

Exploring the Potential of Green Infrastructure

Peter Wilder

w i l d e r a s s o c i a t e s

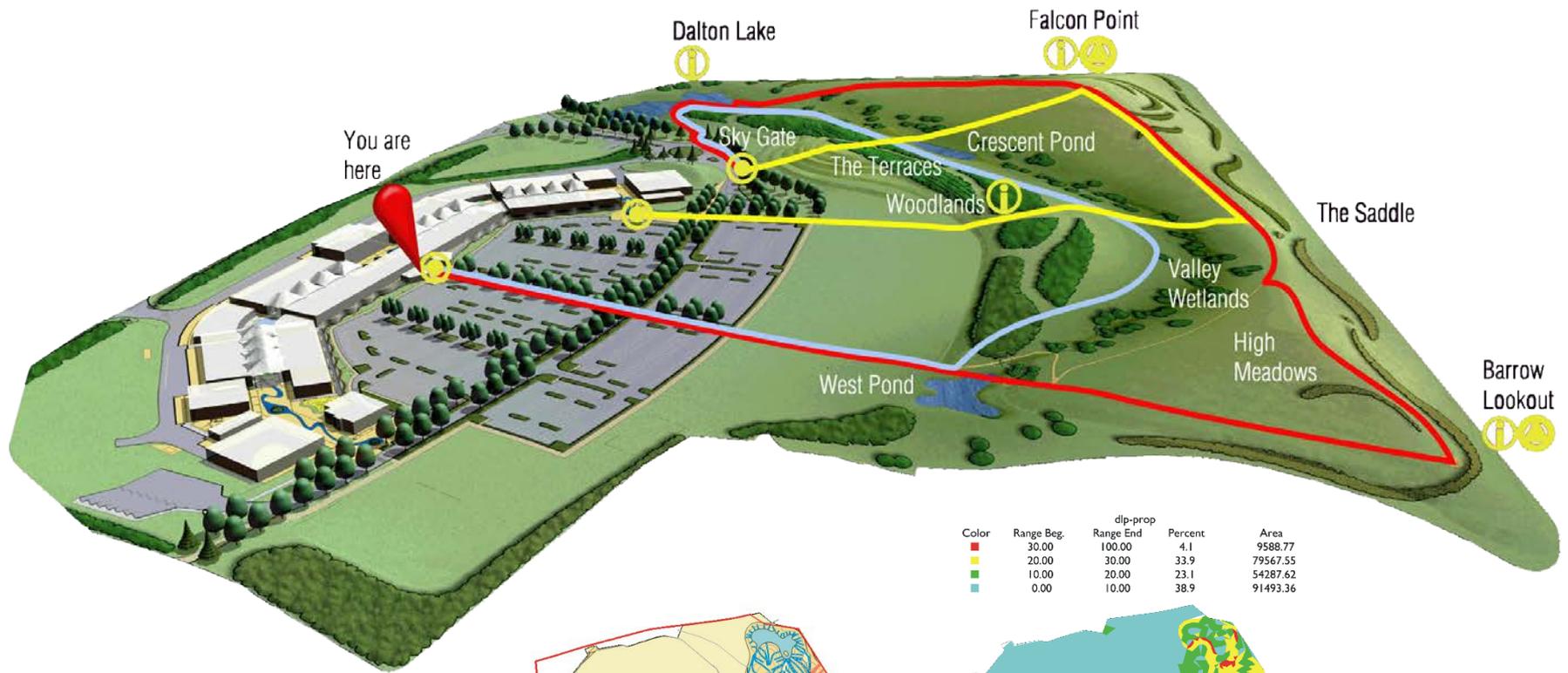


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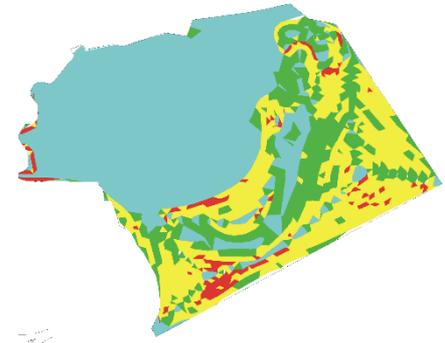
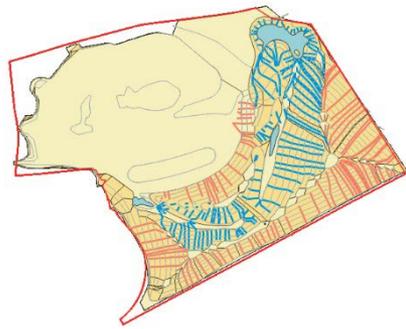




DEALING WITH CONTAMINATED LAND



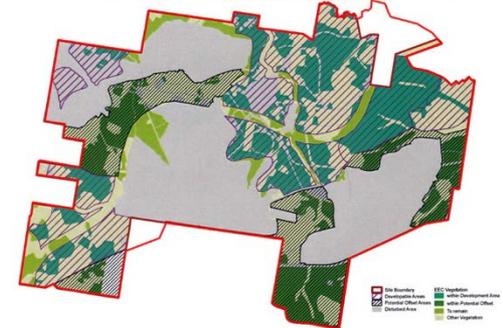
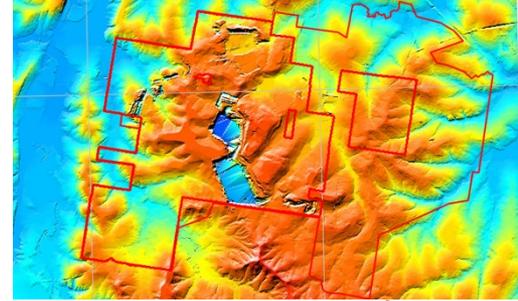
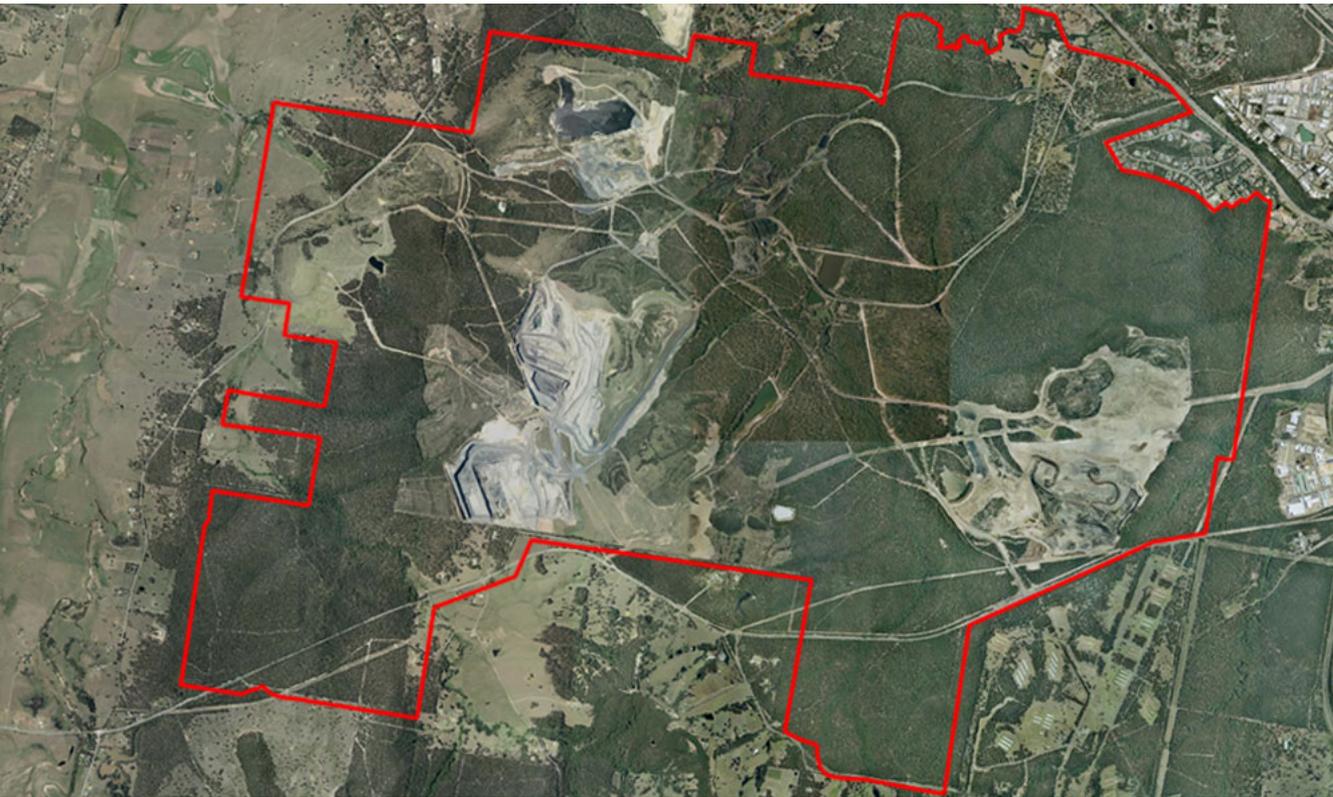
Color	Range Beg.	Range End	d/p-prop Percent	Area
Red	30.00	100.00	4.1	9588.77
Yellow	20.00	30.00	33.9	79567.55
Green	10.00	20.00	23.1	54287.62
Blue	0.00	10.00	38.9	91493.36



