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Edinburgh Tram

Line One, Northern Loop

Utilities Interface Report

Report No. 203011/0055

11 November 2003

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Edinburgh Tram

Line One, Northern Loop

New Transport Initiative

Utilities Interface Report

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1 Introduction

Edinburgh Tram Line One, Northern Loop was initially conceived through the Outline Business Case (OBC) study undertaken for the Waterfront Edinburgh Limited, by Arthur Anderson, Mott MacDonald and Steer Davies Gleave. The scheme was designed to serve key areas including the City Centre, Leith, Newhaven, Granton and passing through the Waterfront Development Area.

The OBC contained a STAG1 appraisal, which was submitted and accepted by the Scottish Executive (SE). Funding of £6.5M was subsequently made available for the project development to STAG 2.

Mott MacDonald (MM) was appointed to undertake the Technical, Operational and Environmental Commission for the development of Edinburgh Tram, Line One Northern Loop. The project Team draws on a number of consultants including Babtie Group (BG), Steer Davies Gleave (SDG), Environmental Resources Management (ERM), Gillespies (GIL), Brain Hannaby and Associates (BHA), McLean Hazel (MH) and Terraquest (TER).

The appointment is partitioned into five work packages and project work commenced in July 2002. The work packages are summarised as follows:

Work Package 1 (WP1)	Patronage and Route Corridor
Work Package 2 (WP2)	Scheme Development
Work Package 3 (WP3)	Environmental Assessment Scoping Report Environmental Statement and NTS
Work Package 4 (WP4)	Patronage and Route Corridor Technical and Statutory Consultations Stakeholder Consultations Public Relations / Marketing Interface; and Formal Consultation
Work Package 5 (WP5)	Patronage and Route Corridor Support during Parliamentary Process and Public Inquiry

The utilities element of the project is encompassed within WP2 and has been undertaken by Babtie Group as part of the Line one project team.

The impact and cost of utility diversions is recognised as a significant factor in the development of a street running tram system. The cost and complexity of diversionary works can be considerable and the overall approach to the development and procurement of the works requires careful management to ensure that risks are properly controlled and the overall impact of diversionary works is minimised as far as possible.

The purpose of this report is to present the work undertaken to date with regard to the identification and diversion of utility apparatus as part of Work Package 2 of Edinburgh Tram Line One, New Transport Initiative. This report has been prepared by Babtie Group as part of the overall Line One team.

The first section of the report describes the initial data collection and consultation process with the utility companies. The second section of the report presents the estimated costs of the diversionary works, together with a discussion of the key issues.

2 Consultation and Strategy

2.1 Data Collection

In order to give proper consideration to the potential cost and impact of utility works the first phase of the project focussed on the identification of the affected utility companies along the length of the proposed tram route, and the collation of data with regard to existing services and supplies.

Utility companies or other service providers, which are identified as being affected by Edinburgh Tram Line One are listed below. Further contact details are included at Appendix A.

- British Telecommunications (BT)
- City of Edinburgh Council
- Scottish Power
- Scottish Water
- Transco
- Thus
- Telewest

City of Edinburgh Council are included as a 'utility provider' with respect to their role as the responsible authority for street lighting and other communication and data cables. City of Edinburgh Council also have responsibility under the New Roads and Street Works Act as the roads authority and it is therefore appropriate that they should be very much involved in the consultation process for the development of any diversionary works strategy.

A comprehensive data collection process was undertaken, commencing in August 2002, to identify existing apparatus along the length of the proposed tram route. Location plans were obtained from Moleseye One Call and the utility companies directly, giving full coverage of the proposed route.

The information obtained was collated to provide a set of composite utility plans at a scale of 1:500 (drawing no's 203011/EDIN/PU/0601 to 0648 inclusive). A full list of the composite utility location plans is referenced at Appendix E. It should be noted for the sake of clarity, that street lighting apparatus and other communication cables are not shown on the composite location plans.

For the record the following minor items remain outstanding with regard to the location of existing utility apparatus.

- Telewest – plans for Easter Road / Regent Road; and
- Thus – plans covering a short length of Constitution Street.

The outstanding plans represent a very minor part of the overall route and it is not considered likely that this will affect the estimation of costs for the diversionary works.

The next stage of the assessment process was to import the swept path alignment of the tram on to the base utility plans. The swept path current at the time was taken from the Technical Development Plans, issue P1. This exercise was undertaken in parallel with the development of the tram alignment in order to allow sufficient time for consultation with the utility companies. It must be recognised therefore that issue P1 of the Technical Development Plans differs in some areas from the current preferred route or 'design freeze' alignment. An assessment of the significant variations between the two route alignments is included at section 3.

Using the composite utility plans a desk top review was then carried out to give a general indication of the relative levels of congestion along the route of the tram. A summary of this review is shown in Table 1.1 below. From this initial assessment it can be seen that the sections of route from Haymarket to the west end of Princess Street and the section from St Andrews Square Loop to the north end of Constitution are the most heavily populated with utility apparatus. The section of the route from Trinity Pumping Station to Haymarket Yards is in general very lightly populated with utility apparatus.

Table 1.1

Drawing Number	Golden Asset	Multiple Stats	Congested Hot Spot	Individual Diversions	Transverse Crossings	Further Investigation	Overall level of congestion in and around tram swept path	Additional Comments
203011/EDIN/PU/0601	*			*	*	*		MP Gas Mains Present
203011/EDIN/PU/0602			*		*	*		Sub station close by
203011/EDIN/PU/0603								No apparatus
203011/EDIN/PU/0604					*	*		
203011/EDIN/PU/0605				*	*	*		
203011/EDIN/PU/0606				*	*	*		
203011/EDIN/PU/0607				*		*		
203011/EDIN/PU/0608	*			*	*			MP Gas main present
203011/EDIN/PU/0609			*		*			
203011/EDIN/PU/0610					*			
203011/EDIN/PU/0611					*			
203011/EDIN/PU/0612					*	*		
203011/EDIN/PU/0613					*	*		
203011/EDIN/PU/0614					*			
203011/EDIN/PU/0615					*			
203011/EDIN/PU/0616								No apparatus
203011/EDIN/PU/0617					*			
203011/EDIN/PU/0618					*			
203011/EDIN/PU/0619	*				*	*		Major Sewer Junction
203011/EDIN/PU/0620		*	*		*	*		
203011/EDIN/PU/0621		*		*	*	*		
203011/EDIN/PU/0622		*		*	*	*		
203011/EDIN/PU/0623		*	*	*	*	*		
203011/EDIN/PU/0624				*	*	*		
203011/EDIN/PU/0625			*	*	*	*		
203011/EDIN/PU/0626		*	*	*	*	*		
203011/EDIN/PU/0627A		*	*	*	*	*		
203011/EDIN/PU/0628A		*	*	*	*	*		
203011/EDIN/PU/0629		*	*	*	*	*		
203011/EDIN/PU/0630		*	*	*	*	*		
203011/EDIN/PU/0631		*		*	*	*		
203011/EDIN/PU/0632A	*	*		*	*	*		Major Sewer Junction, 275kV Cabling

Drawing Number	Golden Asset	Multiple Stats	Congested Hot Spot	Individual Diversions	Transverse Crossings	Further Investigation	Overall level of congestion in and around tram swept path	Additional Comments
203011/EDIN/PU/0633		*		*	*	*		
203011/EDIN/PU/0634A		*	*	*	*	*		
203011/EDIN/PU/0635A		*		*	*	*		
203011/EDIN/PU/0636		*	*	*	*	*		
203011/EDIN/PU/0637		*		*	*			
203011/EDIN/PU/0638					*			
203011/EDIN/PU/0639					*			
203011/EDIN/PU/0640					*	*		
203011/EDIN/PU/0641	*			*	*	*		Sub station affected
203011/EDIN/PU/0642		*		*	*	*		
203011/EDIN/PU/0643		*		*		*		
203011/EDIN/PU/0644		*	*	*	*	*		
203011/EDIN/PU/0645				*				
203011/EDIN/PU/0646				*	*			
203011/EDIN/PU/0647				*	*			
203011/EDIN/PU/0648	*	*		*	*			MP Gas Mains Present

Key

Area lightly congested with PU apparatus

Area moderately congested with PU apparatus

Area heavily congested with PU apparatus

Notes

1. Table shows initial internal assessment of likely areas of congestion.
2. With regard to all apparatus, it should be recognized that the information supplied by the utility companies is not exact and the actual locations of apparatus may vary from that shown on plan.
3. Golden Asset : Major individual items of plant with potential to significantly influence cost/alignment
4. Congested Hot Spot: Area where considerable number of items of PU are apparatus are located in close proximity
5. Multiple Stats : Area where considerable number of items of PU apparatus will require diversion
6. Individual Diversions : Area where diversion of single utility only will be required
7. Further Investigation : Area where size and nature of the apparatus is uncertain

Following this initial assessment, consultation with the utility companies was then progressed in line with the diversionary works strategy outlined below.

2.2 Diversionary Works Strategy

Three key documents have been produced to underpin the current phase of project development, and are included in appendices B, C and D respectively.

- Diversionary Works Strategy – Rev O
- Utilities Interface Document, Volume 1 Procurement Strategy
- Code of Practice for Working On or Near Edinburgh Tram.

The Diversionary Works Strategy (DWS) is an internal project team document and has been developed to ensure that the basis for procuring and managing the utility diversionary works is clearly defined and agreed.

The high level DWS is:

> *To undertake and deliver the diversionary works in the most appropriate manner to deliver Value for Money for the Edinburgh Tram Line One Northern Loop project.*

Value for money will be achieved by ensuring that risks are allocated to the organisation best placed to manage them. The following issues are therefore considered in the DWS:

- Who is best placed to manage the Utilities' diversions?
- Who will contract with the Utilities?
- Who has what responsibilities under the
- Concession Contract (if applicable);
- Construction contract;
- New Roads and Street Works Act 1991;
- Construction (Design & Management) Regulations 1994;
- Transport (Scotland) Act 2001; and
- Any other relevant legislation.

The Utilities Interface Document (UID) and the Code of Practice for Working On Or Near Edinburgh Tram have been produced to provide an agreed frame of reference for discussion with third parties and to clearly establish the parameters for safe working practices when the tram is operational. These documents are included in appendices B, C and D respectively.

The stated approach to diversionary works is:

> *To undertake the minimum of diversions whilst providing for Utilities to access and maintain their plant and apparatus without interruption of the operational services, as far as reasonably practicable.*

Parameters have been established to determine the plant and apparatus that requires diversion, protection or modification. These parameters are set out in the documents referenced above. In summary, for underground services the exclusion zone is defined as 450mm outside of the tram swept path to a depth of 1200mm below existing ground level. Underground services crossing the alignment transversely require to be lowered to 1200mm, although transverse services already installed at a depth between 1000-1200mm are to be considered on a case by case basis.

For overhead plant and apparatus the exclusion zone is defined as 2750mm in any direction from any part of the Overhead Line Equipment (OHLE). However as the OHLE design is not sufficiently developed to be able to identify precise OHLE positions, the current approach is based on diversion of all apparatus up to 900mm above existing ground level.

2.3 Consultation

Consultation has been undertaken with the affected utility companies at various levels to engage them in the development process. It is clearly of importance to the delivery of the tram scheme to maintain a pro active and positive approach to communication with the utility companies. It is proposed that a Utilities Working Group (UWG) be set up at a future date to discuss issues of common interest. It would also be beneficial to establish a Stray Current Working Group as a sub group of the Utilities Working Group.

Following on from the exercise to obtain apparatus location plans, and to formally establish the communication process with the affected utility companies, a workshop was convened on 26 February 2003 with representatives from the Line One project team and Transport Initiatives Edinburgh (TIE). The workshop objectives were to introduce the Edinburgh Tram Scheme to the utility companies in an open and informative forum, to raise awareness of the diversionary works required and discuss the way forward. Representatives from BT, Cable and Wireless, City of Edinburgh Council, Scottish Power, Scottish Water, Thus and Transco attended the workshop. Telewest were invited but chose not to attend. A full list of the names the attendees the workshop is included at Appendix A.

The following information was subsequently issued to all utility companies on 27 March 2003 with a formal request for initial robust cost estimates and programme information.

- 1:500 Composite Utility Location Plans
- Utilities Interface document
- Code of Practice for Working On Or Near Edinburgh Tram.

A summary of their responses is detailed in section 3.

It is noted that, of the utility companies affected, the following made a charge for the provision of the diversionary works estimates.

- BT
- Cable and Wireless - c/o Atkins Telecoms
- Scottish Water.

3 Diversionary Works & Estimated Cost

3.1 Changes in Alignment

As noted previously, the utility companies were provided with a 48 drawing set of composite utility plans showing a swept path alignment prepared from Mott MacDonald's Technical Development Plans issue P1. The alignment upon which the diversionary cost estimates have been prepared is therefore different in certain areas to the current 'Design Freeze' alignment shown on Mott MacDonald Drawings 203011/EDIN/0501 to 0555 Revision P1 inclusive. After review, in the case of specific utility companies, the 'Design Freeze' alignment could add significantly to the diversionary works required. Further details are included in the section dealing with each individual utility below. The main changes to alignment from the Technical Development Plans (Issue P1), is the change in alignment in the Lindsay Road area, a change in alignment in the Haymarket Yards area, and the selection of a new route through the Granton Waterfront development area.

It is important to note that the diversionary cost estimates prepared by the utility companies do not take account of any potential diversions required for the siting of tram stops along the tram route.

3.2 Utility Summary Tables

The following tables have been produced to give an overall indication of the quantity of apparatus that will require to be either diverted out of the swept path of the tram or to receive a degree of protection/reinforcement. The tables were prepared in advance of any detailed discussions or responses from the utility companies and are intended as a guide to the level of work required rather than as a full and complete record of the diversionary works. Due to the complexity of their network a summary table a summary table of ScottishPower apparatus was is not included

Table 3.1

BT – Summary of affected apparatus				
Drawing No.	**Street / Location**	**Size (mm)**	**Material**	**Comments**
0601	West Harbour Road Area (North of carriageway area)	---	---	1 No. Duct
0602	West Harbour Road Area (North of carriageway area)	---	---	1 No. Duct
	West Harbour Road (South pavement)	---	---	1 No. Duct Transverse Crossing
0603	No apparatus affected			
0604	Caroline Park Avenue	---	---	1 No. Duct Transverse Crossing
0605	West Granton Road	---	---	2 No. Ducts Transverse Crossings
	Southern Approach Road	---	---	1 Duct: May have already been moved with the new road construction.
0606	Southern Approach Road	---	---	1 Duct: May have already been moved with the new road construction.

BT – Summary of affected apparatus				
Drawing No.	**Street / Location**	**Size (mm)**	**Material**	**Comments**
0607	Southern Approach Road (Adjacent to children's play area)	---	---	1 Duct: May have already been moved with the new road construction.
	Southern Approach Road (Duct runs parallel with swept pat from approx 50m south of West Pilton Bridge)	---	---	1 Duct: May have already been moved with the new road construction.
0608	No apparatus affected			
0609	Ferry Road Junction	---	---	3 No. Ducts Transverse Crossings
0610	No apparatus affected			
0611	No apparatus affected			
0612	No apparatus affected			
0613	Craigleith Drive Underbridge	---	---	1 No. Duct Transverse Crossing
0614	No apparatus affected			
0615	No apparatus affected			
0616	No apparatus affected			
0617	No apparatus affected			
0618	No apparatus affected			
0619	No apparatus affected			
0620	Haymarket Yards Area	---	---	2 No. Ducts Transverse Crossings
	Haymarket Yards (North verge)			1 No. Duct
	Haymarket Terrace (carriageway)	---	---	3 No. Ducts
0621	Haymarket Terrace (carriageway)	---	---	2 No. Ducts
	Haymarket (carriageway)	---	---	3 No. Ducts Transverse Crossings
	West Maitland Street (From Junction of Morrison Street to Torphichen Street)	---	---	1 No. Duct
0622	Shandwick Place (Canning Street junction)	---	---	1 No. Duct Transverse Crossing
0623	Princes Street (Junction with Hope Street/Shandwick Place)	---	---	2 No. Ducts Transverse Crossings
	Princes Street (South Charlotte St junction)	---	---	1 No. Duct Transverse Crossing
0624	No apparatus affected			
0625	Princes Street (Frederick Street junction)	---	---	1 No. Duct Transverse Crossing
	Princess Street (From junction of the Mound to South St Andrews Street)	---	---	1 No. Duct
0626	Princess Street (From junction of the Mound to South St Andrews Street)	---	---	1 No. Duct
	Princess Street (South St Davids St to South St Andrews St)	---	---	2 No. Ducts
	St Andrews Square (West)	---	---	1 No. Duct
	St Andrews Square (East)	---	---	1 No. Duct
	St Andrews Square Area	---	---	Multiple Transverse Crossings

BT – Summary of affected apparatus				
Drawing No.	**Street / Location**	**Size (mm)**	**Material**	**Comments**
0627A	Queen Street	---	---	1 No. Duct
	St Andrews Square (East)	---	---	1 No. Duct
	St Andrews Square Area	---	---	Multiple Transverse Crossings
	York Place (Elder Street East Junction)	---	---	1 No. Duct Transverse Crossing
0628A	Picardy Place	---	---	1 No. Duct
	Leith Walk (Junction with Picardy Place to London Road)	---	---	1 No. Duct
0629	Leith Walk (Junction with Picardy Place to London Road)	---	---	1 No. Duct
	Leith Walk (Junction with London Road to Annandale Street)	---	---	1 No. Duct
	Leith Walk (Annandale Street Junction)	---	---	Multiple Transverse Crossings
0630	Leith Walk (various locations)	---	---	6 No. Ducts Transverse crossings
0631	Leith Walk (From with junction with Middlefield to Albert street junction)	---	---	1 No. Duct
	Leith Walk (various locations)	---	---	6 No. Ducts Transverse crossings
0632A	Leith Walk (From Arthur Street to junction at Lorne Street)	---	---	1 No. Duct
	Leith Walk (various locations)	---	---	4 No. Ducts Transverse crossings
0633	Leith Walk (From Stead's Place to Jane Street)	---	---	1 No. Duct
	Leith Walk (various locations)	---	---	Multiple Transverse Crossings
0634A	Leith Walk (Crown Street to Constitution Street)	---	---	2 No. Ducts
	Leith Walk (various locations)	---	---	Multiple Transverse Crossings
	Constitution Street	---	---	1 No. Duct
0635A	Constitution Street (Coatfield Lane to Queen Charlotte Street)			1 No. Duct
0636	Constitution Street (Baltic Street/Bernard Street Junction)			Multiple Transverse Crossings
0637	Constitution Street (Roundabout at Ocean Drive)			Multiple Transverse Crossings
0638	No apparatus affected			
0639	Ocean Drive	---	---	3 No. Ducts Transverse Crossings
0640	Ocean Drive	---	---	3 No. Ducts Transverse Crossings
0641	Ocean Drive	---	---	1 No. Duct

BT – Summary of affected apparatus				
Drawing No.	**Street / Location**	**Size (mm)**	**Material**	**Comments**
	Ocean Drive			3 No. Ducts Transverse Crossings
0642	Pier Place	---	---	1 No. Duct Transverse Crossing
0643	Starbank Road to Trinity Crescent	---	---	1 No. Duct
0644	Starbank Road to Trinity Crescent	---	---	1 No. Duct
	Trinity Pumping Station	---	---	2 No. Ducts Transverse crossings
0644	No apparatus affected			
0645	No apparatus affected			
0646	No apparatus affected			
0647	No apparatus affected			
0648	No apparatus affected, that is not covered under drawing 0601			

