Appendix J

Schedule of Mitigation
INTRODUCTION

This Appendix identifies the actions to be implemented to prevent, reduce, remedy or compensate for adverse effects on the environment that might otherwise result as a consequence of the development of Edinburgh Tram Line One. The mitigation measures are identified under the following headings, corresponding to chapters in the ES:

- traffic and transport;
- geology, soils and contaminated land;
- landscape and visual impacts;
- ecology and nature conservation;
- water quality;
- cultural heritage;
- noise and vibration;
- air quality.

Responsibility for the implementation of these measures will be with the scheme designers, construction contractors and the developer as appropriate.

J1 Traffic and Transport

J1.1 Construction

1. During construction, the designated routes and arrival/departure of HGVs will be carefully managed to minimise the potential for queues and other traffic impacts. Measures including staggering of the times of arrival and departure of personnel and plant will be used by the contractor to minimise disruption to traffic and disturbance to residents in the vicinity of construction compounds.

2. HGVs will access compounds and work sites using only major routes appropriate for such vehicles. The contractor will be required to agree appropriate HGV access roads to each compound and each working section with CEC in advance of construction in order to minimise the impacts of increases in traffic and to prevent HGVs accessing sensitive residential locations. The contractor will provide vehicle wheel-washing facilities at all construction compounds.

3. To ensure that HGV movements do not occur during quieter night time periods, construction of the scheme will be limited to the hours of 7am and 7pm, Monday to Saturday where possible. Work will be undertaken outwith these hours in locations identified to be more sensitive during normal working hours but only with the prior consent of the Council.

4. To minimise the extent of road closures during construction, measures will include: constructing the route in manageable sections; ensuring that local diversions are in place; ensuring that construction activities take place at appropriate times (eg use of night closures where appropriate); introducing temporary traffic management regulations to minimise impact of parking and servicing on the flow of traffic; working closely with the public utility companies to ensure that diversionary measures are minimised; and timely completion of the works. These may require separate traffic regulation approvals.

5. For each phase of the construction and before any works can be carried out, the contractor’s traffic management proposals will be submitted to CEC for approval. The Emergency Services will also be consulted as appropriate. Routes normally used by emergency vehicles and for refuse collection will be identified and maintained, or acceptable alternatives provided.
6. In order to minimise potential disruption to local traffic and services, delivery and pick-up points will be assigned in the vicinity of each construction section.

7. Where possible, on-site diversions will be used in preference to road closures, and road traffic managed through signing and use of traffic cones. This may involve, for example, providing temporary narrow lanes alongside the construction working area in order to maintain flows of road traffic in each direction in the narrower area of road carriageway which remains in use. In some instances, where one lane of traffic cannot be maintained in each direction, temporary traffic lights will be used to control a one-way flow of traffic through the restricted areas. Use of traffic lights will be avoided wherever possible, especially during peak periods.

8. Construction personnel will be encouraged to access work sites using public transport wherever possible to minimise disruption resulting from a lack of available parking facilities.

9. The impact on public transport will be reduced as far as possible by effective traffic management in order to minimise disruption and through timely completion of the works. The contractor will discuss any requirement for temporary diversion of bus routes during construction in advance with the bus operators and CEC.

10. The contractor, in consultation with CEC and other stakeholders such as access and cyclist groups, will divert the Roseburn railway corridor cycleway along an alternative route during the construction process. The alternative will be signposted and designed to maintain existing levels of accessibility for cyclists as far as possible.

11. To maintain pedestrian access to homes, businesses, recreational and educational facilities etc, areas of construction, including footpaths, will be fenced off from pedestrians and alternative paths identified.

**J1.2 Design and Operation**

12. The northern footway along Starbank Road will be widened to allow for integration of trams, road traffic and maintenance of pedestrian facilities.

13. Where traffic could increase significantly as a result of the tram, mitigation measures will be drawn up for the detailed scheme. Measures will include signing, traffic calming, review of parking and servicing provision. The findings of a further assessment of the effects of the tram taking account of CETM will be used to inform these detailed mitigation measures.

