

# DEAN VALLEY REGENERATION



Scottish Charity: SC 046270

Company: SC 515394

*To renew and maintain the environment of the Dean Valley*



## **Dean Valley Walkway - Second Phase Feasibility Study Report**

Prepared by Land Use Consultants: September 2018



## Acknowledgements

The Trustees of Dean Valley Regeneration Ltd. would like to thank the sponsors of this study for their generous support.

They include City of Edinburgh Neighbourhood Partnership, Mushroom Trust, Edinburgh World Heritage Trust, Sundial Properties, and many local residents and charitable trusts. We would not have been able to deliver without their continued support and belief in our project.



EDINBURGH WORLD HERITAGE



# Dean Valley - Second Phase: Walkway Feasibility Study

Prepared by LUC in association with David Narro Associates  
September 2018

**Project Title:** Dean Valley Second Phase: Walkway Feasibility Study

**Client:** Dean Valley Regeneration Ltd

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# 1 Introduction

- 1.1 Dean Valley Regeneration Ltd (DVRL) has appointed LUC to develop a Second Phase Feasibility Study for the enhancement of public areas of the Dean Valley between Stockbridge and the Dean Village. The document is consequently a continuation of the work undertaken for the First Phase Feasibility Study by Elizabeth Dorrian (2017).
- 1.2 This Feasibility Study aims to review the previous studies and documentary research; assess the current condition of the second phase study area and prepare outline sketch designs to address the findings along the public areas of the Dean Valley. This study is also required to provide an outline specification and cost estimates for the proposals.
- 1.3 The study area is marked out in Figure 1 and reaches the same extremities as the study area defined in the 2015 Conservation Statement by Peter McGowan. The areas exempt from this study are: the area of the First Phase Feasibility Study which has already been surveyed and subject to proposals and any gardens within private ownership (Belgrave Crescent Gardens, Dean Gardens and Moray Bank Gardens). These areas are also defined Figure 1. Thus the study area encompasses; Upper Dean Terrace, Dean Terrace, the area around India Place and Moray Bank Gardens, Belgrave Crescent, Dean Path and the area of Dean Village leading to the footbridge (Bells Brae, Hawthorn Bank Lane, Damside and Upper Damside). It also includes the structures: Stock Bridge, St Bernard's Bridge, St Bernard's Well, St George's Well, Dean Bridge, Water of Leith Bridge and the Dean Village Footbridge. The area surrounding Lindsay's Mill has also been surveyed, although parts of this area (including structural surveys of the walls) were previously undertaken as part of the First Phase Feasibility Study.
- 1.4 The site was subject to field surveys and appraisals by LUC landscape architects and ecologists, and by David Narro Associates who had responsibility for structural appraisals. The site was visited by Sonia Jackett, Project Landscape Architect and Martin Tabor, Project Director during February and March 2018. This included a walk-round with Andrew Kerr visiting the private gardens of Belgrave Crescent, Dean Terrace and Moray Bank to obtain context for the site. Site was also visited in April 2018 to validate proposals and work undertaken and again in August to provide additional commentary to the area surrounding Lindsay's Mill, now termed 'Lower Miller Row Terrace'.
- 1.5 The site was also visited by David Narro Associates in their surveying of structures included within the study area. LUC's Principal Ecologist, Juli Titherington, attended site on 15.05.18 in order to provide a 'Scoping for Biodiversity' study. This enabled a preliminary assessment and identification of any biodiversity protection issues associated with potential tree and vegetation clearance. More information on this can be found in Chapter 9.
- 1.6 Key stakeholders were consulted about the project and asked for their feedback on the Feasibility Study's aims and remit. More information is found under Chapter 3.



Figure 1: Study Area & Boundaries

## 2 Executive Summary of Existing Research

- 2.1 This part of the Feasibility Study provides a summary of the existing Research on the Dean Valley and seeks to distil the heritage values of the site, drawing on the significant body of research. This Executive Summary covers the following documents:
- Dean Conservation Area Character Appraisal 2004 (City of Edinburgh Council)
  - Dean Valley Designed Landscape Conservation Statement 2015 (Peter McGowan Associates)
  - Biodiversity Report 2016 (Sue Bell Ecology)
  - First Phase Feasibility Study 2017 (Elizabeth Dorrian Landscape Architect)

### Purpose and Scope of Previous Plans

#### Dean Conservation Area Character Appraisal (2004)

- 2.2 The Dean Conservation Area was originally designated in 1975 and extended in 1977. Under Section 61 of the Planning (Listed Buildings and Conservation Areas) (Scotland) Act 1977, conservation areas are described as “areas of special architectural or historic interest, the character or appearance of which it is desirable to preserve or enhance.” It is important to understand that the designation of conservation area ensures a commitment to safeguarding and enhancing the character and appearance of a place by the Scottish Government and all authorities, residents, interests groups should be aware of what features need to be preserved.
- 2.3 The Dean Conservation Area, as defined in Fig. 1 encompasses Dean Valley, Water of Leith and associated designed landscapes between Dean Village in the west and Stockbridge in the east. Its constituent parts include: the Water of Leith and associated walkway, bridges, retaining walls and former industrial structures; Dean Village; St Bernard’s Well and St George’s Well, the private gardens of Belgrave Crescent Gardens, Dean Gardens, Moray Bank Gardens and Doune Terrace Gardens, India Place terrace gardens, allotments and housing; Randolph Cliff and adjacent terraced gardens in the ownership of City of Edinburgh Council. The Phase 1 and Phase 2 Feasibility Studies fall within the Conservation Area, but do not cover areas in private ownership. fig. 1)
- 2.4 The document undertakes a character appraisal which defines key elements that contribute to the special historic and architectural interest of the area. Character Appraisals act as guidance and are non-material considerations for local planning authorities. Thus, the document should also be taken into consideration for the purposes of this document and any proposals which may affect the conservation area.
- 2.5 The Character Appraisal gives a background and history to the area, including a brief description and map of the conservation area. It then goes on to analyse the spatial structure, context and views, the townscape topography and setting, architectural character, natural heritage and open space, gardens and boundaries.

#### Dean Valley Designed Landscape Conservation Statement (2015)

- 2.6 The Dean Valley Designed Landscape: Water of Leith, Dean Village to Stockbridge, Conservation Statement was commissioned by Edinburgh World Heritage, at the instigation of the stakeholders steering group. And with financial support from the City of Edinburgh Council, Historic Scotland (now Historic Environment Scotland) and a number of private individuals.
- 2.7 The research and survey work demonstrates that the Dean Valley, its lush landscape and river corridor, its structures, monuments, and gardens is a Scottish cultural asset of significant importance which should be cared for and promoted as such. The Dean Valley derives its cultural significance from a number of different sources but the group of three private gardens and river corridor make it one of the best examples of Picturesque landscape design in Scotland. It also adds to Edinburgh’s World Heritage Site status and has numerous other designations including; the Dean Village Conservation Area, the New Town Conservation Area, Listed Buildings and it is a local biodiversity site and a special landscape area. It is registered on the inventory of Gardens and Designed Landscape in Scotland with its significance in all categories rated as Outstanding or High except one.
- 2.8 Dean Valley is a semi-natural corridor to the north-west of the city centre, which contains designed landscape features, managed and self-seeded woodland. It is a landmark itself as well as containing many landmarks (i.e. Dean Bridge, St Bernard’s Well). It can be enjoyed as a riverside walkway, or from elevated positions on adjoining streets, or through the three private gardens.
- 2.9 This Conservation Statement covers a visual assessment including the historic development of significant views and an analysis of their change over time. It also recounts the main components and features of the valley and gives an assessment of their significance. The statement goes on to outline the management and maintenance issues facing the Dean Valley including:
- View management
  - Vegetation and garden planting management
  - Invasive species
  - Tree management
  - Balancing nature conservation and designed landscape management
  - Maintaining structural fabric and enclosures
  - Path surfaces
  - Slopes and stability

- Climate change
- Pest and diseases
- Neglected ground
- Access and interpretation
- Access for all
- Opportunities for projects: micro-hydro project
- Other issues

2.10 Its concluding chapter is entitled 'Conservation policies and proposals' and sets out a Vision, Objectives and a Policies and Actions section.

2.11 The Vision encompasses the whole of the valley and is "To promote the conservation and management of the whole Dean Valley design landscape in a coordinated manner to maintain and enhance all aspects of its cultural and natural significance and its functions as communal gardens, river corridor and a public accessible landscape. To manage the river valley landscape and related areas...to conserve their cultural and natural significance in a balanced way and to develop it as an accessible recreation resource."

2.12 The Objectives are listed as mainly applying to the river valley landscape and include:

- To encourage integrated management of the whole of the Dean Valley designed landscape.
- To conserve the designed landscape in its picturesque character, allowing for processes of change in planting, natural regeneration and design improvements.
- To maintain the special qualities of seclusion and untamedness that are essential adjuncts to the picturesque quality of the Dean Valley.
- To improve neglected parts of the Dean Valley to conserve their designed landscape values and fabric, and upgrade access where practical.
- To maintain and restore where necessary the built fabric walls, railings and other enclosures of the valley landscape.
- To maintain the views and visual structure of the valley landscape and restore significant lost views.
- To maintain the woodland and freshwater habitats of the site to enhance their biodiversity, and in keeping with the ELBAP.
- To optimise access for all within the limitations of the site topography and the special nature of the visitor experience.
- To develop and share knowledge and understanding of the Dean Valley, provide interpretation for users and make good use of its educational opportunities.
- To protect the archaeology of the site from all periods.
- To manage using environmentally sustainable methods, minimising environmental impacts.
- To develop proposals that make full use of funding opportunities and income generation from the resources of the site and are financially sustainable in the long term.
- To integrate the objectives, policies and actions of city-wide and regional strategies and plans that pertain to the Dean Valley.

2.13 The Policies and Actions are numerous but a selection includes:

- A full feasibility study identifying precise short and long term works to be included in a project, with costs, based on community consultation and support and incorporating educational, interpretation and activity programmes.
- St Bernard's well area, from steps upstream of the well to St Bernard's bridge – restore the layout as gifted to the city in 1888 as the setting for St Bernard's well, including paths, walls, ironwork, railings and planting; works concentrated on spaces closest to the well.
- Water of Leith Bridge to Lindsay's mill – investigate condition of rockwork and retaining structures below the roadway; develop structural and environmental upgrade proposals based on findings. And Lindsay's Mill public space / viewpoint – improvement and interpretation proposals to repair and upgrade existing provision and reopen views, including tree work and wall repairs. The site also has potential for the Dean weir 2 micro hydro scheme.
- Miller Row riverside (downstream of Lindsay's mill) – create publicly accessible riverside space with views of Dean bridge, with tree management, ivy control, river edge reinforcement, edge safety protection, work to retaining and parapet walls, paved surfaces and new planting.
- Randolph cliff – manages to improve species diversity and views of Dean bridge while maintaining rock-fall protection (no public access); manage ivy covering geological exposure.
- Upper Dean Terrace riverside – improve appearance and biodiversity by reduction of elm and restocking with native species; tackle problem of ivy on structures; retaining walls repairs as necessary based on condition survey; cast-iron railings repairs or replacement.
- Dean Terrace riverside – improve appearance and biodiversity by reduction of undesirable species (privet, sycamore), reduce percentage of elm, and restocking with native species; tackle problem of ivy on structures; retaining walls repairs as necessary based on condition survey; cast-iron railings repairs or replacement.
- India Place bank – reduce shading of allotments, open view from Doune Terrace, and improve the bank's appearance and biodiversity by reduction of undesirable species (sycamore) and a programme of thinning, coppicing and restocking with native small trees and shrubs.

- Produce a detailed view management plan, covering the potential project area, adjoining streets and, where relevant, the three gardens, to take forward the analysis in the CS. To be coordinated with the tree and woodland management plan.
- To manage the tree and woody vegetation cover in the valley in coordination with the preceding policy and on the basis of a tree and woodland management plan that incorporates the CS objectives and CEC policies.
- Commission a tree and woodland survey and management plan within the potential project area, updating any existing survey data, and considering trees and woodland habitat management from the broader perspective of the project objectives.

#### **Biodiversity Report 2016 (Sue Bell Ecology)**

2.14 The Biodiversity Report was commissioned by Dean Valley Regeneration Limited in order to summarise the biodiversity features present within the Dean Valley. It has been produced to both assist in developing proposals for the area and to act as a focus for the development of a management plan, particularly for the woodland areas. The Report includes information on:

- Background Information
- Habitats and Species within the Valley
- Legal and Policy Framework
- Benefits, Constraints and Issues for Biodiversity Related Proposals for the Dean Valley (including issues and mitigation)
- Next Stages
- Protected Species (Bats, Otters)
- Phase 1 Map

#### **First Phase Feasibility Study 2017 (Elizabeth Dorrian Landscape Architect)**

2.15 The First Phase Feasibility Study was commissioned by Dean Valley Regeneration Limited and is a continuation of the work undertaken in the 2016 Biodiversity Study and the 2015 Conservation Statement mentioned above. The study area ran along the Dean Valley walkway, from St Bernard's Bridge to the Water of Leith Bridge but does not include a study of St Bernard's Well or St George's Well nor the bridge structures. It does however include the surveying and proposals concerning:

- Parapet and Landscape Walls
- Railings
- Path Route and Surfacing
- Surface Water Drainage
- Retaining Walls
- Trees
- Signage
- Street Furniture
- Lighting

And proposals concerning the area below Dean Bridge.

2.16 It is noted in the final issue of the report that a number of trees had been felled (it is not known by whom) with significant stumps left in place. In addition a damaged wall had been repointed with cement instead of lime mortar as would have been appropriate and in keeping with the heritage and characteristics of the area. It is apparent that a co-ordinated approach was much needed in order to avoid further detriment to the Dean Valley and the part it plays in the World Heritage Site.

#### **Further Documents**

2.17 Other documents that have been consulted and are sometimes referred to elsewhere in the document but are not covered above include:

- WOL Micro Turbine Feasibility Study 2005 (City of Edinburgh Council)
- Water of Leith, Slope Stabilisation Works 2004 (CAN Geotechnical Limited)
- Miller Row, Dean Village. Damage to Retaining Walls 2016 (Harley Haddow)
- Topic Papers to Support the Water of Leith Management Plan (Sue Bell Ecology for Water of Leith Action Group)

### 3 Stakeholder Consultation

3.1 The following bodies were contacted by LUC in order to both gain feedback on the aims of the study and gather information on any relevant ambitions or aspirations that the key stakeholders may have for the Dean Valley and its walkway;

- City of Edinburgh Council \*
- Inverleith Neighbourhood Partnership
- City Centre Neighbourhood Partnership
- Dean Village Association\*
- Dean Valley Gardens
- Belgrave Crescent Gardens
- Moray Gardens
- Water of Leith Conservation Trust\*
- Edinburgh World Heritage\*
- Historic Environment Scotland\*
- Sustrans
- SEPA\*

\* indicates responses received.

#### Summary of Consultation Findings

3.2 Detail of the individual responses can be found in Appendix 3. A summary of the key themes from the consultation responses are as follows:

##### Railings

3.3 Railings are in need of repair – especially at those at Dean/Upper Dean Terrace

3.4 More work is needed to determine who will ultimately claim responsibility for these railings within CEC

##### Signage

3.5 The need for more signage and wayfinding is supported

3.6 Any signage added must be appropriate to its context and not create clutter (i.e. with reference to a feature of the location - for instance the history of Greenland Mill/Lindsay's Mill, the Dean Bride, St Bernard's Well)

3.7 Any signage must be cognisant of the plans by Edinburgh World Heritage and the City of Edinburgh Council's wayfinding project, and should also seek to either complement or build upon the audio trail established by Water of Leith Conservation Trust.

