

AIRPORT LANDSCAPES

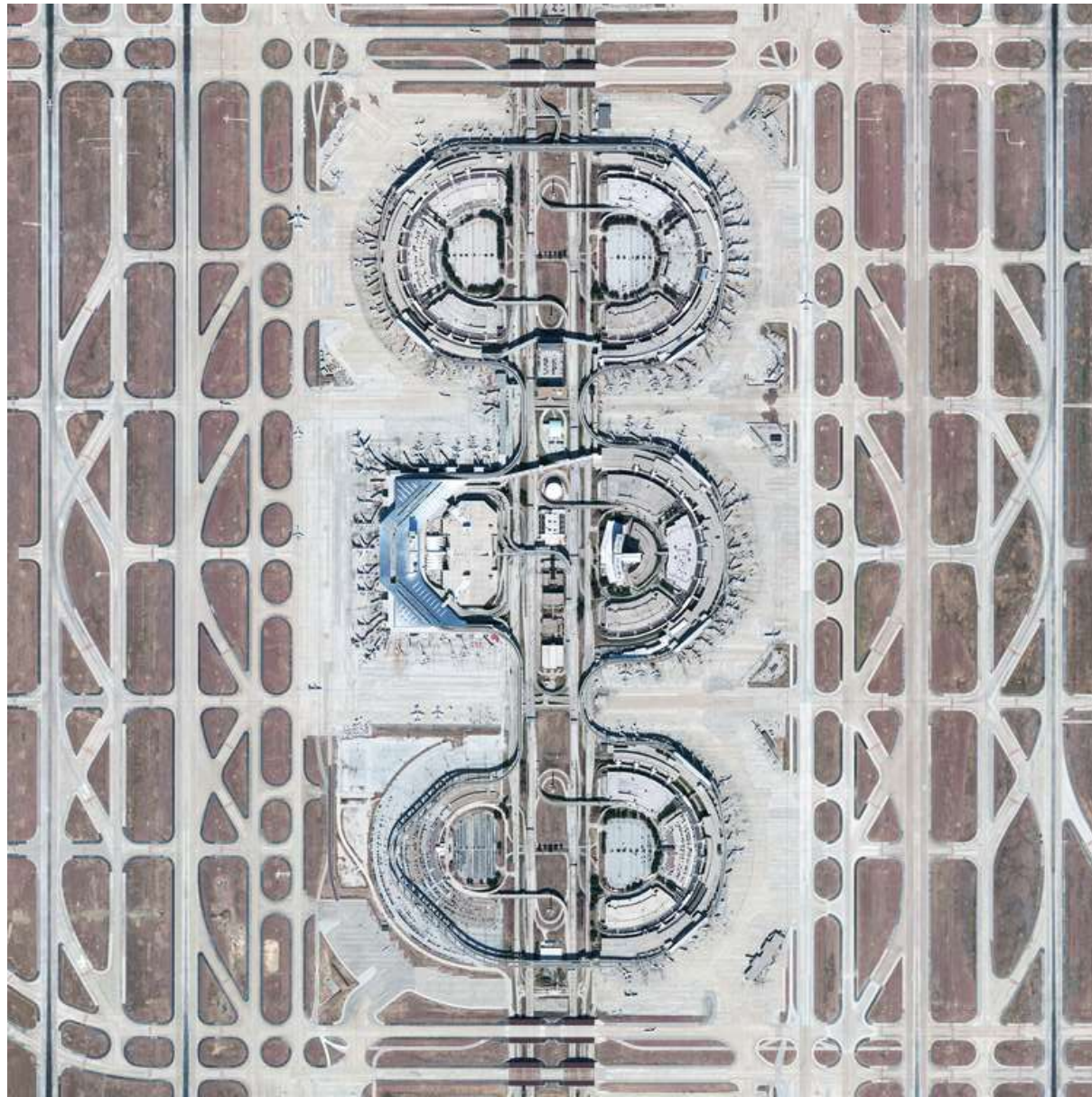
VISUAL

WILDERNESS

FUNCTIONAL

GEOGRAPHICAL





Dallas-Fort Worth Airport / HOK / 1973

A machine for transport “stretched across the Texas landscape like a four-mile-long wagon train”



Soekarno-Hatta Airport, Jakarta / Paul Andreu – ADP / 1985
Nature in the machine: the difference landscape can make



“... integrates landscape and building in an exceptionally beautiful way.” / Aga Khan Award for Architecture, 1995

VISUAL LANDSCAPE

Recent projects in the creation, re-creation, and preservation of landscape

On the landside and within the terminal

In desert and jungle environments

Landscape in the conventional sense of natural scenery

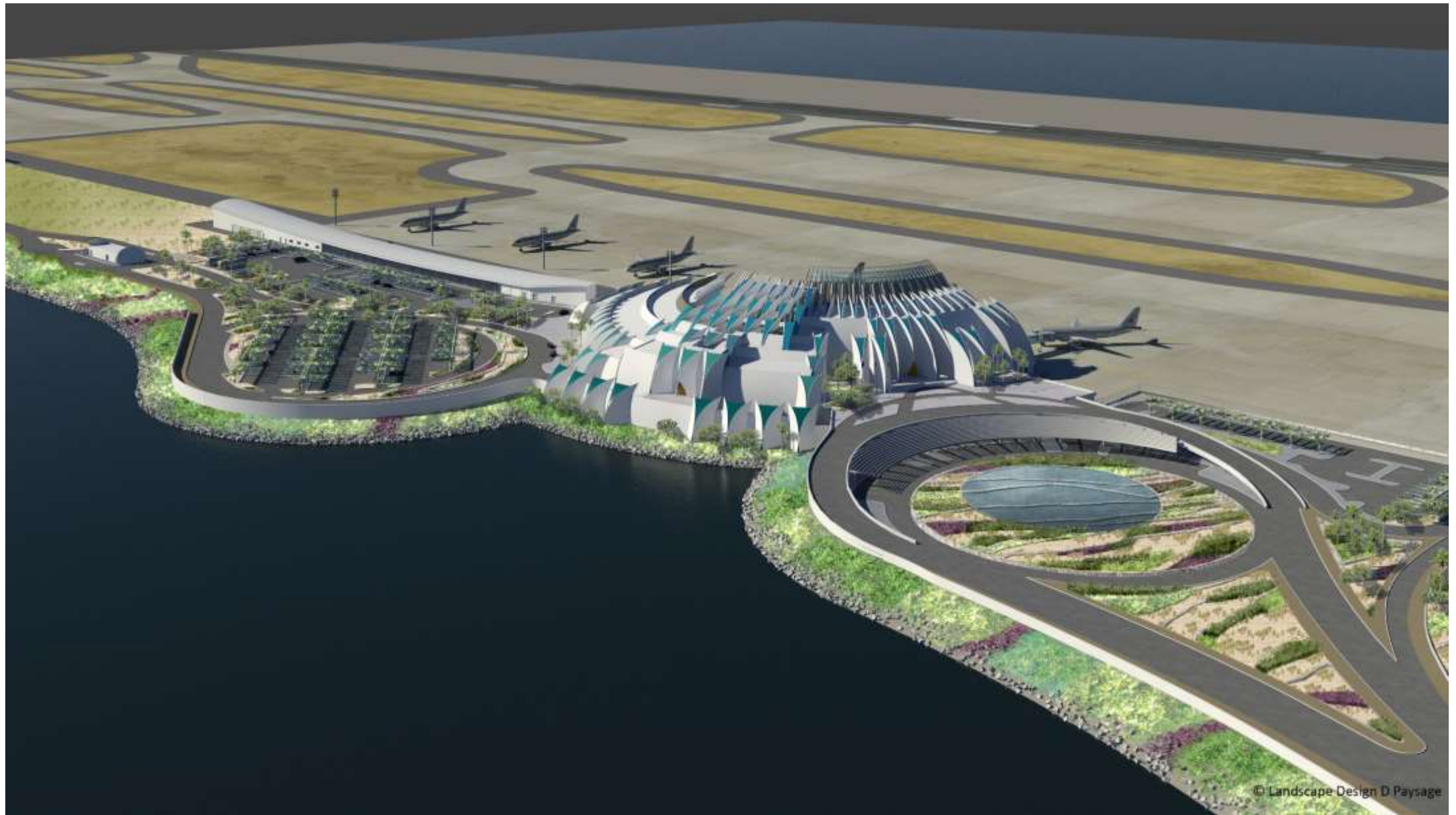


coastal desert

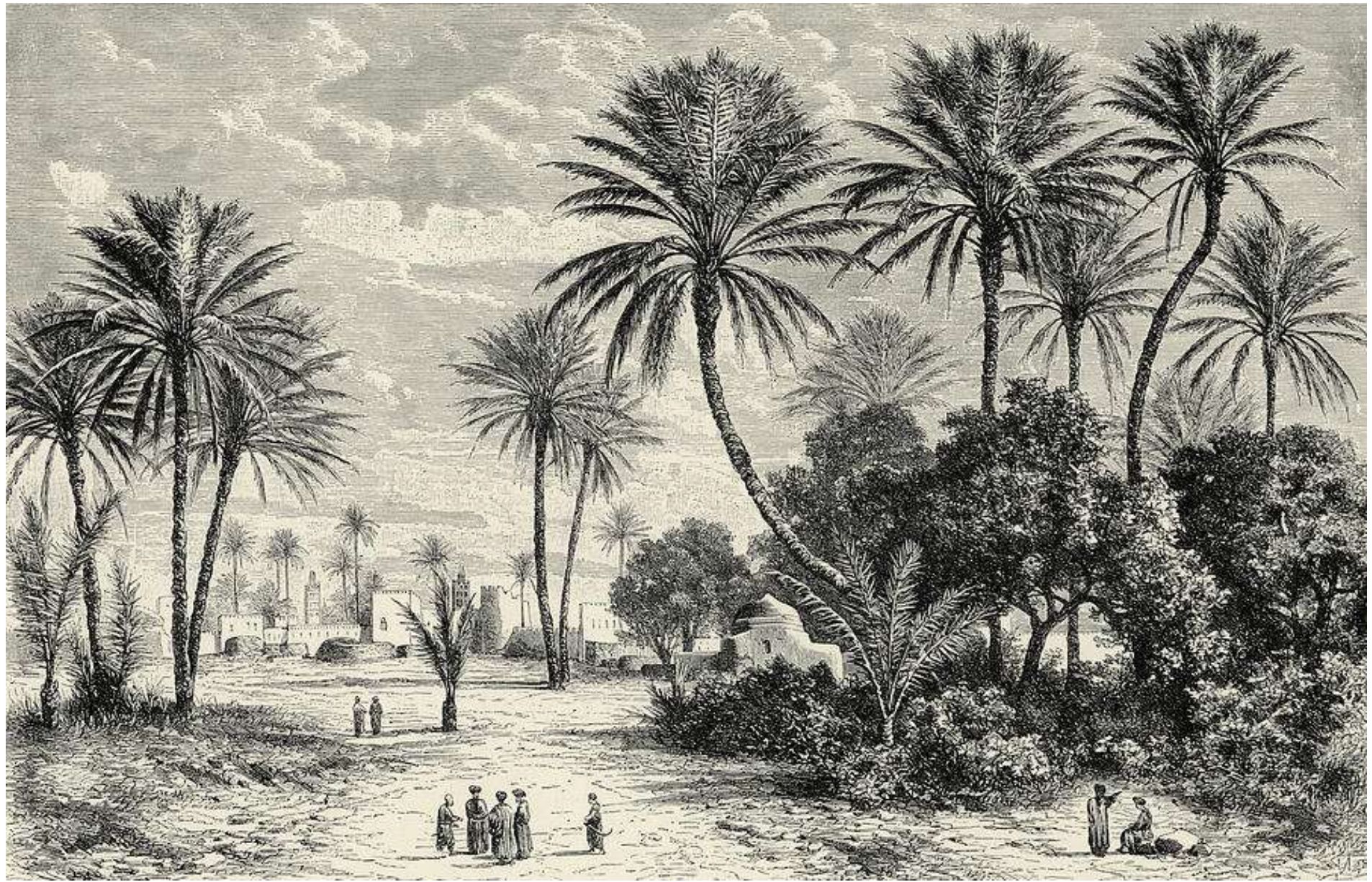


Emiri Terminal – Hamad International Airport, Doha / D-Paysage - ADPI / 2005

creation of an entirely original garden on coastal landfill: "a rich composition, comparable to ... coral reefs"



