



2015



2017

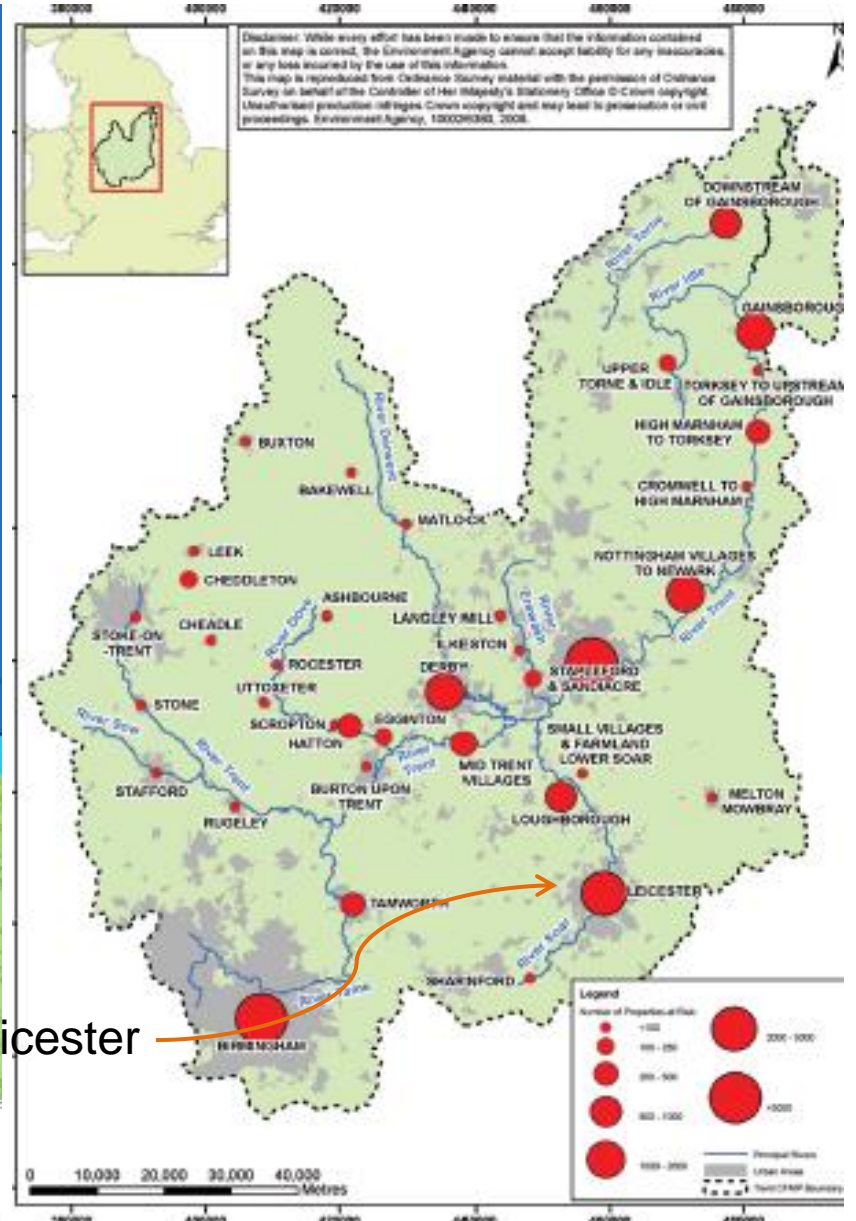
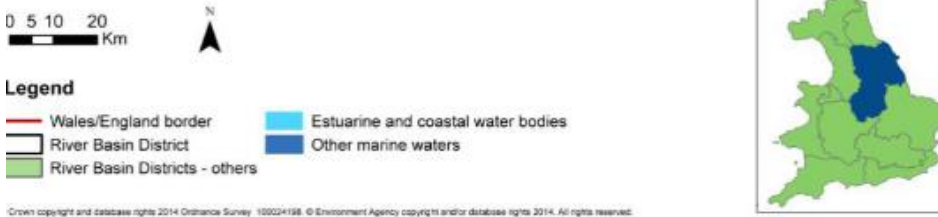
2016



Leicester: some surprising facts

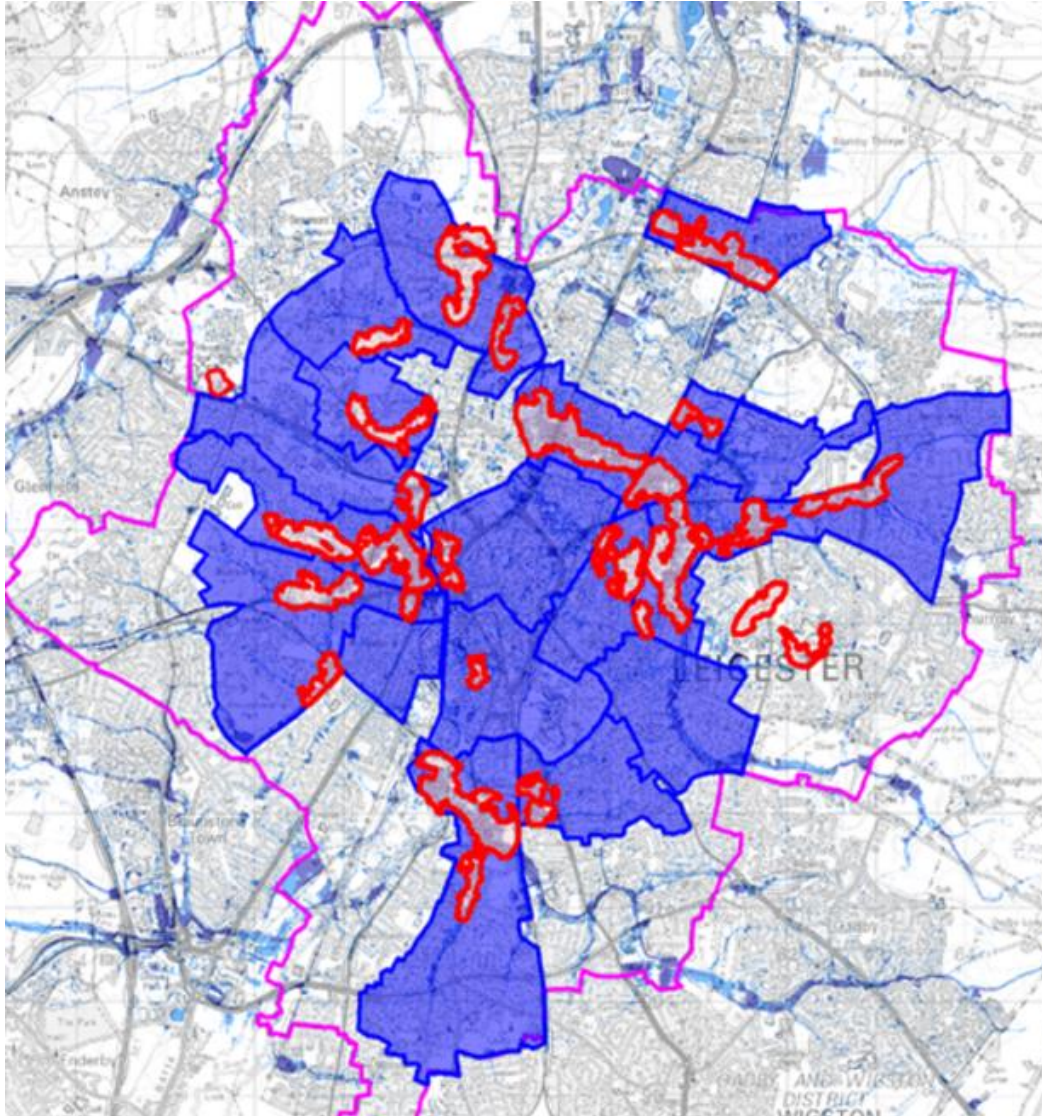


Leicester; in the top 5 principle urban areas at risk from flooding



Leicester

River basin management area



**All forms
(Spatial planning)**



- Promote sustainable drainage (SuDS)
- Issue formal developer guidance for SuDS schemes.