Table 3.2

Cable and Wireless - Summary of affected apparatus				
Drawing No.	**Street / Location**	**Size (mm)**	**Material**	**Comments**
0601	No apparatus affected			
0602	No apparatus affected			
0603	No apparatus affected			
0604	No apparatus affected			
0605	No apparatus affected			
0606	No apparatus affected			
0607	No apparatus affected			
0608	No apparatus affected			
0609	No apparatus affected			
0610	No apparatus affected			
0611	No apparatus affected			
0612	No apparatus affected			
0613	No apparatus affected			
0614	No apparatus affected			
0615	No apparatus affected			
0616	No apparatus affected			
0617	No apparatus affected			
0618	No apparatus affected			
0619	No apparatus affected			
0620	Haymarket Yards (North verge)	---	---	1 No. Duct
	Haymarket Terrace (South verge)	---	---	1 No. Duct Transverse crossing
0621	Haymarket (West side of carriageway)	---	---	1 No. Duct
	West Maitland Street (From junction with Torphichen Street to Atholl Place)	---	---	1 No. Duct

Cable and Wireless - Summary of affected apparatus				
Drawing No.	**Street / Location**	**Size (mm)**	**Material**	**Comments**
0622	West Maitland Street (From junction with Torphichen Street to Atholl Place)	---	---	1 No. Duct
	Shandwick Place (From Canning Street to Princes Street)	---	---	1 No. Duct
0623	Shandwick Place (From Canning Street to Princes Street)	---	---	1 No. Duct
	Princess Street (Junction with Hope Street)	---	---	1 No. Duct Transverse crossing
0624	No apparatus affected			
0625	No apparatus affected			
0626	St Andrews Square Area	---	---	Multiple Transverse crossings
0627A	St Andrews Square Area	---	---	Multiple Transverse crossings
	York Place (Centre of carriageway)	---	---	1 No. Duct
0628A	York Place (Centre of carriageway)	---	---	1 No. Duct
	York Place (Broughton Street Junction)	---	---	1 No. Duct Transverse crossing
0629	Leith Walk (Annandale Street Junction)	---	---	1 No. Duct Transverse crossing
0630	No apparatus affected			
0631	No apparatus affected			
0632A	No apparatus affected			
0633	No apparatus affected			
0634A	No apparatus affected			
0635A	No apparatus affected			
0636	No apparatus affected			
0637	No apparatus affected			
0638	No apparatus affected			
0639	Ocean Drive	---	---	2 No. Duct Transverse Crossing
0640	No apparatus affected			
0641	No apparatus affected			
0642	No apparatus affected			
0643	No apparatus affected			
0644	No apparatus affected			
0645	No apparatus affected			
0646	No apparatus affected			
0647	No apparatus affected			
0648	No apparatus affected			

Table 3.3

Scottish Water, Water Supply – Summary of affected apparatus				
Drawing No.	**Street / Location**	**Size (mm)**	**Material**	**Comments**
0601	Granton Square	300	DI	Main: Primary Distributor, Leith/Granton 1999

Scottish Water, Water Supply – Summary of affected apparatus				
Drawing No.	**Street / Location**	**Size (mm)**	**Material**	**Comments**
	Granton Square	unknown	CI	Main: Secondary Distributor Transverse Crossing
	Granton Square	unknown	CI	Main: Secondary Distributor Transverse Crossing
	Granton Square	unknown	CI	Main: Secondary Distributor Transverse Crossing
0602	West Harbour Road	6"	CI	Main: Secondary Distributor Transverse Crossing
	West Harbour Road	3"	CI	Main: Secondary Distributor Transverse Crossing
0603	No apparatus affected			
0604	No apparatus affected			
0605	West Granton Road	6"	unknown	Main: Secondary Distributor Transverse Crossing
	West Granton Road	400	CI	Main: Gogar to Granton - 400mm Primary Distributor Transverse Crossing
0606	No apparatus affected			
0607	No apparatus affected			
0608	Southern Approach Road (West verge)	450	DI	Main: Primary Distributor, 1999
0609	Ferry Road Junction	9"	CI	Main: Primary Distributor, 1926 Transverse Crossing
	Ferry Road Junction	16"	CI	Main: Primary Distributor, 1952 Transverse Crossing
0610	Disused solum (Roughly adjacent to Telford Gardens)	6"	CI	Main: Secondary Distributor Transverse Crossing
0611	No apparatus affected			
0612	No apparatus affected			
0613	No apparatus affected			
0614	No apparatus affected			
0615	No apparatus affected			
0616	No apparatus affected			
0617	No apparatus affected			
0618	No apparatus affected			
0619	Balbirnie Place	100	CI	Main: Secondary Distributor
0620	Haymarket Yards (North pavement)	150	DI	Main: Secondary Distributor Transverse Crossing
	Haymarket Terrace	6"	CI	Main: Secondary Distributor
	Haymarket Terrace	12"	CI	Main: Primary Distributor, 1913
	Haymarket Terrace	4"	CI	Main: Secondary Distributor
	Haymarket Terrace	6"	CI	Main: Secondary Distributor
0621	Haymarket Terrace	6"	CI	Main: Secondary Distributor
	Haymarket Terrace	12"	CI	Main: Primary Distributor, 1913
	Haymarket Terrace	4"	CI	Main: Secondary Distributor
	Haymarket Terrace	6"	CI	Main: Secondary Distributor
	Haymarket (North side of carriageway)	6"	CI	Main: Secondary Distributor
	Haymarket	6"	CI	Main: Secondary Distributor Transverse Crossing

Scottish Water, Water Supply – Summary of affected apparatus				
Drawing No.	**Street / Location**	**Size (mm)**	**Material**	**Comments**
	West Maitland Street (Morrison Street to Torphichen Street)	4"	CI	Main: Secondary Distributor
	West Maitland Street (Torphichen Street Junction)	6"	CI	Main: Secondary Distributor, 1906 Transverse Crossing
	West Maitland Street (Torphichen Street Junction)	18"	CI	Main: Primary Distributor, 1934 Transverse Crossing
0622	West Maitland Street (Palmerston Place to Manor Place)	6"	CI	Main: Secondary Distributor
	West Maitland Street (Palmerston Place to Manor Place)	5"	CI	Main: Secondary Distributor
	Shandwick Place (Manor Place to Coates Crescent)	6"	CI	Main: Secondary Distributor
	Shandwick Place (Manor Place to Canning Street)	5"	CI	Main: Secondary Distributor
	Shandwick Place (Canning Street Junction)	4"	CI	Main: Secondary Distributor Transverse Crossing
	Shandwick Place (Coates Crescent to Queensferry Road)	9"	CI	Main: Primary Distributor
0623	Shandwick Place (Coates Crescent to Queensferry Road)	9"	CI	Main: Primary Distributor
	Junction of Queensferry Road and Shandwick Place/ Lothian road	Various	CI	Congested hot spot of transverse crossings. Please refer to Drawing: Shandwick Place Water Record (20)
	Princes St (Charlotte St Junction)	15"	CI	Main: Primary Distributor, 1907 Transverse Crossing
0624	Princes Street (Adjacent to Building No. 121)	6"	CI	Main: Secondary Distributor Transverse Crossing
0625	Princes Street (The Mound Junction)	9"	CI	Main: Primary Distributor Transverse Crossing
	Princes Street (The Mound Junction)	16"	CI	Main: Primary Distributor Moorfoot (New) trunk Transverse Crossing
	Princes Street (The Mound Junction)	12"	CI	Main: Primary Distributor Transverse Crossing
	Princes Street (The Mound Junction)	15"	CI	Main: Primary Distributor Crawley 1821 Trunk Mains Transverse Crossing
	Princes Street (Hanover Street to Waverley Bridge)	3"	CI	Main: Secondary Distributor
0626	Princes Street (Hanover Street to Waverley Bridge)	3"	CI	Main: Secondary Distributor
	St Andrews Square Loop	---	---	Multiple Transverse Crossings
	South St David's St (Meuse Lane to Rose Street)	6"	CI	Main: Secondary Distributor

Scottish Water, Water Supply – Summary of affected apparatus				
Drawing No.	**Street / Location**	**Size (mm)**	**Material**	**Comments**
	St Andrews Square East	4"	CI	Main: Secondary Distributor
	St Andrews Square East	6"	CI	Main: Secondary Distributor
	South St Andrews Street	6"	CI	Main: Secondary Distributor
	South St Andrews Street	4"	CI	Main: Secondary Distributor
0627A	St Andrews Square Loop	---	---	Multiple Transverse Crossings
	Queen Street	14"	CI	Main: Primary Distributor, 1908
	North St Andrews Street	8"	CI	Main: Secondary Distributor
	St Andrews Square East	6"	CI	Main: Secondary Distributor
	St Andrews Square East	4"	CI	Main: Secondary Distributor
	York Place (North St Andrews Street to Picardy Place)	12"	CI	Main: Primary Distributor, 1907
0628A	York Place (Elder Street to Leith Walk)	12"	CI	Main: Primary Distributor, 1907
	York Place (Elder Street to Broughton Street)	5"	CI	Main: Secondary Distributor
	York Place (Broughton Street Junction)	12"	CI	Main: Primary Distributor, 1907 Transverse Crossing
	Picardy Place	5"	CI	Main: Secondary Distributor
	Leith Walk (Greenside Place)	6"	CI	Main: Secondary Distributor Transverse Crossing
	Leith Walk (Union Street Junction)	16"	CI	Main: Primary Distributor Transverse Crossing
0629	Leith Walk (London Road to Montgomery Street)	9"	CI	Main: Primary Distributor
	Leith Walk (London Road, to Annandale Street)	6"	CI	Main: Secondary Distributor
	Leith Walk (London Road, to Annandale Street)	8"	CI	Main: Secondary Distributor
0630	Leith Walk (Montgomery Street to Shrub Place)	9"	CI	Main: Primary Distributor
0631	Leith Walk (Albert Street Junction)	12"	CI	Main: Primary Distributor Transverse Crossing
	Leith Walk (Shrub Place Lane to Iona Street)	4"	CI	Main: Secondary Distributor, 1956
0632A	Leith Walk (Iona Street to Smiths Place)	9"	CI	Main: Primary Distributor
0633	Leith Walk (Smiths Place to Casslbank Street)	9"	CI	Main: Primary Distributor
	Leith Walk (Smiths Place to Casslbank Street)	7"	CI	Main: Secondary Distributor
0634A	Leith Walk (Casselbank Street to Duke Street)	7"	CI	Main: Secondary Distributor
	Leith Walk (Casselbank Street to Duke	9"	CI	Main: Primary Distributor

Scottish Water, Water Supply – Summary of affected apparatus				
Drawing No.	**Street / Location**	**Size (mm)**	**Material**	**Comments**
	Street)			
	Leith Walk (Casselbank Street to Duke Street)	4"	CI	Main: Secondary Distributor
	Leith Walk (Constitution Street Junction)	16"	CI	Main: Primary Distributor Transverse Crossing
	Constitution Street (Duke Street to Queen Charlotte Street)	6"	CI	Main: Secondary Distributor
	Constitution Street (Laurie Street to Queen Charlotte Street)	6"	CI	Main: Secondary Distributor
0635A	Constitution Street (Duke Street to Queen Charlotte Street)	6"	CI	Main: Secondary Distributor
	Constitution Street (Laurie Street to Queen Charlotte Street)	6"	CI	Main: Secondary Distributor
	Constitution Street (Queen Charlotte St to Mitchell Street)	12"	CI	Main: Primary Distributor, 1956
	Constitution Street (Queen Charlotte St to Mitchell Street)	6"	CI	Main: Secondary Distributor
	Constitution Street (Queen Charlotte St to Mitchell Street)	6"	CI	Main: Secondary Distributor
0636	Constitution Street (Charlotte St to Bernard Street)	12"	CI	Main: Primary Distributor, 1956
	Constitution Street (Baltic St Junction)	12"	CI	Main: Primary Distributor, 1963 Transverse Crossing
0637	Constitution Street (Constitution Place to Ocean Drive)	4"	Unknown	Connection: Single Supply
	Ocean Drive (North of Tower Place)	4"	Unknown	2No. Connection: Single Supply Transverse Crossing
	Alexandra Dock Area	2 1/2"	Unknown	Connection: Single Supply Transverse Crossing
0638	Victoria Docks	3"	Unknown	Connection: Single Supply Transverse Crossing
0639	Ocean Drive	3"	Unknown	2No. Connection: Single Supply Transverse Crossing
	Ocean Drive (Roundabout at South end of Ocean Terminal)	5"	Unknown	2No. Connection: Single Supply Transverse Crossing
0640	No Apparatus			
0641	Ocean Drive	Unknown (9"??)	Unknown	Connection: Single Supply
0642	Pier Place/Lindsay Road roundabout	250	DI	Main: Primary Distributor, 1999 Transverse Crossing

Scottish Water, Water Supply – Summary of affected apparatus				
Drawing No.	**Street / Location**	**Size (mm)**	**Material**	**Comments**
	Pier Place	300	DI	Main: Primary Distributor Leith/Granton 1999 Transverse Crossing
	Pier Place (Adjacent to no. 110)	Unknown (3"??)	Unknown	Main: Secondary Distributor Transverse Crossing
	Pier Place (Fishmarket Square to Craighall Road)	300	DI	Main: Primary Distributor Leith/Granton 1999
0643	Pier Place/Starbank Road Road	300	DI	Main: Primary Distributor, Leith/Granton 1999
	Starbank Road (North side of carriageway)	9" - 8"	CI	Main: Primary Distributor
	Starbank Road (South side of carriageway)	3" - 4"	CI	Main: Secondary Distributor
0644	Trinity Crescent - Starbank Road	300	DI	Main: Primary Distributor, Leith/Granton 1999
	Starbank Road (North side of carriageway)	8" to 9"	CI	Main: Secondary Distributor
	Starbank Road (South side of carriageway)	4"	CI	Main: Secondary Distributor
0645	No apparatus present			
0646	Disused solum	300	DI	Main: Primary Distributor, Leith/Granton 1999
0647	Lower Granton Road	300	DI	Main: Primary Distributor, Leith/Granton 1999
0648	Granton Square	300	DI	Main: Primary Distributor, Leith/Granton 1999
	All other water supply on drawing No. 0648 covered under listing for sheet No. 0601.			

Table 3.4

Scottish Water, Sewerage – Summary of affected apparatus				
Drawing No.	**Street / Location**	**Size (mm)**	**Material**	**Comments**
0601	No apparatus affected			
0602	West Harbour Road	420	CO	Gravity Pipe: Combined Sewer Transverse Crossing
	West Harbour Road	225	VC	Gravity Pipe: Surface Water Transverse Crossing
0603	No apparatus affected			
0604	Caroline Park	1830	CO	Gravity Pipe: CSO Transverse Crossing
	Caroline Park	1350	CO	Gravity Pipe: Combined Sewer Transverse Crossing
	Caroline Park	1300 x 920	Brick	Gravity Pipe: Surface Water Transverse Crossing
0605	Gasworks site (North of West Granton Road)	450	CO	Gravity Pipe: Combined Sewer Transverse Crossing
	West Granton Road / Southern Approach Road Junction	600	CO	Gravity Pipe: Combined Sewer

				Transverse Crossing
0606	Southern Approach Road	225	VC	Gravity Pipe: Surface Water
0607	No apparatus affected			
0608	Southern Approach Road	375	VC	Gravity Pipe: Combined Sewer Transverse Crossing
0609	Ferry Road Junction	525	CO	Gravity Pipe: Combined Sewer Transverse Crossing
	Disused solum	375	VC	Gravity Pipe: Natural Water
0610	No apparatus affected			
0611	No apparatus affected			
0612	South of Groathill Road Bridge	610	VC	Gravity Pipe: Natural Water Transverse Crossing
0613	No apparatus affected			
0614	No apparatus affected			
0615	No apparatus affected			
0616	No apparatus affected			
0617	No apparatus affected			
0618	No apparatus affected			
0619	Disused solum (Haymarket Yards Area)	1830 x 1220	---	Gravity Pipe: Combined Sewer May require movement of large sewer junction Transverse Crossing
	Disused solum (Haymarket Yards Area)	1580 x 1015	---	Gravity Pipe: Combined Sewer May require movement of large sewer junction Transverse Crossing
	Disused solum (Haymarket Yards Area)	610 x 685	---	Gravity Pipe: Combined Sewer May require movement of large sewer junction Transverse Crossing
	Haymarket Yards Area	610 x 685	---	Gravity Pipe: Combined Sewer Transverse Crossing
0620	Balbirnie Place	1220	---	Gravity Pipe: Loughrin combined sewer Transverse Sewer
	Elgin house area	300	VC	Gravity Pipe: Combined Sewer Transverse Crossing
	Elgin House area	1372	---	Gravity Pipe: Surface Water
	Haymarket Terrace	1750 x 915	---	Gravity Pipe: Combined Sewer
0621	Haymarket Terrace	1750 x 915	---	Gravity Pipe: Combined Sewer
	Haymarket	1420 x 910	---	Gravity Pipe: Combined Sewer
	West Maitland Street	1600 x 990	---	Gravity Pipe: Combined Sewer
0622	West Maitland Street	1600 x 900	---	Gravity Pipe: Combined Sewer
0623	Shandwick Place	1065 x 450	VC	Gravity Pipe: Combined Sewer
	Princes Street (Charlotte Street Junction)	2400 x 930	---	Gravity Pipe: Combined Sewer
0624	Princes Street	1400 x 100	---	Gravity Pipe: Combined Sewer

	Princes Street (Castle St Junction)	1750 x 1000	---	Gravity Pipe: Combined Sewer Transverse Crossing
0625	Princes Street (Adjacent to No. 88)	375	VC	Gravity Pipe: Combined Sewer Transverse Crossing
	Princes Street (Adjacent to No. 74)	1740 x 750	VC	Gravity Pipe: Combined Sewer Transverse Crossing
	Princes Street (Adjacent to No. 64)	150	VC	Gravity Pipe: Combined Sewer Transverse Crossing
0626	South St David's Street	1750 x 915	VC	Gravity Pipe: Combined Sewer
	St Andrews Square West	1600 x 900	---	Gravity Pipe: Combined Sewer
	South St Andrews Street	1830 x 915	---	Gravity Pipe: Combined Sewer
	Princes Street	1680 x 915	---	Gravity Pipe: Combined Sewer
0627A	North St David's Street	1933 x 910 reducing to 1290 x 940	---	Gravity Pipe: Combined Sewer
	North St Andrews Street	225	VC	Gravity Pipe: Combined Sewer
	North St Andrews Street	1675 x 915	---	Gravity Pipe: Combined Sewer
	York Place	1750 x 840	---	Gravity Pipe: Combined Sewer
0628A	York Place	2190 x 900	---	Gravity Pipe: Combined Sewer
	York Place (Broughton Street Junction)	535	VC	Gravity Pipe: Combined Sewer Transverse Crossing
	Picardy Place	1220 x 610	---	Gravity Pipe: Combined Sewer
0629	No apparatus affected			
0630	Leith Walk (McDonald Road Junction)	225	VC	Gravity Pipe: Combined Sewer Transverse Crossing
	Leith Walk (South of Shrub Place Lane)	600	VC	Gravity Pipe: Combined Sewer Transverse Crossing
	Leith Walk (South of Shrub Place Lane)	450	VC	Gravity Pipe: Combined Sewer Transverse Crossing
0631	Leith Walk (Albert Street Junction)	300	VC	Gravity Pipe: Combined Sewer Transverse Crossing
	Leith Walk (Middlefield Junction)	300	VC	Gravity Pipe: Combined Sewer Transverse Crossing
0632A	Leith Walk (Adjacent to House No. 310)	---	---	Complex arrangements of 300VC Gravity Pipes feeding in a 3075 Concrete trunk sewer
	Leith Walk (Adjacent to House No. 310)	3075	CO	Gravity Pipe: Combined Sewer Transverse Crossing
0633	Leith Walk (Springfield Street Junction)	375	VC	Gravity Pipe: Combined Sewer Transverse Crossing