14. The effects on the traffic patterns of local residents from permanent traffic management measures implemented to facilitate operation of the tram will be mitigated by providing and signing suitable alternative routes.

15. A high quality design for the new infrastructure will be implemented to help reduce severance and amenity impacts.

16. A combined walkway and cycleway will be provided adjacent to the tramway in the Roseburn corridor.

17. All pedestrian crossing points for on and off-street sections of the tram will be maintained or locally relocated and additional crossings will be provided where necessary.

18. Where possible, cycle ways will be segregated from tram tracks and advanced cycling stop lines provided at key junctions.

19. Provision will be made for buses and other traffic to pass stationary tram vehicles at tram stops wherever possible.

20. As the detailed scheme is developed, appropriate mitigation measures will be introduced to ensure that the transport network operates efficiently. Specific measures will vary according to the location and the range of amenities in the immediate vicinity. Examples of these measures will include: appropriate signing to encourage traffic to use appropriate routes; incorporation of traffic...
calming measures to discourage traffic from using residential streets (eg the streets to the east and west of Leith Walk); review of parking and servicing provision on the adjacent local road network; and provision of adequate parking for affected residents (eg Granton Road).

21. Where appropriate, some junctions will be remodelled with revised signal priority given to the tram, in order to maintain an optimum level of service for the on-street sections of the tram. As the detailed layout is progressed, impacts will be minimised through local traffic management measures and signal timings.

22. Where banned turns are introduced, adequate alternative routes will be provided. In the case of Leith Walk particular measures will ensure that local residents are not impacted as they travel to and from their homes.

23. To avoid severance for properties located adjacent to the corridor, all of the present crossing points over and under the railway will be maintained, and pedestrian access to the walkway will be provided at all the current access points. Separate pedestrian access will be provided by walkways to tram stops along the corridor. All pedestrian crossing points for the on-street and off-street sections of the tram will be maintained. New signalised pedestrian crossings will be provided at each tram stop to facilitate ease of pedestrian access to the platforms. An increased number of formal pedestrian crossing facilities will be provided along Leith Walk.

24. Throughout the on-street running sections of the route the designs will incorporate facilities for cyclists including cycle lanes segregated from tram tracks, and provision of advanced cycling stop lines at key junctions. The level formation of the Roseburn cycle track will be maintained and a permanent cycleway surface will be laid to mitigate against reduced width of the cycleway.

25. Wherever possible the alignment will incorporate adequate facilities for taxis, and alternative taxi stands will be found for any affected by the works. These will be identified in consultation with CEC. Where the routing of the tram would directly impact upon existing taxi stands, alternative locations will be identified in consultation with CEC.

26. The proposed layout at Haymarket Station will incorporate all modes of transport. This will provide passengers with the benefits of bus/tram/rail interchange facilities. Similarly the proposed layout for Picardy Place will incorporate bus and tram stops and will be easily accessible to pedestrians.

27. Footways will be retained along the majority of streets where the tram alignment is proposed.

J2 Geology, Soils and Contaminated Land

28. In order to avoid impacts on the Firth of Forth Geological SSSI at Wardie Shore, construction access to the foreshore adjacent to Starbank Road for works to the seawall will be designed to avoid the area of geological importance.

29. Erosion will be minimised by avoiding the removal of vegetation where possible, for example along the Roseburn Railway Corridor, and revegetation of bare areas as soon as possible after development is complete. Suitable drainage systems will be put in place in order to prevent surface water build up.

30. Soil horizons will be removed and stored separately to minimise disaggregation.

31. Vehicles with wide tyres to spread vehicle weight, minimisation of tracks for vehicular access, and tilling of the area will be used as needed to minimise soil compaction.

32. A general policy of containment of any potentially polluting material on site will be pursued where possible, and emissions and spillages avoided.

33. Any contaminated material encountered during construction will be dealt with in compliance with best practice, current legislation and statutory guidance.
34. Intrusive environmental investigations will be undertaken in potentially contaminated areas. Appropriate levels of characterisation and risk assessment will be undertaken to establish the presence of contaminant sources that present significant risks to identified receptors and therefore constitute contaminated land.

