

BEBRA GARDENS MASTERPLAN

APPENDIX F

COPY OF BOUNDARY WALLS INSPECTION BY HILL CANNON PARTNERSHIP



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INSPECTION OF BOUNDARY WALLS

AT

BEBRA GARDENS

KNARESBOROUGH

04116/JWG/LB/27.10.04

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INSPECTION OF BOUNDARY WALLS BEBRA GARDENS KNARESBOROUGH

BRIEF

Acting on instructions received from John Hayton of Harrogate Borough Council, the writer visited the above location on 1 October 2004, in order to inspect and report on the structural condition of all the walls, fences and gates around and within the site boundary.

OBSERVATIONS AND COMMENTS

Individual sections were inspected, the locations of which are shown on the appended location plan numbered 04116/BGK/1.

Fence 1

This is a timber fence, 1050mm high, comprising circular section posts built into the ground at 1600mm centres, a top rail fixed to the posts, and green plastic coated diamond pattern wire mesh fixed to the top rail and posts. The fence is reasonably vertical and straight.

Entrance 2

This is the main entrance to Bebra Gardens, and comprises ornate wrought iron double gates 3300mm wide x 1700mm average height, hung on substantial ornate wrought iron pillars mounted on stone plinths. To the Foundry Gardens side of the double gates is a single wrought iron gate, 1200mm wide x 1850mm high, comprising an angle and flat section main frame with vertical infills from 20mm diameter rod at 120mm centres. The single gate is hung on a substantial angle section post cast into a concrete foundation. The double gates are slightly distorted which prevents closure.



Wall 3

This wall is of random stone construction, bedded in mortar, with an average height of 1650mm on the public footpath side, and an average thickness of 300mm. Along the top are 300mm wide half round stone copings bedded in mortar. The wall retains a variable depth of ground on Bebra Gardens side.

At the top of the wall are wrought iron railings, measuring 900mm high above the wall, comprising 40mm x 10mm flats as top and bottom rails, vertical infills from 15mm x 15mm bar at 100mm centres, with a pointed top end, and 40mm x 10mm flat posts at 2750mm centres set into the top of the copings. Every fifth infill is also extended down and set into the coping. 40mm x 10mm flat stays are fixed between each post and built into the ground on the Bebra Gardens side.

The wall has a variable lean from the vertical towards the retained side, and follows a slight outward curve along its length to suit the line of the footpath. The railings are reasonably vertical. There is a 1500mm long bulged area of wall, 4000mm from the junction with Entrance 2, with cracked mortar. At this location there is evidence of limited previous repairs.

Entrance 4

The entrance comprises a single wrought iron gate, 1200mm wide x 1000mm high, hung on the end of Wall 3, and comprises a main frame of 40mm x 10mm flats and vertical infills from 15mm x 15mm bar at 100mm centres, with a pointed top end. The latch is missing.

Wall 5

This wall is of coursed stone construction, bedded in mortar, following the steps down to Waterside. Average height above the steps is 1300mm, with an average thickness of 450mm at the top. Along the top are 475mm wide flat stone copings, bedded in mortar, laid with a slight fall towards the steps for drainage. The wall retains a variable depth of ground on the Bebra Gardens side.



There is a 32mm diameter tubular handrail, 900mm above the steps along the full length of the wall. The upper third is fixed to 40mm x 15mm flat posts with stays at 1750mm centres, built into the ground. The lower two thirds is fixed directly to the wall face.

The wall is reasonably vertical, following an irregular line to suit the steps. There is an 1800mm long collapsed area at the bottom, which has had the stones removed and the gap infilled with timber planks.

Wall 6

This wall is of semi-coursed construction, bedded in mortar, with an average height of 2500mm on the Waterside face, and an average thickness of 450mm at the top. The top of the wall is covered in dense ivy and inaccessible, therefore it was not possible to determine the presence of copings. The wall retains a full depth of ground behind, and is reasonably vertical and straight. The majority of the pointing to the visible wall face is eroded.

Wall 7

This wall is of random stone construction, bedded in mortar, with an average height of 650mm on the path side, and an average thickness of 200mm at the top. Along the top are individual stones on end at 450mm average centres, bedded in mortar, forming a coping. The wall retains a full depth of upward sloping ground behind, and is reasonably vertical and straight.

Wall 8

This wall is of random stone construction, bedded in mortar, and is a flank wall to a set of steps. Average height above the steps is 400mm, and an average thickness of 200mm at the top. Along the top are individual stones on end at 450mm average centres, bedded in mortar, forming a coping. The wall retains a variable depth of ground behind, and is reasonably vertical, following the line of the steps.



Wall 9

This wall is of random stone construction, bedded in mortar, and is a flank wall to a set of steps. Average height above the steps is 400mm, and an average thickness of 200mm at the top. Along the top are individual stones on end at 450mm average centres, bedded in mortar, forming a coping. The wall retains a variable depth of ground behind, and is reasonably vertical, following the line of the steps.