- Alignment of planning policies with LFRMS and control of surface water run-off.
- Implement SuDS legislation.

- Flood risk management strategy embedded within planning and economic development activity



Leicester City Council
Preliminary Flood Risk Assessment
September 2011



URS

LEICESTER CITY COUNCIL

SURFACE WATER MANAGEMENT PLAN
PART 1 REPORT
MAY 2012

UNITED KINGDOM & IRELAND

PREPARED FOR:

Leicester City
local development framework

CORE STRATEGY
adopted
July 2014

Supplementary Planning Document

Climate Change Adopted January 2011

Leicester City
local development framework

Supplementary Planning Document

GREEN SPACE SPD
Adopted April 2011

one passion
one leicester

Leicester's Biodiversity Action Plan 2011 - 2021

Sustainable Drainage Guide

September 2014

Policies

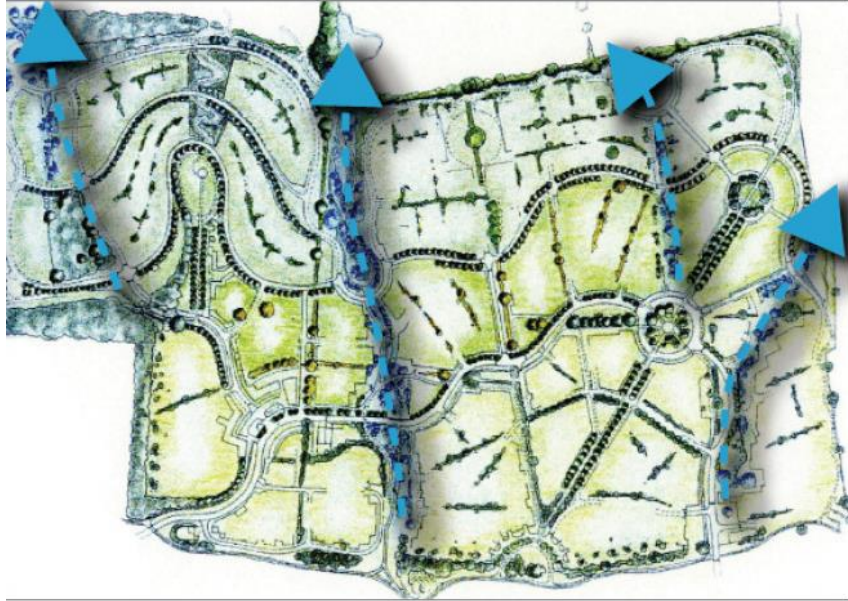


Figure 3: Map showing North Hamilton, the location of SuDS and the flow of water



Hamilton Leicester

Sustainable design

Multi functional 10 year old suDS



Dave Singleton talking about Melton post 16 school in a swale
Talking to our flood defence manager, head of highways adoption
planners



Summer 2011



Winter 2011/2012



Summer 2014



Photo Helen O'Brien

What the mayor said...