a painting-like landscape seen by a select few on the approach to the Terminal



desert oasis



King Abdulaziz International Airport, Jeddah / TN+ - ADPI / 2009

re-creation of a desert oasis at the heart of the terminal: "... the illusion of an oasis grown out of a dune"



an enclosed 2-hectare garden bisected by a people-mover tunnel: a model for terminal landscape such as the Beijing-Daxing pier gardens

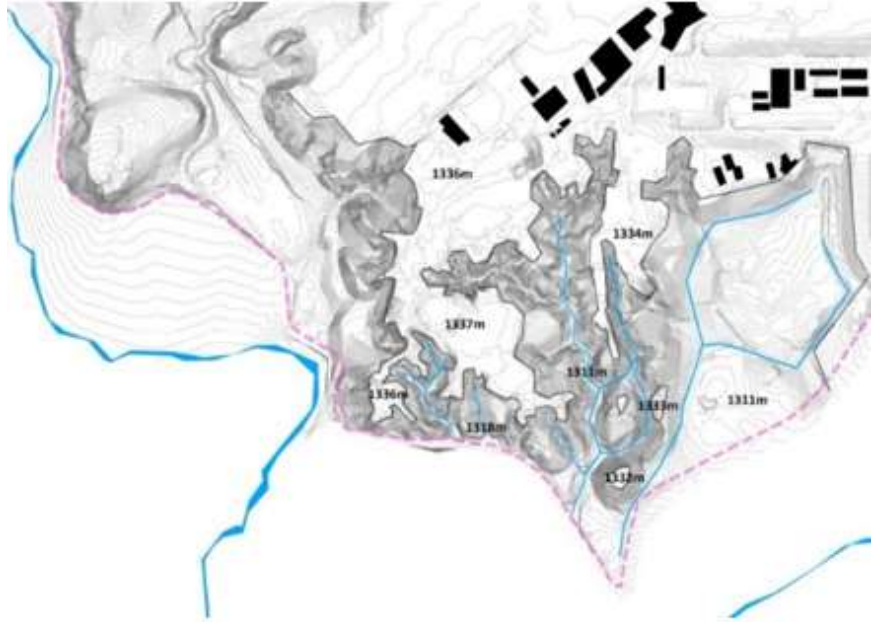


Soekarno-Hatta Airport, Jakarta / the original model for a terminal garden

“The architect's wish to keep the pavilions and circulation completely open to the natural landscape ...”



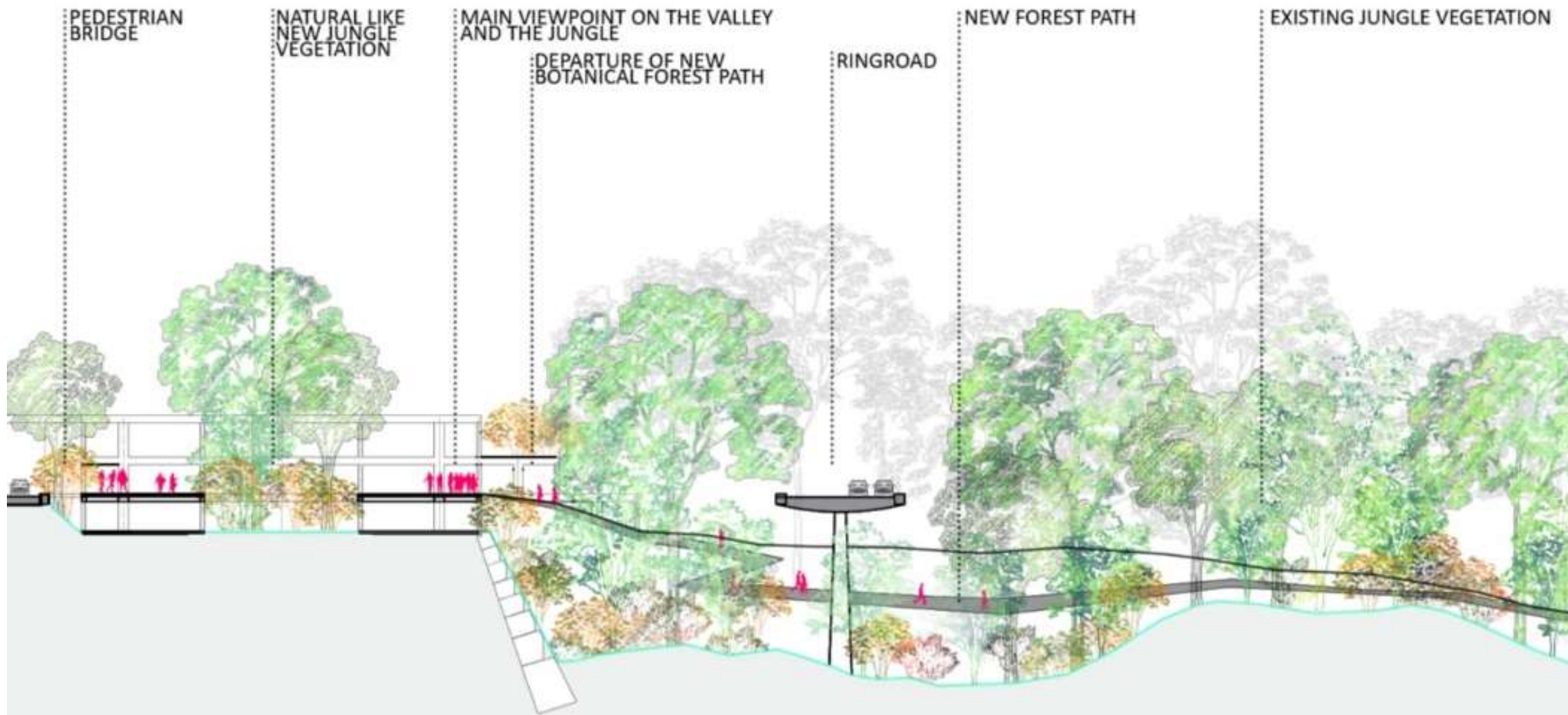
jungle



Tribuvhan Airport, Kathmandu / TN+ - ADPI / 2016 / topography – landscape zones – terminal landside plan
 “preservation of the existing jungle and its integration in the landscape of the airport”

CAR PARK WITH OBSERVATORY TERRACE

"THE JUNGLE"



"A connection is made between the landside and the sacred forest ..."



© ADPI

“An observatory terrace at the canopy level allows the contemplation of the jungle”



looking from the terminal to the jungle and the city beyond

WILDERNESS LANDSCAPE

A new strategy in the landscape management of airside zones

The potential for wild natural landscape within the airport perimeter





conventional airfield landscape, with grass cut flush



Orly Airport

With less mowing, the grass monoculture becomes an ecosystem: “a prairie with a high level of biodiversity”



Charles de Gaulle Airport – airfield prairie / 8 km²



Réserve naturelle de la Bassée / 8 km²

As a restricted-access, pesticide-free space, an airport is like a natural reserve, protecting endangered species. And with its vast size, the airport can harbor flora and fauna in great quantity to counter the 'insect apocalypse' and other population drops.

FUNCTIONAL LANDSCAPE

The re-integration of natural processes into the built environment

Making the soil, air and water healthier

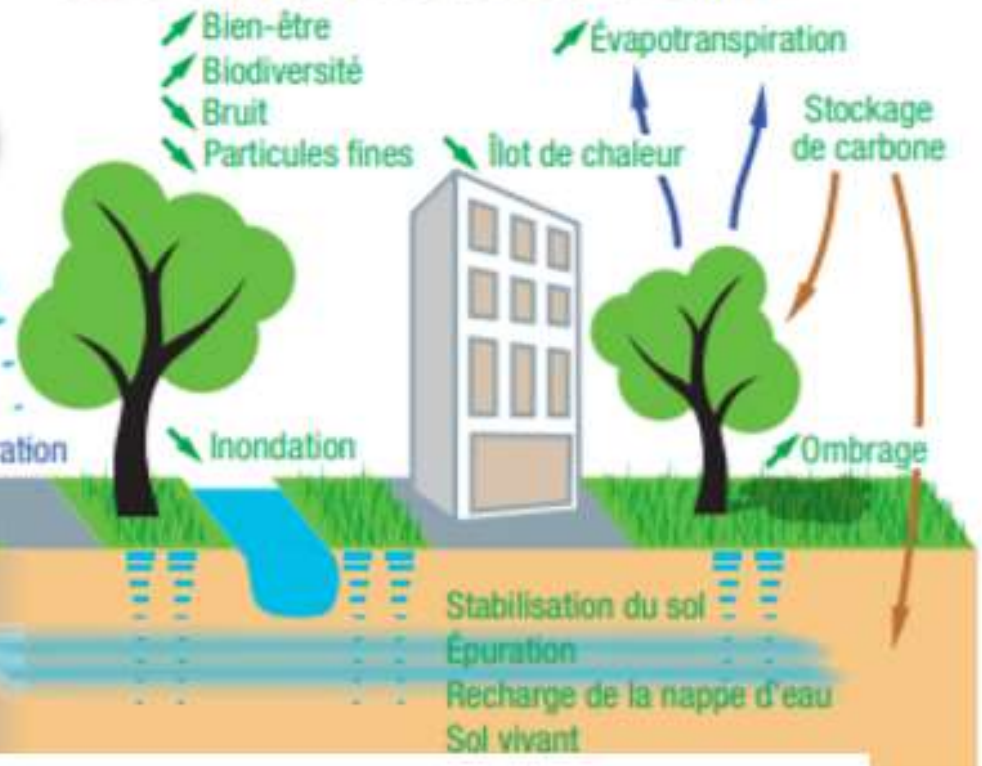
Fostering a sense of well-being for airport users, workers and neighbors