Wall 10

This wall is of random stone construction, bedded in mortar, with an average height of 1500mm on the Wall 7 side, and an average thickness of 350mm at the top. Along the top are irregular stone copings bedded in mortar. The wall retains an 800mm depth of ground on the paddling pool side, and has a pronounced lean from the vertical towards the pool side, following a reasonably straight line. There are some areas of cracked pointing on the path side wall face, and also on the Wall 7 side face, but this face is difficult to access due to the presence of dense laurel bushes.

Fence 11

This is a timber fence, 550mm high on the pool side, comprising posts at 1500mm centres built into the ground, with top and bottom rails fixed to the posts. The fence is reasonably vertical and straight.

Wall 12

This wall is of semi-coursed stone construction, bedded in mortar, with an average height of 1300mm on the pool side, and an average thickness of 200mm. The wall retains a full depth of upward sloping ground behind, and has a slight lean from the vertical towards the retained side, following an uneven line along its length. A tree is planted immediately behind the wall, on the retained side. The wall is bulged and cracked at the tree location, with some other areas having cracked pointing to the pool side wall face.



Fence 13

This is a timber style fence, 1000mm high, comprising posts at 1750mm average centres built into the ground, top, middle and bottom rails fixed to the posts. The fence is reasonably vertical, in two straight sections with a dog leg at mid-length.

Fence 14

This is a timber fence, with an average height of 1250mm, comprising posts at 1250mm average centres built into the ground, four rails, and green plastic coated diamond pattern wire mesh fixed to the rails and posts. The fence is reasonably vertical, with an uneven line along its length.

Fence 15

This is a timber fence, 1050m high, comprising circular section posts built into the ground at 1600mm centres, a top rail fixed to the posts, and green plastic coated diamond pattern wire mesh fixed to the top rail and posts. The fence is reasonably vertical and straight. Some additional top tails have recently been installed adjacent to the junction with Fence 14 to supplement broken ones. One length of previously repaired top rail has detached from the posts and requires re-fixing. Three lengths of top rail at other locations are damaged and require replacement.

Seats

At various locations throughout Bebra Gardens are timber bench seats with dwarf stone walls to the rear and ends.

CONCLUSIONS AND RECOMMENDATIONS

Fence 1

The fence appears to be in a satisfactory structural condition, and does not require any immediate repairs.



Entrance 2

The gates and pillars appear to be in a satisfactory structural condition and working order, despite the distortion of the double gates, and do not require any immediate repairs.

Wall 3

The wall and railing appear to be in a satisfactory structural condition, and do not require any immediate repairs, although the bulged area of wall referred to in this report should eventually be taken down and re-built.

Budget cost for taking down 1.5 linear metres of existing
bulged wall, and re-building using the same stone ~~✗~~ £500

Entrance 4

The gate appears to be in a satisfactory structural condition and working order, despite the missing latch, and does not require any immediate repairs.

Wall 5

The wall and handrail appear to be in a satisfactory structural condition, and do not require any immediate repairs.

Wall 6

The wall appears to be in a satisfactory structural condition, and does not require any immediate repairs, although the eroded pointing referred to in this report should eventually be attended to.

Budget cost for re-pointing 25m² of external wall face ~~✗~~ £1,000



Wall 7

The wall appears to be in a satisfactory structural condition, and does not require any immediate repairs.

Wall 8

The wall appears to be in a satisfactory structural condition, and does not require any immediate repairs.

Wall 9

The wall appears to be in a satisfactory structural condition, and does not require any immediate repairs.

Wall 10

The wall appears to be in a satisfactory structural condition, and does not require any immediate repairs, although the cracked pointing on the paddling pool face should eventually be attended to.

Budget cost for re-pointing 4m² of paddling pool wall face ~~£~~ £160

Fence 11

The fence appears to be in a satisfactory structural condition, and does not require any immediate repairs.



Wall 12

The wall appears to be in a satisfactory structural condition, and does not require any immediate repairs, although the bulged area of wall referred to in this report should eventually be taken down and re-built, and the cracked pointing attended to.

Budget cost for taking down 2.0 linear metres of existing bulged wall, and re-building using the same stone	£700
Budget cost for re-pointing 3m ² of paddling pool side wall face	£120

X

Fence 13

The fence appears to be in a satisfactory structural condition, and does not require any immediate repairs.

Fence 14

The fence appears to be in a satisfactory structural condition, and does not require any immediate repairs.

Fence 15

The majority of the fence appears to be in a satisfactory structural condition, and does not require any immediate repairs, although the broken rails referred to in this report should eventually be attended to.

Budget cost for providing and fixing three lengths of top rail	£75
Budget cost for re-fixing one existing top rail	£25

X

Seats

The bench seats and dwarf walls appear to be in a satisfactory structural condition, and do not require any immediate repairs.



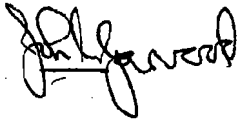
General

The above recommendations are what we consider should be the minimum adopted to ensure the long term serviceability of the walls, fences and gates.

DISCLAIMER

Please note that we have not inspected parts of the walls, fences and gates which are covered, unexposed or inaccessible and we are therefore unable to report that any such part of the property is free from defect.

This report is produced for the benefit of Harrogate Borough Council and no liability is accepted for any reliance placed upon it by a third party. It is not intended for use in undertaking specific repair works and observations contained therein are only applicable at the time of inspection.