January 2018



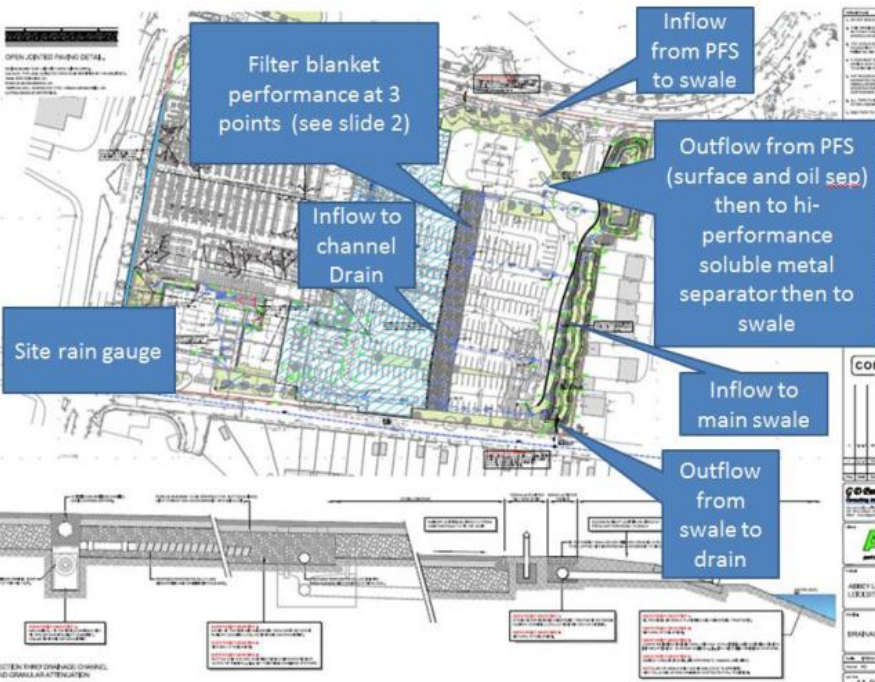
before



Evington Brook
Spinney Hills Park



Permeable paving
Tesco Braunstone Gate



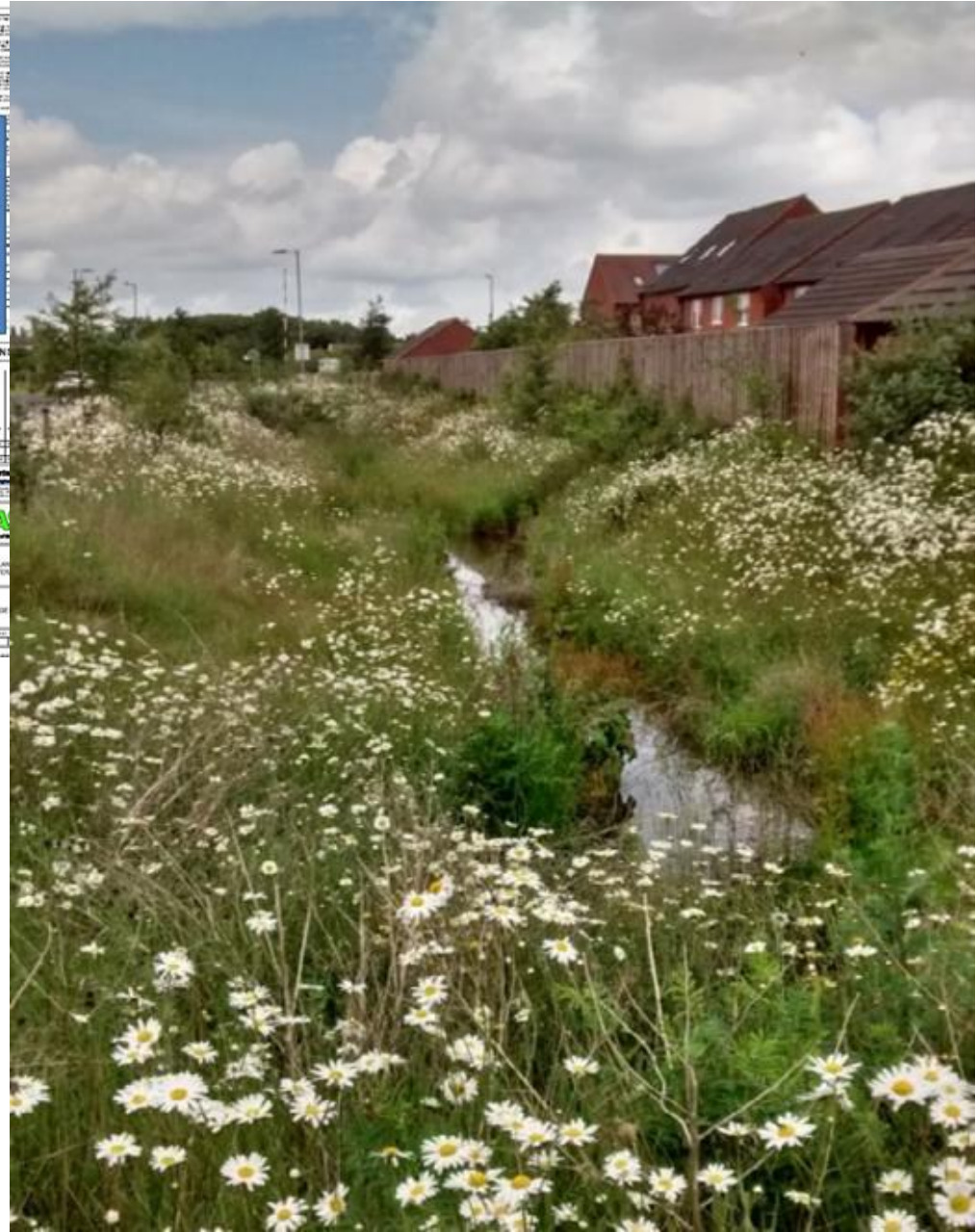
Warning! Sharks!

Okay, there aren't really any sharks, but this pond is not for swimming or fishing or anything else.

It's part of an innovative system that collects rainwater and helps to prevent flooding in the area.

Please stay safe and stay out of the water.

ASDA





KEY ELEMENTS OF THE RIVER TO CITY CONCEPT

EXPOSED AGGREGATE FINISH

PRAIRIE PLANTING

RAIN GARDEN

AQUATIC THEMED PLANTING

SUITABLE TREE SPECIES

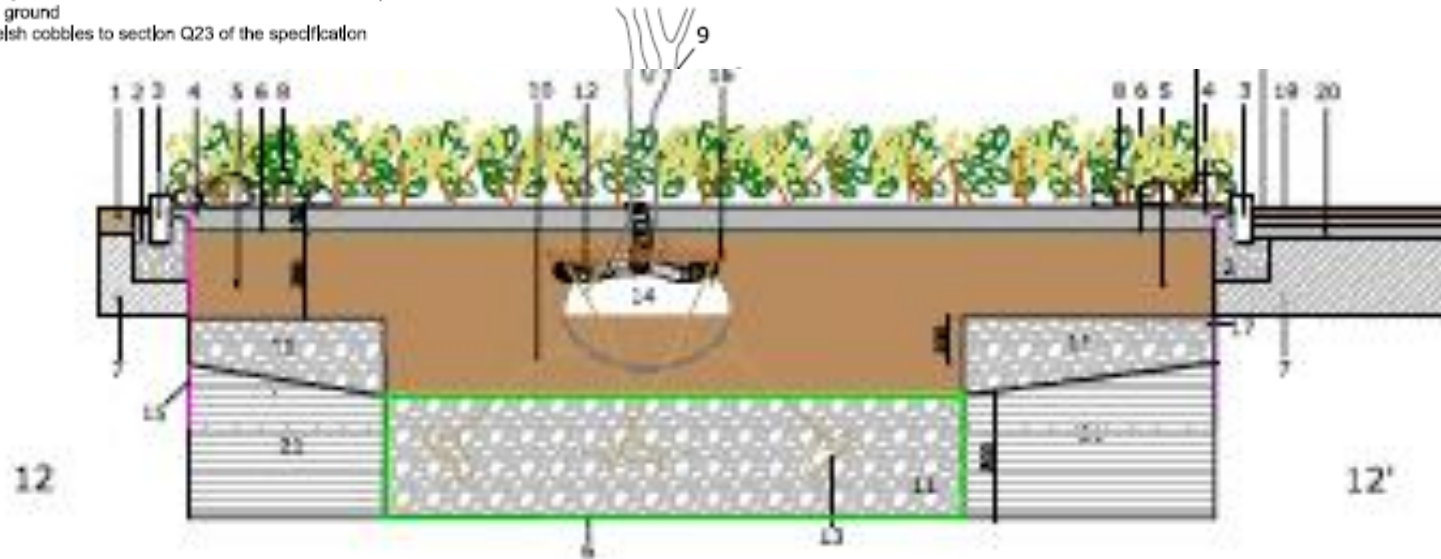
KEY

HARD LANDSCAPE PROPOSALS

SOFT LANDSCAPE PROPOSALS

DETAIL 12 : SECTION 12 to 12' - 1:25 SCALE**Proposed rain garden / exposed aggregate / porphyry paving**

1. Proposed Insitu concrete surfacing with exposed aggregate finish to section Q21 of the specification (100mm depth)
2. Concrete foundation to section Q10 of the specification
3. Raised silver grey granite edging (75 x 200 x 450mm) to section Q10 of the specification
4. 100mm depth free draining river washed gravel to Q23 of the specification
5. Manufactured topsoil created from site won sub-soil material to Q28 of the specification
6. Geotextile Terram 1000 wrap to section D20 of the specification
7. Existing road surfacing
8. Proposed rain garden planting to section Q31 of the specification
9. Proposed ornamental tree planting to section Q31 of the specification
10. Anchoring wires to section Q31 of the specification
11. Proposed site-won crushed free draining stone (30-50mm normal size) to section D20 of the specification
12. Irrigation system to Q31 of the specification
13. Proposed anchoring system to Q31 of the specification
14. Proposed tree / rootball see section Q31 of the specification for details
15. Root barrier where required see Q31 specification for details
16. Timber triangle 30 x 125 x 900mm softwood timber
17. 150Ø drain pipe connected to existing drainage system as overflow system
18. Proposed porphyry paving (150 x 50mm x random lengths) to section Q25 of the specification
19. 40mm depth mortar bed to section Q25 of the specification
20. 60mm depth DBM binder course to section Q22 of the specification
21. Existing ground
22. large welsh cobbles to section Q23 of the specification