##### Vegetation Management, Trees and Views

3.8 Most of the public are tremendously passionate about the 'naturalness' of the valley, this should be taken into consideration within management proposals. The vegetation management and any pruning of trees must be sensitive to the Dean Valley character as it stands today and not just as a historic designed landscape

3.9 Having said that, the management and maintenance of the valley should be holistic so that it balances the 'natural' with its heritage as a designed landscape as the quality of the public realm has an important effect on Edinburgh as a World Heritage Site

3.10 The stripping of ivy everywhere is not desirable (for biodiversity reasons). Proposals should therefore be for the management and control of ivy rather than its eradication

3.11 It is agreed that management of vegetation is needed in order to safeguard and maintain the integrity of features such as bridges, the cliff face or other structures, but the felling of mature trees to reopen historic views is not something that sits well with Water of Leith Conservation Trust. This should be looked at on a case by case basis with pruning and crown lifting being other options to open up views

### The Cliff Face

- 3.12 The Cliff Face has plenty of rockfall, as such there should not be seating added in this area
- 3.13 There is general support for tidying up area adjacent to cliff face although maintenance of this area and the Cliff Face is an issue and problematic. Also any ground cover and bulb planting on CEC owned land has to be of native provenance

### General

- 3.14 Some maintenance requirements could be undertaken by volunteers and a community group
- 3.15 Prior to the commencement of any works, the appropriate licences or consents must be gained if necessary (e.g. works to scheduled monuments, disturbing bats or birds or alterations to watercourses)
- 3.16 Before any work is undertaken, such as the management of trees, the public should be consulted and informed of what is happening and why
- 3.17 More understanding of legality and ownership of certain areas is required. Also decisions need to be made with the council on which department ultimately has responsibility for certain areas (i.e. railings at Upper Dean Terrace)

## 4 Structures and Buildings

### Structures and Buildings by David Narro Associates

- 4.1 This part of the report has been prepared by David Narro Associates (DNA) in order to report on the structural condition of various structures along the length of the Water of Leith Walkway between Stockbridge and Dean Footbridge.
- 4.2 A Chartered Structural and Conservation Accredited Engineer from David Narro Associates carried out a visual inspection of each of the structures identified in the scoping plan (refer to Appendix A), with a view to confirm the general structural condition of each structure, comment on likely required repairs or maintenance issues and provide an assessment of the urgency of any repairs required as part of a risk assessment to establish whether any health and safety risks are present for members of the public using the Water of Leith Walkway within the study area.
- 4.3 This report is based on walkover surveys made on 16 April 2018 and 10 May 2018, and an appraisal of previous archive material. Structures were assessed from the best vantage points available at the time. Some structures could only be observed from a distance and some areas were subjected to a closer inspection.
- 4.4 No investigations were carried out as to the strength of individual structural members. No site investigation work or inspection undertaken to determine the nature or bearing capacity of the foundations, but any openings in existing finishes were used to help determine the condition of masonry, steel and timber elements as necessary. This report does not concern itself with detailing every defect in every structure as most defects are not of structural concern, but any defect which could pose a risk to the public if left untended is listed and any defect which is likely to accelerate deterioration has also been noted.
- 4.5 There are a number of listed buildings and historic structures within the study boundary (figure 1 and plan 10210\_LD\_PLN\_000). The recent surveys and reports by CAN Geotechnical and Harley Haddow have provided our team with a baseline for the study.

### Observations

#### Stockbridge

- 4.6 This road bridge is a single span stone arched bridge which has been continuously maintained by the council roads department over time. The main structure appeared to be in good condition with no signs of structural movement or deflection.
- 4.7 The parapets appeared straight and aligned and there was no apparent movement of the voussoirs, soffit, abutments or the top surface (left photo). On the west side at the base of the parapet there is an old root of cut-back vegetation still protruding from the jointing (right photo).

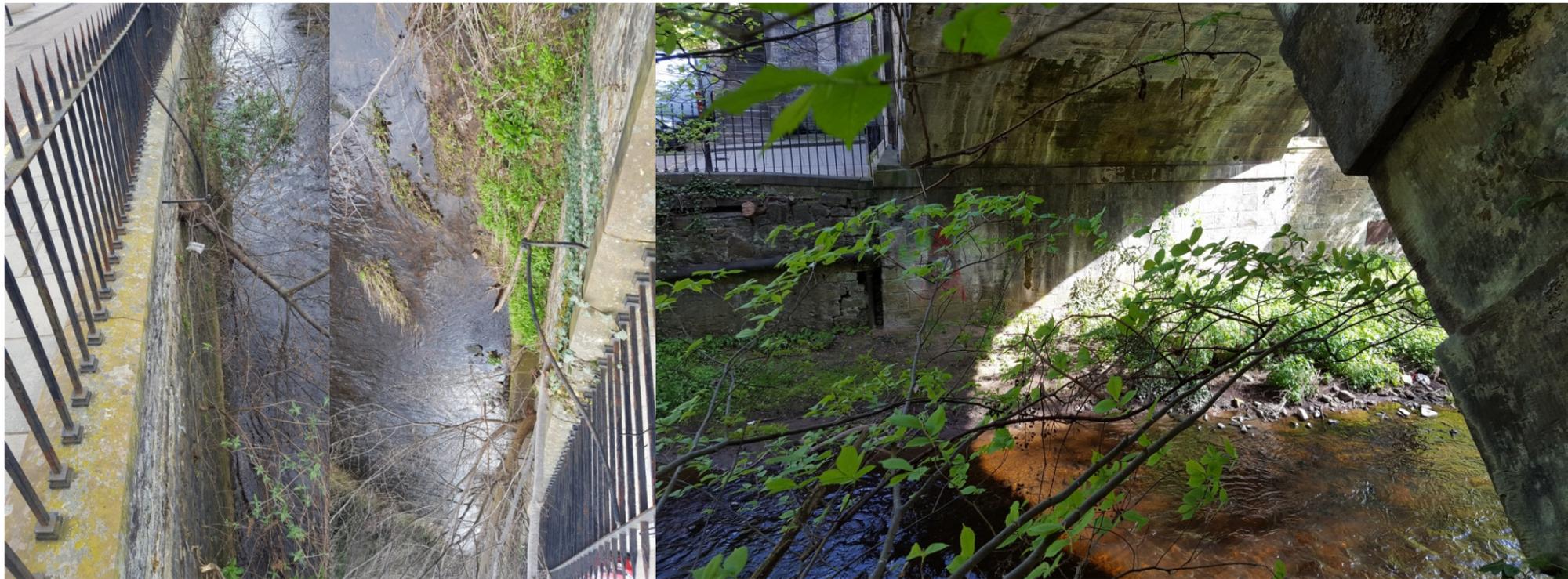


- 4.8 There are some chips in the main stones of the parapets but these are not of structural concern and do not affect the weatherproofing, structural integrity or condition of the bridge:



*Saunders Street (south bank river wall)*

- 4.9 The main stone river wall is generally in good condition but there are some obvious defects in numerous areas.
- 4.10 The main challenge facing the wall is vegetation growth, with large rooted plants and trees protruding from joints in the masonry. These roots will be affecting the core of the wall and will need to be chased out through localised rebuilding on a sustained campaign of remedial works:



4.11 There is also some scouring and washout of the mortar below the parapet cope stones, which exhibit some movement and voiding of masonry adjacent to the footpath. Betterment of the footpath waterproofing and levels could help limit the requirement for future maintenance, along with rebuilding of the stonework below the copes:



*Dean Terrace road wall*

4.12 This wall varies in retention height from approximately 1.5m at the west end to nil at the east end, where the wall turns into a base cope for the railings.

4.13 The railings and base stones appear to be off-plumb in many lengths of the wall. There are numerous instances of missing metalwork in the railings and also corroded sections of both balusters and cross-ties. In one location a tree has grown around the main tie bar and the railing has been adjusted to fit around the tree.



- 4.14 The base stonework and adjacent footpath appears to have moved and settled along the length of the wall, which may be due to root displacement. Some further investigation into the condition of the wall and the footing of the cope stonework should be made by trial pitting and some stone removal.



*North Bank River Wall at Dean Terrace*

- 4.15 This wall immediately adjacent to the river is on abandoned land and is not actively managed by any parties. It exhibits similar issues to the South Bank Wall, with vegetation growth from within the wall representing the biggest threat to its structural integrity. There are some missing stones which should be re-instated by indentation.



*St Bernard's Bridge*

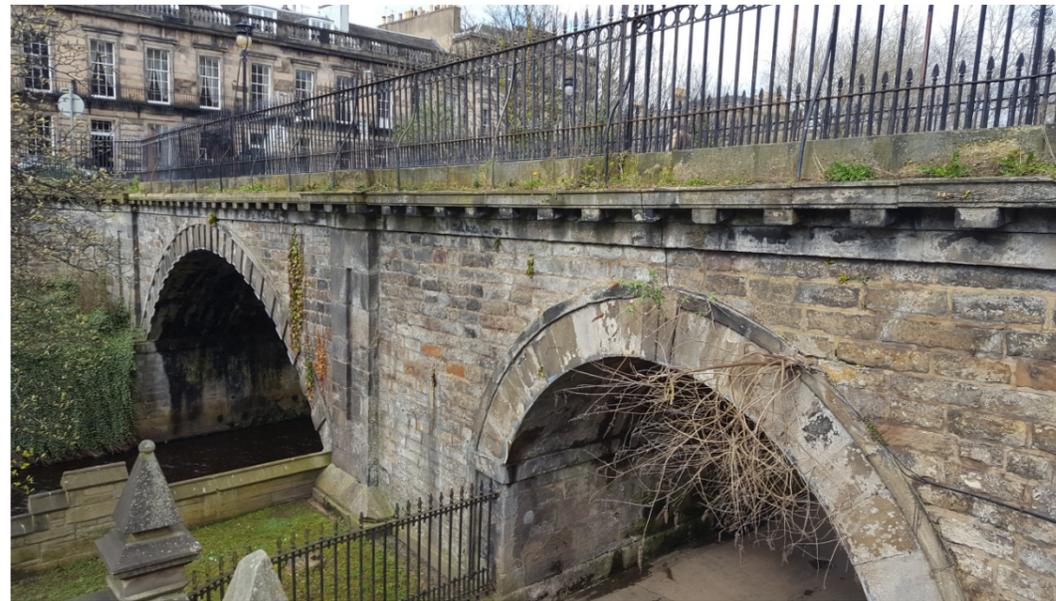
- 4.16 This road bridge is a single span stone arched bridge which has been continuously maintained by the council roads department over time. The main structure appeared to be in good condition with no signs of structural movement or deflection.

4.17 The parapets generally appeared straight and aligned and there was no apparent movement of the voussoirs, soffit, abutments or the top road surface.



4.18 There is some salt leaching and staining evident on the soffit of the main vault along with some open joints. The salt migration suggests the waterproofing of the main bridge roadway and footpaths may be breached and should be checked and repaired.

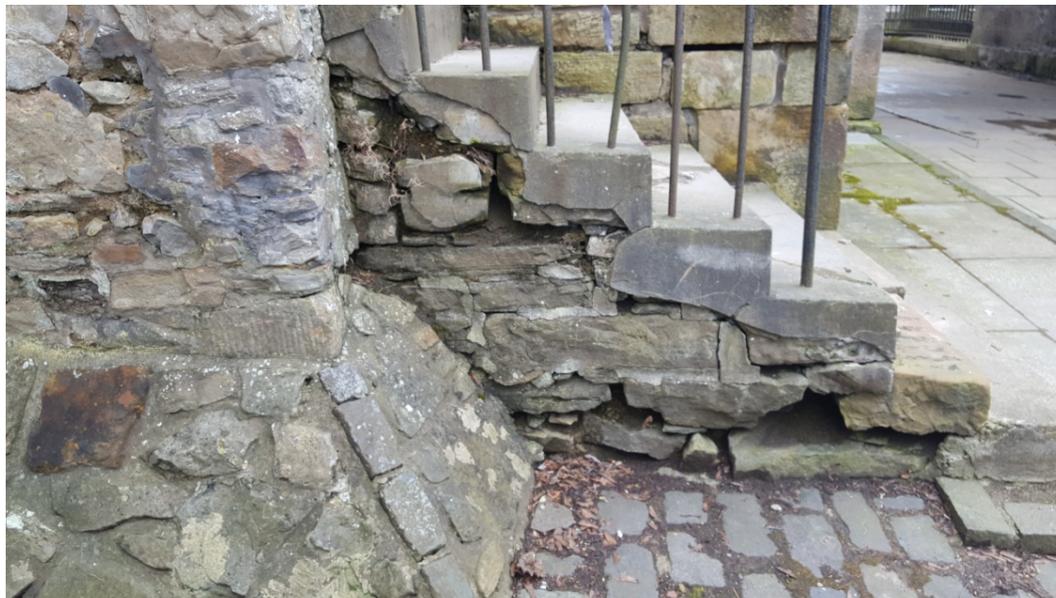
4.19 There is some vegetation growing out of the spandrel panels on both sides of the bridge, and old roots have not been removed entirely from the masonry above the voussoirs on the south side of the bridge.



4.20 There was some movement evident in the cope stones of the parapet which should be re-set as part of future maintenance. The stairs on the south-west side of the bridge has two steps which are in very poor condition and should be replaced or repaired and re-set to remove trip hazards. The walls associated with these steps are also demonstrating signs of movement and distress, and require partial duntaking and rebuilding.



4.21 The parapet balustrade to the south-east stairs needs to be fully repointed as there are open joints throughout and some signs of misalignment:



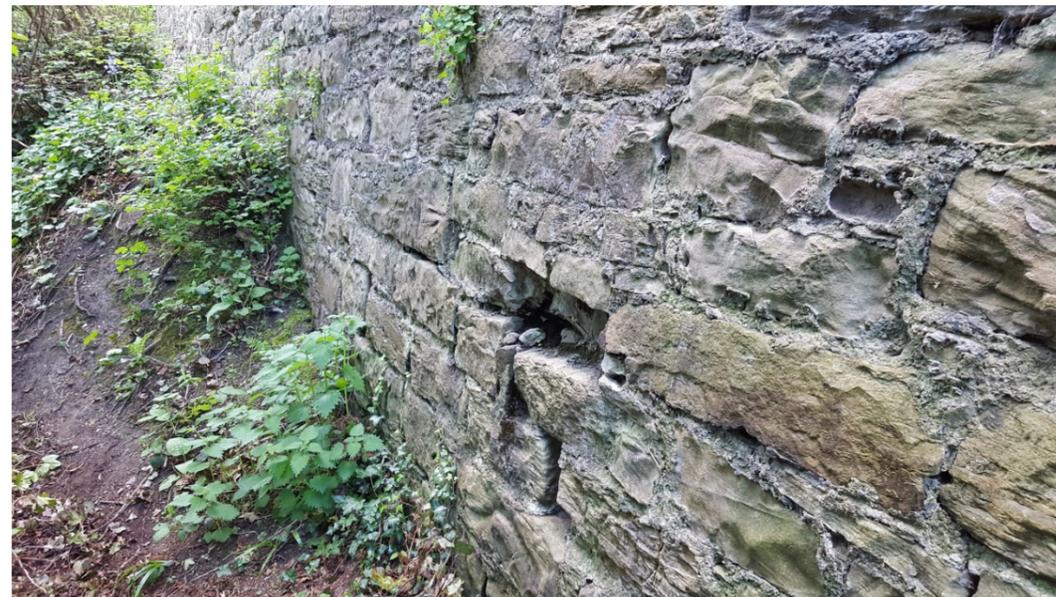
*India Place southwest road wall*

- 4.22 The wall retains the India Place road and pavement to the south-west of St Bernard's Bridge, and is set back from the main Water of Leith footpath. This wall is generally in reasonable condition given its age and likelihood of limited maintenance in the past.
- 4.23 There are a number of locations where there are open joints and small openings in the masonry (which may be old weepholes) which may need some attention. There was no obvious signs of movement or distortion in the wall, or signs of leaning, bulging or distress:

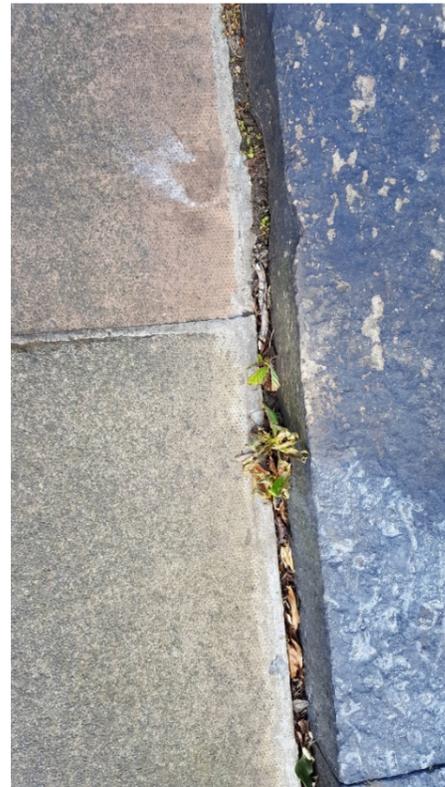


*Upper Dean Terrace wall*

- 4.24 This wall is a massive retaining structure which appeared to be in good condition generally, given its age and probable past maintenance programme. Ivy has been cleared from the wall and some repairs carried out a few years ago.