HYDROLOGY AND LANDFORM AS PART OF MASTERPLAN



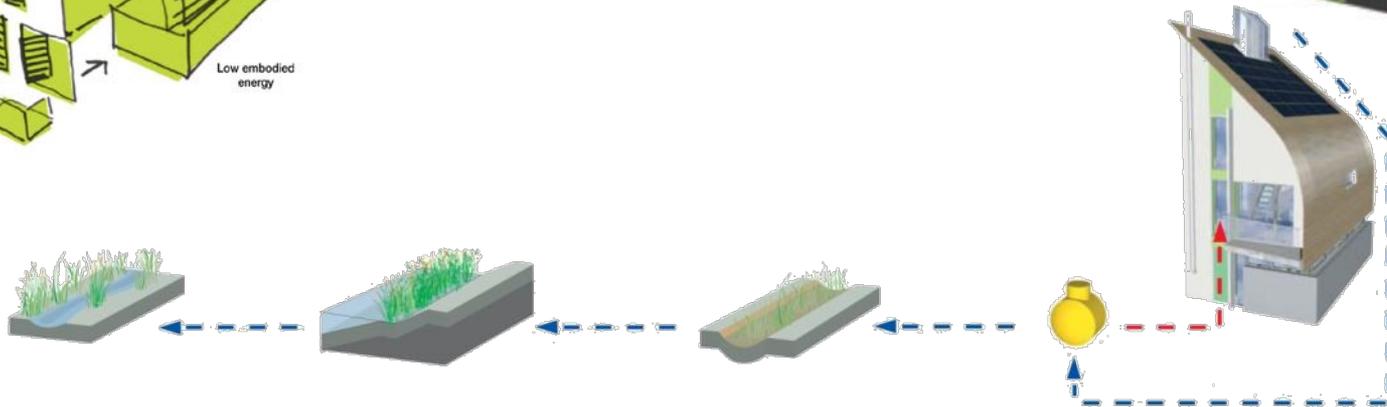
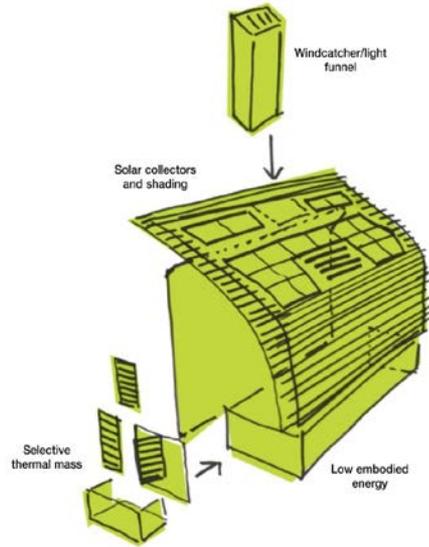
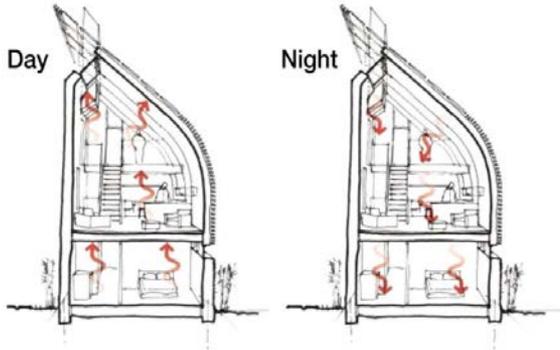
THE CREATION OF PLACE



LARGE SCALE LAND RESTORATION



BRE INNOVATION PARK 2005



PROTOTYPE FOR NEW CARBON NEUTRAL BUILDING 2007



1

CED Ltd.
Cedec Gravel

2

The Natural Coatings Co.
Interlocking Block

3

Sustainable Drainage Systems Ltd.
Vortex Flow Control

4

Dupont™
Xavan® Pond Liner & Plantex

5

British Sugar Topsoil
Topsoil

6

Arnold Laver Timber World
Timber Decking

7

Envac Automated Waste Collection
Surface Receptacle

8

Formpave Ltd.
Aquasett Paving

9

Aquila Design
Amaryllis Bench

10



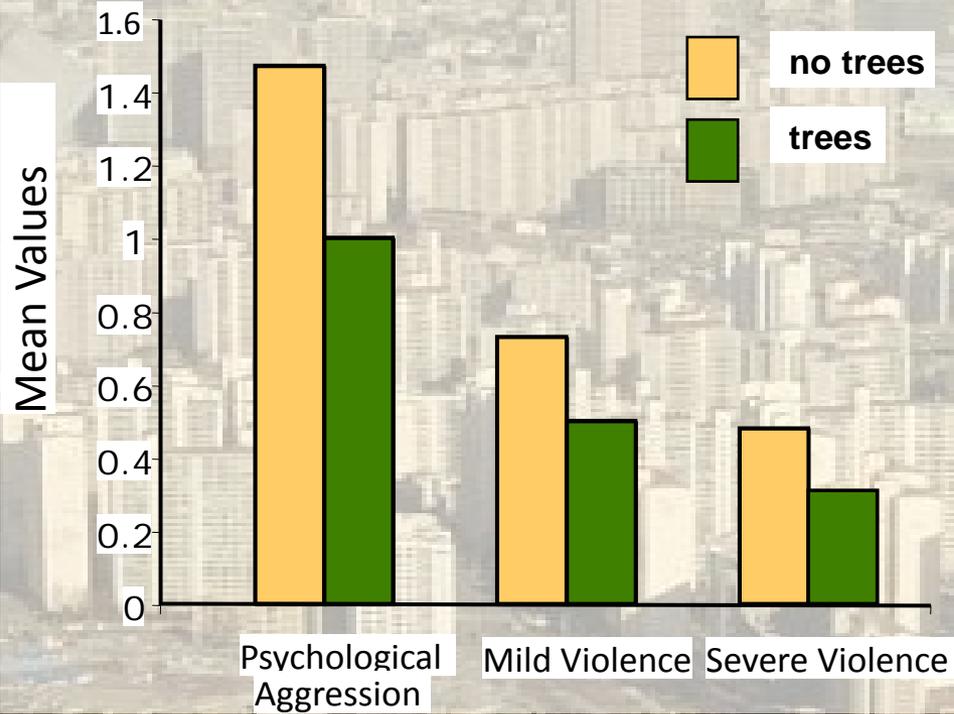
Hanson
Solent Gold Gravel, Crushed Granite and Green Slate





UK-China Innovation Park – Signing Ceremony

SIGNING OF MOU AT DOWNING STREET



Aggressive behaviour against partner linked to increased mental fatigue in non green living spaces – Kuo and Sullivan (2001)

Urbanisation correlates with increased risk of psychosis 72% and depression 16% (Sundquist et al., 2004)

“There was a tree here, but it got chopped down in 1994”