35. For areas where site investigation reveals the presence of contaminated land, a management plan will be prepared in order to comply with all the relevant treatment, handling and disposal legislation. The plan will set out measures to avoid the remobilisation of contaminants via surface waters, groundwater and in the ambient air. The plan may include any of the following mitigation measures where site investigation identifies the presence of contaminants:

- removal of contaminated material and disposal at a licensed and approved site, followed by verification sampling of the sides and base of the excavation to confirm that the quality of the remaining soil is acceptable with reference to site specific, risk assessment derived clean-up levels;

- isolation of contaminated material *in-situ*;

- treatment of contaminated material *in- or ex-situ*;

- containment and treatment of groundwaters; and

- use of appropriate personal protective equipment (PPE) that provides a high level of protection for personnel against any contaminants that may be encountered.

36. Excavated materials classified as giving rise to an environmental hazard, or as special waste, will be disposed of at a suitably licensed waste disposal site. All parties will discharge their statutory obligations in relation to the Waste Management Duty of Care, imposed by section 34 of the *Environmental Protection Act 1990* and if applicable, the *Special Waste Regulations 1996*.

**J3 Landscape and Visual Impacts**

37. A Design Manual will be developed for the project in consultation with CEC, Historic Scotland and the World Heritage Trust and will be used to guide the detailed design of all elements of the scheme. General commitments from the current draft of the Design Manual include:

- Improvement to the pedestrian realm including comprehensive wall to wall repaving of footways where the substantial majority of a pedestrian area requires to be disrupted and resurfaced to install the tram;

- Careful design of the OLE to simplify the layout, balance conductor wire and support cable sizes against support spacing so as to minimise the visual intrusion of the wiring,

- Use of visually appropriate methods of support and integration of OLE supports with other vertical elements in the street (lighting and signing poles) as far as possible;

- Coordinated spacing of new poles and rationalisation with existing ones, including detailing and design of wire supports and their arrangement to suit the form of the street, particularly at junctions;
• Simple alignment of the tram through formal streets to minimise the need for complex OLE support structures or wiring, and to reduce the impact on the important designed vistas of the New Town;

• Use of surfacing and kerb materials appropriate to the location, in accordance with City of Edinburgh Council’s public realm strategies;

• A coordinated and visually integrated design for tram stops, creating high quality pedestrian spaces.

Design Manual commitments in specific sections of the route are set out below.

**Haymarket**

38. Improvement to the pedestrian realm as part of the comprehensive redesign of Haymarket junction required for the tram.

39. The creation of an appropriate setting for the war memorial.

40. A simple alignment of the tram through Haymarket junction to reduce the impact on the important designed vista down Shandwick Place terminating at Haymarket Station.

41. A straight alignment into and along West Maitland Street to respect the formality of urban design of the New Town.

42. A coordinated and visually integrated design for the tram stop including walls or other architectural devices to recreate some of the enclosure of the entrance to Haymarket Terrace lost with the demolition of the Caledonian Ale House, to link the tram stop with Haymarket Station and to enhance the setting of the station building.

43. The possible introduction of barrier fencing and hedging between Balbirnie Place and the tram in order to create visual enclosure and reinforce the urban form between the housing and the tram.

44. Soft landscape works to the open space between Balbirnie Place and the new offices at Haymarket yards to compensate for the loss of amenity.

45. Simple, unobtrusive design for the housing of the substation to the rear of 15 Devon Place.

**New Town: West End**

46. A straight alignment along West Maitland Street and Shandwick Place to respect the formality of urban design of the New Town.

47. The redesign and reconstruction of the affected parts of the garden spaces to a design and standard acceptable to Historic Scotland and CEC planning department.

48. Retention of as many of the existing mature trees as possible, where removal is unavoidable replacement of lost trees with an equivalent number of semi-mature specimen trees of a minimum 40cm girth, of species suitable for the location.

49. If the design of Rutland Place entails the realignment of kerbs, the kerbs, adjacent paving, dwarf walls and bespoke railings would be rebuilt and made good to match the existing.