4.25 There is some bulging evident in the middle section of wall but this has not resulted in cracking of the masonry. There is evidence of some movement of the wall and settlement of the footpath sub-base, along with some separation between railing coping stones and footpath. It is probable that the wall is not a solid structure but made of arches spanning parallel to the road. The apparent movement should be investigated further by trial pitting or exploratory localised opening-up of the outer stonework.



4.26 There has also been some rotation of the main coping stones which is not reflected in the wall below, with most of the wall exhibiting no signs of untoward lean or out-of-plumbness. Some scour and cracking of the masonry below the cope is evident to the east end of the coping nearest the St Bernard's Bridge:



4.27 There is some missing metalwork on the railings which should be repaired to maintain the integrity of the balustrade.



*St Bernard's Well*

4.28 This building was fully refurbished around five years ago and it has not deteriorated in any way from that refurbishment project. No works are required to the building.

4.29 The small section of walkaway cantilevered on brackets from the main wall appeared to be in good condition, as did the supporting wall below:



*St George's Well*

- 4.30 The main building appeared to be in reasonable condition given its age and probable past maintenance programme.
- 4.31 There is some algal growth at eaves level at the overflow drips. The chimney appeared to be in good condition, as did the rest of the masonry apart from some localised open joints. The latter require repointing and where vegetation growth is present; this should be treated with herbicide and removed.



- 4.32 There was some scour evident at the base of the east end of the wall at river level, which may require some localised rebuilding:



*Randolph Cliff*

- 4.33 The cliff face was almost entirely obscured by vegetation and without removal and abseiling down the cliff from above, it is impossible to confirm the structural integrity of the cliff face. In order to confirm that there is no risk of failure from rock-fall off the cliff, exposure and some coring investigations would be required to ascertain whether there are fissures and cracks in the rock which may pose a threat. There has been some rock catching netting installed at the base of the cliff near the Dean Bridge (by CAN Geotechnical Ltd on instruction by the council in late 2004). This suggests there have been rock falls in the past, but there is no evidence of recent rock falls. The integrity of this rock catching fence would need to be tested and maintained over time.
- 4.34 At the base of Randolph Cliff the boundary wall to the walkway becomes low and discontinuous. This allows illicit access into the cliff area below the bridge with associated health & safety risks. Consideration should be given to increasing the height of the boundary wall in this location, and to extending the wall to close the existing gaps. These measures would prevent access from the walkway to the cliff area.



*Dean Bridge*

- 4.35 This road bridge is a multi-span stone arched bridge built by Thomas Telford between 1829-31. The main structure is a magnificent example of a well-constructed stone bridge which has been used continuously since its construction. The council roads department is currently responsible for its maintenance which would mainly consist of standard repairs to the main carriageway, footpaths and parapets. The main structure appeared to be in very good condition with no signs of structural movement or deflection and no signs of stone deterioration on the main piers or soffits of the arches.



- 4.36 There was evidence of failure of waterproofing of the road surface resulting in salt movement and staining of the soffit of the vaults. Trapped water may not have a route out of the spandrel fill material and some investigation into the previous maintenance actions carried out should be made to confirm whether the incorrect use of cement repointing has been carried out at some point in the past, thereby restricting water egress.
- 4.37 The parapets appeared to be in very good condition along with the footpaths on each side of the road, with only minor surface damage to some isolated stones. The main structural lines of the bridge appeared true and aligned and there was no apparent movement of the voussoirs, soffit, abutments or the top surface.



*Dean Weir*

- 4.38 This structure was observed from three different vantage points (from the north-east in Dean Gardens, from the west from a garden at the end of West Mill Lane, and from the seating area off Miller Row), and in each case the weir was obscured by the water flowing over the top of the structure. No means of assessing the weir structure directly was found, but the water appeared to be flowing over the top in a uniform depth and line, suggesting the structure below is correspondingly uniform.
- 4.39 Further investigation would only be possible by limiting the water flow over the weir in sections. The Flood Prevention Department at the City of Edinburgh Council should have records of the weir structure, including condition reports. DNA contacted the department and were told that the records would be difficult to access.



*Lower Miller Row Terrace*

- 4.40 The Lower Miller Row Terrace area adjoins the remains of the Lindsay's Mill structures, adjacent to the weir. The Lyndsay's Mill walls are substantial structures which have been surveyed in 2016 by Harley Haddow, on behalf of the City of Edinburgh Council. The 2016 survey describes the condition of the remaining Mill walls and provides recommendations for repairs and associated tree removals. The former viewing platform enclosed by the highest parts of the Mill structure is closed to public access for safety reasons.
- 4.41 Downstream of Lindsay's Mill is the Lower Miller Row Terrace area which is terraced with a masonry wall running along the base of the embankment, parallel to the Water of Leith. This wall varies in height between 1m and 2m, and is partly retaining (up to 1m retained). This wall is heavily overgrown by ivy and its condition cannot be viewed without ivy removal. It is evident that part of the wall has collapsed and been lost. Several mature and self-seed trees grow along the line of the wall, but it is not possible to determine whether these grow within or behind the structure without ivy clearance.

*Water of Leith Bridge*

- 4.42 This road bridge is a single span stone arched bridge which has presumably been maintained by the council roads department over time. The main structure appeared to be in good condition with no signs of structural movement or deflection. The parapets on both sides of the bridge appeared to lean outwards but this does not cause undue structural concern. There was no apparent movement of the voussoirs, soffit, abutments or the top road surface.



- 4.43 Vegetation growth is apparent in some joints which should be chased out as part of normal maintenance. The vegetation appears to be growing around the spandrel panel which might indicate the fill is wet and providing a continuous source of water:



*Damside (north bank river wall)*

- 4.44 There was limited opportunity to view the wall in detail but DNA can confirm that the wall appeared to be intact and generally in good condition, given its age and past maintenance history. The riverside freestanding wall appeared to be leaning outward at the main curve in the river but there was no sign of cracking or distress, suggesting the wall has been maintained with this distortion in the past.



*Dean Footbridge*

- 4.45 This footbridge is a steel trussed bridge with timber infill boarded floor. The abutments are clad in masonry but are probably reinforced concrete. The abutments appeared to be in good condition with no obvious signs of distress, movement or distortion.



- 4.46 Generally the steel framing was in good condition with intact durability coatings, except for one area at the south-east bearing where the paint coating had broken down and allowed some surface rusting to occur. This area should be wire-brushed back to sound and a rust inhibiting paint applied prior to finishing coat as part of normal maintenance (left image). The main timber deck had water staining marks across the soffit along with some shakes along the timbers, which would be expected for exposed timberwork acting as a flooring deck. There were no obvious signs of rot or decay but this should be checked further at a number of locations to confirm the timber is intact.



*Hawthornbank Lane (south bank river wall)*

4.47 The walls along this stretch of river are conjoined with the private properties ranged along the riverside, stepping down from the higher level of Hawthornbank Lane (at one or two storeys above street level) to three or four storeys down to riverside. The buildings and walls appeared to have been maintained over time. Although there was limited opportunity to view the wall in detail but DNA can confirm that the wall appeared to be intact and generally in good condition, given its age and past maintenance history.



**Assessment of Remedial Works**

*Urgency of Repairs*

4.48 The recommendations included in this report for structural repair, maintenance or conservation have been prioritised into categories of urgency as set out below:

- Immediate – Work which should be put in hand without delay for public safety or health and safety reasons, to prevent imminent damage or to arrest rapid deterioration. This can include immediate further investigative survey work.

- Urgent – Work which should be put in hand within weeks, months, or within a year at the most. Failure to do so would be likely to result in significant further damage or deterioration, having increasing structural significance with increased complexity and costs associated with the remedial works.
- Necessary – Work which should be carried out before the next five-yearly inspection, for which there is time to plan, and which can be integrated with other work. This is work which is necessary to keep the building in a state of good repair.
- Desirable – Work which is desirable, if not strictly necessary, but which may improve the functioning or performance of the building from a structural point of view. Alternatively, work which is not necessary immediately, but is likely to become due before the next five-yearly inspection or which can sensibly be incorporated with other work.

4.49 The following table summarises the requirements for identified defects for each structure:

**Table 1**

Reference:	Structure:	Defect:	Repair Recommendation:	Urgency Assessment:	Order of Cost
4.16-4.21	St Bernard's Bridge	Stairs on the south-west side of the bridge has two steps which are in very poor condition	Replaced or repair and re-set	Immediate	£3000
4.9-4.11	Saunders Street (south bank river wall)	Vegetation growth from wall, including large rooted trees and shrubs	Cut trees and shrubs back to the wall ; chase out root by localised dismantling and rebuilding. Treat area with biocide before rebuilding	Urgent	£15,000
4.9-4.11	Saunders Street (south bank river wall)	Scouring and washout of the mortar below the parapet cope stones	Improve footpath waterproofing and re-set or rebuild stonework below cope	Urgent	£5000
4.12-4.14	Dean Terrace (road wall)	Base stonework and adjacent footpath appears to have moved and settled along the length of the wall	Investigate wall further. Re-set or rebuild stonework below cope	Urgent	Further investigation required
4.15	North Bank River Wall	Vegetation growth from wall, including large rooted trees and shrubs	Cut back trees/ shrubs to the wall; chase out roots by localised dismantling and rebuilding. Treat areas with biocide before rebuilding	Urgent	£20,000
4.16-4.21	St Bernard's Bridge	Vegetation growth from wall, including remnants of large roots	Chase out root by localised dismantling and rebuilding. Treat area with biocide before rebuilding	Urgent	£5000
4.24-4.27	Upper Dean Terrace Wall	Rotation of the main coping stones and damage to wallhead/ foundations	Re-set copes and associated repairs to wallhead	Urgent	£75,000
4.24-4.27	Upper Dean Terrace Wall	Missing railing metalwork	Repair railings	Urgent	See railings section
4.35-4.37	Dean Bridge	Failure of waterproofing of the road surface resulting in salt movement and staining of the soffit of the vaults	Repair road and pavement waterproofing and relieve water pressure in fill material	Urgent	Further investigation required
4.42-4.43	Water of Leith Bridge	Vegetation growth is apparent in some joints	Chase out root by localised dismantling and rebuilding. Treat area with biocide before rebuilding. May require repointing to allow water to drain from spandrel fill	Urgent	£15,000
4.45-4.46	Dean Footbridge	Corrosion to steelwork above south-east bearing	Wire-brush back to sound and a rust inhibiting paint applied prior to finishing coat	Urgent	£1000
4.6-4.8	Stockbridge	On the west side at the base of the parapet there is an old root of cut-back vegetation still protruding from the jointing.	Chase out root by localised dismantling and rebuilding. Treat area with biocide before rebuilding	Necessary	£1000
4.12-4.14	Dean Terrace (road wall)	Railings and base stones appear to be off-plumb in many lengths of the wall. There are numerous instances of missing metalwork in the railings and also corroded sections of both balusters and	Repair and restore iron railings	Necessary	See railings section

		cross-ties			
4.16-4.21	St Bernard's Bridge	Movement evident in the cope stones of the parapet	Re-set stonework	<b>Necessary</b>	£15,000
4.16-4.21	St Bernard's Bridge	South-east stair parapet balustrade has open joints and some misalignment	Repoint fully	<b>Necessary</b>	£1500
4.24-4.27	Upper Dean Terrace Wall	Bulging evident in the middle section of wall. Evidence of some movement of the wall and settlement of the footpath sub-base.	Investigate wall construction further at base and below upper footpath. Repair footpath and main wall if necessary	<b>Necessary</b>	Further investigation required
4.33-4.34	Randolph Cliff	Potential risk of damage to cliff from tree growth ; access to cliff face from the walkway	Removal of trees growing from the cliff face ; extension and increase height of walkway boundary wall to prevent illicit access on to cliff face area	<b>Necessary</b>	£15,000
4.40-4.41	Lower Miller Row Terrace walls	75m long x average 2m high : 10 m collapsed section of wall, self-seeded trees and extensive ivy cover needing removal.	Remove ivy to enable inspection and quantification of repair requirements (c. 200m2). Removal of self-seeded trees from the wall. Rebuild collapsed section (10m x 2m high).	<b>Desirable</b>	£25,000
4.22-4.23	India Place (southwest road wall)	Open joints and small openings in the masonry (which may be old weepholes)	Repoint fully	<b>Desirable</b>	£24,000
4.30-4.31	St George's Well	Scour evident at the base of the east end of the wall at river level	Rebuild or repair wall at low level	<b>Desirable</b>	£2000
4.16-4.21	St Bernard's Bridge	Salt leaching and staining evident on the soffit of the main vault along with some open joints.	Waterproofing of the main bridge roadway and footpaths may be breached and should be checked and repaired.	<b>Desirable</b>	Further investigation required
4.42-4.43	Water of Leith Bridge	Parapets on both sides of the bridge appeared to lean outwards. Detailed investigations needed to determine the cause and necessity for repairs	Re-set masonry or pin parapets subject to feasibility	<b>Desirable</b>	Further investigation required
4.44	Damside (north bank river wall)	Wall appeared to be leaning outward	Re-set masonry	<b>Desirable</b>	Further investigation required
44.52-4.53	India Place/ Doune Terrace Garden Retaining Wall	Graffiti within arched buttresses	Remove graffiti (and positive management of adjacent areas as 4.53). Feature lighting option not costed and subject to feasibility.	<b>Desirable</b>	£2000 (graffiti removal only)
4.52-4.53	Lindsay's Mill walls (LMRT)	Graffiti in two locations on the riverside wall	Remove graffiti ( and positive management of adjacent areas as 4.40-4.41)	<b>Desirable</b>	£250 (graffiti removal only)

## Outline Costs

4.50 The above table includes an estimation of the costs of the recommended repairs excluding contingencies and VAT. Where possible these are based on the quantification of repairs and application of cost rates, based on 2018 commercial rates from recent contracts of a similar nature, and advice from specialist contractors. Due to the presence of ivy and obscured or inaccessible nature of some structures, a number of items require further detailed investigations to determine the full scope and nature of remedial requirements. Excluding the items requiring further investigation the estimated costs for repairing structures amounts to **£224,750.00**.

## Graffiti

4.51 Only a few areas of graffiti were found within the study area boundary. The main locations of graffiti were identified as:

- on the wall of the steps leading down to the water near St Bernard's Well- contained within the First Phase Feasibility Study;

- On the India Place retaining wall, where it should be granted that extensive graffiti has occurred within the areas framed by the wall's arched buttresses. This area is little trafficked by pedestrians and relatively secluded due the height of the retaining wall, summer tree cover and lack of direct surveillance from adjacent properties, and
- On the lower part of the Lower Miller Row Terrace retaining wall, where it can be reached from the riverside terrace. Access to this this area is however difficult and potentially hazardous, which makes it attractive for anti-social behaviour, due to the secluded nature of the site. Graffiti is in two locations on the wall which is not visible from the Walkway, but can be seen from paths within the private gardens on the opposite bank (Dean Gardens).

### Recommendations for Graffiti

- 4.52 In the first instance, removal for the graffiti is required by means which do not damage the masonry. Solvents will be required to remove the spray and oil based paints used and power wash machinery may be able to remove certain paints.
- 4.53 Improvements to visibility will allow increased surveillance and security for the areas which currently suffer from graffiti. The recommendations for vegetation management and restoring views will consequently help to deter vandals and antisocial behaviour. Measures to prevent access will also help to reduce the likelihood of graffiti, e.g. boundary walls being rebuilt or repaired, new fences if sensitively sited and potentially the introduction of dense, thorny, planting which can act as a deterrent e.g. dog rose, hawthorns and so forth.
- 4.54 The India Place/Doune Terrace Garden retaining wall would make an excellent subject for feature lighting of the arched buttresses/recesses, which would deter anti-social behaviour and make an attractive townscape feature of the retaining wall.



