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SURFACE

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Invasive Ruins

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the

The purpose of this thesis is to search for a way in which architecture can become a tool used to create a new definition for age-value and historic-value. Instead of proposing an architecture typology that will exist and be admired 'forever', the proposal becomes a suggestion of ruin; to allow the new building language to age over time along side with its natural site. Like the way the sand moves with the change in wind, or weather, to create different arrangements of dunes, the architecture mimics that adaption; and once successful in creating this bond with nature, it itself becomes stronger and more able to adapt as well. The process of re-distribution of sand across a beach becomes a model for this ruin; it allows ruin to become part of the process, and become a positive aspect. Dunes decay over time and they change in form but they are still dunes. Dunes, ruins and architecture all share the ability to change. Most would define their kind of change in very distinct, different ways, but in this thesis their definitions and values will begin to overlap. As the architecture and landscape systems mold into one system and start to change (or ruin) the existing beauty will be dramatized and exaggerated. What was once considered banal, will be exciting and beautiful. The necessity of this process is to show and provoke not just the memory but the future action. To test this model of design, it must be placed in a natural landscape that will allow for a dynamic change, obvious clues to adaption to this landscape, but also infiltration of the existing typology must be visible. To set a new standard for design that revolves around ruin would contrast in extreme to design of preservation. The question is then, will the new be able to invade the old because of its 'new-age' value, or will the old continue to be concrete and heavy minded. What can be used in the design process as tools for success of creating a 'new' monument in a community that is built apon tradition and historic preservation but is constantly experiencing devastation because of its natural threats. Through the use of multiple systems (landscape, the built environment, the site's forces and the historic influence) that stem from current ideas from both the city and its natural site, a dwelling will emerge from the landscape in a language that both suits it and works productively with it to create one larger system. Using the beach as the primary site, the dunes will act as a background system that will both teach the system while becoming incorporated. Studying the way that dunes have developed, moved, and transitioned will go side by side with their destruction. Looking at how and when these systems become damaged will help determine an overall design system that mimics it while supporting its natural movements. So by learning from the system that inhabits the site, a new, built system will be able to become part of it instead of interfering with its natural course.

thesis

L = landscape
A = architecture
S = site
UV = use value
AV = art value
HV = historic value
a = area so a_l = landscape area
d = dunes

architecture proof

L
L A = S

$A = f(x,y,z) = (ax)l + (by)m + (cz)n$

where	x = point
	y = line
	z = plane
and	l, m and n are quantity
and	a, b and c are materials

So...

if	a = wood
	b = steel
	c = concrete
	l = 8
	m = 6
	n = 2

then,

$A = f(wood, steel, concrete) = ((wood)x)8 + ((steel)y)6 + ((concrete)z)2$
$= 8 \text{ wood columns} + 6 \text{ steel walls} + 2 \text{ concrete buildings}$

$L = f(x,y,z) = xl + ym + zn$

where	x = wind	
	y = water	
	z = plants	
and l,m and n are strengths	when l and m > h = hurricane	
	when n > a_l then d < z	

So...

if	l = 3
	m = 5
	n = 2

then,

$L = f(x,y,z) = x3 + y5 + z2$

therefore,

$[L + A]^t => HV$ where t = time

$A (l + m + n) => UV$

$L = f(x,y,z) => AV$

When architecture is seen as constant symbol or reference of a certain time it can be seen as a monument. The definition of monument varies, but in terms of this thesis, the idea of permanency and restoration of monuments is important to contrast the argument that invasion from an architecture that can be seen with similar standards of the existing monuments. This architecture could portray the ability to be ruined while keeping the positive title that the monuments have is a way to introduce a new typology of architecture into an old typological area.

Many scholars have studied and come up with their own definition of what a monument is and how it can be formed into such a standard. Some believe it can be anything that someone looks at as marking an important time or action. Others believe that it must have to earn its monumental status by being observed over time and acquiring set standards to be approved for the category. What moves one object above another making one a monument and another not? How can the same piece been seen as a monument in one setting and not in another? Who decides what should and should not be a monument? What is the role of a monument? Does it change over time?

To answer these questions a range of opinions must be compared. But first the four players must be introduced. Aldo Rossi's idea of defining a monument has to do with permanence. The monument must be coordinated with the infrastructure of the city, while the city as a whole is able to stand alone. It can be described as two kinds of elements: one, as a static element, or an element that has lost a need for its function, and two, a dynamic element, an element that has changed program or purpose and will continue to change and advance over time. But most importantly these elements will react in these ways because of the urban fabric, and affect the urban fabric with its own changes. An example of this (mentioned by Rossi) is the city of Alhambra Spain, where an object is unable to perform as its original use but still impacts the city in a strong way and becomes "a past that we are still experiencing" (Rossi, 59 [4]) The city is then seen as a stand alone man-made entity, instead of the usual combination of multiple separate entities. The argument stems from this idea that the monument supports the cities structure while it grows. Because the city depends on the monuments to stand while it is growing, the need for preservation appears. If any monuments in the infrastructure fail to perform because of their decay, the city itself becomes in a state of decay.

"a past that we are still experiencing"
(Rossi, 59)

Alois Riegl focuses on the inequality between the traditional definition of a monument (a human created element that was made for the purpose of recording an

supporting

important event in time) and the then modern definition (with centers around value rather than intention). He looks into elements, or objects, that have never been seen as anything important but are now becoming known and placed into the category of monumental status and be-

monument (merriam webster dictionary)
1 obsolete : a burial vault : sepulchre
2 : a written legal document or record : treatise
3 a (1) : a lasting evidence, reminder, or example of someone or something notable or great (2) : a distinguished person b : a memorial stone or a building erected in remembrance of a person or event
4 archaic : an identifying mark : evidence: also : portent, sign

5 obsolete : a carved statue : effigy
6 : a boundary or position marker (as a stone)
7 : national monument
8 : a written tribute

ing preserved. Although he is interested in this change of preservation requirements he also believes the old traditional way of deciding is validity from a historically related perspective at the least.

Diane Ghirardo ideas about monuments stem from the publics opinion relating to each monuments exposure. Her monuments become public figures where the majority of the city encounters them and judges them. The outcome becomes simple; they are monuments whether or not they are publicly liked, they are monuments because they are public. The judgments that they receive comes from the cultural impact of the citizens of the public. Her main ideas are about the power of the public eye. If something is placed and seen by the public it becomes iconic whether or not it is liked. The argument lies in the ability

"They are aesthetic objects that invite aesthetic judgments." (Ghirardo, 103)

for an object that is disliked and abandoned in the private eye to move into the public eye and achieve monumental status. Also the difference between private and public spaces and the judgment of what lies in each plays to this point.

Anthony Jackson has a similar stance about the cultural aspects of monuments. He centers around the voice of international style on local style. The power that the international voice has in some places defines local monuments. Arguing that, it becomes necessary that although the foreign power forces through to manipulate everyone's idea of culture, only the culture itself has the power to define its own monuments. This leads to a change in vernacular use because designs are starting to be intertwined with site and culture specificities and are influenced more by both. Some points that do not line up in these literatures are about the placement of intentional monuments. Can a monument be un-intentional? When does it become a monument if it was not built for a certain event or awareness?

thesis discussion

An example of a monumental piece that was not made for that purpose would be an artifact. At the time it was made there is a small chance that it was made to remember a time and explain a cultural moment, but it became one because of its survival and because of the changes that occurred around its survival.

Rossi believed that because the monuments were part of the structure of the city they were always being built intentionally, whether or not the city and its occupants realized was not the point.

Jackson and Riegl wander into the background of production, into the process of the monument. Jackson looks at the new division between architects and the public which Riegl missed. He starts to understand the division starting from the difference of desire and standards for the city's architecture face as well as the face of architecture in general. (the face being the image of architecture, not what it represents but how it looks) The public are hoping for the continuation of the architecture that has stood well for so long as well as the preservation of those precedents. They look for the simplicity of the vernacular which plays into the cultural aspects of the direct surroundings. While the architect is focused on practicing the perfect international

"Nowadays whole districts of housing or warehouses are protected that were never accepted into the architects' canon of significant monuments" (Jackson 14)

architecture style. Which is unfamiliar and foreign to the direct culture and landscape of the public. This separation leads to the public veering off on their own to decide what is deemed a monument and carefully disposes of the architects opinion. "Nowadays whole districts of housing or warehouses are protected that were never accepted into the architects' canon of significant monuments" ([3] Jackson 14) Riegl, although similar, sees the argument more about time during process. How can artifacts become monuments? He states that it is when the culture decides as a unit that they are valid for that stature.

An artifact becomes a monument when it acquires an intangible amount of value; unless it is intentionally created as a monument, this acquisition of value can take a long amount of time.

alois riegl
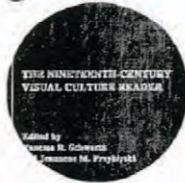
An intentional monument: "a human creation, erected for the specific purpose of keeping single human deeds or events (or a combination thereof) alive in the minds of future generations" (Riegl 1982: 21).
An unintentional monument: "a are much more numerous, are remains whose meaning is determined not by their makers, but by our modern perceptions of these monuments, i.e. by retrospective cultural memory." Riegl (1982: 23).

diane ghirardo

"Public space in the 19th and 20th centuries has been optimistically defined as the space of the collective, understood not as belonging to an individual or a class or a corporation, but to the people as a whole. Perhaps one of the most significant developments of the late 20th century has been the interpretation of public space in two related ways: as spaces for consumption, and as spaces to be segregated in highly specific ways, to be monitored and controlled. The exclusionary practices that made earlier public spaces so much the realm of male clites and that allowed them to be defined as public, thereby denying legitimacy to competing definitions, were matched by the parallel practices of monarchs, oligarchies, and dictators, who also exercised control over the public sphere, in turn defining access for men and women of lower classes." (Ghirardo, 49)

aldo rossi

"The system that enables us to analyze a work of art is. constituted in the following. As the present investigation is intended to establish and identify the nature of urban artifacts, we should initially state that there is something in the nature of urban artifacts that renders them very similar – and not only metaphorically – to a work of art. Thy are material constructions, but nothwithstanding the material, something different : although they are conditioned, they also condition. This aspect of 'art' in urban artifacts is closely linked to their quality, their uniqueness, and thus also to their analysis and definition. (Rossi, 32)

anthony jackson

"There is something very wrong with architecture as it is practiced today. Architecture is not something rare that only the initiated can understand. Its just another name for buildings. Like other artifacts, buildings may be considered merely utilitarian or they may be enhanced by various means, such as decorating them to make them more visually attractive, or using them as images to evoke other sensations. In either case, they embody the values of the people who produce them."(3, Jackson)"The contention that architecture is rare is part of the politics of exclusion that governs the activities of the art world. As an external device, it keeps the uninitiated at bay. Used internally, it determines the ranking system of the day. This factional infighting is not new, nor are the verbal means by which it is carried out. Typically, it takes place in two phases and at two scales. The style is to supplanted is devalued. The pattern was set by the Renaissance architect, Giorgio Vasari, who dismissed the earlier Gothic style to enable its replacement." (7, Jackson)

house:
1. a building for human beings to live in; specif.,
a. the building or part of a building occupied by one family or tenant; dwelling place
c. an inn; tavern; hotel
2. the people who live in a house, considered as a unit; social group; esp., a family or household
3. something regarded as a house; place that provides shelter, living space, etc.; specif.,
a. the habitation of an animal, as the shell
b. a building or shelter where animals are kept
5. any place where something is thought of as living, resting, etc.
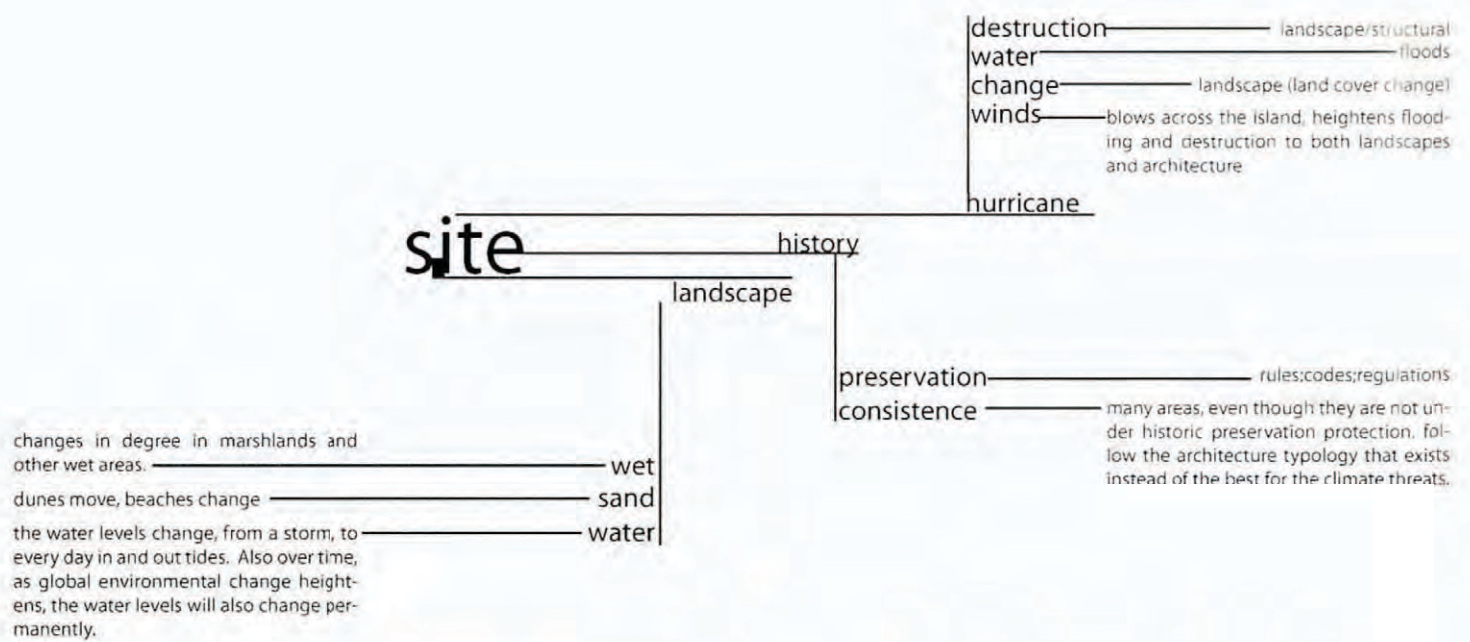
housing:
1. to provide, or serve as, a house or lodgings for
2. to store in a house
3. to cover, harbor, or shelter by or as if by putting in a house
4. Archit., Mech. to insert into a housing
5. to take shelter
6. to reside; live

[dwelling]

Because the historic districts are the primary protection areas, the rest of the island, the residential areas are the most exposed to damage. The typology of the coastal architecture is similar to other coasts around the world; stilt architecture with light wood materials set in dune or marsh landscapes. This responds to the landscape but not the climate; this technique is unsuccessful when hurricanes sweep across the island. Choosing a this program for a tool in exploration of hurricane responsive design techniques here in Galveston will allow for opportunities of invasion throughout the residential areas of the island, and possibly into the historic neighborhoods as well.
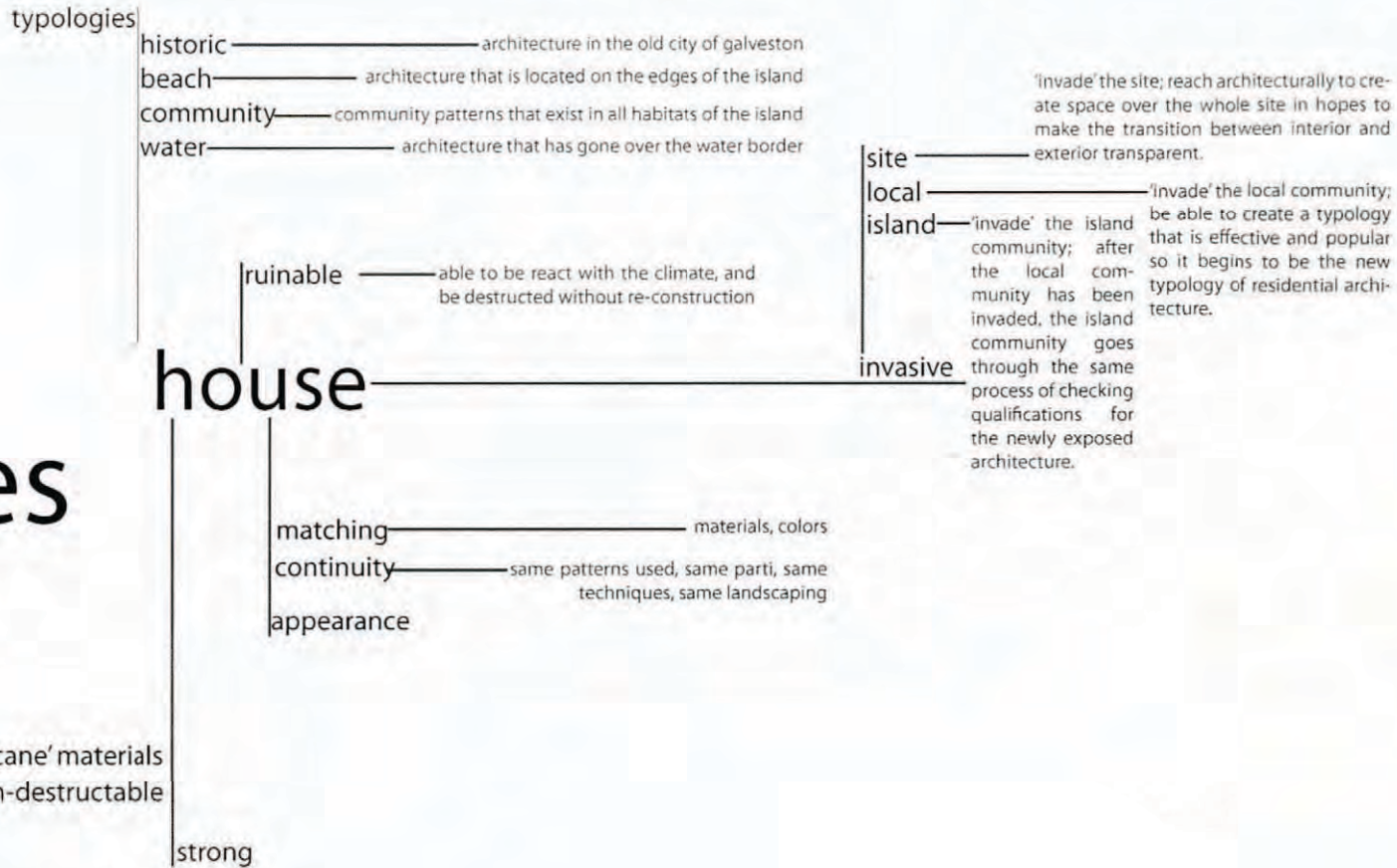
destruction ———————— landscape/structural
water ———————————————— floods
change ———————— landscape (land cover change)
winds ———— blows across the island, heightens flood-
ing and destruction to both landscapes
and architecture

hurricane

site ———————————————— history

landscape

preservation ———————————— rules;codes;regulations
consistence ———————— many areas, even though they are not un-
der historic preservation protection. fol-
low the architecture typology that exists
instead of the best for the climate threats.