**New Town: Princes Street**

50. A straight alignment, to respect the formality of urban design of the New Town and allow simplest overhead wiring design, along the full length of Princes Street from South Charlotte Street to
South St David and St Andrew Streets, and the minimum practical change in alignment at South Charlotte Street.

51. A street layout that increases as far as possible the space for pedestrians, whilst maintaining adequate tram run-times and adequate space for bus services including, in particular the footway widening across the nearside traffic lane described above.

52. The use of visually appropriate methods of support, including designing a simple and elegant support column.

53. The stop located east of the end of Castle Street so that it does not affect the important designed vista of the Castle from Castle Street.

**New Town: St Andrews Square**

54. Straight alignments either side of St Andrew Square, to respect the formality of urban design of the New Town and allow simple overhead wiring design.

55. Possible increased space for pedestrians on South St Andrew and South St David Streets.

56. The use of visually appropriate methods of support including a simple and elegant support column.

57. The stops located south of St Andrew Square so that they do not impact on the square itself or the designed vista down George Street, and so that they are as close as practical to Waverley Station.

**New Town: York Place**

58. A straight alignment down York Place, to respect the formality of urban design of the New Town and to allow simple overhead wiring design.

59. The use of natural stone to face all visible components associated with changes in level, together with bespoke designed hand-railing where safety rails are required.

**Leith Walk**

60. Between Gayfield Square, Leith Street and York Place the redesign of the public realm will be considered as part of the junction designs.

61. The reinstatement of decorative railings, sculpture, paving, planting, sculptures and trees at Elm Row to match the existing, on a new line to suit the revised road layout.

62. The integration of the layout and design of span wire supports and the design and positions of street lighting columns to give an ordered layout of a family of columns, including where appropriate the replacement of the existing street lighting.

**Leith**

63. Fully integrated on-street running to minimise the need to alter the road layout through the narrow small scale streets.

64. A coordinated and visually integrated design for the tram stop, including improvement to the pedestrian realm in the vicinity of the stop.

65. The use of visually appropriate methods of support for the OLE, including the use of building mounted brackets for the span wires wherever possible.
66. the integration of the layout and design of span wire supports and the design and positions of street lighting columns to give an ordered layout of a family of columns, including where appropriate the replacement of the existing street lighting.

**Port of Leith**

67. The coordination of the design for the tram and for the new developments to ensure, as far as this is within tie’s power, the proper integration of the tram with the new townscape.

68. Appropriate finishing to the visible parts of the ramp structure between Lindsay road and the dock road.

69. The scale and massing of the depot building and its siting within the context of the available site must be carefully considered to ensure an appropriate fit with the surrounding area.

**Newhaven to Granton**

70. A new combined footway and cycle path on the north side of Starbank Road, seaward of the existing sea wall, finished in a manner architecturally appropriate for the location (contingent on acceptable impacts on nature conservation issues).

71. The use of grass infill between the tracks across the extensive lawn areas created by the removal of the old Granton Railway along Lower Granton Road (note: the extent of this may be affected if an amended road layout is adopted through the Wardie section to accommodate residents parking needs).

**Waterfront Granton**

72. Materials will reflect the design intentions of the Waterfront Edinburgh masterplan. The track bed is likely to be grassed through most of the development, with occasional crossing points of high quality modern concrete paving, as required by the pedestrian network.

**Pilton**

73. The use of grass infill between the tracks and, wherever the room is available, planting of a hedge immediately in front of the existing and any new barrier fencing.

**Roseburn Railway Corridor**

74. The new works will be designed in sympathy with the character of the railway solum and felled trees will be replaced with a mixture of native and decorative shrub planting.

75. Roseburn Bridge will be reinstated to match its existing appearance.

**Impacts on Views**

76. The Princes Street stop will be located so that it does not affect the view from Castle Street.

77. A central alignment on Princes Street and simple and visually lighter OLE design will minimise the effect on views out of the street.

78. Along the railway corridor visual mitigation will be provided by screening, particularly replacing and reinforcing hedges along the site boundary.
J4 Ecology and Nature Conservation

79. Construction activities will be confined to the minimum areas required for the works.

80. Temporary work areas including site accesses will be situated on areas of hard standing or areas of low conservation value wherever possible.