.....
JOHN W GARWOOD CEng MICE
For Hill Cannon

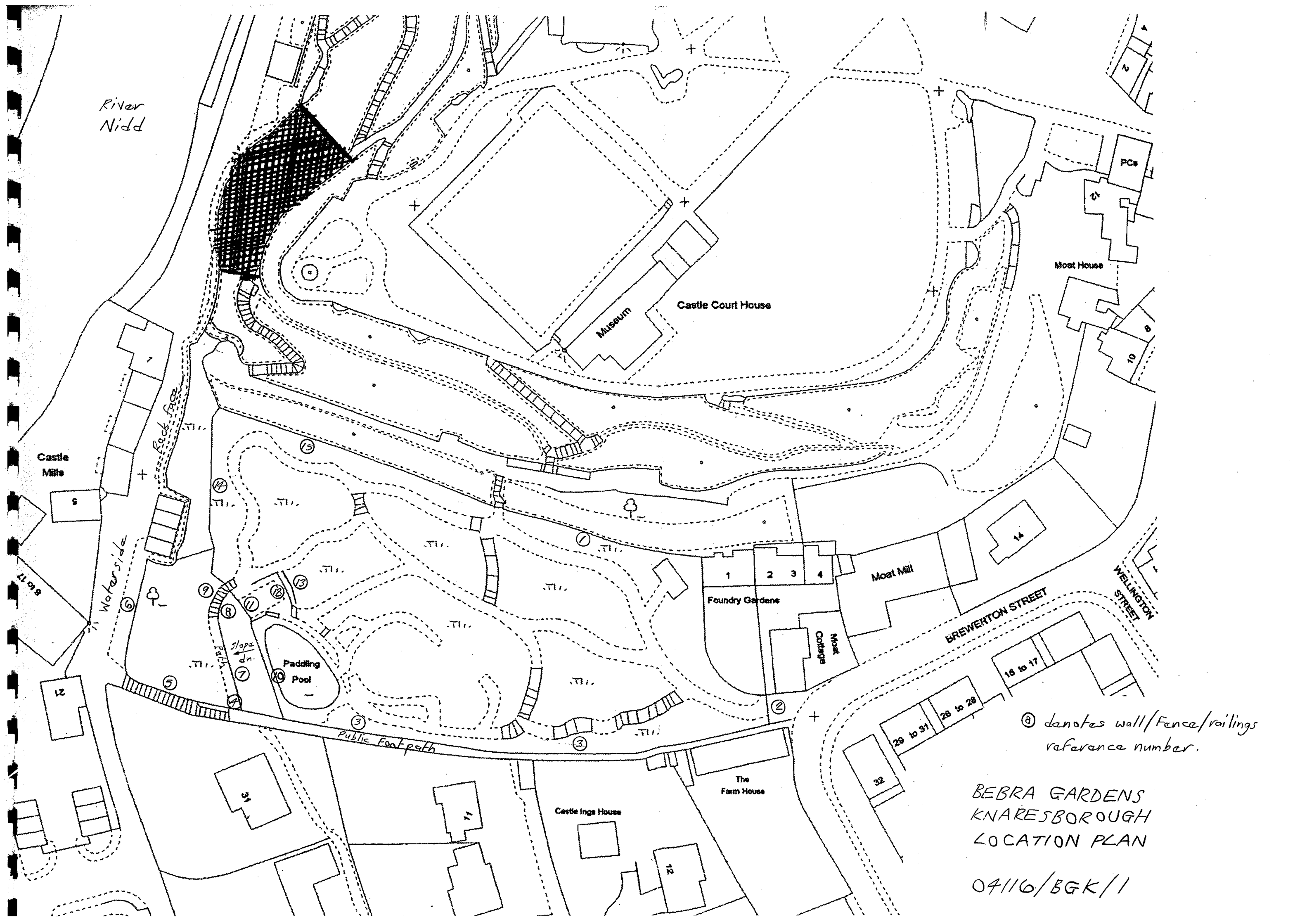


APPENDIX

- Location plan numbered 04116/BGK/1.

04116/JWG/LB/27.10.04





River Nidd

Castle Court House

Museum

Moat House

Castle Mills

Back Lane

Waterside

Foundry Gardens

Moat Mill

BREWERTON STREET

WELLINGTON STREET

Padding Pool

The Farm House

Castle Ings House

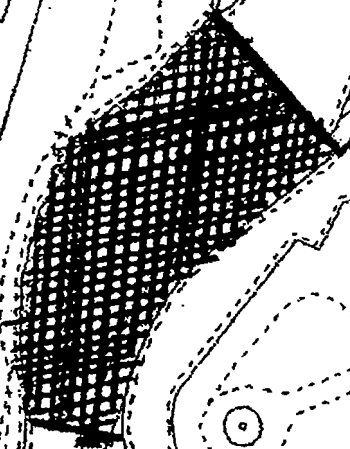
Public foot path

⑧ denotes wall/fence/railings reference number.