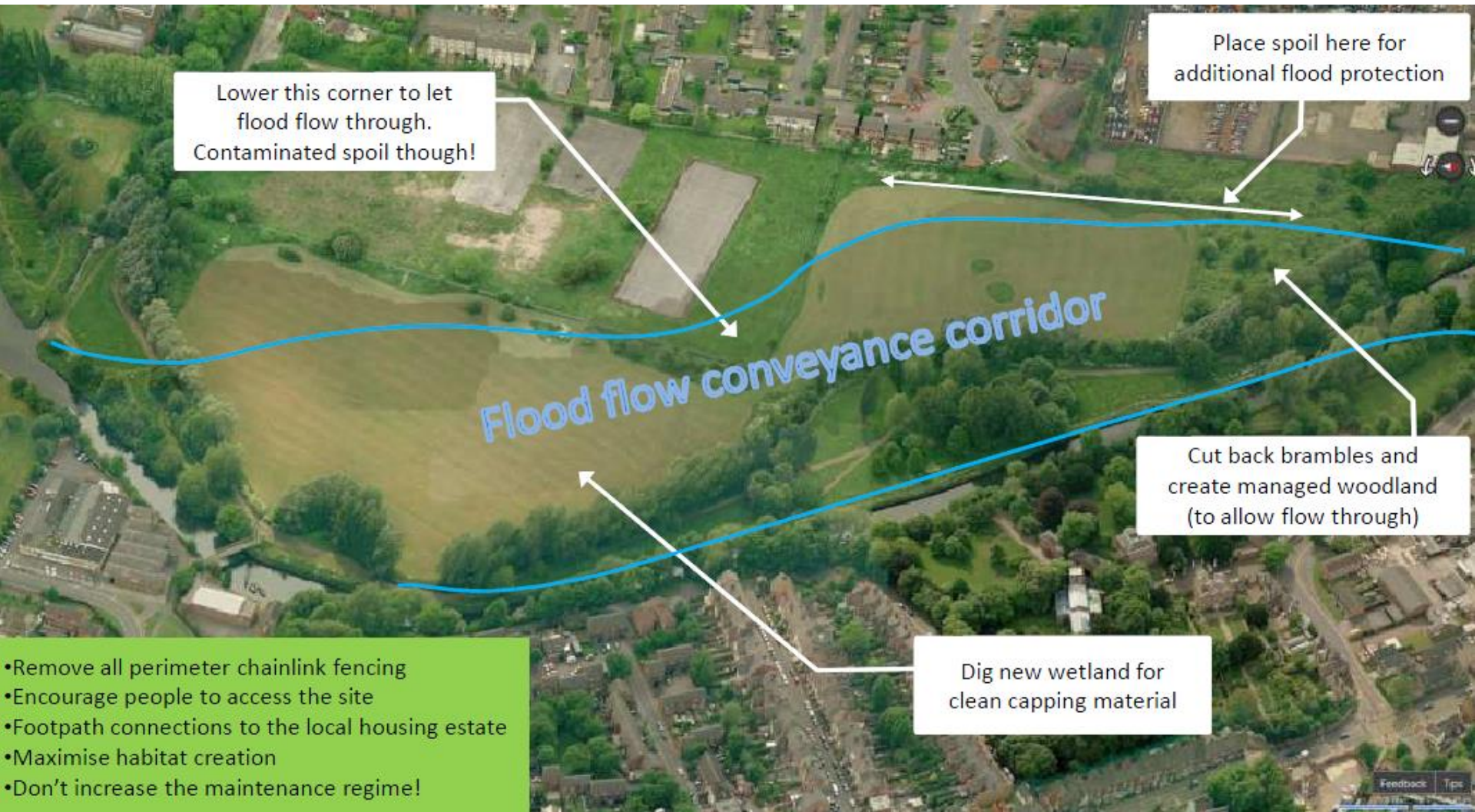




Before 2014







Ellis Meadows

Innovative delivery of flood alleviation through green infrastructure

Chryse Tinsley: Landscape Architect, Leicester City Council

Jonathan Vann: Managing Director, Riverscape Environmental Consultants

www.leicester.gov.uk/parks



- 1 Flood Retention Lake
- 2 Woodland habitat
- 3 Wildflower Meadow
- 4 Picnic Area

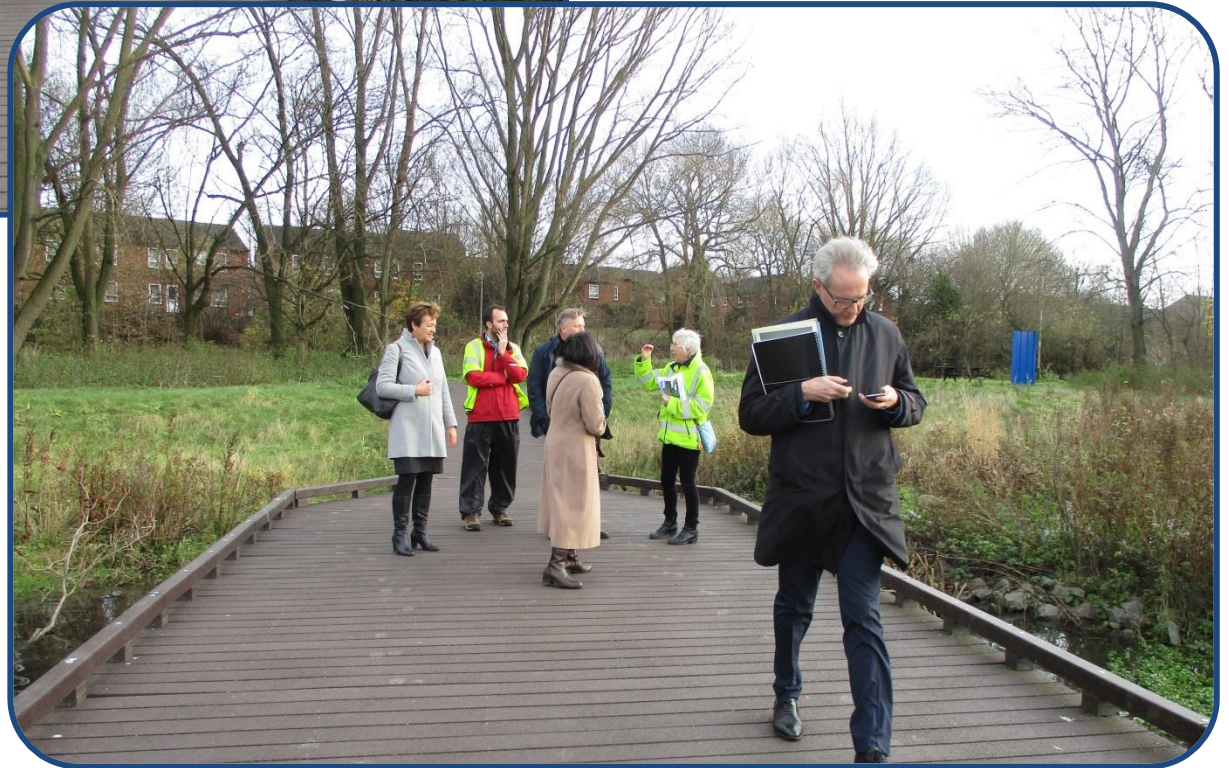
- Cycle Route 6
- E Entrances



Environment secretary Andrea Leadson launches new funding scheme; Natural Flood Management; from Ellis Meadows