changes in degree in marshlands and
other wet areas. ——————————————————— wet

dunes move, beaches change ——————————— sand

the water levels change, from a storm, to ——————— water
every day in and out tides. Also over time,
as global environmental change height-
ens, the water levels will also change per-
manently.

architecture

issues

house

typologies

historic ———————————————— architecture in the old city of galveston
beach ———————————— architecture that is located on the edges of the island
community ————— community patterns that exist in all habitats of the island
water ————————————— architecture that has gone over the water border

ruinable ——————— able to be react with the climate, and
be destructed without re-construction

matching —————————————— materials, colors
continuity ————— same patterns used, same parti, same
techniques, same landscaping
appearance

'hurricane' materials
un-destructable

strong

site ——————— 'invade' the site; reach architecturally to cre-
ate space over the whole site in hopes to
make the transition between interior and
exterior transparent.

local ———————————— 'invade' the local community;
be able to create a typology
island ——— 'invade' the island that is effective and popular
community; after so it begins to be the new
the local com- typology of residential archi-
munity has been tecture.
invaded, the island
community goes
invasive through the same
process of checking
qualifications for
the newly exposed
architecture.

rese

arch

The Spanish explorer Cabeza de Vaca was the first European to land on the island in 1528 because his ship was wrecked in the marshlands on the outer banks of the island. He then lived with the current inhabitants, the Karankawa Indians (who shared the island with the Akokisa tribe) and became both their slave and doctor. The next European to come to the Galveston was the Frenchman Robert Cavelier la Salle. He took over the island and named it St. Louis after his king in around 1600.

Other Europeans came and went, it wasn't until the 1830's when Michel Menard and Samuel Williams started to create the current Galveston. (Their homes are still standing along with some of the other key players of the islands foundation)

Galveston was, starting in 1839, the leader of this support because it was the largest active port west of New Orleans as well as the largest city in the state.

In this point in time Texas as a whole was a major part of the success and growth of the country. Galveston was, starting in 1839, the leader of this support because it was the largest active port west of New Orleans as well as the largest city in the state. But when the storm of 1900, still considered the deadliest storm today, hit Galveston the blooming city was washed over with water and devastated the island beyond repair. To this day it has never reached the point of success as it had before the hurricane blew it apart.

They raised the entire island 8 feet and 17 feet at the sea wall.

The community that survived the storm, and decided not to flee the island decided to take some steps to prevent total destruction again. They raised the entire island 8 feet and 17 feet at the sea wall. The sea wall was also slanted so that the storm surge and flooding would flow off easily.

Galveston began to focus on restoring the original beauty of the island

(engineer was Henry Martyn Robert who also developed Roberts Rules of Order)

The Island suffered for years after the next devastating

galveston

event, which took place in 1957. The Texas Rangers took over the town which at that point thrived as a gambling

Ship Elissa was restored and became the face of the new Galveston.

and drinking resort town. Eventually, in the 1980s, Galveston began to focus on restoring the original beauty of the island. [see historic preservation] George Mitchell,

They now are preserving over 2000 buildings which are also registered as historically preserved.

a Galveston native, led this exertion, using the Historic Districts as a focal point (mainly the downtown). The downtown area is one of the most successful historically preserved and largest Victorian iron-front commercial architecture in the United States. Even the 1877 Tall Ship Elissa was restored and became the face of the new Galveston.

As Galveston became more and more involved in the pres-

extensive code laws for following the architecture typology are enforced by the islands Historic Foundation.

ervation of its architecture history, the organization of a selection of world known architects designed an exhibit that took place throughout the city (arches that spanned the streets of the historic district) for Mardi Gras, which is now an important tourist event for the island. As more people visit the island to appreciate the culture that has been kept through out the years of devastation from consistent natural threats, the Galveston Historic Foundation grows. They now are preserving over 2000 buildings which are also registered as historically preserved. In the four historic districts, as well as their immediate surroundings, extensive code laws for following the architecture typology are enforced by the islands Historic Foundation. This calls for an interesting and challenging design problem; one that looks into ways in which a dwelling can become integrated into such a strict and uniform typology while being able to invade through clarity and positive change.

texas history

Michel B. Menard House
The house, built in 1838 and the oldest on the island, is in the Greek revival style.

1838

Samuel May Williams
This rare combination of Creole-plantation and New England architectural styles was built in 1838 for Samuel May Williams, secretary to Stephen F. Austin and founder of the Texas Navy.

1838

Ashton Villa
The first of Galveston's great Broadway mansions, this opulent Italianate Mansion set the standard for the magnificent homes that followed. The National Trust for Historic Preservation featured Ashton Villa as one of 12 National Trust Save America's Treasures sites

1859

St. Joseph's Church
The oldest German Catholic Church in Texas and the oldest wooden church building in Galveston, St. Joseph's was built by German immigrants in 1859-60. The building is a simple wooden gothic revival structure, rectangular with a square bell tower with trefoil window. The softly painted interior features a coffered ceiling with painted quatrefoils and other gothic symbols, plaster of Paris.

1860

1861

U.S. Custom House
The Boston firm of Blaisdell and Emerson built it in 114 days, an unprecedented accomplishment at the time. The extensive use of fireproof cast iron was revolutionary and likely accounted for the survival from the 1885 Galveston Fire.

1880

Garten Verein
Tthe five-acre homestead of Robert Mills, a prominent Galveston businessman, was laid out as a park, with a clubhouse (Mills' former home), lawns, gardens and walkways, other game spaces including a dancing pavilion which is the only one of the structures to survive the 1900 Storm (though it required extensive rebuilding).

1892

Bishop's Palace
Built of stone and steel for the railroad magnate Walter Gresham and his family, this famous house was designed by Nicholas Clayton, Galveston's premier Victorian-era architect. The Bishop's Palace is recognized as one of America's finest examples of Victorian exuberance and Gilded-Age extravagance.

19c.

The Strand and Galveston's Historic Downtown
The historical foundation was founded to save and restore a historic house, by the early 1970's Galveston Historical Foundation began to concentrate on saving the unique collection of 19th century commercial buildings in the city's downtown area.

[1]

[2]

[3]

G
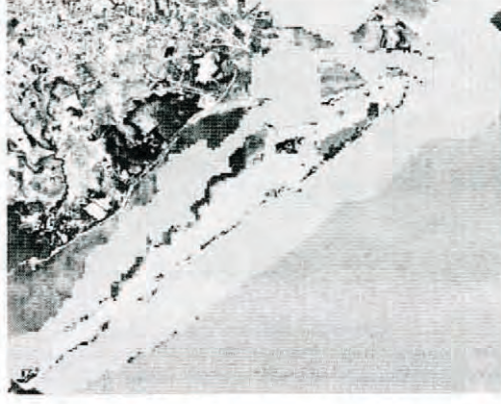
1879 Aug 23rd a cat2, 105mph

1879 Aug 23r 1886 June

1888 June 16, 18 inches of rain

1900,the great galveston hurricane

1909 july, 10 ft storm surge, cat 3

1915 Aug 5th

1932 Aug 14th 145mph winds

1934 july 28th, a storm surge of 5.9ft with a cat 2

1943 July 27th a storm surge of 4 ft with a cat 2,nineteen killed,86mph winds

1947 August 24th

1959 in july hurricane debra hit with 95mph winds bar 29.07 14.42 inches of rain

1915 a 12 ft s.s 275 killed despite the wall,120mph winds aug 17th
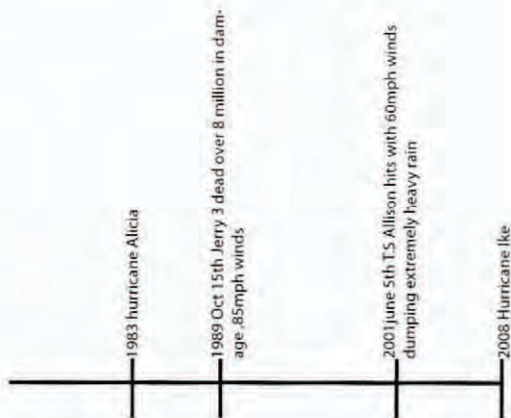
1900 the great galveston hurricane kills 8,000 people with a 15ft storm surge even though it was low tide while hitting it traveled 6 to 10 miles inland .The pressure at landfall was 27.55inches with winds of 110mph.Half of Galveston destroyed with 2,600 buildings destroyed & 10,000 people left homeless would have been much worse if not moving so quickly. It is said that a one inch steel hull of an ocean going freighter was pierced through with a piece of lumber.According to the hurricane research division winds were of Category 4 strength at landfall.

1915 Aug 5th a cat 4 kills 275 ,12' tides flooded Galveston 5' to 6' in the Business District. Winds at Galveston were 97 mph gusts to 130mph putting this in the cat 3/4 range. Press 940 mb,.Seawall prevented a repeat of the 1900 disaster.Causes 50 million in damage.

983 hurricane Alicia on aug 18th causes 2 bill damage as a cat 2/3 with 71 to 98mph winds. 21 killed 1.2 billion dollars in damage,a 10 to 12 ft storm surge at normal high tide.90% of Dwellings on Jamaica bch destroyed.Many highrise glass buildings sustained heavy damage. Pressure in Galveston was measured at 989mb 29.20 inches at 2:00AM.

2008 Hurricane Ike hits Galveston on Sept 13th with 110mph winds causing extensive damage in entire area by 15 ft storm surge.

[1] This is a diagram of the damage of hurricane Ike, the latest hurricane that has affected the island.
As seen in the diagram, the entire island was affected from flooding to complete destruction.
[2] Storm surge height after hurricane ike. This shows the level of damage of seal level rise, and then the amount of damage caused.
[3] One of the reasons that Galveston is affected so much by the hurricanes that hit it is because the land is at sea level (or in some places 2ft above sea level). This has been taken into consideration and a sea wall has been built to raise the island from the sea over 12ft. But this does not have the affect that the citizens of Galveston need.

1983 hurricane Alicia

1989 Oct 15th Jerry 3 dead over 8 million in damage .85mph winds

2001June 5th TS Allison hits with 60mph winds dumping extremely heavy rain

2008 Hurricane Ike

On average Galveston gets hit directly by hurricanes once every 8.63 years, but is affected every 2.94 years.

This killer weather system of Galveston was first detected over the tropical Atlantic on August 27. While the history of the track and intensity is not fully known, the system reached Cuba as a tropical storm on September 3 and moved into the southeastern Gulf of Mexico on the 5th. A general west-northwestward motion occurred over the Gulf accompanied by rapid intensification. By the time the storm reached the Texas coast south of Galveston late on

On average Galveston gets hit directly by hurricanes once every 8.63 years, but is affected every 2.94 years...

September 8, it was a Category 4 hurricane. After landfall, the cyclone turned northward through the Great Plains. It became extratropical and turned east-northeastward on September 11, passing across the Great Lakes, New England, and southeastern Canada. It was last spotted over the north Atlantic on September 15.

This hurricane was the deadliest weather disaster in United States history. Storm tides of 8 to 15 ft inundated the

This hurricane was the deadliest weather disaster in United States history (even compared to Hurricane Katrina).

whole of Galveston Island, as well as other portions of the nearby Texas coast. These tides were largely responsible for the 8,000 deaths (estimates range from 6,000 to 12,000) attributed to the storm. The damage to property was estimated at $30 million...

Today, Galveston is still being hit by hurricanes. The community has taken some measure in protecting themselves. But not enough to allow protection to all communities and members of the island. Property that is located in the marsh lands (that take up the majority of the island) is very unstable and is the first to bear damage after a storm, no matter the severity.

hurricane:
1 : a tropical cyclone with winds of 74 miles (119 kilometers) per hour or greater that occurs especially in the western Atlantic, that is usually accompanied by rain, thunder, and lightning, and that sometimes moves into temperate latitudes.

Hurricanes generally move in the same direction over the same path with little variation. The force is what changes, the strength of the wind is the instigator in the curve of the path. (as well as what the ocean is doing along with the rain force; waves/rainfall)

beach/dune

A combination of gently rising and falling tides and small elevational differences in the land help create an interesting collection of habitats where the bay meets the land.

Broad looking over the Spartina marsh and Butterowe Bayou in Galveston Island State Park expanses of land that are regularly flooded by high tides form extensive marshes.

grassland/prairie

When high tides inundate the low lying marsh land the bases of the plants become completely submerged. Juvenile fish and aquatic invertebrates can hide and forage among the basal stalks of submerged cordgrass during this time. Small crabs, worms, snails, mussels, larval fish, and other marsh animals often inhabit microhabitats (for example just above the water on the cordgrass blades) that are constantly shifting as the tides rise and fall.

Sloughs and bayous are finger like extensions of the bay that form a matrix of open waters within the marshland.

freshwater ●━ Many of these areas were once native seacoast bluestem - gulfdune paspalum habitat that prairie habitat in Galveston Island State Park were heavily grazed by cattle before the park was established. These grasslands have changed since cattle have been excluded but they have not entirely reverted back to their previous natural state. One of the most important changes that occurred once cattle grazing ended was the abundant growth of woody plant species.

One of the aims of this management is to restore native prairie habitat, which is one of the most threatened habitats of Gulf coast barrier islands. Burning and mowing are being used to reduce prairie flowers in Galveston Island State Park woody vegetation even further in what are already relatively open grasslands.

Freshwater can be found in ponds and swales, which are low marshy areas that can contain standing water during certain times of the year. Both of these habitats are important in an example of a freshwater swale in Galveston Island State Park serving as a source of freshwater for animals.
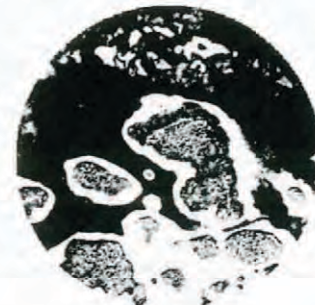
habitat [MARSH]

An area of low-lying wetland in which the level of water is generally shallow and often fluctuating. The water may be either standing or slow-moving. The water in a marsh is also more or less neutral or alkaline, in contrast to the water in a bog, which is acidic. The environment of a marsh is in general well-oxygenated and nutrient-rich and allows a great variety of organisms to flourish. In contrast to a swamp, in which there is an abundance of woody plants, the plants in a marsh are mostly herbaceous. Reeds and rushes dominate the vegetation of marshes.

[salt marsh] A marsh in which the water is saline, especially a coastal wetland that has halophyte vegetation and is regularly flooded at high tide. Coastal salt marshes help to preserve the shoreline by accommodating storm tides.