### Maintenance

- 4.55 The future maintenance of structures following implementation of the above recommendations should ideally involve the following actions :
- **Inspections:** regular inspections of the structures and buildings should be undertaken to identify any deterioration in condition, any damage resulting from vandalism/ tree falls/ traffic impacts and potentially from vegetation encroachment / self-seeded growth. Road and pedestrian bridges are subject to inspections by the city council under its statutory obligation as roads authority. It is also assumed that the railings and parapets within the public domain are the responsibility of the City Council and require inspections and maintenance to ensure pedestrian safety. Formal Inspections and reporting at a maximum 5yearly intervals are recommended, with more regular informal inspections during routine maintenance operations to identify any changes in condition that may require attention.
  - **Routine Maintenance of Structures:** following repairs and rebuilding required by the above recommendations, the structures will require a limited regime of routine maintenance to prevent deterioration in condition, and to address any ad hoc damage. Key actions for routine maintenance include:
    - Removal of self-seeded vegetation from the structures, and repeat treatments of any re-growth following previous self-seeded tree and shrub removals
    - Cutting back of ivy encroachment onto structures to contain its growth to appropriate embankments/ soft landscape areas
    - Remove any fallen tree limbs from structures , and undertake pruning to prevent future damage from unsafe trees;
    - Rectification and clearance of defective drains where these are causing scour, waterlogging of structures;
    - Removal of any graffiti from structures as soon as possible following its appearance to deter further graffiti
  - **Future repairs at tree removal sites:** in the locations where self-seeded trees have been removed from walls / structures, it may not be possible to remove the roots and stump without significant disruption; in these cases it may be necessary and prudent to wait until the tree stump and roots have rotted with no re-growth before the wall repairs can be completed. In this scenario the remains of the dead stump and roots will be removed during localised dountakings, to allow the structure to be rebuilt as solid masonry to its original line and levels.
  - **Future Adhoc repairs:** where inspections identify a need for repairs these should be undertaken in accordance with best conservation practice using masonry to match the existing walls and lime mortar construction.

## 5 Railings

- 5.1 The First Phase study addressed significant lengths of railings along the riverside walkway, this study has recorded the railings in other public areas namely along the private gardens (with the exception of Belgrave Crescent) and Saunders Street.
- 5.2 The majority of railings across the study area are all made of cast iron but vary in design and levels of ornamentation at different locations. The majority of the railings are in fairly good condition, with the exception of those found at Upper Dean Terrace and Dean Terrace.
- 5.3 In certain areas ivy has overgrown and obscured railings. The removal of ivy in these areas is needed in order to determine damage and any repair work needed. More information on ivy management can be found in Chapter 8.
- 5.4 The private garden railings have largely been removed and the boundaries defined by hedgerows, with only limited lengths of the original railings remaining. These are mostly associated with the gateways which retain the cast iron posts and gates.
- 5.5 Drawings 10210\_LD\_PLN\_101-107 highlight the location of the railing types as well as any significant areas of damage (tree breaching, dense ivy cover, large panels missing or leaning sections).

### Railing Types and Condition

#### Dean Village/ Hawthornbank Lane

- 5.6 The railings at Hawthornbank Lane are approximately 1.24 m high and made from wrought iron and steel. The railing pattern comprises simple spiked balusters with square section bars and a horizontal top rail. Heavy section end posts with a wrought spiked feature top are also present. These railings surmount a parapet wall adjacent to the lane. They are generally in good condition although need localised repairs and repainting.



Railings at Hawthornbank Lane



Belgrave Crescent Railings

#### Belgrave Crescent

- 5.7 The Belgrave Crescent railings at the gardens boundary have largely been removed and the boundary is now defined by a clipped privet hedge, inside which is mesh fencing. Limited sections of the original railings remain at the gateways and short sections flanking the gates. Elsewhere the railings have been removed leaving the stone copes beneath the hedge. The remaining railings are cast iron and have round section balusters with spiked collared finials. The main railings lengths had no lower dog rail panel, but this feature is present on the remaining gates. The remnants of the original railings would enable facsimiles to be cast should repairs or reinstatement

of the railings ever be required. Given the integrity of the hedge and length of missing railings, it would be a significant undertaking to restore the Belgrave Gardens boundary railings, potentially difficult to justify at the present time.

- 5.8 At the eastern end of Belgrave Crescent approaching and adjacent to the church, the road boundary treatment changes to a low parapet wall surmounted by railings of the same pattern. These railings are intact and in good condition.

### Eton Terrace

- 5.9 Eton Terrace railings are approximately 1.23m high and made from cast iron. The railing pattern comprises heavy round section balusters with spear finials. The railings have an ornamental horizontal top rail which is cast iron and has round bosses where each baluster passes through the rail. These railings are secured into a stone cope which appears to be in good condition and of consistent line and level. The railings have no lower dog rail panel. The gates into the private garden have heavy round posts with 'acorn' pattern finials. The gates have the same spear finials but also have intermediate balusters to prevent access by dogs. The railings are in good condition with some localised repairs needed.



Eton Terrace Railings



Railings to Upper Dean Terrace and Dean Terrace

### Upper Dean & Dean Terrace

- 5.10 The railings at Upper Dean Terrace and Dean Terrace represent the majority of the railings within the public domain and consequently the principal subject for this study. They are approximately 1.47m high and made from cast iron. The railing pattern comprises fluted square balusters with spear finials. Below the finials is an ornamental panel with octagonal feature elements set between each baluster. The railings also have a dog rail with short balusters and small spear finials set between the main balusters. Backstays are present at intervals along the railings and are fixed into the base wall. The railings are in extremely poor condition and need extensive repairs; furthermore their base course stone copes have rotated along significant lengths resulting in an irregular alignment with leaning and broken panels. This determines that full repair of the railings must address both the structures below (as discussed in Section 4) and the ironwork. This would present the following options for restoration:

- Option A: Where the railings retain the correct alignment and are in reasonable condition (ie these are only relatively short lengths) it would be possible to restore the railings in situ. Such restoration would typically include replacement of lost or degraded octagonal features; replacement of individual lost or broken balusters and reconnection of broken horizontal rails.
- Option B: where there is a need to realign the copes and railings it may be possible to jack the railings and copes to the correct alignment then underpin/ pack the copes in-situ, this option would potentially minimise disruption and the scope of replacement copes and railings. Alternatively the railings could be cut in panels to allow the railings and copes to be lifted together and set aside while the wallhead and foundations are repaired. Thereafter the copes with railings would be lifted back into place and the ironwork reconnected and repaired. However, it is possible that given the poor condition of the railings, that they would not withstand lifting / realignment without further breakages, in which case there would be a need for more extensive ironwork repairs or replacement. This approach would potentially allow the viable sections of the existing railings to be retained, although the scale of subsequent repairs/ refurbishment would still be significant.
- Option C: where the railings are badly damaged or have significant missing components a practical solution would be the removal of the existing railings to allow new replacement railings to be installed. This option would involve the careful cutting of the balusters (main balusters and dog rail balusters) at cope level, leaving the copes exposed and accessible for lifting and re-bedding after wallhead and foundation repair work has been completed. In this scenario the copes would be re-bedded to the correct alignment and level, then the old baluster stumps and associated lead would be removed carefully by core cutter. This would result in new sockets for the replacement railings. The latter would be provided as new castings (ideally in ductile iron for additional resilience) to match the original railings.

5.11 It is likely that a combination of the above options would be required, and that the comparative scope of each treatment would need to be confirmed following investigation of the walls, and a specialist assessment of the ironwork. It is likely that a significant contingency will be required to cover the potential risks associated with realigning and lifting old railings. With each option there would be a need to repaint the railings and where original railings are retained removal of the existing paint and rust by control sand blast treatment should be used to expose the bare metal and to gain a clearer picture of the ironwork condition and repair requirements.

#### *Summary of damage to railings along Upper Dean Terrace and Dean Terrace*

5.12 The railings along Upper Dean Terrace and Dean Terrace were found to be in the worst condition. At several locations the railings are leaning and the stone copes have been displaced ie rotating and where trees grow close the railings the copes have been lifted. These movements have contributed to the railing damage causing the brittle cast iron to snap. The railings are generally in poor condition with corrosion and damage in a number of places, with broken and lost panels, finials, and deformation where tree roots and trunks have grown into and under the railings. The restoration of the railings at this location will involve some tree management or selective removal to allow the original alignment to be reinstated. Although in recent years the ivy has been cut back in this location, it is evident that it is already encroaching on the copes and railings again.

5.13 Along Upper Dean Terrace, between Ann Street and St Bernard's Bridge there were approximately;

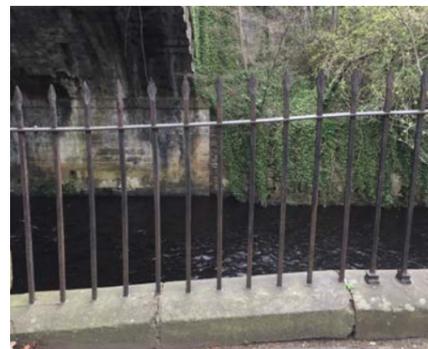
- 131 Ornamental octagonals either broken, damaged or missing;
- 227 dograils either broken, damaged, missing or with missing and broken finials;
- 15 main finials either broken, damaged or missing;
- 29 main balustrades either broken, damaged or missing;
- and 3 snapped backstays.

5.14 Between St Bernard's Bridge and Stock Bridge, along Dean Terrace there were approximately;

- 18 Ornamental octagonals either broken, damaged or missing;
- 15 dograils either broken, damaged, missing or with missing and broken finials;
- 7 main finials either broken, damaged or missing;
- 12 main balustrades either broken, damaged or missing;
- and 1 snapped backstay.

#### **St Bernard's Bridge**

5.15 The railings along St Bernard's Bridge match those at Dean Terrace; however the octagonal feature is absent. The railings along the bridge are generally in good condition although they need some localised repairs and refurbishment.



Railings at; St Bernard's Bridge, Saunders Street and Doune Terrace

#### **Saunders Street**

5.16 The railings to Saunders Street are wrought iron with simple square section balusters and angular spear finials. The base of the balusters is set within an ornamental cast iron collar. These railings are in relatively good condition, although there is a section of leaning railings and some localised repairs and clearing of Ivy is needed.

#### **Doune Terrace**

5.17 For the most part the railings on Doune Terrace were removed and only short sections remain. The remaining section of railings has square section balusters set at 45 degrees and surmounted with ornamental finials. These railings also have a panel of octagonal features below the top rail, and lower dog rail panel. The latter has smaller section short balusters with Fleur de Lys finials. These remnants could provide patterns for potential railing and gate restoration work. The railings were set into a substantial stone base course which is largely intact, despite the removal of the railings which has left the baluster 'stumps' within the stone. The stone base course requires some localised repairs and localised realignment. The railings are only present for a short section as Doune Terrace meets Gloucester Street. The boundary to Moray Bank Gardens is then formed by the remaining cope and hedge until the main gates, where the railings again reappear as Doune Terrace curves up to meet Moray Place. The railings that remain are in generally good condition although may need some localised repairs.

5.18 Typical elevations for Doune Terrace and Dean/Upper Dean Terrace can be found in Appendix 3.

## Recommendations

5.19 Recommendations for the railings can be found on plans 10210\_LD\_PLN\_101-107.

5.20 The following table summarises the requirements for identified defects for each section of railings:

**Table 2**

Reference:	Railings:	Defect:	Repair Recommendation:	Urgency Assessment:	Order of Cost
5.10-5.14	Upper Dean and Dean Terrace ( 146m of total 291m)	Badly damaged railings requiring approximately 50% replacement and comprehensive repairs to the remaining railings.	Remove existing badly damaged sections of railings, core out baluster stumps to allow the erection of new railings. New railings to be cast iron to match original pattern. Subject to detailed inspection findings ( post shot blasting) undertake localised repairs and replace lost/ broken balusters and ornamental elements of cast iron insitu. Repaint the entire length of railings	<b>Urgent</b>	£87,600
5.10-5.14	Upper Dean and Dean Terrace ( 145m of total 291m)	Railings sections requiring in-situ repairs and reinstatement of lost / broken elements eg octagons and individual balusters. Where necessary the railings and copes will need to be lifted to allow repairs to the wallhead/ cope foundation	Shot blast railings to remove paint and expose ironwork/ clarify extent of repairs, Replace lost and broken components with cast iron components to match the original pattern. Reconnect railing panels where these have been set aside for wallhead repairs	<b>Urgent</b>	£36,000
5.16	Saunders Street ( 194m)	15 m Railings leaning and 5m damaged cope.	Realignment of localised section c. 15m in length. Replace cope and railings over 5m	<b>Necessary</b>	£10,000
5.17	Doune Terrace (94m)	Railings missing over the majority of Doune Terrace, copes remain as base course.	Reinstate missing railings to the original pattern. Core out old baluster stumps to allow erection of new railings. Undertake local repairs to cope stones where damaged.	<b>Necessary</b>	£47,000
5.6	Hawthornebank Lane	No major defects	Refurbishment / re-painting	<b>Desirable</b>	£1000
5.9	Eton Terrace ( gardens boundary)	Original railings intact and in good condition, only localised repairs required	Minor repairs and associated refurbishment ( e.g. replacement of broken finials)	<b>Desirable</b>	£2000
5.15	St Bernard's Bridge ( 112m both sides)	Minor localised damage and in need of refurbishment	Shot blast railings to remove paint and expose ironwork/ clarify extent of repairs. Repair broken / lost components to match the original details in cast iron.	<b>Desirable</b>	£17,000
5.7-5.8	Belgrave Crescent ( gardens boundary)	The majority of the garden boundary railings have been removed and the boundary is defined by a well maintained hedge	Reinstatement of the lost railings is a possibility but would involve the severe cutting back/ removal of the established hedge. This is not considered a priority and would re	<b>Low priority</b>	N/A

## Outline Costs

5.21 The above table includes an estimation of the costs of the recommended repairs to railings in the study area excluding VAT and contingencies. These will require verification once shot blasting has been undertaken, allowing the condition of the exposed ironwork to be inspected in detail. Cost estimates are based on the restoration and repair of cast iron ( grey iron) to match the historic patterns , and includes the coring of old railing stumps to allow the erection of new cast iron railings where required. The estimates have assumed that where sound and repairable, the historic railings will be repaired insitu and broken elements reinstated without complete replacement of the railings. Advice from Ballantine's of Bo'ness has been sought to verify the order of costs and this has highlighted the significant increase in ironwork costs over recent years. This has also confirmed that the cost of repairs/ restoration varies considerably according to the pattern and complexity of the railings e.g. simple balusters without ornamentation are less expensive than more complex railings with dog rails, octagonal ornamental panels. Full restoration / replacement costs for existing stone copes is estimated to cost in the order of £500 to £750/ linear metre; while repairs in situ and redecoration would cost in the order of £100 to £200/ linear metre. The latter will also be influenced by the scope of works commissioned as there will be economies of scale and efficiencies for undertaking long lengths of railing repair/ restoration. The Upper Dean Terrace and Dean Terrace costs will require verification following detail investigations of the supporting wall and ironwork condition post shot blasting. The estimated costs for repairing / reinstating the railings amounts to **£200,600**. Given the risks regarding the condition of the railings and their associated base walls, a significant contingency allowance should be included in planning for these works ( @ 15% ) this would suggest a budget of **£230,000** would be appropriate.

## Maintenance

- 5.22 The future maintenance of the railings following implementation of the above recommendations should ideally involve the following actions :
- **Inspections:** regular inspections of the railings should be undertaken to identify any deterioration in condition, any damage resulting from tree movements or fallen branches, traffic impacts, vandalism and potentially from vegetation encroachment / self-seeded growth. Formal Inspections and reporting at a maximum 5yearly intervals are recommended, with more regular informal inspections during routine maintenance operations to identify any changes in condition that may require attention. Where railings provide an essential safety function as parapet rails , these must be reviewed regularly to allow any damage to be repaired timeously , or at least to allow temporary safety measures to be put in place until such time that repairs can be undertaken. It is likely that the local residents could assist in reporting any damage to the Council.
  - **Routine Maintenance of Railings:** following repairs/ reinstatement and refurbishment required by the above recommendations, the railings should require a limited regime of routine maintenance to prevent deterioration in condition. Key actions for routine maintenance include:
    - Cleaning of railings to remove deposited dirt, salt spray from roads, aphid dew, bird fouling and any graffiti. This should ideally be undertaken once yearly.
    - Cutting back of vegetation encroachment onto the railings : this should include the prevention of ivy growth onto the railings and the cutting back of branches which extend through the railings;
    - Remove any unsafe tree limbs where they overhang the railings and may potential endanger the public and the railings
    - Localised repairs of any emerging problem areas to prevent escalation of the problem, followed by local re-painting;
    - Re- painting of the railings to refresh the decoration at a maximum 10 yearly intervals;
- 5.23 **Future Adhoc repairs:** where inspections identify a need for repairs these should be undertaken in accordance with best conservation practice using ironwork specialists capable of replacing and restoring cast and wrought iron.