	Leith Walk (Stead's Place to junction with Jane Street)	450	VC	Gravity Pipe: Combined Sewer
0634A	Leith Walk	375	VC	Gravity Pipe: Combined Sewer
	Leith Walk (Duke Street Junction)	1000	Brick	Gravity Pipe: Combined Sewer Transverse Crossing
	Leith Walk (Duke Street Junction)	2030	---	Gravity Pipe: Combined Sewer Transverse Crossing
	Constitution Street	225 - 250	VC	Gravity Pipe: Combined Sewer
0635A	Constitution Street (South of Hose No. 99)	375	VC	Gravity Pipe: Combined Sewer
	Constitution Street (House No. 99 to Queen Charlotte Street)	420 x 400	Brick	Gravity Pipe: Combined Sewer
	Constitution Street (North of Queen Charlotte Street)	680 x 490	Brick	Gravity Pipe: Combined Sewer
0636	Constitution Street (Queen Charlotte Street to Bernard Street)	680 x 490 reducing to 520 x 400	Brick	Gravity Pipe: Combined Sewer
	Constitution Street (Bernard Street to Tower Street)	1290 x 680	Brick	Gravity Pipe: Combined Sewer
	Constitution Street (Tower Street to Ocean Drive Roundabout)	225	VC	Gravity Pipe: Combined Sewer
0637	Constitution Street (Tower Street to Ocean Drive Roundabout)	225	VC	Gravity Pipe: Combined Sewer
0638	No apparatus affected			
0639	No apparatus affected			
0640	Annfield Pumping Station	---	---	CSO Outfall
0641	No apparatus affected			
0642	Pier Place (Newmarket Place Roundabout to Fishmarket Square)	300	VC	Gravity Pipe: Combined Sewer
	Pier Place (Newmarket Place Roundabout to outfall at Newhaven Harbour	525-600	CO	Gravity Pipe: Surface Water
	Pier Place (Newmarket Place Roundabout to Newhaven Harbour Slipway)	675 - 685	CO	Gravity Pipe: Combined Sewer
0643	Pier Place	525	CO	Gravity Pipe: Surface Water
	Pier Place (Craighall Road Junction)	300	VC	Gravity Pipe: Combined Sewer Transverse Crossing
	Pier Place (Craighall Road Junction)	1050 x 600	VC	Gravity Pipe: Combined Sewer Transverse Crossing
	Starbank Road	1250	---	Gravity Pipe: Combined Sewer, Granton Leith Interceptor Sewer
	Starbank Road	375	VC	Gravity Pipe: Combined Sewer
0644	Starbank Road - Trinity Crescent	1050	CO	Gravity Pipe: Combined Sewer

	Starbank Road - Trinity Crescent	400	VC	Gravity Pipe: Combined Sewer
	Trinity Crescent (Trinity Pumping Station)	---	---	Hatchbox
	Trinity Crescent (Trinity Pumping Station)	1680	TUNNEL	Gravity Pipe: Combined Sewer Transverse Crossing
	Trinity Crescent (Trinity Pumping Station)	375	---	Gravity Pipe: Combined Sewer Transverse Crossing
0645	Disused Railway solum	1200	CO	Gravity Pipe: Combined Sewer
	McKelvie Parade	600 x 500	Brick	Gravity Pipe: Combined Sewer Transverse Crossing
0646	Disused Railway Solum	300	VC	Gravity Pipe: CSO Transverse Crossing
0647	Disused Railway Solum	300	VC	Gravity Pipe: CSO Transverse Crossing
0648	Granton Square	600 x 410	Brick	Gravity Pipe: CSO Transverse Crossing

Table 3.5

Telewest – Summary of affected apparatus				
Drawing No.	**Street / Location**	**Size (mm)**	**Material**	**Comments**
0601	West Harbour Road (North pavement)	---	---	1 No. Duct
0601	Along West Harbour Road	---	---	4 No. Ducts Transverse Crossings
0602	West Harbour Road (South pavement)	---	---	1 No. Duct Transverse Crossing
0603	No apparatus affected			
0604	No apparatus affected			
0605	No apparatus affected			
0606	No apparatus affected			
0607	No apparatus affected			
0608	No apparatus affected			
0609	Southern Approach Road (Junction with Ferry Road)	---	---	1 No. Duct Transverse Crossing
0610	No apparatus affected			
0611	No apparatus affected			
0612	No apparatus affected			
0613	No apparatus affected			
0614	No apparatus affected			
0615	No apparatus affected			
0616	No apparatus affected			
0617	No apparatus affected			
0618	No apparatus affected			
0619	No apparatus affected			
0620	Traffic island at Haymarket Yards / Terrace Junction	---	---	1 No. Duct Transverse Crossing
0621	West Maitland Street (West side of carriageway)	---	---	1 No. Duct
	West Mailand Street (Junction with Grosvenor Street)	---	---	4 No. Ducts Transverse Crossings

0622	West Maitland Street (East side of carriageway)	---	---	1 No. Duct
	Shandwick Place (Junction with Canning Street)	---	---	1 No. Duct Transverse Crossing
0623	No apparatus affected			
0624	No apparatus affected			
0625	No apparatus affected			
0626	St Andrews Square area	---	---	3 No. Ducts Transverse Crossings
0627A	North St Andrews Street (East side of carriageway)	---	---	1 No. Duct
	St Andrews Square area	---	---	2 No. Ducts Transverse Crossings
0628A	No apparatus affected			
0629	Leith Walk (Union Place)	---	---	1 No. Duct Transverse Crossing
0630	No apparatus affected			
0631	Leith Walk	---	---	2 No. Ducts Transverse Crossings
0632A	Leith Walk	---	---	2 No. Ducts Transverse Crossings
0633	Leith Walk (Manderston Street Junction)	---	---	1 No. Duct Transverse Crossing
0634A	Leith Walk (Junctions with Crown Place and Duke Street)	---	---	1 No. Duct Transverse Crossing
0635A	No apparatus affected			
0636	No apparatus affected			
0637	Ocean Drive (Roundabout at Tower Street)	---	---	1 No. Duct Transverse Crossing
0638	No apparatus affected			
0639	No apparatus affected			
0640	No apparatus affected			
0641	No apparatus affected			
0642	Pier Place	---	---	1 No. Duct Transverse Crossing
0643	No apparatus affected			
0644	Trinity Crescent (Transverse crossing at the Old Pier Public House and Trinity Pumping Station)	---	---	1 No. Duct Transverse Crossing
0645	No apparatus affected			
0646	No apparatus affected			
0647		---	---	
0648	Apparatus covered under drawing No. 0601			

Table 3.6

Thus – Summary of affected apparatus				
Drawing No.	**Street / Location**	**Size (mm)**	**Material**	**Comments**
0601	No apparatus affected			
0602	No apparatus affected			
0603	No apparatus affected			
0604	No apparatus affected			
0605	No apparatus affected			

Thus – Summary of affected apparatus				
Drawing No.	**Street / Location**	**Size (mm)**	**Material**	**Comments**
0606	No apparatus affected			
0607	No apparatus affected			
0608	No apparatus affected			
0609	No apparatus affected			
0610	No apparatus affected			
0611	No apparatus affected			
0612	No apparatus affected			
0613	No apparatus affected			
0614	No apparatus affected			
0615	No apparatus affected			
0616	No apparatus affected			
0617	No apparatus affected			
0618	No apparatus affected			
0619	No apparatus affected			
0620	Haymarket Yards (South verge)	---	Fibre Optics	1 No. Duct
	Haymarket Terrace (South verge)	---	Fibre Optics	1 No. Duct
0621	Haymarket Terrace (Roseberry Crescent Jnctn)	---	Fibre Optics	1 No. Duct Transverse Crossing
	Haymarket Terrace	---	Fibre Optics	1 No. Duct
0622	No apparatus affected			
0623	No apparatus affected			
0624	No apparatus affected			
0625	No apparatus affected			
0626	St Andrews Square Loop	---	Fibre Optics	Multiple Transverse Crossings
	St Andrews Square East - South St Andrews Street	---	Fibre Optics	1 No. Duct
0627A	St Andrews Square Loop	---	Fibre Optics	Multiple Transverse Crossings
	Queen Street (North St Davids Street to North St Andrews Street)	---	Fibre Optics	1 No. Duct
	St Andrews Square East	---	Fibre Optics	1 No. Duct
0628A	Leith Walk (Picardy Place to London Road)	---	Fibre Optics	1 No. Duct
0629	Leith Walk (Picardy Place to London Road)	---	Fibre Optics	1 No. Duct
	Leith Walk (Centre of carriageway, from North of Montgomery Street)	---	Fibre Optics	1 No. Duct
0630	Leith Walk (Centre of carriageway)	---	Fibre Optics	1 No. Duct
0631	No apparatus affected			
0632A	No apparatus affected			
0633	Leith Walk (Junction with Manderston Street)	---	Fibre Optics	1 No. Duct Transverse Crossing
0634A	No apparatus affected			
0635A	No apparatus affected			
0636	No apparatus affected			
0637	No apparatus affected			
0638	No apparatus affected			

Thus – Summary of affected apparatus				
Drawing No.	**Street / Location**	**Size (mm)**	**Material**	**Comments**
0639	No apparatus affected			
0640	No apparatus affected			
0641	No apparatus affected			
0642	No apparatus affected			
0643	No apparatus affected			
0644	No apparatus affected			
0645	No apparatus affected			
0646	No apparatus affected			
0647	No apparatus affected			
0648	No apparatus affected			

Table 3.7

Transco – Summary of affected apparatus				
Drawing No.	**Street / Location**	**Size (mm)**	**Material**	**Comments**
0601	West Harbour Road	500	PE	1 No. Medium Pressure (MP) Mains
	West Harbour Road	90	PE	1 No. LP Mains pipe Transverse Crossing
0602	West Harbour Road	32	PE	1 No. LP Mains pipe
	West Harbour Road	150	DI	1 No. LP Mains pipe Transverse Crossing
	West Harbour Road	500	PE	1 No. Medium Pressure (MP) Mains Transverse Crossing
0603	No apparatus affected			
0604	No apparatus affected			
0605	West Granton Road	48"	CI	1 No. Medium Pressure (MP) Mains Transverse Crossing
	Southern Approach Road (North end)	400	PE	1 No LP Mains pipe, May have already been diverted during road construction, location uncertain. Transverse Crossing
0606	No apparatus affected			
0607	No apparatus affected			
0608	Southern Approach Road	355	PE	1 No. Medium Pressure (MP) Mains
0609	Ferry Road Junction	9"	CI	1 No LP Mains pipe Transverse Crossing
	Ferry Road Junction	10"	AUDCO	1 No LP Mains pipe Transverse Crossing
0610	No apparatus affected			
0611	No apparatus affected			
0612	No apparatus affected			
0613	No apparatus affected			
0614	No apparatus affected			
0615	No apparatus affected			
0616	No apparatus affected			
0617	No apparatus affected			
0618	No apparatus affected			

Transco – Summary of affected apparatus				
Drawing No.	**Street / Location**	**Size (mm)**	**Material**	**Comments**
0619	No apparatus affected			
0620	Haymarket Yards	90	PE	1 No LP Mains pipe
	Haymarket Yards (Junction with Haymarket Terrace)	180	PE	1 No. LP Mains pipe Transverse Crossing
0621	West Maitland Street (Morrison Street to Torphichen Street)	15"	CI	1 No. LP Mains pipe
0622	West Maitland Street (Palmerston Place Junction)	15"	CI	1 No. LP Mains pipe
0623	No apparatus affected			
0624	No apparatus affected			
0625	Princes Street	30"	CI	1 No. Medium Pressure (MP) Mains Transverse Crossing
0626	South St David's Street (Rose Street Junction)	200	ST	1 No. LP Mains pipe
	South St David's St (St Andrews Square Junction)	63	PE	1 No. LP Mains pipe runs in 4" CI pipe Transverse Crossing
	South St Andrews Street (St Andrews Square Junction)	90	PE	1 No LP Mains pipe Transverse Crossing
	South St Andrews Street (St Andrews Square Junction)	90	PE	1 No LP Mains pipe Transverse Crossing
0626	Princess Street	8"	CI	1 No LP Mains pipe Transverse Crossing
0627A	North St David's Street	63	PE	2 No. LP Mains pipes Transverse Crossings
	Queen Street	8"	CI	1 No. LP Mains pipe Transverse Crossing
	Queen Street	3"	ST	1 No. LP Mains pipe Transverse Crossing
	North St Andrews Street	8"	CI	1 No. LP Mains pipe Transverse Crossing
	North St Andrews Street	90	PE	2 No. LP Mains pipes Transverse Crossings
0628A	York Place (Broughton Street Junction)	9"	CI	1 No. LP Mains pipe
0629	Leith Walk (Gayfield Square Junction)	18"	SI / CI	1 No. LP Mains pipe Transverse Crossing
0630	No apparatus affected			
0631	Leith Walk (Shrub Place)	9"	CI	1 No. LP Mains pipe Transverse Crossing
	Leith Walk (Pilrig Street Junction)	9"	CI	1 No. LP Mains pipe Transverse Crossing
0632A	Leith Walk (Balfour Street Junction)	9"	CI	1 No. LP Mains pipe Transverse Crossing
0633	Leith Walk (Smiths Place Junction)	9"	CI	1 No. LP Mains pipe Transverse Crossing
	Leith Walk (Jane Street Junction)	180	PE	1 No. LP Mains pipe running in a 10" CI pipe Transverse Crossing
	Leith Walk (Jane Street Junction to Junction with Manderston Street)	500	PE	1 No. Medium Pressure (MP) Mains

Transco – Summary of affected apparatus				
Drawing No.	**Street / Location**	**Size (mm)**	**Material**	**Comments**
0634A	Leith Walk (East side of carriageway in the Crown Street Area)	12"	CI	1 No. LP Mains pipe
	Constitution Street (Duke Street Junction)	9"	CI	1 No. LP Mains pipe
0635A	No apparatus affected			
0636	Constitution Street (South of Bernard Street Junction)	8"	CI	1 No. LP Mains pipe
	Constitution Street (Bernard/Baltic Street Junction)	24"	CI	1 No. LP Mains pipe Transverse Crossing
	Constitution Street (Bernard/Baltic Street Junction)	9"	CI	1 No. LP Mains pipe Transverse Crossing
	Constitution Street (North of Bernard Street Junction)	12"	CI	1 No. LP Mains pipe
0637	Constitution Street (Ocean Drive Roundabout area)	90	PE	1 No. LP Mains pipe
0638	No apparatus affected			
0639	Ocean Drive (Roundabout at Ocean Terminal)	180	PE	1 No. LP Mains pipe Transverse Crossing
	Ocean Drive (Roundabout at Ocean Terminal)	250	PE	1 No. LP Mains pipe Transverse Crossing
0640	No apparatus affected			
0641	Ocean Drive	125	PE	1 No. Medium Pressure (MP) Mains Transverse Crossing
	Ocean Drive	250	PE	1 No. Medium Pressure (MP) Mains Transverse Crossing
0642	Ocean Drive to Pier Place	250	PE	1 No. Medium Pressure (MP) Mains
	Pier Place	90	PE	2 No. LP Mains pipes Transverse Crossing
0643	Starbank Road	6"	CI	1 No. LP Mains pipe
0644	Starbank Road	6"	CI	1 No. LP Mains pipe
0645	No apparatus affected			
0646	No apparatus affected			
0647	No apparatus affected			
0648	No apparatus affected, that is not covered under drawing 0601			

3.3 BT

BT provided a diversionary cost estimate of £6,285,523 (Exc. VAT). However, no information regarding the breakdown of individual diversions or major items of apparatus was provided. BT also declined to provide any information on lead in times.

Following review of the BT apparatus location plans, no items of BT plant which would pose significant diversionary works issues were identified along the route of the tram line. Details of BT's diversionary works cost estimate is contained in Appendix F.

3.4 Cable and Wireless

The diversionary works cost estimate prepared by Cable and Wireless totalled £592,800 (exc. VAT). No significant diversionary works issues were identified along the route of the tram. Cable and Wireless provided a full breakdown of costs along with plans detailing the diversionary works to be undertaken.

The majority of the proposed Cable and Wireless diversionary works occurs on two sections of the route, namely the section of the route between Haymarket Terrace and Lothian Road, and the section around the St Andrews Square loop to Picardy Place. Cable and Wireless estimate that approximately 6 to 9 months lead in time is required for the diversionary works identified.

As the Cable and Wireless network serves only selected users along the route there is greater scope for diverting Cable and Wireless apparatus on to alternative roads, when compared to relocating utilities which have a much greater frequency of service connections such as water, gas and electricity.

Details of the Cable and Wireless diversionary works cost estimate is contained in Appendix F. Drawings detailing Cable and Wirelesses proposed diversionary works are also included in Appendix F.

3.5 ScottishPower

ScottishPower provided a diversionary costs estimate of £2,937,272 (exc. VAT). In the case of ScottishPower, the change in alignment to the current 'design freeze' alignment has significant impact on the cost of ScottishPower diversionary works. The design freeze alignment shows the tram route requiring the demolition of the Ocean Drive Primary Substation. A cost estimate for the demolition and relocation of the substation was obtained form Scottish Power, and it was anticipated that the relocation would add approximately £1.5m to the diversionary works cost estimate. Adding this to the initial diversionary works cost estimate increases the total cost estimate to £4,437,277 (exc. VAT).

Of the initial diversions identified by ScottishPower, the diversion of 2 x 275 kV transmission cables on Leith Walk (cables run from the junction with Arthur Street to the junction with Dalmeny Street) account for just over £1.6m of the diversionary cost estimate. These are substantial items of plant and lead in times of around 18 months would be expected for any construction works to be carried out. Excavations for joints in transmission cables may require to be 2 to 3 metres wide and 6 to 8 metres long. It is likely that there would be a significant impact on traffic at this site during the period of the diversionary works being undertaken.

In total, 63 diversionary works schemes were identified by ScottishPower. Of these two schemes were estimated at costing over £100,000. These are the diversion of two 275kV Transmission Cables on Leith Walk and a £195,000 diversion of cables in the St Andrews Square area. Of the remaining schemes, 5 were estimated at costing between £50,000 and £100,000, and the remainder were estimated at costing less than £50,000.

A cost summary spreadsheet detailing ScottishPowers proposed diversions for Edinburgh Tram Line One is contained in Appendix F. It should be noted that the spreadsheet does not contain the diversionary cost estimate for the Ocean Drive Substation.

3.6 Scottish Water

Scottish Water provided a detailed diversionary cost estimate for the project. Information on the diameter and depth of apparatus was verified using Scottish Water's GIS system. The diameter and depth information was also obtained from the GIS system and was augmented by reference to ongoing manhole and sewer surveys where applicable.

Scottish Water identified 248 diversionary schemes from the 48 combined public utility apparatus drawings issued to them. It is likely that the total number of Scottish Water affected assets is less than 248 due to the fact that assets can span several sheets. This will not however, affect the total cost estimate, as the estimated cost for each diversion has been calculated by the length of diversion required on each sheet.

Scottish Water have included protection works for their apparatus at several of the over and underbridges on the disused Roseburn Railway Solum section of the route. Unless there are major bridge works occurring at these sites it is unlikely that any utility diversion work will be required. However, this cannot be confirmed until proposed works (if any) for each bridge has been finalised. Removing these costs from Scottish Water's diversionary works cost estimate would result in a reduction of diversionary works cost of approximately £100,000.

Scottish Water identified each scheme using a 'work' label to identify the activity that would be required for the asset, namely: 'Divert', 'Protect', and 'Do Nothing'. Schemes given a work label of 'Do Nothing' are thought to be non-essential at this stage but may require to be included in the project at a later date. The total diversionary cost estimate prepared by Scottish Water is £11,864,840 (Exc. VAT). A breakdown of costs is identified in Table 3.8.