Increasing the autonomy of the airport in energy, water, food and waste cycles

NATURE NON PRISE EN COMPTE

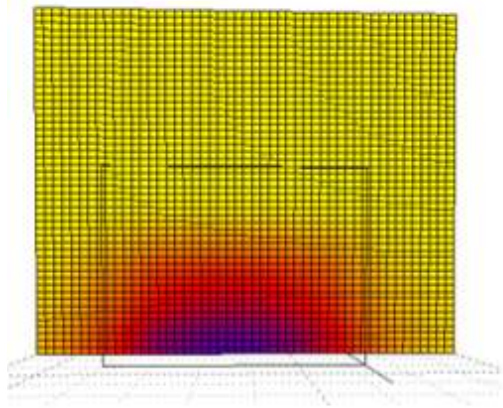


INTÉGRATION DE LA NATURE EN VILLE

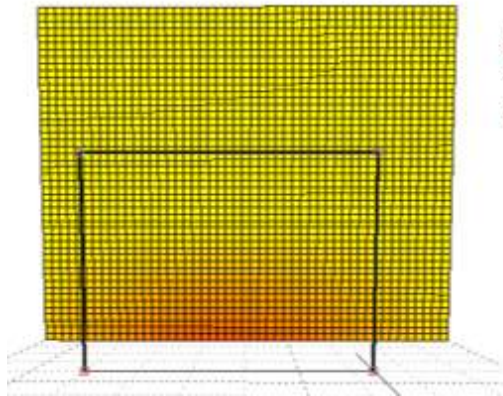


Integration of nature in the city:

reduce heat-island effect / re-charge water table / improve soil / purify air / enhance biodiversity / store carbon

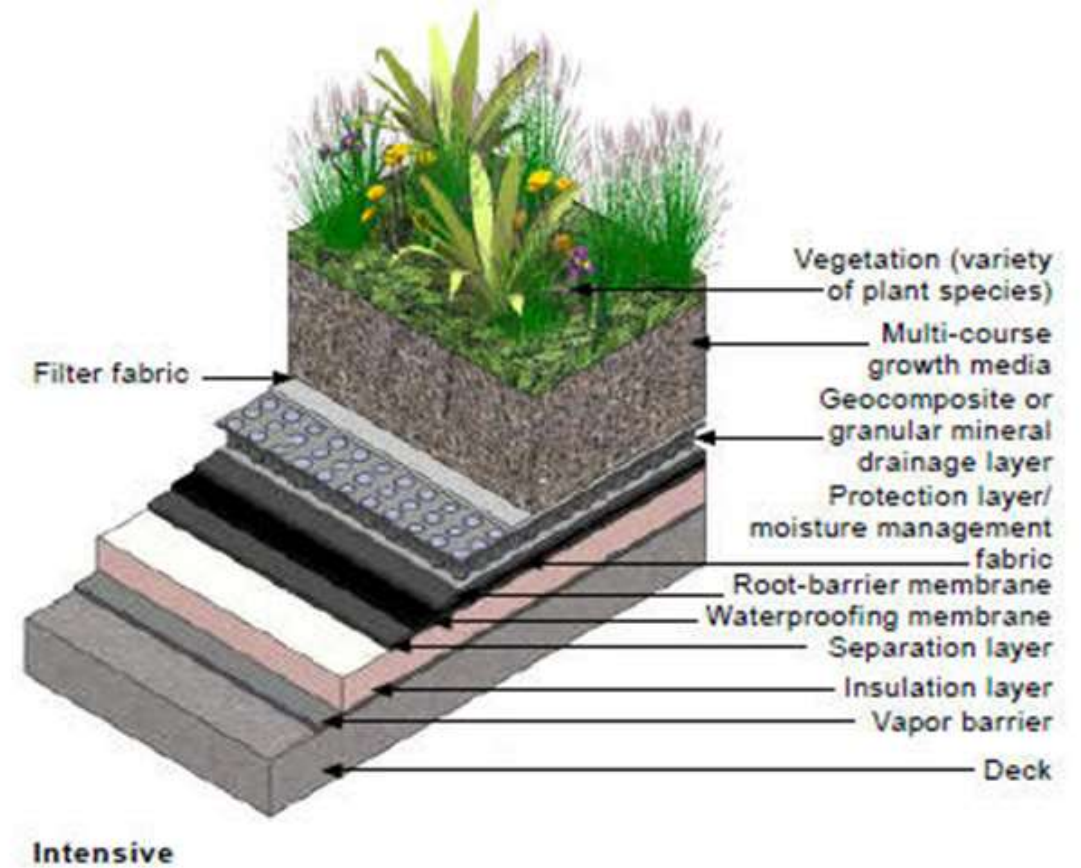


Trees 4m high
 2m from the East facade
 Facade 8m High

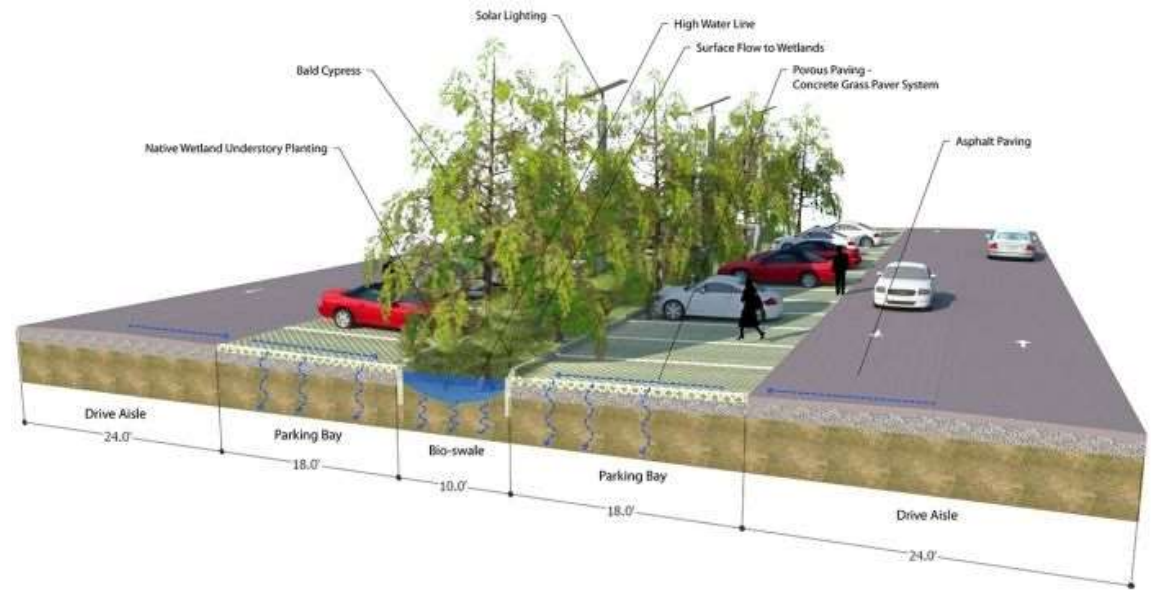


Trees 4m high
 4m from the East facade
 Facade 8m high

Source: Ecotect

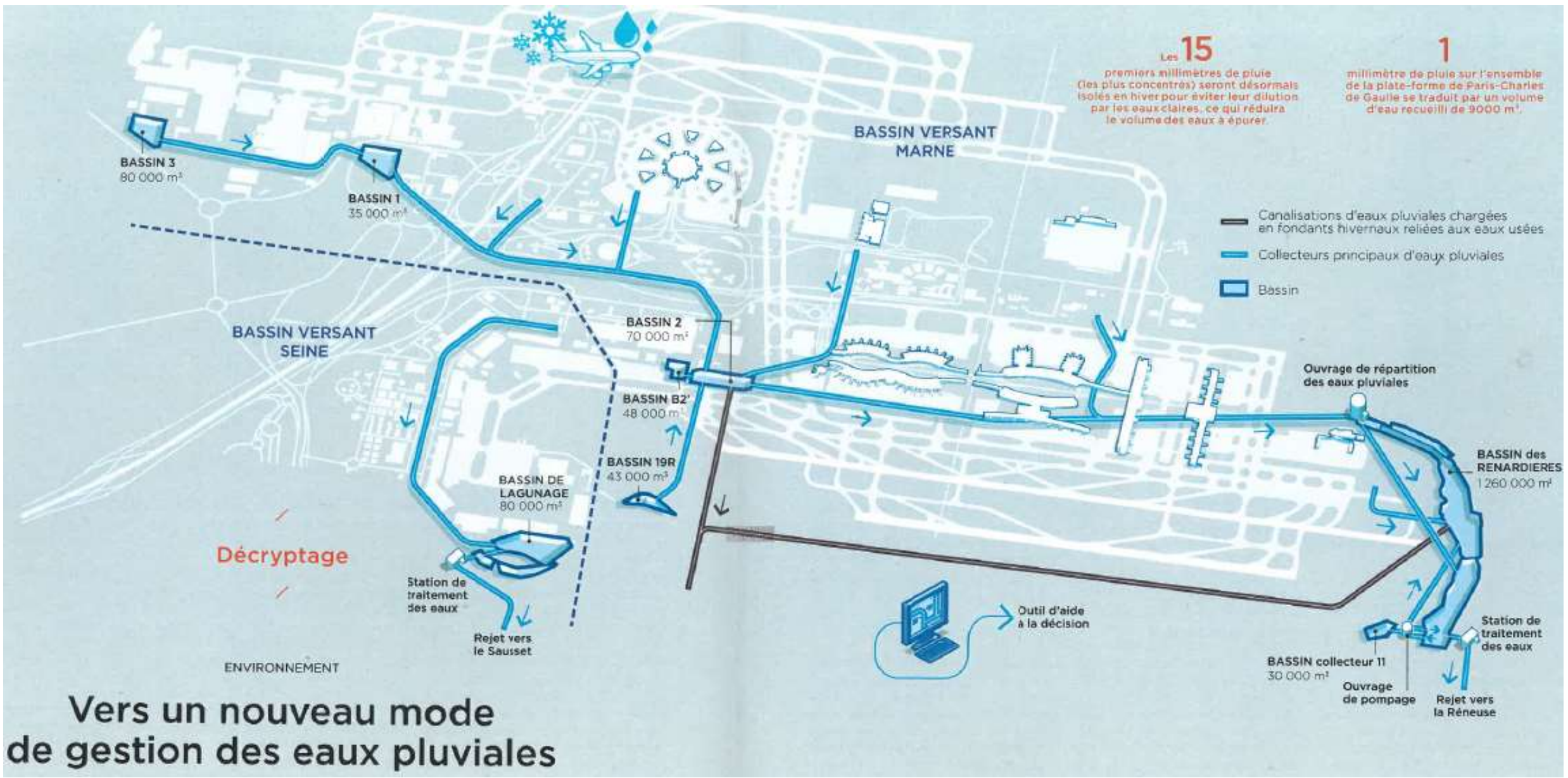


Through bio-climatic design for buildings: planted façade buffers / vegetated roofs



