

How new development can help tackle  
multiple pressures from climate change

**Robert Barker > Director  
Baca Architects**

Deltas in times of climate change  
Rotterdam, 30<sup>th</sup> September 2010

#### Awards

RIBA presidents research (UK) awarded - Winner 2009  
Green Dot Award (US) - Bronze Winner 2010  
Evening Standard New Homes - Highly Commended 2010  
International Urban Landscape Award (DL) - Bronze Winner 2009  
DEFRA Innovation fund for the Life Project - 2007  
RIBA Sustainable Living by Design - Winner 2006  
Evening Standard New Homes - Commendation 2010  
Docklands Barges - Winner 2009  
Nijmegen - Shortlisted 2009

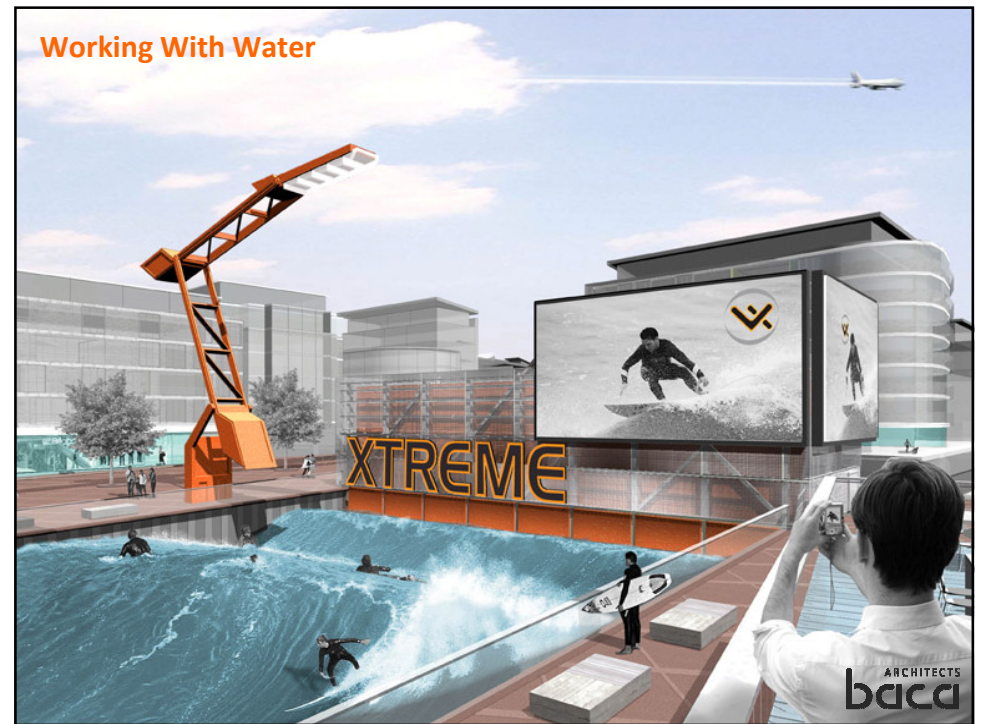
#### Working With Water



Working With Water

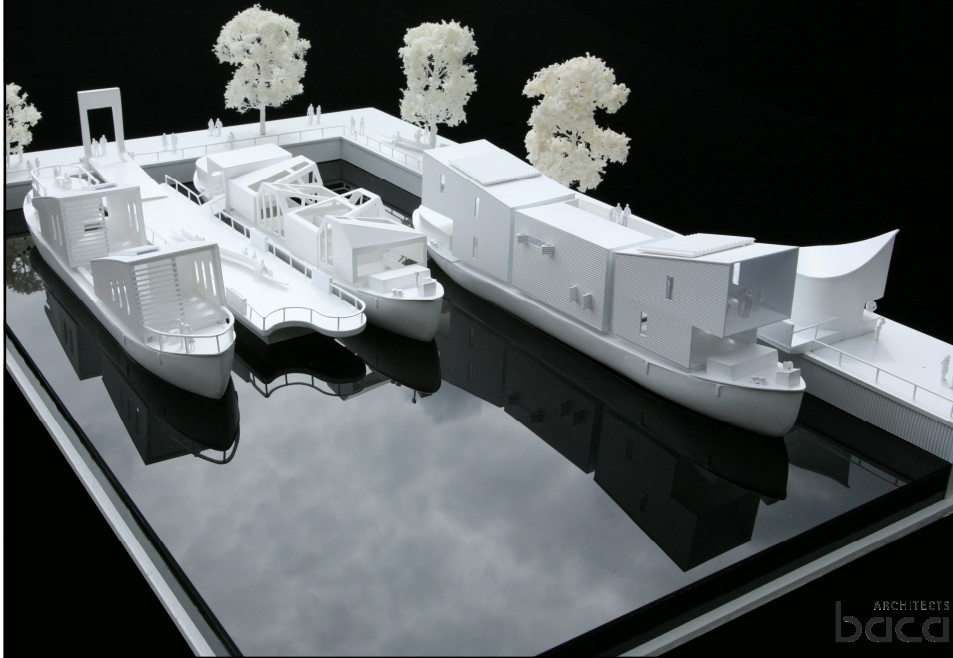


Working With Water





## Working With Water



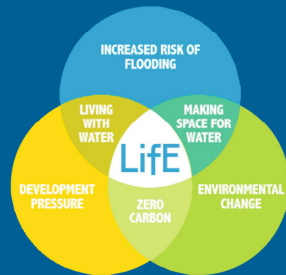