Table 3.8

Work Items	No. of Schemes	Total Length	Total Cost
Water main protection	90	783	£406,740
Water main diversion	49	6,578	£4,151,450
Sewer protection	12	95	£68,850
Sewer diversion	27	3,597	£6,028,750
'Non-essential' Water main protection	0	0	£0
'Non-essential' Water main diversion	0	0	£0
'Non-essential' Sewer protection	70	779	£1,209,050
'Non-essential' Sewer diversion	0	0	£0
Total	**248**	**11,832**	**£11,864,840**

Of the 248 schemes identified by Scottish Water, 3 were identified as costing more than £0.5m. The 3 largest schemes are:

- The diversion of a 1600 x 990 mm combined sewer on West Maitland Street;
- The diversion of a 1300 x 680 mm combined sewer on Constitution Street; and
- The diversion of a 1250 mm diameter combined sewer on McKelvie Parade.

The Scottish Water report also included approximate timescales for carrying out the diversion works. The three largest schemes identified above are all estimated to require 5-6 weeks construction duration each.

It is the impact of the tram on Scottish Water's sewerage system which poses the greatest challenge for diversionary works. The sewerage system is gravity fed and therefore options for diversion are more

limited. It is expected that priority may have to be given to sewerage apparatus when allocating space alongside the tram line for relocated utility apparatus, in order to avoid costly and lengthy diversions.

Extracts from Scottish Water's Diversionary Works Report are contained in Appendix F.

3.7 Telewest

Telewest did not provide a diversionary cost estimate for the project. As the vast majority of Telewest plant is located within the footways in central Edinburgh, as opposed to within the carriageways, it is not thought that a large quantity of diversionary works would be required. It is considered that a reasonable diversionary works cost estimate for Telewest plant would be comparable to that prepared by Thusm and would be in the order of £500,000 for the complete route.

3.8 Thus

Thus provided a detailed diversionary works cost estimate of £425,000. This figure contained a provisional amount of £60,000 for proposed ducting to allow future expansion of their network. The change in alignment from the original swept path plan issued to the PU companies, to the current 'design freeze' plan means that an additional thus duct will require to be diverted in the Haymarket Yards area. However, the 'design freeze alignment requires one less Thus duct diversion on Haymarket Terrace, so any potential increase in cost is likely to be a zero balance. Thus did not provide any information on lead times for construction work.

As the Thus network serves only selected users along the route there is greater scope for diverting Thus apparatus on to alternative roads, when compared to relocating utilities which have a much greater frequency of service connections such as water, gas and electricity.

A cost summary spreadsheet detailing Thus PLC's proposed diversions for Edinburgh Tram Line One is contained in Appendix F.

3.9 Transco

Transco provided a diversionary works cost estimate of £1,900,000 (exc. VAT). However, it is noted that the estimate prepared by Transco does not include costings for individual service connections which may have to be renewed when uncovered. Transco's DRS system does not record these connections, hence figures on the possible numbers of properties involved are unclear. Each individual service costs £400 to renew. The renewal of a connection to a 12 flat tenement block could therefore cost in the region of £5,000. Given that a significant proportion of the tram route runs through areas of tenement housing, it is considered likely that the cost for diversionary works on Transco apparatus could increase significantly once the extent of service connections is uncovered at the construction stage.

Transco's cost estimates are based on a suitable location being available for the replacement gas main. Should this not be the case in certain areas of the route, due to congestion, lengthier and more costly diversions will have to be carried out.

Transco highlighted a 48" diameter Steel Medium Pressure Mains which will require to be diverted as part of the tram works. This diversion is considered not to be part of standard diversion works which contractors would undertake and would have to be covered by a separate contract. Transco's estimate for the diversionary cost of such a main is approximately £120,000. The estimated lead in time for the moving of such a main would be approximately 6 months from planning to the commencement of work on site.

It is also noted that Transco are undertaking a mains replacement programme in Edinburgh over the coming years. This may mean that some of the mains earmarked for diversion are removed from the swept path reducing the need for diversionary works, but conversely it could mean that new mains are laid within the swept path adding further to diversionary costs. It is therefore important that communication is maintained with Transco to avoid any future conflict in this regard. Whilst Transco are fully aware of the current tram proposals, they are not required by statute to take full cognisance of the proposals until the tram proposals become a committed scheme.

Transco declined to provide lead in times for the proposed works. A copy of Transco's cost estimate is contained in Appendix F. A set of maps detailing diversions identified by Transco are also contained in Appendix F.

3.10 Programme

Based on other schemes current at this time it is estimated that three months are programmed for the preparation of C3 diversionary cost estimates and a further 6 to 8 months are scheduled into the project programme for the preparation of the detailed C4 estimates, in accordance with the New Roads and Street Works Act, 1991. These are likely to be minimum durations.

Diversionary works could be undertaken as an advanced works package or alternatively programmed to be undertaken in parrallel with the tram track construction period. The latter approach is perhaps the most flexible as this would result in a phased approach to the diversionary works to match the laying of different sections of track. It would also have the advantage of disrupting traffic flows only once during the tram construction period, as opposed to disrupting traffic for the period of advanced works and then again for the construction period. Also items of plant which have longer lead times can be incorporated into the project programme early, reducing the overall project duration.

4 Summary

Table 4.1 gives a summary of the diversionary works cost estimates by utility company. Costs associated with the diversion of City of Edinburgh Council lighting and communication cables are excluded. A separate allowance for these works has been made by the cost consultant in preparing the overall project costs. Costs are shown excluding VAT and excluding any potential discount.

Transco's costs have been increased to reflect the service connections which will be required in some form. At this stage the number of service connections can only be estimated, but a reasonable number should clearly be allowed for. Based upon on the swept path alignment of drawings 201011/EDIN/PU/0601 – 0648, an allowance has been made for service connections to approximately 70 properties. £30,000 has therefore been added to Transco's diversionary works cost estimate to account for this.

Table 4.1

Utility Company	Diversionary works cost estimate (Exc. VAT)
Scottish Water	£11,864,840
British Telecom	£6,285,523
Scottish Power[1]	£4,437,272
Transco	£1,930,000
Cable and Wireless	£592,800
Telewest[2]	£500,000
Thus	£425,800
TOTAL	£26,036,235

The diversionary costs for Scottish Water account for approximately 50% of the overall budget. This is not unexpected, as Scottish Water have a much greater volume of apparatus within the tram's swept path in comparison with the other utilities.

Full details of the Utility Company responses and cost estimates are contained in Appendix F. Due to the size of the report prepared by Scottish Water, only an excerpt of the main findings of the report is attached.

Drawing 203011/EDIN/PU/0649 (attached) gives a breakdown of relative diversionary works cost by drawing number. This drawing has been prepared to show the anticipated spread of diversionary works along the tram route on a relative cost basis, based on the cost breakdowns provided by the utility companies. Where the cost estimate was not provided on an individual drawing sheet basis a simple pro-rata calculation was made to simply spread the cost across the affected areas. It is recommended that this drawing is updated as the diversionary costs are further developed through the C3 and C4 estimating process.

[1] Estimate includes £1.5M for the relocation of Ocean Drive Primary Substation.
[2] The Diversionary works cost shown for Telewest is an estimate only.

The sections of the route from Haymarket to the west end of Princess Street and the area from the St Andrews Square up to the north end of Constitution Street appear to be the most costly sections of the route in terms of utility diversionary works.

Appendix A: Utility Company Details

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Edinburgh
EH11 2RP

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Fax: 0131 345 3764

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Atkins Telecoms
Clifton House
Clifton Place
Glasgow
G3 7YY

Tel: 0141 342 2967
Fax: 0141 32 2962

ScottishPower

Ken Sharp
Scottish Power
Telferton House
53 Fishwives Causeway
Telferton Industrial Estate
Edinburgh
EH7 6UX

Tel: 0131 272 4212

ScottishWater

Aaron Laing
Scottish Water
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6 Castle Drive
Carnegie Campus
Dunfermline
KY11 8GG

Tel: 01383 848200
Fax: 01383 662000

Telewest

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Telewest Communications Plc
Unit 7
Bothwell Park Industrial Estate
Uddingston
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G71 6NZ

Transco

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Transco
24 Bankhead Drive
Sighthill
Edinburgh
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Tel: 0131 453 6585

Thus

John McMillan
Thus Plc
1-2 Berkeley Square
99 Berkeley Street
Glasgow
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Tel: 0141 567 1234

List of attendees at PU Workshop 27 February 2003

Utility Company Representatives

Alan Renton – BT
John McNeil – Atkins Telecoms (Cable and Wireless)
Ken Sharp – Scottish Power
Andrew Downie – Scottish Water
Bob Bailey – Thus Plc
John McMillan – Thus Plc
Robert Brown – Transco
Don McMillan – Transco

Project Team Members

Geoff Duke – TIE
Mark Bain – Mott MacDonald
Helen Bradley – Babtie
Alastair Camelford – Babtie
Sandy Wallace – City of Edinburgh Council

Appendix B: Diversionary Works Strategy

1b

Transport Initiatives Edinburgh

Edinburgh Tram
Line One Northern Loop
Diversionary Works Strategy

DRAFT FOR DISCUSSION

BTR0003048 11/10/2002 Revision 0

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Transport Initiatives Edinburgh
Edinburgh Tram Line One Northern Loop
Diversionary Works Strategy

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Appendices

Appendix A Implications Of A Promoter Led And Concessionaire Led Approach

Appendix B Spreadsheet For Preparation of C3 And C4 Estimates

Appendix C Swept Path Diagram

1 Introduction

1.1 The Diversionary Works Strategy (DWS) has been developed to ensure that the basis for procuring and managing the publicly and privately owned services and supplies (Utilities) diversionary works is clearly defined and agreed. The strategy will underpin all aspects of the Utilities interface with the Edinburgh Tram Line One Northern Loop (the Project) Construction or Concession Contract both during procurement and implementation.

1.2 The DWS document is an internal project team document that will be submitted for agreement as appropriate. It is not intended that this document be circulated outside of the project team, as the information pertinent to the Utilities will be included in the Utilities Interface Document.

2 Strategy Objectives

2.1 The high level DWS is:

> *to undertake and deliver the diversionary works in the most appropriate manner to deliver Value for Money for the Edinburgh Tram Line One Northern Loop project.*

2.2 Value for Money will be achieved by ensuring that risks are allocated to the organisation best placed to manage them. Therefore the DWS must consider and identify:

- Who is best placed to manage the Utilities' diversions?
- Who will contract with the Utilities?
- Who has what responsibilities under the
- Concession Contract (if applicable);
- Construction contract;
- New Roads and Street Works Act 1991;
- Construction (Design & Management) Regulations 1994;
- Transport (Scotland) Act 2001; and
- Any other relevant legislation.

2.3 The DWS has been developed and implemented to ensure that all information required for the key stages of project procurement is available when required.

2.4 The basis of the strategy is to undertake the minimum of diversions in order to minimise:

- cost;
- disruption; and
- programme delay.

2.5 It will however be important to ensure that Utilities can access and maintain their plant and apparatus without interruption of the operational services, as far as reasonably practicable. The strategy must consider the 'whole-life' costs associated with Utilities diversions and ensure that the achievement of minimum diversions does not create

unnecessary operational constraints or costs during the life of the Concession or other operating contract. This is consistent with the understanding that there will be no relief from the provisions of the Performance Monitoring System resulting from Utilities related disruption to the System.

2.6 A Value Engineering exercise will be conducted to investigate what mitigating action can be taken to further minimise the necessary diversionary works. It is expected that the Engineering Adviser will play an active role in the Value Engineering process.

3 Strategy

3.1 General

3.1.1 The procurement of the Project infrastructure will be structured to deliver the project such as to achieve the Promoter's objectives. The key objectives that influence the diversionary works model are understood to be:

- Value for Money;
- Commencement of Passenger Services by end 2009;
- Minimised disruption for General Public and Businesses.

3.1.2 Recent light rail schemes have adopted differing diversionary works models, although the Utilities Advisor considers that these are best achieved using a diversionary works model based on a Concessionaire led approach. The table in Appendix A, compares the implications for a range of parameters of a Promoter led and Concessionaire led approach.

3.1.3 In order to deliver Value for Money the model needs to consider and identify the organisation best placed to:

- Procure the Utilities' diversionary works;
- Finance / pay for the Utilities' diversionary works; and
- Manage the Utilities' diversionary works on site.

3.2 Procurement

Method of Procurement is still to be decided. The following and preceding paragraphs are based on Procurement through the Private Finance Initiative (PFI), adapted to allow for Procurement by Traditional Contract.

3.2.1 Legal Advisors on a similar project advised that it is possible for the Concessionaire / Contractor to be responsible for the procurement and payment of the necessary diversionary works and the Project benefit from the cost sharing provisions within the New Roads and Street Works Act 1991, as noted below.

For the purposes of the works under the New Roads and Street Works Act 1991 the discount (a contribution from a relevant Utilities company) is available to the transport authority. This includes any body undertaking works activities relating to the tramway under statutory authority. The Concessionaire / Contractor will be acting under a statutory authority delegated to them under the Edinburgh Tram Line One Northern Loop legislation and will therefore be entitled to receive the discount.

3.2.2 The Utilities will not favour this arrangement and may try to suggest that the cost sharing arrangements are not applicable on the basis that the diversionary works are not being procured by the Transport Authority and that the Concessionaire is a private sector company. In order to overcome this scenario the Promoter will need to write to the Utilities formally confirming that they are the Transport Authority and that the Concessionaire / Contractor will be procuring the diversionary works as the Promoter's Agent.

3.2.3 In addition, the Utilities may suggest that the costs sharing arrangements only apply pro-rata to the proportion of public funding of the Project. Therefore it may be also prudent for the letter to confirm that the diversionary works are being wholly funded by the public purse and not through any private sector contributions.

Is scheme to be wholly public funded? Impact of payment through Congestion Charging? TIE/CEC/Legal/PM

3.3 **Payment**

3.3.1 The costs identified in the C4 Estimates will be included in the Concession or Construction Contract as Provisional Sums and the arrangements for the Concession Company (if applicable) to draw down the funds will be set out in the diversionary works payment mechanism.

3.3.2 The diversionary works payment mechanism must ensure that the Concessionaire can only use the Provisional Sum monies for the purposes for which they are intended. Therefore the Concessionaire will be required to submit confirmation of the scope of the diversionary works and the associated cost estimate provided by the respective Utilities. (This will either be the C4 Estimate obtained by the Promoter or a revised C4 Estimate obtained by the Concessionaire.) In the event that the revised cost estimates exceed the associated Provisional Sum the balance will be for the Concessionaire's account and the Promoter will not be liable for the additional cost. If the Contract is procured by traditional means then the Resident Engineer will allocate payment as appropriate. In these circumstances, the Promoter will remain liable for the additional cost.

3.3.3 It is envisaged that the Concessionaire / Contractor will negotiate with the Utilities to undertake certain civils works on their behalf. In this scenario the Concessionaire / Contractor will be required to include his associated civils works costs within the submission for provisional sum monies. If the contract is procured by traditional means,

this will be paid at the Dayworks Rates included with the Tender Submission. However, for a PFI contract it will be important to ensure that this does not provide an opportunity for the Concessionaire to recover the entirety of the provisional sum monies avoiding the gain share arrangements discussed later in this section.

The Concessionaire's costs associated with the management and co-ordination of the Utilities diversionary works are not discussed within this Diversionary Works Strategy.

3.3.4 In order to benefit from the cost sharing provisions under the New Roads and Street Works Act 1991, 75% of the estimate value must be paid to the Utilities prior to the commencement of Works. In the event that the revised cost estimates are lower than the associated Provisional Sums 75% of the revised estimates will be released.

3.3.5 A number of Utilities on similar projects have advised that they would prefer a series of Orders rather than one single Order for the whole project. This is to overcome internal project management and financial issues and it has been suggested that the diversionary works Orders could be sub-divided by area, or per financial year.

3.3.6 On completion of the diversionary works the Utilities will submit a final account which will reflect the Utilities' reasonable costs associated with the diversionary works. The Concessionaire (if applicable) will be required to submit this information to the Promoter in order to drawdown the remaining 25% of the respective Provisional Sum monies, as appropriate.

3.3.7 The following section discusses the proposal that the Concessionaire / Contractor will be responsible for the on-site management and co-ordination of the diversionary works. Therefore any increases in the diversionary works costs between submission of C4 Estimate and Final Account arising from poor management, abortive works, piecemeal working or abortive mobilisation will be for the Concessionaire's account.

3.3.8 It is proposed that a gain share arrangement is included to share any savings of the Provisional Sum monies between the Promoter and the Concessionaire. A gain share arrangement will however, only be relevant to a contract procured through the PFI.

50/50% gain share? _ Only Relevant to PFI Utilities/Financial/PM

3.3.9 The gain share arrangement would only be applied once all of the Utilities' diversionary works are complete and the final accounts settled. Indeed the gain share would only be paid once the Promoter receives confirmation from the Concessionaire that all of the final accounts for the Utilities' diversionary works have been settled.

3.3.10 The Utilities are nervous of the problems of non-payment when major diversionary works are procured and paid by private sector companies. A gain share arrangement should contribute towards providing incentives to the Concessionaire to settle final accounts promptly. It is envisaged that the Concessionaire will exercise the rights under the New Roads and Street Works Act 1991 to audit the Utilities' costs. Clearly non-payment may remain an issue in the event that there are no savings to be allocated from the Provisional Sum monies. It is believed that the provisions of the Housing Grants Act will provide the necessary protection for the Utilities Companies.

Are Utilities diversionary works covered within the Housing Grants Act? Legal

3.4 **Management And Co-ordination On Site**

3.4.1 In order to meet the Promoter's objective of minimising disruption to the general public and business it is intended that the majority of the diversionary works are undertaken during the construction period, rather than as Advance Works. It is clear that the Concessionaire / Contractor is best placed to manage and co-ordinate the diversionary works undertaken during the construction phase of the Project.

3.4.2 Diversionary works will be considered and undertaken as Advance Works if there is a clear commercial or programme advantage to the Project. Utilities Companies will be requested to provide appropriate supporting information, which will be considered, on a case-by-case basis.

3.4.3 In order to minimise disruption to the general public and businesses, it is intended that diversionary works be undertaken concurrently with construction of the tram infrastructure. This is only practical if the Concessionaire / Contractor is provided with suitable road closures, which permit a certain level of consecutive working. Road closures of significant length provide the additional benefit of reducing the total number of closures required and therefore the number of different disruption scenarios to the general public, motorists and businesses. It is accepted that long-term closures with established diversion routes are accepted more readily than constantly modified/changeable diversion routes.

3.4.4 In the event that it is not possible to provide suitable road closures it may not be practicable to expect the Concessionaire / Contractor to implement concurrent working. The outcome of this will be that some areas may have to be closed twice as Utilities and Main Contract Works are undertaken separately. This clearly does not meet the Project objective of minimising disruption. Secondly if concurrent working is not achievable the total construction programme may be lengthened and extend beyond the deadline for the commencement of passenger services.

Temporary Traffic Management Strategy	Utilities/CEC/PM

3.5 Street Authority

3.5.1 The identity and role of the Street Authority needs to be considered in relation to the magnitude and nature of the Works to be undertaken by the Concessionaire / Contractor during the Construction Period. The interface between the Street Authority manager and the Concessionaire / Contractor should be defined and scoped in a manner to ensure that all statutory requirements are met and whilst permitting both parties to work efficiently.

3.5.2 The Edinburgh Tram Line One Northern Loop Act (2003 / 2005?) should be written such that it encompasses all legislation regarding the role of the Street Authority. This matter needs to be progressed between the Promoter (Transport Initiatives Edinburgh (TIE)) and City of Edinburgh Council (CEC) in order that a clear indication of the identity and requirements of the Street Authority can be provided in the Utilities Interface Document.

