



**Parsons
Brinckerhoff**

Edinburgh Team Project Design Office
CityPoint, 1st Floor
65 Haymarket Terrace
Edinburgh EH12 5HD
United Kingdom
44-(0)131-623-8600
Fax: 44-(0)131-623-8601
www.pbworld.com/ea

Our Ref: ULE90130-SW-LET-01346

21st January 2009

tie Limited
CityPoint, 1st Floor
65 Haymarket Terrace
Edinburgh
EH12 5HD

Attention: Tony Glazebrook

Dear Tony

A8 Underpass ICP Considerations and Evidence for the Health and Safety File

Please find enclosed the answered RFI no. 008 dated 30th October 2008 and response showing SDS answer dated 14th November 2008.

Following our discussion in November (Glazebrook, Dolan J and Dolan A) SDS was tasked to advise the methodology of the SDS consideration and principles in bringing together the design for the A8 Underpass, culminating with any design decision making in providing the final design for the underpass and in particular covering areas where appropriate standards were lacking or gave choices, and where significant risks could arise.

SDS has followed appropriate standards for Roads and established tramway practice on the A8 Underpass (and as designed elsewhere in the UK) and does not consider that the existence of an underpass of modest length used exclusively by guided vehicles driven on line of sight gives rise to significant risks. We have previously explained that because the ETN utilise Line-of-Sight driving, no specific Design Risk Assessment is necessary as the underpass is no different to any other part of the network. There should be no need to undertake any separate assessment or consideration. Consideration of whether such assessment is required via the SDS Design Engineering Processes and the experience of the designers of track, structures, OLE and Civil disciplines. The experience comes from highway experience within the SDS Design TEAM (DTL's and their experience of the appropriate standards and requirements). PB's letter of 3rd June 2008 (enclosed) identifies considerations to the issues of the underpass design and may be considered by tie and ICP as appropriate evidence for the H & S File, as it demonstrates the designers thought process, when considering the issues. John Dolan did feel that this demonstration of the Designers' evidence and thought process would be useful in order that later reviewers of the H & S File (Operators and Maintainers) may understand the basic design principles which were considered and what design decisions were taken to provide the design which was finalised and constructed.

Information that needs to be captured in the evidence file should primarily document areas where appropriate standards were lacking, or gave choices, and where significant risks could arise. SDS feels that as informed above and in answer to RFI no. 008 appropriate standards for Roads and established tramway practice elsewhere in the UK have been followed with the design of the Underpass. Please see SDS letter ref. ULE90130-06-LET-00233 dated 3rd June 2008.

The following response is given by SDS using its considerable staff experience of the design and construction of other light rail systems to meet the requirements of HMFII and other interested authorities. Although not written down in the Engineering Plan, we list below the appropriate manner in which the design for the underpass was derived.

*Over a Century of
Engineering Excellence*

*In association with Macrow
Corderoy, Ian White Associates
Quill Power Communications, SDG*

Parsons Brinckerhoff Ltd
Registered in England and Wales. No. 0564514
Registered Office:
Amber Court, William Armstrong Drive
Newcastle upon Tyne NE4 7YQ

CEC00989463_0001



Parsons
Brinckerhoff

Edinburgh Team Project Design Office
CityPoint, 1st Floor
65 Haymarket Terrace
Edinburgh EH12 5HD
United Kingdom
44 (0)131 623 8000
Fax: 44 (0)131 623 8001
www.pbworld.com/ea

1. Requirements Definition Stage (September '05 to December '05) identified the Technical Specifications to be provided and the Standards to be used to provide the Preliminary Design and the Detailed Design.
2. Discussion with HMRI took place during early 2006 to brief the Inspectorate with the design as handed to SDS and the further SDS design intent on the underpass. Nothing gave rise to any issue from either party (HMRI or SDS) where standards were lacking or choices were to be made which would import additional risk to the design or otherwise.
3. Preliminary Design was delivered to tie in June 2006 and confirmed to meet the Clients requirement in January 2007. (Reviewed and confirmed by tie and the TSS Preliminary Design Report).
4. Interaction with the ICP (following on from HMRI movement away from the Project) in 2007/2008 and the design considerations for the A8 Underpass were documented in SDS letter ref. ULE90130-05-LET-00233 dated 3rd June 2008 (enclosed).
5. IDC work has continued during this period along with VE exercises with the Client and Technical Support Team. These VE sessions during 2007/2008 have driven the soffit levels to the minimum (TOR to soffit). The OLE Design has been further reviewed for compliance with minimum clearances to the relevant standards. Compliance has been confirmed as acceptable and a reasonable design proposal, albeit there is a contradiction in regulations of wire clearances on this issue.
6. Close out design by IDC's for this Underpass will be demonstrated by IDC signed forms from each DTL having interface on the A8 Underpass, in line with the SDS Engineering Plan. These IDC Certificates form part of the DAS material for each Section and Sub-Section of the ETN.