## Working With Water



# The **Life** Project

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Long-term Initiatives for Flood-risk Environments adopts an integrated approach to adaptable, zero carbon, flood resilient development.



Innovation Fund  
The Life Project



RIBA President's Award for Professional  
Practice Research 2009



International Urban Design Award 2009,  
Bronze Medal



HCA Sustainability Framework  
Consultant 2010

Lower Catchment  
Site 3 > Littlehampton





## Littlehampton > Regenerating the South Coast



## Life > Site 3 > The River Arun at Littlehampton

Life



### Flood Risk

- The River
- The Sea
- Rainfall
- Sewers
- Ground Water

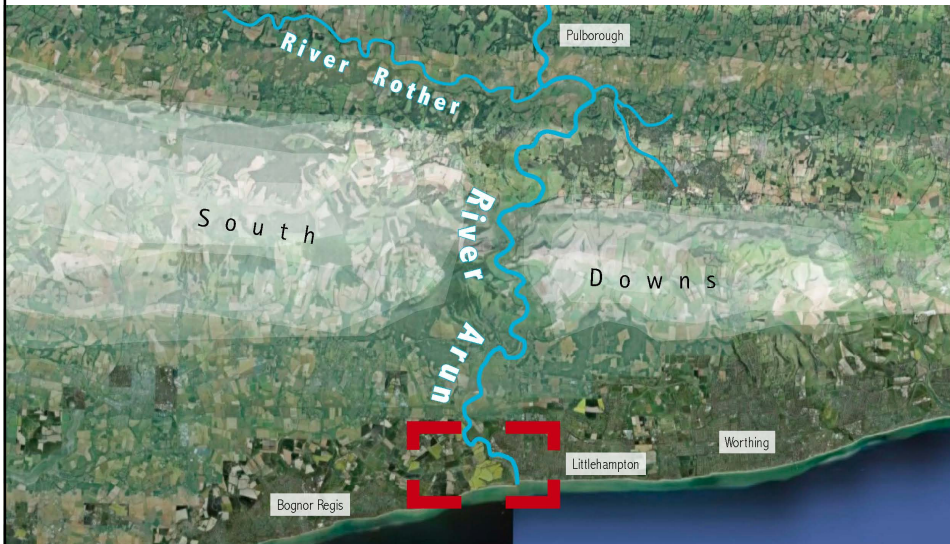


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Life > Site 3 > Understanding the context

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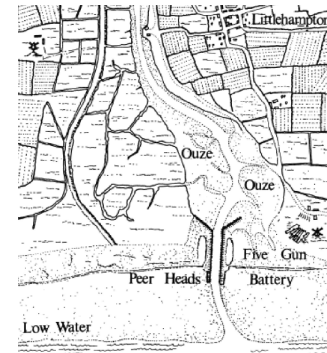