Clarification of identity, role and responsibilities of the Street Authority	TIE/CEC/Legal

3.6 Construction (Design & Management) Regulations 1994

3.6.1 Under the Construction (Design & Management) Regulations 1994 (CDM) the Concessionaire / Contractor may hold the responsibilities of the Client, Planning Supervisor, Principal Contractor and Designer. Notwithstanding this, the Utilities may intend to undertake streetworks under their own mandate rather than CDM, even though the site will be under 'control' of the Principal Contractor. The Concession / Construction Contract will need to include provisions clarifying such circumstances.

Confirmation required from Planning Supervisor.	PM

3.7 Summary

3.7.1 After investigation and consideration the Concessionaire / Contractor has been identified as best placed to procure, pay and manage the Utilities' diversionary works. Further work is required to ensure that the construction programme is optimised and achievable based on the traffic management strategy that is developed and agreed.

4 Diversionary Works Process

4.1 Outline

4.1.1 The New Roads and Street Works Act 1991 (NRSWA) and the associated Code of Practice 'Measures Necessary Where Apparatus is Affected by Major Works (Diversionary Works)' set out the process for identifying, scoping, procuring and implementing diversionary works for major projects.

4.1.2 The NRSWA includes provisions for Promoters to issue Notice of Major Works in advance of the commencement of the project in order to ensure that no new Utilities plant and apparatus is installed in direct conflict with the proposed New Works. In the event that such apparatus is installed after the Section 144 Notice has been installed, the cost of the necessary diversionary works is for the Utilities' account.

4.1.3 Cost sharing provisions are included for the construction works, but it is important to note that Utilities are entitled to charge for the preparation of subsequent estimates and proposals.

4.1.4 The diversionary works strategy is based on the premise that NRSWA process will be followed with the Utilities Advisor obtaining the C3 draft proposals and estimates on behalf of the Promoter. These will be used at this stage to assist with route selection and produce a more detailed design to comply with the strategy of minimising cost and disruption. If the project is procured through the PFI, these costs will be updated and included with the Invitation to Negotiate (ITN).

4.1.5 C4 detailed proposals and estimates will be prepared for inclusion in the Best and Final Offer (BAFO) Documentation after working through a value engineering exercise or for inclusion in the Contract Documents following detail design. The Utilities will be provided with all of the pertinent Project information within the Utilities Interface Document in order for them to scope the necessary diversionary works appropriately.

4.1.6 It should be remembered that the NRSWA is only applicable to the Utilities' plant and apparatus installed within the bounds of the public highway. Plant and apparatus located outside the pubic highway and the process for procuring the necessary diversionary works will need to follow the provisions that will be set out in the proposed Edinburgh Tram Line One Northern Loop Act (2003 / 2005?).

4.2 Estimates for the preparation of C3 and C4 Estimates

4.2.1 Appendix B includes a copy of the spreadsheet, which the Utilities are required to complete and submit by a future date.

Copy of Appendix B to be prepared.	Utilities

4.3 Electronic Communication

4.3.1 It is intended to electronically transfer drawings between the Promoter and Utilities companies. This will ultimately extend to Bidders and the appointed Concessionaire / Contractor.

4.4 Development of C3 Estimates

4.4.1 The C3 estimates are intended to assist with route selection and produce a more detailed design to comply with the strategy of minimising cost and disruption. They may be updated in the future, prior to being included in ITN documentation issued to Bidders at a future date. This would provide the Bidders with an outline of the nature and scope of the diversionary works required for the Project to permit them to price the requirements of the contract relating to the agreed DWS and Concession procurement strategy.

4.4.2 The provisions of The Street Works (Sharing of Costs of Works) (England) Regulations 2000 appear to have revised the cost sharing arrangements for major transport works in England from 82%/18% to 92.5%/7.5%. Legal Advisors on a similar project in England advised that:

> A proportion of the diversionary works costs will be borne by the Utilities company. For major works such as tramways then:
> - If the concessionaire does the work then the Utilities pays 7.5% of the cost
> - Of the Utilities does the work then the concessionaire pays them 92.5% of the cost

> However, for works which constitute major highway works, such as bridge works:
> - If the concessionaire does the work then the Utilities pays 18% of the cost
> - Of the Utilities does the work then the concessionaire pays them 82% of the cost

4.4.3 However, it would appear that no similar legislation has been introduced in Scotland, with the most recent legislation being The Road Works (Sharing of Costs of Works) (Scotland) Regulations 1992. The 82%/18% cost sharing arrangements would therefore appear to apply for this commission, although legislation may be introduced to bring Scotland in line with England during the life of this commission.

4.5 Development of C4 Estimates

4.5.1 More detailed diversionary works information will be required for the Tender Documents at the detailed design stage or for the BAFO documentation against which the final Bidders will be required to fine-tune their Bid. Therefore C4 detailed estimates and

proposals will be requested at a later date, after Parliamentary Approval has been obtained.

4.5.2 This process will commence with the issue of the following information:

- Utilities Interface Document;
- Highways Interface Document;
- Operational Safety Document;
- Stray Current Corrosion Control Agreement;
- Outline Construction Programme;
- Any revised swept path drawings;
- Topographical survey;

4.5.3 The C4 process will commence with detailed design work, which will feed into the value engineering exercise. On completion of this exercise the scope will be 'frozen' so that the Utilities can finalise their detailed estimate.

4.6 Bidders use of C4 Estimates

4.6.1 The C4 detailed proposals and estimates will be made available to the Bidders without warranty on the basis that the diversions identified are based on the information noted previously.

4.6.2 The Bidders will no doubt review this information and consider whether they wish to propose alternative approaches. It is anticipated that the Utilities companies will charge the private sector for re-design work once the C4 estimates have been completed. Hence the bidders will need to take a view on the potential cost saving of their design development or alternative diversionary works criteria against the costs (and potential programme delay) associated with the required re-design.

4.7 Plant and apparatus located outside of the public highway

4.7.1 A minor quantity of Utilities plant and apparatus requiring diversion may be located outside the pubic highway and the process for procuring the necessary diversionary works will need to follow the provisions that will be set out in the proposed Edinburgh Tram Line One Northern Loop Act (2003 / 2005?).

4.8 Utilities/Bidder Liaison

4.8.1 In order to maintain goodwill between the Utilities and the Project it will be pertinent to develop Bidder/Utilities Communication Protocols to ensure that inquiries are put to the Utilities in an appropriate manner. It is envisaged that all Bidder queries and inquiries will be channelled through the Procurement Project Manager and passed to the Utilities Adviser as appropriate. The respective Utilities Co-ordinator will then progress the query/inquiry with the relevant Utilities.

5 Interfaces

5.1 Utility Interface Document

5.1.1 The Utility Interface Document will be prepared as a two-volume document with Volume 1 outlining the Procurement Strategy, as led by the Utilities Adviser, and Volume 2 outlining the Project Works Strategy. This will be prepared by the Concessionaire / Contractor confirming their intentions. Volume 1 will be issued to the Utilities with the letters requesting preparation of the C3 and C4 estimates respectively.

5.2 Utilities Liaison

5.2.1 Utilities liaison will be undertaken on a day-to-day basis by the respective Utilities Co-ordinators. It is proposed that a Utilities Working Group (UWG) will be set up, who will meet on a monthly basis and discuss issues of common interest and matters arising.

5.2.2 It is also proposed that a Stray Current Working Group (SCWG) will be established as a sub-group of the Utilities Working Group and that they will also meet monthly.

5.2.3 The UWG and SCWG will regularly meet at an agreed time, but not concurrently. These arrangements will stand until the appointment of the Concessionaire / Contractor.

5.3 Emergency Services

5.3.1 Liaison will also be required with the emergency services at pertinent stages of the development of the diversionary works scope and safe working protocol.

6 Scope of Necessary Works

6.1 Diversion Criteria

6.1.1 The diversion criteria will be used to determine the plant and apparatus that requires diversion, protection or modification works. The diversion criteria will be defined such that Utilities plant and apparatus is diverted as far as reasonably practicable to ensure that future emergency or maintenance activities will not necessitate operational restrictions or suspension of services.

6.1.2 For the underground services the exclusion zone will be defined as [450mm] outside of the swept path to a depth of [1200mm]. Underground services crossing the alignment perpendicularly will need to be lowered to [1200mm]. Refer to diagram in Appendix C.

Diagram for Appendix C to be Prepared.	Utilities

6.1.3 For overhead services the exclusion zone will be defined as [2750mm] in any direction from any part of the Overhead Line Equipment (OHLE). Furthermore the location of OHLE poles to be located in the rear of footways will be identified so that the Utilities companies can identify the existing services located within the rear of the footway that will need to be re-located.

6.1.4 The criteria will also make it clear that services should be re-located such that there is no conflict with the new Tram infrastructure, OHLE foundations, Tram stops and duct routes.

6.2 Treatment of affected services to remain in-situ

6.2.1 Notwithstanding the diversion criteria set out above there may be plant and apparatus for which it is not practical or cost effective to re-locate. Such services to remain in-situ will be considered on a case-by-case basis. It is envisaged that some main drainage and clean water supplies may remain in-situ. In this event some form of Agreement formally setting out provisions such as future access and the implications of System disruption will be required.

6.3 Future Provision

6.3.1 It will be prudent to take a view on the inclusion of spare ducts or under-track crossings to provide an element of future provision for Utilities plant and apparatus. The Utilities will be requested to identify appropriate future provision.

6.4 Advance Works

6.4.1 From the ongoing liaison with the Utilities, long lead-time item works and/or materials will have been identified. The Utilities will be requested to undertake network checks to identify any network capacity or outage constraints, the nature of any works which have to be completed before diversionary works can commence, “off site” works and any

diversion sequencing constraints. All of these will contribute to the identification of diversionary works that should be undertaken as Advance Works.

6.5 Civils Works

6.5.1 It is intended to request the Utilities to itemise civils works which could be undertaken by the Concessionaire / Contractor, but to still provide an estimate for undertaking the works themselves. It is envisaged that there will be co-ordination, programme, traffic management, security and economy of scale benefits generated by such an initiative although it is not intended to make this a mandatory requirement of the Concession / Construction Contract.

6.6 Incoming Supplies

6.6.1 The relevant Utilities will be approached to discuss incoming supplies in principal but the contractual and commercial arrangements will be included within the Concessionaire's / Contractor's scope of work.

Transport Initiatives Edinburgh
Edinburgh Tram Line One Northern Loop
Diversionary Works Strategy

Appendix A

Implications Of A Promoter Led And Concessionaire Led Approach

Parameter	**ADVANCE WORKS Promoter**	**IMPLEMENTATION Concessionaire**
Diversion Criteria: Exclusion Zone	As defined in DWS	Could be revised through design innovation and scope of necessary diversions further reduced.
Out-turn Cost of diversions	In line with value engineering and estimates	Could be further reduced through Concessionaire innovation (common civils works). Could be increased due to later implementation
Co-ordination Costs	Promoter	Co-ordination costs included within Concessionaire's bid plus associated risk premium
Programme Long lead time and off-site works	Reduction in Construction programme as works undertaken concurrently with procurement process	Although some diversionary works could be undertaken concurrently with works, initial delays would lengthen construction programme Could delay start of diversionary works with 'knock-on' effect on construction works
Scope: unidentified services	Promoter retained risk of further services being uncovered requiring diversion	Concessionaire would be responsible for ensuring that all services are diverted to enable construction
Scope: New locations	Position of diverted services may conflict with proposed infrastructure.	Concessionaire can ensure that diverted services will not conflict with proposed infrastructure
Design innovation	Potentially constrained	Opportunity for design innovation

Parameter	**ADVANCE WORKS Promoter**	**IMPLEMENTATION Concessionaire**
Ease of construction	Utilities work co-ordinated by Utilities Adviser leaving a 'clear' site for Concessionaire at Contract award.	Utilities work co-ordinated by Concessionaire, prior to commencement of infrastructure works.
Operational & Maintenance		Concessionaire has first hand knowledge of location of diverted services. Concessionaire would have opportunity to review/renegotiate any diversions that may have maintenance implications.
Public perception	Disruption during advance works and implementation.	Disruption during implementation.
Traffic	Disruption during advance works and implantation	Disruption during implementation.

Transport Initiatives Edinburgh
Edinburgh Tram Line One Northern Loop
Diversionary Works Strategy

Appendix B

Spreadsheet For Preparation of C3 And C4 Estimates

Transport Initiatives Edinburgh
Edinburgh Tram Line One Northern Loop
Diversionary Works Strategy

To be completed at a later date

Transport Initiatives Edinburgh
Edinburgh Tram Line One Northern Loop
Diversionary Works Strategy

Appendix C

Swept Path Diagram

Transport Initiatives Edinburgh
Edinburgh Tram Line One Northern Loop
Diversionary Works Strategy

To be completed at a later date

Appendix C: Utilities Interface Document

1b

Transport Initiatives Edinburgh

Edinburgh Tram
Line One Northern Loop
Utilities Interface Document

Volume 1
Procurement Strategy

DRAFT FOR DISCUSSION

BTR0003048 11/10/2002 Revision 0

Babtie Group 95 Bothwell Street, Glasgow G2 7HX
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Transport Initiatives Edinburgh
Edinburgh Tram Line One Northern Loop
Utilities Interface Document

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Appendices

Appendix A C3 Estimate Spreadsheet
Appendix B Swept Path Alignment Drawings

Transport Initiatives Edinburgh
Edinburgh Tram Line One Northern Loop
Utilities Interface Document

1 Purpose

1.1 The purpose of the Utilities Interface Document is to set out the requirements and processes to deliver the necessary diversionary works required for the Edinburgh Tram Line One Northern Loop project.

1.2 The term 'Diversionary Works' is defined by the New Roads And Street Works Act 1991 (NRSWA) as the measures necessary where the publicly and privately owned services and supplies (Utilities) apparatus is affected by major highway, bridge or transport improvement works.

1.3 This document is divided into two volumes. Volume 1 covers the diversionary works procurement strategy that is led by Babtie Group Ltd as the Edinburgh Tram Line One Northern Loop Utilities Adviser. Volume 2 will cover the Concessionaire / Contractor led Works Strategy. The requirements for any Advance Works will be included in Volume 1.

1.4 This issue of the document is provided for the preparation of the initial C3 Estimates. It is envisaged that the document will be expanded with further detail and re-issued for the preparation of the C4 Detailed Proposals and Estimates after Royal Assent is granted to the Edinburgh Tram Line One Northern Loop Act (2003 / 2005?).

2 Background

2.1 The Project Team of Mott MacDonald (Lead Consultant), Babtie Group Ltd, Steer Davies Gleave et al, has been appointed by Transport Initiatives Edinburgh (TIE) to provide technical, operational and environmental consultancy services on the Edinburgh Tram Line One Northern Loop project.

2.2 TIE will be the Promoter of the Edinburgh Tram Line One Northern Loop Act (2003? 2005?), which will permit the development, construction and subsequent operation of the Edinburgh Tram.

2.3 TIE, as a wholly owned subsidiary of the City of Edinburgh Council, is the Transport Authority in relation to the provisions of the NRSWA.

2.4 The construction and operation of the Edinburgh Tram Line One Northern Loop is likely to be awarded to a Concessionaire in the form of a 30 year Design, Build, Finance and Operate (DBFO) Concession, although this has still to be confirmed.

Procurement route to be confirmed by TIE.

2.5 The procurement and implementation of the necessary diversionary works, within the public highway, will be undertaken in accordance with the provisions of the NRSWA and the associated Code of Practice, 'Measures necessary where apparatus is affected by Major Works (Diversionary Works)'.

2.6 The procurement and implementation of the necessary diversionary works, outside of the public road, will be undertaken in accordance with the provisions of the Edinburgh Tram Line One Northern Loop Act (2003? 2005?), in relation to realising the proposed scheme.

3 Application of New Roads And Street Works Act 1991

3.1 If the contract is procured through a DBFO Concession, TIE intends to delegate its Transport Authority functions in relation to the NRSWA, to the Concessionaire.

To be confirmed by TIE.

4 Diversionary Works Strategy

4.1 The Edinburgh Tram Line One Northern Loop diversionary works strategy is:

> *to undertake the minimum of diversions whilst providing for Utilities to access and maintain their plant and apparatus without interruption of the operational services, as far as reasonably practicable.*

4.2 The Project Team intend to develop robust and long term working relationships to deliver the optimum solution for the Edinburgh Tram Line One Northern Loop project.

5 Procurement

5.1 The Promoter will request C3 and C4 Estimates and Proposals in accordance with the NRSWA and the associated Code of Practise.

5.2 It is requested that Utilities provide the details of any necessary diversionary works for plant and apparatus located outside of the public road, with the C3 and C4 estimates, notwithstanding the fact that these will not be subject to cost sharing arrangements under NRSWA. Such diversions should be clearly identified.

5.3 The Utilities are requested to prepare and submit the estimate and proposal information using the C3 Estimate Spreadsheet shown in Appendix A.

5.4 The parameters to be used for the identification of plant and apparatus to be considered for diversion are set out in Section 7 of this document. These parameters have been established to permit the Utilities to access and maintain their plant and apparatus without interruption of the operational tram services, as far as is reasonable practicable.

5.5 It is anticipated that the development of the Utilities' estimates and proposals will be undertaken concurrently with the procurement of the Edinburgh Tram Line One Northern Loop Concession Contract. The C3 Estimates are required to be included in the Invitation to Negotiate (ITN) documentation and the C4 Estimates are required to be included in the Best & Final Offer (BAFO) documentation (or for detailed design, if the contract is procured through a traditional contract).

5.6 The Orders for the diversionary works will be placed by the Concessionaire / Contractor after Contract Award, in accordance with the NRSWA process. Similarly, the cost of diversions will be paid direct to the Utilities by the Concessionaire.

5.7 From Contract Award, the Concessionaire / Contractor will be responsible for all liaison, co-ordination and implementation. This will include temporary traffic management, security, signing and guarding for diversionary works that are undertaken in conjunction with the construction works relating to the tram infrastructure.

5.8 Utilities diversionary works undertaken separately from the tram construction works will need to be fully resourced by the respective Utilities.

5.9 It is envisaged that the Concessionaire / Contractor will liase with the Utilities to identify civils works for which it could be more cost and/or programme effective for the Project for the Concessionaire / Contractor to undertake. Such works may include common trenching, duct/pipe laying, chamber construction, removal of abandoned services, final reinstatement, traffic management, security, signing and guarding.

5.10 The Concessionaire / Contractor will be responsible for obtaining all necessary permissions and/or approvals including work permits which may be required.

6 C3 Draft Estimates And Proposals

6.1 The C3 Draft Estimates and Proposals are to be based on:

- The Swept Path Alignment (SPA) drawings;
- The Utilities Interface Document; and
- The Draft Highways Interface Document.

These Drawings and Spreadsheet etc still have to be approved.

6.2 The detail of the C3 Draft Estimates and Proposals should be submitted, in hard copy and electronically, using the C3 Estimate Spreadsheet (see Appendix A) which will be provided in soft copy.

6.3 The C3 Estimate should also incorporate the applicable cost sharing discount and outline indications of betterment and deferment of renewal.

6.4 Utilities are requested to prepare their C3 Estimates on the basis of there being no Developer Contributions.

7 Diversionary Parameters

7.1 The SPA drawings are issued to the Utilities to identify the necessary diversionary works, using the diversion parameters stated below and as indicated on the cross section drawing in Appendix B.

7.2 For underground plant and apparatus the exclusion zone is defined as 450mm outside of the swept path to a depth of 1200mm below existing ground level. Underground services crossing the alignment transversely will need to be lowered to 1200mm, although transverse services already installed at a depth between 1000-1200mm will be considered on a case-by-case basis.

7.3 The drawings will indicate the proposed associated highway works and also the locations of the Stops. Plant and apparatus in direct conflict with these items should be considered for diversion.

7.4 For overhead plant and apparatus the exclusion zone is defined as 2750mm in any direction from any part of the Overhead Line Equipment (OHLE). The OHLE design is not sufficiently well developed to be able to identify the precise OHLE positions. Therefore Utilities are requested to prepare C3 Estimates based on diverting all overhead plant and apparatus up to 9000mm above existing ground level.

