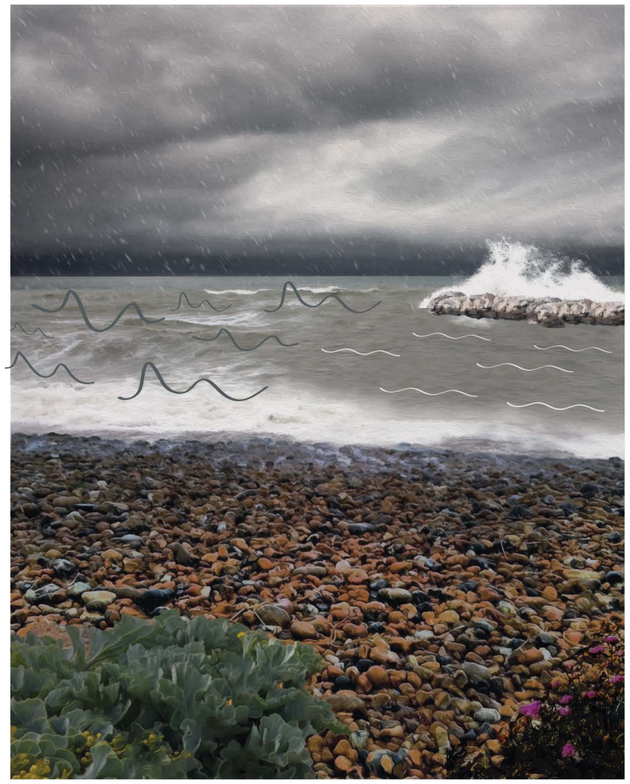
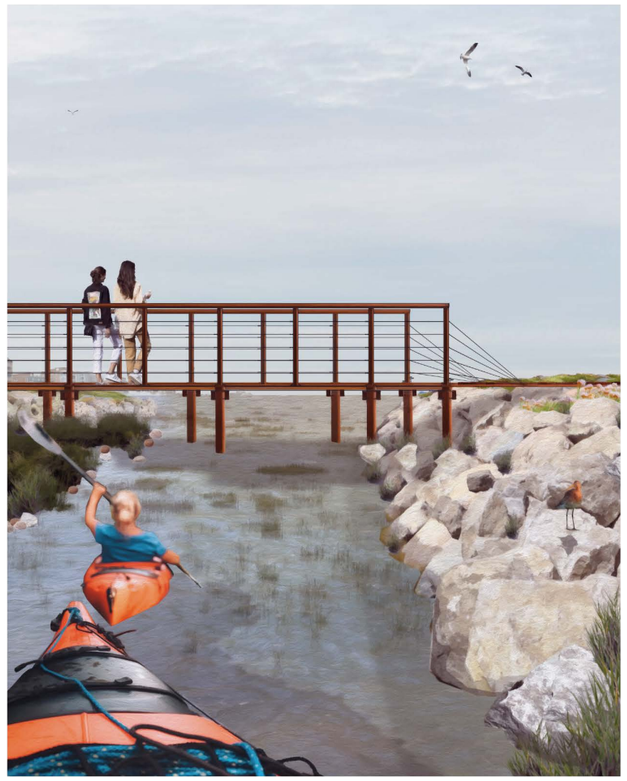


PROTECT

ENHANCE



CONNECT

Country / City	United Kingdom / London
University / School	Kingston University London / Kingston School of Art
Academic year	2019/2020
Title of the project	Shifting Shores
Authors	Georgina Stretch

TECHNICAL DOSSIER

Title of the project	Shifting Shores
Authors	Georgina Stretch
Title of the course	MLA Landscape Architecture
Academic year	2019/2020
Teaching Staff	Enrico Evangelisti, Íñigo Cornago Bonal, Kristof Fatsar
Department/Section/Program of belonging	Department of Architecture and Landscape
University/School	Kingston University London / Kingston School of Art

Written statement, short description of the project in English, no more than 250 words

Brighton's geological make up of chalk and clay is gradually being eroded. The shingle beach continually shifts W-E due to longshore drift. The **Shifting Shores** project addresses Brighton's current and future challenges of **climate change, erosion, extreme coastal weather** and **sea level rise** through a series of bespoke coastal defences which work together to protect the city whilst creating a biodiverse and active landscape for people to **relax, socialise and exercise.**

Extensive testing using a working wave model of Brighton's coast informed a **breakwater system** suitable to reduce wave height and energy, thus protecting the fragile coastline. In addition, rip-rap and a terraced design help to protect the leisure spaces along the beachfront allowing year round activity in the space. An **artificial saltmarsh** and breakwater **reef** introduce **ecosystem engineers** such as kelp, native oysters and marram grass which help to adapt the onshore and offshore environment creating a more stable and sheltered habitat and enabling for juvenile fish and coastal bird populations to thrive. A series of boardwalks have been designed to provide safe passage onto sea sculpted islands, whilst still exposing the user to the elements of the wind and waves. Planting palettes and materiality define each terrace, each selected for their use and tolerance to exposure. Ornamental species are situated closest the urban edge whereas salt tolerant coastal meadow mixes are proposed on the islands best suited to wind and waves.