81. Impacts to areas of identified nature conservation interest, including the Firth of Forth SPA/Ramsar Site/SSSI and Urban Wildlife Sites will be avoided as far as possible. Where works in these areas are unavoidable, the contractor will be required to ensure that best practice measures are adopted to minimise any direct or indirect adverse impacts.

82. The contractor will be required to agree method statements in advance of construction with CANHU, SNH, SEPA and CEC for all construction activities in or adjacent to sensitive areas and for restoration proposals.

83. Bird monitoring will be undertaken to further inform an Appropriate Assessment of the effects of the works within the SPA, and the information obtained will be used to develop detailed mitigation measures for the species and habitats affected. The details of the surveys will be agreed with SNH. The surveys are likely to involve data collection over a year, with the frequency of monitoring varying throughout the year from one to four counts per month, depending on the time of year. The findings of the surveys will be used to refine the mitigation measures proposed in the ES.

84. Best site management practices will be adopted to minimise the risk of secondary impacts (including direct incursions, pollution etc) to habitat adjacent to the scheme corridor.

85. Trees will be retained where possible and where works close to trees are required, techniques will be used to safeguard tree roots to reduce the number of trees that are damaged or lost in accordance with the requirements of BS5837.

86. Topsoil and subsoil will be stripped and stored separately and reinstated appropriately as soon as possible to minimise adverse impacts to the soil structure. Topsoil (and the seed bank which it contained) from areas of local nature conservation interest will be replaced along the works as close as possible to the location from which it was taken.

87. Any invasive alien species listed on Schedule 9, Part II of the Wildlife and Countryside Act 1981 and amendments identified within the scheme corridor will be removed from site at the start of works following best practice guidance to ensure they are not spread inadvertently along the route.

88. The site has been checked for the presence of protected species and badger has been identified close to the area of works within the Roseburn Railway Corridor. As they are mobile species, further surveys will be undertaken prior to work commencing. Any subsequent mitigation measures required will be agreed with CANHU and SNH and the work will comply with the requirements of relevant legislation.

89. Measures to mitigate the impacts from the scheme on badgers will include sett relocation (if necessary), badger fencing in appropriate locations and badger tunnels under the tram route. The specific details of the mitigation measures will be worked up for the final scheme in consultation with CANHU, SNH and the Edinburgh and Lothians Badger Group. Areas of any maintenance activities will be checked for badger presence prior to undertaking them. If any signs of setts etc are identified, appropriate licences will be obtained.

90. No bat roosts have been identified along the scheme corridor, however, all bridges and other built structures and mature and dead trees to be affected will be checked for roosting bats and nesting birds prior to construction and appropriate mitigation measures agreed with SNH and

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(1) An Appropriate Assessment is required to determine the impacts of the proposal upon Natura site interests and specifically to provide the information necessary to ascertain whether it will not adversely affect the site’s integrity.

(2) British Standards Institution (BSI) (1991) Trees in Relation to Construction BSI.
implemented if bats are found. If bats are likely to be disturbed, a licence will be obtained from CANHU.

91. Bat and bird boxes will be erected in areas close to where mature trees are to be felled, or where built structures will be affected during construction in order to provide new habitat.

92. Wherever possible, habitat removal (particularly woodland and other trees) will take place outside the breeding bird season (approximately mid March to the end of June) to avoid effects on nesting birds. Where this is not possible, all woodland and scrub will be checked for nesting birds before removal. If any are identified appropriate mitigation measures will be agreed with SNH and implemented.

93. Areas of habitat disturbed during construction in areas not required for permanent works will be fully restored on completion of the works.

94. The impacts to the Roseburn Railway Corridor will be limited to the minimum necessary through the implementation of mitigation measures, including the adoption of best practice measures during construction. As much vegetation will be retained as possible, while enabling safe completion of the works.

95. The mitigation of impacts to wildlife will be designed to be consistent with the species priorities set out in the LBAP. Opportunities will be sought to enhance these habitats and to create new habitats of value within the landscaping proposals.