7.5 Utilities are requested to identify plant and apparatus to remain in-situ in certain circumstances and/or locations where there is no practical opportunity for re-location. These should be included within the C3 Estimate to remain in-situ and will be considered and developed further, on a 'case by case' basis. In the event that plant and apparatus remain in-situ, provisions will need to be agreed including future Utilities access to plant and apparatus and the implications of disruption to the Tram.

7.6 Utilities are requested to include any proposals for future provision to mitigate disruption to the operational services, although these will be at no cost to the Project.

7.7 Utilities are requested to identify any long lead-time works and/or materials, and any network or capacity constraints.

7.8 Utilities are requested to advise of any capital project works adjacent to the route of the Project, to identify whether any commercial advantage exists in co-ordinating such works. These will be considered and Advance Works may be agreed where there is a clear commercial benefit to the Project.

7.9 Utilities are requested to identify any known interfaces between the Project and other (road) scheme requirements, especially if there may be any mutual benefit arising from co-ordination on timing and/or scope of diversions. The implementation of such arrangements will be subject to agreement with the Roads Authority.

8 Protection And Temporary Works

8.1 Utilities are requested to advise if there is any plant and apparatus which does not need to be diverted, but is assessed as having a particular vulnerability. Preferred permanent protection measures should be outlined such that the Concessionaire can be advised accordingly. The final details will be agreed directly between the Concessionaire / Contractor and the respective Utilities companies.

8.2 Where protection measures are not deemed suitable for a given piece of apparatus it may be necessary for the Concessionaire / Contractor to design and implement temporary works which will have to be discussed and agreed with the Utilities involved. The Concessionaire will be responsible for all aspects of this process.

9 Compliance With Highways Interface Document

9.1 A Draft Highways Interface Document has been developed in conjunction with the Roads Authority detailing all matters concerned with the impact of both Utilities diversion and infrastructure construction works on the Road. The requirements of this document are to be adhered to all by contractors working on the Project.

Is a Draft Highways Document being prepared by City of Edinburgh Council / TIE?

10 Compliance With Work In Proximity Code Of Practise

10.1 The Work in Proximity Code of Practice (CoP) will be developed providing guidelines on precautions to be taken when working on or near to the live tramway. The Work in Proximity CoP will be finalised by the Concessionaire / Contractor in liaison with the Utilities, Roads Authority, Emergency Services and Her Majesty's Railway Inspectorate.

10.2 The rules and procedures laid down in the Work in Proximity CoP will apply to all Utilities, their Agents or works contractors, when maintaining, repairing or replacing apparatus adjacent to the operational Tram system.

10.3 The Work in Proximity CoP outlines the dangers and precautions to be taken when working near live overhead conductor wire and procedures for obtaining the necessary consents and approvals when works fall inside the 2750mm electrical safety clearance zone.

10.4 The diversion parameters have been established cognisant of the Work in Proximity CoP to ensure that access to apparatus can be achieved with minimal disruption to both the Utilities' plant and apparatus and the Tram operational system.

10.5 The Work in Proximity CoP will provide guidance on the locations of work sites and pedestrian management whilst working at such locations.

10.6 The Work in Proximity CoP will identify procedures such that plant and apparatus, which has remained in-situ, can be accessed under controlled circumstances.

11 Emergency Works Diverting Utilities Resources Away From Tram Works

11.1 It is inevitable that at some point during the Project a given Utilities will have to carry out Emergency Works as defined on Section 111 of the NRSWA.

11.2 This may require that resources carrying out works on the Project are diverted to carry out such works with a consequential effect on the Edinburgh Tram scheme.

11.3 The necessary notice periods for Emergency Works as prescribed in Section 116 of the NRSWA will need to be given to the Roads Authority.

12 Programme

12.1 The Concessionaire / Contractor will be responsible for managing the construction programme information including the Utilities' diversionary works. This information will be shared by all parties in order to highlight potential clashes of activities and to aid the overall co-ordination of the diversion programme.

12.2 The Edinburgh Tram – Line One Northern Loop construction period is likely to commence around 2006 until 2009, although it is envisaged that all Utilities diversionary works would need to be complete by 2007/08.

13 Provision Of Public Information On Utilities Diversions

13.1 The Concessionaire / Contractor will be responsible for supplying up to date information to the public and business community on the timing and progress of the Utilities' diversion programme, in accordance with the Highways Interface Document. The Utilities shall provide any information requested by the Concessionaire / Contractor in support of their public information obligations.

14 Stray Current Control

14.1 A Stray Current Working Group will be established with the remit to develop and agree the Stray Current Control Agreement.

14.2 The Stray Current Control Agreement will be developed further during operation of the tram, and agreed alterations to the system made as required. It is anticipated that the Stray Current Working Group forum established during implementation will be continued through the life cycle of the project to take account of improvements in technology and stray current control.

Transport Initiatives Edinburgh
Edinburgh Tram Line One Northern Loop
Utilities Interface Document

Appendix A

C3 Estimate Spreadsheet

Transport Initiatives Edinburgh
Edinburgh Tram Line One Northern Loop
Utilities Interface Document

Appendix B

Swept Path Alignment Drawings

Appendix D: Code of Practice For Working On Or Near Edinburgh Tram

Edinburgh Tram
Line One, Northern Loop
New Transport Initiative

Code of Construction Practice

May 2005
Report No. 203011/0086B

17 May 2005

GILLESPIES · McLEAN HAZEL · ERM · Babtie · steer davies gleave · Mott MacDonald

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Mott MacDonald

Edinburgh Tram
Line One, Northern Loop
New Transport Initiative
Code of Construction Practice

May 2005
Report No. 203011/0010A

17 May 2005

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Note

For the avoidance of doubt;

*** wherever the term 'the Contractor' is used in this document 'the Contractor' is to be taken to include the principal contractor(s), sub-contractors, agents, representatives and employees.**

*** this Code will only come into effect should the Edinburgh Tram Bill receive Royal Assent**

1 Preface

1.1 The Project

Generally speaking the routes for the Edinburgh Tram are as follows;

- Edinburgh Tram Line 1: A loop joining the City Centre with Leith, Granton, Craigleith and Haymarket.
- Edinburgh Tram Line 2: Joint use of the section of tramway in St Andrew Square, Princes Street, Shandwick Place, and Haymarket and a branch from Line 1 running westward from a junction near Haymarket Yards to serve areas of west Edinburgh.

1.2 Purpose of the Code of Construction Practice

The purpose of this Code of Construction Practice (the Code) is to define standards of construction practice in so far as they affect the environment, amenity and safety of local residents, businesses, the general public and the physical surroundings and the natural and cultural heritage in the vicinity of proposed works.

The views of The City of Edinburgh Council and with the statutory environmental bodies the Scottish Environment Protection Agency (SEPA), Scottish Natural Heritage (SNH) and Historic Scotland (HS) have all been incorporated in this Code.

The Code draws on similar codes produced for other light rail and similar schemes, and covers specific legislative requirements as well as general requirements and compliance with current Standards.

Tie intends that the provisions of the Code will be incorporated in the contract(s) for the construction of the Edinburgh Tram. The Contractor will be required to comply fully with the terms of the Code. Contractual provision will be made for auditing compliance and rectifying any breaches of the Code during construction.

Tie will establish an appropriate person ['the Supervisor'] to ensure compliance with the Code by all contracting parties.

In this Code, 'construction' includes all site preparation, demolition, materials delivery, spoil disposal, materials and waste removal and all engineering, construction and commissioning activities. This Code will apply throughout the construction, testing and commissioning period

1.3 Compliance with Applicable Legislation, Codes and Standards, Etc

Compliance with this Code will not absolve the Contractor from compliance with all legislation, Codes and Standards relating to construction. The Contractor shall be responsible for ensuring that the current versions of all legislation, Codes and Standards are complied with. Wherever this Code makes reference to any Legislation, Standards or Codes it shall be the Contractor's responsibility to ensure that the current versions are used at all times. It is the contractor's responsibility to ensure that the current versions of all legislation, byelaws, standards and guidance are complied with. The Contractor

shall fully comply with all relevant Legislation, Codes, Standards and the general guidance from the Health and Safety Executive and HM Railways Inspectorate.

1.4 The Site

The Site, for the purposes of this Code, is defined as the land occupied by Contractor within limits of deviation shown on the deposited plans and sections annexed to the **Edinburgh Tram Acts of the Scottish Parliament** together with all other areas listed in the Edinburgh Tram Acts as being required either temporary or permanently for the purposes of construction of the Edinburgh tram system.

The site may be divided into a number of active working areas at any time. Within these working areas the provisions of this Code shall apply for such periods as each working area is being used for construction and is not available for –and restored to – its previous or future use as appropriate.

NOTE
Any advanced works carried out by or on behalf of tie or The City of Edinburgh Council in advance of the appointment of the Contractor and any other works carried out by or on behalf of tie or The City of Edinburgh Council in relation to the construction of the Edinburgh Tram shall also be covered by the requirements of this code.

1.5 Environmental Management System

The Contractor will implement an Environmental Management System in accordance with ISO 14001

2 Liaison and public information

The Contractor shall appoint a liaison officer to manage all public relations, information and press related matters, who shall liaise with **tie**, The City of Edinburgh Council, other statutory bodies, members of the public, press and the media on all matters relating to the works.

2.1 Information Centre and Website

The Contractor shall provide and maintain an Information Centre at a location to be agreed with **tie.** The Information Centre shall be accessible to stakeholders, frontagers, interested third parties and the general public, between the hours of 0900 and 1700, Monday to Friday (excluding local and national Public Holidays). Up to date information on the progress of the works and the current areas affected by construction shall be freely available at the Information Centre. The Contractor shall also provide and maintain a website which shall provide the same information.

2.2 Weekly newsletter

The Contractor shall publish a weekly newsletter every Wednesday, detailing works to be undertaken in the forthcoming week and outlining, with appropriate maps and diagrams, any alterations to road traffic circulation patterns required by the coming week's works. This newsletter will be published;

- on the Website,
- by Fax and email to; local and national newspapers and other news media, The City of Edinburgh Council, Lothian and Borders Police, the emergency services and to any other persons or organisations that have requested receipt of the newsletter.

Sufficient free-distribution, take-away hard copies of the newsletter shall be placed in the Information Centre by 0800 every Thursday morning. No charge will be made for this service.

2.3 Complaints Hotline

The Contractor shall also provide and maintain a Freephone Hotline to deal with any complaints, comments or queries received in connection with the Edinburgh Tram Works. The Hotline will be answered by the Liaison Officer, a deputy or by another designated competent operator between the hours of 0700 and one hour after work terminates for the day, on every day when construction work is being undertaken. Outwith these hours an automated call recording service will be provided. The telephone number, fax number and website address of the hotline shall be publicised through the press and the Weekly newsletter and clearly displayed on hoardings around every worksite and at other suitable locations within and in the vicinity of every worksite.

2.4 Contacts Log

All complaints, comments and queries received shall be registered in a suitable Log and appropriate action in response instigated within 24 hours by the Contractor. A record of remedial action shall be logged, in the event of a complaint a follow up letter or electronic communication shall be passed to the complainant within 48 hours of the initial complaint, outlining their complaint and the remedial action being undertaken by the Contractor. All comments, questions and complaints shall be logged

in writing together with any response and a record of any actions taken, including a record of the time when that action is completed. An up to date copy of the Contacts Log shall be compiled daily, together with a report on the progress of any actions. The Contacts Log shall be inspected and signed daily by a nominated senior representative of the Contractor and shall be counter signed by the Contractor's Project Director at least once per week. and the Weekly newsletter

A copy of each week's Contacts Log shall be placed every Friday in the Information Centre, where it will remain until completion of all construction works. All deposited copies of the Contacts Log may be freely inspected by any person during the normal opening hours of the Information Centre.

An additional copy of the Contacts Log shall be forwarded to **tie** once per week and the master register shall be available for **tie** to inspect at any other time during normal working hours.

2.5 Communications Regarding Noise

(a) The Contractor shall give seven days notice to local residents who may be adversely affected by noise from the proposed programme of work, providing a description of the work to be carried out, measures that will be taken to control noise or other disturbance, and the proposed hours of working.

(b) The Contractor shall provide the City of Edinburgh Council Department of Environmental and Consumer Services with a list of contacts who will be responsible for investigating and resolving noise issues during the construction phase of the project.

2.6 Staff identification

The Contractor shall ensure that all site construction staff are easily identifiable to the public by use of identity cards or an other equally effective system.

3 Hours of Working

(a) Normal hours of working for construction of Edinburgh Tram Lines One and Two shall be:

Monday – Saturday 0700 – 1900 hours.

(b) These hours of work shall not apply to equipment which is required to operate continuously (e.g. for safety or environmental reasons) or to work undertaken within fully enclosed areas such as buildings.

(c) In certain circumstances essential work outside of these hours may be undertaken with the prior approval of **tie** and The City of Edinburgh Council. These circumstances may include Sunday and evening/night working on public roads and in the vicinity of the railway network, where such working is required to minimise disruption to other traffic. Application for prior approval must be made at least two weeks in advance.

(d) Where Sunday or evening/night working has the potential to disturb nearby land users and, occupiers shall be notified seven days in advance, providing a description of the work to be carried out, measures that will be taken to control noise or other disturbance and the proposed hours of working.

4 Site arrangements

4.1 Site Housekeeping

(a) A 'good housekeeping' policy shall be applied at all times. This shall include, but not necessarily be limited to, the following requirements:

(i) all working areas shall be kept in a clean and tidy condition;

(ii) all working areas shall be a no-smoking area. Specific areas within the site shall be designated as smoking areas and shall be equipped with containers for smoking waste. These shall not be located at the boundary of the site adjacent to neighbouring land;

(iii) open fires shall be prohibited at all times;

(iv) all necessary measures shall be taken to minimise the risk of fire and the Contractor shall comply with the requirements of the local fire authority;

(v) radios (other than two-way radios used for the purposes of communication related to the works) and other forms of audio equipment shall not be operated on any work site;

(vi) any waste susceptible to spreading by wind or liable to cause litter shall be stored in enclosed containers;

(vii) rubbish shall be removed at frequent intervals and the site kept clean and tidy;

(viii) hoardings shall be frequently inspected, repaired and re-painted as necessary;

(ix) adequate toilet facilities shall be provided for all site staff;

(x) food waste shall be removed frequently;

(xi) wheel washing areas shall be brushed clean frequently.

(b) The Contractor shall inspect all working areas at least fortnightly and shall provide a written report on compliance with this section of the Code to tie. A nominated representative of **tie** may carry out inspections of the site at any time without prior notice of time and place of the inspections. Access to all areas of the works shall be given to visiting inspectors and the Contractor shall give inspectors all reasonable assistance during their site inspection. contractor

4.2 Fencing and Hoardings

(a) The Contractor shall ensure that all working areas are sufficiently and adequately fenced off from members of the public and to prevent animals from straying on to working area. Hoardings shall be provided to suit the location but may be:

(i) A wire mesh fence, where appropriate for minimum security needs, or

(ii) A 2.4 m minimum height, plywood faced, timber framed boundary hoarding, of a surface density of not less than 7kg/m² or other hoarding providing equivalent security and noise attenuation, in the vicinity of noise sensitive neighbours, or

(iii) Or other designs where a particular appearance or acoustic rating is considered to be required and is agreed with The City of Edinburgh Council.

, or

(b) Hoardings that create poorly-lit pedestrian routes shall have bulkhead lights fitted and these shall be illuminated in hours of darkness.

,or

(c) The location and design of site boundaries, hoarding and temporary structures on the public highway shall permit adequate visibility at junctions and proper forward visibility along the highways in accordance with the National Roads Directorate advice notes and the requirements of The City of Edinburgh Council.

CEC

(d) The Contractor shall ensure that where hoardings are provided, they are painted on the side facing away from the working area in a colour and style to be approved by **tie** and The City of Edinburgh Council and include identification of the project and contact information.

(e) All hoardings shall be maintained in a neat and tidy condition.

(f) The Contractor are is expressly prohibited from displaying or allowing to be displayed any advertisement, notice, etc including illicit bill or fly posting on the hoardings. The Contractor shall ensure that all graffiti, fly posting or defacement to the hoardings is removed and made good or obscured within 48 hours.

(g) An information board shall be provided at each working area detailing information on the work programme and estimated duration of the works, together with the web address and a 24 hour telephone number for use by members of the public who wish to lodge complaints or comments (see Section 2).

(h) All fencing and hoarding shall be removed as soon as reasonably practicable after the completion of work.

Lighting and hoarding shall be removed as soon as is consistent with the safe and efficient operation of each work site.

I(b) Site lighting shall be positioned and directed as so to minimise nuisance to residents and to minimise distractions or confusion to passing drivers on adjoining public highways. This provision will apply particularly to working areas where work after dark will be carried out and the Contractor shall provide appropriate lighting for these sites.

(c) So far as is practicable, all power to temporary traffic signals, lighting etc shall be taken from mains supplies rather than from portable generators. Where portable generators are used industry best practice will be followed to minimise noise and pollution from such generators.

(d)The Contractor shall comply with the Institute of Lighting Engineers document *Guidance Notes on Reduction of Light Pollution 2000* in so far as is reasonably practicable and applicable to the construction works.

4.3 Access and Loading

(a) Lorries shall enter and exit the site in a forward direction, except where space restriction does not permit this. If the reversing of vehicles into public spaces is required, then the movement shall be properly controlled by a responsible person(s) observing the rear of the vehicle. The sounding of audible reversing alarms shall not be permitted outside normal working hours, except where this has been approved by The City of Edinburgh Council in connection with works permitted under Clause 3(c). Entry/exit conditions shall be subject to prior approvalby The City of Edinburgh Council before implementation.

(b) All loading and unloading of vehicles shall take place off the public highway as far as is reasonably practicable.

4.4 Security

(a) Adequate security shall be exercised by the Contractor to protect the public and prevent unauthorised entry to or exit from the site. Site gates shall be closed and locked when there is no site activity and site security measures shall be implemented.

(b) Site security cameras, where used, shall be placed in locations which will not unduly infringe upon the privacy of local residents.

4.5 Living Accommodation

No living accommodation shall be provided within any construction working area .CEC Mess rooms, locker rooms, toilets and showers will be permitted.

4.6 Clearance of Site on Completion

(a) The Contractor shall clear and clean all working areas and accesses as work proceeds and when no longer required for the carrying out of the works.

(b) All surplus soil and materials, temporary roads and hard standings, plant, sheds, offices and temporary fencing shall be removed, post holes filled and the surface of the ground restored as near as practicable to its original condition, or to such condition as has previously been agreed with tie and The City of Edinburgh Council..

4.7 Pest Control

The Contractor shall ensure that the risk of infestation by pests or vermin is minimised by adequate arrangements for the disposal of food waste or other material attractive to pests. If infestation occurs he shall take such action to deal with it as required by The City of Edinburgh Council.

5 Roads, Footpaths, Cycleways and Bridleways

5.1 General

The Contractor shall submit to tie and The City of Edinburgh Council a statement setting out the proposed measures (including specified traffic routes) to be taken with respect to traffic and highway safety for the duration of the contract, for approval before **the relevant** work commences. The Contractor shall circulate the approved statement to other bodies identified by The City of Edinburgh Council.

The measures to be taken with respect to traffic and highway safety shall include but not necessarily be limited to:

a) Use of Temporary Traffic Regulation Orders (TROs). The Contractor shall consult with **tie** and The City of Edinburgh Council on the arrangements for agreeing and implementing Temporary TROs to facilitate road closures etc. The use of Temporary TROs shall take into account the requirement for, and availability of suitable alternative routes.

b) Use of temporary signing and lining where required by The City of Edinburgh Council to identify places where construction is taking place.

c) Use of temporary signing to restrict vehicle type/sizes and define routes for construction traffic.

d) Use of appropriate temporary signing and lighting wherever works are in progress to ensure the safety of all road users.

e) Preparation and implementation of a programme agreed with The City of Edinburgh Council for road closures and temporary traffic signal arrangements.