## 6 Pavements

- 6.1 The First Phase study examined the majority of the walkway surfaces. This study has analysed other publically accessible pavements and adjoining areas, with a focus on the historic pavements. The pavements vary in type and condition and include:
- localised areas of historic whin setts
  - historic flagstone footways;
  - some recent high quality stone flag pavements (Yorkstone);
  - concrete slab pavements
  - asphalt road and footways;
- 6.2 The study area retains a number of streets and lanes with whinstone sett surfaces, many of which also have whinstone kerbs and channels. These are strong characteristic features of the area (and of the World Heritage Site generally). They have however, been incrementally removed to facilitate maintenance and this has diluted the character of the townscape in affected areas. Where whinstone pavements remain they are in the best condition where they have not been disturbed by utility companies.
- 6.3 Historic flagstone pavements remain at Dean Village and these are distinctive red / brown sandstone with a riven surface. The historic flagstone areas are limited and new stone pavements in the New Town and adjacent areas have utilised Yorkstone as the closest equivalent. Yorkstone slabs have been used in the Dean Village and in recent streetscape improvements in the local area. These have utilised slabs with a sawn surface.
- 6.4 Many of the local footways have been paved in large format concrete slabs. These include grey slabs and mixtures of grey, pink and cream, presumably in an attempt to replicate the colours of historic sandstone flags. Many of these pavements have suffered from vehicle overrun with resultant cracking adjacent to the kerbs.
- 6.5 Generally pavements across the site are in good condition and only in need of localised repairs, with the more significant ones indicated on the drawings for this report. Typical issues include:
- Unsympathetic patching of historic pavements (setts and flagstones) following disruptions by utility companies. Patches are mostly in bitumen macadam or in-situ concrete;
  - Disruption and framing of manholes and service boxes by concrete haunching creating an intrusion in the pavement surface;
  - Cracking of stone and concrete slabs by vehicle overrun on corners and along footways with low kerbs , where vehicles pull onto the footway to park or load;
  - Poor quality reinstatement of historic pavements leaving irregular setted surfaces, difficult to access by pedestrians , especially those with mobility impairments;
  - Localised instability of flagstone and slab pavements leading to the rocking of slabs underfoot and some tripping hazards where slabs remain dislodged.

### Recommendations

- 6.6 Localised repairs should be undertaken as indicated on the photosheet overleaf and drawings. It should be noted however, that the site would benefit from a more holistic approach to materials, one that reinforces the character and heritage significance of the Dean Valley, and acknowledges the part it plays in the Edinburgh UNESCO World Heritage Designation. Whilst the First Phase feasibility study focused on the walkway as a shared cycle and pedestrian route, the majority of the public footpaths in this study focus on the adjoining areas.
- 6.7 In summary the recommendations for the main pavements in the Phase 2 study area are as follows:

#### Whin sett pavements

- 6.8 Setted carriageways, lanes and their associated whinstone channels and kerbs are recognised for their cultural significance and importance to the townscape of Edinburgh, as identified in the City of Edinburgh Council's 'Finalised Strategy for Setted Streets' (March 2018). The principles contained in this strategy should apply to the Dean Valley area. Setted pavements should therefore be subject to protection and where disturbance is unavoidable; restoration should be undertaken by specialists to ensure the repaired surfaces are consistent with the historic areas. Whinstone setts, kerbs and other components can be supplied by the Scottish Stone suppliers and this allows future streetscape schemes to extend the materials and character of the heritage areas, maintained and kept, in keeping with the heritage of the valley.
- 6.9 The typical problems relate to localised disturbance of whin sett pavements and these should ideally be addressed by a programme of remedial work that involves breaking out the tarmac and concrete patches and reinstating the area with whinstone setts (or channels) to match the surrounding areas. Most of the historic sett surfaces are laid with whin dust jointing (i.e. flexible) and this technique would be require specialists as most modern stone pavements are laid as rigid construction with high strength mortars . The latter would not be appropriate for patching, but may be suitable where large areas of setts are being laid.
- 6.10 Areas of whin setts disrupted and re-laid unevenly will be required to be uplifted and re-laid properly by specialists. In these situations the construction will have to ensure appropriate construction of the roadbase to prevent future settlement.
- 6.11 The whinstone kerbs and channels are also important characteristic features which should be restored if damaged by utility disruptions or drainage works.

### Stone Flag Pavements

- 6.12 Historic stone flag pavements where broken or uneven require localised reinstatement or repairs, ideally salvaging and re-using the original material as much as possible. Where there is a need for new stone slabs to make up the deficit, these should ideally use reclaimed flags of the same material, or failing that new Yorkstone selected to match the existing colours as closely as possible. In certain areas it may be appropriate to source historic slabs from small remnant areas nearby, and to renew the adjacent areas holistically with new Yorkstone. This approach might avoid a piecemeal appearance. Recent trials by the City of Edinburgh Council have concluded that 'Scoutmoor' Yorkstone provides the most sympathetic match for the New Town's historic flagstones, and has proven to be a robust paving material. The majority of pavements within the study area are adopted and maintained by the City of Edinburgh Council, and so paving restoration and renewal will require prior consent from the Council.
- 6.13 Where new Yorkstone pavement have been damaged (e.g. by vehicle overrun) it will be possible to source a close match for the original stone. In such location the reinstatement process should also look to preventing future damage by integrating measures which prevent vehicle overrun.

### Concrete Slab Pavements

- 6.14 In recent years significant local areas of concrete slabs have been replaced by Yorkstone and it would be beneficial if this process continued to address other streets in the area, and especially those fronting the Dean Valley. The concrete slab pavements to Saunders Street and India Place should be a priority for repaving the pavements with historic flagstone or Yorkstone as they are direct public access routes to the walkway. Latterly Upper Dean Terrace and Dean Terrace may be included in the upgrade as they also front on to the Dean Valley. Most of these footways have existing whin kerbs and these should be retained and repaired during footway resurfacing. In areas where concrete kerbs exist it would be beneficial to replace these with whinstone prior to footway renewal in Yorkstone.

### Resin Bound Gravel to Lindsay's Mill

- 6.15 The area of Lindsay's Mill and Miller Row has been subject to environmental improvements in the past (c. 1990) to create a viewpoint/ seating area and to improve the amenity of the walkway. This treatment included some form of resin bonded gravel with whin sett trims. However these surfaces have deteriorated and suffered from invasive vegetation growing through the surface, suggesting that the area was not well constructed. The poor condition of the surfaces warrants re-laying. This would involve uplifting the existing hard surface, salvaging the setts for reuse and reconstruction of the base courses with eradication of any deep rooted weeds. The renewed surface should include resin bound gravel with whin sett trims using the reclaimed setts. The 10 no. wooden bollards also need replacing.

Table 3

Reference:	Pavements:	Defect:	Repair Recommendation:	Urgency Assessment:	Order of Cost
6.8-6.11	Whin setts / kerbs & channels	Localised disruption at manholes/ utility disruptions & local potholes/ unsecure setts	Programme of repairs and reinstatement with whin setts , kerbs and channels , constructed to match the local area (flexible or rigid)	Necessary	£20,000
6.12-6.13	Stone Flag Pavements	Localised damage by vehicle overrun / impact damage	Reinstatement of damaged slabs with reclaimed historic slabs , or 'Scoutmoor' Yorkstone	Necessary	£10,000
6.14	Concrete slab pavements	Cracking at roadside caused by vehicle overrun	Comprehensive re-pavement in 'Scoutmoor' Yorkstone slabs, retaining existing whin kerbs. Upper Dean & Dean Terrace footway adjacent to railings ( 730 m2) , and Saunders Street footway adjacent to railings ( 485m2) Doune Terrace (235m2)	Desirable	£220,000
6.15	Lindsay's Mill Area	Vegetation growing through surface. Bollards derelict.	Resurface area with resin bound material, with proper asphalt road base to prevent weed growth. Setts to be reclaimed and relaid. 10no. Wooden Bollards replaced.	Desirable	£32,500

### Outline Costs

- 6.16 The above table includes an estimation of the costs of the recommended repairs to pavements in the study area, excluding contingencies and VAT. These costs are based on commercial rates from recent contracts where natural stone pavements have been constructed. Rates of £150/ m2 have been applied for the renewal of footways in Yorkstone (excluding kerbs and fixtures and assuming no remedials to drainage and utilities). The total estimated costs amount to **£282,500**. Taking into account the potential for unforeseen costs it would be prudent to allow for contingencies; at 10% this would suggest a practical budget of **£310,750** excluding VAT.

### Maintenance

- 6.17 The future maintenance of the pavements following implementation of restoration work and any new pavement works should ideally involve the following actions :

- **Inspections:** regular inspections of the carriageways and footways should be undertaken to identify any deterioration in condition, any damage resulting from vehicle overrun, impacts with fixtures (e.g. bollards/ signposts etc.) tree roots and drainage problems. Formal Inspections and reporting at a maximum of 6monthly intervals are recommended, with more regular informal inspections during routine maintenance operations to identify any changes in condition that may require attention. Where damage presents a hazard to pedestrians and traffic these must be identified and repaired timeously.
- When utility companies undertake work that disrupts the study area pavements, restoration measures must be in place and approved to avoid scars in the pavements. Inspections during and after the restoration works are recommended.
- **Routine Maintenance of Pavements:** following repairs and the development of new pavements, they will require ongoing maintenance. As most of the pavements are adopted by the City of Edinburgh, it will be the council's responsibility to maintain the pavements, ideally this would entail the following actions:
  - Regular cleaning of pavements to remove litter, deposited dirt, chewing gum and staining from oil/ drinks and dog fouling.
  - Seasonal removal of leaves;
  - Seasonal gritting/ salting to prevent slipping in winter;
  - Potential pavement joint remedial work / re-grouting where mortars have become loose or removed;
 The localised reinstatement and consolidation of loose setts in flexible / whin dust bedded areas. This should ideally be undertaken as early as possible to avoid an escalation of the problem and pothole creation;

6.18 **Future Adhoc repairs:** where inspections identify a need for repairs these should be undertaken by stone pavement specialists. .



**P2** - Setted area to water at Dean Valley in need of maintenance



**P4** - Resurfacing to Water of Leith Bridge needed



**P1** - Damage to walls and steps at Dean Valley Footbridge



**P3** - Localised repairs/upgrading to surface on Hawthornbank Lane



**P5** - 'Entrance' to Dean Valley Walkway from Saunders Street would benefit from upgrade in material surfacing and signage



**Left: P6** - Installation of drop and flush kerbs required outside gates to Doune Terrace Gardens



**Left: P7** - Vegetation removal and resurfacing using resin bound or bonded gravel

Photosheet 1: Pavement and Surfaces

## 7 Signage

- 7.1 There are relatively few elements of furniture, signage or facilities for walkway users at present. There is consequently potential to improve the amenity of the walkway and to make it more attractive to users by providing new facilities and furniture at strategic locations i.e. at key viewpoints, where space permits and where there is a need for resting points and wayfinding information.
- 7.2 Signage along the walkway and in adjacent areas is also limited and wayfinding can be difficult. There is consequently potential for better signs and for better placed signs to provide more effective orientation, without creating clutter. Some of the strategic viewpoints and feature areas also hold potential for interpretation of the Dean Valley heritage. Clearly there is a wealth of material to interpret and the challenge will be to distil this heritage in order to develop a cohesive interpretation strategy. It is not the purpose of this report to develop such a strategy but potential locations for physical interpretation have been indicated on the Signage Plans, with key views, wayfinding and suggestions from the first report taken into consideration.
- 7.3 The plans indicate where signage is currently located, where it is potentially needed in order to facilitate better wayfinding and what locations may benefit from Interpretation Signage or panels.

### Interpretation Signage

- 7.4 The following codes have been marked on the drawings 10210\_LD\_PLN\_501-507 and highlight potential locations for interpretation signage.
- i1: A small wall mounted panel could be installed on the Water of Leith Bridge, looking towards Dean Village. The inscription may provide an overview of the history of Dean Village and be accompanied by a historical photo of the view.
  - i2: The interpretation signage at Miller Row is in poor condition, along with the area generally. New interpretation panels should be included as part of any upgrading works to this area.
  - i3: At this location an interpretation sign could be provided to give an account of the Cliff Face.
  - i4: An interpretation panel should be provided at St Bernard's Well and could incorporate a historic view of the Well.
  - i5: A rail mounted interpretation panel could be provided at this point, both to signal the route to the Dean Valley Walkway and also provide a history of the route. The panel could allude to the Stock Bridge and provide a historical photograph of the view towards it.
- 7.5 The following images provide some examples of robust interpretation signage that could be placed along the route. All signage should be slim-line to allow for most space to be used by pedestrians and cyclists. Information panels could be standalone, mounted on walls, railings or built in to new purpose built structures if any are required. It is imagined that all other wayfinding (directional) signage will coincide with City of Edinburgh Council standard signage.



## Recommendations

- 7.6 All new signage for the Dean valley should be considered strategically and should fit within any strategy for interpreting and waymarking the World Heritage Site and the Water of Leith itself. This will require an integrated and collaborative approach working with partner organisations (e.g. CEC; EWH; Water of Leith Conservation Trust). Potentially this could result in a 'suite' of signs which continue along the Water of Leith beyond the study area. This should aim to prevent a mismatch of signs in the area, and should rather seek to reinforce the character on the river corridor. A consistent suite of signs will also assist in achieving efficiencies for maintenance and ease of supplying replacement signs or components. A signage and interpretation strategy should define the requirements, and guide the design process. It would also allow appropriate levels of integration with signage in the neighbouring New Town and Edinburgh as a whole
- 7.7 It is recommended that the supplementary wayfinding signs are installed, particularly at the termination of Hawthornbank Lane and the Water of Leith Bridge. There is also a good opportunity to create a higher quality entrance at the point where Saunders Street ends and becoming the walkway as it passes under St Bernard's Bridge. Extra signage and possibly an interpretation panel could help facilitate this.
- 7.8 If interpretation panels are to be pursued, it is recommended that DVRL engage with the necessary officers in the City of Edinburgh Council, in order to establish the style and design of the panels, what could be included on them and establish any likely maintenance requirements and responsibilities.
- 7.9 New signs should be of a high quality, designed to be robust and vandal resistant, taking into account the likelihood of graffiti and need to clean or replace signage panels.

## Costs

- 7.10 The order of costs for new signs has been estimated as follows, based on indicative commercial rates 2018 and are exclusive of professional fees. The final costs will depend on the detailed design and sophistication of the signs but the following figures provide a basis for budgeting :
- Costs for 5no. new interpretation panels (excluding design costs) are estimated at £2500 per panel (excluding graphic design). Giving a total of £12,500.
  - Costs for an estimated 6 no. Wall mounted wayfinding signs; £3600.
  - Costs for an estimated 6 no. Finger post wayfinding signs; £5000.
- 7.11 These estimated costs amount to a total of **£21,100** excluding VAT.

## Maintenance

- 7.12 The future maintenance of wayfinding and interpretation signs should ideally involve the following actions :
- **Inspections:** regular inspections of the signs should be undertaken to identify any deterioration in condition, any damage resulting from vandalism/ graffiti and vegetation encroachment. Inspections and reporting at monthly intervals are recommended.
  - **Routine Maintenance of Signs:** following the installation of new signs, they will require ongoing cleaning and maintenance., ideally this would entail the following actions:
    - Regular cleaning of signs to remove deposited dirt, and any graffiti.
    - Cutting back of any encroaching vegetation that obscures signs;
    - Checking and re-securing sign fixings and supports;
- 7.13 **Future Adhoc repairs:** where inspections identify a need for repairs these should be undertaken by signage specialists, and generally the damaged signs should be replaced with like-for-like signs of the same specification as originally employed.
- 7.14 For interpretation signs, it is likely that they will need 'refreshment' after a number of years. This will involve a strategic replacement programme potentially after 10 years.