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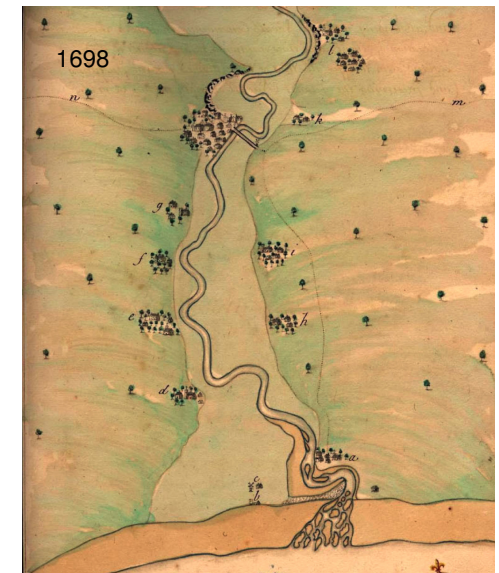
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Life > Site 3 > Learning from the past

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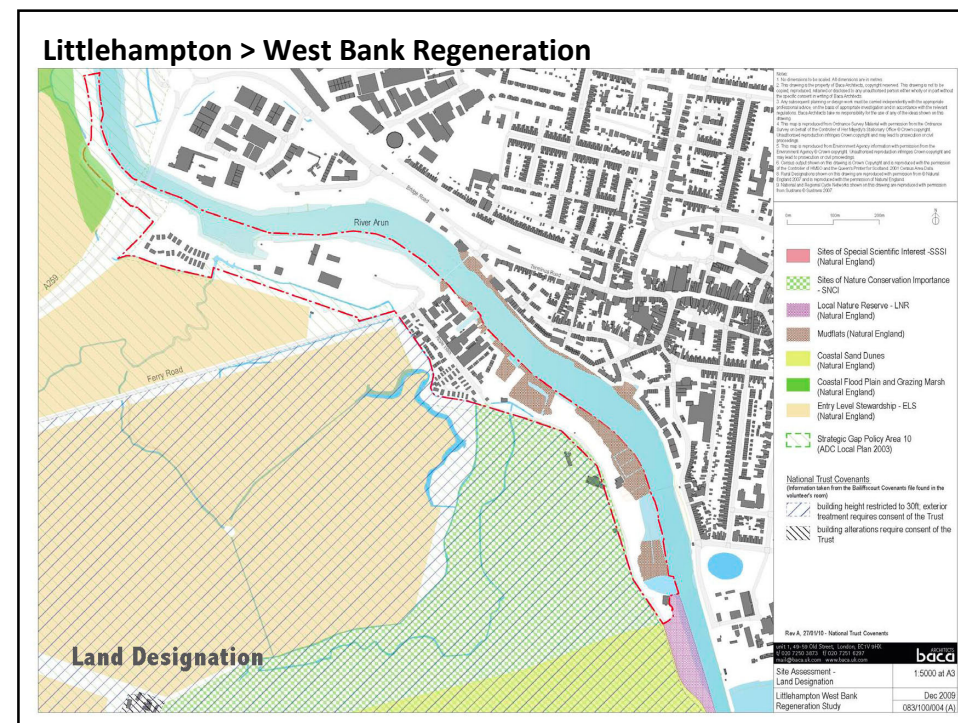
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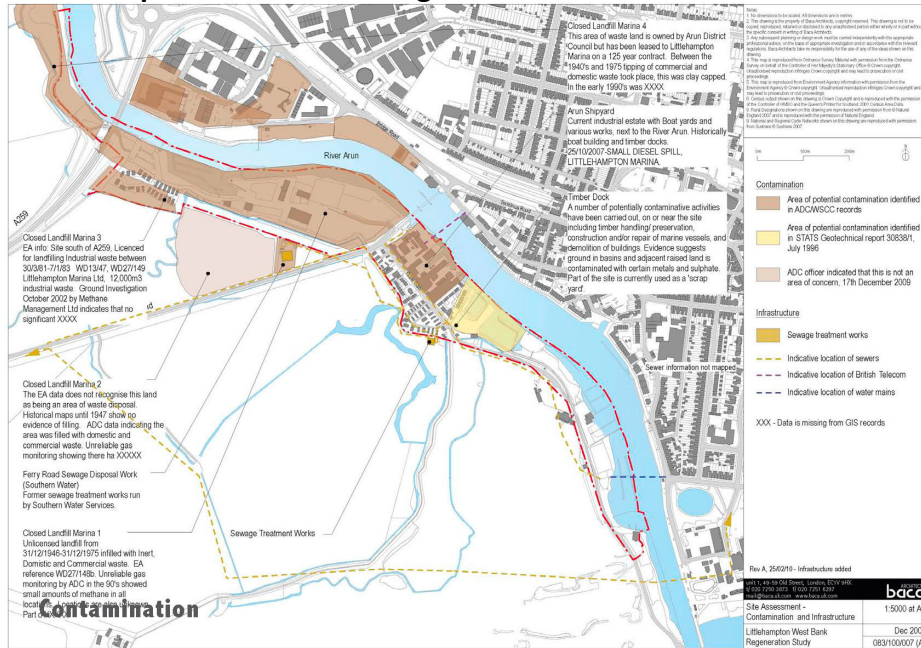
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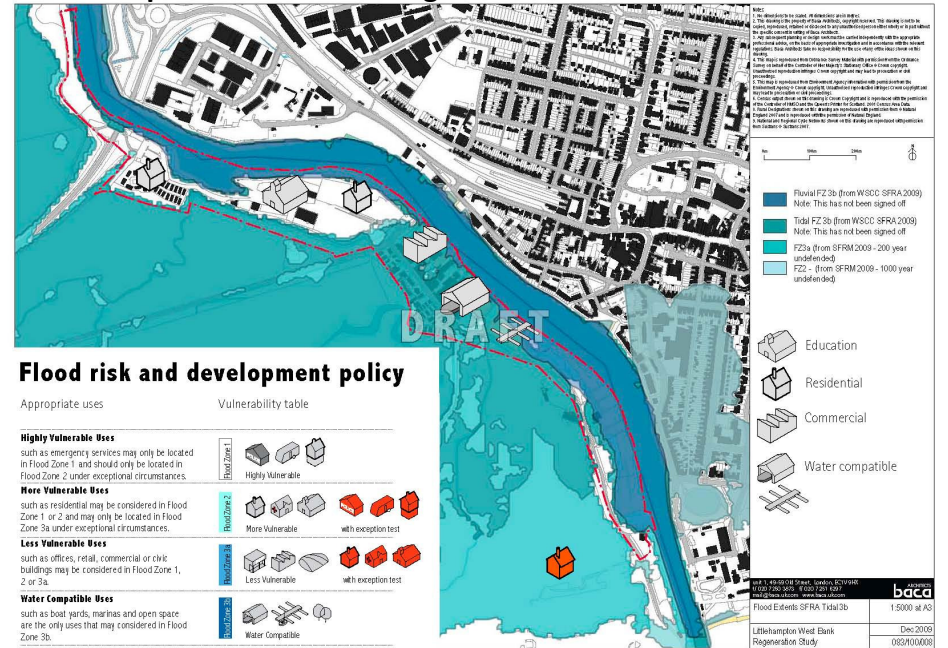




## Littlehampton > West Bank Regeneration



## Littlehampton > West Bank Regeneration





**Littlehampton > West Bank Regeneration**

**DRAFT**

**Future Extents (2106)  
information from SFRA**

**Flood Extents - Future**

Legend:

- Tidal Flood Zone 3b (predicted 2106)
- Tidal Flood Zone 3a (predicted 2106)
- Tidal Flood Zone 2 (predicted 2106)

Scale: 0 100m 200m

North Arrow

Map Details:

Map of Littlehampton > West Bank Regeneration showing flood extents for 2106. The map is labeled 'DRAFT'. A red box highlights 'Future Extents (2106) information from SFRA'. The legend indicates three flood zones: Tidal Flood Zone 3b (predicted 2106), Tidal Flood Zone 3a (predicted 2106), and Tidal Flood Zone 2 (predicted 2106). The map shows the River Arun flowing through the town, with buildings and roads visible. A scale bar and north arrow are also present.