BEBRA GARDENS
 KNARESBOROUGH
 LOCATION PLAN

04116/BGK/1

River
Nidd



Museum

Castle
Mills

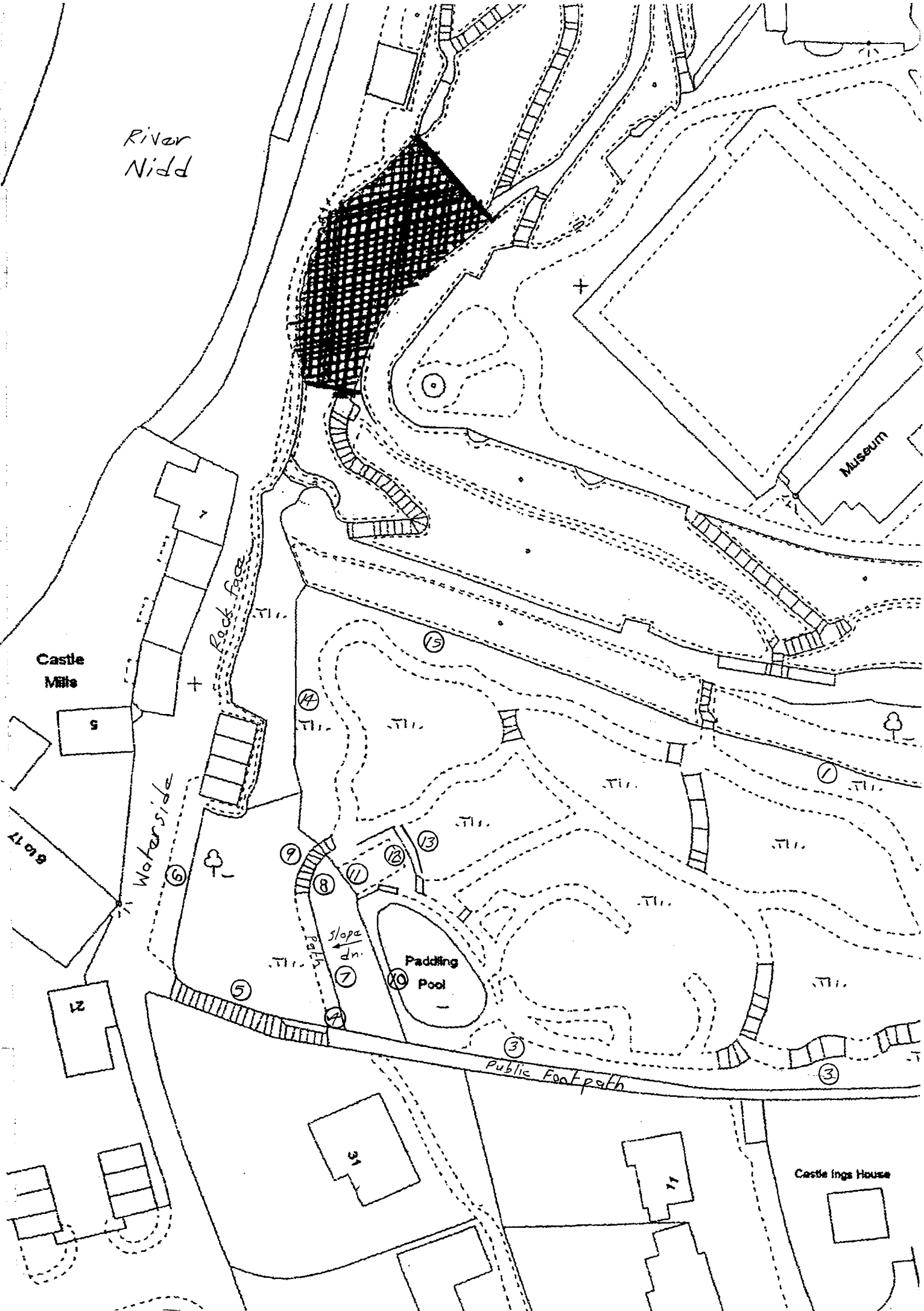
Rock face

Waterside

Padding
Pool

Public Foot path

Castle Ings House





HILL CANNON (UK) LLP

Consulting Civil and Structural Engineers • Parking Consultants • Planning Supervisors



THE PRACTICE was formed in 1967 as a partnership between James Hill and John Cannon. James Hill is retained as a consultant. The current senior partners are Christopher Whapples, Glynn Rhodes and Stephen Vollar.



Since its formation the Practice has carried out more than 9,000 private, commercial, industrial and public commissions using most structural materials including reinforced concrete, structural steelwork, masonry and timber. Members of the practice also have experience in all aspects of Highway Works.



Being independent Consulting Engineers, we can advise impartially on the form of construction and choice of materials best suited for any particular structure.



The design of structured car parks is an engineering discipline in which the Practice is particularly experienced. More than 80 such buildings have been constructed using the TRICON System conceived in 1971 and developed continuously by the Practice. Over 600 other commissions involving inspections, design and remedial works, feasibility studies and advising on all aspects of car parking have been completed. A specialist group has been established to provide Parking Consultancy, offering advice on all aspects of parking and parking structures.



Many commissions have been carried out involving major alteration works associated with the refurbishment of buildings, both ancient and modern.