## 8 Trees

- 8.1 It is evident that there has been significant self-seeded tree growth along the Dean Valley and in many places this is having a detrimental effect on walls, railings and paths. Younger self-seeded growth is also starting to fill gaps and will present problems in the future when it further encroaches on structures and closes views. The majority of the self-seeded trees are Ash and Sycamore with lesser quantities of Beech and other pioneering species. The issues relating to these trees are identified in the First Phase study but are also relevant to the Phase 2 study area and other areas. Typical issues requiring management interventions include:
- The growth of self-seeded trees out of walls and structures is causing disruption to the masonry and compromising the stability of the walls, and in places, damaging associated railings. These trees will cause increasing damage as they mature and their root mass expands. Their movement in windy conditions is also likely to de-stabilise the walls leading to collapses which could endanger pedestrians, and cause damage to adjacent structures and pavements;
  - Self-seeded tree growth on Randolph cliff where soil cover is thin and the likelihood of wind throw high, potentially leading to rock falls and cliff instability;
  - Dense and uncontrolled growth of self-seeded trees is creating heavy shade which is detrimental to the amenity of the valley and preventing ground flora development in some areas;
  - The limited species diversity in the self-seeded woodland is also an issue that deserves management intervention i.e. to allow improvements to biodiversity and arboricultural interest from exotic specimens;
  - The uncontrolled growth of self-seeded trees is also blocking views along and into the valley, with many historic views now compromised;
  - A number of large historic trees are becoming diseased and unsafe, or are carrying significant deadwood in addition to also contributing to loss of views and encroaching on structures;
  - The invasive spread of ivy to cover trees is potentially damaging the trees and creating evergreen obstructions to views into and along the valley.
- 8.2 This report identifies the locations of large specimen trees, and reports on the locations where trees are damaging walls, footpaths or railings and what action is necessary.
- 8.3 City of Edinburgh Council provided some information for trees along the Dean Valley and India Place. It is important to note however, that the tree surveys provided only indicate mature and veteran trees. The significant number of self-seeded trees (of sapling to semi-mature size) along the valley and at India Place are not recorded on topographic surveys or present on the tree survey plans. This means that it is unlikely that any trees doing damage to walls, railings or structures have been picked up in previous surveys. CEC aims to survey the area once every 5 years, but due to budget constraints it must be appreciated that they are not often able to meet surveying targets. They run an annual summer survey for all sites for Dutch elm disease.
- 8.4 The area adjacent to Lower Miller Row Terrace contains a number of large mature trees together with dense scrub and self-seeded saplings. The area is also heavily overgrown with ivy which blankets the mature trees, walls and embankment, and makes access very difficult. The large mature trees form broadly two rows: at the high level adjacent to the Walkway trees grow close to the walkway wall and these are recorded in the Phase 1 report (T1 to T10); a second row of large trees grows at the lower level, closer to the Water of Leith. These grow close to the river's edge and along the line of a lower terrace which is covered by ivy. This lower line of mature trees comprises c. 8 nr trees and includes Ash, Wych Elm, Sycamore and Alder. These are heavily covered by ivy which appears to be damaging the trees. Between the large trees the self-seeded saplings are dominated by Sycamore, Hawthorn, Ash and Elm.
- 8.5 A more comprehensive tree survey by an arboriculturalist is required to fully understand the quantity and impact of the self-seeded trees in the valley.
- 8.6 Whilst this report has marked out what it believes to be the larger specimen trees, there are a number of areas where health and safety has not permitted LUC to undertake a more detailed survey of the area. Notably these are along the embankment below Dean Terrace, the embankment between Doune Terrace and India Place and the Lower Miller Row Terrace area.
- 8.7 The tree survey and recommendations can be found in drawings 10210\_LD\_PLN\_301 – 307 (Appendix 3) and the Tree Survey Proforma can be found in Appendix 1.

### Recommendations

- 8.8 Stakeholder consultation has identified that tree management is sensitive issue, and that many consider the density of woodland to be a positive characteristic, as it provides green seclusion from the city. However as outlined above the uncontrolled development of self-seeded trees and woodland presents a number of risks to the integrity of structures and has some negative effects on the character of the valley. These risks and negative effects require to be addressed by management interventions which include:
- Where self-seeded trees are growing out of walls (e.g. Saunders Street) and bridge structures they could cause extreme damage in the future if not acted upon now. They should consequently be removed by cutting at the base, close to the structure, and the stumps treated to prevent re-growth. Subsequent structural repairs to the masonry should then remove embedded roots before the structure is rebuilt. In some places it may be prudent or necessary to leave the stump in place until it has degraded.
  - Self-seeded tree growth on Randolph cliff should be carefully felled and stumps left in-situ, but treated to prevent re-growth;
  - Trees leaning at extreme angles from the valley sides should be examined to determine their stability and their potential to cause damage. Potentially dangerous trees should be removed or subject to tree surgery to improve balance and stability;
  - Where self-seeded trees are growing densely and have little diversity, selective thinning should be considered, leaving the best future specimens, whilst providing more space for them to develop, and for other species to become established i.e. other species of trees and ground flora.
  - Selective pruning and crown lifting should be undertaken to remove branches which are unsafe or encroaching on structures and railings. In certain locations it may be possible to open up or restore views by careful pruning, and this process could be undertaken incrementally to judge the effects and adjust accordingly. Similarly it would be possible to improve sunlight penetration by pruning rather than clearance. Crown lifting should seek to lift crowns of small mature trees to a minimum of 2 metres, and lift crowns of tall mature trees to a minimum of 3.5metres

- Many of the larger and veteran trees could become a danger if they succumb to disease, develop deadwood or unsafe branches. If dead trees or large limbs were to fall, then they could cause significant damage to adjacent structures and endanger the public. In such cases dead trees should be removed and dead branches removed by tree surgery.
- Ivy growth should be removed from tree trunks;
- Cut back woody scrub and undergrowth to control the spread and improve the shape of plants (especially for elder, holly and privet) ,

8.9 Drawings 10210\_LD\_PLN\_301 – 307 indicate the locations and types of tree work to be undertaken. These have been carefully chosen to address the threats to the built heritage of the Dean Valley, and to improve the natural heritage and amenity of the landscape. These recommendations also take into account the findings of the stakeholder consultation.

#### India Place Tree Replacement

8.10 The brief for this study specifically requested LUC to examine at trees along India Place, and to assess the management requirements , responding to the recommendations within the Conservation Statement, with the aim of reducing the shading of allotments, opening views from Doune Terrace/Moray Bank Gardens, and generally improving the bank's appearance and biodiversity by reduction of undesirable species (sycamore) and a programme of thinning, coppicing and restocking with native small trees and shrubs. Currently the India Place terrace is populated by sapling trees, a mixture of predominantly ash and sycamore which are densely spaced and elongated in form.

8.11 Recommendations for India Place include :

- Clearing the embankment of self-seeded sapling trees and shrubs in the first instance. This will allow an understanding of which remaining trees are healthy and worth retaining. Many of the trees appear to be in poor condition and extensive clearance is recommended. Following this approach, the cleared areas will be available for replacement tree and understorey planting.
- New planting should include small to medium sized trees with biodiversity and amenity value. Suitable species include: cherry (*Prunus avium*) , blackthorn ( *Prunus spinosa*) , bird cherry ( *Prunus padus*); Hawthorn (*Crataegus monogyna*) ; crab apple (*Malus sylvestris*); Hazel ( *Corylus avellana*) and rowan (*Sorbus aucuparia*). These species will provide nature conservation benefits and given their small size they will not obscure views from Doune Terrace or overshadow the allotments below.
- Low maintenance ground flora should be introduced

8.12 Full recommendations for this area can be found on plan 10210\_LD\_PLN-308).

#### Lower Miller Row Terrace area Tree Management

8.13 The brief for this study was extended to cover the area below Lower Miller Row Terrace, and to provide an outline of the management requirements. This area is inaccessible and unmanaged at present. It contains a number of mature trees and significant self-seeded tree growth. The area is also heavily overgrown with ivy which is choking the mature trees and blocking views across and to the Water of Leith.

8.14 Recommendations for the Lower Miller Row Terrace area include :

- Selective removal of self-seeded sapling trees where these are growing from walls, and where overcrowding occurs. Leave the best specimens for development without overcrowding. This will allow for succession while helping to open views below the canopies of the mature trees;
- Removal of ivy from the mature trees to improve the condition and longevity of the trees and to open up views to the Water of Leith;
- Pruning / tree surgery to the older mature trees to remove deadwood and branches overhanging the Walkway.

8.15 Full recommendations for this area can be found on plan 10210\_LD\_PLN-309).

## Costs

8.16 Costs for the initial programme of tree works are estimated as follows:

- Removal of self-seeded trees from structures: estimated 20nr @ £500 each: £ 10,000
- Removal of self-seeded trees from Randolph Cliff : estimated 15nr @ £300 each: £ 4500
- Removal of self-seeded trees from the Lower Miller Row Terrace area : estimated 10nr @ £300 each: £ 3000
- Removal of self-seeded trees from India Place : estimated 30nr @ £300 each: £ 9000
- Selective pruning and crown lifting : £6500
- Removal of cut wood generally: £1000
- Dead-wooding of mature/ veteran trees: £4500
- Cutting and Clearance of ivy from trees : £4500
- Cutting back of scrub/ understorey : £3500
- Re-planting of India Place terrace 50nr trees @ £50 each : £2500

8.17 These estimated costs amount to a total of **£49,000** excluding VAT

## Maintenance

- 8.18 The future maintenance of trees and woodland in the study area should ideally involve the following actions :
- **Inspections:** inspections of the trees and woodlands should be undertaken to identify any deterioration in the condition of old trees (e.g. through disease, deadwood, wind/water damage) warranting tree surgery or felling. Any new self-seeded growth in structures should also be recorded and other changes in the woodland condition should be reported where they warrant management interventions. Inspections should be at minimum 5 yearly intervals.
  - **Routine Maintenance of Trees & Woodland:** following the initial programme of tree works ( as recommended above) routine management of the trees should include the following actions:
    - Regular removal of any tipped, or windblown litter;
    - Deadwood removal where branches extend over paths and structures;
    - Cutting back of any branches encroaching on railings, signs, and where they are closing important views;
    - Removal of any re-growth from stumps in structures and re-application of herbicide to prevent further re-growth;
    - Removal of any new self -seeded growth in structures;
    - Cutting back any re-growth of ivy from trees;
    - General management of woodland to maintain diversity in age and species mix, and protection of historic and popular views.
- 8.19 **Future Adhoc tree works:** where inspections identify a need for urgent tree works, these should be undertaken by arborists/ tree surgeons with prior approval from the Council and landowner.

## 9 Vegetation Management and Views

### Views

- 9.1 An analysis of historic photographs clearly indicates to which extent the growth of vegetation within the valley has modified views and spatial experiences over time. The combination of self-seeded tree, scrub and ivy growth, together with the maturing of designed plantings has gradually reduced intervisibility, and has closed many popular views and panoramas. Furthermore the density of planting has increased shading and reduced areas where sunlight can penetrate to the walkway corridor. It is evident that views and spatial qualities could be restored, or at least improved, through management, and that this might entail subtle measures, such as crown lifting / pruning and ivy removal; or more definitive/ permanent measures involving the selective felling of trees and clearance of scrub. In many cases it is the self-seeded and incorrectly planted vegetation that is problematic, and here the case for removal is more clear-cut (i.e. it may also benefit the integrity of walls and embankments). The removal or pruning of mature designed plantings requires careful consideration to ensure heritage significance is respected, but also to respond to situations where veteran trees are becoming unsafe. Lower level scrub and shrub planting also blocks views in many situations and this may require removal or pruning with long term maintenance to retain open views.
- 9.2 The views shown on Photosheets 2-6 and drawing 10210\_LD\_PLN\_600 (plan shown overleaf but is also contained within Appendix 3 along with full set of drawings) are based on the views within the public realm from Figure 3: Views and Visual Survey contained within the Dean Valley Designed Landscape Conservation Statement by Peter McGowan Associates.
- 9.3 For the purposes of this report the views have been divided into four main categories; views depicted historically and still visible today, other significant views still visible today, significant views or views depicted historically blocked today by vegetation/fence lines and views depicted historically not visible today. The majority of key views within the public realm are blocked by vegetation (trees and ivy) and were only apparent due to the survey taking place in winter, allowing glimpses to be seen through the leafless trees.

#### View 1

- 9.4 View 1, from the footbridge at Dean Valley remains visible and is largely clear of trees.

#### View 2

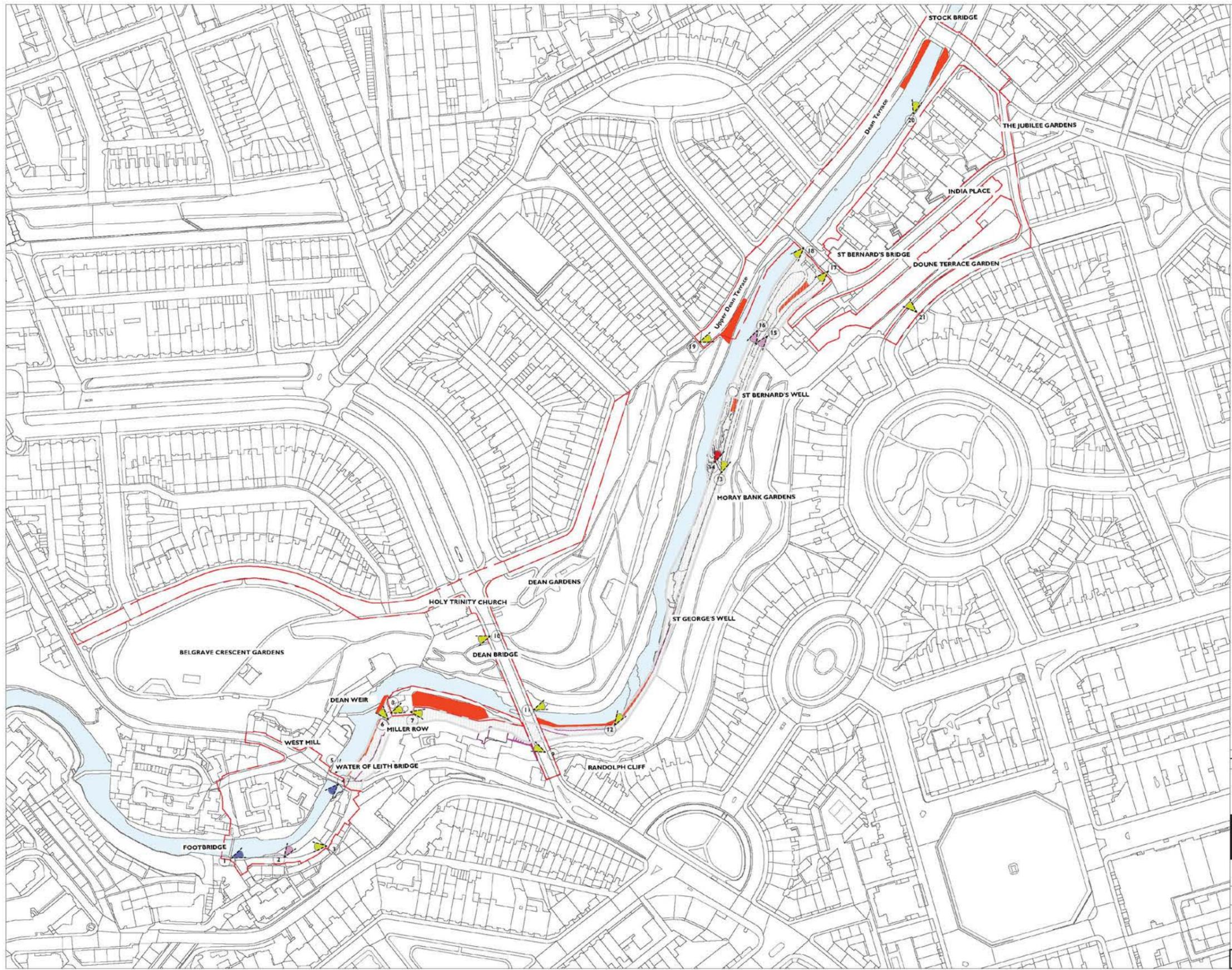
View 2, is partially still visible today, albeit with the addition of some railings in the foreground as shown on the photo. For most of the year the view beyond Water of Leith Bridge, towards Holy Trinity Church will be mostly obscured by the trees and vegetation on the banks of Belgrave Crescent Gardens in the west and the banks of the walkway on the east. Some management and maintenance of the trees along the walkway, pruning them back, would help reinstate View 2 and also View 5.