VANKE GREEN BUILDING PARK BEIJING

北京万科绿色建筑主题公园

家



Imagery Date: 6/23/2010

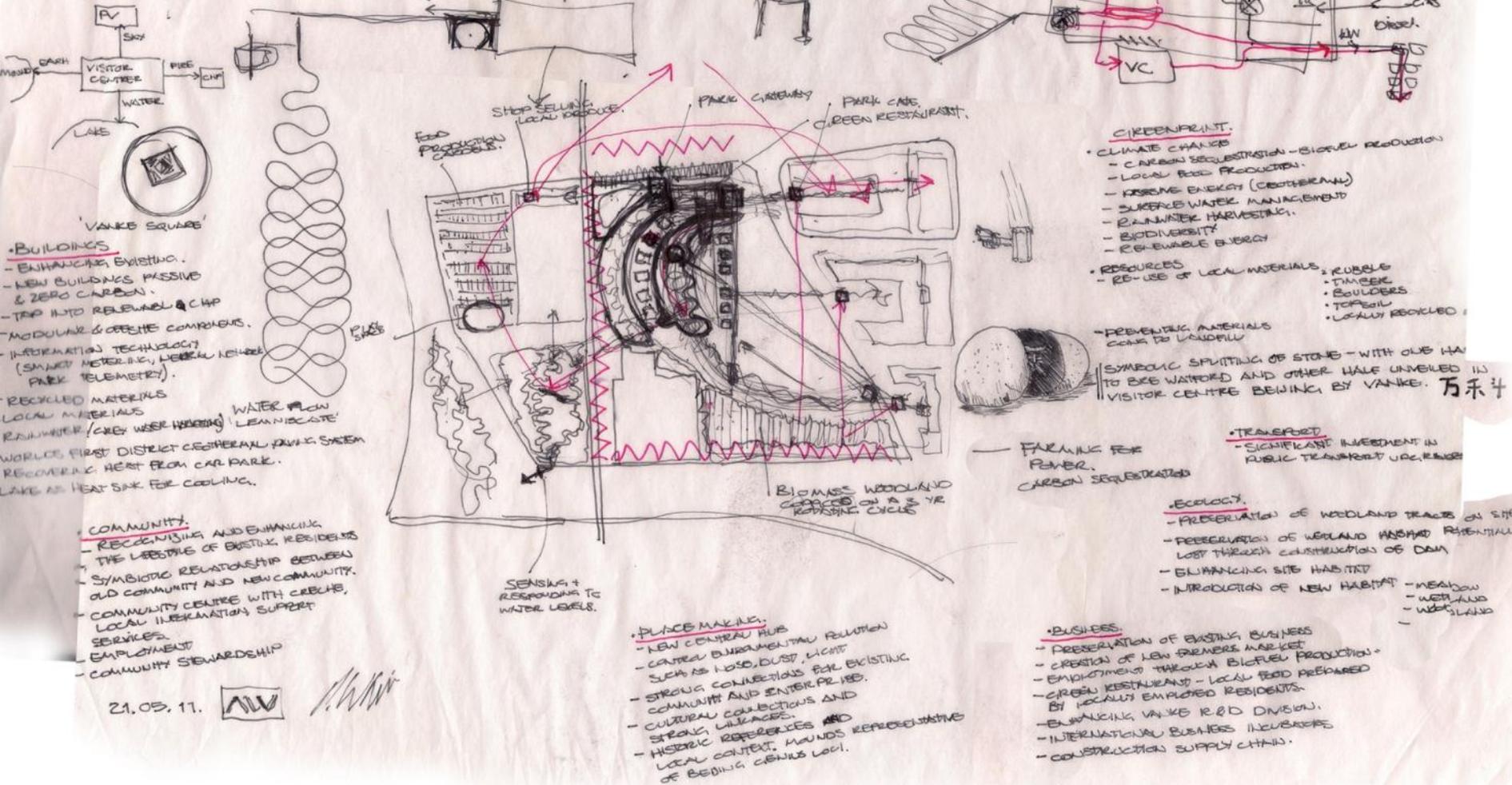
Image © 2011 GeoEye
© 2011 Mapabc.com

Imagery Date: 6/23/2010

39°44'50.21" N 115°11'50.53" E Elev. 46 m

Google
Eye alt: 1.67

VANKE GREEN BUILDING PARK



- BUILDINGS**
 - ENHANCING EXISTING.
 - NEW BUILDINGS PASSIVE & ZERO CARBON.
 - TOP INTO RELEVANT & CHP
 - MODULAR & GREEN COMPACTS.
 - INFORMATION TECHNOLOGY (SMART METERING, WIRELESS NETWORK, PARK TELEMETRY).
 - RECYCLED MATERIALS LOCAL MATERIALS
 - RAINWATER / GREY WATER RECYCLING
 - WORLD'S FIRST DISTRICT CENTRAL PARKING SYSTEM RECOVERING HEAT FROM CAR PARK.
 - LAKE AS HEAT SINK FOR COOLING.

- CARBON FOOTPRINT**
 - CLIMATE CHANGE
 - CARBON SEQUESTRATION - BIOFUEL PRODUCTION
 - LOCAL FOOD PRODUCTION
 - RESERVE ENERGY (GEOHEAT)
 - SURFACE WATER MANAGEMENT
 - RAINWATER HARVESTING
 - BIODIVERSITY
 - RENEWABLE ENERGY
- RESOURCES**
 - RE-USE OF LOCAL MATERIALS
 - RUBBLE
 - TIMBER
 - BRICKS
 - TOPSOIL
 - LOCALLY RECYCLED
 - PREVENTING MATERIALS GOING TO LANDFILL

- COMMUNITY**
 - RECOGNIZING AND ENHANCING THE LIFESTYLE OF EXISTING RESIDENTS
 - SYMBIOTIC RELATIONSHIP BETWEEN OLD COMMUNITY AND NEW COMMUNITY.
 - COMMUNITY CENTRE WITH CREATHE, LOCAL INFORMATION SUPPORT SERVICES
 - EMPLOYMENT
 - COMMUNITY STEWARDSHIP

- TRANSPORT**
 - SIGNIFICANT INVESTMENT IN PUBLIC TRANSPORT USE, REDUCE CARBON SEQUESTRATION
- ECOLOGY**
 - PRESERVATION OF WOODLAND TRACES ON SITE
 - PRESERVATION OF WOODLAND HAVING ESSENTIAL LOST THROUGH CONSTRUCTION OF DAM
 - ENHANCING SITE HABITAT
 - INTRODUCTION OF NEW HABITAT
 - MEADOW
 - WETLAND
 - WOODLAND

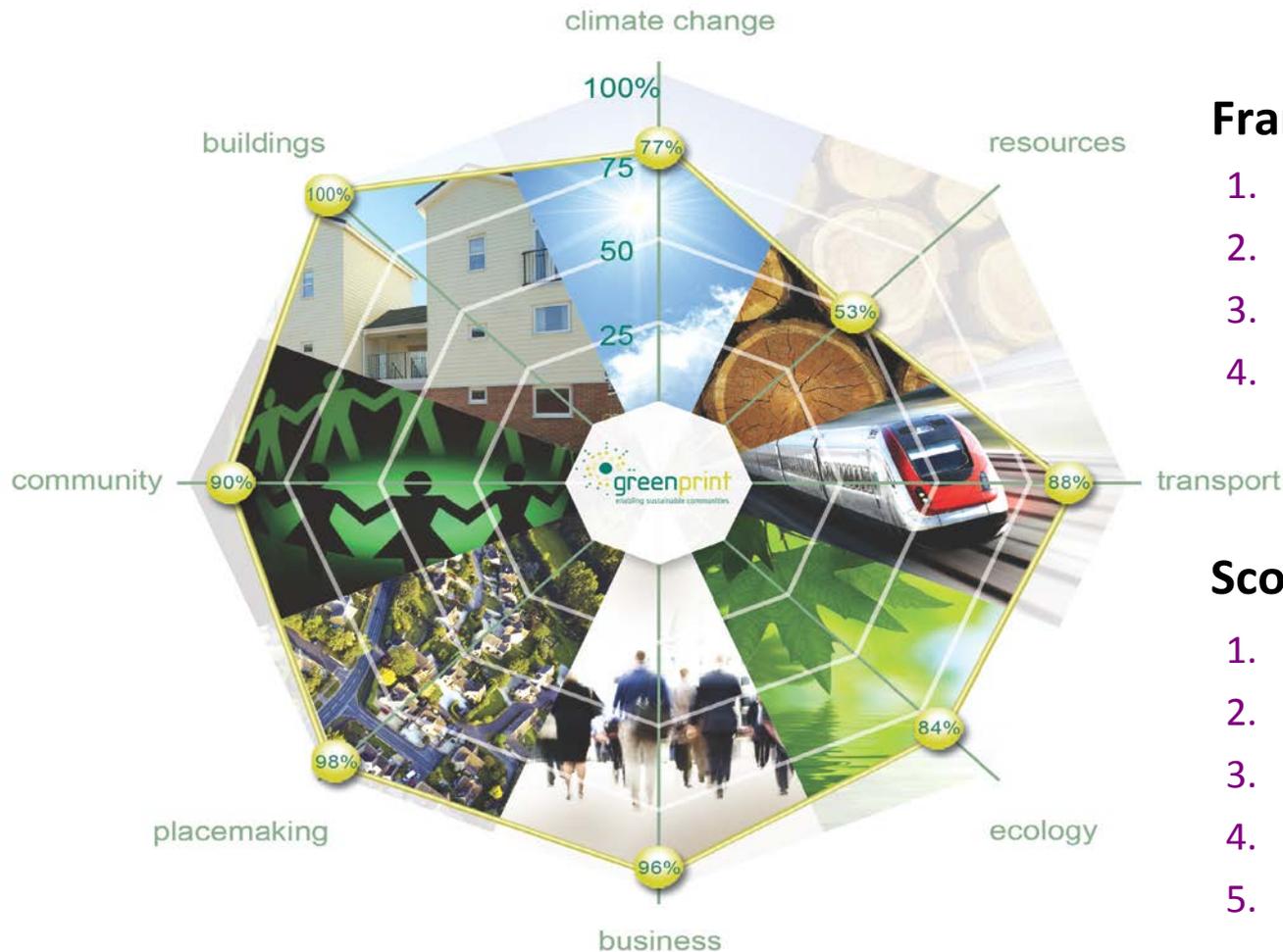
- PLACE MAKING**
 - NEW CENTRAL PUB
 - CENTRE ENVIRONMENTAL RELATION
 - SUCH AS WIND, DUST, LIGHT
 - STRONG CONNECTIONS FOR EXISTING COMMUNITY AND ENTERPRISES.
 - CULTURAL CONNECTIONS AND STRONG LINKAGES.
 - HISTORIC REFERENCES AND LOCAL CONTEXT. MOUNDS REPRESENTATIVE OF BEIJING GENUS LOCAL.