These areas could be considered the least stable. Because of their constant rearrangement of land mass and flooding qualities, the houses and structures built on them are hardly successful. The stilt approach has been the most successful over all but when a storm comes and the wind blows, it will not be sturdy enough to stand up through the storm, even if it can allow for flooding, it does not for wind.

habitat [WETLAND]

A low-lying area of land that is saturated with moisture, especially when regarded as the natural habitat of wildlife. Marshes, swamps, and bogs are examples of wetlands. A Closer Look Wetlands are areas such as swamps, bogs, and marshes where water either covers the soil or is present at or near the surface, particularly in the root zone, at least a good portion of the year, including the growing season. In the past, wetlands were generally considered unproductive or undesirable lands smell and unhealthful, a breeding ground for mosquitoes and other pests and many were filled in to create farmland or to develop land for housing and industrial use. More than half of the original wetlands in the continental United States have disappeared in the name of reclamation, disease prevention, and flood control. Scientists now realize that, far from being noxious barrens, wetlands play a key role in the ecosystem. They act as filters, removing pollutants, including metals, from waters. They serve as reservoirs, and they aid flood and erosion control by absorbing excess water. Wetlands are home to a great variety of plant and animal species, some endangered, that have evolved to live in the wetland's unique conditions. The preservation and, where possible, restoration of these vital habitats has become a primary goal of environmentalists around the world.

This habitat is a major part of Galveston Island. It envelopes both the southern and northern ends. The northern end is the Galveston State Park, which has helped preserve this habitat and its features.

habitat [DUNE]

A dune is a hill or ridge of wind-blown sand. The majority of the coastal side of the island that faces the gulf of mexico experiences this habitat and the conditions that it has. Sand dunes are in many environments all over the world both in wet and dry areas. They form in similar ways in both, are effected by similar forces. But the reason the dunes on coastal areas are so interesting in their interaction with water as well as wind. Dunes are very unstable environments to build on because they are constantly moving and changing shape and density. A semi-successful design usually has very deep foundation units that reach below the unstable areas that move.

habitat [PRAIRIE]

A prairie is an extensive area of flat or rolling grassland. The part of Galveston on the northern central end was once a prairie. Some parts still remain in this habitat category, but most of this area is now developed. All of the historic quarters are in this area. It is the most developed area of the island. The most density of building and street, and very little green space left. So much so that communities on the island have exceded its boundries and interspersed into the water landscape the encompases the island.

habitat [WAVES]

Floods are caused by a variety of factors, both natural and man-made. Some obvious causes of floods are heavy rains, melting snow and ice, and frequent storms within a short time duration. The common practice of humans to build homes and towns near rivers and other bodies of water (i.e., within natural floodplains) has contributed to the disastrous consequences of floods. In fact, floods have historically killed more people than any other form of natural disaster. Because of this fact, humans have attempted to manage floods using a variety of methods with varying degrees of success. [science.jrank.org]

In fluid dynamics, wind waves or, more precisely, wind-generated waves are surface waves that occur on the free surface of oceans, seas, lakes, rivers, and canals or even on small puddles and ponds. They usually result from the wind blowing over a vast enough stretch of fluid surface. Some waves in the oceans can travel thousands of miles before reaching land. Wind waves range in size from small ripples to huge rogue waves. There is little forward motion of individual water particles in a wave, despite the large amount of energy it may carry forward.

When directly being generated and affected by the local winds, a wind wave system is called a wind sea. After the wind ceases to blow, wind waves are called swell. Or, more generally, a swell consists of wind generated waves that are not — or hardly — affected by the local wind at the same moment. They have been generated elsewhere, or some time ago.[1] Wind waves in the ocean are called ocean surface waves.

dur

Sand dunes are found in many climates of the world near salt and fresh water as well as in deserts. The sand dunes in deserts have become mountains of rock over time and consistency of weathering. Depending on where the dunes are in the world, what climate they are coming from, the sand grain material is determined. Some sand dunes that are erosions of volcano rock are black, where others are made from gypsum. Like the fact that they form mountains of rock, they also come from rock. In Galveston, which is more of a tropical climate, the sand is made from the combination of reef animals and algae, including sea shells and other plants and animals that live in the sea grass meadows and coral reefs.

Looking at the marks of stable forms around sand dunes (telephone poles/walls) the lines of the sand's movement pattern can be studied. One fact that has been proven is the sand does not normally move above more than a few feet above ground.

"Myriads of sand grains bouncing and rolling up the windward surface of a dune often form a series of ridges and troughs called wind ripples. Bouncing sand grains tend to land on the windward side of each ripple, thus producing a low ridge. Without getting too complicated, the spacing of ripples is related to the average distance grains jump. This in turn, is related to the wind velocity and size of the grains. Wind ripples are often very spectacular and photogenic, especially when the thousands of tiny ridges catch the shadows of early morning or late afternoon." (dunes defined)

Costal sand dunes are buffer zones of sand and vegetation that have 1. large quantities of sand, 2. persistent wind capable of moving the sand, 3. suitable locations for sand to accumulate. The first factor to cause a sand dune to exist is to have a consistent on shore wind that is able to move sand. This wind will move the sand that is on the beach into piles and they continue to grow until they become so steep on the leeward side that the pile collapses from its own weight and creates a better angle. Throughout the continuation of the process the sand drifts in the direction of the wind.

Sand dunes follow the lines of existing objects like rocks or trees and sometimes walls (also drift wood, decaying plant matter, and other objects or plants that are washed up in high tide). It would be important to consider the placement of any stable object in the path of sand dunes because you would need to understand how the sand would form around it. Some plants are more adaptable to the habitat that a sand dune provides and have the qualities that they need to survive; high salt tolerance, waxy leaves that retain water, rolled leaves to reduce surface area and exposure to evaporation. These plants are called pioneer plants and they are necessary because they help stabilize the dunes; their leaves decrease wind speed and their roots help the erosion problems by binding the sand.
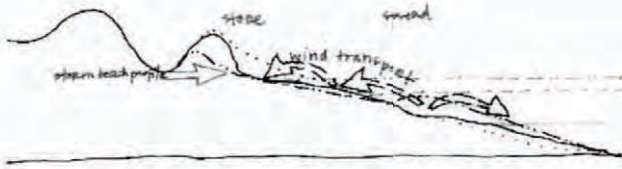
After the pioneer plants settle into the habitat of the dunes and alleviate the sand other plants that couldn't exist in that climate are able to move in and help the erosion problems. If the grasses that take over the surface area of the dunes are removed, the dune cannot exist and is destroyed.
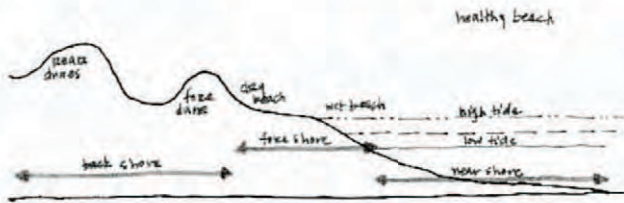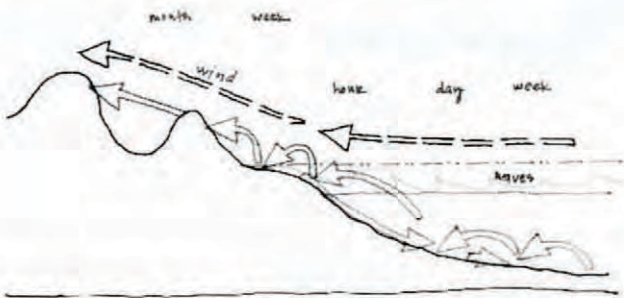
dunes

borrow   bring
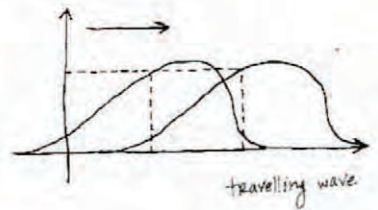
old beach profile →

beach during the storm

stone   sand

wind transport

storm beach profile →
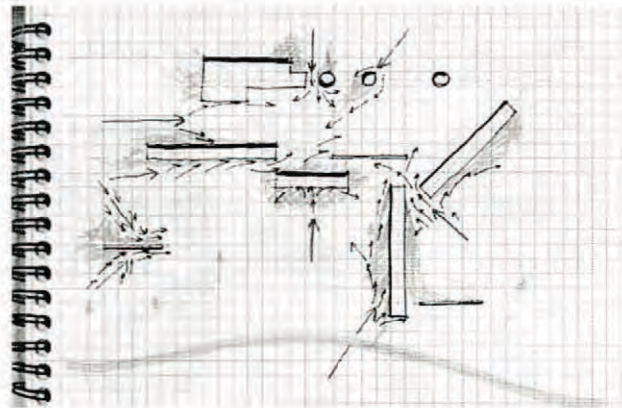
beach after the storm

healthy beach

beach
dunes

fore
dune   dry
beach   wet beach   high tide

fore shore   low tide

back shore   near shore

healthy beach

month   week

wind   hour   day   week

waves

beach building process

wave height at the highest $1/_{0} = 340$

wave height of the highest $1/3 = 2.83$

average wave length = .77

most probable wave height = 1.41

wind

fetch

max

micro ripples

ripples

chop

fully developed sea

waves and wind.

travelling wave.
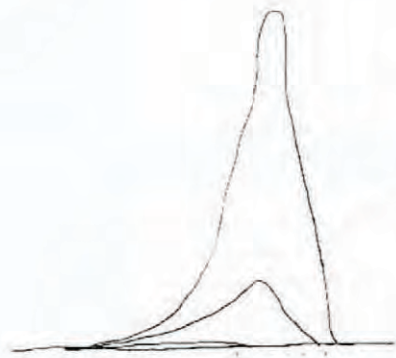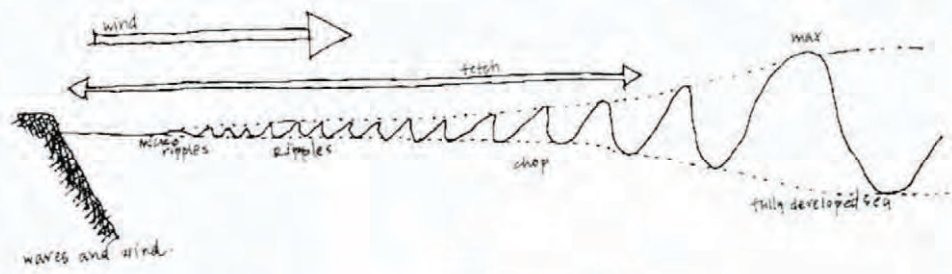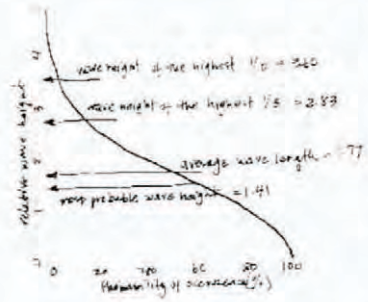
Beaches are formed as an ongoing event and process. If They are destroyed, by a hurricane or flood, they will re-build themselves. Dunes work the same way. They are able to adapt to their surrounding threats and re-built. Wave and tidal actions transport sand, pebbles, sea shells and gravel to the shorelines of oceans seas and lakes. The sand, pebbles, and gravels were either transported by ero-sion from the continental landmass by rivers and streams, or created by the mechanical weathering of wave actions against rock formations near the shore. Wind and storms can deposit the rock and shell particles further inland, cre-ating a gently sloped beach.

Beaches are deposition landforms, and are the result of wave action by which waves or currents move sand or oth-er loose sediments of which the beach is made as these particles are held in suspension. Alternatively, sand may be moved by saltation (a bouncing movement of large particles). Beach materials come from erosion of rocks

A beach is an unstable environment which exposes plants and animals to changeable and potentially harsh conditions.

offshore, as well as from headland erosion and slumping producing deposits of scree. Some of the whitest sand in the world, along Florida's Emerald Coast, comes from the erosion of quartz in the Appalachian Mountains. A coral reef offshore is a significant source of sand particles.

The shape of a beach depends on whether or not the waves are constructive or destructive, and whether the mate-rial is sand or shingle. Constructive waves move material up the beach while destructive waves move the material down the beach. On sandy beaches, the backwash of the waves removes material forming a gently sloping beach. On shingle beaches the swash is dissipated because the large particle size allows percolation, so the backwash is not very powerful, and the beach remains steep. Cusps and horns form where incoming waves divide, depositing sand as horns and scouring out sand to form cusps. This forms the uneven face on some sand shorelinesis.

A storm surge is an onshore gush of water associated with a low pressure weather system. The most extreme storm surges result from extreme weather systems, such as tropical cyclones or hurricanes, but storm surges can also be produced by less powerful storms. Storm surges can cause beach accretion and erosion. Deltas are nourished by alluvial systems and accumulate sand and silt, growing where the sediment flux from land is large enough to avoid complete removal by coastal currents, tides, or waves.

Most modern deltas formed during the last five thousand years, after the present sea-level high stand was attained. However, not all sediment remains permanently in place: in the short term (decades to centuries), exceptional river floods, storms or other energetic events may remove significant portions of delta sediment or change its lobe distribution and, on longer geological time scales, sea-level fluctuations lead to destruction of deltaic features.

Coastal erosion is the wearing away of land or the removal of beach or dune sediments by wave action, tidal currents, wave currents, or drainage (see also beach evolution). Waves, generated by storms, wind, or fast moving motor craft, cause coastal erosion, which may take the form of long-term losses of sediment and rocks, or merely the temporary redistribution of coastal sediments; erosion in one location may result in accretion nearby. The study of erosion and sediment redistribution is called 'coastal morphodynamics'. It may be caused by hydraulic action, abrasion, and corrosion.

On rocky coasts, coastal erosion results in dramatic rock formations in areas where the coastline contains rock layers or fracture zones with different resistances to erosion. Softer areas become eroded much faster than harder ones, which typically result in landforms such as tunnels, bridges, columns, and pillars.

On sedimentary coasts, coastal erosion typically poses more of a danger to human settlements than it does to nature itself.

The forces in coastal zones are more diverse than in typical riverine conditions and the data requirements are more extensive. There are several distinct types of hydraulic problems that may be encountered:
Wave surge and tidal action along a coastline
Seasonal shifts of the shore
Along shore and offshore transport of beach sands
Floods resulting from upland runoff in combination with tides and waves

The beach and near-shore zone of a coast is the region where the forces of the sea react against the land. The physical system within this region is composed primarily of the motion of the sea, which supplies energy to the system, and the shore, which absorbs this energy. Because the shoreline is the intersection of the air, land and water, the physical interactions that occur in this region are unique, very complex, and difficult to fully understand. While there have been significant advances in understanding beach processes in recent years, the ability to predict changes is still limited.

On coasts where the shoreline is unconsolidated sediment such as a clay, sand or silt, the energy from the waves, wind and tide can cause rapid change in the shape and dimensions of the shoreline. Waves are the most significant factor to cause shoreline change. As waves move from
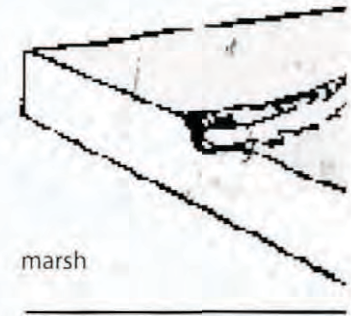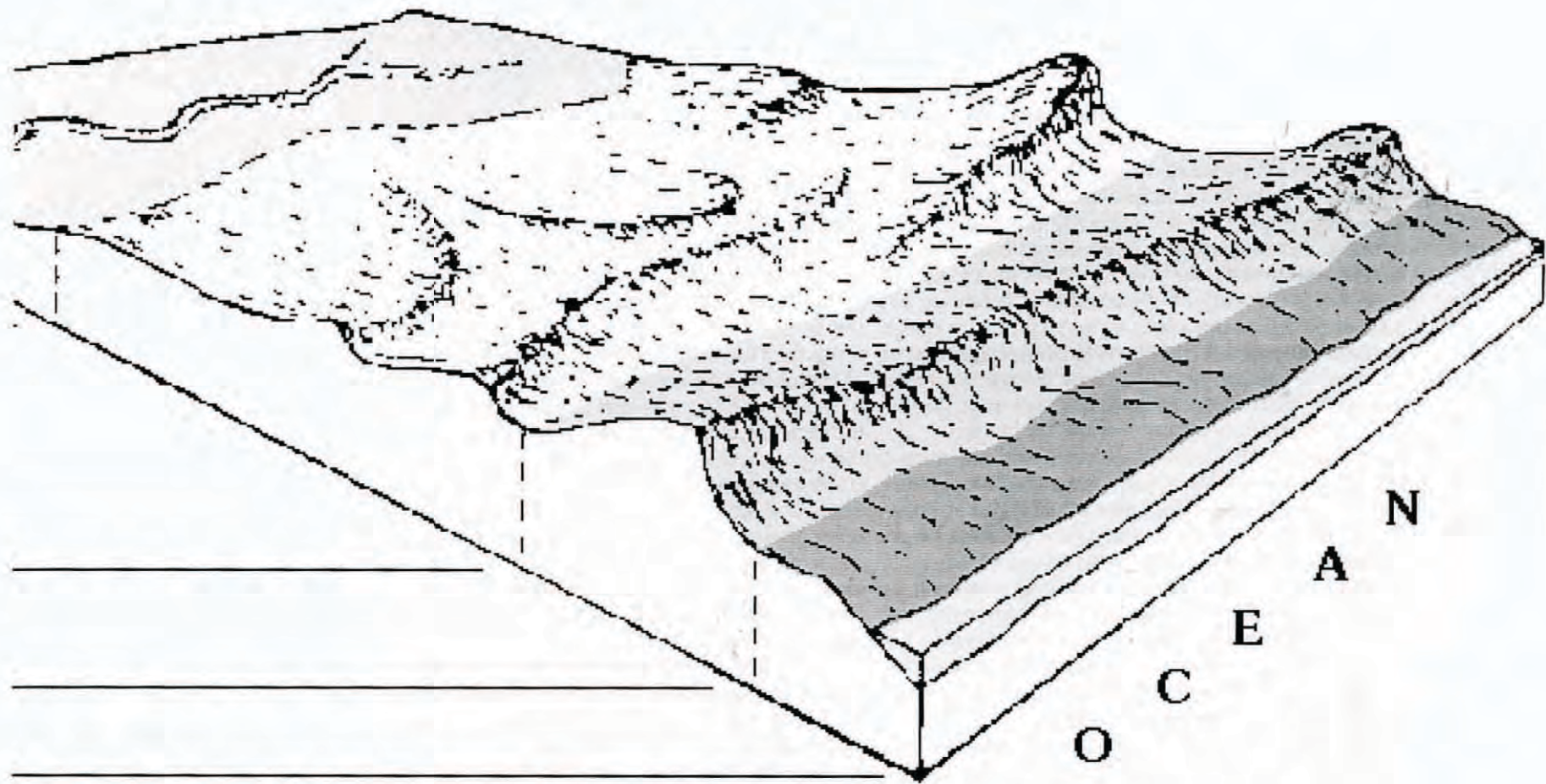

marsh

back dunes

frontal dunes

beach and berm

O C E A N

offshore to the beach they will often break, reform and break again. The process of breaking results in a portion of the wave energy being dissipated. Additional energy is dissipated on the beach with the resultant transport of the beach sediment.