Map Source: bca

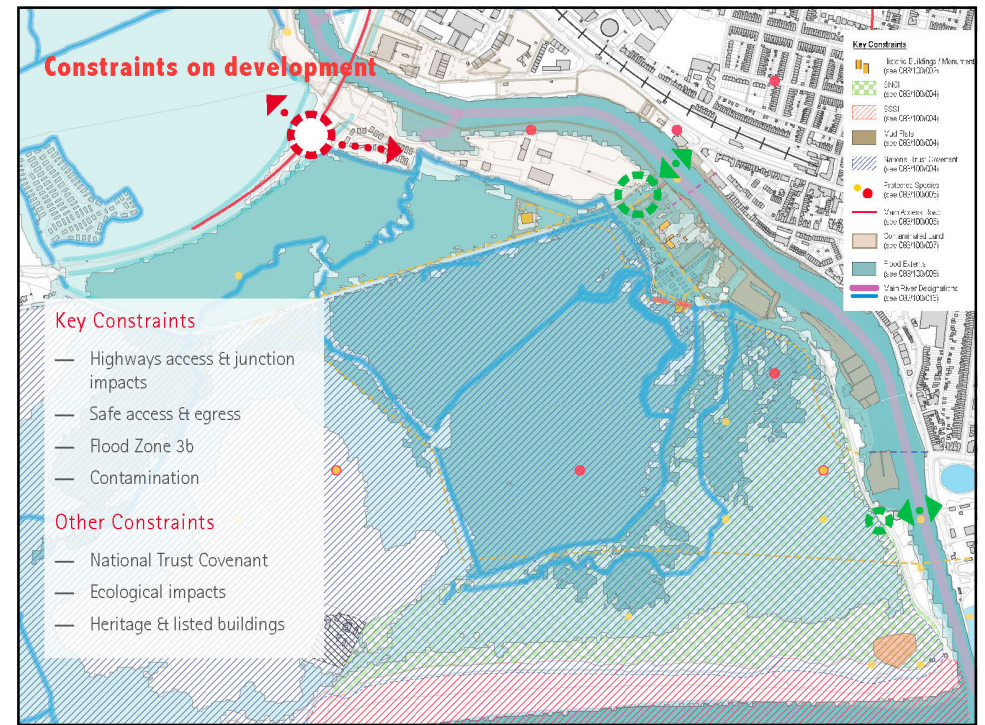
Map Date: 15/01/2015

Map Scale: 1:5000 at A3

Map Title: Littlehampton > West Bank Regeneration Study

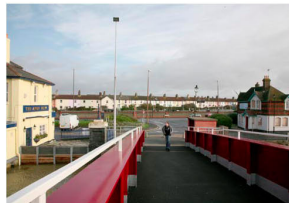
Map Author: Dec 2009

Map Reference: 083/100015



## Potential show stoppers

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Adapting to flood risk & climate change

Access and congestion

Cleaning up land contamination

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## Sections through the site



Hard defences



Soft defences



Hard defences



Land raising (terps)



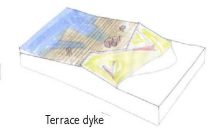
Flood storage



Weir controls



Play dyke



Terrace dyke

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## LifeE > Using a range of tools

**RESOURCES ENERGY DEMAND**

Category	Demand by floor area (kWh/m <sup>2</sup> /yr)	space heating	space cooling	hot water	electricity (excl cooling)
<b>Residential</b>	Demand by floor area (kWh/m <sup>2</sup> /yr)	15.0	0.0	33.1	41.7
	<b>Total demand (MWh/yr)</b>	<b>994</b>	<b>0</b>	<b>2,191</b>	<b>2,762</b>
<b>Commercial</b>	Demand by floor area (kWh/m <sup>2</sup> /yr)	24.2	48.6	11.7	120.6
	<b>Total demand (MWh/yr)</b>	<b>241</b>	<b>484</b>	<b>116</b>	<b>1,199</b>
<b>Infrastructure</b>	Demand per m length of road (kWh/m/yr)	n/a	n/a	n/a	22
	<b>Total Energy Demand (MWh/yr)</b>	<b>1,235</b>	<b>484</b>	<b>2,307</b>	<b>3,962</b>