96. Best site management practices will be adopted to minimise the risk of secondary impacts on the Water of Leith such as pollution incidents during construction and operation of the tram.

97. During the construction period, measures will be implemented to reduce the risk of pollution including best management practices to control dust, noise, drainage etc and using appropriate bunds etc around storage tanks to contain spills and leaks. Best site management practices will be implemented to reduce the risk of introduction of alien species from vehicles and other machinery during construction, for example wheels on all vehicles will be cleaned before they come onto site.

98. New structures within the Firth of Forth SPA/Ramsar Site/SSSI will be designed to provide habitat for birds that currently use this stretch of the sea wall. Detailed mitigation measures will be developed in consultation with CANHU and SNH.

99. Where street trees require removal, they will be replaced by an equal number of trees in the same location or if this is not possible in another location agreed with the CEC.

100. Opportunities will be sought in the design of the new walkway structure along Starbank Road to provide additional roosting opportunities for the species using this area and to mimic the existing habitat along the sea wall.

101. Where possible, the existing vegetation on the north western side of the depot site will be retained and enhanced by protecting these trees during construction and through landscaping using native deciduous species. This will provide screening for the depot and offer some habitat for local fauna.

J5 Water Quality

102. All drainage measures will be discussed and approved by SEPA. All construction works will be undertaken in accordance with SEPA’s Pollution Prevention Guidelines and in particular PPG6 (1).

103. All surface water discharges from construction activities will pass through sediment traps (such as settlement lagoons or tanks) in order to reduce suspended solids prior to discharge. Similarly,
decontaminating filters and oil separators will be incorporated into the site drainage systems in order to minimise the risk of contamination to surface waters (SEPA PPG No.5 (1)).

104. Construction vehicles will be maintained to reduce the risk of hydrocarbon contamination and will only be active when required. Other construction materials will be managed in such a way as to effectively minimise the risk posed to the aquatic environment, particularly for construction along Starbank Road.

105. Disturbance to areas close to watercourses will be reduced to the minimum necessary for the work. Exposed soil areas, such as within the Roseburn Railway Corridor, will be minimised in order to reduce the potential for increased siltation and contaminated run-off. Where it is necessary to introduce new areas of hardstanding surfaces, requirements from SEPA on Sustainable Urban Drainage System (SUDS) will be implemented during the detailed design stage.

106. A construction method statement will be submitted for approval by the relevant statutory authorities prior to commencement of construction. The method statement will outline mitigation measures designed to minimise potential impacts upon the water quality of the Firth of Forth, including temporary coffer dams and/or a floating curtain of geotextile material to surround the works. Mitigation measures outlined in the method statement will require approval by relevant statutory authorities prior to implementation.

107. The contractor will use biodegradable products for vehicle washing to avoid contamination from discharges. Excess water from the depot will be treated via an oil/grit interceptor prior to approval of a discharge consent from Scottish Water or SEPA for discharge of effluent to the public sewer or to a watercourse.

108. Bins will be provided on site for collection of construction waste.

109. Dust suppression techniques will be applied to all soil stockpiles.

110. A construction method statement will be prepared by the contractor detailing mitigation measures to minimise the risk of accidental spillages and sediment disturbances within the tidal area of the Firth of Forth. The method statement will be submitted for approval by the relevant statutory authorities (SNH, SEPA and CEC) prior to commencement of construction.

111. A flood risk assessment will be undertaken for the detailed design to ensure local flooding risks are not increased. The flood risk assessment will be submitted to SEPA and CEC to ensure that planned flood prevention measures for the detailed design are considered to be adequate.

112. The contractor will identify opportunities along the scheme alignment for the implementation of SUDS in accordance with SEPA requirements and guidelines. The contractor will ensure that the detailed drainage design will create no significant impacts on downstream flooding as a result of run-off discharges.

J6 Cultural Heritage

113. The preferred mitigation strategy is to preserve archaeological and architectural resources in situ. This approach has been adopted in the evolution of the scheme and all reasonable opportunities have been taken to avoid listed buildings etc.