- BUSINESS**
 - PRESERVATION OF EXISTING BUSINESS
 - CREATION OF NEW BUSINESS MARKET
 - EMPLOYMENT THROUGH BIOFUEL PRODUCTION
 - GREEN RESTAURANT - LOCAL FOOD PREPARED BY LOCALLY EMPLOYED RESIDENTS
 - ENHANCING VANKE R&D DIVISION.
 - INTERNATIONAL BUSINESS NETWORKS
 - CONSTRUCTION SUPPLY CHAIN.

21.05.11.



Sustainability Framework



Framework

1. Objectives
2. Principles
3. Benchmarks
4. KPIs

Score

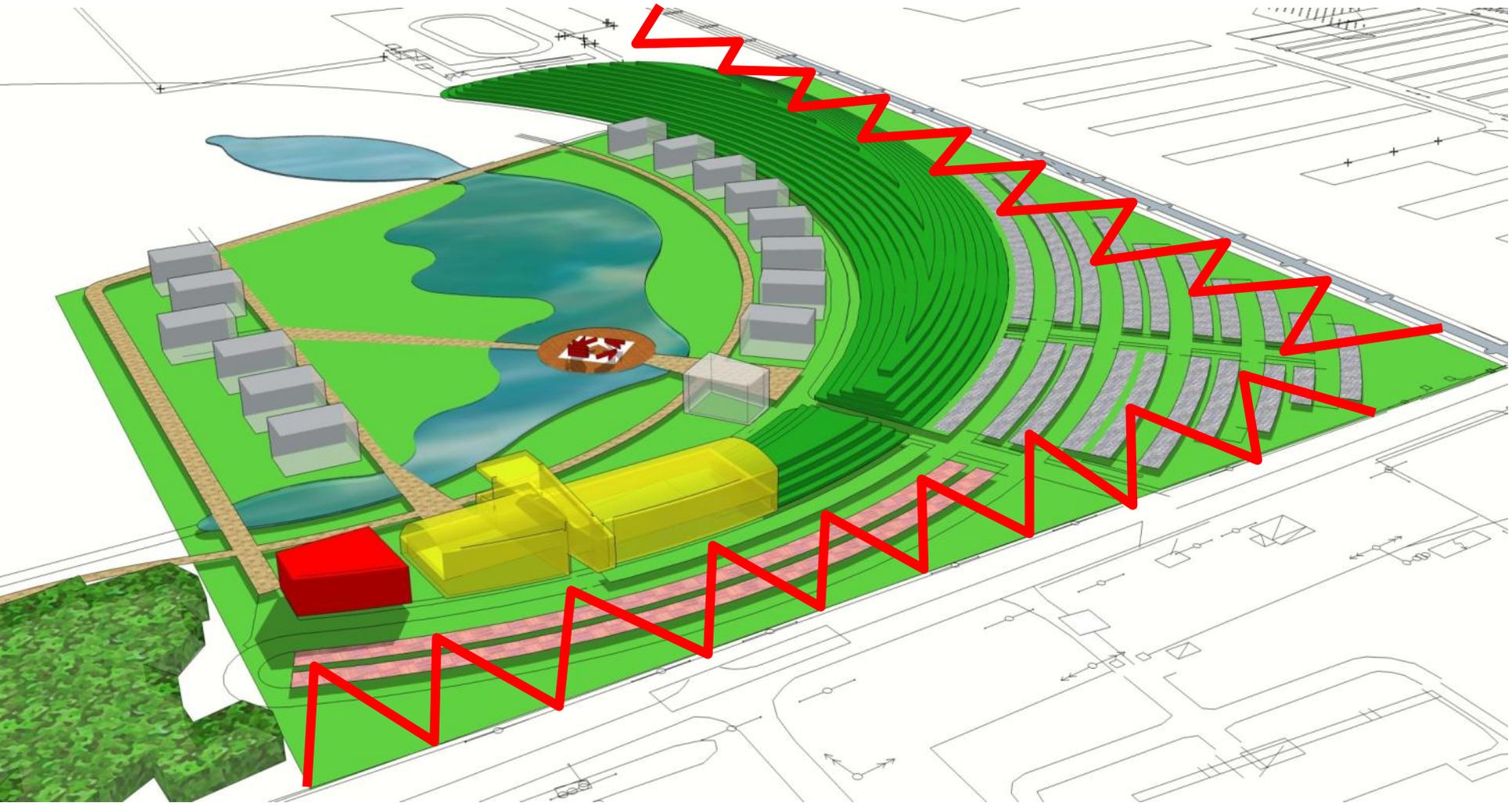
- | | |
|--------------|-----------|
| 1. No grade | < 50% |
| 2. Good | 50% – 64% |
| 3. Very Good | 65% – 74% |
| 4. Excellent | 75% – 84% |
| 5. Exemplar | >84% |



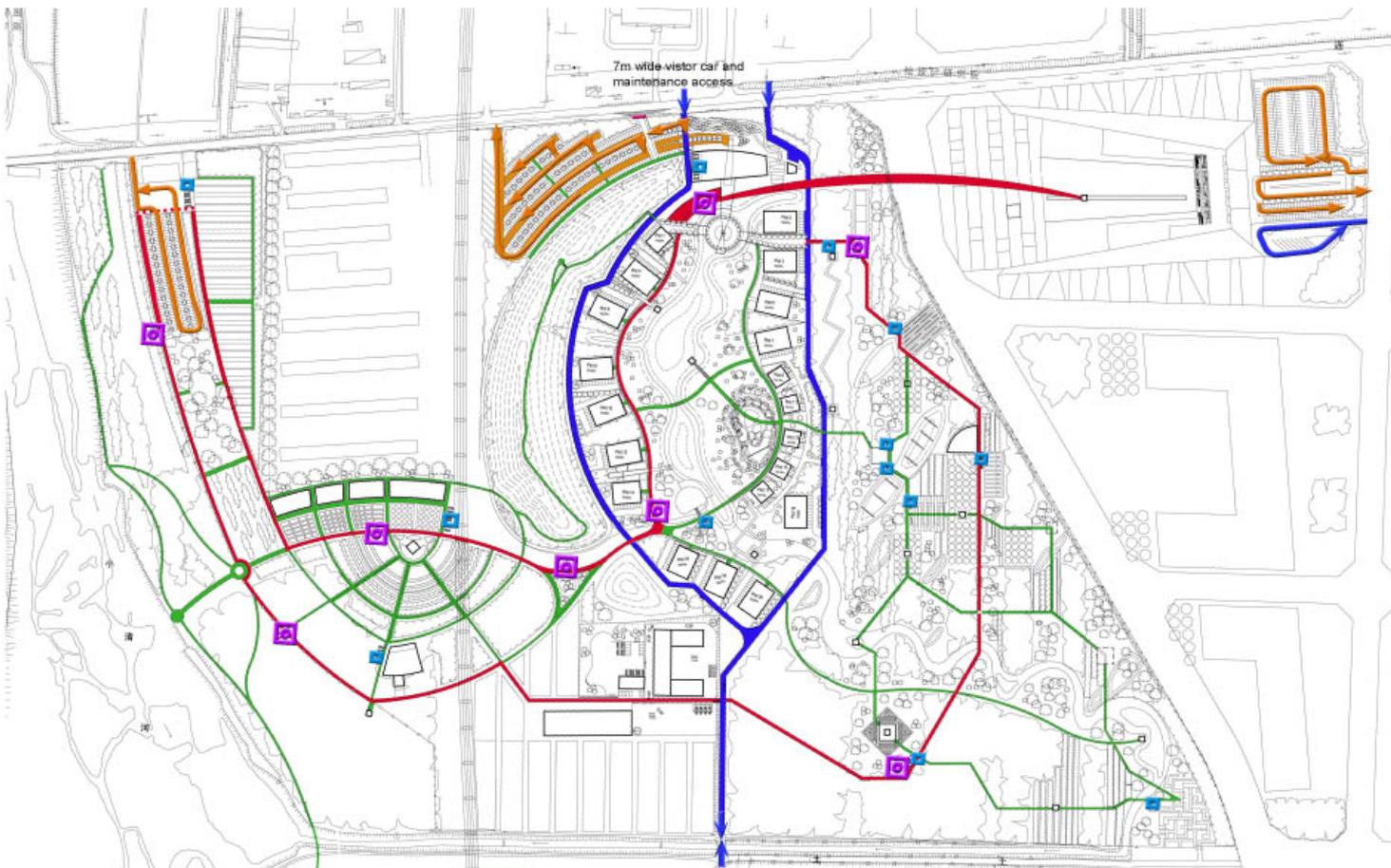
- 1 VISITORS CENTRE AND RESTAURANT
- 1A DISTRICT CENTRAL HEATING PLANT
- 2 CAR PARK WITH GEOTHERMAL PAVING
- 3 MOUND WITH RUBBLE CORE
- 4 INNOVATION BUILDINGS
- 5 DEMONSTRATION BUILDINGS
- 6 MATERIALS DEMONSTRATION AREA
- 7 ATTENUATION POND
- 8 PLANTATION GARDENS
- 9 STORMWATER WETLAND
- 10 DISCHARGE TO RETAINED CANAL
- 11 BIOFUEL PRODUCTION AREA
- 12 RETAINED WOODLAND
- 13 FOOD PRODUCTION GARDENS
- 14 MEADOW
- 15 LINK BRIDGE TO VANKE R&D AREA
- 16 PUBLIC FACE OF VANKE R&D
- 17 EMPLOYEES ENTRANCE AND CAR PARK
- 18 FUTURE PHASE INCUBATOR UNITS