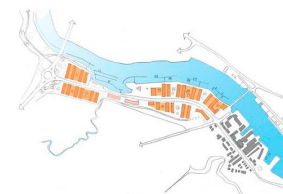
**Table of Energy Use assumptions for LIFE Project, Fulcrum Consulting 2007**

Use	Space Heating	Space Cooling	Hot Water Heating	Electricity (excl cooling)
<b>Residential</b>	15.0 kWh/m <sup>2</sup> /yr	0.0 kWh/m <sup>2</sup> /yr	33.1 kWh/m <sup>2</sup> /yr	41.7 kWh/m <sup>2</sup> /yr
<b>Office</b>	24.2 kWh/m <sup>2</sup> /yr	48.6 kWh/m <sup>2</sup> /yr	11.7 kWh/m <sup>2</sup> /yr	120.6 kWh/m <sup>2</sup> /yr
<b>Retail</b>	24.2 kWh/m <sup>2</sup> /yr	48.6 kWh/m <sup>2</sup> /yr	11.7 kWh/m <sup>2</sup> /yr	120.6 kWh/m <sup>2</sup> /yr
<b>Industrial</b>	17.1 kWh/m <sup>2</sup> /yr	0.0 kWh/m <sup>2</sup> /yr	17.1 kWh/m <sup>2</sup> /yr	20.0 kWh/m <sup>2</sup> /yr
<b>Education &amp; Healthcare</b>	18.0 kWh/m <sup>2</sup> /yr	11.0 kWh/m <sup>2</sup> /yr	18.0 kWh/m <sup>2</sup> /yr	18.0 kWh/m <sup>2</sup> /yr
<b>Infrastructure</b>	N/A	N/A	N/A	22 kWh/m/yr

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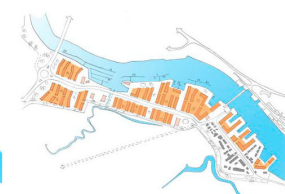
## Development Options



**Option 1**  
Littlehampton Marina site only

Development Area .....apx 7.2 Hectares  
Residential Units .....up to 250 homes  
Density .....35 units/hectare  
Commercial floor space..... 13,000 sq ft

Unlikely to provide sufficient investment to pay for improvements to flood defences.



**Option 2**  
Marina and harbour/shipyard

Development Area .....apx 12.7 Hectares  
Residential Units .....up to 600 homes  
Density .....47 units/hectare  
Commercial floor space..... 25,000 sq ft

May not provide sufficient investment to pay for improvements to flood defences.  
It offers the opportunity for some other benefits.



**Option 3**  
Marina, shipyard and land to the west

Development Area .....apx 18.6 Hectares  
Residential Units .....up to 1000 homes  
Density .....54 units/hectare  
Commercial floor space..... 92,000 sq ft

Most likely to provide sufficient investment for improvements to flood defences.  
It also offers the opportunity for numerous other benefits.

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Precedent - Christchurch

Littlehampton > West Bank



Concept plan - coastal destination

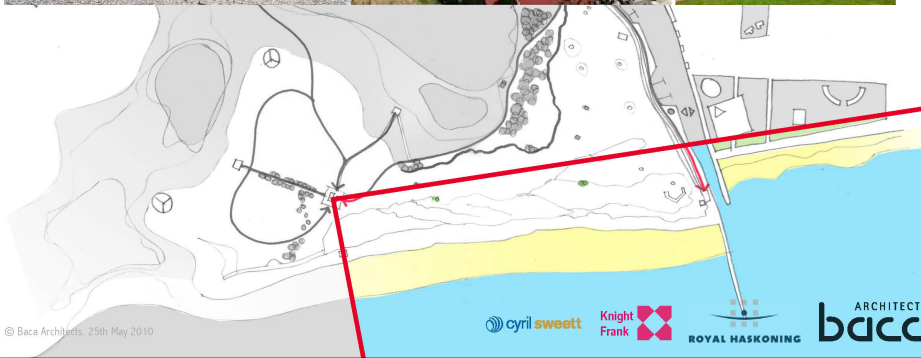
Littlehampton > West Bank





Concept plan - mirador (multiple vistas)