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CLIMATE CHANGE AGAIN

11th International Biennial Landscape Barcelona

Barcelona September 2020

SCHOOL PRIZE

Connect with friends

Escape the city

Observe the wildlife

Dive into the deep

A

AA

A

AA

Ornamental Mix

Lowland Meadow

Scattered Woodland

Coastal Meadow

Salt Marshland

Coastal Meadow

Vegetated Shingle

Shingle Beach

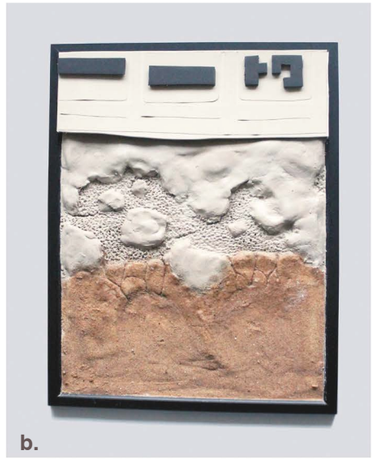
Marine Reef Habitat

SHIFTING ECOLOGICAL REGIIME

The model making process has enabled the spacial exploration of a series of coastal defence systems, topographic levels and user experience.

Construction of a scaled construction model investigates the use of rip- rap as a secondary coastal defence in tandem with salt marsh vegetation and coastal breakwaters.


a.


b.


c.


d.


e.


f.


g.

a. *Existing coastal form: clay, cardboard and sand.*
b. *Sea sculpted naturalised islands and salt marsh form.*
c. *Terraces lead to protected beach and coastal islands.*
d. *Path network laces across the terraces and onto the coastal islands: cardboard topographic model.*
e. *Paths alternate in height with steps and slopes allowing access from north to south and east to west.*
f. *Paths vary in width and materiality to create a diverse experience on both A- B paths and less direct routes through ornamental planting.*
g. *Boardwalk construction model (1:20) connecting land and sea: clay, mesh, timber, granite materials.*

Ornamental Mix

Pinus Pinaster provides height and evergreen colour throughout the year.

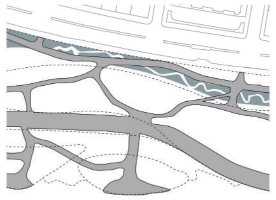
Achillea varieties provide vibrant colours through the summer months.

Pinus Mugo is low gorwing dense pine which provides shelter for species on it ley side.

Delosperma cooperi is very hardy evergreen perennial providing colour throughout the year.

Populus tremula is a deciduous tolerant of exposed coastal conditions with a deep ochre hue in the autumn.

Grasses provide autumn to winter interest when many of the other species die back.



The ornamental mix has been designed to inject colour and vibrance into the site. Tree, shrubs, grasses and perennials suitable for the harsh coastal conditions have been selected to be used in the borders of the top terrace. This mix provides a variety of species which can support Brighton's biodiversity.

Pinus Pinaster | *Pinus Mugo* | *Populus tremula,*

Achillea 'Terracotta' | *Delosperma cooperi* | *Molinia caerulea*

Amenity Mix

Agrostis capillaris is hard wearing and displays feather-like seed head at the end of the growing season.

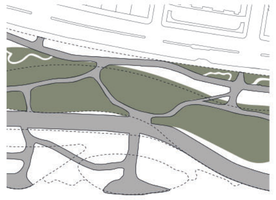
Scilla siberica has a indigo colour and bell shaped petals.

Festuca rubra creates a thick carpet-like sward trapping in moisture throughout the summer and winter months.

Muscari pseudomuscari is a very delicate spring bulb with tiny flower heads.

Poa pratensis is another durable grass species suitable for a variety of uses.

Crocus laevigatus is a very small spring bulb which provide a fourish of both purple and orange in the spring.



The amenity mix is designed to be flexible, durable and consistent. Grass species have been selected that are suitable fro cutting short or leaving to grow long creating meadows swards. Within this mix there will be bulbs planted alongside path areas to provide early spring interest.

Agrostis capillaris | *Festuca rubra* | *Poa pratensis*

Scilla siberica | *Muscari pseudomuscari* | *Crocus laevigatus*

Marshland Mix

Blysmus rufus is a small hedge which had bumble bee like seed heads which rustle in the wind.

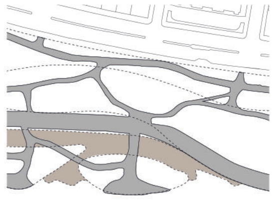
Crithmum maritimum is suitable for rock ledges so should seed well within the rip rap edges of the site.

Salicornia europaea is a small green succulant. It has fleshy leaves which absorb the salt around them.

Aster tripolium is a bright flowering coastal plant.

Spartina maritima is thick grass sward which grows quickly in the optimum environment.

Crambe maritima is a large flowering plant which supports coastal insect populations.



The marshland mix is made up native coastal species which are extremely salt and water tolerant. These species will be submerged in high tide and exposed to the elements at low tide. These species support a huge variety of native coastal species helping to improve the coastal biodiversity.