- PARK PAVILLIONS
- A GATEWAY PAVILLION
 - B SCRUBLAND PAVILLION
 - C MEADOW PAVILLION
 - D TREE TOP PAVILLION
 - E ORCHARD PAVILLION
 - F WILDLIFE PAVILLION
 - G WETLAND PAVILLION

NOISE 噪音



ACCOUSTIC BUFFERING



- KEY**
- 4.5M WIDE ROADS FOR PARK MAINTENANCE & CONSTRUCTION TRAFFIC. INCLUDES DEDICATED CYCLE PATH SIDE
 - CAR ACCESS 6M WIDE ROUTE
 - 3M WIDE PATHS FOR VIP CIRCULATION AROUND PARK & ELECTRIC PEOPLE CARRYING TROLLEY
 - 1.8M WIDE PEDESTRIAN & CYCLE PATHS
 - BUS STOP
 - PICK UP POINT ELECTRIC PEOPLE TROLLEY
 - CYCLE PARKING AREAS

'.....PRIORITISE PEDESTRIAN AND CYCLE MOVEMENT.....'

THE PARK PROVIDES SERIES OF LINKED PEDESTRIAN ROUTES FOR A PERSONALIZED 'LEARNING EXPERIENCE' THROUGH THE PARK.

STRATEGICALLY LOCATED PAVILIONS PROVIDE INFORMATION OF THE AREA, ENCOURAGE HUMAN INTERACTION AND CREATE A POSITIVE SENSE OF PLACE.

A VIP DEDICATED ROUTE PROVIDES AN INFORMATIVE FAST TRACK THROUGH THE ESSENTIAL ELEMENTS OF THE PARK



家

**GREEN BUILDING PARK BEIJING
ACCESS & CIRCULATION**

DATE: NOV 2011 SCALE: 1:2000 @A1 DWG: 1427-GBPD-03 rev B



TRANSPORT PLANNING



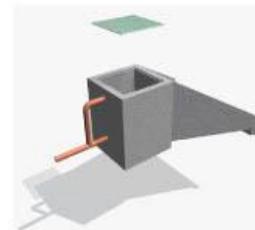
© wilder associates 2012



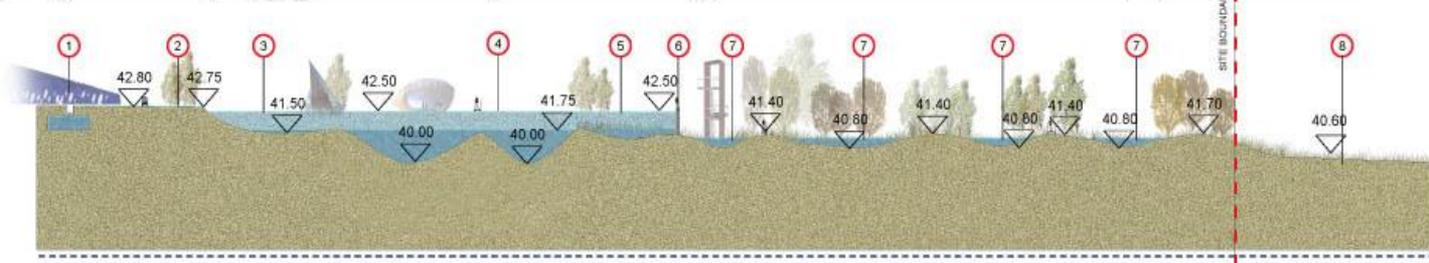
FEATURE LAKE ACTING AS RETENTION

THE PARK IS DESIGNED TO MANAGE THE WATER EFFICIENTLY, MINIMIZING THE IMPACT OF FLOODING AND MAXIMIZING THE USE OF WATER RESOURCES.

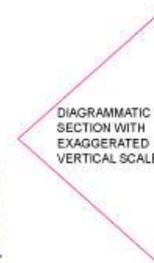
A MEANDERING SWALE WITH INTERMITTENT WATER BODIES FOSTERS THE CREATION OF DIVERSE HABITATS.



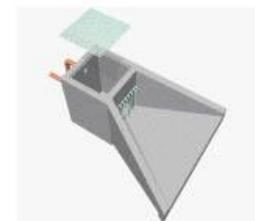
HEADWALL: HOUSING FOR VORTEX FLOW CONTROL



SWALES WITHIN VEGETATED LANDSCAPE



DIAGRAMMATIC SECTION WITH EXAGGERATED VERTICAL SCALE



'... TO MANAGE WATER...PREVENT FLOODING...AROUND AND DOWNSTREAM OF THE PARK...'

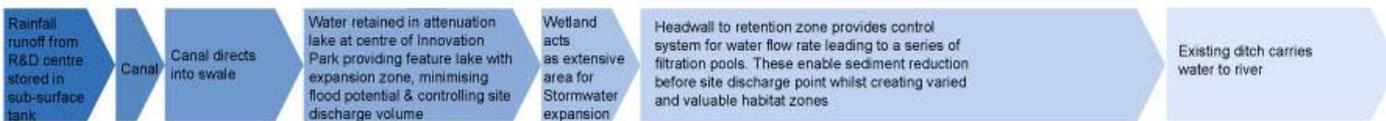


IMAGE : WILDER ASSOCIATES

SURFACE WATER MANAGEMENT STRATEGY



HEAVY FLOODING IN BEIJING JULY 2012



- KEY**
- 1 VISITORS CENTRE
 - 2 BOTANICAL GARDENS
 - 3 STORM WATER WETLAND
 - 4 DISCHARGE TO RETAINED CANAL
 - 5 BIOFUEL PRODUCTION AREA
 - 6 RETAINED WOODLAND
 - 7 FOOD PRODUCTION GARDENS
 - 8 MEADOW
 - 9 WET MEADOW
 - 10 PROPOSED WOODLAND
 - 11 PROPOSED SCATTERED TREES
 - 12 TREETOP WALK
 - 13 SCRUB AREA
 - 14 GATEWAY GARDENS
 - 15 LAKESIDE RESTAURANT
 - 16 BOTANIC GARDEN RESTAURANT
 - 17 GREENHOUSES
 - 18 FARM SHOP
 - 19 VANKE R&D CENTRE
 - 20 INCUBATOR UNITS
 - 21 WESTERN GATEWAY
 - 22 COMMUNITY PARK
 - 23 BIO-FILTRATION CENTRE
 - 24 FACADE TECHNOLOGY CENTRE
 - 25 WIND TURBINE CENTRE
 - 26 GREEN ROOF CENTRE
 - 27 PHOTOVOLTAICS
 - 28 FUTURE USE
 - 29 LABYRINTH
 - 30 RESTAURANT
- A GLADE PAVILION
 - B TREE TOP PAVILION
 - C ORCHARD PAVILION
 - D WILDLIFE PAVILION
 - E WETLAND PAVILION
 - F WOODLAND PAVILION
 - G MATERIALS DEMONSTRATION AREA