Having worked on many successful commissions for clients involved in 'Design and Construct' contracts, the Practice is well experienced in producing designs where sound and well considered engineering principles result in economical and durable structures.



The Practice is experienced in assessing structural problems and the partners have acted as expert witnesses in disputes related to the construction industry.



The Practice is not restricted geographically. Design commissions have been carried out economically for buildings sited throughout the United Kingdom from the south coast of England to the north of Scotland. Designs for work overseas are regularly undertaken.



Several papers have been published in technical journals, and members of the Practice regularly speak at seminars throughout the UK.

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BEBRA GARDENS MASTERPLAN

APPENDIX G

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REPORT ON

Bebra Gardens Ecological Survey

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TABLE OF CONTENTS

SECTION	PAGE
1.0 INTRODUCTION.....	1
2.0 APPROACH	2
3.0 ECOLOGICAL FEATURES	3
3.1 Habitats	3
3.1.1 Woodland.....	3
3.1.2 Scrub	3
3.1.3 Rockery.....	4
3.2 Species.....	4
3.2.1 Bats.....	4
3.2.2 Birds.....	4
3.2.3 Other Fauna.....	4
4.0 RECOMMENDATIONS AND OPPORTUNITIES	5
4.1 Woodland	5
4.2 Mature trees	6
4.3 Scrub	7
4.4 Rockery	7
5.0 REFERENCES.....	8

LIST OF FIGURES

Figure 1 Ecological ‘Walk Over’ Survey

LIST OF APPENDICES

Appendix 1 Bird Nesting Box Design
 Appendix 2 Creating a bog garden

1.0 INTRODUCTION

The objectives of the ecological walk over survey were as follows:

- to identify features of ecological value (and potential ecological value) within the Gardens; and
- to propose recommendations for the management of the Gardens in favour of identified features, and suggest potential opportunities for habitat creation to enhance the ecological value of the Gardens.

2.0 APPROACH

A survey of Bebra Gardens was undertaken on Thursday 8 March 2007. This entailed walking the entire site, noting observations of any important ecological features. Particular attention was directed at the following:

- mapping of habitats within the Gardens;
- looking at ways of developing the Gardens as a wildlife resource

3.0 ECOLOGICAL FEATURES

3.1 Habitats

3.1.1 Woodland

Much of Britain used to be covered by woodland and thousand of species have adapted to living in this habitat however, few native woods remain in Britain today. The area of semi natural woodland area just outside the western boundary of the site is significant in the context of Bebra Gardens as it represents a ‘wild’ area where native flora can flourish. The area includes semi mature ash and sycamore; the ground flora consisted of bramble, cow parsley, dock, dandelion and garlic mustard; ivy is abundant and provides ideal cover and nesting habitats for birds.

Although Bebra Gardens has been mainly planted with ornamental shrubs and trees, these are of particular value to birds as they provide a variety of habitats for birds to forage and nest in. Blue tits live in the canopy, robins sit amongst the lower branches and dunnocks and blackbirds feed on the ground. Several large mature trees are of particular importance in the Gardens, particularly horse chestnut and sycamore, several of which have small cavities that could be suitable places for small birds to roost and evergreen conifers provide cover for birds all year round.

3.1.2 Scrub

The moat area on the northern side of the Gardens provides a valuable area of native scrub; it has a variety of grasses, tall ruderal plants such as rosebay willowherb, nettle and broad leaved dock and woody plants such as bramble and elder. Scrub provides nectar for insects and seeds for birds and mammals. Tall herbs and grasses growing alongside the scrub offer shelter for small mammals and nest sites for birds; species of birds likely to nest in this habitat are dunnock and wren which prefer closed canopy scrub. This habitat is at the early stages of woodland succession with self seeded ash in evidence.

Photograph X – Scrub in moat area next to Bebra Gardens.



3.1.3 Rockery

The rockery is a historical feature of the garden and has recently been planted with alpines. Surrounding the rockery are areas of bare ground, ornamental shrubs and trees. The rockery is on a steep slope and at the base of the rockery is a small marshy area, once thought to be a spring.

3.2 Species

3.2.1 Bats

The friends of group have not reported any sightings of bats in the area but the Gardens would be suitable habitat for bats, with sheltered spots amongst large trees providing abundant invertebrate prey. Also being situated in the midst of residential dwellings, these houses might act as the most likely roosting sites for bats foraging in the Gardens.

Being situated closely to The Yorkshire Dales National Park it is likely that there will be bats present in the area, the National Park itself contains ten species of bat. Several of the mature trees on site had small cavities that could be used by bats and some trees on the fringes of the site had coverings of ivy which would also be suitable for bats to roost in. As Bebra Gardens is located near to a river it will be suitable habitat for Daubentons bats and the nearby by bridge could be a potential roosting site.

3.2.2 Birds

Many species of birds were noted during the survey including long tailed tit, blackbird, great tit, blue tit, wood pigeon, greenfinch, crow, robin, wren, nuthatch, jackdaw, magpie and house sparrow. A rich habitat of trees, shrubs and flowers provide an ideal habitat for birds. Several large conifers and shrubs such as laurel provide quiet places for birds to hide and forage. Considering the close proximity to the river and areas of woodland on the opposite banks of the river. It is likely that many more bird species visit the Gardens from these areas.