Blysmus rufus | *Salicornia europaea* | *Spartina maritima*

Crithmum maritimum, | *Aster tripolium* | *Crambe maritima*

Coastal Meadow Mix

Campanula rotundifolia is a deli-cate purple flower which looks its best in the height of summer.

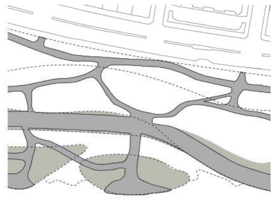
In colour contrast is the glaucium flavum otherwise known as the sea poppy which is bright yellow.

Centaurea nigra is bright pink thistle like plant. It has long flowering period and keep its foliage late into the autumn.

Linaria vulgaris is a small yellow wildflower which attracts huge volumes of insects.

Eringium maritimum is a hardy coastal species suitable fro wet, wildy and salty conditions.

Galium verum is a light and fluffy wild flower with bright yellow flowers.



The coastal meadow mix is a grass and wildflower mix made up of coastal species. Many of these are tolerant of extreme conditions and provide pollination of bees and insects. These are wild and rugged plants suitable for the exposed coastal environment.

Campanula rotundifolia | *Centaurea nigra* | *Eringium maritimum*

Glaucium flavum | *Linaria vulgaris* | *Galium verum*

Urban → **Coastal**

Habit	Plant name	Foliage	Ult. Height	Exposure	Salt Tollerance	Soil Type	Interest Period (J F M A M J J A S O N D)
Trees	*Pinus Mugo*	Ev	400	FS	H	WD	
	Pinus Pinaster	Ev	1200	FS	H	WD	
	Populus tremula	Dec	1200	FS	M	WD	
Grasses	*Panicum Virgatum*	Ev	100	FS	H	M	
	Osmunda regalis	Dec	300	S	L	WD	
	Molinia caerulea	Ev	1000	FS	H	WD	
	Miscanthus sinensis	An	220	PS	H	M	
	Schizachyrium scoparium	An	100	PS	H	WD	
Perennials	*Eringium maritimum*	Ev	100	FS	H	WD	
	Achillea 'Terracotta'	Pr	80	FS/PS	M	WD	
	Armeria Maritima	Ev	50	FS	H	WD	
	Lobularia maritima	Pr	50	FS/S	H	WD	
	Centranthus ruber	Pr	100	FE	M	WD	
	Glaucium flavum	Pr	100	FS	H	WD	
	Delosperma cooperi	Pr	10	S	M	WD	
	Dianthus deltoides	Ev	50	FE/PE	H	WD	

Habit	Plant name	Foliage	Ult. Height	Exposure	Salt Tollerance	Soil Type	Interest Period (J F M A M J J A S O N D)
Grasses	*Agrostis capillaris*	Ev	50	FS/PS	M	Any	
	Agrostis castellana	Ev	50	FS/PS	M	Any	
	Festuca rubra	Ev	50	FS/PS	M	Any	
	Lolium perenne	Ev	50	FS/PS	M	Any	
	Poa pratensis	Ev	50	FS/PS	M	Any	
Bulbs	*Crocus laevigatus*	Dec	10	FS	L	WD	
	Muscari pseudomuscari	Dec	50	FE/PE	L	Any	
	Scilla siberica	Dec	50	FE/PE	H	DW	

Habit	Plant name	Foliage	Ult. Height	Exposure	Salt Tollerance	Soil Type	Interest Period (J F M A M J J A S O N D)
Shrubs	*Crambe maritima*	Ev	100	FS/PS	H	WD	
	Crithmum maritimum	Ev	50	FS	H	WD	
Grasses	*Ammophila arenaria*	Ev	120	FS/PS	H	WD	
	Aster tripolium	Dec	50	FE	H	M	
	Blysmus rufus	Dec	100	FE	H	M	
	Elymus repens	Ev	150	FS	H	WD	
	Leymus arenarius	Ev	150	FS	H	WD	
	Puccinellia maritima	Ev	80	FS	H	WD	
	Salicornia europaea	Dec	30	FE	H	M	
	Spartina maritima	Ev	70	FS	H	WD	

Habit	Plant name	Foliage	Ult. Height	Exposure	Salt Tollerance	Soil Type	Interest Period (J F M A M J J A S O N D)
Grasses	*Campanula rotundifolia*	Dec	40	FE/FS	H	M/WD	
	Centaurea nigra	Dec	100	FE/FS	H	M/WD	
	Daucus carota	Dec	100	FE/FS	H	M/WD	
	Digitalis purpurea	Ev	100	FE/FS	H	M/WD	
	Galium verum	Dec	50	FE/FS	H	M/WD	
	Hypericum perforatum	Ev	100	FE/FS	H	M/WD	
	Leucanthemum vulgare	Dec	100	FS/PS	H	M/WD	
	Linaria vulgaris	Dec	50	FS	H	M/WD	
	Lotus corniculatus	Dec	10	FS	H	M/WD	
	Plantago maritima	Dec	30	FS	H	M/WD	
	Silene uniflora	Dec	31	FS	H	M/WD	
	Thymus serpyllum	Ev	10	S	H	WD /M	

TERRACE TRANSITIONS