114. All mitigation will be agreed with Historic Scotland and the City Archaeologist prior to construction.

115. The mitigation measures which will be implemented for archaeological sites are:

- Level 1: General survey. A detailed photographic record will be undertaken prior to construction. Following completion of this and interpretation of the results may lead to

(1) Scottish Environmental Protection Agency, Pollution Prevention Guidelines No.5 - Works in, Near or Liable to Affect Watercourses.
implementation of Levels 3 and 6. All photographic and other records from this mitigation strategy and those outlined below will be lodged with the NMRS.

- Level 2: Detailed standing building survey. Plans/elevations at a scale of 1:10 to 1:200 will be made with a full photographic record prior to construction. In addition Levels 3 and 6 mitigation will be implemented.

- Level 3: Watching brief. This response will be implemented for all sites with high archaeological potential and where there will be intrusive excavations. The excavations will allow opportunity for salvage excavation. The findings of the watching brief may require the upgrading of fieldwork to Level 5.

- Level 4: Detailed standing building survey and salvage. Full survey to RCAHMS standards detailing internal and external features and fittings including any which come to light during demolition which will require to be monitored. Attempts will be made to retrieve and conserve representative examples of architectural and other decorative elements of the fabric. Once the site has been levelled, Level 3 mitigation strategy will be adopted in the event of further destructive works, with the possibility of escalation to Level 5.

- Level 5: Archaeological excavation. This level of mitigation may be deemed necessary as a result of evidence gathered by other levels, particularly Levels 3 and 4. Provision will be made for the examination and possible conservation of any artefacts recovered. Specialist samples will be taken from key deposits exposed in section faces and routine/control samples from any features which may be excavated in plan. Plans/elevations at a scale 1:10 and/or 1:20 with a full photographic record.

- Level 6: Further documentary research and archiving. This response includes further detailed examination of unusual archival sources particularly industrial sources which would not routinely be consulted. It also allows for copying of documents considered relevant, which then may be archived with bodies such as the RCAHMS, NMRS and the SRO.

116. The majority of sites (66 out of 86) have a suggested Level 1 mitigation response (detailed photographic record). A high proportion of such sites comprise historic street furniture in the buffer zone, most of which are unlikely to suffer physical impact during the works, but preventive measures will be considered to avoid damage, particularly where the features form part of Listed Buildings.

117. Thirteen sites are recommended for Level 2 mitigation (detailed standing building survey).

118. This higher level of survey has been suggested due to the physical impact on such sites expected as a result of engineering works.

119. Level 3 mitigation (watching brief) is suggested for five sites.

120. The two sites recommended for Level 4 mitigation (Detailed standing building survey and salvage) are both at Haymarket.

J7 Noise

121. Where work is required outside the hours of Monday to Saturday 0700 hours to 1900 hours, prior approval will be sought from the local authority.

122. Best practicable means (1) will be used during the construction of the scheme in order to reduce noise levels as far as possible. All contractors will be expected to adhere to the contractual requirements to ensure compliance with the appropriate methods of construction, choice of plant and equipment and the appropriate hours of work during construction. The following mitigation

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(1) Defined in section 79 (9) of the Environmental Protection Act 1990
measures will be employed to reduce noise from construction compounds: locating equipment as far from noise sensitive receptors as possible; using electrical forklifts and cranes in preference to diesel powered machinery wherever possible to reduce noise levels dramatically; locating site offices so that they acoustically screen noisy activities; keeping night-time work to a minimum; moving materials required for night-time working as close as possible to the work area for which they are required during daytime; providing screening of lorry haul routes; screening or partially enclosing noisy activities; and maximising the use of pre-fabricated components.

123. All compressors, generators and pumps will be silenced models fitted with properly lined and sealed acoustic covers or enclosures, which will be kept closed whenever the machines are in use.

124. All pneumatic percussive tools will be fitted with mufflers or silencers of the type recommended by the manufacturers.

125. All machines in intermittent use will be shut down in the intervening periods between work, or throttled down to a minimum, and noise emitting equipment which is required to run continuously will be housed in a suitable acoustic enclosure.