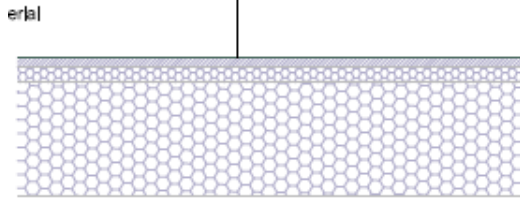
Leicester goes Italian





City centre schemes

Flexible parking - permeable
As NBS Q22/
40mm aggregate drain asphalt 10mm
60mm permeable asphalt 20mm
450mm coarse graded aggregate
on Terram 1000



Surface Type 4a
FLEXIBLE PERMEABLE CAR PARK
(New Construction)

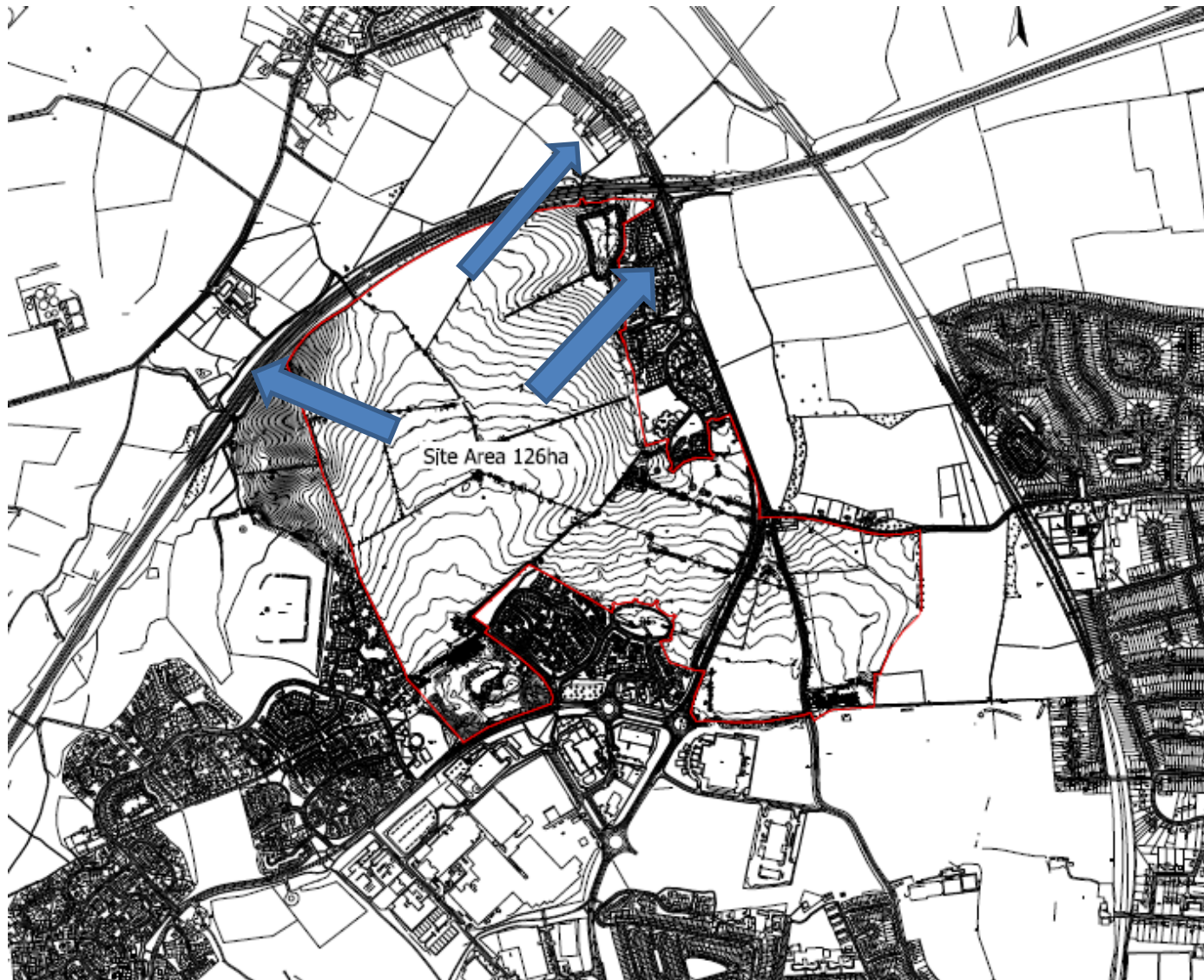




Oakley's Road



Ashton Green is seen as the most innovative and sustainable new development in Leicester in more than 30 years and will enable substantial progress towards delivering the 20,000 new homes needed in the City over the next 20 years.



Ashton Green



The site in general slopes down to the A46 which forms the main northern boundary. Presently it is drained by a network of field boundary ditches and other water courses some of which convey water year round. Where possible these should be retained and improved by the addition of ponds and cascades into which swales can be linked. This will attenuate and treat the increase in surface water runoff from roads, parking areas and alike.