Littlehampton > West Bank



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Concept plan - mirador (multiple vistas)

Littlehampton > West Bank

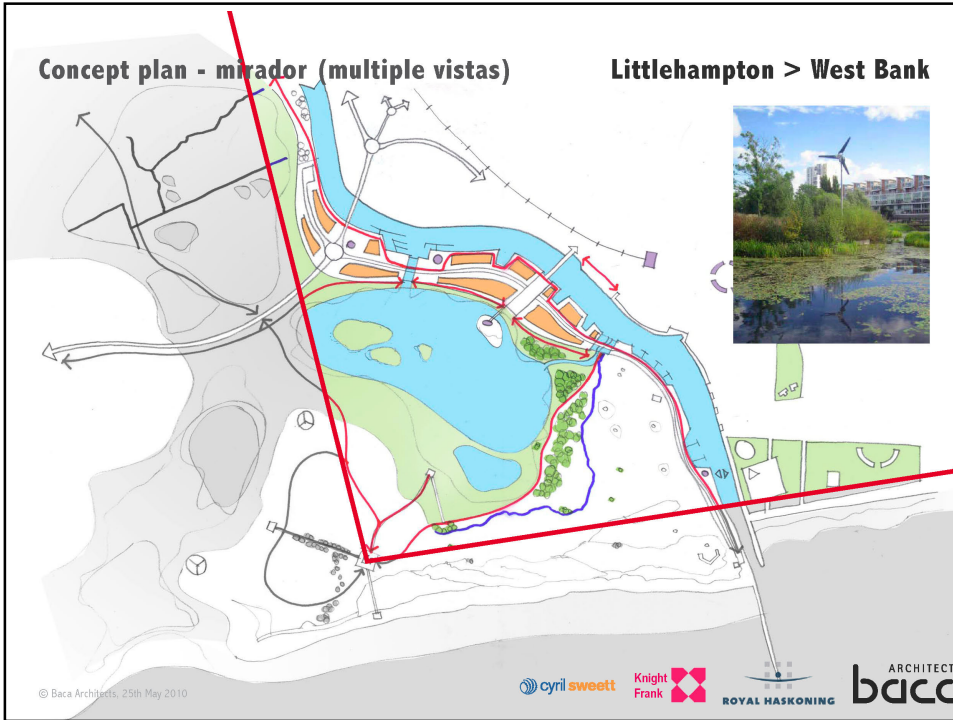


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## Concept plan - mirador (multiple vistas)

## Littlehampton > West Bank



## Littlehampton > Riverside

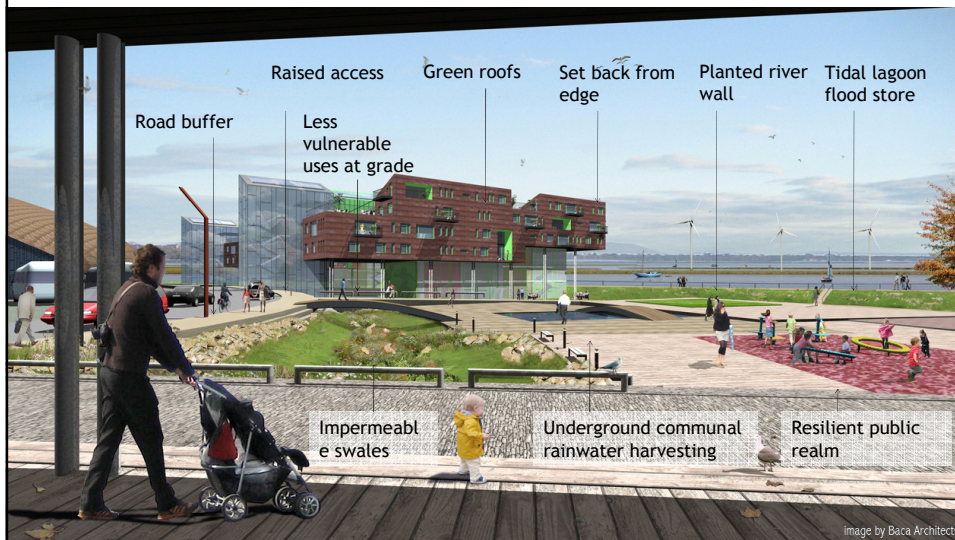






Life > Site 3 > Integrated flood-risk measures

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Life > Site 3 > Integrated flood-risk measures