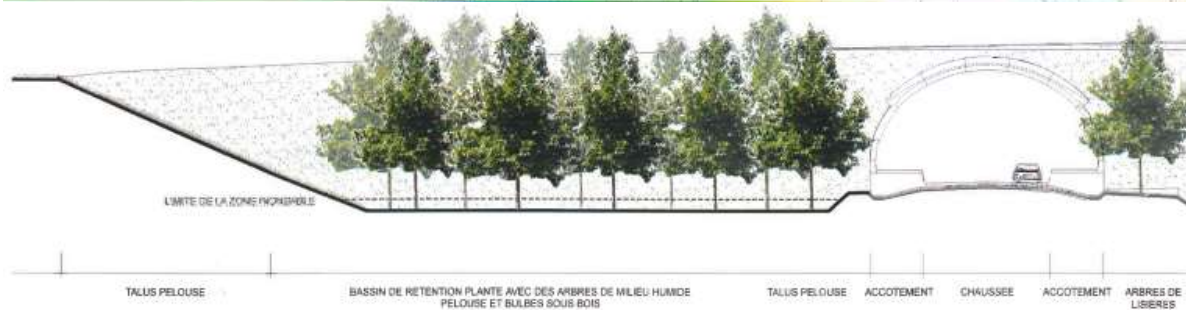
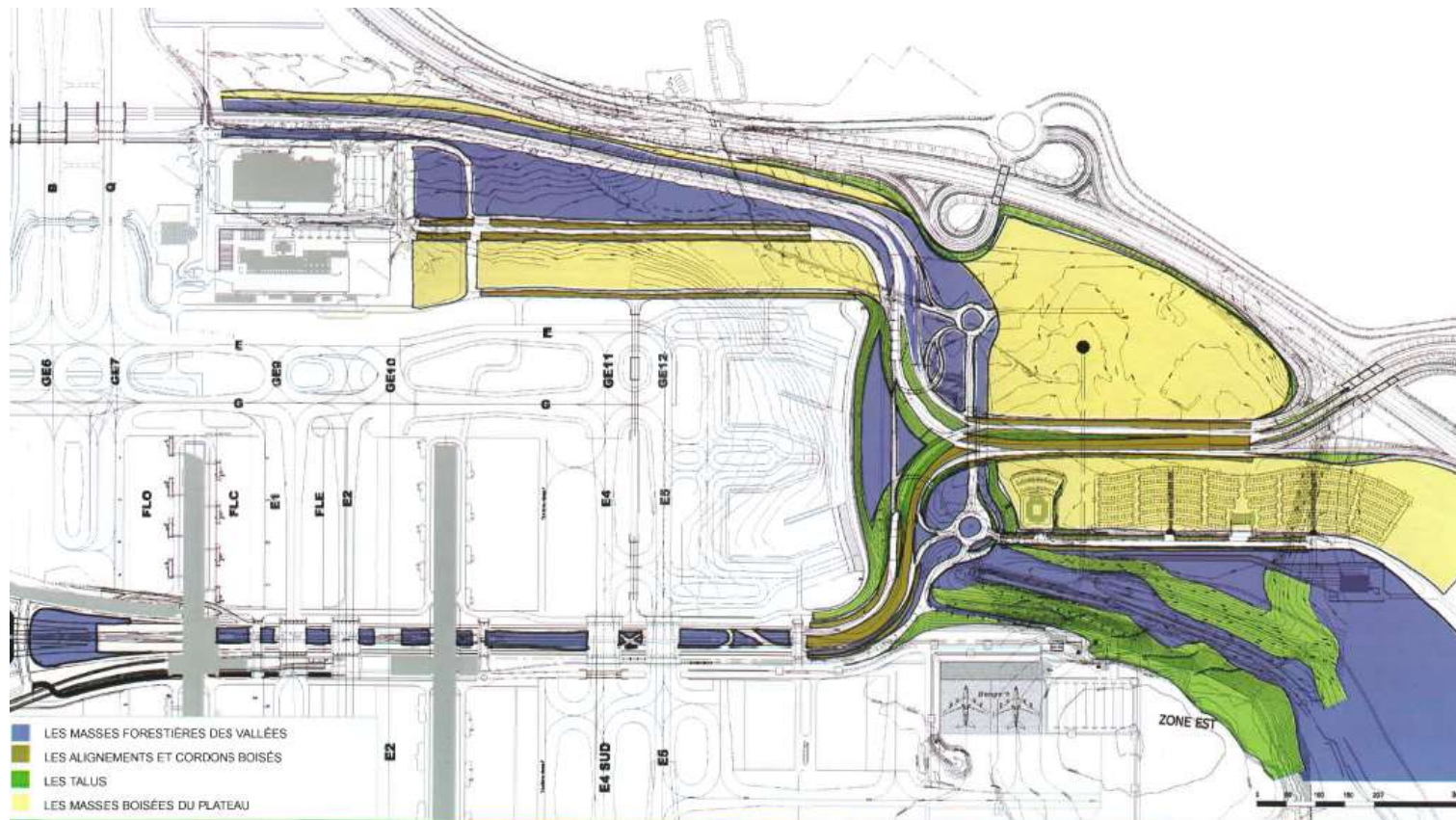
Orlytech parking lot, Paris / D-Paysage – ADPI

Through green infrastructure design: on-site stormwater retention using permeable pavement and bioswales



Charles de Gaulle Airport - stormwater management system

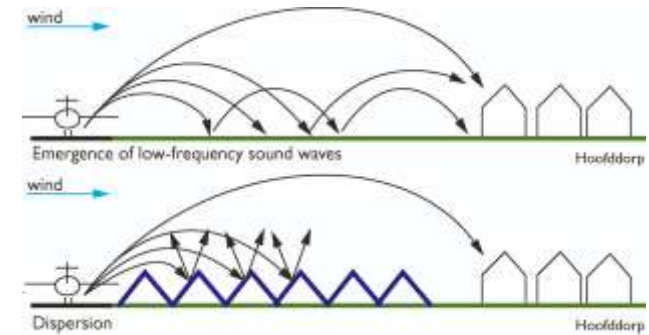
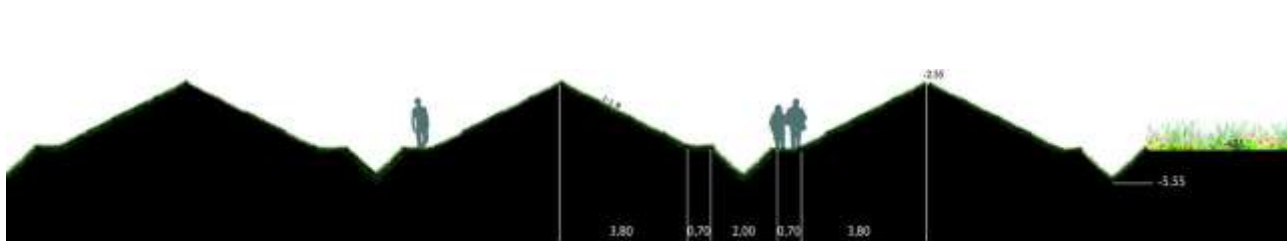
Conventional infrastructure for a 32 km² platform: retention basins, treatment plants, pumping stations, and future canalization to the Marne River



Charles de Gaulle Airport – East – landscape master plan / Michel Desvigne – ADP / 2003

Integration of green infrastructure: permeable paving, bioswales, planted retention basins (above), constructed wetlands ...

« L'interaction des études d'équipements, la topographie et des espaces de plantation fait émerger une cohérence. »



Landart Park - Schiphol Airport, Amsterdam / H+N+S landscape architects - Paul de Kort artist – TNO sound engineers
 Soundscape: a recreational park with 3-meter ridges which deflect runway noise away from the residential neighborhood



Cochin International Airport / “the first airport in the world that completely operates on solar power ... will significantly reduce global warming”

Energy landscape: vast airport land area is ideal for solar, with over 20 hectares at Kochi in solar farm and carport producing up to 15MW



Cochin Airport / the solar farm “led to the concept of organic farming utilising the vacant areas adjacent and in between the panels”
Agricultural landscape: produces 80 tons of vegetables per year, re-uses maintenance water, and increases efficiency of the solar panels

AMENDEMENT N°328

ARTICLE ADDITIONNEL

AVANT L'ARTICLE PREMIER, insérer l'article suivant:

Après la troisième phrase du premier alinéa de l'article 1^{er} de la Constitution, est insérée une phrase ainsi rédigée : « Elle agit pour la préservation de l'environnement et de la diversité biologique et contre les changements climatiques. »

Aligning with the new amendment to the French Constitution: the capacity for action within the airport design world
Kathmandu: for preservation of the environment / Orly & CDG: for biodiversity / Cochin: against climate change

GEOGRAPHICAL LANDSCAPE

What separates airports from other infrastructure is their geographical scale

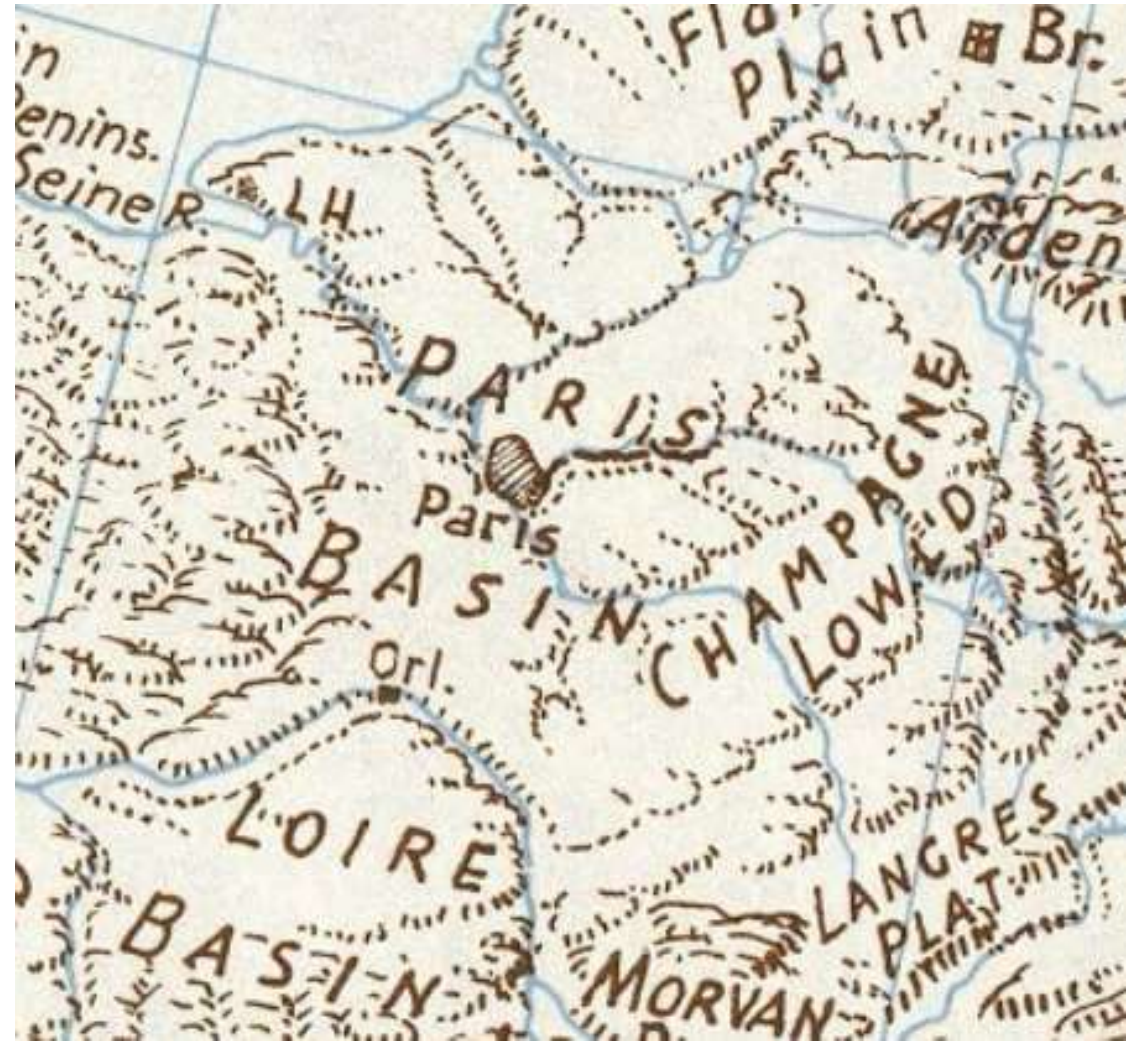
Their concentrated size exerts a regional impact on the landscape