ive SuDS strategy



the swale

the pond

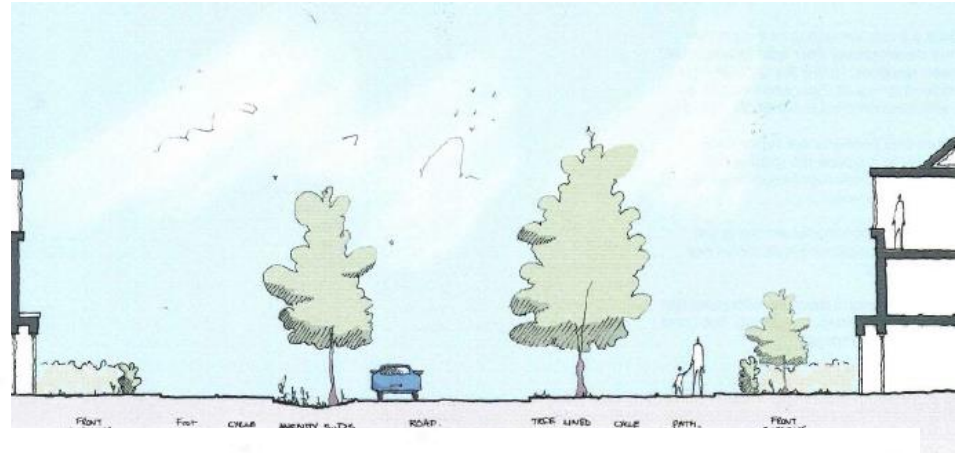
the highway



Phase 1 Feb 19 2018

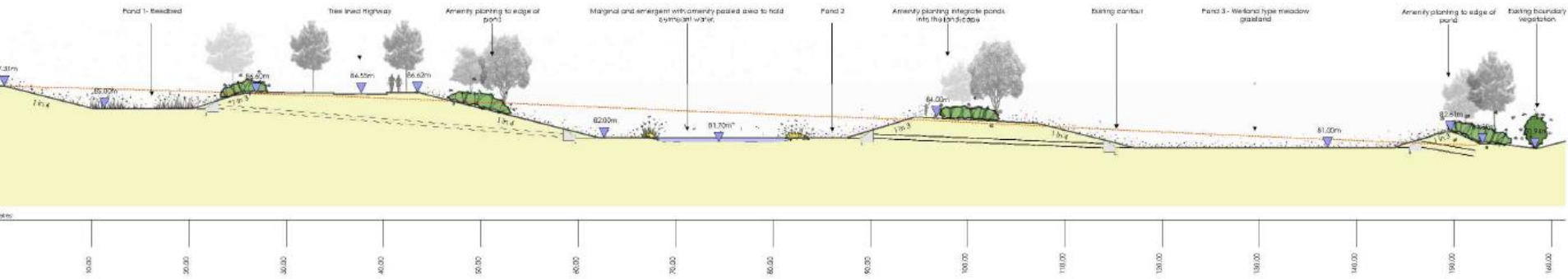


Phase 4

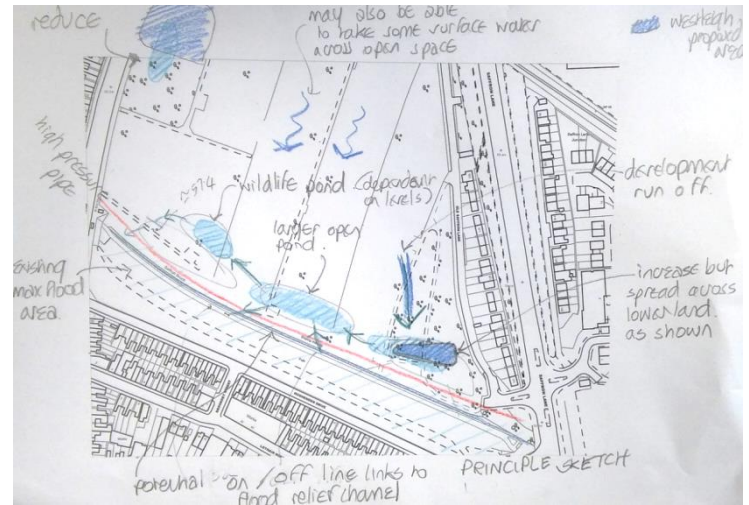




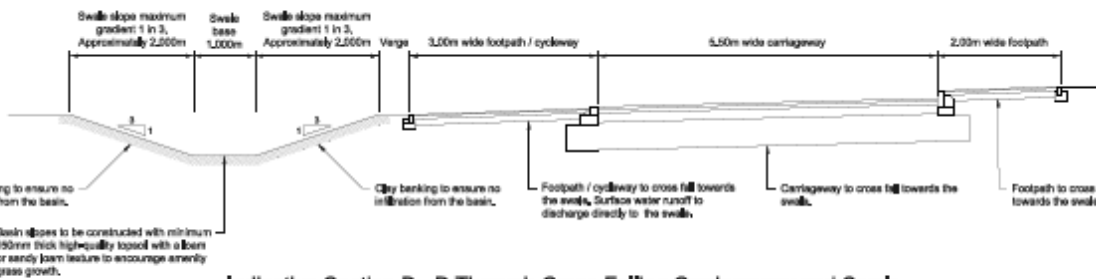
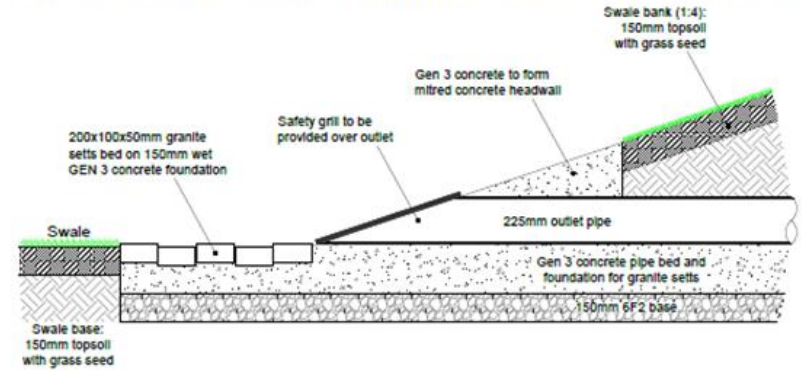
Phase 4



New housing



MITRED CONCRETE HEADWALL - HW1, HW2, HW4, HW6, HW7, HW9 & HW10



Indicative Section B - B Through Cross Falling Carriageway and Swale

Deterior basin to be constructed in accordance with adopting authority standards and CIRIA Report C789 - The SuDS Manual.

Levels to be confirmed at detailed design stage.

St Mary's allotments

Riverside improvement works

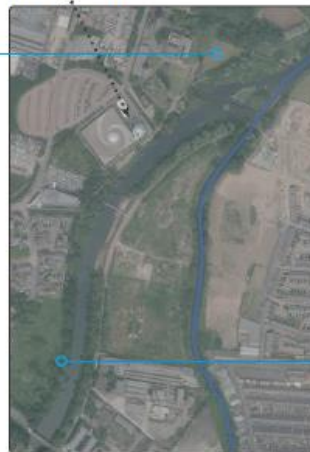
Leicester City Council is working with the Environment Agency on projects along the River Soar to reduce the risk of flooding and make better use of land for development and open public space. This will include the creation of temporary water storage sites, improved access to waterside public spaces and additional places for local wildlife.

Swan's Nest Wetland

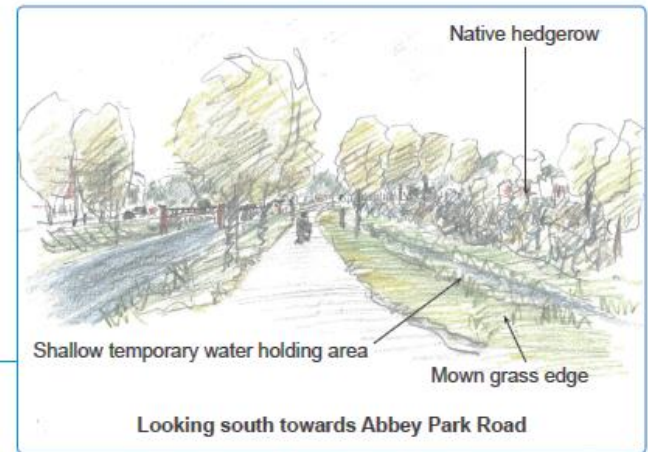


This site will feature a new shallow pond to compliment the existing wetland, offer enhanced views of the weir, and see the planting of new fruit trees and a wildflower meadow. Swan's Nest Wetland will also provide temporary flood compensation for development at the former John Ellis site, and help to improve water quality and biodiversity along Corporation Road ditch.