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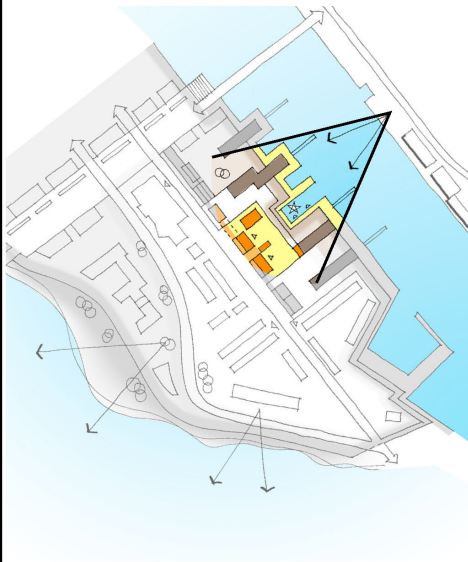


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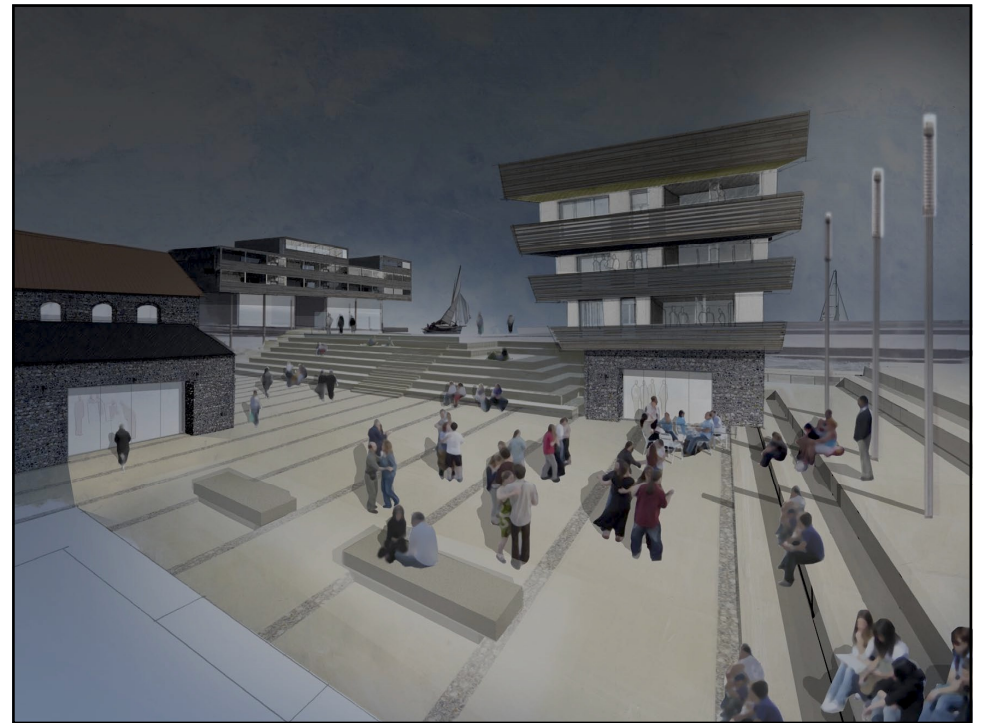
## Heritage



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## Role of new development in tackling climate change

- Financial benefits (joint funding and partnering)
- Land acquisition
- Stakeholder (actor) engagement
- Wealth and job creation
- Asset creation
- Positive response to climate change
- Improving our environment

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