5.2 Temporary Road Closures and Diversions

It will be necessary to close or divert certain specified highways, footpaths and cycle ways in order to construct the Edinburgh Tram. These closures may be temporary during the construction period, or they may be permanent and form part of the Edinburgh Tram Scheme.

Details of the locations of the proposed permanent closures and diversions are shown on the deposited plans and sections relating to the Edinburgh Tram. It is the Contractor's responsibility to finalise the arrangements for these closures and diversions with The City of Edinburgh Council to suit his programme of works.

Before breaking up, closing or otherwise interfering with any street or footpath to which the public has access, the Contractor shall make such arrangements with The City of Edinburgh Council as may be reasonably necessary to cause as little interference with the traffic in that street or footpath during the construction works as shall be reasonably practicable.

Temporary road closures that result in the diversion of bus routes should be bus operators and the Traffic Commissioner.

Pedestrian access to properties shall be maintained at all times where practicable unless otherwise agreed with The City of Edinburgh Council and the owners and tenants of affected properties. Access to and from public facilities shall be maintained at all times unless otherwise agreed with the administrating bodies.

Wherever the Edinburgh Tram works interfere with the existing public or private roads or other ways over which there is a public or private right of way for any traffic, the Contractor shall construct diversion ways as necessary. The standard of construction and lighting shall be suitable in all respects for the class or classes of traffic using the existing ways and the widths of the diversions shall not be less than that of the existing way unless otherwise agreed with The City of Edinburgh Council or the owner of the private road.

Diversion routes shall be constructed in advance of any interference with the existing ways, shall be kept as short as reasonably practicable and shall be maintained to provide adequately for the traffic flows. All diversion routes shall be removed and the highway returned to The City of Edinburgh Council as soon as is reasonably practical after completion of the Contractor's works. Liaison shall be undertaken with The City of Edinburgh Council regarding any special events such as the Edinburgh Festival, Christmas, New Year, sporting events, filming etc which might interact with the diversions.

A horizontal clearance of 0.6 metres shall be provided from the kerb line, where practicable, for any hoarding less than 5.1 metres in height to avoid fouling by vehicles. The minimum headroom beneath any projection over the highway shall be 5.1 metres.

5.3 Parking Provision for Construction Traffic

Areas/locations of parking provision for site and construction traffic shall be agreed with The City of Edinburgh Council prior to the commencement of works.

No daytime or overnight parking of site or construction vehicles outside any construction compounds or work sites shall be allowed except where the delivery or removal of materials is taking place at that location and with prior agreement with The City of Edinburgh Council.

5.4 Pedestrian and Cycle Routes and Bridleways

The Contractor shall ensure that all existing pedestrian and cycle routes and Bridleways are maintained throughout the construction period unless otherwise agreed with The City of Edinburgh Council. Any temporary replacement footway or cycleway shall meet the following requirements:

(a) All temporary and diverted footways, which replace footways that are currently accessible to wheelchairs and pushchairs, shall continue to be usable by such users where reasonably practicable.

(b) Tactile paving shall be used where present on existing pedestrian facilities unless otherwise agreed with The City of Edinburgh Council.

(c) Any temporary footways/ cycle ways shall have uniform surfaces. There shall be no steps and any longitudinal gradients shall be preferably 1 in 20 and no greater than 1 in 12. Cross falls should be suitable for disposal of surface water run off but should not ideally exceed 1 in 30.

(d) Ramps shall be provided at all junctions of footways and cycle ways with carriageways. Gradients shall not exceed 1 in 12 and the base of the ramps shall be flush with the carriageway. All temporary footways and cycle way ramps shall be surfaced in non-slip material and kept free from mud and debris.

(e) Existing footway/cycle way widths shall be maintained where practicable. Footway/cycle way widths shall not be reduced without the prior agreement and approval of The City of Edinburgh Council.

(f) Clear signing and protection measures shall be provided at all times for each pedestrian/cycle route or bridleway affected by the works in accordance with Chapter 8 of the Traffic Signs Regulations and General Directions 1981 and relevant safety legislation. The Contractor shall liaise and agree the signing requirements of all pedestrian/cycle routes affected by the works with The City of Edinburgh Council, and shall provide any additional signage and/or protection measures required and agreed with The City of Edinburgh Council.

(g) Headroom clearance over footways and cycle ways shall be a minimum of 2.3 metres. A horizontal clearance of 0.6 metres shall be provided from the kerb line, where practicable, for any hoarding less than 5.1 metres in height to avoid fouling by vehicles. The minimum headroom beneath any projection over the highway shall be 5.1 metres. Where a path is a designated bridleway, headway clearance shall be a minimum of 3.6 metres. All pedestrian routes diverted onto the carriageway shall be clearly defined by continuous barriers, constructed to the reasonable requirements of The City of Edinburgh Council.

5.5 Maintenance and Repair of the Highway

The Contractor shall carry out a pre-construction inspection and take photographs of the public roads, footways and cycle ways in the vicinity of the Site in conjunction with The City of Edinburgh Council. The Contactor shall produce a report of the results of the joint inspection. The report shall establish the general highway conditions within and in the vicinity of the Site and the level of reinstatement required. The report shall be agreed and signed by both the Contractor and The City of Edinburgh Council.

The Contractor shall take every reasonable precaution to prevent his operations from unnecessary damage to the roads and footpaths within the site and in the vicinity of the Edinburgh Tram works.

The Contractor shall carry out all maintenance works as are necessary to maintain the roads and footpaths affected by the works in a safe and serviceable condition to the satisfaction of the reasonable requirements of The City of Edinburgh Council.

Snow clearance, salting, gritting will be carried out by The City of Edinburgh Council.

5.6 Existing Street Furniture

No street furniture or other features within the vicinity of the Site and construction works, but outside the area covered by the Edinburgh Tram Acts of the Scottish Parliament, shall be unnecessarily disturbed or altered by the works. Any damage to street furniture consequent upon construction activities connected with the Edinburgh Tram shall be reported to tie and the appropriate owner or authority (unless the appropriate owner can not be identified) immediately on discovery of the damage. Any damage shall be replaced or made good as soon as practicably possible and to the reasonable satisfaction of the owner of the street furniture or other feature.

Any street furniture or other obstructions outside the area to be occupied by the Contractor but which are required to be moved in order to gain access to the Site shall, subject to the prior consent of the owner thereof, such consent not to be unreasonably withheld, be removed and reinstated/replaced as appropriate, on completion of the works. Any costs associated therewith shall be borne by the Edinburgh Tram contractor, including the costs of reinstatement or replacement.

5.7 Lorry Movements and Access to sites

The Contractor and his sub-contractors and suppliers moving loads, construction plant, materials and spoil (including vehicles used for carrying such when empty) shall limit the use of the public highways for such purposes as far as reasonably practicable.

All access routes shall be agreed with The City of Edinburgh Council prior to the commencement of the relevant works.

Vehicles arriving or leaving the Site shall do so during the normal working hours as specified in Section 2.2.1 of this Code unless otherwise agreed with The City of Edinburgh Council. Access (which is deemed to include both the route and entrance to any work site) by lorries shall be as agreed with The City of Edinburgh Council and the Lothian and Borders Constabulary.

The Contractor shall take all reasonable measures to ensure that delivery vehicles do not remain stationary on the highway unnecessarily prior to entering the Site. In exceptional circumstances, for example where the site is very constrained, it may be necessary to have the potential for a limited number of vehicles to stand on the highway. The location of such standing areas their size and the duration of any standing periods shall be subject to prior agreement with The City of Edinburgh Council and the Lothian and Borders Constabulary.

The Contractor shall ascertain and comply with any restrictions in respect of abnormal load routes as they may affect access to the Site.

5.8 Mud on Roads

The Contractor shall take strict measures to minimise the spillage of mud and loose materials on roads arising from excavation works. These will include, but not necessarily be limited to:

1. The provision of easily-cleaned hard standings for vehicles entering, parking and leaving the Site or construction compound.
2. The provision of wheel washing facilities at construction compounds, including, where practicable, mechanical wheel spinners, adequate provision for drainage via settlement tanks and regular maintenance of settlement tanks.
3. The use of mechanical road sweepers and surface flushing apparatus to clean the hard standing and to remove any mud or debris deposited by site vehicles on roads, footpaths, and in gullies or drains in the vicinity of the site. The road sweepers or other equipment are to be readily available whenever the need for cleaning arises.
4. The Contractor shall ensure that vehicles are loaded and sheeted in such a manner as to prevent material falling off during their journey..
5. The Contractor shall also comply with the requirements regarding the control of dust outlined elsewhere in this Code.

5.9 Provision, Erection and Maintenance of Traffic Safety and Control (Traffic Safety Measures)

The Contractor shall provide, erect and maintain such traffic signs, road markings, lamps, barriers and traffic control signals and such other measures as may be necessitated by the construction of the Edinburgh Tram works in accordance with the requirements of the Contract and to the approval of The City of Edinburgh Council. The Contractor shall not commence any work that affects the public highway until all traffic safety measures necessitated by the work are fully operational.

The Contractor shall keep clean and legible at all times all traffic signs, road markings, lamps, barriers and traffic control signals and shall position, replace, reposition, cover or remove them as required by the progress of the works and to the reasonable requirements of The City of Edinburgh Council.

So far as practicable, all power to temporary traffic signals, lighting, etc. shall be taken from mains supplies rather than from portable generators. Where portable generators are used all reasonable measures will be taken to minimise noise and pollution from such generators.

5.10 Implementation of the Closure of Highways and Access to Frontages

The Contractor shall not close any highway or private accesses until immediately before the area is required for construction in accordance with the Contract and the agreed programme of works. The construction of the works shall follow in the area of a temporary closure expeditiously and shall be carried out efficiently and in a continuous manner to ensure that all temporary closures are re-opened as quickly as possible.

The Contractor shall, in carrying out the Edinburgh Tram works, take all reasonable precautions to prevent or reduce any disturbance or inconvenience to the owners, tenants or occupiers of adjacent properties, and to the public generally. The owners, tenants or occupiers of affected properties shall be informed of the works to be undertaken, their planned duration, road and access closures and alternative access routes (where required) in writing and by locally posted public notices at least one calendar month prior to work starting.

The Contractor shall render all necessary assistance to occupiers of premises affected by the Edinburgh Tram works to enable them to get materials or goods into or out of their premises during their normal working hours.

5.11 Access for Emergency Vehicles

Routes for emergency service vehicles and personnel to gain access to work sites, the construction corridor and neighbouring sites along the route shallshall be agreed with the emergency services and The City of Edinburgh Council prior to the start of construction.

6 Noise

6.1 Noise Control

(a) The Contractor shall have a general duty to take all practicable measures to minimise nuisance from noise. The noise limits specified in this section or which may be otherwise agreed with The City of Edinburgh Council shall not be regarded as a licence to make noise up to the stated limit.

(b) Subject to the specific requirements of The City of Edinburgh Council, the following minimum requirements shall be met:

(i) During normal working hours, as defined in Clause 3 (a), the maximum noise levels measured 1 metre from any occupied dwelling or other building used for residential purposes, generated by construction plant and equipment shall not exceed the following limit:

Monday to Saturday (inc.)	0700-1900 hours	$L_{Aeq\ 12\ hour}$ 75 dB

(ii) Outside normal working hours, the following limits shall apply:

Period	*Hours*	*Limit*
Monday to Saturday (inc.)	1900-2200	$L_{Aeq\ 3\ hours}$ 65 dB
Sunday & Bank Holidays	0800-2000	$L_{Aeq\ 12\ hours}$ 65 dB

The default noise limit for any night-time (2200 to 0700 hours) construction work shall be $L_{Aeq\ 1\ hour}$ 55dB at residential buildings. Higher noise levels may be permitted where ambient noise levels are higher.

(iii) The maximum noise levels measured 1 metre from any school, college or other teaching facility resulting from construction work shall not exceed the following limits:

At any time when occupied	$L_{Aeq\ 1\ hour}$ 65 dB

(iv) The maximum noise level measured 1 metre from any office building or other building used for office purposes during normal working hours shall be as defined in paragraph (b)(i) of this clause.

(c) In order to ensure that the best practicable means are used to meet the levels set out above, a programme of on-site monitoring by a suitably qualified practitioner shall be agreed between the Contractor, **tie** and The City of Edinburgh Council. This monitoring programme shall include the location and frequency of readings and will define to whom the results shall be made available. Monitoring will be undertaken at locations identified in the Environmental Statements as those where mitigation measures may be necessary to avoid significant noise disturbance.

(d) In exceptional difficult circumstances essential work causing noise above these limits may be permitted with the prior approval of *tie* and The City of Edinburgh Council. Application for prior approval must be made at least two weeks in advance of the relevant works commencing, and must be fully justified and kept to the minimum necessary. Conditions may be attached to any permission for such works.

(e) In the event that measurements indicate noise has exceeded the limits in paragraph (b) of this clause the Contractor shall take all practicable measures to prevent recurrence. If this does not enable the limits to be met exceptional permission must be applied for under the terms of paragraph (b) of this clause.

(f) Without prejudice to the other requirements of this Section, the Contractor shall comply with the recommendations set out in BS 5228 'Noise Control on Construction and Open Sites' insofar as these are reasonably practicable and applicable to the construction works and in particular with the following requirements:

(i) All vehicles and mechanical plant used for the purpose of the work shall be fitted with effective exhaust silencers and shall be maintained in good and efficient working order.

(ii) All compressors and generators shall be 'sound reduced' models fitted with properly lined and sealed acoustic covers which shall be kept closed whenever the machines are in use, and all pneumatic percussive tools shall be fitted with mufflers or silencers of the type recommended by the manufacturers.

(iii) All machines in intermittent use shall be shut down in the intervening periods between work or throttled down to a minimum. Noise emitting equipment which is required to run continuously shall be housed in a suitable acoustic enclosure (see BS5228 Part 1:1997, Figures B.1, B.2 and B.3 (or later issue)).

(iv) Stationary equipment with significant noise output shall be sited away from sensitive site boundaries as far as is practicable.

(v) Temporary noise barriers shall be used to reduce noise levels where appropriate and practicable. Barriers shall be located as close to the plant as possible, and shall have a mass per unit area of at least 7kg/m^2.

(vi) No deliveries shall arrive at the site before 0700 hours.

(vii) The engines of all parked vehicles or vehicles waiting to enter any work area shall be switched off within two minutes of arrival.

(viii) Work compounds shall be laid out so that accesses and loading areas are located as far away from sensitive neighbours as practicably possible and so that temporary structures screen noisy areas where practicable.

(g) Without prejudice to this Section, the Contractor shall comply with the City of Edinburgh Department of Environmental and Consumer Service's document *Construction Site Noise: A Guide for Contractors*, August 2000 (or current issue, if subsequent amendments issued), and shall liaise with that department in accordance with the requirements therein.

7 Vibration

7.1 Vibration Control

(a) Subject to the specific requirements of The City of Edinburgh Council, the following minimum requirements shall be met:

(i) To protect residents and users of buildings from nuisance and harm the Contractor shall, as far as practicable, not exceed the Vibration Dose Values specified in BS6472:1992 as resulting in a 'low probability of adverse comment'.

(ii) To protect buildings and other structures from physical damage, peak particle velocity levels shall not exceed 5mm/sec except for particularly sensitive buildings or structures where the level shall not exceed 3mm/sec. If vibration levels are predicted to exceed the criteria specified then vibration monitoring will be undertaken by a suitably qualified practitioner during the activity and the contractor will adopt alternative methods of working to reduce vibration levels as necessary. The monitoring programme shall be agreed between the Contractor, tie and The City of Edinburgh Council. This programme will include the location and frequency of readings and will identify to whom the results should be made available.

(b) In order to ensure that these levels are not exceeded a programme of on-site monitoring by a suitably qualified practitioner shall be agreed between the Contractor, tie and The City of Edinburgh Council. This programme will include the location and frequency of readings and to whom the results should be made available.

7.2 Inspection of Buildings and Other Structures

(a) All buildings and other structures, including scheduled monuments and listed buildings, within or adjacent to any working area which may be at risk of physical damage or vibration shall be identified by the Contractor and agreed with The City of Edinburgh Council.. A record of the conditions and survey of any defects shall be prepared prior to commencement of construction

(b) The results of this record of the conditions and survey of any defects shall be provided to The City of Edinburgh Council, the property owner and occupier and in the case of scheduled or listed features, to The City of Edinburgh Council and Historic Scotland.

(c) After the construction works have been completed and at any time up to two years after the opening of the tramway the owners of properties identified under the provisions of 7.2 (a) of this Code may, upon providing reasonable evidence of damage, request that a second defects survey is undertaken. Any damage that is identified as being caused by construction of the tram system shall be repaired within a reasonable time of identification at the expense of the Contractor to the reasonable satisfaction of the property owner and such that the property is returned to the standard of repair and stability existing before construction works on the Edinburgh Tram commenced. .

8 Dust and Air Pollution

8.1 Dust and Other Air Pollution

(a) The Contractor shall take all necessary measures to avoid creating a dust nuisance during construction and demolition works.

(b) Measurers to prevent dust shall include the following:

(i) The provision of easily-cleaned hard standings for vehicles

(ii) The enclosure of material stockpiles at all times and damping down of dusty materials using water sprays during dry weather.

(iii) The hard surfacing of heavily-used areas which will be kept clean by regular brushing and water spraying.

(iv) Control of dust released from cutting or grinding of materials on site. Any mobile crushing plant that is used during construction must be appropriately licensed and sited so as to minimise dust annoyance to any persons who may be liable to be affected by emissions. The Scottish Environment Protection Agency (SEPA) shall be notified in advance of any mobile crushing plant being brought onto site.

(v) The complete sheeting of all vehicles carrying spoil and other dusty materials.

(vi) Watering of unpaved surfaces and roads.

(vii) A limit on vehicle speeds on unpaved surfaces of 20 kph.

(c) Where dust generating works (e.g. excavation, demolition) are undertaken close to buildings such that there is a potential for soiling of windows and ledges with dust the contractors shall clean those windows and ledges as necessary – and at least weekly - during periods of dust generating work and on completion of works.

(d) The Contractor shall take precautions to prevent the emission of smoke or fumes from construction vehicles, site plant and stored materials including volatile substances. Vehicles and plant shall be well maintained and measures shall be taken to ensure that engines and motors are not left running for long periods when not directly in use.

(e) The engines of all parked vehicles or vehicles waiting to enter any work area shall be switched off within two minutes of arrival.

(f) Work compounds shall be laid out so that accesses and loading areas are located as far away from sensitive neighbours as practicably possible and so that temporary structures screen noisy areas where practicable.

(g) There shall be no burning of waste on site.

9 Disposal of Waste and Contaminated Materials

9.1 Waste

(a) The Contractor will develop a Waste Management Plan in accordance with Site Waste Management Plans: Guidance for Contractors and Clients (DTI 2004). This shall in particular identify:

- responsibilities for waste management;
- the types and quantities of waste materials likely to be generated;
- measures to be taken to minimise generation of waste;
- proposals for recycling and/or re-use;
- measures to be adopted for management of waste on site including enclosure, segregation, secure storage, sorting for recovery, and other on-site handling;
- proposed treatment and disposal routes;
- licensing arrangements.

(b) The plan shall be developed in accordance with the principles set out in Scotland's National Waste Plan, 2003 and in consultation with SEPA and The City of Edinburgh Council. and CEC.

(c) The Contractor shall undertake regular audits to demonstrate compliance with statutory requirements and the Waste Management Plan. Their audit programme shall be set out in the Waste Management Plan.

(d) Spoil or other waste materials arising from the works shall, wherever reasonably practicable, be used in the works.

(e) The disposal of waste, including any surplus spoil, shall be managed so far as is reasonably practicable, to maximise the environmental and development benefits from the use of surplus material and to reduce any adverse environmental effects of disposal.