COMPOSITE: CONSERVATION RECREATION URBANIZATION AREAS





Charles de Gaulle Airport / from the edge of outer space, 2018



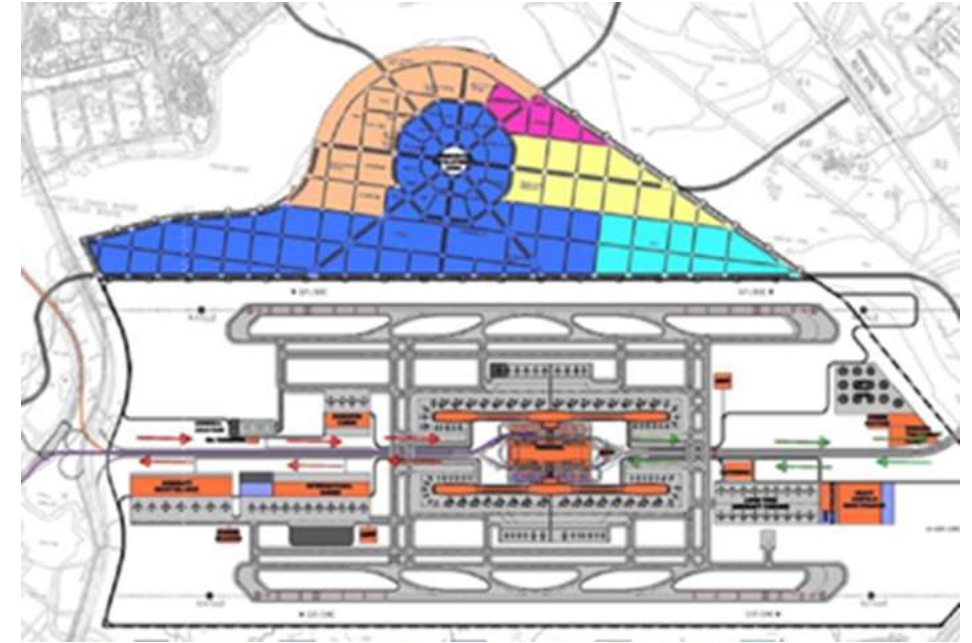
Landform map / Erwin Raisz, 1960

“The airplane has unveiled for us the true face of the Earth” and in so doing allows us to see the impact of the airport itself on the Earth’s surface
CDG at the scale of a geographical landform



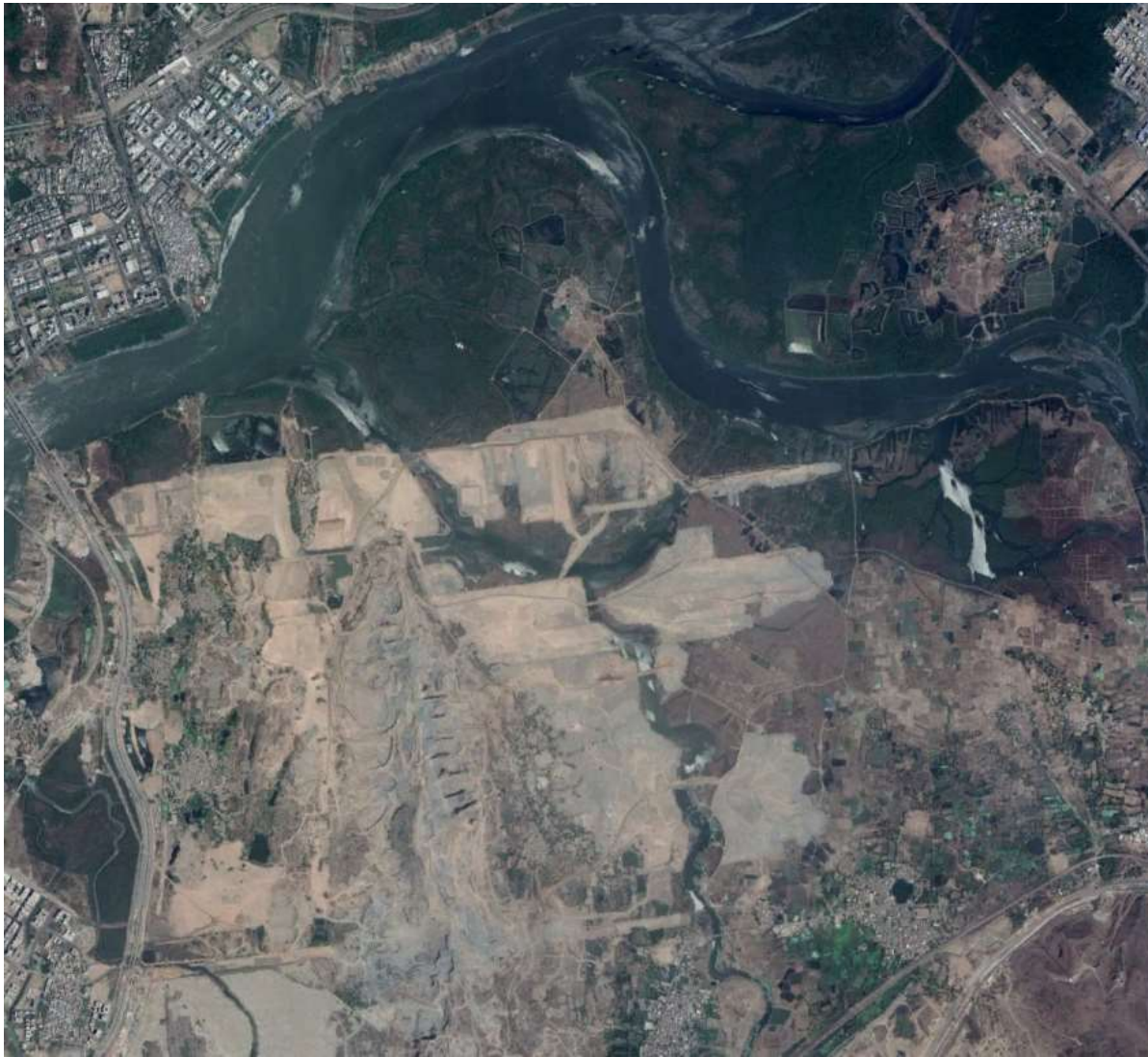
Khartoum New International Airport / fenced site and access road

No airport is built on a blank slate, but some have more impact than others



An example of extreme development impact:

- Cutting a mangrove forest on the estuary
- Diverting one river and 'correcting' another
- Leveling a 90m hill
- Erasing the agricultural landscape
- Demolishing 10 villages

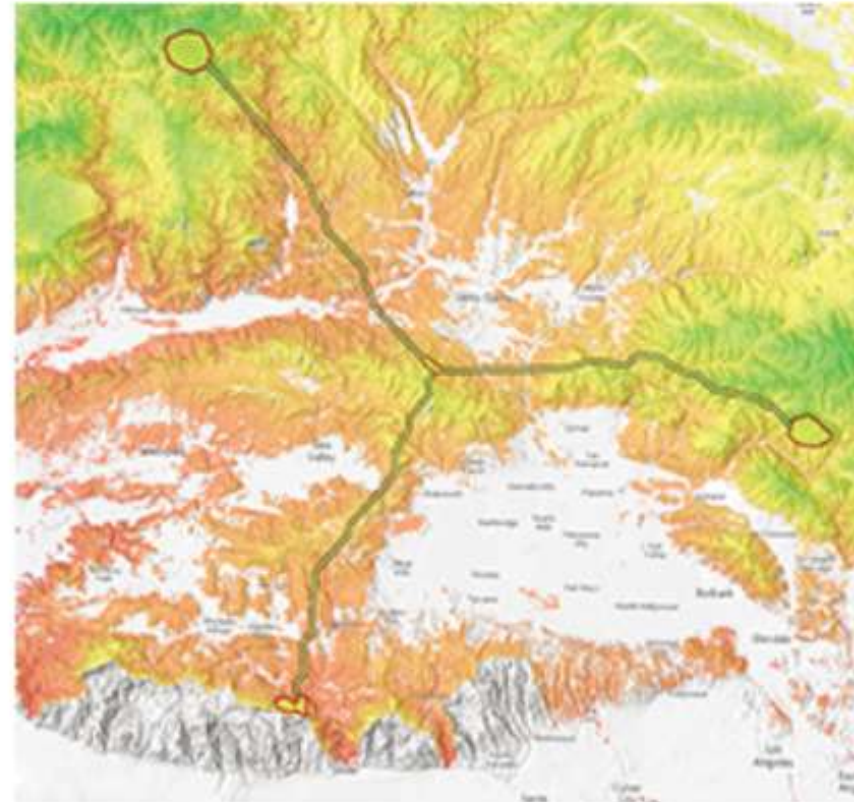
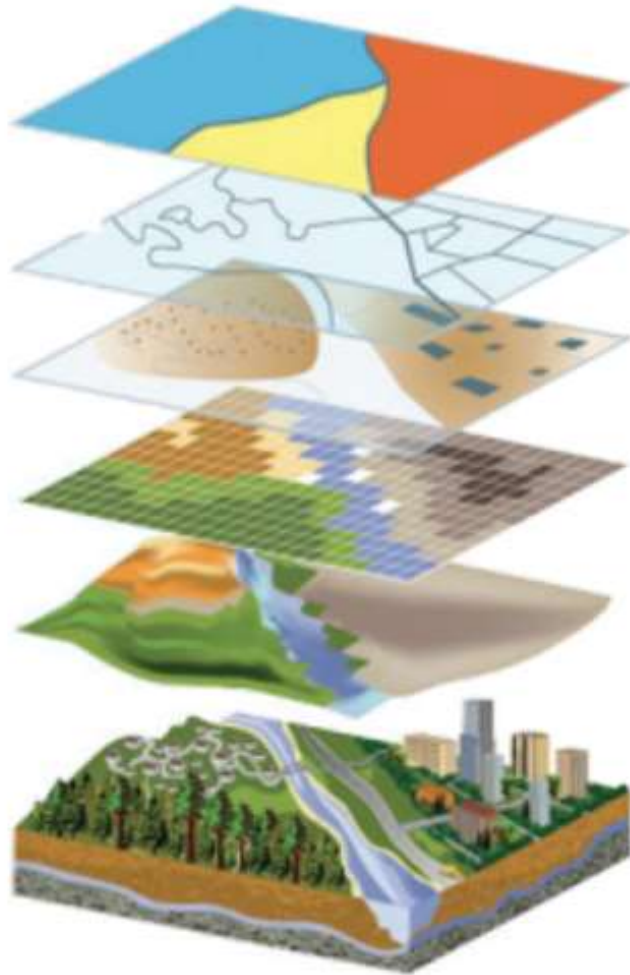