Space Centre



Cardinal's Meadow



We will be opening up the frontage by removing the fencing to help access along the pathway, creating a series of ponds and wetland to store water when needed and improving areas for wildlife by planting trees and wildflowers.



ESTABLISH PREFERENCE ON ORGANISATION THAT WILL TAKE LONG TERM RESPONSIBILITY + MAINTENANCE OF THE <u>SUPS, STREETS + OPEN SPACES</u>			STAGE A CONCEPT DESIGN
SUPS [*] DESIGN IN ACCORDANCE WITH LCC STANDING ^{**} ADVICE	SUPS [*] DESIGN NOT IN ACCORDANCE WITH LCC STANDING ^{**} ADVICE	HYBRID	STAGE B DESIGN DEVELOPMENT
AGREEMENT OF LCC ADOPTION IN PRINCIPLE	CONFIRMATION OF MANAGEMENT CO ARRANGEMENTS	? ASSESSED ON SITE BY * SITE BASIS	
LCC ADOPTION (SUBJECT TO FINAL APPROVAL BY LCC) MANAGEMENT + MAINTENANCE SCHEDULE AGREED (MECHANISM) COMPUTED SOMS CALLOCATED + AGREED (MECHANISM)	? WHAT NEED + HOW MUCH FLEXIBILITY ? WHAT SIGN -OPES REQUIRED	?	STAGE C FINAL DESIGN - PLANNING APPLICATION
			STAGE D TECHNICAL APPROVALS
			STAGE E FINAL INSPECTION / HANDOVER
* ¹ IN DOCUMENT NEED TO CLEARLY STATE OUR STANDING ADVICE * ² WITH A CHECKLIST OF ...			

Technical adoption guide

Hierarchy of approaches

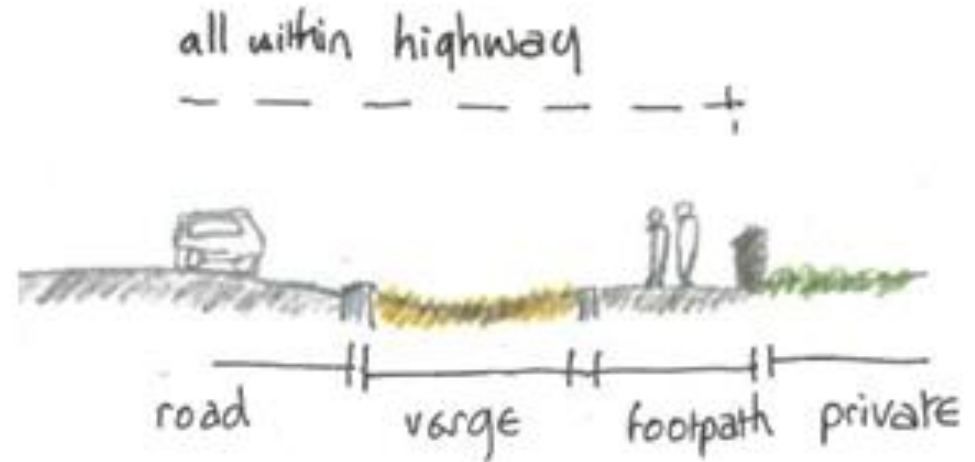
Design aims

- Surface water should be kept at surface as much as possible
- Design should be looking at containing and limiting run off from site
- Suds is a preferred option

Adoption

- Method of build should be as simple as possible
- The area from the back of the footpath to and including road carriageways should all be considered highway; this applies whether the green areas are to be maintained by the city council or by a management company

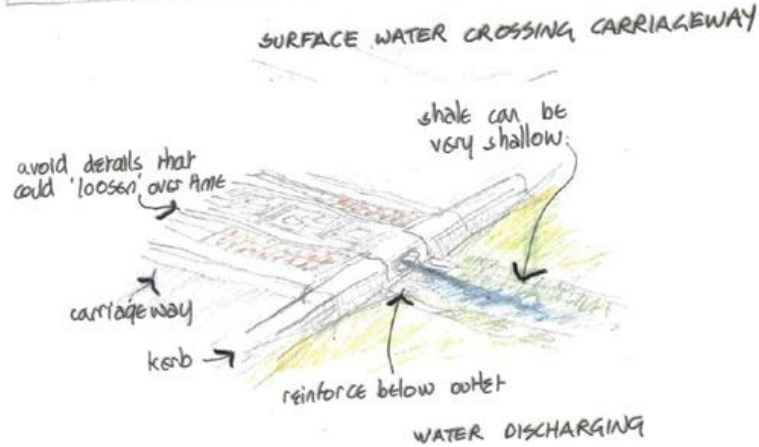
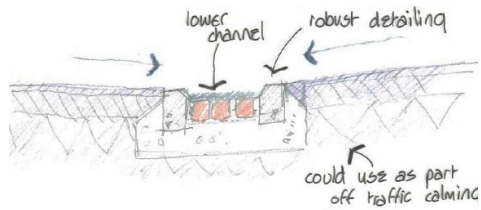
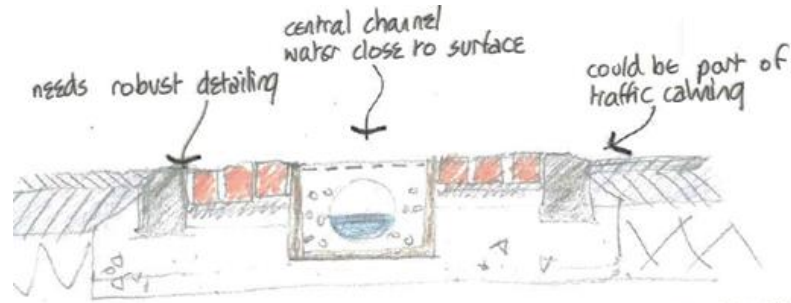
Commuted sums will be dependent on whether it can be adopted by a management company and the degree of risk



Aim

to keep water close to surface

- limits excavations,
- keeps swales shallow
- limits danger
- makes maintenance easier