On many sandy coasts the landward end of this region is characterized by the presence of a longshore bar. The inshore region extends from the bar (or bars) across the surf zone to position of the tidal low water line. The foreshore extends from the low water line to the upper limit of swash and the beginning of the beach backshore. On beaches where dunes are present, the seaward toe of the dune marks the end of the backshore. If dunes are not present on the beach, the landward limit of the beach backshore is generally considered to be the upper limit of storm wave impacts. Other important features illustrated in these figures include the berm and the trough (just inshore of the alongshore bar).

Normal Conditions. As a wave moves toward the shore it will break when the wave height is equal to about three-quarters of the water depth. The actual depth at breaking is a function of the beach slope and the wave length and period. Breakers are classified as four types: plunging, spilling, surging and collapsing. Plunging breakers have distinct curls, spilling breakers break more gradually, and have characteristic white water and surging breakers begin to form a plunging face, but reach the beach before this face is formed. Collapsing breakers are a transition category between plunging and surging.

The form of breakers is controlled by wave steepness and nearshore bottom slope. Breaking results in a dissipation of wave energy by the generation of turbulence in the water and by the suspension and transport of sediment. The broken wave forms a bore that moves across the surf zone to the beach where it forms the wave uprush and backwash in the swash zone. The formation of the bar is directly related to the sediment transport characteristics of the breaking waves. The dimensions and locations of the various wave zones are functions of the wave characteristics and the stage of the tide. Regions with relatively large tide ranges will have wider limits to the positions of these zones.

Storm Conditions. The high winds associated with storms generate large waves. In open water, the actual size and period of the waves are a result of a combination of the size of the storm (fetch), the length of time the storm winds have been blowing across the fetch (duration), and of course the magnitude of the wind itself. In enclosed bodies of water, such as bays and estuaries, the shape of the shoreline as well as the depth of the water also affect the wave conditions. As the storm waves move to the coast, they are modified by the presence of the shallow water, and when they reach their limiting depth, they break. These breakers, and the associated energy dissipated are greater than during normal conditions, and therefore there is more energy available to erode the shoreline. These changes often include the movement of the bar offshore, the recession of the beach, and in extreme storms, the erosion of the dune. Since the storm conditions may also include the presence of a storm surge, the portion of the beach profile exposed to wave attack is greater than during normal non-storm conditions.
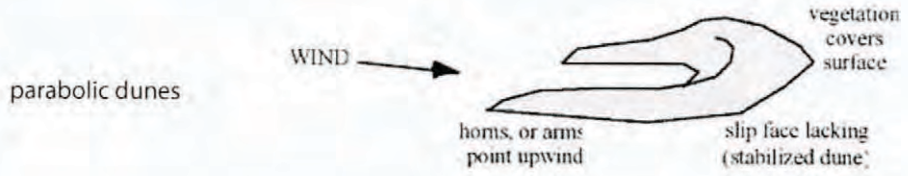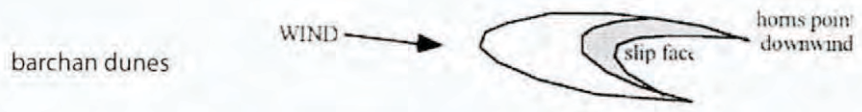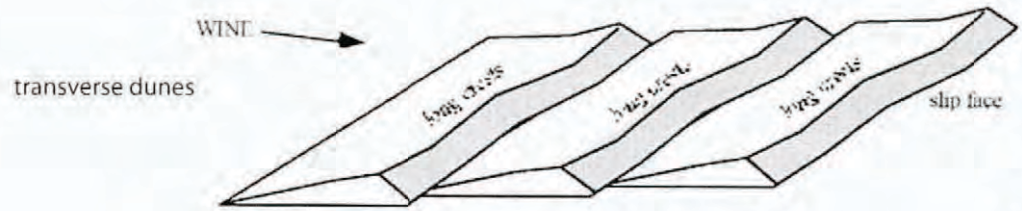
As the waves and surge increase, sediment is moved offshore as the bar migrates to deeper water. The bar may in

Waves that are produced by wind are affected by the wind speed, wind duration and fetch. Fetch is the distance that an unobstructed and constant wind, both in terms of speed and direction, acts over a body of water. Land is an absolute limit to fetch but changes in water depth and wind direction can also limit fetch. For very large bodies of water, the change in wind directions due to the circular wind field of a hurricane can limit fetch.

It is possible to predict wave heights for specific wind and waterway conditions. The primary factors are water depth, wind speed and fetch. If the wind duration is not sufficient to produce the computed wave height, then the waves are duration limited rather than fetch limited. If the waves are duration limited, the fetch distance used for computations should be reduced until the required duration equals the actual wind duration.

Wave heights and lengths also have a random nature in that each wave, even in a constant wind field, does not have the same height or arrive at a consistent period. The predictive equations are developed to predict the significant wave height, Hs, which is defined as the average of the one-third highest waves. The heights of less frequent waves can be estimated based on the significant wave height. [www.fhwa.dot.gov]

transverse dunes

WIND →

long crests · long crests · long crests · slip face

lobate dunes

WIND →

blowout · slip face · isolated dune lobe

barchan dunes

WIND →

slip face · horns point downwind

parabolic dunes

WIND →

horns, or arms point upwind · vegetation covers surface · slip face lacking (stabilized dune)

fact grow large enough to cause the storm waves to break further offshore thereby reducing the wave energy in the breaker zone. This process of bar migration offshore can be thought of as a process by which the shoreline is protecting itself from further erosion by the storm waves..

The beach berm is naturally built by the waves during periods of relatively low wave energy and sediment accretion. The berm elevation approximates the highest elevation reached by normal waves. When storm waves erode the berm and transport the sediment offshore, the protective value of the berm is reduced and large waves can penetrate further landward across the beach backshore. The width of the berm at the time of a storm is thus an important factor in the amount of dune and upland damage a storm can inflict.

During severe storms, such as hurricanes (or large northeasters), the higher water levels resulting from storm surge may lead to dune erosion. It is not unusual for 20 to 30 m wide dunes to disappear in a few hours. This dune erosion will be greater when the period of maximum storm surge coincides with a high astronomic tide. After the storm has passed and the waves return to normal size and period, the beach goes through a period of recovery. Material is transported from the bar and nearshore profile back to the beach above mean water level. The berm builds out, and when the sediment dries, is transported by the wind to rebuild the dune.
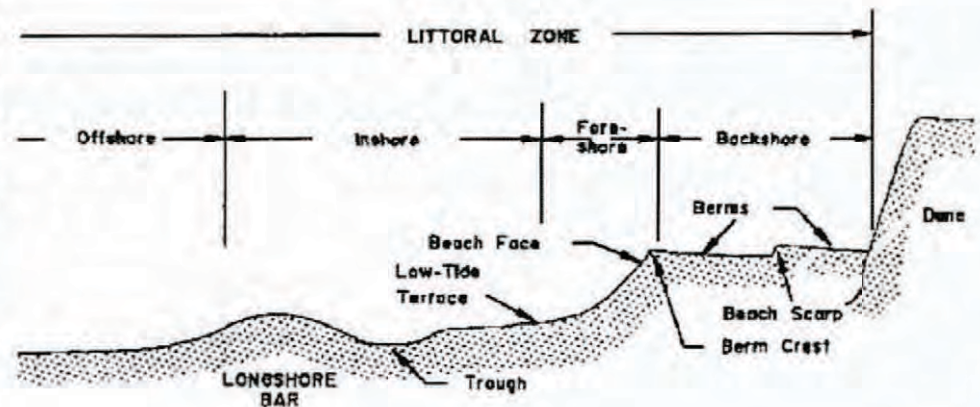
During very large storms the combination of the surge and large waves may succeed in completely overtopping the dunes causing extensive coastal flooding. When this occurs, the water transports beach and dune sediments landward in a process referred to as overwash. In some cases, on barrier islands, the overwash may transport sediment completely across the island and deposit the material in the estuary (sound or bay). This transport of material out of the littoral zone represents a net loss of material from the beach and nearshore. In rare cases, the overwash and storm flooding (from both the ocean and the estuary) may erode enough sediment to cut an inlet across the island. Such an inlet may close within a matter
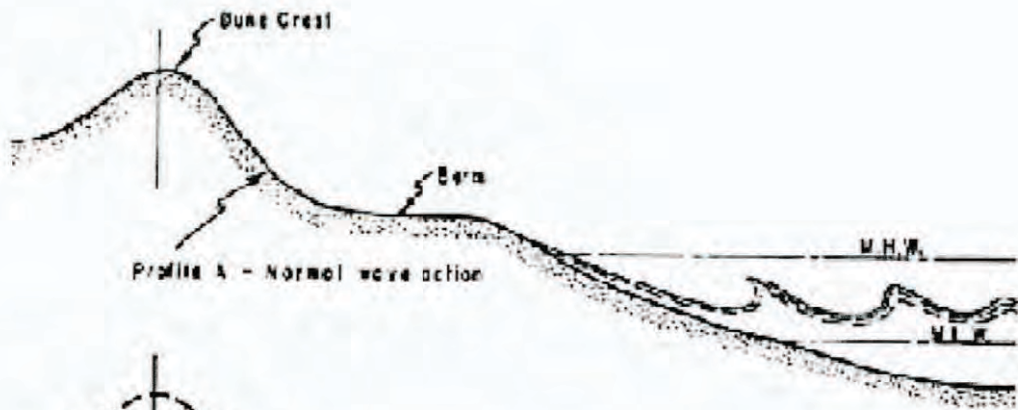
of weeks or months, or in extreme cases become a new feature of the barrier island.

Beach and Dune Recovery. Following a storm there is a return to more normal conditions that are characterized by low wave heights and longer periods than during storms. These waves that are not generated by the local winds along the coast are termed swell. As noted above, these waves tend to transport material back to the shoreline, moving the bar shoreward and rebuilding the berm. Often the rebuilding of the beach is incomplete, as there is a net loss of material from the system as material is transported far offshore, or along the beach. This latter transport is referred to as longshore transport.

On some shorelines there is a characteristic seasonal change in the shape of the beach. During the winter months, with relatively frequent storms, the beach is cut back so it appears to be relatively narrow and flat. During the summer months the beach rebuilds, the berm widens and the foreshore returns to the characteristic summer profile.

There are four major types of dunes. Barchan dunes are crescent-shaped dunes that are concave downwind, as shown below. Barchan dunes form in places where there is limited sand and a constant wind direction. The parabolic dune is a crescent shaped dune that is concave upwind and forms in areas in which there is some vegetation and a good supply of sand. The longitudinal dune is a linear dune that is parallel to the direction of the wind and forms in areas in which the wind direction is not constant and the supply of sand is moderate to good. Longitudinal dunes can be kilometers in length, and the formation of them is not entirely understood. They are formed in areas in which there is a desert pavement and variable winds. Transverse dunes are linear dunes that are perpendicular to the direction of the wind and are not as long as longitudinal dunes. Transverse dunes form in areas with abundant sand and little vegetation. [www.fhwa.dot.gov]
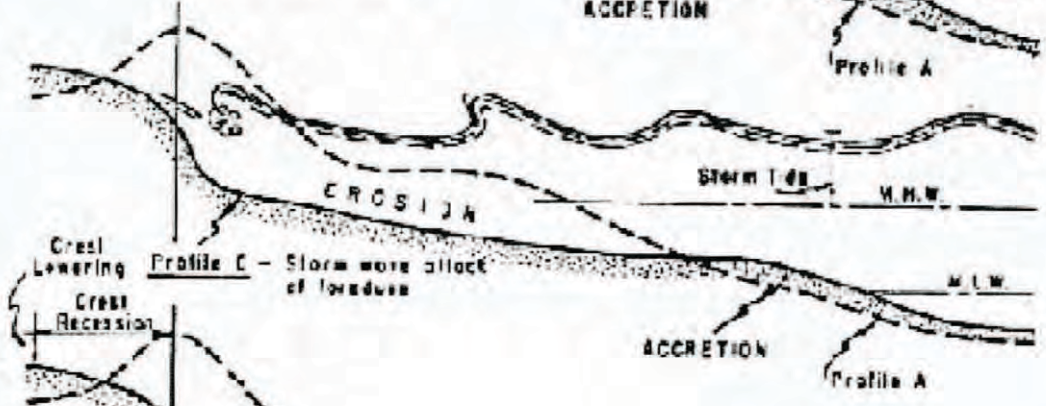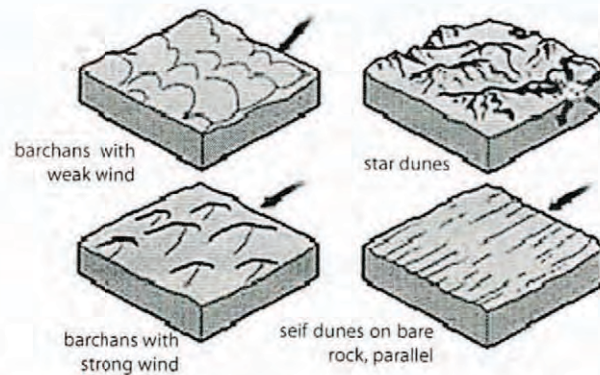

LITTORAL ZONE

Offshore — Inshore — Fore-shore — Backshore

Beach Face
Low-Tide Terrace
Berms
Dune
Beach Scarp
Berm Crest
Trough
LONGSHORE BAR

Dune Crest

Berm

M.H.W.

M.L.W.

Profile A - Normal wave action

normal wave action

EROSION

M.H.W.
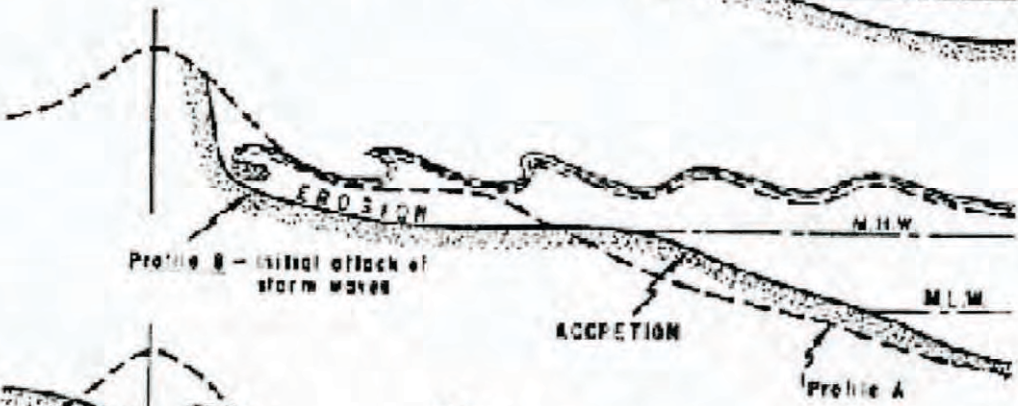
Profile B - initial attack of storm waves

ACCRETION

M.L.W.

Profile A

initial attach of storm wave : erosion

EROSION

Storm Tide

M.H.W.

Crest
Lowering

Profile C - Storm wave attack
of foredune

ACCRETION

M.L.W.

Profile A

storm wave attack of foredune : crosion

Crest
Recession

EROSION

M.H.W.

Profile D - After storm wave attack,
normal wave action

M.L.W.