SDS believe the above letter and in particular the above history of events (items 1-6 above) demonstrates the methodology of design for the A8 Underpass and the decisions and assessments considered, whilst providing such design. SDS would agree with John Dolan that the SDS letter ref. ULE90130-05-LET-00233 dated 3rd June 2008 (enclosed) and RFI no. 008 should be housed as evidence within the H & S File such that the Operator and Maintainer may peruse the design considerations and designer decision making in preparing the A8 Underpass Detailed Design.

Yours sincerely



Alan Dolan
Deputy Project Manager
Parsons Brinckerhoff

Co: S. Reynolds D. Sharp (tie)
J. Chandier C. Brady (BSC)
C. Reid S. Rothhaus (BSC)
T. Kelly

Over a Century of
Engineering Excellence

In association with Halcrow
Conderoy, Ian White Associates
Gulf Power Communications, SDG

Parsons Brinckerhoff Ltd
Registered in England and Wales No. 2654614
Registered Office
Amber Court, William Armstrong Drive
Newcastle upon Tyne NE4 7YQ

CEC00989463_0002



Parsons
Brinckerhoff

Edinburgh Train Project Design Office
CityPoint, 1st Floor
55 Haymarket Terrace
Edinburgh EH1 5HO
United Kingdom
44-(0)131-633-8600
Fax: 44-(0)131-623-8601

Our Ref: ULE90130-05-LET-00233

Your Ref:

3 June 2008

Bilfinger Berger UK Limited
Scotland and Ireland Regional Office
Lochside House
3 Lochside Way
Edinburgh
EH12 9DT

Attention: Scott McFadden

Dear Scott

Gogar A8 Underpass – ICP Comments

SDS is in receipt of an email from Tony Glazebrook dated 19th February 2008 seeking a point by point response to comments and questions raised by John Dolan, Ie's Independent Competent Person with regard to the A8 Underpass.

The comments and questions appear to betray an expectation of a "railway engineering" approach to the design that is inappropriate to a tramway and this gives Ie's to some concern.

We have reproduced the comments and questions in italic font with our response in normal font below:

I should be interested in receiving a presentation on the proposals for the A8 Gogar underpass, which is over 65m long and, therefore, effectively a tunnel. I have studied the drawings on the Ie's website, but they are a bit thin.

SDS does not expect that the underpass to be designated as a tunnel but awaits Ie's further instructions in this respect. The SDS design follows established tramway practice adopted in Sheffield and Salford where underpasses are exclusively for tram but designed as highway underpasses. The A8 underpass is Road compliant in accordance with DMPB and RSP2.

SDS has issued to Ie's a series of drawings of this overline structure.

SDS (Andy Dixon) met with John Dolan and Transdev to discuss the underpass on 14th April and this letter is informed by that meeting.

I note that the General Arrangement drawings, ULE90130-05-BRG-00535 and 536 have only been issued for tender purposes, and are dated March 2007.

In no particular order, my queries so far include:

*a) What inspection / maintenance regime has been assumed for the sub-way and the cuttings at each end?
Will it be necessary to establish an "access only when trams not running" regime?*

Over a Century of
Engineering Excellence

In association with Halcrow
Corderoy, Ian White Associates
Quill Power Communications, SDG

Parsons Brinckerhoff Ltd
Registered in England and Wales
No. 2654014 Registered Office:
Alderley Court, Wilton, Ainslieburg Drive
Newcastle upon Tyne NE1 7JG

CEC00989463_0003



SDS anticipates that the inspection and maintenance regime will be based on established practice in Sheffield and Manchester.

b) What arrangements will be in place to deter the public from accessing the subway and the cuttings?

Pedestrians will be discouraged by deterrent paving and appropriate signage in accordance with current practice elsewhere.

c) Will the tram drivers still be operating on "line of sight"? If so, what are the implications of the sharp curve to the north and the reverse curve to the south for visibility, and thus speed and journey time?

Trams will be operated on line of sight throughout the network in accordance with normal practice for a tramway. Regardless of whether it is in an underpass or anywhere else, a line of sight tramway, like any public road, requires drivers to maintain a safe speed to stop on sight. Sheffield Supertram and Manchester Metrolink have set speed limits through the underpasses which helps their drivers and this will be considered in due course for the Edinburgh Tram Network.

d) Has an assessment been made of the need for emergency lighting? If lighting is continually illuminated, what back-up arrangements ensuring security of provision?