Navi Mumbai International Airport, Mumbai / 2018
One year later, the geographical-scale transformation is well-advanced



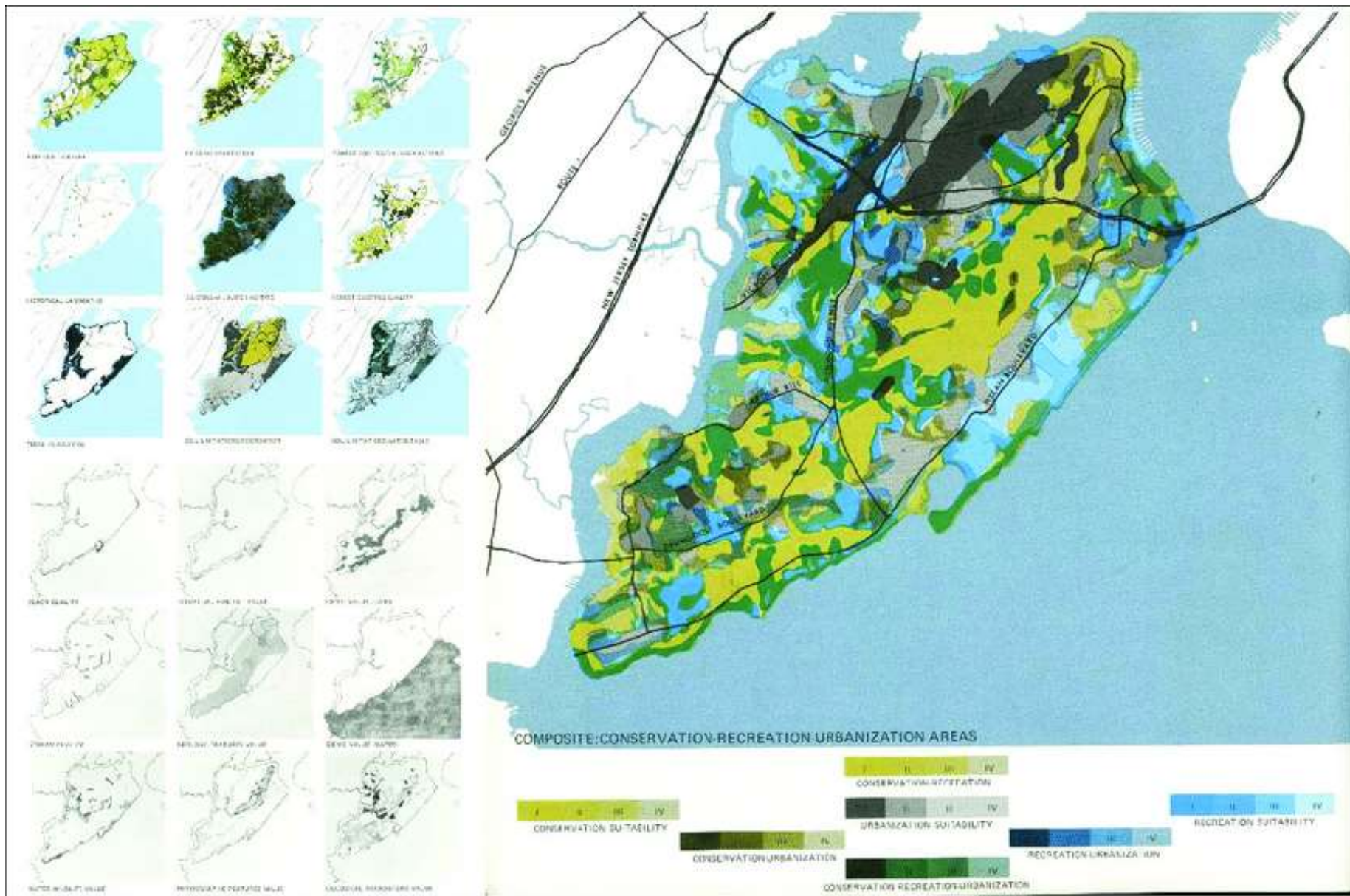
A better way, for the environment as well as for the airport itself.
With a different design method, which could be summed up as:

1. **Analyze the space**
2. **Find the sense of place**
3. **Engineer with nature**
4. **Allow art to be featured**



1. Analyze the space with new tools: Geographical Information System

"... analyzes spatial location and organizes layers of information into visualizations using maps ... lets you evaluate suitability and capability ..."



“ ... ask nature to reveal intrinsic suitabilities for the land uses in question” / Ian McHarg, 1969
 A precursor in 'cartographic clash analysis' with a strong influence on the environmental design movement



2. Find the sense of place: three examples, beginning with the Forest



“The unique airport in the forest, where you roll your suitcases between pinetrees and lupins”



Oslo Airport / Aviaplan AS

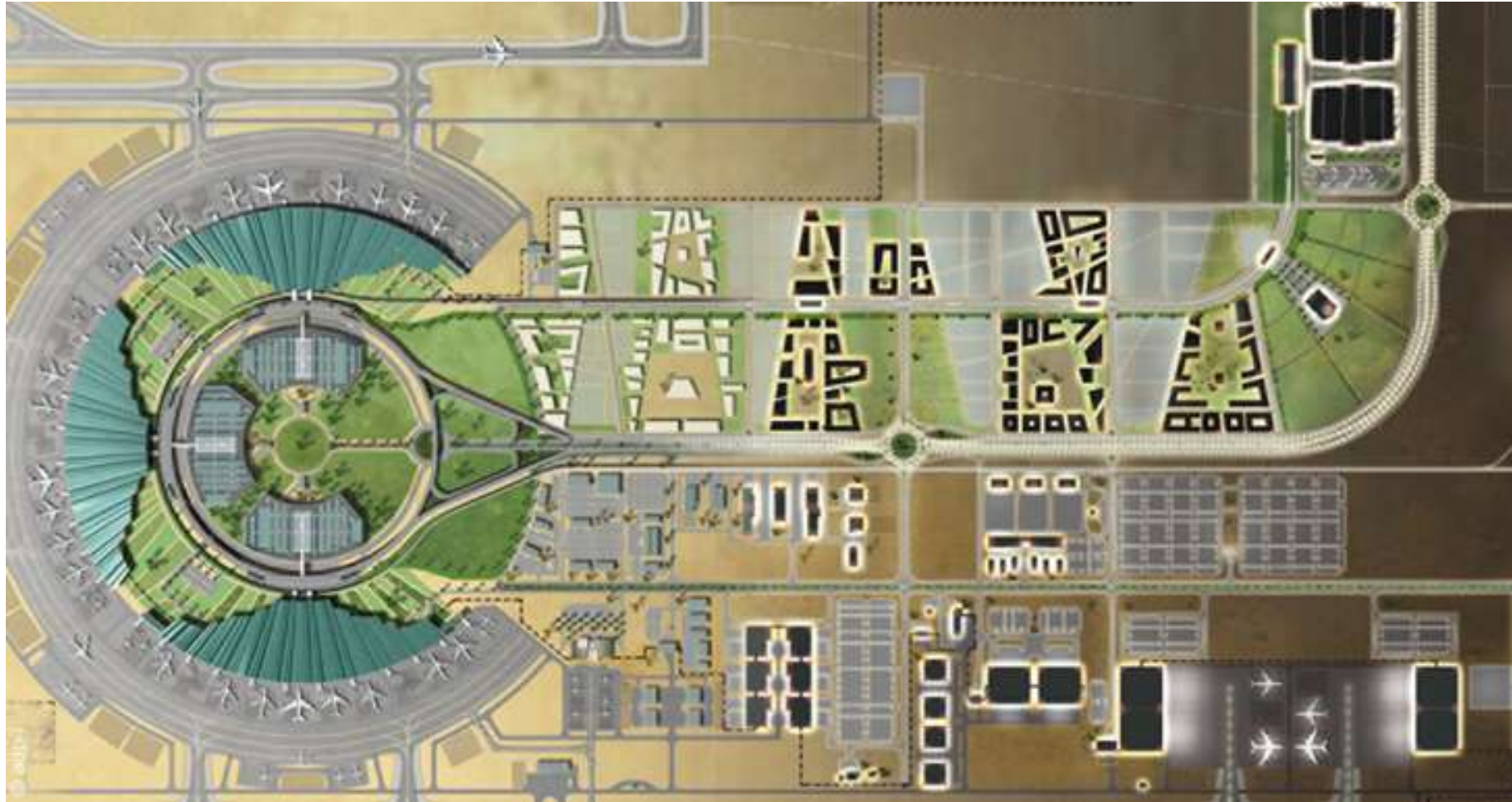
The strong vision of a forest habitat nurtured the airport's ambitious program of environmental management in energy, water and waste