LEVEL 3 - ENGAGED - INTERACTIVE MEDIA

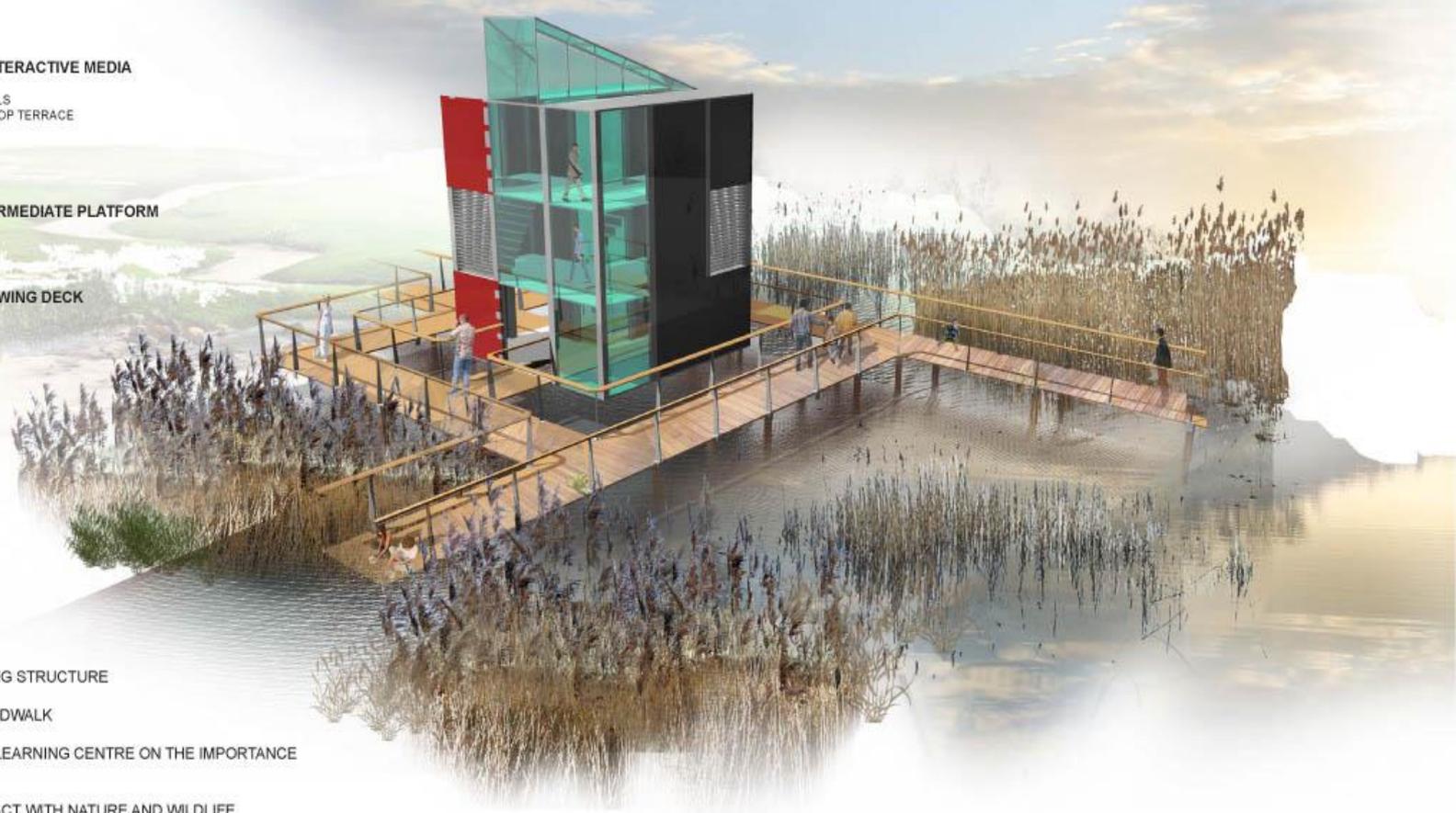
INTERACTIVE INFORMATION PANELS
FULL VIEW OF WETLANDS FROM TOP TERRACE

LEVEL 2 - ACTIVE - INTERMEDIATE PLATFORM

- WILDLIFE OBSERVATORY

LEVEL 1 - PASSIVE - VIEWING DECK

- TRANSITING BY



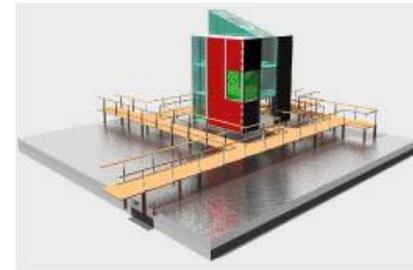
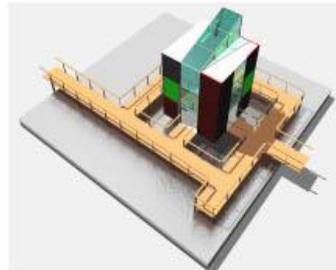
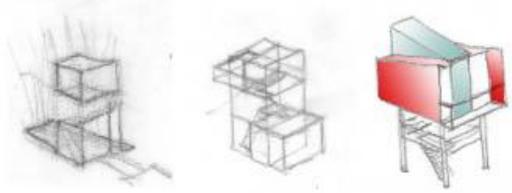
LIGHT FLOATING STRUCTURE

DECKED BOARDWALK

INTERACTIVE LEARNING CENTRE ON THE IMPORTANCE
OF WETLANDS

DIRECT CONTACT WITH NATURE AND WILDLIFE

DESIGN DEVELOPMENT



LOCATION PLAN

IMAGE : WILDER ASSOCIATES

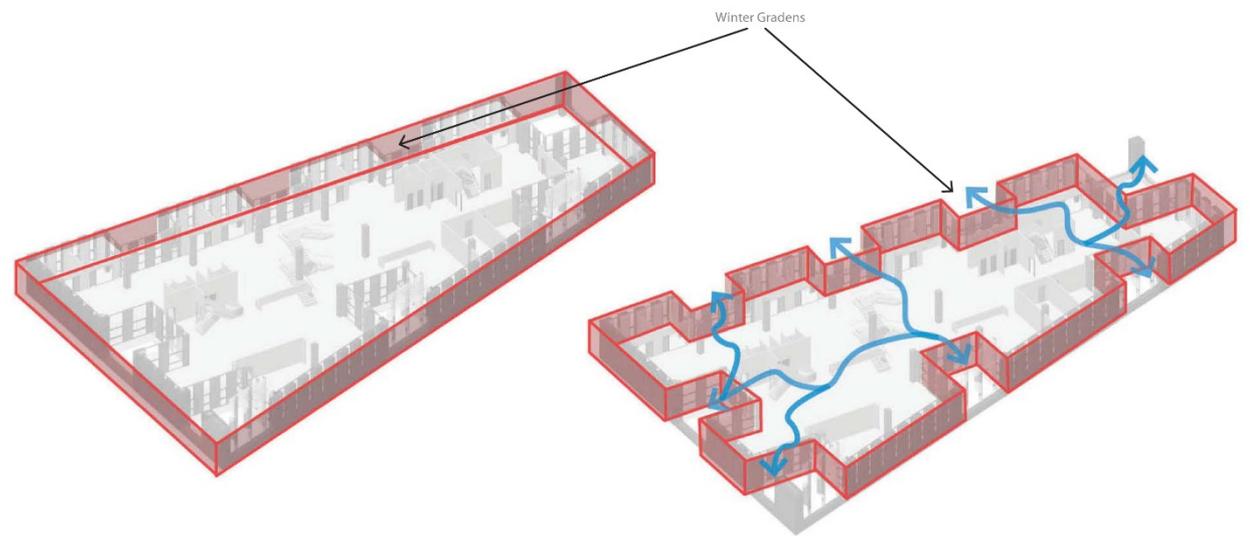
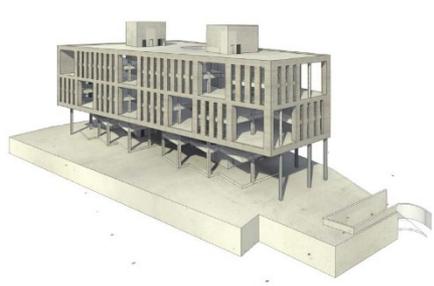
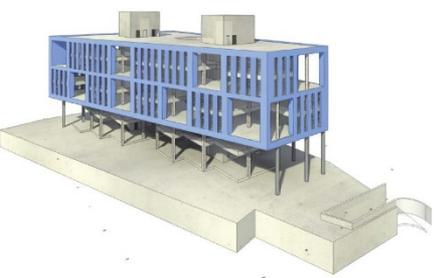
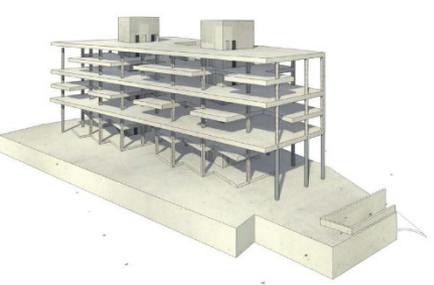
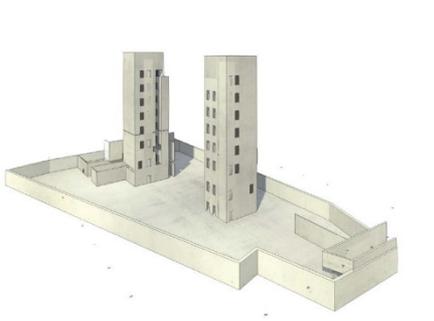
WETLANDS INTERPRETATION CENTRE