126. All items of plant will be maintained in good working condition to minimise extraneous noises arising from mechanical vibration.

127. As far as practicable, demolition works will be carried out using equipment which breaks concrete by bending, in preference to percussive methods.

128. Where practicable, rotary drills and bursters actuated by hydraulic or electrical power will be used for excavating hard materials.

129. Care will be taken when loading or unloading vehicles, dismantling scaffolding or moving materials etc to reduce noise emissions.

130. A potentially important means of reducing construction noise will be the use of fixed or mobile noise barriers (typically to a height of approximately 2.4 m). These will be used, where possible, directly adjacent to areas of noisy ground level construction activity to minimise noise impacts at adjacent receptors.

131. Acoustic enclosures will be used to reduce construction noise, where appropriate, to the specifications outlined in BS5228.

**Design and Operation**

132. Noise barriers will be provided where practicable, and in agreement with residents, to reduce noise impacts to at most a slight level. Indicative locations are identified in Chapter 13.

133. The operator will ensure a high standard of maintenance during the operating life of the tram system to avoid noise levels increasing unnecessarily due to wear and tear of the wheel and rail surfaces.

134. Tram stops and audible announcement systems will be designed to minimise noise, including use of screens at the rear of platforms, directional speakers and signal limiting devices. Output sound levels will be lowered within applicable guidance limits, in sensitive locations.

135. Measures will be taken in design of the tram and during operations to reduce the risk of wheel squeal on tight bends.

**J8 Air Quality**

136. Water suppression or dust extraction will be fitted to drilling and grinding equipment.

137. Drilling and excavation surfaces will be adequately wetted to suppress dust where needed.

138. Surfaces will be damped down prior to clearing in dry weather.
139. Debris piles will be kept watered as necessary.

140. Suitable measures will be taken to prevent the deposition of mud and dirt on public roads.

141. All containers will be enclosed or covered by suitable tarpaulins / nets to prevent escape of dust or waste materials during loading and transfer from site.

142. Lorries will be sheeted during transportation of construction materials and spoil.

143. Mitigation measures will be implemented to control the generation of black smoke particles from tarmac laying and the associated use of hot bitumen, as suggested by the Building Research Establishment (BRE) (1): bitumen will not be overheated; pots and tanks containing hot bitumen will be covered to minimise fume production; spillages will be avoided as far as possible; where possible bitumen will not be heated with open flame burners.

144. Shrouding and wind shielding will be used to control dust from batching plants, as described in the draft Process Guidance Note on Blending, Packing, Loading, Unloading and the use of Bulk Cement (2). Spillages of cement will be cleaned up using wet handling methods. Deliveries of cement to batching plants will be by tanker and stored in silos prior to use.

145. The DTI guidance (3) on the control of dust from construction and demolition activities will be followed, where applicable and practicable.

J9 General Construction

Community Liaison

146. The contractor will be required to contribute to and participate in, a consultation strategy. This will include circulation of information about ongoing construction works (such as periods of noisy construction activity, road closures and diversions, works affecting footways etc) and a telephone number for use by the local community to obtain information. The telephone will be attended during all operational hours and a person with the appropriate authority to respond to calls and resolve any problems that occur will be available. A log of all complaints and actions taken will be available for inspection by the public.

147. Community Liaison Groups (CLGs) will be established prior to construction to ensure continuity of public consultation with affected residents in sensitive areas. CLGs will provide a forum for local residents to discuss the design, mitigation and management of the construction work.

Environmental Management

148. The contractor will be required to implement an Environmental Management System (EMS) which meets the requirements of ISO 14001 (4) for the construction works. This system, which will be approved by tie and the City of Edinburgh Council, will detail procedures to manage activities which have the potential for environmental impacts. It will be supported by appropriate training of site staff at the start of the construction period and throughout as required. Client’s representative(s) on site will audit the contractor’s compliance with the EMS at regular intervals during the works.

(4) ISO 14001 is the international standard for environmental management system (International Standardisation Organisation, 1996).
149. The contractor will be required to securely fence off the area of the works in advance of construction in order to protect public safety and ensure that there is no unauthorised access to the site.