3.2.3 Other Fauna

Other fauna observed during the survey were a grey squirrel and a red admiral butterfly.

4.0 RECOMMENDATIONS AND OPPORTUNITIES

4.1 Woodland

One form of woodland management that would benefit the site would be to create habitat piles from the trees due to be removed from the Gardens. By stacking sections of logs and branches into piles in hidden corners of the site it would provide habitats for invertebrates. Those attracted could be centipedes, which eat slugs and also ladybirds which are a known asset to any garden; one ladybird is thought to consume 5,000 aphids in its lifetime.

Other quiet area of the Gardens such as the corner next to the Foundry, are ideal habitats for birds but could be developed by planting native berry producing small tree such as rowan or berry producing shrubs such as hawthorn, cotoneaster or pyracantha.

Photograph X – Wildlife area next to the Foundry



4.2 Mature trees

At present the trees are of limited value for hole nesting birds and bats. This is because there are too few holes and crevices that are suitable for inhabitation by these creatures. To provide potential nesting and roosting opportunities, bird boxes and bat boxes should be affixed to the trees in suitable positions. The location of individual boxes depends upon a range of factors, including prevailing winds, density of surrounding foliage and potential for disturbance and / or vandalism. It should be noted that persons erecting these should be trained in how to use a ladder.

Provision of Bat Roosts

The provision of artificial roosting spaces, in the form of bat boxes would benefit any bats foraging in the area. Nine bat boxes which should be a mixture of wooden bat boxes and Schwegler 2F bat boxes are recommended to attract different species of bats. These would be erected on mature trees at a height of 4 metres. Each tree should have two or three bat boxes, to provide roost sites with different aspects (Cowan, 2003). The entrances to the boxes should be clear of branches so that the bats have a clear flight path.

Provision of bird nesting boxes

The provision of nest boxes for bird species using the Gardens would be of benefit. Many types of boxes are available but generally the entrance hole varies depending on what type of bird you are trying to attract. Birds are opportunists and will take advantage of any sites available. In Bebra Gardens it is likely that these species could be attracted to use nest boxes:

- 25mm for blue and great tit;
- 28mm for great tit;
- 32 mm for house sparrows and nuthatches;
- 46mm for starlings; and
- 50mm for great spotted woodpeckers.

The nest box hole should be at least 125mm from the bottom of the box to prevent young birds falling out (RSPB 2006). To attract robins, a small box with a 100mm high open front should be designed. For further information on nest box design please see Appendix X

4.3 Scrub

Area of scrub such as those on the banks of the castle moat, should be left as overgrown areas to provide nectar, seeds and cover for various invertebrates, small mammals and birds.

4.4 Rockery

At present, other than the paddling pool, there are no waterbodies at the site. The creation of a bog garden at the foot of the rockery would provide an extra dimension, encouraging a whole range of flora and fauna to the site. To enable this, several elements would have to be explored; whether the water emerging is acid or alkaline as many bog garden plants thrive in acid conditions. Also, the area suggested would need to be excavated to a minimum of 45 cm (Royal Horticultural Society). For further detailed instructions on creating a bog garden please refer to the information provided in Appendix X.

To further enhance the habitat, locally sourced wetland plants could be introduced to include the following: purple loosestrife, flowering rush, marsh marigold, water avens, native iris such as stinking iris and yellow flag.