ACCRETION

Profile A

after storm mave attack, normal wave action : erosion

barchans with
weak wind

star dunes

barchans with
strong wind

seif dunes on bare
rock, parallel

dune patterns •

wind

crossbeds created by top-
set deposits making dune
accretion

crossbeds created by foot-
set deposits making dune
migration

tabular
forsets

wedge
forsets

interdune deposits

preliminary dune •

Different types of dunes are made from different effects.
On coastal dunes the waves effect the changes in the
dunes where as on desert or land locked dunes, wind is
the major influencer in change and movement. Above is a
diagram of four different types of dunes caused from dif-
ferent wind movements.
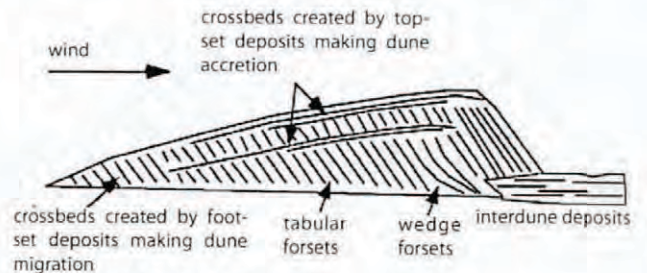
Dunes start their process at the shape below. After a sand
surface is moved from its flatness, it creates this shape.
The shape changes its depth depending on the velocity
and strength of the force. In case to the left, it is wind.
But below is from water. And when the forces become as
strong as hurricane winds and waves create a completely
different landscape of dunes than usual. If the hurricane
is strong, then it could possibly take out the entire dunes-
cape so it must restart its process again.

sediment coming
from erosion of
cliffs

transport of sand
offshore

wind carries sand
into lagoon

wash-out

longshore currents
transport sidement

dune

lagoon

river carries mud into the
lagoon and estuary
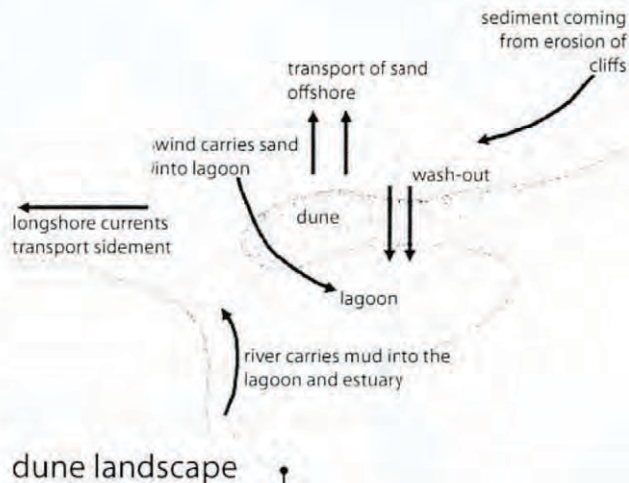
dune landscape

Native dunegrass (Elymus mollis) is a type of large grass that normally grows on sand and gravel beaches. The leaves are dusty to bright green, 6 to 15 mm wide and 30 to 80 mm long. The stems may grow up to 1.5 m tall. In undisturbed areas, native dunegrass can form a dense fringe between the beach and the forest, its blades gently waving and rustling in the wind. It is an important coloniz-ing plant among sand dunes and driftwood, and helps to stabilize shifting sand so that other plants can grow there.

evidence

dwe

lling

How does one define the space that they live in, that they dwell in, that they call their home? For many it is a house or an apartment or even a trailer. Others describe it more as place; a street number, or their vehicle. If they are 'homeless' they may call home where they sleep, or a shelter, or maybe home is where they lived before. Home can be where you are with the people closest to you, not necessarily where you live, but where you are most comfortable with your surroundings and with the people you love. When people have multiple houses, and places to go that they can live in, how do they decide which one is their home? Or are they all? Does the one that they are in most become their home? Or students that live in more than one place; a dorm room or a college apartment and their parents house where they grew up. How do they describe where their home is? Or are both places home; home to different parts of their lives.

Home is a reflection of many parts of the inhabits self. Their living style, community, culture and direct natural environment all help create their dwelling. The way that it looks,

"There are three main aspects of the dwelling: as a symbol of the self, as physical encoding of many of the values of a society, and as an indication of the processes by which these have been assimilated." (153, Oliver)

is laid out, the materials, the structure, the placement on its site, even the way that the space is used. "There are three main aspects of the dwelling: as a symbol of the self,

as physical encoding of many of the values of a society, and as an indication of the processes by which these have been assimilated." (153, Oliver) The indications of a house are related to the community as well as the person. The

"A good house is a single thing, as well as a collection of many, and to make it requires a conceptual leap from the individual components to a vision of the whole." (147, Moore)

community, which shares culture, influences the whole of the house. A house built by a tribe in rural Africa would not be built in a suburb of England, nor a house in Japan be built on another island like Hawaii. This is not only because of climate differences, but because of cultural differences. The communities are built off of their customs and their beliefs and their realizations of their surroundings. Each house should represent their inhabitant, reveal their individuality but also allow for a community connection. Communities are successful when they allow for

program

an individual interpretation of their strongest traits. This then can create a richly diverse atmosphere but still is able to form connections that create a community. "A good house is a single thing, as well as a collection of many, and to make it requires a conceptual leap from the individual

dwelling: (merriam webster dictionary)
1 a : building or place of shelter to live in; place of residence; abode; home.
2. a : shelter (as a house) in which people live.
dwell (merriam webster dictionary)
1 : to live or stay as a permanent resident; reside.
2 : to live or continue in a given condition or state; to dwell in happiness. :

home: (merriam webster dictionary)
1 a : one's place of residence : domicile b : house
2 : the social unit formed by a family living together
3 a : a familiar or usual setting : congenial environment; also : the focus of one's domestic attention b : habitat
4 a : a place of origin; also : one's own country b : headquarters

[dwelling]

components to a vision of the whole." (147, Moore)
Stemming from culture comes tradition. Tradition is a main element in deciding strategies for dwelling design. It can impact through the cultural traditions and create an architecture that reflects the community and the dwell-

"It can be argued that there is no such thing as a 'traditional building,' and no larger field of 'traditional architecture.' There are only buildings that embody traditions." (7, Moore)

ers' beliefs. "It can be argued that there is no such thing as a 'traditional building,' and no larger field of 'traditional architecture.' There are only buildings that embody tra- ditions." (7, Moore) Different cultures and communities define tradition separately. Each writes and creates their own guidelines and is influenced by different aspects of life. These aspects can come from their natural surround- ings or religious beliefs or any other influence of their life style. Because communities and groups of people differ with these aspects, the outcomes, or traditions differ. "A thing is traditional if it satisfies two criteria: it is the result of a process of transmission, and it has cultural origins in- volving common people." (6, Bourdier) Once traditions are established they are projected through many parts of the communities living. Not just the way that they live, but what they live in. Architecture is a tangible way to under- stand traditions. Like books of rules laying out the tradi-

"A thing is traditional if it satisfies two criteria: it is the result of a process of transmission, and it has cultural origins involving common people."
(6, Bourdier)

tions, a piece of architecture from a community can help someone who comes from a different community un

derstand that way of life. This idea is also used to pass tradition from generation to generation. Continuing the traditional architecture, the same way a house is passed down, insures that the tradition is maintained and protected. "Traditional dwellings and settlements are the built expression of a heritage that continues to be transmitted from one generation to another. Usually the product of common people without professional intervention, they provide the habitat for much of the world's population."(5, Bourdier) This may be a positive for sustaining tradition, but it can be a negative for evolvement of community. If the community is stuck in a time period of standstill they are unable to advance techniques and learn from the

"Traditional dwellings and settlements are the built expression of a heritage that continues to be transmitted from one generation to another."
(5, Bourdier)

faults of their ancestors. Technology plays a huge role in this. If one community uses technology to advance their building typology so it fits their needs while another is constant with the original, one will allow the community to advance and the other hold it back. This is the same as any other kind of evolution. Plants and animals adapt to the change of their surroundings constantly. When a new threat approaches, they change the best that they can right away to adjust to it. They do not allow for it to take over their life style and kill them out. When plants start to die off, they adapt in similar ways. They develop a

poisonous aspect about them so that their predators become less of a threat. Humans adapt, but not in a direct way that other species do. We need to learn from them in

"Why is it that the word 'traditional' can evoke, on the one hand, feeling of the real and the authentic and hence some quality to be desired, but on the other hand, a sense of limitation?
(27, Bourdier)

order to understand the need for adaption. "Why is it that the word 'traditional' can evoke, on the one hand, feeling of the real and the authentic and hence some quality to be desired, but on the other hand, a sense of limitation – of a deficiency in boldness and originality? We can acquire new insight and greater clarity as to their true import if we couple the idea of tradition with the idea of constraint-vs-choice." (27, Bourdier) Adaption and traditional upkeep can be seen in architecture through historic preservation and new architecture typologies. When an architecture is restored consistently so it never changes from the time it was built until now there comes a problem. It is positive because it embodies an architecture time period that no longer exists, but it does not speak to the present time. Since the climates of the world evolve as a constant rate, the effect of change is constant. If a designer from 1900 and a designer from 2000 both designed and built the same house for the same client they would be different. This is because both designers understand the problem differently since they have different threats to consider.

tradition: (merriam webster dictionary)

1 a : an inherited, established, or customary pattern of thought, action, or behavior (as a religious practice or a social custom)

b : a belief or story or a body of beliefs or stories relating to the past that are commonly accepted as historical though not verifiable

2 : the handing down of information, beliefs, and customs by word of mouth or by example from one generation to another

without written instruction

3 : cultural continuity in social attitudes, customs, and institutions

4 : characteristic manner, method, or style

One hundred years of evolving and learning changes the standards for design. So if communities continue to keep the same standards of an outdated time, they will have problems with the evolution of their surroundings which they have no control over.

The way that the spaces of the house are then described and laid out are from the influence of each culture. This is why rooms are aligned specifically by each culture; tradition calls for different steps through the house. "Architecture is a reflection of behavior or the use of space which, in turn, is a reflection of culture – in other words, they are not one and the same." (3, Kent) In French architecture, the enfilade is what describes the status of the visitor. Through this, the rooms are connected and must be experienced in a straight line. Other traditions concentrate on hierarchy of sex. The set up of the same relates to the male or the female occupant. In most cases, the dwelling is a space cre-

> "Architecture is a reflection of behavior or the use of space which, in turn, is a reflection of culture – in other words, they are not one and the same." (3, Kent)

ated to protect the inhabitants from the nature (and what it brings) that it sits in. It becomes a separation from the climate, or from the landscape, or from the animals that share the environment. This bounded space is then divided by the traditions of set culture. And then the interior environment is created and becomes a reflection on both person and culture through tradition. "Architecture creates boundaries out of otherwise unbounded space while the

space: [merriam webster dictionary]
1 a : a limited extent in one, two, or three dimensions : distance, area, volume b : an extent set apart or available c : the distance from other people or things that a person needs in order to remain comfortable
2 : a set of mathematical elements and especially of abstractions of all the points on a line, in a plane, or in physical space
3 a : the opportunity to assert or experience one's identity or needs freely b : an opportunity for privacy or time to oneself

use of space can be seen as a means to organize that unbounded space. The type of space a boundary partitions depends on the culture and time period it occurs in and

> "Architecture creates boundaries out of otherwise unbounded space while the use of space can be seen as a means to organize that unbounded space." (2, Kent)

can range from inner-outer and public-private space." (2, Kent) Spaces that allow a connection to the exterior of the dwelling are the most successful in terms of a healthy relationship between its natural environment. Interior space is enhanced by this as well because it allows for an easier transition between outside and inside. "Architectural partitions usually are conscious manipulations by humans to create boundaries where they do not exist by nature. While natural phenomena can also create the same type of boundaries in space in different cultures, architecture artificially partitions in very visible way." (2, Kent) Although the partitions are made to create a separation between inside and outside there are also methods of connection. For example windows and doors, porches are transition spaces, as well as garages. Each piece of program has a job and all together, if positioned correctly the spaces in-

> "Architectural partitions usually are conscious manipulations by humans to create boundaries where they do not exist by nature." (2, Kent)

side create an interior experience. But also separate and connect to the living exterior landscape.

In order to create a house that will sustain its surrounding threats, the climate of the region must be considered during the design process. Local design challenges involving climate (flooding, snow, tornadoes, tsunamis, hurricanes

and climatic impacts. If a dwelling is designed to respond to the nature of the site's changes it will undoubtedly last longer. And as the changes occur, the knowledge of adaption will appear and allow for a successful sustainable architecture. But without the plan for adaption, if the building is a representation of a certain time, the protection

"Nature, is a source of danger as well as a blessing." (20, Bourdier)

from local environmental change is weak. This argues that historic preservation is unsuccessful. If the building was designed and built for a climate of environmental hazards that happened one hundred years ago, and maintained to that state, how is it supposed to with hold for the one hundred years of the advancement of the threat? In Galveston Texas, hurricanes have been a local natural threat for over one hundred years, but in many places of the island historic preservation is the driving architectural typology. This is happening even with the rise of the threat. Flooding is worse on all parts of the island, and starting to happen in places that it has not ever happened before. Hurricanes are hitting the island more frequently and with stronger forces. But no measures have been taken to adapt through an advancement in their architecture typology because they are focused on repairing the original state to ensure memory. This could be seen as a means to ensure the community that the threat may be high, but they can overcome it and continue to live as they always have, it could also be ignorance to acknowledge the increase of threat, or it could be seen as a simple cultural rule that insists on keeping tradition no matter what around them

"The house is a miniature cosmos, and a totality of natural environment, community and family" (20, Bourdier)

changes. "The house as a miniature cosmos, and as a totality of natural environment, community and family" (20, Bourdier)
Looking into the future this community, along with many other communities in the world, is going to experience an even larger rise of threat. If they do not develop a connection with their natural environment and adapt to it by allowing tradition to change and hopefully impact positive cultural change, their community, like unadaptive species will expire and become extinct. This in turn, would reverse the preservation of old traditions, and not allow for any part of their culture to be passed down. But if they adapt to change, their traditions adapt, and are able to continue their culture.

Many parts of our society and surroundings are impacted by invasion. The invasion of new products into our popular culture has been influencing our population for years. New items are introduced by media and incorporated into our lives taking over and replacing what had been doing the same tasks before. This process can be seen as an overtaking of the old and replacing it with the new; the new technology, the new ideas or the new technique because the old is outdated. This replacing process can also be considered a form of adaption and advancement.

In this thesis, these invasion techniques can be transferred into a diagrammatic scheme of taking over and changing a site. The idea that before a place is invaded there is consistency. When a site is invaded, people from outside the community come into the community and disperse. This creates a combination of the new and the old. If the old is strong, and fights off the new, it will remain the prominent people. But if the invasion is successful, it takes over and creates a new community.

In Galveston, the city and its community are focused on maintaining their strong connection with their history through architecture. They have been abused by hurricanes and their destruction throughout their existence and to prove to themselves and their visitors that they can overcome this destruction they keep these historic structures as monuments. They are relying on these buildings to remind them that they can survive. But this is blinding them to create a better lifestyle for themselves.

This thesis will propose a new prototype. Considering the designs and likeliness of the historic laws and codes, a new design parti and language will be introduced. It will be designed to interact with the natural landscape at a higher level than the historic buildings that sit on the landscape and are successful only when a solid barrier separates it from that completely.

Like an invasion, this prototype will start in one habitat of the island, if successful in its schemes, it will become a community and then be introduced and developed for other habitats until it invades the entire island.

invasion: (merriam webster)
1. The act of invading, especially the entrance of an armed force into a territory to conquer.
2. A large-scale onset of something injurious or harmful, such as a disease.
3. An intrusion or encroachment.
4. (Military) the act of invading with armed forces
5. any encroachment or intrusion
6. the onset or advent of something harmful, esp of a disease
7. (Medicine / Pathology) Pathol the spread of cancer from its point of origin into surrounding tissues
8. (Life Sciences & Allied Applications / Botany) the movement of plants to a new area or to an area to which they are not native

invasive architecture

Like defined before, a monument can be considered many different things to every person and their ideas. But for the majority of people, a monument is something that has come to be recognized with age. So then comes the idea about preserving this age, preserving the monument so it continues to give the same view of what it represents no matter how long ago that was. Although some great works of architecture have continued to be preserved through-out time and their existence, there are certain pieces that are more monumental because they have remained on their own. They have survived natural and man induced disasters, as well as population growth and industrial ex-pansion. An example of this would be in Rome, where the old city stands with the new city. Most of the old parts have been saved, but not re-built to their original stature.

In this thesis, preservation is questioned. In Galveston, where historic preservation thrives, the reason for it has not been questioned in the most productive ways. The historic foundation is taking under a huge task not only to continue to rebuild each destroyed structure, but to pro-vide a protective system from the damage that the con-sistent flooding and hurricane damage brings. Instead of this, an architectural system should be introduced as a way to limit this process of rebuilding.

This system will incorporate a hybrid of multiple systems that work together in order to be the most successful on its specific site. The systems will include adaption, inva-sive, code compliant, site coherence and a parti system that will be different levels of strong and weak. This will allow for some parts of the dwelling to be ruined or flex-ible to destruction, while others will maintain their original state as much as possible.