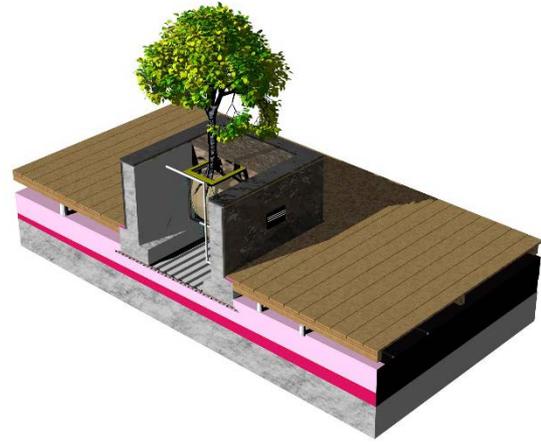


VISITORS CENTRE



MEIXI LAKE ECO-CITY

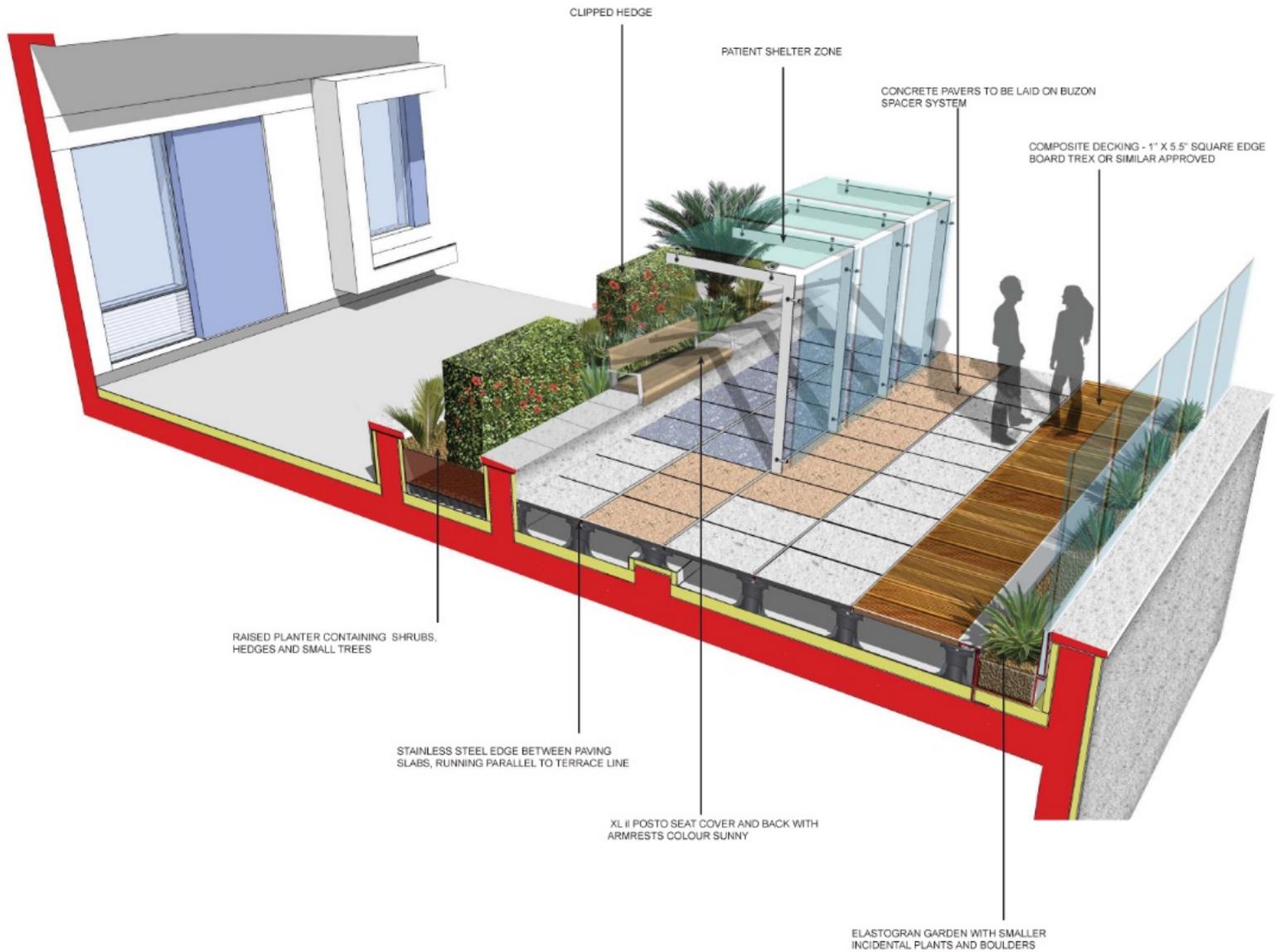




ROOF LEVEL BIOFILTRATION SYSTEM AND GREEN FACADE



KING EDWARD MEMORIAL HOSPITAL BERMUDA



ROOF LEVEL GARDENS FOR RAINWATER RECOVERY



VISUALISATION

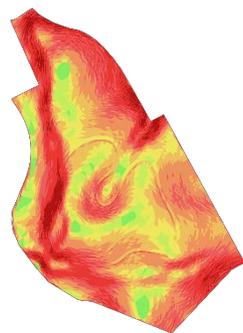


ACTUAL SCHEME

SCHEME DELIVERY



Vegetation



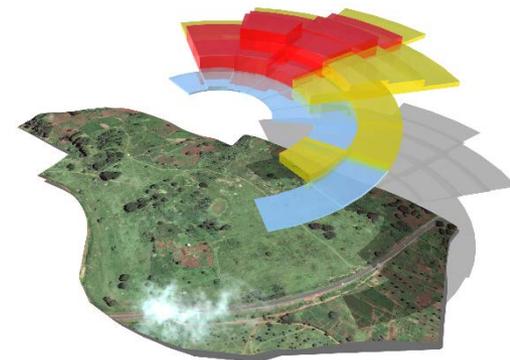
Topography



Hydrology

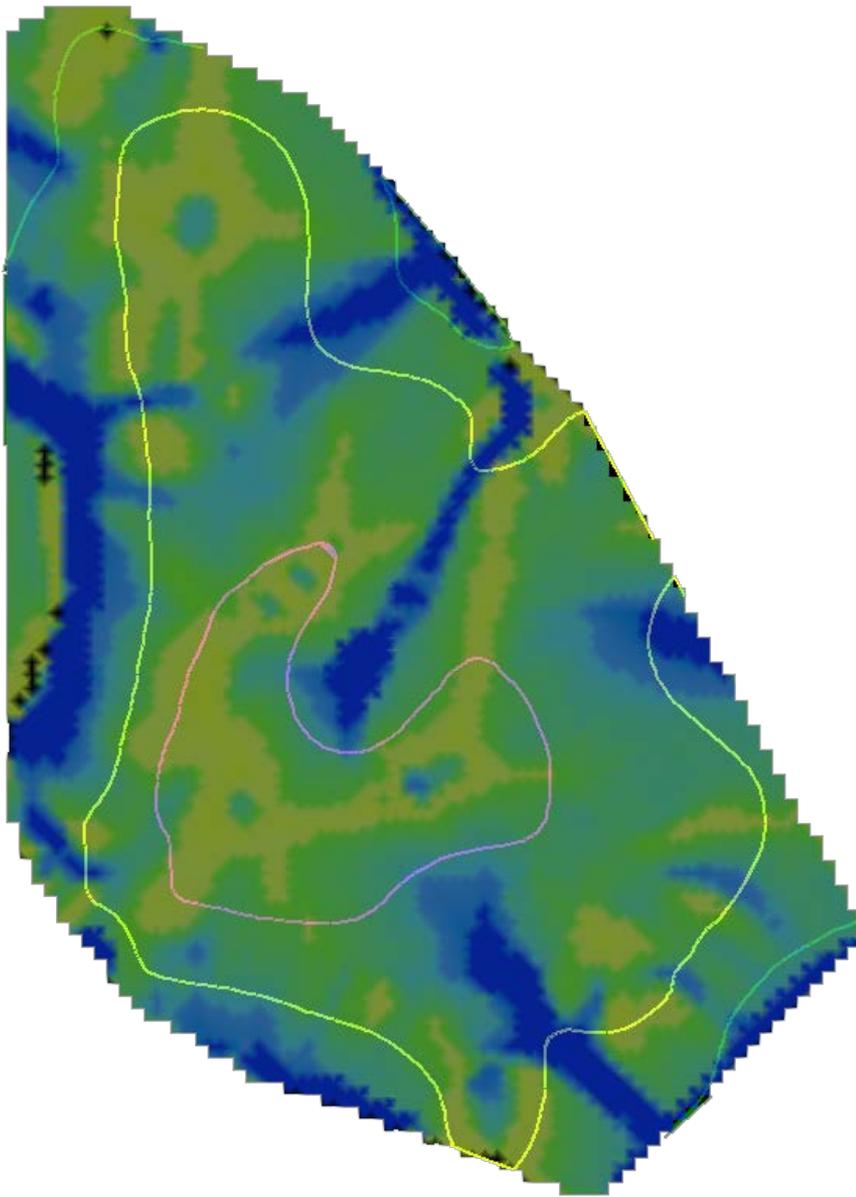


Wind

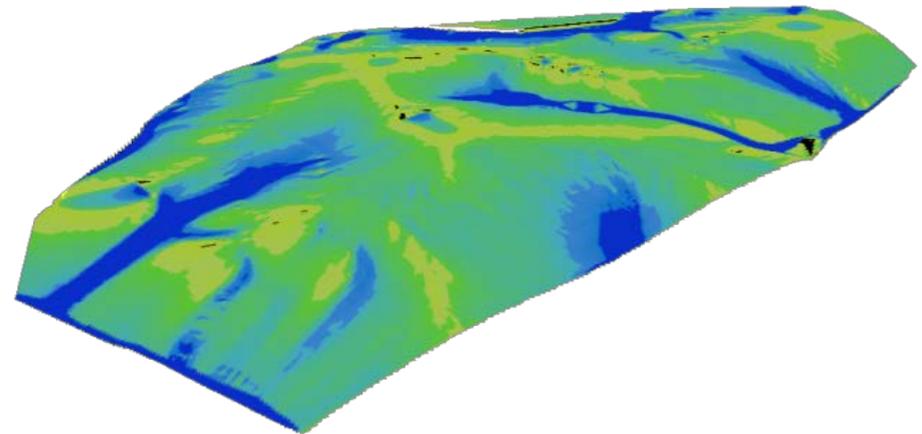


Prevailing Wind

Hydrological modelling using WinDes[©] software enables us to interrogate surface flows, catchment and design in real time with real SuDs components



Flood Flow Map



Gradient Mapping

Wind Mapping

IMAGE : WILDER ASSOCIATES

HYDROLOGICAL MODELLING USING MICRODRAINAGE



IMAGE : WILDER ASSOCIATES

VISUALISATION FROM TERRAIN MODEL



SUDS APPROACH

- ① Green roof as primary filtration system
- ② Collection channel to catch pit & silt trap
- ③ Petrol and Oil Interceptor
- ④ Rainwater harvesting tank
- ⑤ Oversized pipe attenuation system
- ⑥ Discharge headwall to attenuation pond
- ⑦ Attenuation and biofiltration lagoon

- Ⓐ Main distributor roads
- Ⓑ Residential roads or Homezones