5.0 REFERENCES

Alana Ecology <http://www.alanaecology.com/>

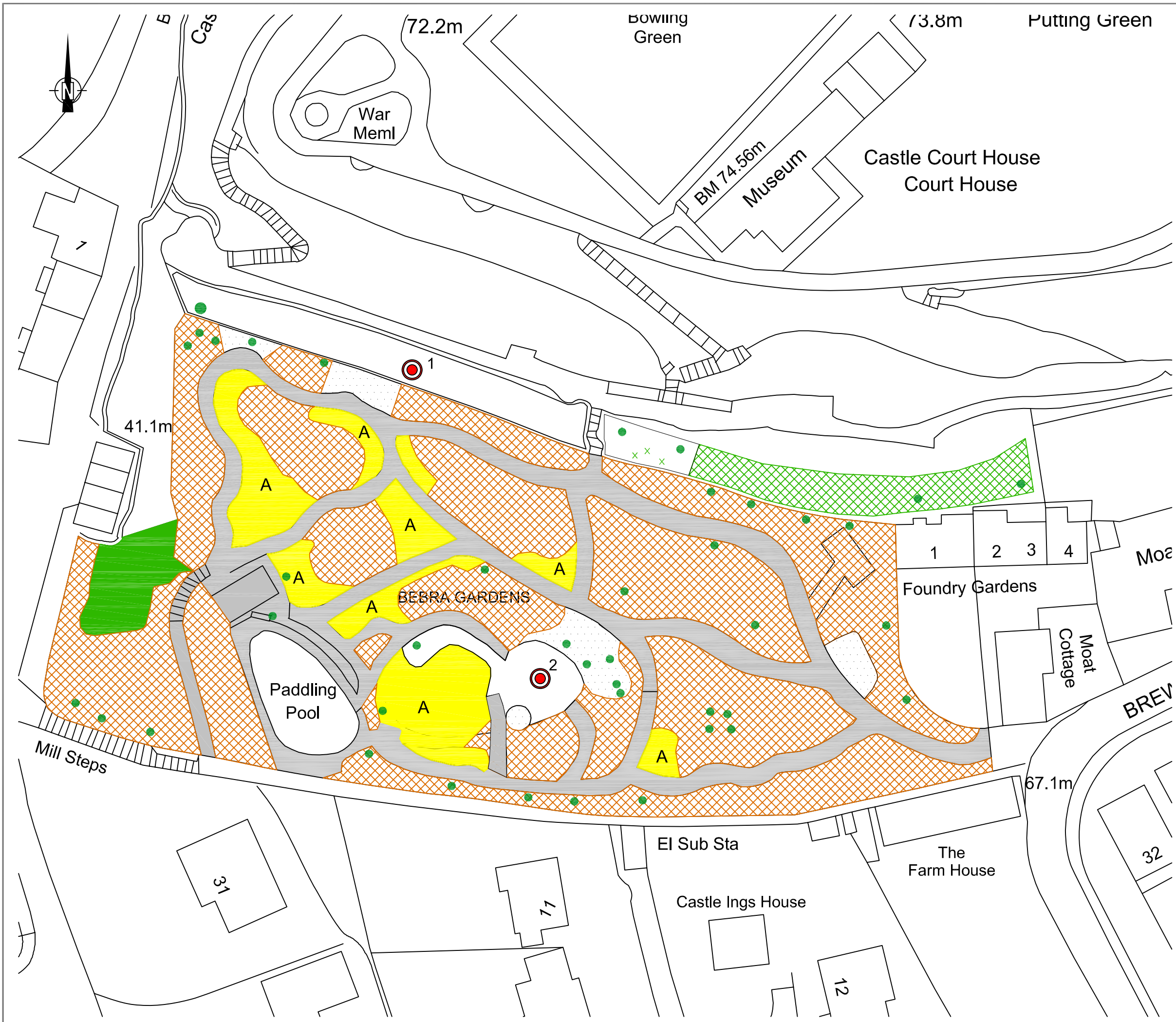
Cowan, A. (2003) *Trees and Bats*. Arboricultural Association, Romsey.

Royal Horticultural Society http://www.rhs.org.uk/advice/profiles0503/bog_gardens.asp

RSPB (2006) Making a nestbox RSPB Website

<http://www.rspb.org.uk/advice/helpingbirds/nestboxes/nestboxes/making.asp>

FIGURE 1



- Legend**
- Semi natural Broad-leaved Woodland
 - Standard/Single Trees
 - Dense Scrub
 - Scattered Scrub
 - Introduced Shrub
 - Amenity Grassland
 - Hardstanding
 - Bare Ground
 - Ground flora
cleavers
cow parsley
ivy
nettle
dogs mercury
cuckoo pint
garlic mustard
lesser celandine
grass species
planted daffodils
Canopy
ash
 - Rockery

Rev	Description	Chkd	Appd	Date
Client				
Harrogate B C				
Project				
BEBRA GARDENS				
Title				
Ecology "Walk Over" Survey				
Project No.	06582255	Checked	J.F	Scale
File No.	582221	Approved		1:500 @ A3
Created By	G.K.	Date	March 2007	Status
Figure No.	1			Draft
Revision				



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APPENDIX 1



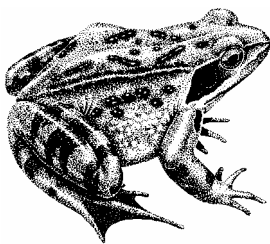
You can add to the wildlife value of your pond by creating an adjacent marshy area. This will provide a natural buffer or link between the pond and neighbouring habitat, and add to the food and shelter available to wildlife. Lots of interesting and beautiful native plants can be grown, which will attract a host of wildlife. Also, if it is not possible to have a pond at all for some reason, a bog garden is a good alternative in itself, and just as valuable for wildlife. Some insects depend on certain plants found in marshy areas in order to complete their life cycle, for example the orange tip butterfly lays its eggs on lady's smock, which the caterpillars will then feed on.

If you are lucky enough to have a naturally marshy area, leave it to grow over the summer and see if anything interesting comes up. You can then add more native plants as necessary.



Orange tip butterfly

If starting from scratch, choose a low-lying area and dig out a hollow if necessary (to about 30cm deep). Line with liner off-cuts, old plastic sacks or bags, or all of these. If using new liner or liner overhanging from a pond liner, make a few holes in it and cover with crocks. Replace any removed turf over the edges of the liner, and/or edge with logs, soil and stones. Replace some of the soil, and plant up with suitable plants (see list below). Make a path through the area if it is large (e.g. stepping stones). Also include some rotting logs, and stones, as these will provide homes for invertebrates and also attract the animals that feed on them. Amphibians may also shelter and feed here, and hibernate here over the winter.



In the wild, bogs usually stay damp not only because they have inhibited drainage from above, but also because they draw up water from underneath. This is very unlikely to happen in the garden, so in addition to watering in dry summer months, you could consider burying a perforated hose in the soil. The hose can be connected up to a water supply, so that the bog can be watered from below.