2. Find the sense of place: the Desert

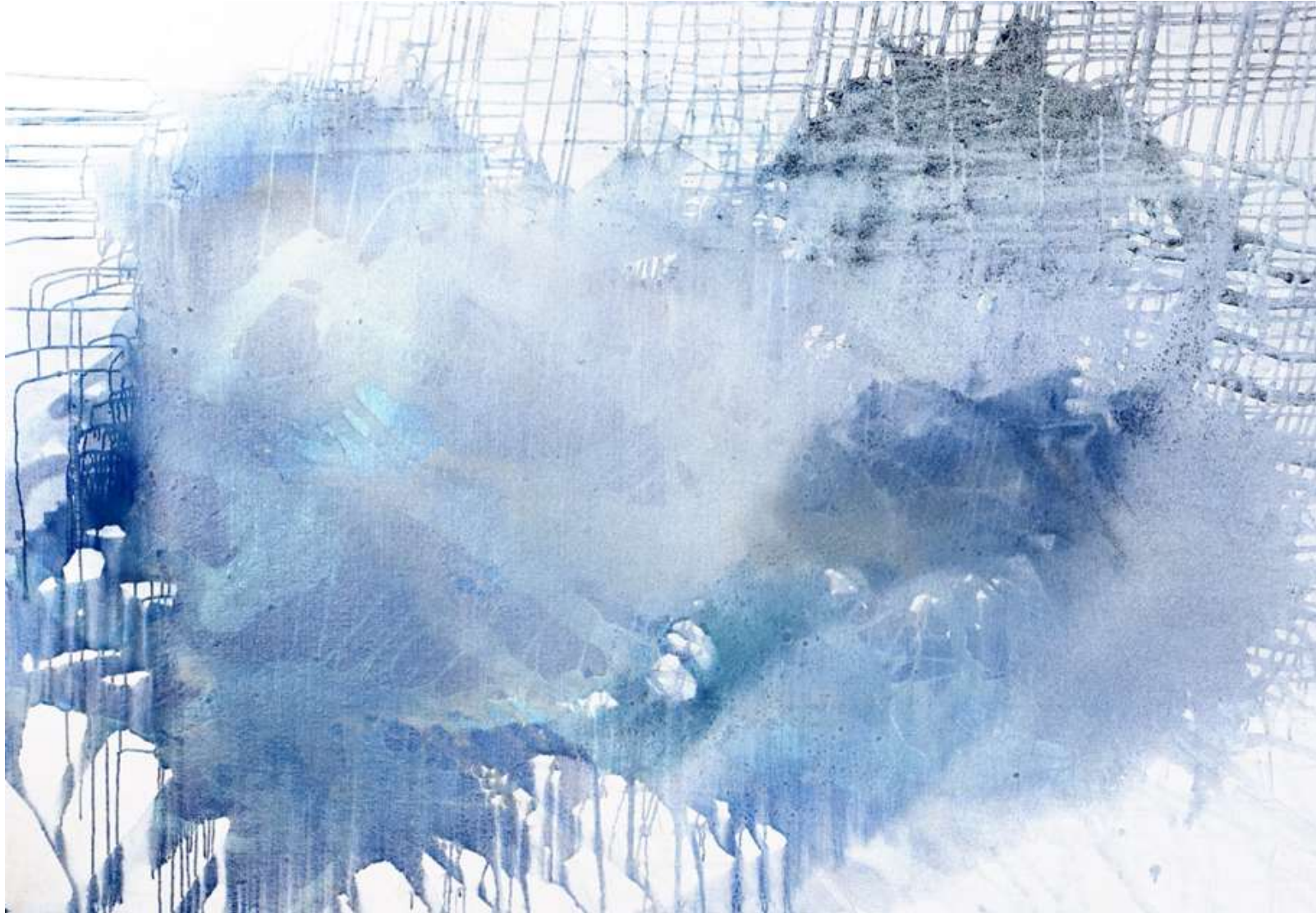


“duality of contrasting landscapes ... with palm groves and dune-scapes”



Middle Euphrates International Airport, Karbala / D-Paysage - ADPI

An urban landscape derived from the caravanserai, evoking travel, trade and hospitality in the desert



2. Find the sense of place: Aquatic environments
seacoast, island, river delta, swamp ... anywhere water is dominant ...



Kansai International Airport, Osaka / Typhoon Jebi, September 2018

... increasingly in catastrophic ways ... demonstrating the impact of a changing environment on the airport

QUESTIONS FOR AIRPORTS:

Are you aware that there is an increased fire risk due to higher temperatures?



Are you aware that more airports may be used as a shelter or relief hub for weather-related disasters?



Do you know how climate change may affect the foundations of terminal buildings?

What should you do to prevent increasing wildlife-strike risks due to changes in the local ecosystem?

Will there be enough water available with increasing desertification around your airport?

What would happen to your airport if the electrical power supply failed during strong winds and storms?



Is your airport safe from potential inundation due to sea-level rise?

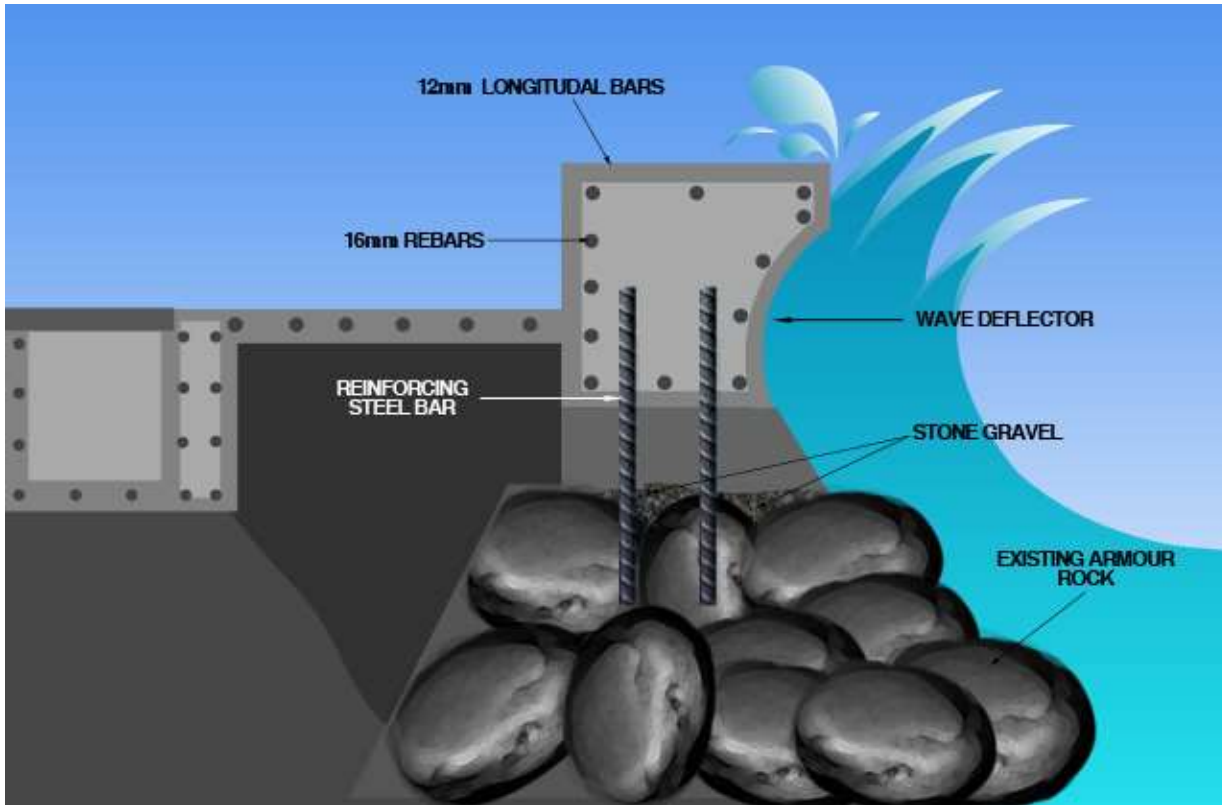
Have you considered whether your runway will be long enough for aircraft to take off at higher temperatures?

How will temperature change affect navigational signals and satellite coverage?

Can ground access be maintained with more extreme disruptive weather?

Airports' Resilience and Adaptation to a Changing Climate / ACI Policy Brief - September 2018

With climate change bringing sea-level rise and increasing frequency and intensity of storms, manifested in storm surges, numerous coastal airports are now vulnerable



new seawall design



seawall / dike

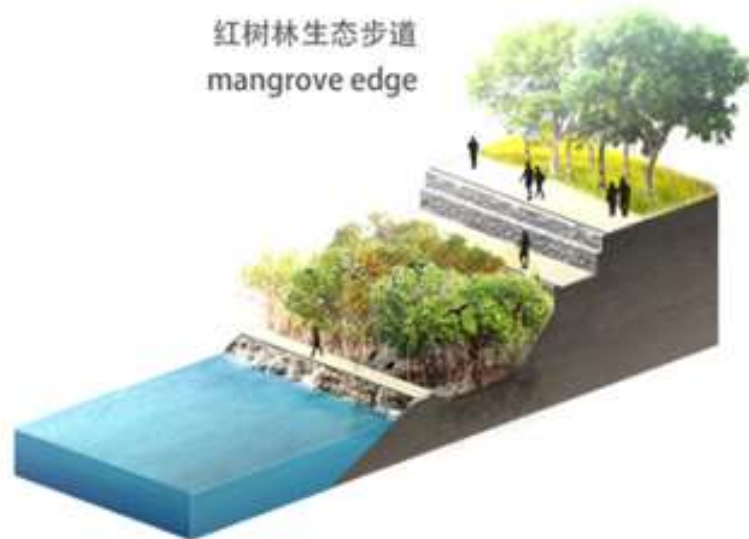
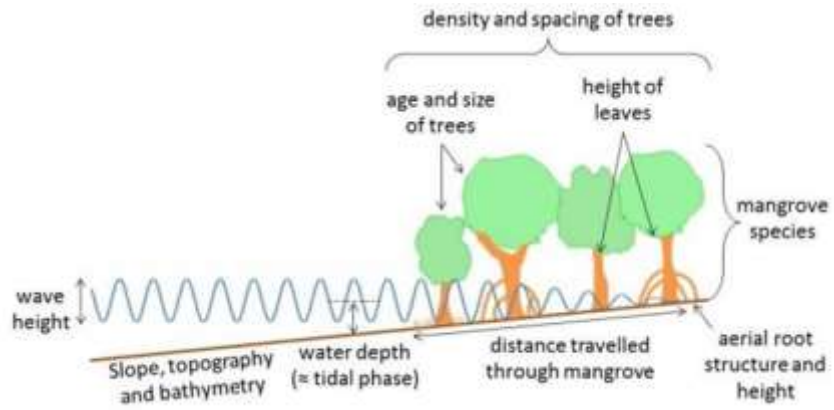
At the site perimeter, are conventional solutions sufficient to safeguard airport infrastructure?



What solutions does the natural environment offer?