- Ⓒ Traffic table and pedestrian crossovers
- Ⓓ Play zones within wildlife and SUDS corridor
- Ⓔ Recycling and composting centre
- Ⓕ Communal gardens and allotments

ENVIRONMENT / WATER & SUDS

- 1** SURFACE WATER COLLECTION INTO SUB-SURFACE ATTENUATION POND
- 2** SURFACE WATER SWALES FOR CONVEYANCE AND FILTRATION OF SURFACE WATER RUNOFF
- 3** FILTRATION PONDS FOR COLLECTION, FILTRATION AND DISCHARGE OF WATER FOR LANDSCAPE IRRIGATION, GROUND WATER RE-CHARGE OR ATTENUATION
- 4** ATTENUATION PONDS OR STORM WATER WETLAND

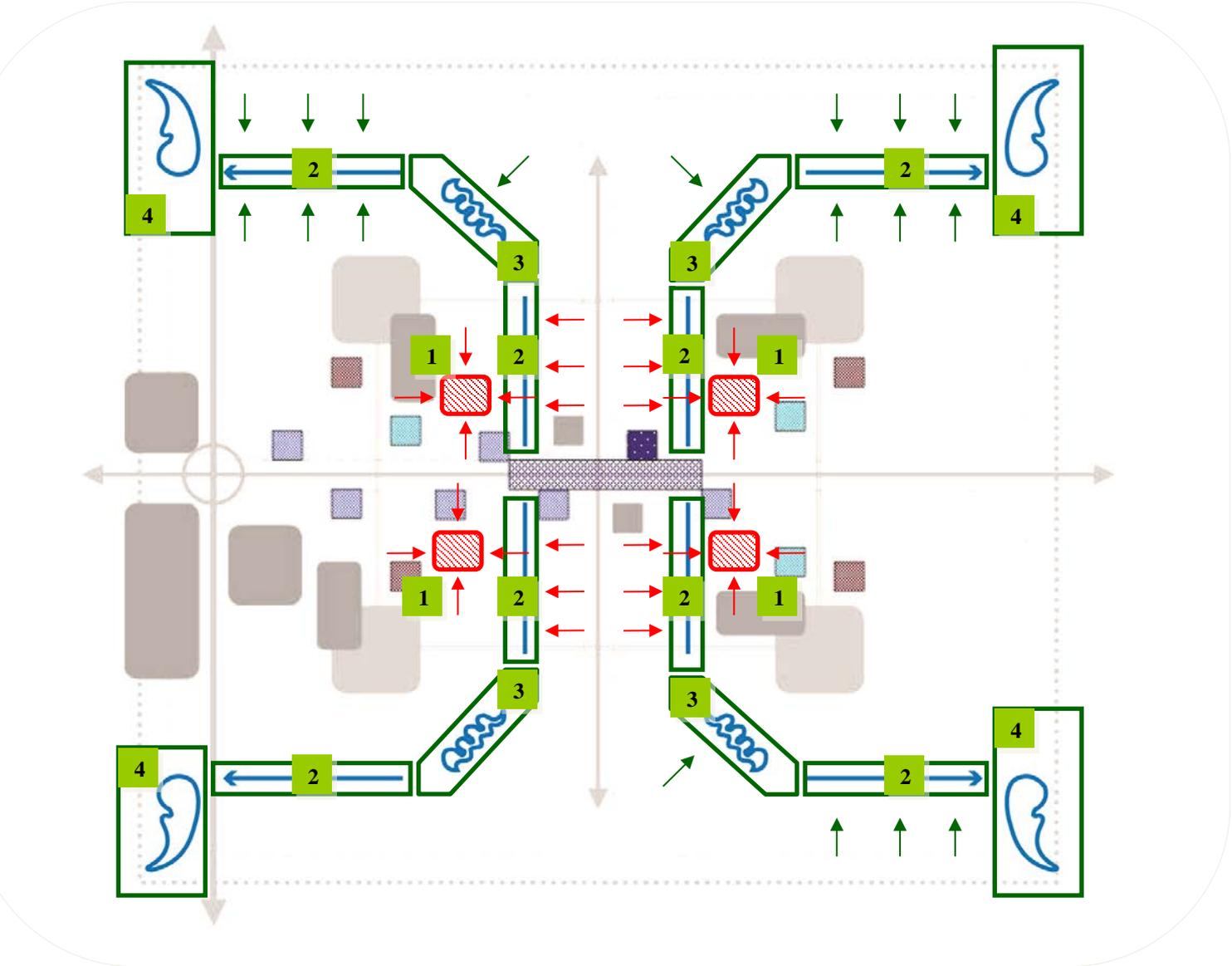


IMAGE : WILDER ASSOCIATES

SUDS IS ABOUT GOOD HYDROLOGY PRINCIPLES



Seven Sisters Ponds

Highgate Ponds

Wood Pond

Thousand Pound Pond

Stock Pond

Kenwood Ladies Bathing Pond

Bird Sanctuary Pond

Model Boating Pond

Highgate Men's Bathing Pond

Highgate No. 1 Pond

Hampstead Ponds

Mixed Bathing Pond (No. 3)

Hampstead No. 2 Pond

Hampstead No. 1 Pond

Vale of Health Pond

Whitestone Pond

Leg of Mutton Pond

Swan Pond

Lily Pond

Viaduct Pond

WILDERNESS IN OUR CITIES



HAMPSTEAD HEATH BOATING POND



STAKEHOLDER CONSULTATION



WALKING THE HEATH



BECAUSE LANDSCAPES LIKE THIS ARE WORTH FIGHTING FOR



Thank you!

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