Bog Garden Creation

Bog Garden Creation

Suitable plants for a marshy area include:

Meadowsweet *Filipendula ulmaria* (fairly tall, good for birds in autumn, may become invasive)

Purple loosestrife *Lythrum salicaria* (tall, good for bees)

Lady's smock (cuckoo flower) *Cardamine pratensis*

Gipsywort *Lycopus europaeus*

Ragged robin *Lychnis flos-cuculi*

Marsh marigold *Caltha palustris*

Water forget-me-not *Myosotis scorpioides*

Hemp agrimony *Eupatorium cannabinum* (tall, good for insects)

Various native rushes and sedges (may become invasive)

Bugle *Ajuga reptans* (creeping)

Water avens *Geum rivale*

Marsh woundwort *Stachys palustris*

Creeping Jenny *Lysimachia nummularia* (ground cover)

Birdsfoot trefoil *Lotus comiculatus*

Bogbean *Menyanthes trifoliata*

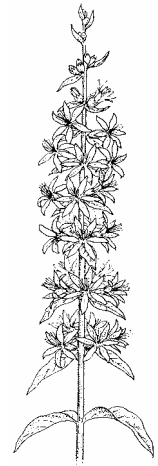
Brooklime *Veronica beccabunga* (creeping)

Great burnet *Sanguisorba officinalis*

Meadow buttercup *Ranunculus acris*

Common fleabane *Pulicaria dysenterica*

Skullcap *Scutellaria galericulata*



Purple loosestrife



Cuckoo flower



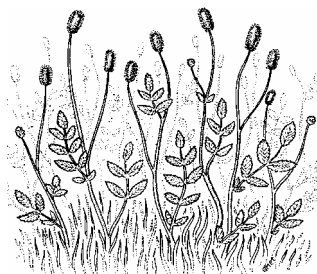
Flowering rush



bugle



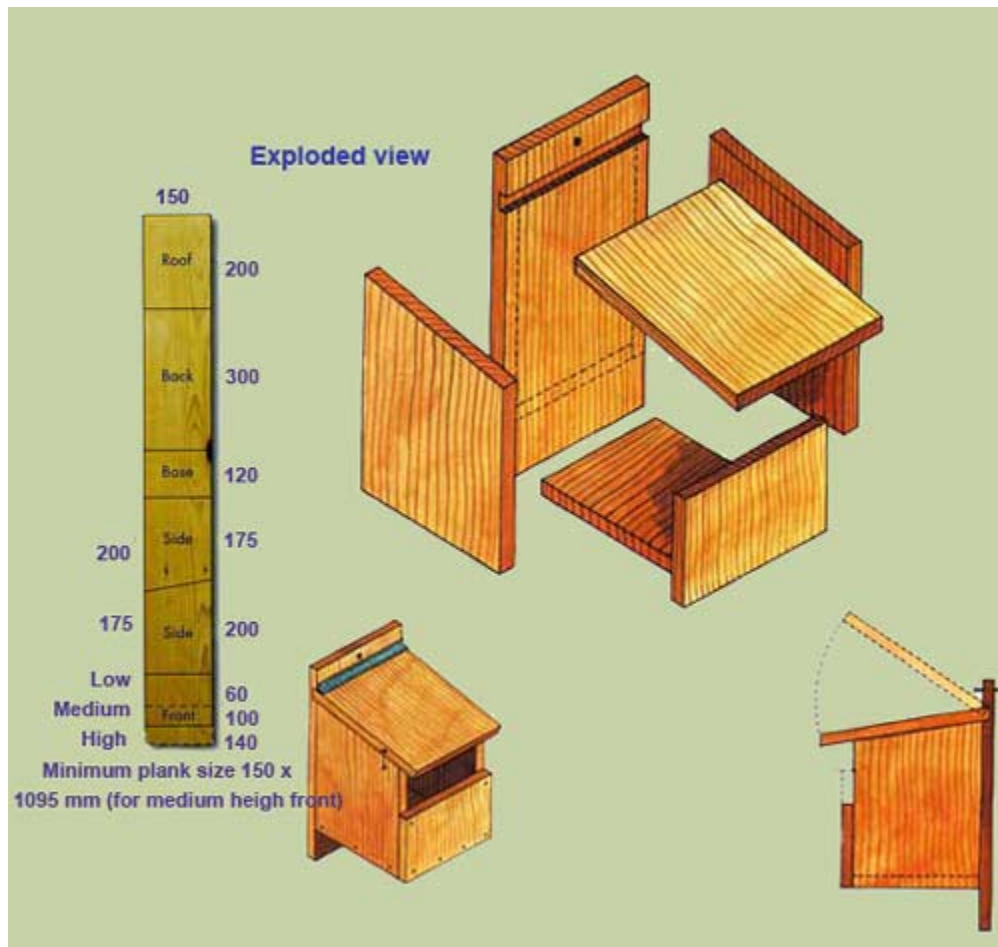
bogbean



Great burnet

APPENDIX 2

Robin Box



(British Trust for Ornithology 2004)