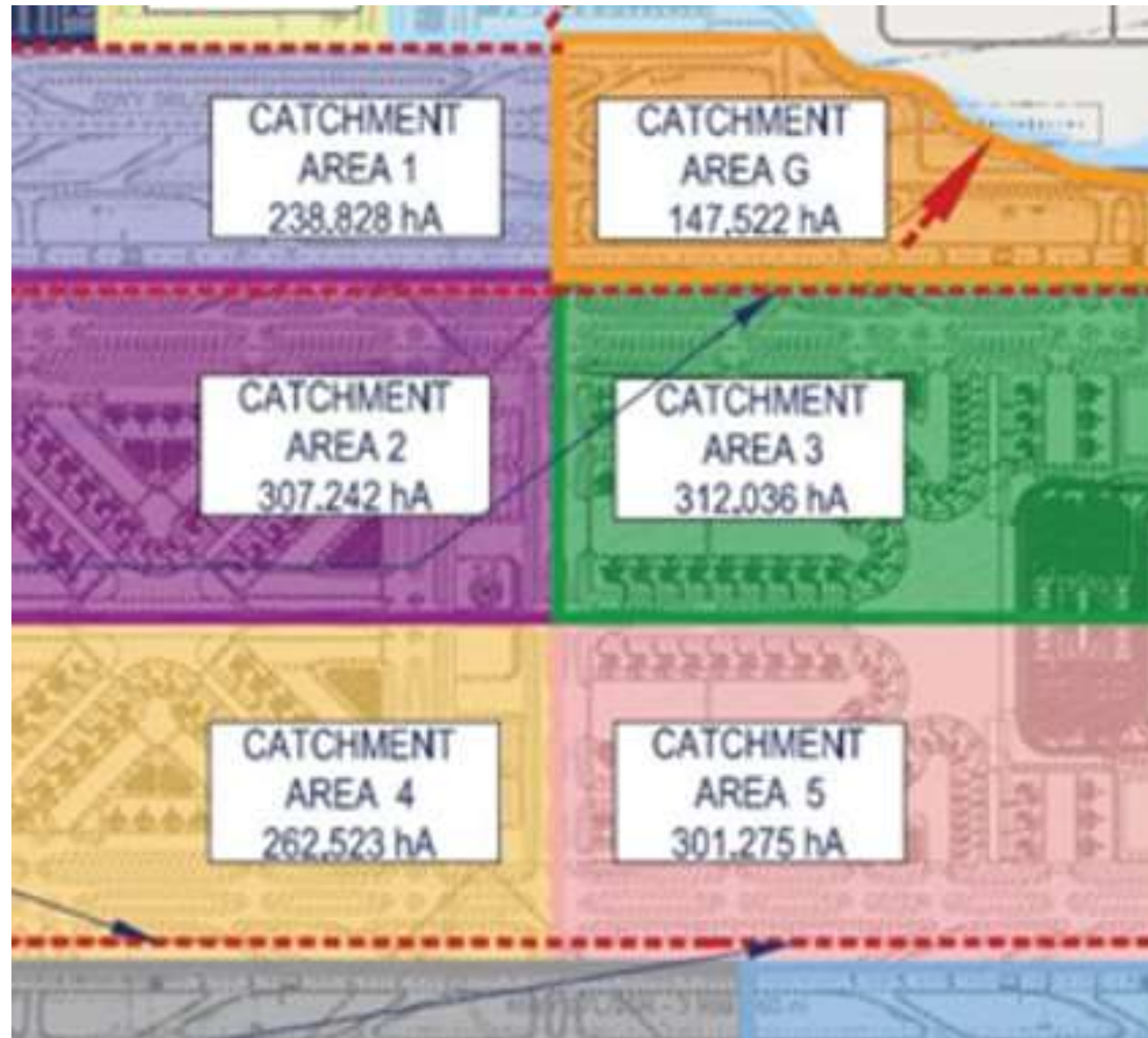
In tropical countries, for example, mangroves are the prevalent coastal ecosystem.

They play “a critical role in protecting lives and property from storm surges. They also stabilize shorelines and improve water quality.”



3. Engineer with nature: mangroves + seawall = hybrid infrastructure

Creating large-scale green infrastructure through bio-engineering, using new techniques of reinforcing coastal vegetation



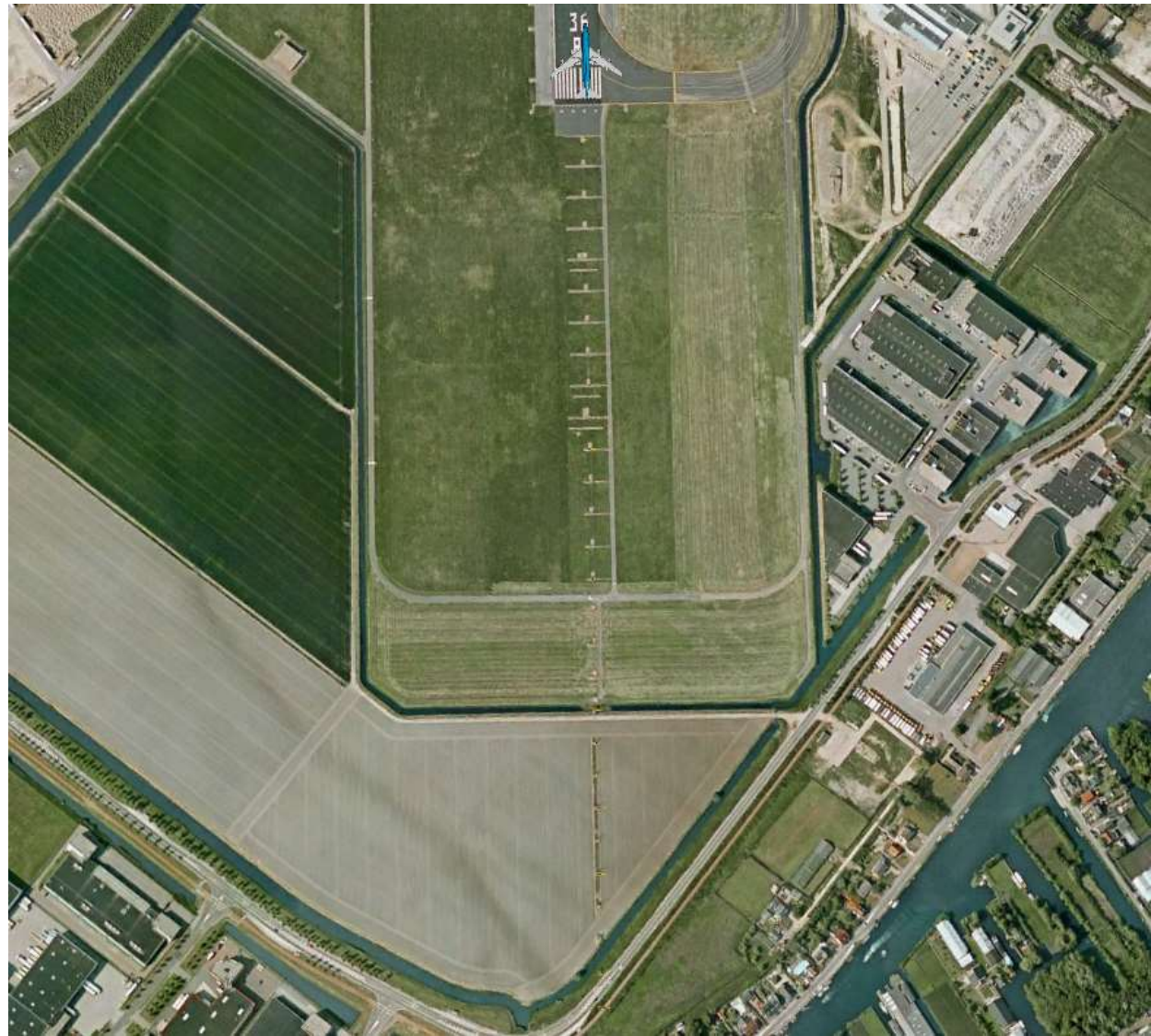
Within the airport platform, are conventional solutions well-suited to managing stormwater in an aquatic landscape?



If we look again to the site itself, does the existing landscape offer alternative solutions?
Could its basin-and-dike structure be adopted for managing stormwater?



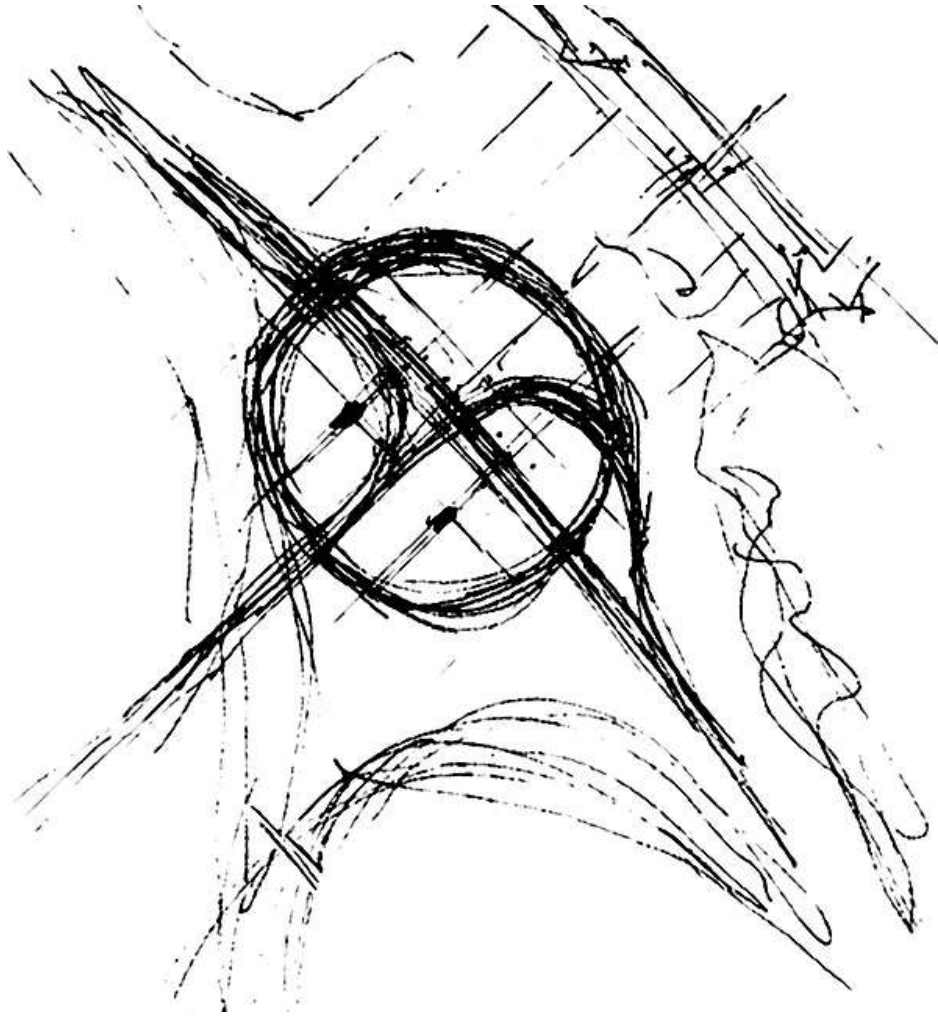
Or look next door to the Dutch, the experts in creating and managing fantastic water landscapes
For all types of land uses: forest, agricultural, residential, industrial



... and airport: a close look at Schiphol reveals canals, channels and basins woven into the landscape



4. Finally, allow art to be featured: Angkor - West Baray / Siem Reap Airport
An artful water-management landscape, with architecture adding the 3rd dimension



Transmanche Terminal, Calais / Paul Andreu – ADP

A similar approach for today's infrastructure: an 'ouvrage d'art' bringing together architecture and engineering in an aquatic landscape



“At the borderline between land and water...a harmonious combination of geometric patterns deriving from a variety of systems: the road link, the railway lines, the surrounding land ...”



... where the third dimension, not built, evokes the voyage to come