive (in association with City of Edinburgh Council and Scottish Enterprise Edinburgh and Lothian) finalised the West Edinburgh Planning Framework. This framework is effectively concerned with setting out a long-term vision (to 2020 and beyond) for the A8 transport corridor from Edinburgh Park to Newbridge. In terms of transport improvements it relies heavily on the introduction of the West Edinburgh Tram Line with *'options for the initial phases of the scheme to terminate at Edinburgh Park, Gogarburn, or Edinburgh Airport before extending to Newbridge'*.

CEC Planning will shortly publish the revised finalised Rural West Edinburgh Local Plan (due to go to committee in May or June and subsequently be put on deposit for public consultation in July or August). They would like to publish this plan showing a single preferred tram alignment. However, it should be possible to identify an indicative line beyond the airport in the finalised plan (perhaps in a brief in the written statement rather than on the proposals map). As the Local Plan Public Inquiry is unlikely to be held before summer 2004 at the earliest (and then last for a year), it should be possible to make a pre-inquiry modification (or if necessary post inquiry modification) to the Local Plan showing a more accurate and detailed alignment once the position at the airport becomes clearer.

F:\PROJECTS\30894 Edinburgh Tram Line 2\Reports\Route Development Report (formerly Design Pause)\Part A - Design pause\Final\Appendicies\Appendix F - Airport Report.doc

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It is assumed (backed by significant BAA study and documentation) that Edinburgh Airport is:

a) unlikely to relocate, and
b) will continue to grow to meet market demand for the foreseeable future requiring a considerable growth in its footprint on the ground.

The Royal Highland Agricultural Society of Scotland, whilst showing steady improvement and upgrading and some growth in shows held and attendance, its long term sustainability on this site is neither guaranteed nor self evident to the study team.

Options

1. Terminate Edinburgh Tram line 2 at Edinburgh Airport / RHASS East Gate, with TIE/CEC commitment to extend once BAA expansion is confirmed.
2. Do not identify a specific tram alignment but include in the Parliamentary Bill powers over a wide corridor between the airport and Newbridge (through/past the showground), whilst developing side agreements with BAA and RHASS to enable the line to be fixed once the BAA White Paper has been issued.
3. Disregard BAA's full expansion aspirations, by selecting a route for the tram between the airport and the showground. This could be such that partial airport expansion is possible, but the onus would be on BAA to realign the tram within their expansion if required.
4. Identify a line through the Royal Highland Showground which allows for the airport expansion.
5. Revise the alignment to run along the A8 to Newbridge with a spur line to Edinburgh Airport.
6. Adjust the FM Route Option 1 to avoid the showground and its listed wall, potentially crossing the A8 to join the southern link to Newbridge.

Potential Implications

Option 1 would likely not have any impact on the Airport, but may have a negative impact on services to the showground. Additionally there would be no defined access to Newbridge, or the potential depot and park and ride sites being considered within the Tram Line 2 study. Regardless of the strength of commitment from TIE and CEC, there will be a risk that circumstances would postpone the extension beyond the airport. Stopping short of Newbridge would fail to fulfil the aspirations outlined in the West Edinburgh Planning Framework.

The exact legal position on option 2 has not been fully investigated however initial enquiries suggest that it should be a viable alternative, not withstanding this it would be advisable to seek confirmation through Bircham Dyson Bell (BDB) from the Non Executive Bills Unit of the Scottish Executive. Further this option may provoke objections from both BAA and RHASS who could be understandably concerned about their lack of control over the final alignment, regardless of their input to the side agreements.

Option 3 may raise an intractable objection from BAA. If this were the case it would still be possible to drop back to option 1 immediately prior to submission of the bill. This is indicative of

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the lack of any significant bargaining power over BAA, other than their need to improve their public transport accessibility.

Whilst option 4 will likely only impact the Royal Highland Show itself (two weeks a year) this option would certainly put RHASS offside, generating a major objection to the scheme. This option would require an annual two-week shutdown of services beyond the showground. Initially this would only affect Newbridge services and possibly depot access. Clearly this would have operational implications and could also adversely impact patronage.. In the longer term however it would impact extension proposals to Kirkliston and / or West Lothian.

Option 5 would introduce considerable operational deficiencies to the system. Whilst it would provide a good service to the emerging developments in Newbridge with potential for routes beyond, they would be disrupted by the need for some services to run the spur to the airport. It is likely that both BAA and RHASS could object to this option.

A careful alignment would be required for the final option to avoid the listed wall. In addition a stop would need to be located at the South East corner of the showground to provide access to the East Gate. Running South of the showground the tram would be within the highway reserve requiring a potential realignment of the A8 and an at-grade crossing (potentially staggered) which would impact traffic flow for both tram and A8 traffic.

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