No lighting has been included in the underpass. The tramway is not lit anywhere on the network although it will often benefit from nearby lighting provided for other reasons. If a tram loses power in the underpass, the emergency, on-board lighting will illuminate most of underpass. Elsewhere, between Cogarth and Ingliston Park and Hide for example, the tramway will be in comparative darkness.

e) How will those with mobility impairments transfer to the walkway if a tram has to be evacuated? Has thought been given to designing and positioning the walkway so that it can act as derailment containment and provide easy transfer? This would be preferable to the rail down the middle of the 4' suggested on the drawings

SDS considers that there is no difference for a tram-only underpass to that of any other road underpass with public service vehicles. A change to the design would require a change instruction from the

f) What happens to the walkways at the ends of the subway? Arrangements need to be made to facilitate the movement of evacuated passengers to a position of safety. This means that a hard surface needs to be provided in one or other cress (with a crossing from the cress not used) until the track reaches grade or passengers can be removed otherwise. Note that the gradient to the South is 1 in 15 rising, very close to the 1 in 12 design limit for wheelchairs (either propelled by the user or a helper). The cutting to the North is much flatter, but it is much further to a place of safety.

Emergency evacuation does not normally require wheelchair users to make their own way off the system.

g) The tunnel is at the bottom of a dip. What arrangements are made to remove water? Is the Control alerted if the tunnel starts to flood, either because any pump provided has failed or because it has been overwhelmed in a cloudburst? This is partly related to c) above and the lack of sight lines for drivers.

SDS has designed the underpass on the same principles that it would for an underpass for road vehicles. Drainage is provided but under certain conditions ponding may occur (as it does in Brookhill) and in extreme conditions there may be flooding (like most road and railway routes have in the last year). This being a line of sight operation, trams will stop short of any deep water.

h) Do the parapet arrangements meet TD 19/06, including those relating to OLE in 4.42? What parapet height has been chosen - is this an area prone to vandalism (record on nearby railway)?

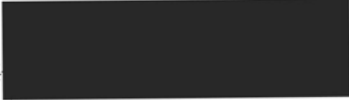


The parapets are being designed in accordance with the Design Manual for Roads and Bridges (TD, Railway Safety Publication 2 and Railway Safety Principles and Guidance Part 2 Section A. There is an existing vehicle restraint fence on the south side and the design will include vehicle restraint in the form of approach fencing transition fencing and parapet above both portals as shown on ULE90130-05-BRD-00536 and 00554.

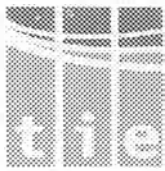
i) Is the road one from which pedestrians are excluded by Order? How is this enforced /access deterred?

The SDS design assumes that pedestrians have access to the footpaths on each side.

Yours faithfully


Jason Chandler
Parsons Brinckerhoff

cc
Kate Shudall
Andy Groves
Bahman Kernani
Andy Dixon
Andy Porter



REQUEST FOR INFORMATION

From Competent Person



Keywords

Function eg: Functional Specification, Value Engineering	Design selection
Area eg: Operations, Track, Wheel/Rail, Environment, (Protection, Hazard / Noxious, Aggregate / Spoil)	All
Phase eg: Opening, Operation, Maintenance, Renewal, Decommission	Design assurance

REQUEST

In the response to RFI 005, you indicated that, at the meeting on 28 October 2008, SDS agreed to provide the requested qualitative assessment, so that the reasons behind the decision made could be captured for the Evidence File.

At that meeting, it was indicated to SDS that the other decisions and assessments that had informed the selection of particular design options should also be documented, so that they too could be captured for the Evidence File. It was emphasised that this was primarily to cover areas where appropriate standards were lacking, or gave choices, and where significant risks could arise.

The existence of such documents will improve the safety of the operating system, by providing those responsible for asset operation or maintenance with an understanding of the logic and assumptions behind particular system and asset configurations, so reducing the risk of inappropriate repair, modification, replacement or other asset management activities endangering health and safety, particularly of operating staff, passengers and third parties.

Please let me know the timescale within which these important pieces of evidence are to be produced, and what common format will be adopted.

(Note – The designer’s responsibilities for the avoidance of risks to maintainers and the like - Regulations 11(3)(d), 11(3)(e) and 18(2) of the Construction (Design and Management) Regulations 2007 – are a matter for the CDM co-ordinator. Evidence in respect of such risk avoidance does not, therefore, form part of this request. However, where material provided for the Health and Safety File in respect of such risks also adequately demonstrates appropriate management of risks to others, that material is regarded as captured for the Evidence File.)