9.2 Contaminated Land and Materials

(a) The Contractor shall identify all areas within the Site where contaminated land including land contaminated by invasive alien species listed on *Schedule 9, Part II* of the *Wildlife and Countryside Act 1981 and amendments*, may be encountered. In each of these areas the contractor shall:

(i) carry out appropriate site investigations to the satisfaction of *tie* and The City of Edinburgh Council to determine the extent and type of contaminants present on the site;

(ii) identify potential sources, pathways and receptors and assess the risk of harm to receptors;

(iii) liaise with the Local Authority and SEPA to address their reasonable requirements and agreeing control or protection measures necessary for dealing with identified risks;

(iv) obtain any necessary licences for the storage, treatment and disposal of contaminated material (including dewatering discharge);

(v) ensure that removal and disposal of contaminated materials complies with a strict consignment note system and that delivery is to appropriately licensed disposal facilities.

(b) The Contractor shall develop management procedures to be followed in the event that contaminated or hazardous materials are discovered on site during construction.

(c) If contamination that has not been previously identified is encountered on site, no further development shall take place (except to the extent that would not disturb that contamination) until a site investigation is carried out in accordance with paragraph (a) of this clause.

(d) The Contractor shall comply with the guidance in HSE *Protection of Workers and the General Public during the Development of Contaminated Land* 1991 and to the DEFRA *Helping to Prevent the Spread of Invasive Non-native Species Horticultural Code of Practice* March 2005 in so far as this is reasonably practicable and applicable to the construction works.

(e) Appropriate precautions must be taken if materials containing asbestos are encountered. The contractor will observe the exposure limits and measurement methods for asbestos, set out in HSE Guidance Note EH 10 1988 and shall comply with HSE Guideline Note MS13 Asbestos 1988, the Health and Safety Commission Approved Code of Practice and Guidance Note Work with Asbestos Insulation and Asbestos Coating 1983 in so far as these are applicable to the construction works.

10 Protection of the Water Environment

10.1 Waste Water and Run-off

(a) The Contractor shall prepare and implement a Construction Site Drainage Plan (the Plan) in consultation with SEPA. The Plan shall include measures to ensure that surface water runoff is contained and managed appropriately and that appropriate measures are taken to respond to inundation of the site. Sustainable Drainage (SuDS) measures shall be included within the works where reasonably practicable and applicable, in accordance with the guidance in:

- Interim Code of Practice for SuDSu (CIRIA 2004);
- Sustainable Urban Drainage System – Design Manual for Scotland and Northern Ireland (CIRIA C521);
- Sustainable Urban Drainage Systems – Best Practice Manual (CIRIA C523).

(b) There shall be no washout from temporary construction laydown and storage areas into local watercourses.

(c) No water containing silt shall be pumped directly into watercourses but shall be stored in settlement lagoons or tanks, or filtered prior to discharge, or discharged onto a grassy area to soak away, or discharged to foul sewer.

(d) Waste water and site discharges to surface water or sewer shall only be permitted where the effluent quality and discharge location is acceptable to SEPA or Scottish Water (as appropriate). COPA discharge consent shall be obtained if required prior to discharge.

(e) The Contractor shall ensure that all treatment facilities are regularly inspected and maintained and that a full record is kept of inspection, maintenance and other measures to maintain equipment performance.

(f) Approval from SEPA shall be obtained prior to any excavation below the water table, including any site de-watering and discharge. Application for prior approval must be made at least two weeks in advance of the relevant works commencing. Cut-off ditches may be used to prevent water from entering excavations.

(g) The Contractor shall comply with BS 6031: 1981 Code of Practice for Earthworks, regarding the general control of site drainage is so far as these are applicable to the construction works.

(h) The Contractor shall ensure that areas of exposed ground and stockpiles are minimised to reduce silty runoff. Geotextiles or other equivalent measures shall be used where necessary to prevent silty run-off from soil mounds close to watercourses.

(i) The Contractor shall ensure that any water that has come into contact with contaminated materials is disposed of in accordance with the requirements of SEPA or Scottish Water (as appropriate).

(j) The Contractor shall take suitable precautions to prevent the entry of pollutants into any bodies of water and report any incidents to SEPA.and Scottish Water

(k) Procedures for responding to potentially polluting incidents or inundation of the site by floodwaters shall be implemented in accordance with SEPA Guidance (see Section 10.6).

10.2 Storage of Polluting Materials

(a) The Contractor shall make provisions to ensure that oil drums and containers or other potential contaminants stored on the site are properly isolated and bunded and that no oil or other contaminants are allowed to reach watercourses or groundwater, including aquifers. Oil storage containers with a 200 litre capacity or greater shall be stored in compliance with the *Control of Pollution (Oil Storage) (Scotland) Regulations 2003 (Draft)* insofar as these are reasonably practicable and applicable to the construction works. Drip trays and other secondary containment measures will be used where necessary to prevent spills during refuelling of small static and mobile equipment. Storage locations for such materials shall be positioned away from watercourses. All surface water or other contaminated water which accumulates in bunds shall be removed by manually controlled positive lift pumps and not by means of a gravity drain.

(b) Spill response kits containing equipment appropriate to the quantity and types of materials present on site shall be available for use in the event of a fuel spillage. Personnel shall be trained in their use.

10.3 Protection of Aquifers

(a) The Contractor shall have due regard for protection of underlying aquifers and adhere to the SEPA's Groundwater Protection Policy for Scotland. In all instances, measures to ensure appropriate protection of aquifers will be undertaken subject to prior approval of SEPA. Prior approval shall be sought in writing, prior to commencement of the relevant tram works.

10.4 Control and Management of Foul Drainage

Where permanent facilities are not accessible foul water and sewage effluents produced by the construction workforce shall be contained by temporary foul drainage facilities. All foul water so collected will be disposed of off-site by a licensed contractor.

10.5 Works in the Vicinity of Water

The Contractor shall take suitable precautions to prevent the entry of pollutants including sediments and dusts into any bodies of water and report any incidents to SEPA.

Crossings of watercourses shall be designed and constructed so as not to impede the flow, obstruct the movement of floodwater or exacerbate erosion of the channel and banks.

In watercourses that support migratory fish, works shall be avoided during upstream and downstream fish migration, spawning, incubation and hatching periods.

Where bankside habitat is temporarily affected, it shall be reinstated to its original form on completion of the works.

Areas of bankside adjacent to Working Areas shall be fenced off during construction to prevent damage to the banksides.

Stripping of surface vegetation near water shall be kept to a minimum. Exposed surfaces shall be seeded or reinstated with vegetation as soon as is practical after construction in that Working Area is complete.

Where culverting is required, it shall be designed and constructed to permit the passage of fish and other aquatic fauna under normal flow conditions

10.6 Guidance

The Contractor shall comply with all relevant SEPA Pollution Prevention Guidelines, these will include, but not necessarily be limited to:

PPG1 General guide to the prevention of water pollution.
PPG2 Above ground oil storage tanks.
PPG3 The use and design of oil separators.
PPG4 Disposal of sewage where no mains drainage is available.
PPG5 Works in, near or liable to affect watercourses.
PPG6 Working at construction and demolition sites.
PPG7 Refuelling facilities
PPG8 Storage and disposal of used oils.
PPG13 High pressure water and steam cleaners.
PPG18 Control of spillages and fire fighting runoff.
PPG19 Garages and vehicle service centres.
PPG21 Pollution incident response planning.
PPG22 Dealing with spillages on highways.
PPG23 Maintenance of structures over water.
PPG26 Pollution prevention storage and handling of drums and intermediate bulk containers.

10.7 Water Environment and Water Services (Scotland) Act 2003

The Contractor should be aware that new licensing requirements under the Controlled Activity Regulations (currently in draft) may come into force prior to or during the construction programme and will affect many activities in or around water. The contractor shall make best endeavours to inform himself of the date that these Regulations come into force.

11 Ecology

11.1 Encroachment into Wildlife Areas

(a) The Contractor shall:

(i) take all reasonably practicable measures to minimise harm to and disturbance of wildlife caused by noise and vibration, dust and other air pollution.

(ii) minimise habitat loss by keeping the working corridor and extent of working areas to the minimum necessary for the works. Removal of habitats and new planting shall be undertaken in consultation with Scottish Natural Heritage (SNH) and the Local Authority.

(iv) fence off adjacent habitat to prevent unnecessary incursion or damage. Staff shall be made aware of the need to avoid damage to adjacent retained areas.

(v) areas of habitat disturbed during construction in areas not required for permanent works shall be reinstated or replaced on completion of the works in accordance with the Landscape and Habitat Management Plan (LHMP).

(vi) soil stripping, storage and placing shall comply with the guidelines set out in British Standard (BSI Code of Practice for Earthworks (BS6031).

(b)

Approval shall be obtained from *tie*, SNH, SEPA, Scottish Executive Environment Group Wildlife Habitats Division (SEEG WHD) and The City of Edinburgh Council, for detailed method statements for any works proposed in designated sites, including Special Protection Areas (SPA)/Ramsar sites, Sites of Special Scientific Interest (SSSI), Sites of Interest for Nature Conservation (SINC) and Wildlife Sites.

Applications for approval shall be made at least one calendar month prior to relevant works commencing.

11.2 Protected Species

(a) In advance of any works, the Contractor shall employ suitably qualified professionals to check all working areas and any land within 30 metres of the boundary of the working area (or 100m from any piling operations or use of explosives) for the presence of protected (as defined by statute.) Where protected species are identified, appropriate mitigation measures shall be agreed in advance with the relevant authorities and in accordance with any requirements for licensing, and these measures shall be implemented. The Contractor shall be responsible for obtaining any required licences from the relevant authority.

(b) Where any habitat has to be cleared in the breeding bird season, typically March – June/July for most species, the habitat must be checked prior to removal for the presence of nesting wild birds, their nests and eggs/young. If found, no habitat can be removed until nesting is complete, or unless other suitable mitigation is agreed in advance with SNH.

(c) The Contractor shall be responsible for obtaining a licence from SNH for any work that may cause disturbance to a badger or involves the damage or destruction of a sett. Licence applications shall be made for hand digging within 10m, heavy machinery operating within 30m, and piling or use of explosives within 100m, and no works shall proceed until the required licences are obtained. Alternative setts shall be provided in the event of and in advance of any loss

(d) The Contractor shall be responsible for obtaining a licence from SEEG WHD for any work which may cause disturbance to otters or involve damage or destruction to an otter holt or lying up site or if any works are proposed within 30m of an otter holt or lying up site. Alternative setts shall be provided in the event of and in advance of any loss

(e) All bridges and other built structures and mature and dead trees within the working area shall be checked by a licensed bat handler for their use by roosting or hibernating bats prior to felling or other potentially damaging operations. If found, mitigation measures shall be agreed with SNH and SEEGWHD and implemented, including review of the design to seek ways of avoiding loss of the roost. If avoidance is not possible, a development licence shall be applied for from SEEGWHD for disturbance to a European Protected Species. Alternative roost sites shall be provided in advance of any loss. Any loss of feeding habitat shall be compensated for by new habitat creation as detailed in the LHMP. All mitigation measures for protected species shall be installed as early as possible during the construction process so that use can be established at an early stage.

Where appropriate use of mitigation measures by target species will be positively encouraged using a variety of techniques e.g. feeding.

(f) Permanent mitigation structures for protected species including mammal fencing and tunnels and artificial badger setts shall be checked during construction and approved on completion by a suitably qualified ecologist and reported to SNH. Should these structures not be to the required standard specified, remedial measures will be taken by the

(g)Mitigation shall aim to compensate for loss of foraging specifically for badgers through creation of appropriate grassland and scrub habitat in line with the Civil Aviation Authority Advice Note 3 – Potential Bird Hazards from Amenity Landscaping and Building Design

(e) Contractor personnel shall be briefed by a suitably qualified professional on measures for protected species as part of site induction.

11.3 Protection of Mature Trees

For the purposes of this Code, "trees" are defined as trees with a diameter of over 10cm girth at a height of 1.5 m above ground level.

(a) Loss of trees shall be avoided as far as reasonably practicable. The Contractor shall comply with the guidelines set out in British Standard (BS) 5837:1991 *Trees in relation to construction* insofar as these are reasonably practicable and applicable to the Edinburgh Tram construction and landscaping works.

(b) All tree surgery operations shall comply with the BS 3998 *Recommendations for Tree Works* and a method statement addressing safety of workers and the public shall be prepared and implemented.

(c) Felling shall be carried out in accordance with the Forestry Commission's Forest and Water Guidelines 2004, relating to the influence that woodland and trees can have on the freshwater environment, insofar as these are reasonably practicable and applicable to the construction works.

(d) Prior to felling, trees suitable as bat roosts shall be checked by a licensed bat handler for roosting and hibernating bats and should any be identified required licences and mitigation measures shall be agreed with the SNH and SEEGWHD.

(e) Woody material generated should be retained on site as far as is reasonably possible and used as part of habitat creation measures

(f) Adverse effects on all trees within or in the vicinity of the site shall be minimised by the adoption of suitable mitigation measures. These may include but are not limited to the following:

(i) selective removal of lower branches in an approved manner, to reduce mechanical damage by construction plant;

(ii) control of construction activities to minimise compaction of the ground beneath the entire canopy of the tree. No heavy materials or plant shall be stored, and construction traffic movements shall be controlled, by fencing or other means, so as to minimise vehicle movement within the canopy;

(iii) the use of matting around the root zone to minimise soil compaction;

(iv) the use of chestnut paling around the trunk to prevent damage.

11.4 Tree Replacement

Where trees are removed, damaged or die as a consequence of the construction, they shall be replaced by at least an equal number of trees of a broadly similar or approved size and in a location as close as possible to the original position. All tree planting shall be agreed with *tie* and The City of Edinburgh Council and shall be in accordance with the LHMP. The supply, storage, handling, planting and maintenance of new planting shall be undertaken in accordance with the appropriate British Standards, including, but not necessarily limited to;

- (BS5837) *Trees in relation to construction,*
- (BS3998) *Recommendations for Tree Works* and
- (BS4428) *Code of Practice for General Landscape Operations (excluding hard surfaces).*

11.5 Control of Invasive and Alien Species

If any invasive alien species listed on *Schedule 9, Part II* of the *Wildlife and Countryside Act 1981 and amendments*, are identified along the route, including Japanese knotweed (*Fallopia japonica*), giant hogweed (*Heracleum mantegazzianum*) or Himalayan balsam (*Impatiens glandulifera*), a strategy shall be developed and implemented prior to the construction phase of the project to manage their presence. The strategy will ensure the control of these species and prevent the spread of them within and outside the development area. The soil containing these species or parts thereof shall be dealt with as contaminated material and disposed of in accordance with clause 8.2 of this Code.

12 Archaeology and Cultural Heritage

12.1 Archaeological and Heritage Mitigation Plan

(a) In advance of construction the Contractor shall prepare an Archaeological and Historic Mitigation Plan and this shall be submitted to *tie*, Historic Scotland and The City of Edinburgh CouncilCEC for approval. The scheme will identify the level of mitigation proposed at each site of archaeological or historic significance (as defined by statute and/or Historic Scotland), taking into account the measures outlined in the Environmental Statements. These may include:

- prior archaeological evaluation by trial excavations;
- a detailed photographic record prior to construction;
- a watching brief during construction;
- a detailed standing building survey and salvage;
- archaeological excavation;
- preservation in situ;
- further documentary research and archiving;
- or other such measures as may be approved.

(b) No development within or immediately adjacent to an area which is, in the opinion of The City of Edinburgh Council, of known or suspected archaeological importance, shall commence until a scheme to deal with any archaeological remains on the site has been submitted to and approved by The City of Edinburgh Council and implemented. Application for prior approval shall be made at least two calendar months in advance of the relevant works commencing.

(c) No development within or adjacent to an area which is designated as a Scheduled Ancient Monument shall commence without confirming whether Scheduled Monument Consent is required with Historic Scotland, and where necessary obtaining such consent. The Archaeological and Historic Mitigation Plan will identify the Schedule Ancient Monuments and Listed Buildings that will be affected and will outline the works that can take place in proximity to them and will detail the necessary mitigation.

(d) All records obtained through the mitigation will be lodged with the National Monuments Record of Scotland (NMRS).

(e) The Archaeological and Historic Mitigation Plan will outline the appropriate procedures that will be followed should any significant archaeological remains be found during the pre-construction excavations.

(f) Any archaeological works carried out on site shall be undertaken by a suitably qualified investigating body acceptable to The City of Edinburgh Council. The results shall be provided to the property owner and occupier and in the case of scheduled or listed features, to the CEC and Historic Scotland.

(g) The Contractor shall take all reasonable precautions to prevent employees, subcontractors, their employees, or any other persons from removing or damaging any fossils, coins, articles of value or antiquity, structures or other remains or any other thing of archaeological or historical interest during investigations and during all construction works. The Archaeological and Historic Mitigation Plan will outline the legal obligations placed on those who discover portable antiquities or disturb human remains.

(h) The Contractor shall appoint a suitably qualified professional person, to record the condition of all scheduled and listed buildings and structures or parts thereof, within or adjacent to the construction working areas which are identified as at risk from physical damage or vibration. This shall be carried out in accordance with the Institute of Field Archaeologists Standards and Guidance. The results shall be provided to the property owner and occupier and in the case of scheduled or listed features, to the the City of Edinburgh Council and Historic Scotland.

(i) At least one month prior to commencement of the relevant excavation works, a copy of each survey undertaken under paragraphs (h) of this clause shall be provided to *tie*, the property owner and occupier and in the case of scheduled or listed features, to the the City of Edinburgh Council and Historic Scotland.

(j) After the construction works have been completed and at any time up to two years after the opening of the tram the above parties may, upon providing *tie* or the contractor with reasonable evidence of damage, request that a second defects survey is undertaken. Any damage that is so identified as being caused by construction of the tram system shall be repaired within a reasonable time of identification at the expense of the Contractor to the reasonable satisfaction of the property owner and such that the property is returned to the standard of repair and stability existing before construction works on the Edinburgh Tram commenced..

12.2 Guidance

(a) All archaeological investigations, watching briefs or other activities shall be carried out in accordance with guidance from the Institute of Field Archaeologist, particularly – but not necessarily limited to - standards and guidance for:

- field evaluation;
- excavation;
- archaeological watching brief;
- archaeological investigation and recording of standing buildings or structures;
- collection, documentation conservation and research of archaeological materials;
- the IFA policy statement on Environmental Protection;
- the IFA Code of Conduct;
- the British Archaeologists and Developers Liaison Group Code of Practice.

Appendix E: Combined Public Utility Apparatus Location Plans

Edinburgh Tram

Line One, Northern Loop

Utilities Interface Report
Appendix E - Drawings

Report No. 203011/0055

11 November 2003

GILLESPIES McLEAN HAZEL ERM Babtie steer davies gleave Mott MacDonald

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Edinburgh Tram

Line One, Northern Loop

New Transport Initiative

Utilities Interface Report

Appendix E - Drawings

Report No. 203011/0055

11 November 2003

Issue and Revision Record

Rev	Date	Originator	Checker	Approver	Description
0	11 November 2003	Alastair Camelford	Helen Bradley	Helen Bradley	For issue

Disclaimer

Note

The full set of combined apparatus location plans are attached separately in additional folder entitled Appendix E. The following drawings are contained in folder – Appendix E:

- *203011/EDIN/PU/0600 – Key Plan; and*
- *203011/EDIN/PU/0601 to 0648 inclusive, Combined Apparatus Utility Plans.*

Appendix F: Cost Estimates

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Scottish Power	*Diversionary Works Cost Estimate* *Spreadsheet of planned diversions*
Scottish Water	*Extract from Scottish Water, Asset Diversion Estimate Report*
Transco	*Diversionary Works Cost Estimate*
Thus	*Diversionary Works Cost Estimate* *Spreadsheet of planned diversions*