Figure 2: View 2 - Thomas Begbie, Dean Village with Holy Trinity Church c1850s



Figure 3: View 2 - Towards Holy Trinity Church today



**Notes**  
 Do not scale from this drawing.  
 All dimensions are drawn in millimetres.  
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- KEY**
- Views depicted historically and still visible today
  - Other significant views visible today
  - Significant views or views depicted historically blocked today by vegetation/fence lines
  - Views depicted historically no visible today
  - View number (refer to photographs)
  - Area of pruning and management required in order to reinstate view

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Project Dean Valley Regeneration Phase 2 Feasibility Study	
Client Dean Valley Regeneration Limited	
Scale @ A2 1:2000	Status FOR REPORT
Drawing Title Location of Views	
Job No 10210	Drawing No 10210_LD_PLN_600



**View 1**



**View 2**



**View 3**



**View 4**

Photosheet 2: Views 1 - 4

### View 3

- 9.5 The view from Hawthornbank Lane towards the Dean Village footbridge is obscured by railings and a number of trees in a private garden. The view does appear once further down the lane, but should there be a need to reinstate the view from this point, some pruning and crown-lifting of the trees in this location will be required.

### View 4

- 9.6 View 4 is still visible; although care must be taken to ensure the vegetation on the south side of the river bank (Hawthornbank Lane side) does not overgrow anymore and begin to obscure anymore buildings or the bank.

### View 5

- 9.7 See View 2

### View 6

- 9.8 The view of the weir is now obscured by railings and trees with overgrown ivy. At the time of the photo there was construction work being undertaken on buildings at Miller Row which may account for the items at the view point. Once close up to the railings the weir can be seen through the current branches. To reinstate the view, removal of ivy, pruning of branches and possibly crown lifting will be required.

### View 7

- 9.9 Historical photos show this view as always containing large trees on the southern bank and on the bank beyond the archway, partially obscuring the view to Moray Bank Gardens and Randolph Crescent behind. With the management of trees however (as indicated on 10210\_LD\_PLN\_600) this view towards the category B listed 3 Miller Row (the former squash court), Dean Bridge with Randolph Crescent and the north of the walkway behind, could be opened up and create a new key view within the Dean Valley as noted in Figure 3 of the Conservation Statement.

### View 8

- 9.10 Whilst this panoramic view is still visible, the Dean Bridge is largely obscured by self-seeded scrub. The Holy Trinity Church is partially obscured by trees within the Dean Gardens. The vegetation within the public realm could be managed and cut back to reinstate the wide view of the Dean Bridge from this point, incorporating the old mill wheels in the foreground.

### View 9

- 9.11 This view, across to Miller Row, the Weir and Belgrave Crescent Gardens is obscured by trees. Management of trees on the southern bank between Dean Bridge and Miller Row, would help open the views from this point towards Miller Row and the Weir.

### View 10

- 9.12 The north-eastern part of this view is partially obscured by the mature trees in Dean Gardens.

### View 11

The historical view shown in the photograph below (fig.4) is no longer possible due to the mature trees in Dean Gardens. The wall along Dean Bridge is also fairly high which means the extensive views shown in the historical photo below is somewhat tempered.



Figure 5: View down the valley from Dean Bridge c1870 by George Washington Wilson



Figure 4: View down the valley from Dean Bridge today obscured by trees



**View 5**



**View 6**



**View 7**



**View 8**

Photosheet 3: Views 5 - 7



**View 9**



**View 10**



**View 11**



**View 12**

Photosheet 4: Views 9 - 12

### View 12

The historic photograph shows the view from the point where Greenland Mill stood; down towards St George's Well and St Bernard's Well. Given the state of St George's Well it could be argued that the view is now redundant. What the current photograph shows however, is just how overgrown the self-seeded banks have become. Should there be a desire to reinstate the view, it would benefit from the upgrading of railings and clearance of trees and vegetation in this vicinity.



Figure 6: Photograph c1860 of Dean valley from Greenland mill, with St George's and St Bernard's wells (RCAHMS)



Figure 7: The view today

### View 13

The view east towards St Bernard's Well is obscured by trees in directly to the side of the well as seen in figure 9. Removal of these would help restore the view of St Bernard's Well if traveling along the walkway from the west.



Figure 8: F Hurst, St Bernard's well and walkway, 1926 (RCAHMS)



Figure 9: The view today

#### View 14

9.13 View 14 is no longer visible due a retaining wall being built and the erosion of the bank below.

### Vegetation Management

9.14 The above survey of key views within the valley and walkway aid in an understanding of where vegetation management and removal could benefit intervisibility, together with the integrity of structures. Along with marking the extents of vegetation removal in order to open up views (as indicated on plan 10210\_LD\_PLN\_600), the Tree Survey plans 10210\_LD\_PLN\_301 – 307 suggest further areas of vegetation management and removal. Areas of ivy for removal in particular, are also referred to on other plans in order to prevent further damage to railings and structures (see 10210\_LD\_PLN\_101-107).

9.15 The pruning, crown lifting and in some cases removal of trees will allow more daylight into the valley which could aid in improving the shrub layer and ground flora. These could potentially be planted with low maintenance, native aromatic plants such as honeysuckle, or may allow the establishment of bulbs (e.g. Bluebells/ Snowdrops) beneath the canopy. At the moment the ground is either barren or largely covered by ivy.

9.16 There would be scope and logic to an incremental approach in which clearance and management is prioritised / sequenced. This might involve the following :

- Urgent: removal of trees that dangerous or self-seeded growth in structures (as referenced in Section 8). Once these have been removed the results should be assessed ,to inform the next stage of management;
- Necessary: removal of self-seeded trees that block important historic views, together with crown lifting and pruning to restore views and spatial qualities
- Necessary: clearance of ivy from trees
- Desirable: selective clearance and pruning of self-seeded trees and scrub where density and lack of diversity is limiting amenity and sunlight.

9.17 The above approach would allow the local community and stakeholders to see the benefits of positive management working in an incremental manner so that change is progressive rather than sudden e.g. the restoration of a view through selective pruning would provide an example of how simple and discrete measures could have surprising benefits.

#### A Comprehensive Approach to Ivy

9.18 Whilst ivy can provide an effective / low maintenance ground cover, and have biodiversity benefits, it can also present management problems. Ivy growth is extensive within the Dean Valley and has become invasive in many areas, spreading from embankments to cover walls, choke trees and spread over paths and hardstandings. This invasive activity can cause damage to trees and particularly structures.

9.19 It is essential that ivy is removed from structures as a priority. Its rapid growth means that its aerial roots intrude into joints, displacing stones, bricks and suckers will contribute to surface decay. As such the stability of an entire wall can be threatened. This should also be taken into consideration for the priority removal of trees and saplings growing out of walls.

9.20 Conversely the ivy is capable of growing in shaded areas where other species would struggle to become established (e.g. under the heavy canopy sycamores, beech and horse chestnuts). The approach to ivy management must therefore be responsive to the situation and to the threats posed by the ivy i.e. with priorities for controls /removal given to areas where it is most damaging and where it encroaches negatively on structures, views and access routes.

#### Specification for Ivy Removal

9.21 The below provides an indicative specification for Ivy Removal.

9.22 Main ivy stems should be severed just above ground level. Two cuts at least 150mm apart should be made in each stem. Severed pieces of stem to be removed and disposed of away from site.

9.23 Extreme care to be taken when removing ivy stems in order to avoid cutting of the tree.

9.24 Dead ivy may take a while to fall off from the tree (1-2 years). It may be possible to pull dead ivy off with care (trees only – ivy growing over dry stone or unbonded walls should be scraped/cut off rather than pulled off the structure). Ivy must only be pulled off when brown and dead to avoid damage to trees cause by bark being pulled off with ivy.

9.25 Non chemical control: Dig out wooded stump and dispose of.

9.26 Chemical controls: extreme care to be taken with any chemicals used to kill ivy. Chemicals may contact the bark of the support tree and cause damage. Severe the stem and treat stump with a proprietary stump and rootkiller based on glyphosate. Chemical ivy removal to be undertaken by and/or under the supervision of an experienced professional.

9.27 Ivy is an exceptionally hard plant to kill permanently due to its waxy leaves and resistance to most toxins. Whilst the above will go some way into removing ivy from structures and trees, a key element should be the *control* of ivy. This requires maintenance. Ivy should therefore be cut back periodically to prevent it from re-colonising trees and structures.

#### View 15

9.28 View 15 is largely vegetation free. A single holly tree obscures the well from this point however, and removal should be considered if the view were to be restored.

#### View 16

9.29 In this view, St Bernard's Well is unobscured by vegetation, although the overgrowth of ivy on the retaining wall is prominent.

#### View 17

9.30 View 17 would benefit from vegetation clearance at the southern end of St Bernard's Bridge in order to open up the view to St Bernard's Well.

### View 18

- 9.31 The historic depiction of St Bernard's Well, The Dean Bridge and the Dean Village beyond, in Joseph Brown's Dean valley from St Bernard's Bridge (c1896) suggests a clear, albeit perhaps romanticised view, very much unlike the one we see today. One particular tree in the foreground blocks the view immediately, and the trees beyond block any view to Dean Bridge. What the picture does show which is consistent with the current situation however, is an abundance of trees and vegetation surrounding St George's Well and the opposite bank. Views from the Bridge are not completely blocked however and would open with some maintenance (as suggested in View 17). The (Platanus sp.) specimen tree in the foreground may benefit from some pruning but is an attractive tree adding to the character of the valley currently and does not necessarily need to be removed, unless there was a wish for the exact historic view to be reinstated.



Figure 10: Dean Valley from St Bernard's Bridge by Joseph Brown (c1896)



Figure 11: The View from St Bernard's Bridge today

### View 19

- 9.32 The view from the corner of Anne Street and Upper Dean Terrace is now heavily obscured by vegetation of the banks of the Water of Leith. The area would benefit from removal of larger self-seeded scrub, pruning and crown lifting as well as the removal of ivy,

### View 20

- 9.33 The view to Stockbridge is heavily marred by overgrown with vegetation. A number of trees are growing out of and damaging the walls. These should be removed, as should the excessive cover of ivy. The removal of vegetation in this area would open up the view to Stockbridge and allow greater light into many of the adjacent flats and apartments.



**View 13**



**View 14**



**View 15**



**View 16**



**View 17**

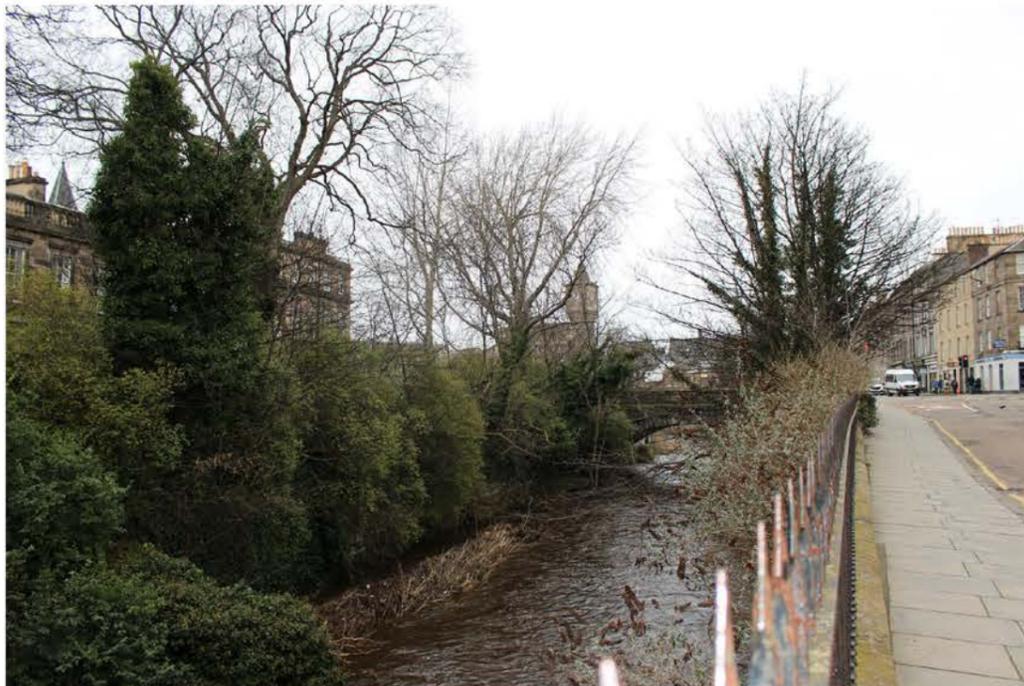
Photosheet 5: Views 13 - 17



**View 18**



**View 19**



**View 20**



**View 21**

Photosheet 6: Views 18 - 21

## View 21

- 9.34 View 21 now shows the hedge boundary to Moray Bank Gardens and large trees along the embankment.

## Perspective Views

- 9.35 Appendix 4 utilises the winter photos used in the previous pages as a basis for perspective views viewed in summer (trees in full leaf) or with the trees subjected to either removal or management to open up views. Comparing the two photos enables the viewer to understand the extent to which views are obscured by trees and vegetation and offers a starting point for discussion on the extent of work needed for each view.

## Scoping for biodiversity study

- 9.36 From a habitats perspective the Dean Valley is a mixture of mature deciduous woodland and confined river corridor, with some private gardens. The ground flora in the public land is sparse, generally confined to tall ruderals and tough waste ground plants such as ivy and bramble. Removal of any vegetation must be undertaken with great care, not only for impacts on views and habitat, but also bank stability. The fauna expected to be found include species identified in the Local Biodiversity Action Plan (LBAP) bats, birds, otters, and invertebrates. The proposals are unlikely to have long-term detrimental impacts on the range and distribution of local populations provided care is taken during the course of works: to avoid death, injury, and direct impacts on breeding. Any loss of roosting and/or nesting potential should be compensated on a like-for-like basis as much as possible. In the case of bats and otters, as protected species, their shelters carry legal protection even when not currently occupied. The 'Biodiversity Report' by Sue Bell Ecology (2016) raises some issues and need for mitigation in Chapter 4.4 in more detail.
- 9.37 The Biodiversity Report is very thorough and highlights potential benefits (4.2) and constraints/threats (4.3) to vegetation removal in the valley. Proposals for vegetation removal must be considered and examined on a case by case basis.
- 9.38 Each proposal or action will have to include consideration of impacts and possible mitigation as part of the planning process rather than as an afterthought to an action already decided. The proposals here require a delicate balance of extending a hand to management action, be it tree felling, trimming, ivy removal, or widespread clearance, and staying that hand from acting too much and cutting too deeply. As The Biodiversity Report suggests, there is no one size fits all mitigation strategy as any effective mitigation will be based on detailed baseline survey and the objectives of the management action to be taken. There are four key elements to be considered when determining mitigation which may be required:
- Balance between "neglect" and allowing natural processes;
  - Location, extent, and nature of any tree clearance;
  - Tree diseases and assemblage of tree species;
  - Management of ivy.
- 9.39 In addition, dedicated bat surveys should be undertaken once a scope of works is known for any management action. It is not economic, nor practical to survey every potential roost in detail at this stage, but once individual trees/walls/structures have been singled out for management, bat surveys should then be incorporated prior to action.
- 9.40 To take an excerpt from the Biodiversity Report:
- "To maximise the opportunities for biodiversity and avoid the adverse effects identified above, the project will require biodiversity to be an integral part of the planning process. The biodiversity value of the public space is linked to and enhanced by the existence and current management of the open spaces in the adjoining private gardens, and this relationship needs to be considered in reviews of the biodiversity. As more information is gathered about the presence and distribution of species and habitats along the Dean valley, this can be used to refine and develop the actions included in the Conservation Statement (McGowan, 2015). Many of the effects can be avoided by considering tree management on a case-by-case basis, and it may be necessary to compromise between widespread clearance of vegetation to open up views, and selective removal of individual trees, which would improve visibility and benefit biodiversity."*
- 9.41 Where large scale works might affect the river bed and corridor more directly or significantly, care should be taken to ensure that the geomorphology of the river is reinstated in a sensitive manner which will benefit local wildlife: bird species such as dipper, bat species such as Daubenton's, which depend on the water environment for foraging. This could involve the creation of riffles interspersed with larger cobbles or horizontal branch replacements, as well as calmer pools or areas of still water.
- 9.42 An altered view from that expressed in the Biodiversity Report may be worth considering with regards to non-native tree species. At the time of writing the report might have offered priority for tree removal, but given the increasing threat of Dutch Elm disease and Ash dieback, some consideration must be given to retain naturalised non-natives, such as sycamore. As there is no single species of native tree that can replace ash, for example, in its niche, there has been some relaxation on the planting and retention of naturalised non-natives. Updated advice should be sought from Scottish Natural Heritage (SNH) and/or Forestry Commission Scotland re: the position on ash and elm replacement, should it be required.