The building will be intertwined with levels of strength systems. They will move into each other while creating a clean transition from the outside site to the interior of the house. The systems strength and traits will mimic other natural systems that are destructed but are still able to sur-vive and contribute to the larger system they live in.
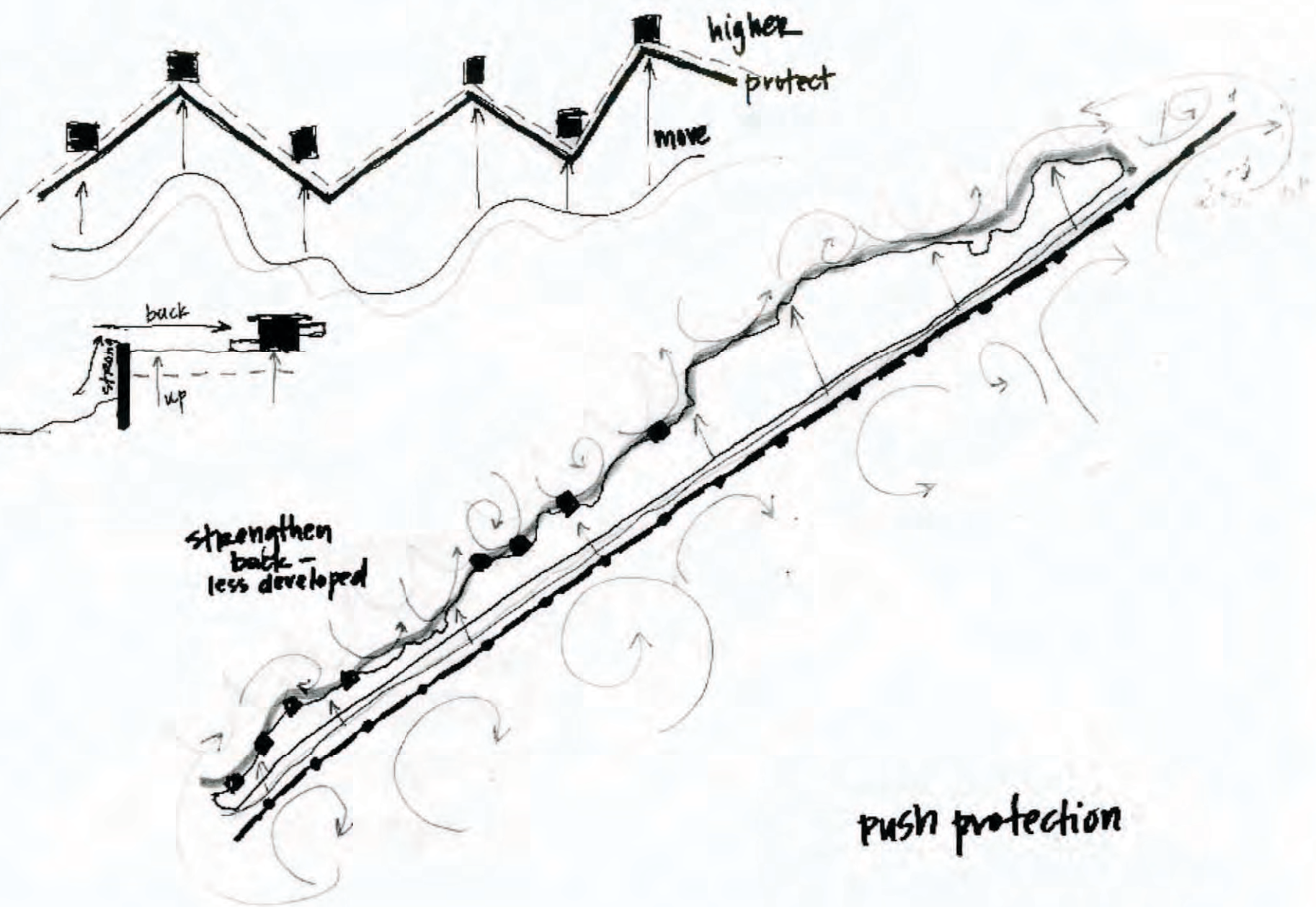
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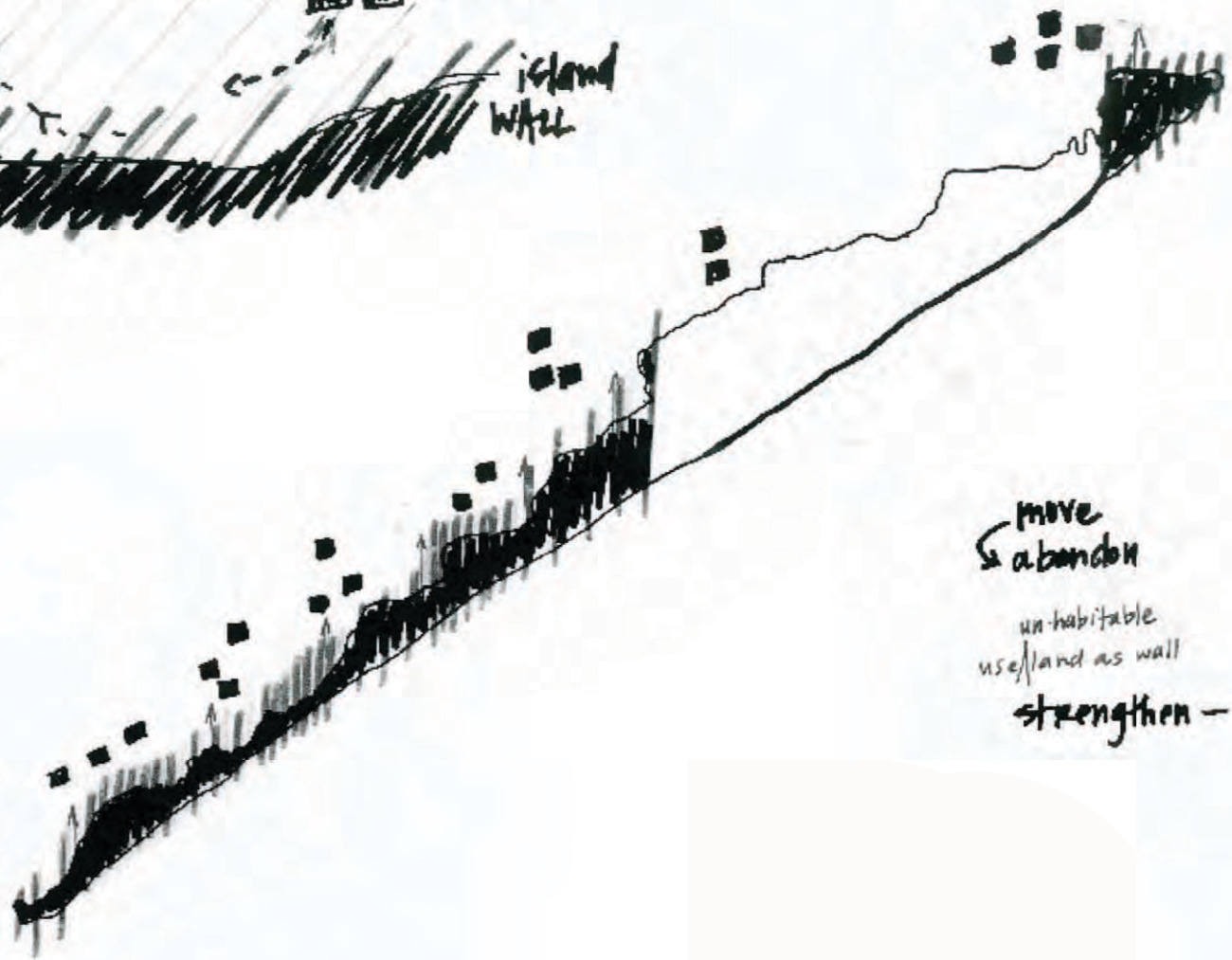
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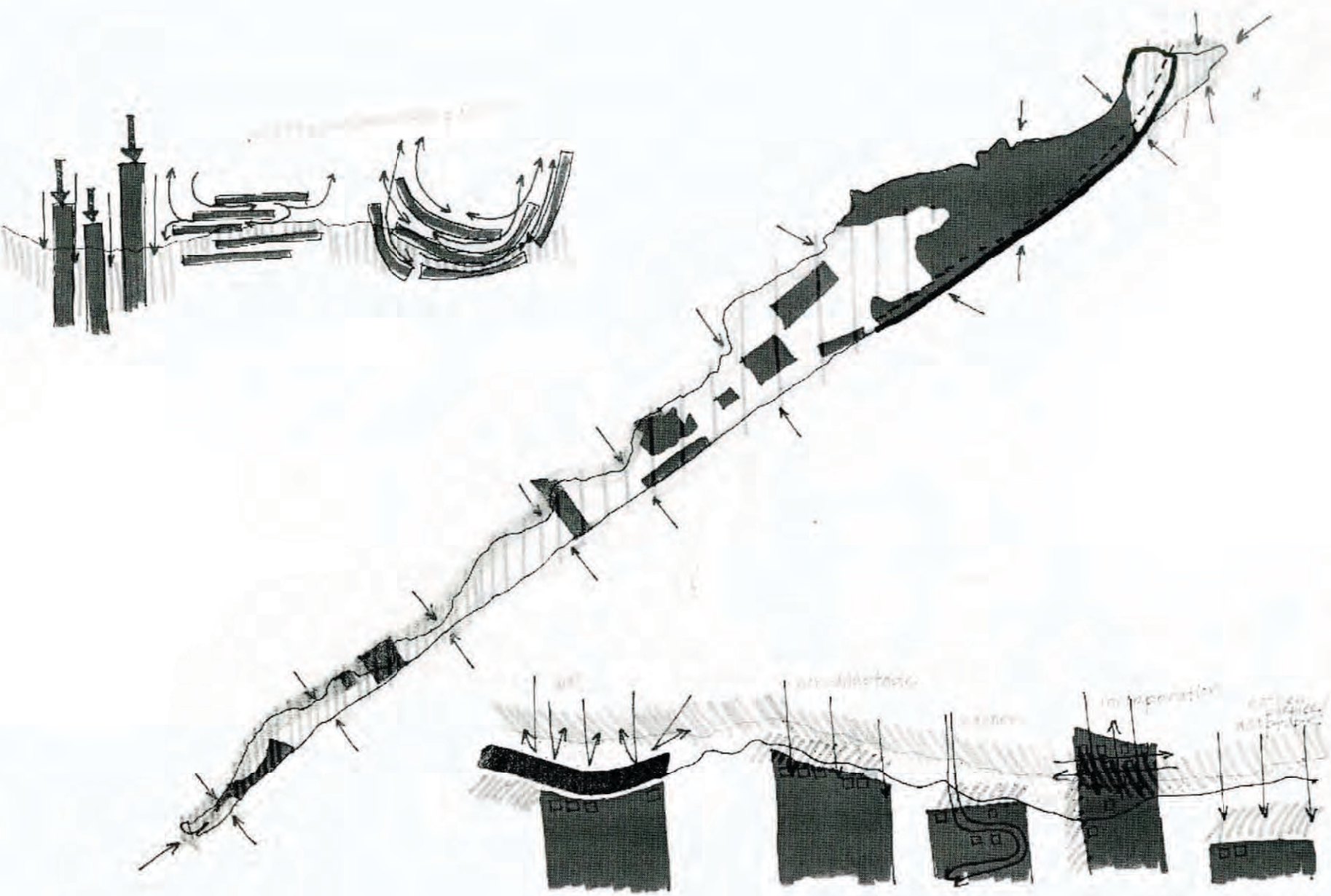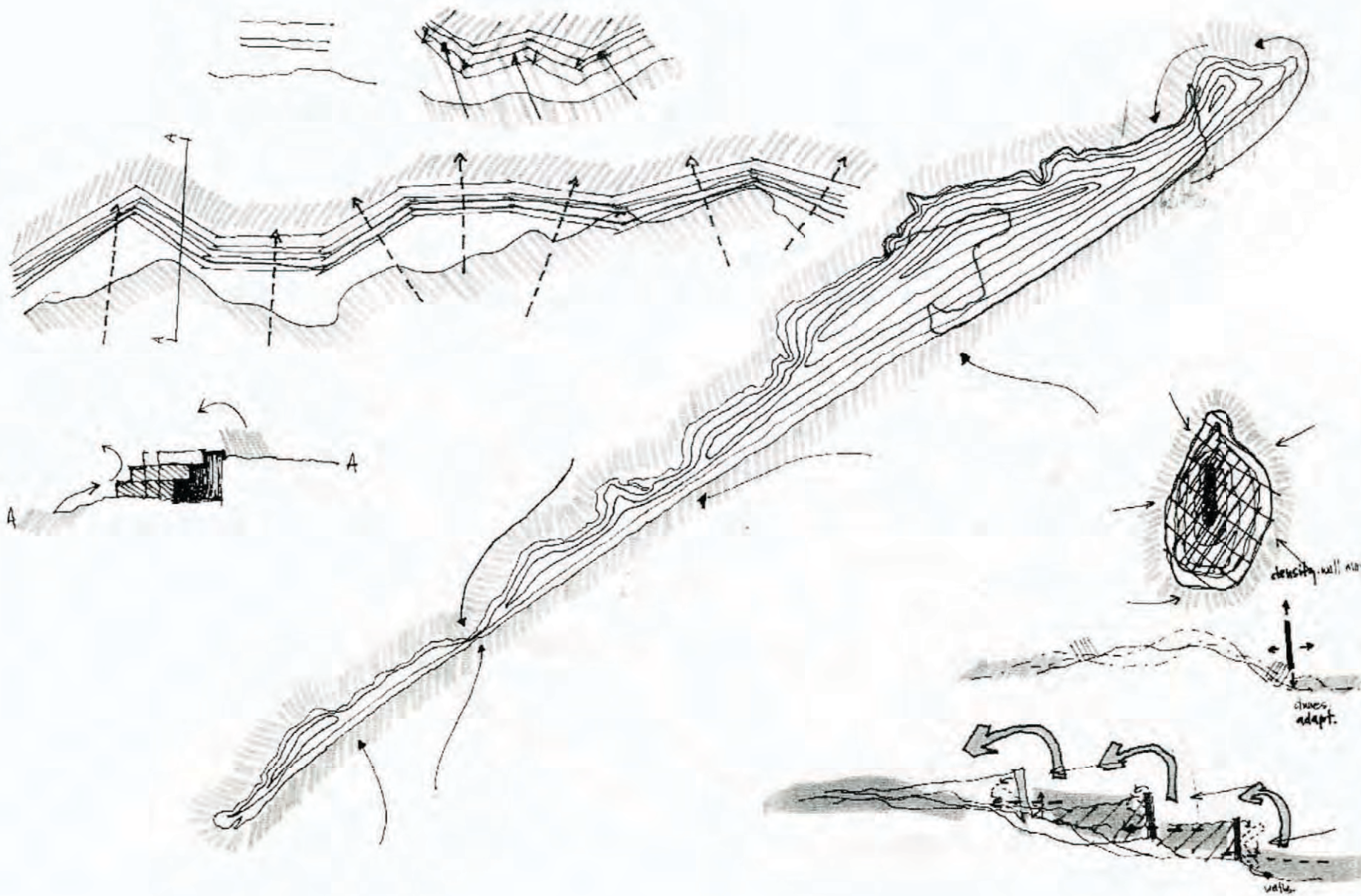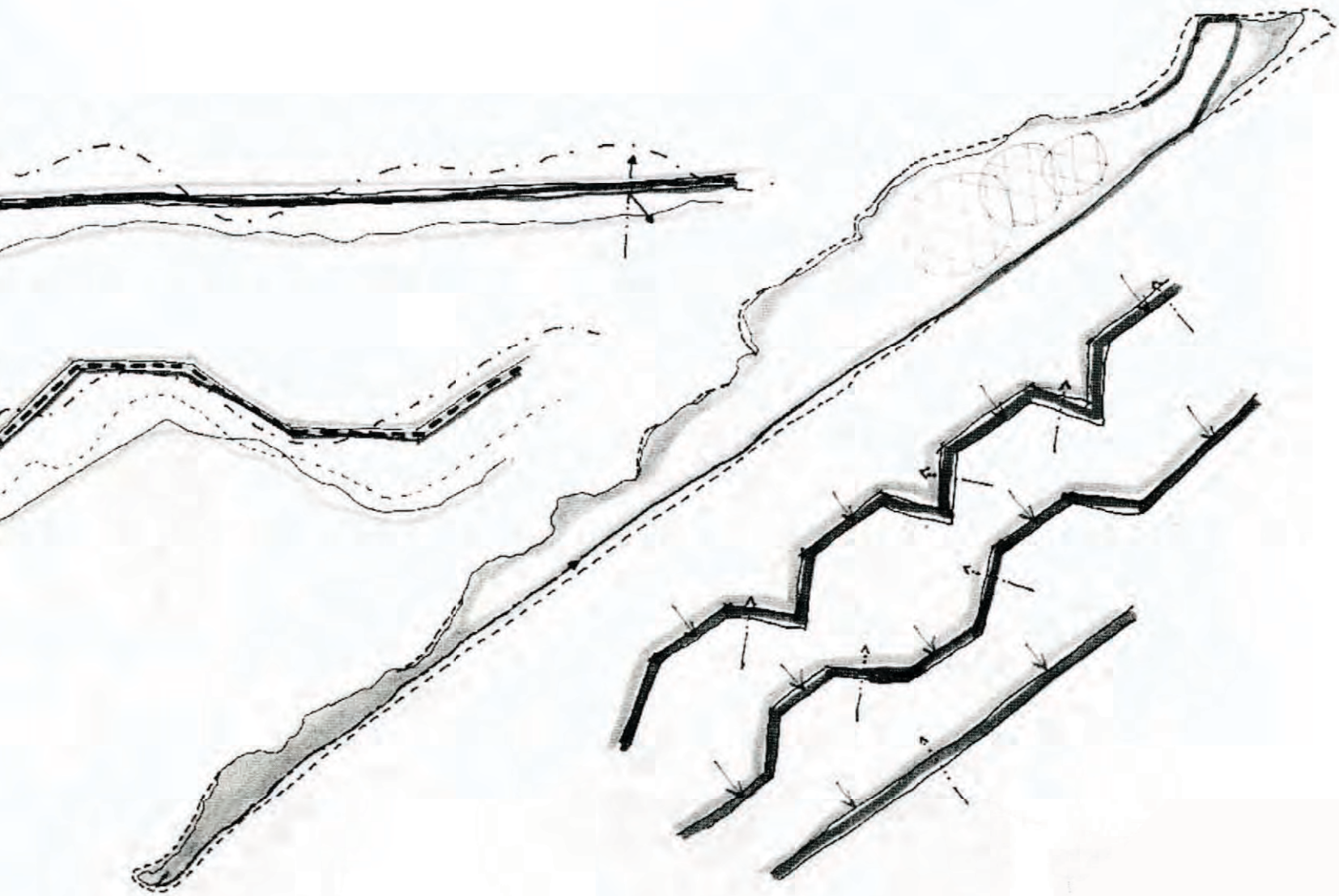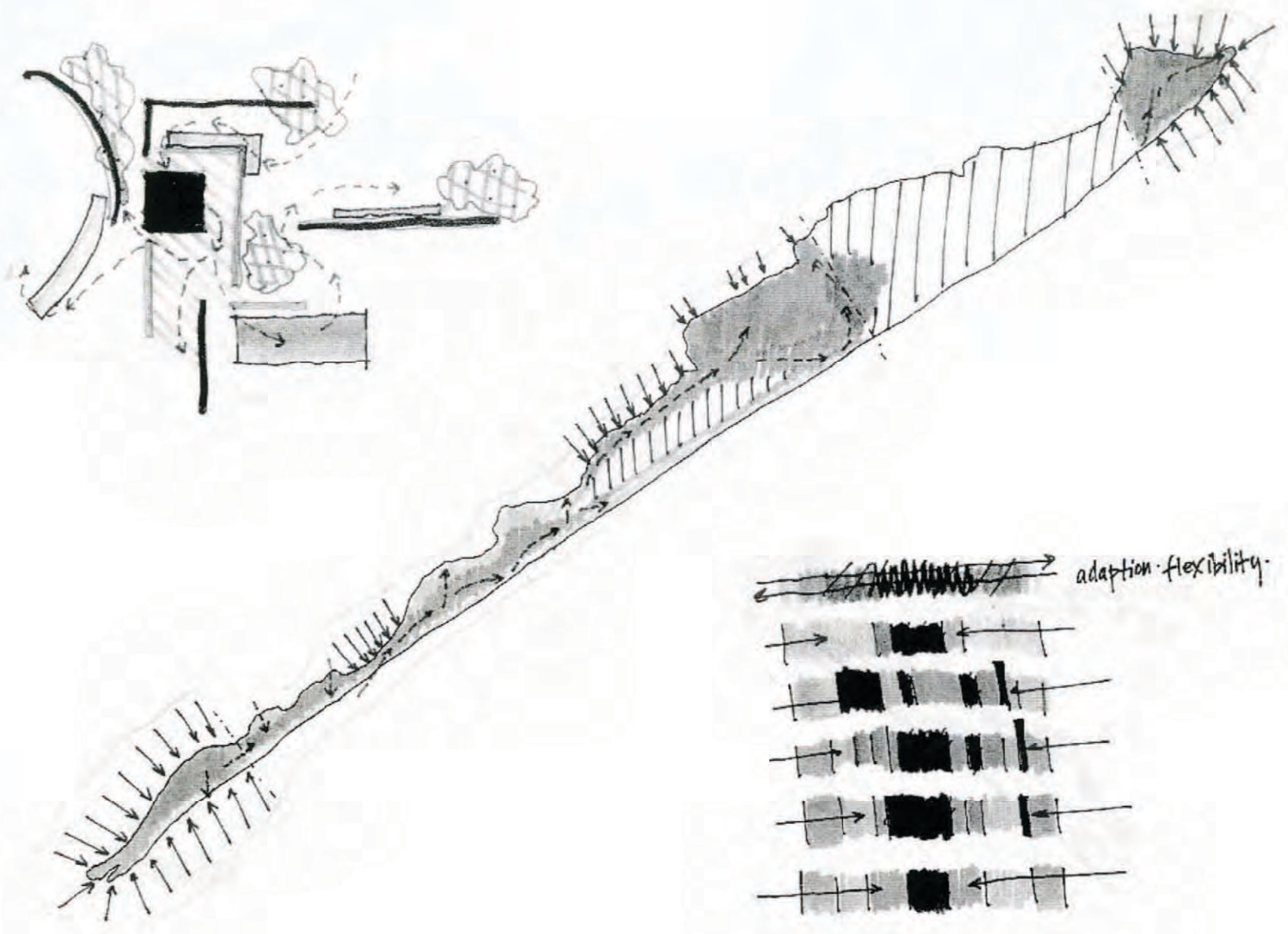
move to location (safe)