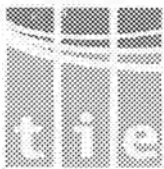
Notes on Timescale: Definition of the timescale for documentation of the evidence to be completed by 14 November 2008, in advance of the HMRI visit proposed for November 17.

Form issued to: T Glazebrook D Crawley

Date 30 October 2008

Reference RFI 008

Doc No.	Issue	Version	Title	Sheet
DELHSQE.2188	1.0	Approved	Request for Information from CP	1



REQUEST FOR INFORMATION

From Competent Person



RESPONSE From	Name PB	Date 14 November 2008
----------------------	------------	--------------------------

NB If relevant documentation exists on the "tie" extranet, this may be referenced.

General
Information that needs to be captured in the evidence file should primarily document areas where appropriate standards were lacking, or gave choices, and where significant risks could arise. SDS has followed appropriate standards for Roads and established tramway practice elsewhere in the UK and does not consider that the existence of an underpass of modest length used exclusively by guided vehicles driven on line of sight gives rise to significant risks. Nevertheless, the following response is given by SDS using its considerable staff experience of the design and construction of other light rail systems to meet the requirements of HMRI and other interested authorities.

Proposals for the A8 underpass:
SDS does not expect the underpass to be designated as a tunnel. The SDS design follows established tramway practice adopted in Sheffield and Salford where underpasses are provided exclusively for trams but designed as highway underpasses in keeping with the principles of 'line-of-sight' driving. The A8 underpass is Road compliant in accordance with the Design Manual for Roads and Bridges and RSP2. SDS (Andy Dixon) met with the ICP (John Dolan) and Transdev to discuss the underpass on 14th April 2008 and the following is a summary of SDS's responses originally contained in their letter dated, 3rd June 2008.

Inspection / Maintenance Regime for Subway and Cuttings:
SDS anticipates that the Maintenance Regime proposed by BSC would be based upon established practice on Sheffield Supertram and Manchester Metrolink.

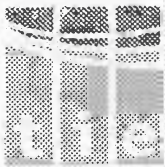
Public Access Deterrents:
Pedestrians will be discouraged by appropriate signage, deterrent paving and 'shepherd boards' in accordance with current practice on several, if not all, UK light rail schemes elsewhere which satisfies HMRI requirements.

'Line-of-Sight' Operation:
Trams will operate on 'line-of-sight' throughout the Edinburgh Tram Network in accordance with normal UK tramway practice elsewhere. Regardless of whether it is in an underpass or anywhere else, like a public road, this requires drivers to maintain a safe speed to stop on sight. Sheffield Supertram and Manchester Metrolink have set speed limits through their underpasses which help tram drivers and this will be considered in due course for the Edinburgh Tram Network.

Emergency Lighting and Potential Back-up Arrangements:
No lighting has been included in the underpass. The tramway is not lit anywhere on the network although it will often benefit from nearby lighting provided for other reasons. If a tram loses power in the underpass, the emergency, on-board lighting will illuminate most of the underpass. Elsewhere, for example between Gogarburn and Ingliston Park and Ride, the tramway will be in comparative darkness. This is normal practice for tramways and for roads.

Transfer of the Mobility Impaired in the Underpass:
SDS considers that there is no difference for a tram-only underpass to that of any other road underpass accommodating public service vehicles. A change to the design would require a change instruction from tie

Doc No	Issue	Version	Title	Sheet
DEL.HSQE.2198	1.0	Approved	Request for Information from CP	2



REQUEST FOR INFORMATION

From Competent Person



Evacuation of Wheelchair Users up Walkways at Underpass Approaches:

Emergency evacuation does not normally require wheelchair users to make their own way off the tramway.

Underpass Drainage:

SDS has designed the underpass on the same principles as for an underpass for road vehicles. Drainage is provided but under certain or extreme conditions, ponding or flooding may occur. Being a line-of-sight operation, trams will stop short of locations where flood water covers the rails.

Parapet Arrangements:

The parapets are designed in accordance with the Design Manual for Roads and Bridges (TD), Railway Safety Publication 2 and Railway Safety Principles and Guidance, Part 2, Section A. There is an existing vehicle restraint fence on the South side and the design will include vehicle restraint in the form of approach fencing transition and parapet above both portals as shown on Dwg. Nos. ULE90130-05-BRG-00536 and 00554.

Pedestrian Access to Road:

The SDS design assumes that pedestrians have access to the footpaths on each side of the road.

CP Follow-Up		
No Action <input type="checkbox"/>	Further Request <input type="checkbox"/>	Refer to Health & Safety <input type="checkbox"/>
Ref:		
Comments	Date	

Doc No. DEL.HSQE.2183	Issue 1.0	Version Approved	Title Request for Information from CP	Sheet 3
--------------------------	--------------	---------------------	---	------------