## Costs

- 9.43 Section 8 on Tree Management provides outline costs for tree removals, pruning and ivy clearance from trees. In addition to these allowances there will be a need to invest in more extensive control and removal of invasive ivy on structures as proposed above. This type of work will require repeat visits and ongoing maintenance but it is estimated that an initial programme of ivy clearance from structures would cost **£15,000** (approximately 30 days x £500 for manpower and equipment)

## 10 Randolph Cliff Area

### Reinstatement of Cliff Face and design of garden area to the east.

- 10.1 The area to the east of the Dean Bridge comprises two distinctively different types of landscape - the western section has an exposed cliff face with very steep connecting slopes. It is rugged and has picturesque qualities in which the combination of exposed rock and largely self-seeded vegetation create a striking somewhat wild contrast to the adjacent Moray Bank Gardens and garden area to the east. The eastern section is tiered and has a perimeter wall and intermediate retaining walls. It is clearly a more 'designed' area retaining a number of veteran trees, but otherwise quite devoid of understorey vegetation due to dense tree canopy.

#### Proposals for the Cliff face area

- 10.2 Proposals for the management of Randolph Cliff are included within Section 4 'Structures and Buildings' and within Section 8 'Trees'. These address requirements to ensure the stability of the cliff and to prevent illicit access from the walkway. The latter will require the repair and extension of the walkway boundary wall. The adjoining terraced garden retaining walls also require some remedial work.

#### Proposals for the garden area to the east of the Cliff Face

- 10.3 Proposals for this area have taken into account the practical and safety constraints of maintenance and access. They have also taken into account the feedback given by CEC staff with regards to maintenance issues and native planting. Figure 13 offers a conceptual image of what this area could look like if the proposals were carried out (including the pruning back of tree canopy mentioned elsewhere in this study).
- 10.4 The design aim is to recreate the atmosphere of nearby Dean Gardens and Moray Bank Gardens, both of which are transitions between an unmanaged area and an ornamental garden in their current state. This is an area where crown lifting and some selective clearance of existing saplings would benefit by allowing more light into the terraced former garden areas, providing a better environment for establishing plants and relieving the gloom under the large heavy canopy trees. The planting strategy takes into consideration the need for low maintenance and the shaded conditions; CEC have also requested predominantly native planting. Swathes of ferns, grasses, shade tolerant ground cover and perennials are proposed to will create an attractive understorey fitting to its context, next to the cliff face.
- 10.5 The Phase 1 study developed outline proposals for the area of the walkway around the Dean Bridge support pillar. This includes pavement improvements and boundary wall repairs and extensions to deter access onto the cliff area.

### Costs

- 10.6 Outline costs associated with the above proposals for the terraced garden area are as follows:

- Tree management ( included in Section 8)
- Walkway wall repairs and extension ( included in Section 4)
- Cultivation and planting of the terraced areas : 1640m<sup>2</sup> x £15 = £24,600
- Terrace retaining wall repairs : estimated : £15,000

- 10.7 These estimated costs amount to a total of **£39,600**.

### Maintenance

- 10.8 The future maintenance of the terraced garden area at Randolph Cliff should ideally involve the following actions :

- **Inspections:** inspections of the trees and understorey plantings should be undertaken to identify any deterioration in the condition of the mature trees warranting tree surgery or felling.. Any new self-seeded growth in retaining walls should also be recorded and any evidence of tipping, litter deposition or antisocial behaviour should be reported where they warrant management interventions.. Inspections should be at minimum yearly intervals.
- **Routine Maintenance of the terraced garden areas:** following the development of the terraced gardens ( as recommended above) routine management of the planted areas should include the following actions:
  - Regular removal of any tipped, or windblown litter;
  - Re-firming of shrubs and replacement of any losses ;
  - Removal of any re-growth from stumps in retaining wall structures and re-application of herbicide to prevent further re-growth;
  - Removal of any new self -seeded growth in the retaining walls;
  - Cutting back any invasive ivy where it threatens new planting areas;

- 10.9 **Future Adhoc works:** where inspections identify a need for works to address antisocial behaviour or illicit access to the cliff face, appropriate management measures should be devised, potentially including deterrents, increased policing and possibly sensitive barriers.



Figure 13: Conceptual visual illustrating proposals for 'Baxter's Land' with low maintenance planting and opening up of tree canopy

# 11 Conclusion

11.1 This report has been based predominantly on survey information gathered during site appraisals. These surveys have informed the plans and recommendations outlined above which provide an overview of the condition of; structures, railings, surfaces, signage, trees and vegetation and the current outlook of historic views within the public realm. The recommendations seek to identify the level of need for management interventions, and in all cases are mindful of the need to address threats to the heritage whilst also considering the sensitivity of works that would result in localised changes in character. In this respect the views of stakeholders have been respected.

## Next Steps

- 11.2 The scale of funds required to undertake the works defined in the Phase 1 and Phase 2 reports suggests that external funding will be required, and in that a **funding strategy** is required to identify potential funders and the steps required to secure funding. In this case CEC in partnership with the HLF and HES are potential prime funders, but other partnership funders will likely be required and may include SNH, Sustrans, Charitable Foundations and private contributors (including local residents associations). In the case of HLF, applications for funding must be supported by substantial documentation, and the work undertaken to-date would provide a substantial part of this. HLF funding may also provide 'Development Funding' towards outstanding feasibility work.
- 11.3 Without major funding the implementation of works will have to be undertaken incrementally as the funds and resources become available. This should logically be prioritised to ensure that urgent items are addressed as soon as possible. Moreover, as previously mentioned in the report, much of the work will have to be done on a case by case basis due to the complexities of ecology and sensitives concerning opinions on the naturalness and 'wildness' of the valley. Thus any biodiversity scoping should be done as and when for the implementation of any works.
- 11.4 The brief outlined the need to produce outline costs for a Conservation Management Plan (including a biodiversity study for the whole valley landscape). It is understood that this requirement relates to DVRL's intention to pursue Heritage Lottery Fund (HLF) support, in conjunction with partner organisations. In reviewing this part of the brief LUC concludes that the commissioning of these additional pieces of work may not be necessary at this stage, but that a Conservation Management Plan may be required at a later stage as supporting information for the Development Phase of an HLF application. HLF Guidance on Heritage Grant applications sets the requirements at each stage <https://www.hlf.org.uk/looking-funding/our-grant-programmes/heritage-grants>. There are three sequential stages :
- First Round: preparing the first application, setting out the project proposals and providing supporting information. In summary this round requires:
    - Outline information on capital work proposals , and on activities proposals
    - Outline of intended project outcomes
    - Information on how the project will be managed & delivered (detailed information for the Development Phase and outline information for the Delivery Phase)
    - Outline information on how the project will be sustained and maintained after funding support has stopped in outline and the first round application requires
    - Information on Project Costs and funding (detailed information for the Development Phase and outline information for the Delivery Phase)
  - Second Round (Development Phase): will follow a successful Round 1 application and will include more detailed project information, potentially including a Conservation Plan, Activity Plan and Management / Maintenance Plan. The Development Phase work may be subject to grant support (Development Funding) from HLF, and this should be applied for in the First Round application.
  - Third Round (Delivery Phase): will follow the Second Round application to HLF, and their 'permission to start '. It will include the Technical Design (RIBA Stage 4) and Construction/ Maintenance (RIBA Stages 5 & 6). The costs of this phase (e.g. capital works, activity programme, in kind and professional fees, contingencies and VAT) will be subject to HLF grant support.
- 11.5 If DVRL intend to seek HLF support, it must follow the above route, and secure partnership support as outlined above. LUC believes that the surveys and reports commissioned recently by DVRL and partners ( i.e. Dean Conservation Area Character Appraisal; Dean Valley Designed Landscape Conservation Statement; Phase 1 and Phase 2 Dean Valley Walkway Feasibility Studies and the Biodiversity Report ) provide a substantial body of information which could be used to support a HLF (or other funding route) application. In this case it may not be necessary to commission a separate Conservation Management Plan until the Development Phase of an HLF project. If required at the Development Phase a Conservation Management Plan would be able to draw heavily on the baseline information provided by the earlier reports, and to focus on updates and amendments to meet the funding body requirements.
- 11.6 For a First Round application to HLF, it is considered that a substantial part of the required information is already available, but there are specific gaps relative to HLF's required outcomes which would have to be addressed. These principally relate to the required 'Outcomes for People' and the need to demonstrate how the local community could engage with the local heritage and benefit from the regeneration of the Dean Valley landscape. This aspect of the First Round HLF requirements may require an Outline Activity Plan, in addition to the tailoring of the existing information to meet the First Round application requirements and may also require further consultation with the local community.
- 11.7 LUC has included an allowance for the preparation of a Conservation Management Plan within the Total Cost Plan (Table 4), and this assumes that the existing reports and surveys would be utilised as baseline information. In this case it would be necessary for the funding application work to progress in a timely fashion, so that the reported information does not require substantial updating. The Total Cost Plan does not include for all the potential work required to support an HLF application , and as indicated above, there are a number of deliverables needed for which additional work will be required.
- 11.8 An important next step would be to develop an **Action Plan** for the Dean Valley Walkway and area that:
- Defines the programme for fund raising/ grant applications and subsequent development stages.
  - Secures support from partner organisations, the community and HLF. This should be a high priority action, as this will determine whether a HLF application is viable, and the scale of funding that is likely to be available.
  - Confirms and progresses the funding application process (HLF or other funders) and the preparation of supporting information for the first round;
  - The Action Plan would distil the mechanisms for delivery of the works, outlining a long term plan of; what needs to be done, when it needs to be done and who needs to/can do it. This should be produced for scenarios which include substantial and limited funding support.

- Determines potential parallel initiatives that could progress imminently without significant funding support i.e. through use of existing resources and by the contributions of community/ volunteer/ special interest groups. This would allow some works to be completed in advance of the larger capital works items, thus maintaining momentum and support. Strategically, it will be important to undertake certain work first i.e. the clearing of ivy to investigate any further areas of damage to structures and railings before extensively repairing these structures; or prioritising the removal of trees damaging structures before removing any trees or vegetation to restore historic views.
- The plan would suggest what works need to be done by a specialist and what works could be done with the help of volunteers, for instance with the Water of Leith Conservation Trust who have already undertaken vegetation management and ivy clearing work to the Dean Valley Walkway. A partnership between DVRL and other organisations could be set up with the aim of collating volunteers and establishing programmes of work suitable for people with differing abilities and interests. This approach could encompass activities which range from simple 'clean-up' days (e.g. similar to that run by the Friends of River the Kelvin), to conservation management activities, possibly involving training programmes.

11.9 One of the HLF requirements would be the preparation of a **Management and Maintenance Plan** – this would be a helpful addition to the work undertaken to-date, and should define the management responsibilities for taking forward the works, and the subsequent upkeep; it will define the maintenance tasks in more detail and take into consideration the programme of works contained within the Action Plan. As maintenance has been highlighted as a major issue this is an important piece of work for the Dean Valley. The Management and Maintenance Plan could be produced in outline for an HLF First Round application, and in more detail at the Second Round.

11.10 There are a number of specialist surveys required to inform the detailed design of restoration works and future management; these principally relate to structures, and to the tree/ woodland cover within the Dean Valley, as outlined in the relevant sections of this report. If an HLF application route is to be followed, then some of this follow-on survey work could be undertaken at the Development Phase, and potentially supported by HLF funding.

## Total Costs

**Table 4**

<b>Item:</b>	<b>Total cost for Chapter Item:</b>
Chapter 4: Buildings and Structures	£224,750
Chapter 5: Railings	£230,000
Chapter 6: Pavements	£310,750
Chapter 7: Signage	£21,100
Chapter 8: Trees	£49,000
Chapter 9: Vegetation Management	£15,000
Chapter 10: Randolph Cliff Area	£39,600
<b>SUB TOTAL*:</b>	<b>£890,200</b>
Update to 2006 Micro Hydro Report	£17,500
Conservation Management Plan ( cost estimate assumed to support a Round 2 HLF Application and utilising the information contained in previous studies )	£15,000
Additional work potentially required for an HLF application: Activity Plan (and associated engagement £10 – 12K ); Management Maintenance Plan (Outline £5-7K); detailed survey/ site investigation works ; HLF application writing	Not costed
<b>TOTAL:</b>	<b>£922,700</b>

\*Please note these totals exclude fees for professional services outlined in the conclusion (i.e. for the Funding Strategy or Action Plan)

## Appendix 1 - Tree Survey Table

Tree No.	Species	Approx Girth (mm)	CEC Easytree Ref	Damaging Wall	Damaging Footpath	Damaging Railing	Other Issues/Comments	Action
T1	Salix alba	2300						
T2	Salix alba	1500-1700					In private garden. Currently blocks views for residents.	Possible pruning of branches
T3	Betula papyrifera	1500					In private garden. Currently blocks views for residents.	Possible pruning of branches
T4	Prunus sp.	300-400					In private garden. Currently blocks views for residents.	Possible pruning of branches
T5	Betula papyrifera	300-400					In private garden. Currently blocks views for residents.	Possible pruning of branches
T6	Fraxinus excelsior	600					Blocking View 20. Suggest removal .	Removal or crown lifting
T7	Fraxinus excelsior	900					Blocking View 20. Suggest removal .	Removal or crown lifting
T8	Acer pseudoplatanus	200					Blocking View 20. Suggest removal .	Removal or crown lifting
T9	Acer pseudoplatanus	/		X			Growing from wall.	Remove
T9	Acer pseudoplatanus	1000						
T10C	Acer pseudoplatanus	900					Blocking View 20, suggest crown lifting	Crown lift
T10B	Acer pseudoplatanus	900					Blocking View 20, suggest crown lifting	Crown lift
T10C	Acer pseudoplatanus	MultiStem					Blocking View 20, suggest crown lifting	Crown lift
T11A & B	Ulmus glabra	/		X			Growing from wall.	Remove

<b>T12A</b>	Ulmus glabra	200						
<b>T12B</b>	Acer pseudoplatanus	200						
<b>T13</b>	Acer pseudoplatanus	1200						
<b>T14</b>	Salix alba	1000						
<b>T15</b>	Salix alba	1500						
<b>T16-20</b>	Ulmus glabra	/		X		X(T19)	All growing from wall. T19 also damaging railing.	Remove
<b>T19</b>	Aesculus hippocastanum	1500						
<b>T20</b>	Fraxinus excelsior	300						
<b>T21</b>	Fraxinus excelsior	1000						
<b>T22</b>	Acer pseudoplatanus	900						
<b>T22A</b>	Ulmus sp.	400						
<b>T22B</b>	Populus sp.	1000				X		Railings seem to have been designed to allow tree growth.
<b>T23</b>	Acer pseudoplatanus	500						
<b>T24</b>	Ulmus sp.	500						
<b>T25</b>	Fraxinus excelsior	500						
<b>T26</b>	Populus sp.	500						

<b>T27</b>	Acer pseudoplatanus	500					Partially blocking view 17.	Prune back to allow views to St Benard's Well
<b>T28</b>	Platanus sp.	500						
<b>T29</b>	Platanus sp.	500						
<b>T30</b>	Alnus glutinosa	500						
<b>T31</b>	Alnus glutinosa	500						
<b>T32</b>	Fraxinus excelsior	500						
<b>T33</b>	Fraxinus excelsior	500						
<b>T34</b>	Acer pseudoplatanus	500						
<b>T35</b>	Acer pseudoplatanus	500						
<b>T36</b>	Fraxinus excelsior	500						
<b>T37</b>	Acer pseudoplatanus	500						
<b>T38</b>	Acer pseudoplatanus	500						
<b>T39</b>	Tilia sp.	500						
<b>T40</b>	Acer pseudoplatanus	700					Blocks views to St Bernard's Well	Prune/Crownlift
<b>T41</b>	Acer pseudoplatanus	700					Blocks views to St Bernard's Well	Prune/Crownlift
<b>T42</b>	Alnus glutinosa	500						

<b>T43</b>	Group of Prunus sp.	200-300						
<b>T44</b>	Group of Prunus sp.	100-300						
<b>T45</b>	Ulmus sp.	900+						Poor condition.
<b>T46</b>	Prunus sp.	300-400						
<b>T47</b>	Fraxinus excelsior	400-500						
<b>T48</b>	Prunus sp.	200-400						
<b>T49</b>	Prunus sp.	200-400						
<b>T50</b>	Prunus sp.	200-400						
<b>T51</b>	Acer pseudoplatanus	200-400						
<b>T52</b>	Group of Prunus	100-400						
<b>T53 - T60</b>	Unknown at this time	/						

## Appendix 2 - Stakeholder Feedback

## Appendix 3 - Drawings and Proposals

## Appendix 4 - Perspective Views