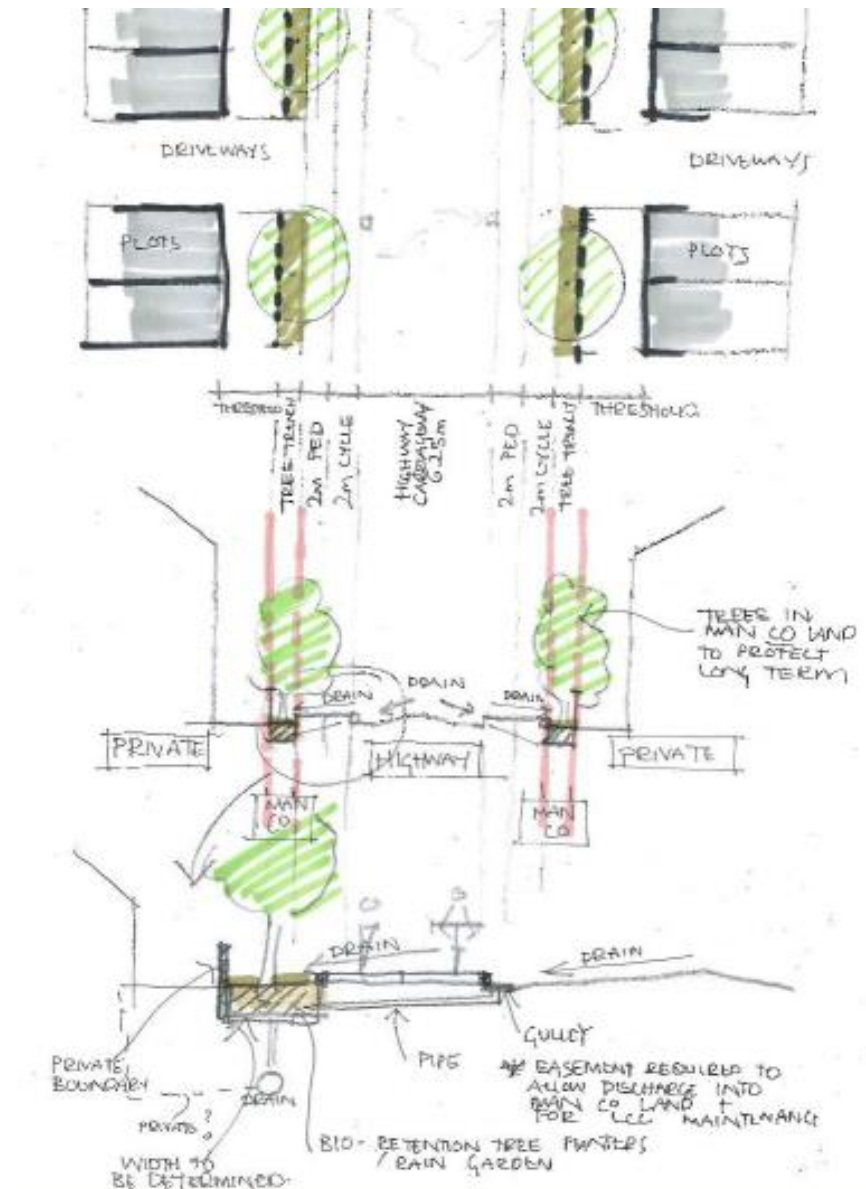
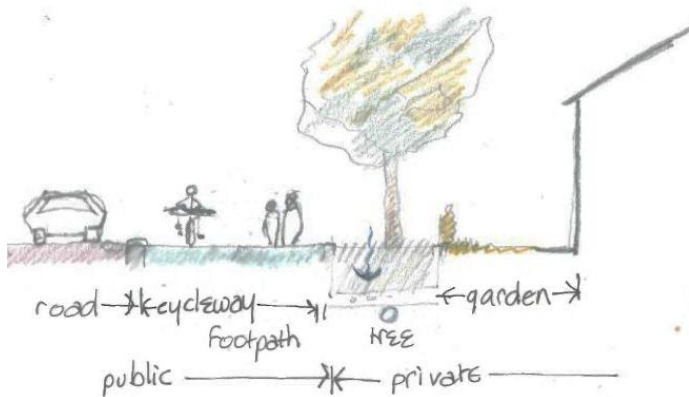
Culvert emerging from road; needs to discharge onto reinforced surface

Commuted sum negotiable

Trees to back of footpath/cyclepath

- Highway extent of responsibility back to footpath to back of footpath
- Management company or private owner beyond this area

The tree/soft verge takes highway run off. The highway authority have an easement to manage the water but the management of the tree and soft areas is the management company's



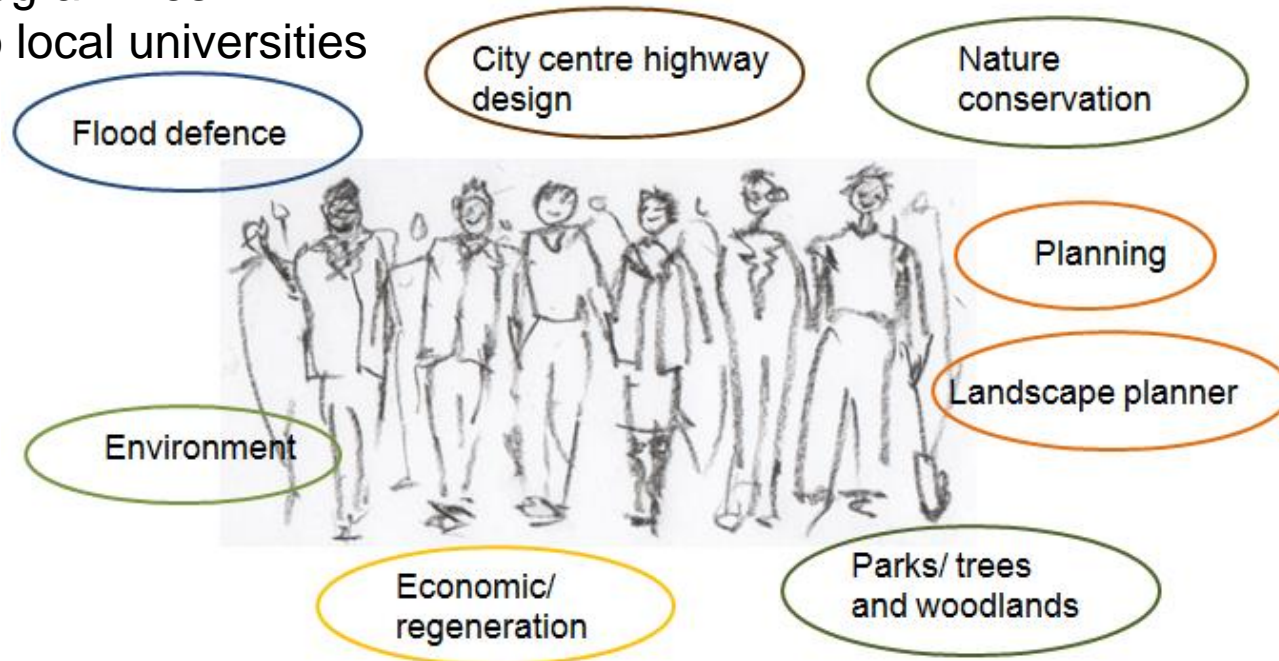
No Commuted sum

Successes

- Changing attitudes
- Increasing numbers of good case studies
- Possibilities re painless adoption

Challenges

- Schools programmes
- Getting into local universities



.. from a local resident who wrote into the council on June 16th 2017

'Have just discovered Ellis Meadows ... and wanted to say how wonderful it is. The mass of white daisies were beautiful and the large ponds lovely. I realise from the signboards that it is in essence part of a flood relief scheme along the River Soar, but it really is a lovely natural area'

Disconnected downpipe

Happy parks officer

Rain garden



Enthusied children

be happy