island
WALL

move
& abandon

un-habitable
use land as wall

strengthen — wall

des

ign

I want to produce a didactic effect by manipulating architecture for the outcome of its landscape. The placement of building will stem from the qualities of dunes (which is the landscape system of the site). The landscape will become art-value while the architecture remains use-value, historic-value, and age-value. When Riegel speaks about value, he uses these terms. Which are all values found in the architecture of the island, but in singular strict ways. To allow for a strong didactic element, the design of the built environment will be based on the outcome of the landscape. This way, the outcome of the natural effect will have the opportunity to be exaggerated and therefore produce certain natural effects that otherwise would be overlooked. Unlike the idea that most monuments have been exaggerated by scale ,this monument will become noticed by the effect it has on its landscape. Its viewers will learn from that instead of the architecture itself. The art-value of the exaggerated landscape versus the use-value that the architecture brings will create an understanding of the product or relationship that defines natural and cultural histories. Which in turn will lead to changing cultural and human behaviors that will emphasize an architecture whose use and symbolism values address these issues rather than stress a limited historic value.

So this way, the architecture is secondary to the effect it brings. It causes the beauty instead of being the beauty. The landscape becomes manipulated but not in ways normal to building sites. It will stay within its normal movements, those movements will just be enhanced to an extreme in hopes that their beauty will be realized and appreciated in a higher way, hopefully on the standards of the historic values of Galveston in order to help the community understand their own environment.
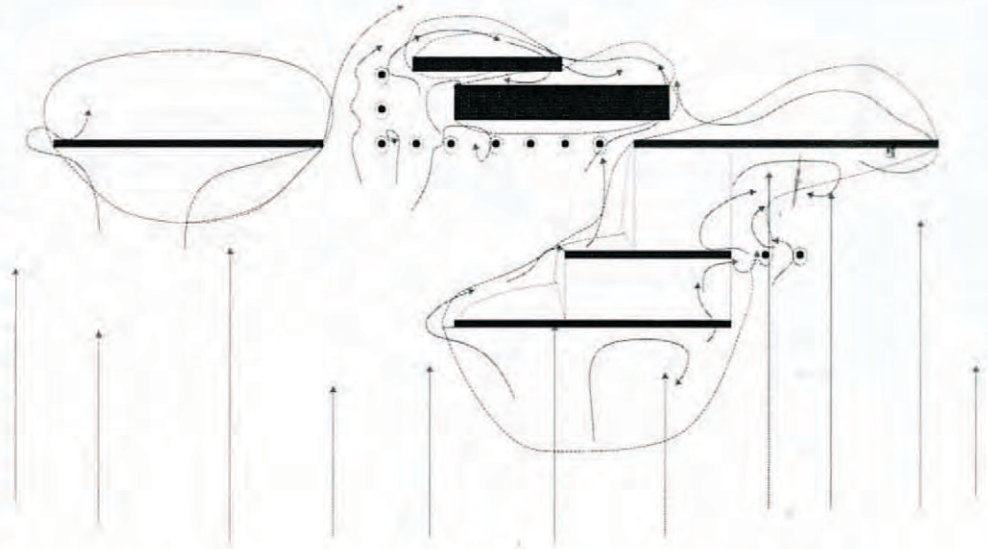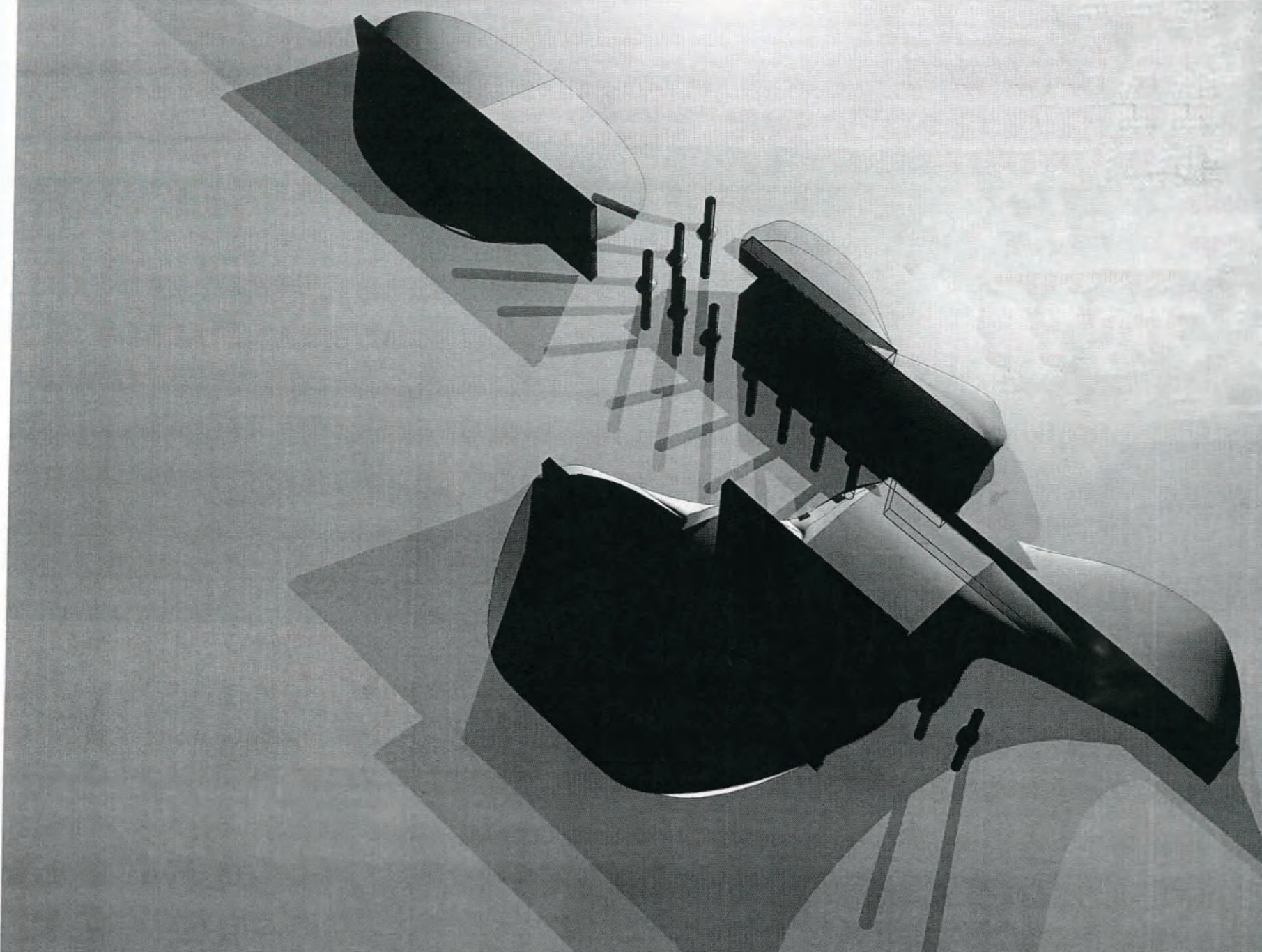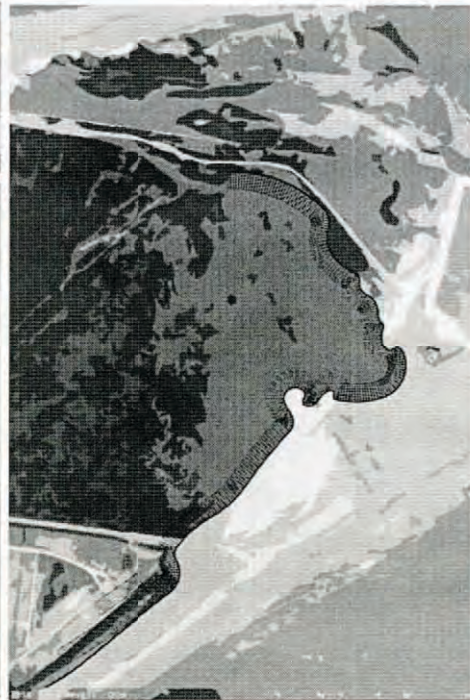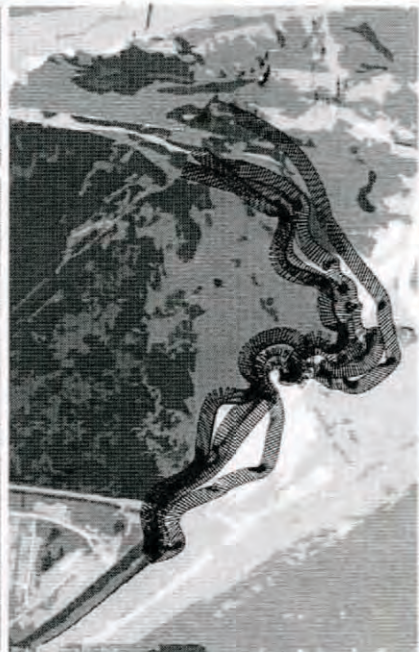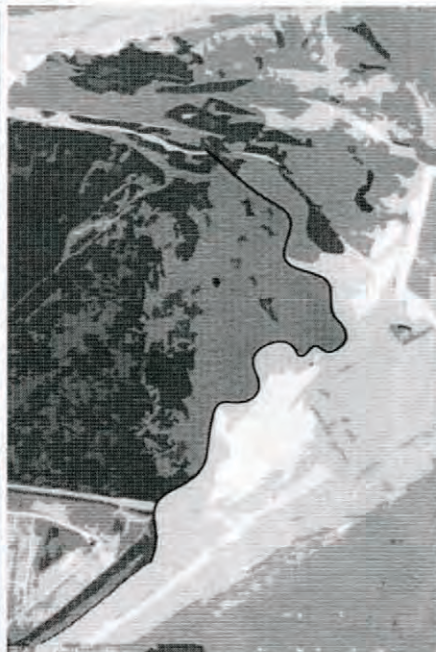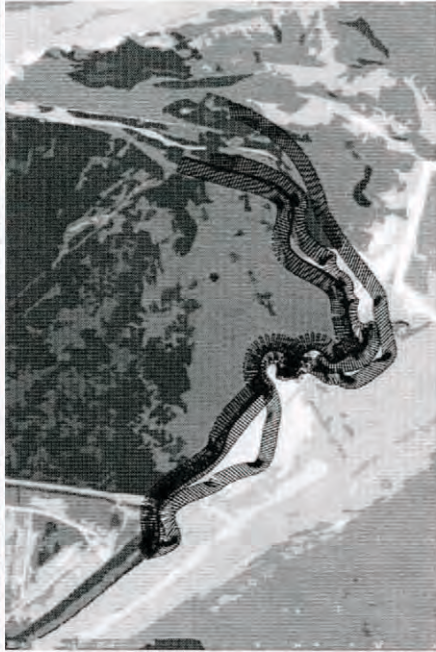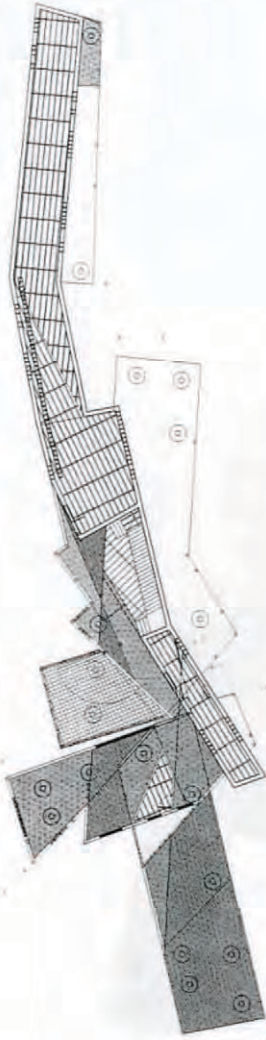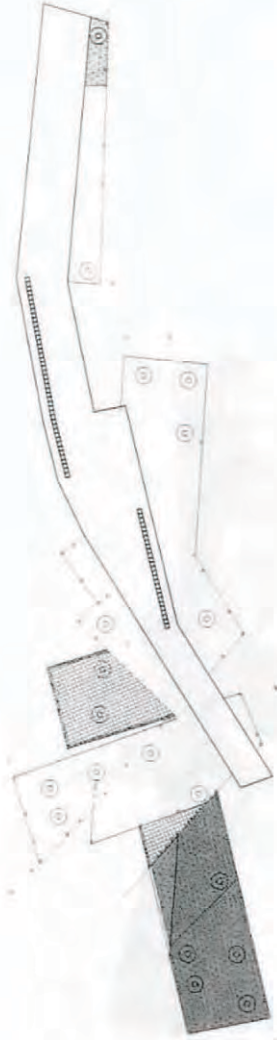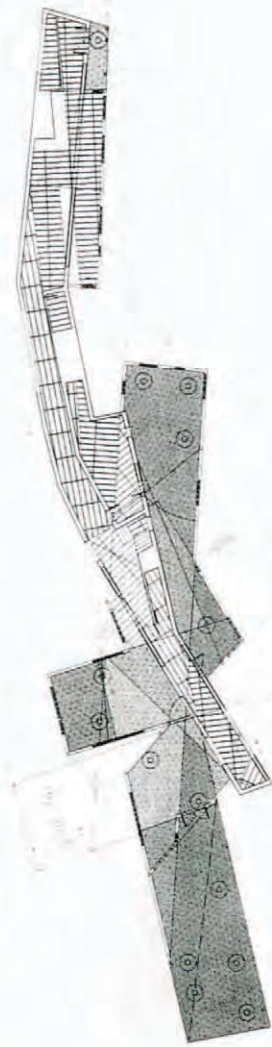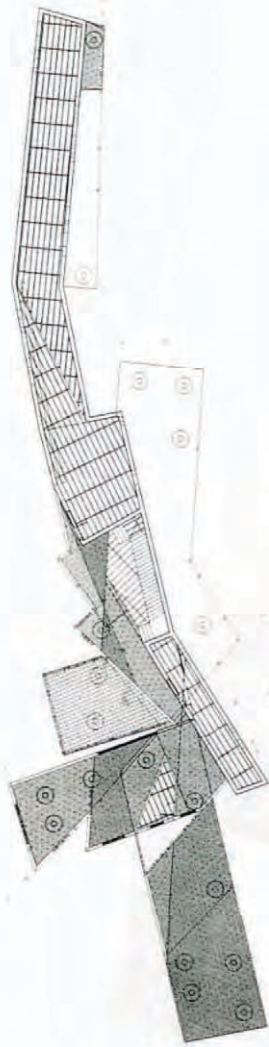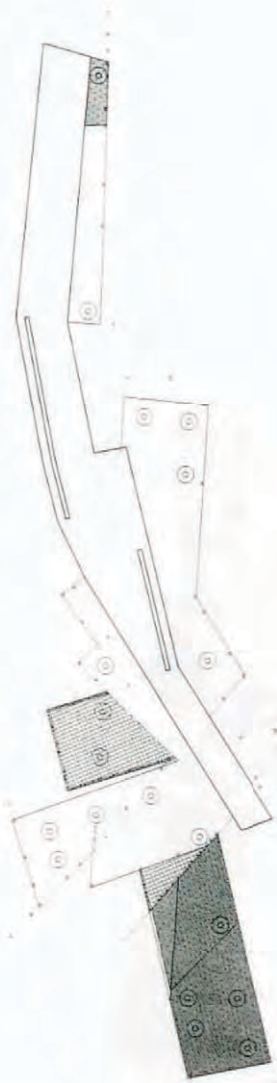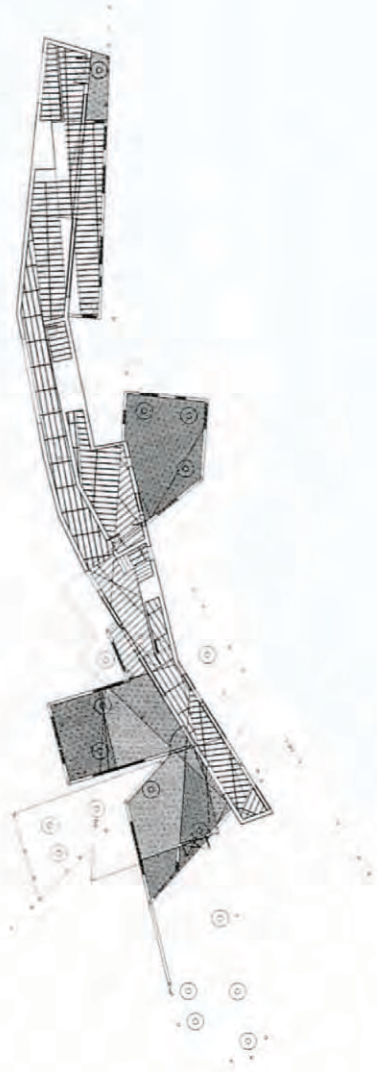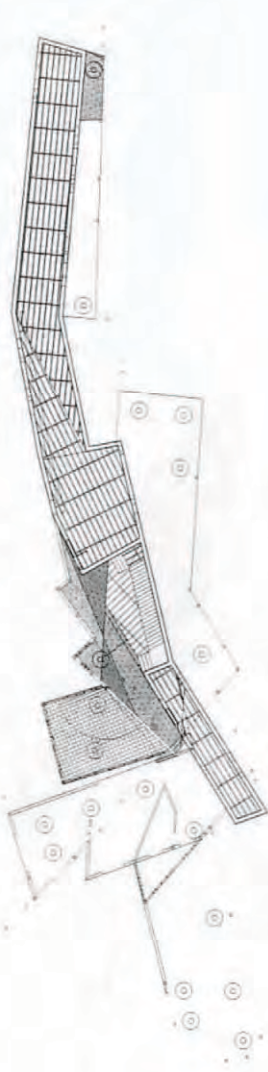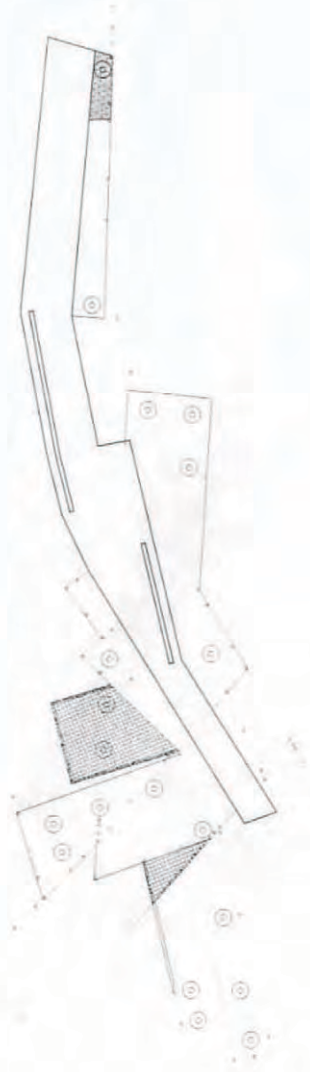
monument:

1. alois reigl;

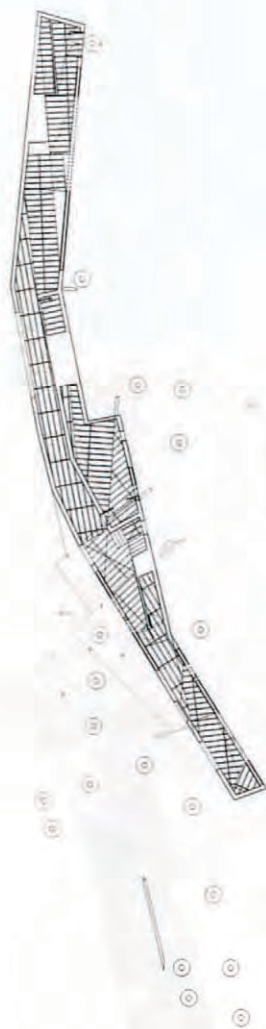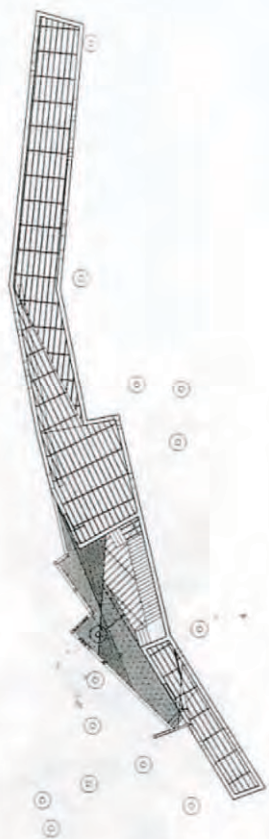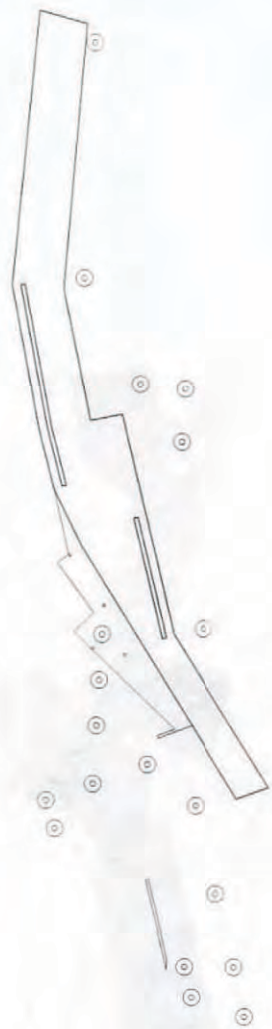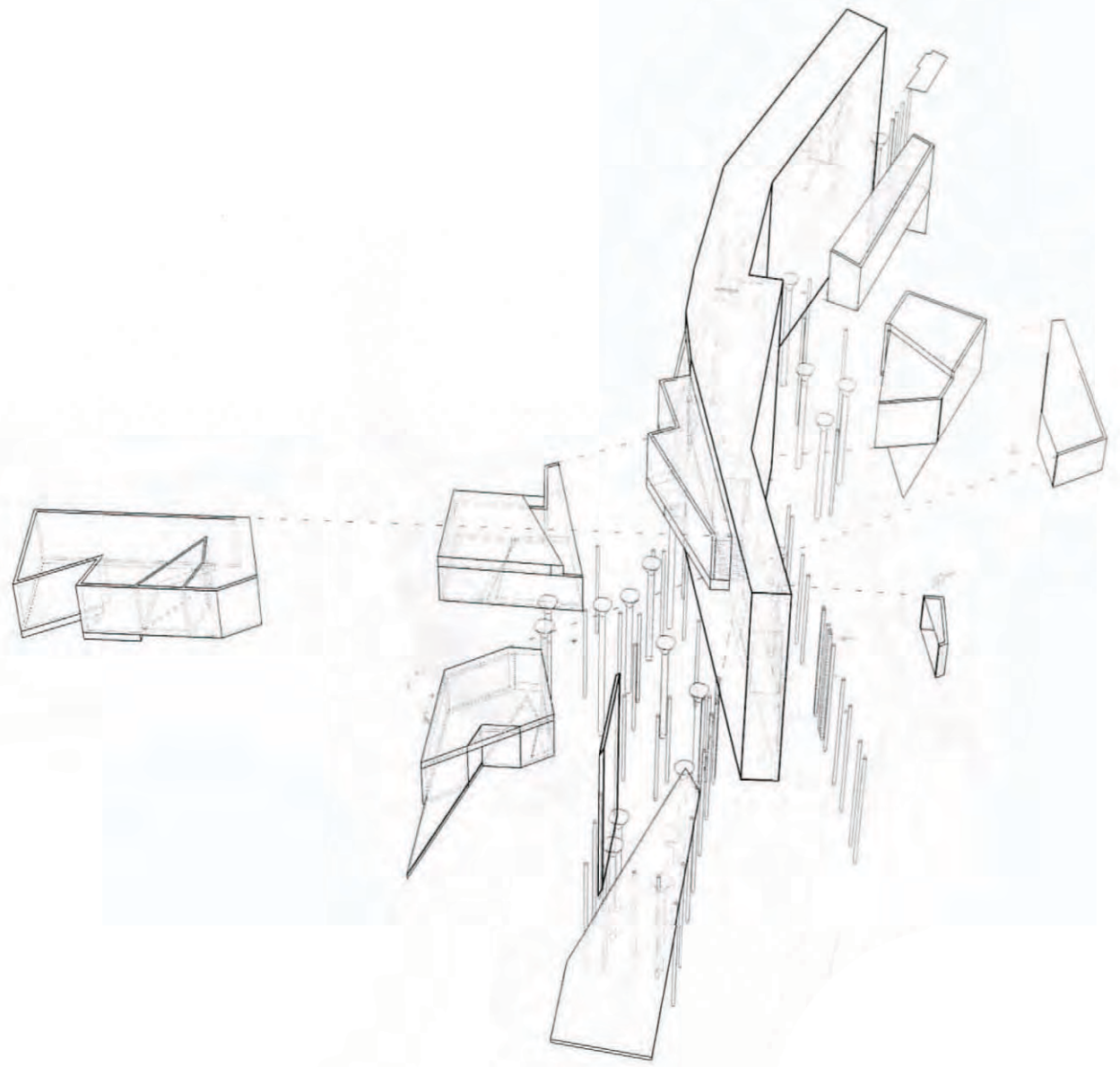In a famous study about the 'cult of monuments', first published in 1903, Alois Riegl distinguished between two kinds of monuments: intentional and unintentional, and then between four principle values of monuments which curiously resemble those suggested by William Lipe in another context.

An intentional monument is

"a human creation, erected for the specific purpose of keeping single human deeds or events (or a combination thereof) alive in the minds of future generations" (Riegl, 21).

Intentional monuments are concerned with commemoration, or prospective memory. In every present, they "recall a specific moment or complex of moments from the past", and thus make "a claim to immortality, to an eternal present and an unceasing state of becoming" (Riegl, 24, 38). Riegl believed that all of antiquity and the Middle Ages knew only intentional monuments (Riegl, 26).

According to Riegl (23), unintentional monuments, which are much more numerous, are remains whose meaning is determined not by their makers, but by our modern perceptions of these monuments, i.e. by retrospective cultural memory. Riegl added that deliberate monuments can also become 'unintentional', when they were built for the benefit of contemporaries or immediate progeny only but survive much longer.

2. www.merriam-webster.com

1 obsolete : a burial vault : sepulchre

2 : a written legal document or record : treatise

3 a (1) : a lasting evidence, reminder, or example of someone or something notable or great (2) : a distinguished person b : a memorial stone or a building erected in remembrance of a person or event

4 archaic : an identifying mark : evidence; also : portent, sign

5 obsolete : a carved statue : effigy

6 : a boundary or position marker (as a stone)

7 : national monument

3. Cambridge dictionary

1 REMEMBER a building or other structure that is built to make people remember an event in history or a famous person

a national monument 'They built the statue as a monument to all the soldiers who died.'

2 OLD PLACE an old building or place that is important in history 'an ancient monument'

Historic Value:

1. alois reigl:

a. Riegl argues that the (art-)historical value first developed during the Renaissance in 15th–century Italy and coincided with the first measures for the preservation of monuments (26). Initially, a distinction was drawn between the art-value and the historical value. But in the 19th century it became

clear that as every work of art was also a historical monument, so every historical monument constituted at the same time an art monument (Riegl, 22, 28). Historians and archaeologists believe that they can bridge the gap between past and present through thorough study, and they want to preserve ancient monuments, with the help of legislation, first and foremost as historical sources:

i. "The historical value of a monument arises from the particular, individual stage it represents in the development of human activity in a certain field... The more faithfully a monument's original state is preserved, the greater its historical value: disfiguration and decay detract from it... It is the task of the historian to make up, with all available means, for the damage nature has wrought in monuments over time... The objective of historical value is ... to maintain as genuine as possible a document for future art-historical research." (Riegl, 34)

b. The study of ancient monuments and artefacts as a source of information about the past may go back a long time further than Riegl imagined, and was perhaps an element of history culture already in later prehistory.

age-value:

1. alois reigl;

a. Antiquity and pastness as such can be valued aesthetic attributes. According to Riegl (29-31), such age-value is a phenomenon of the 20h century alone, even though it builds on historical value in general and on a tradition that can be traced back to the 17th century in particular. Age-value depends on the knowledge of age, which rests partly on the perception of traces of 'pleasing decay' and aging. Age-value contributes to the aura and authenticity of an object, and creates a context for nostalgia:

i. "It is probably fair to say that ruins appear more picturesque the more advanced their state of decay: as decay progresses, age-value becomes less extensive, that is to say, evoked less and less by fewer and fewer remains, but is therefore all the more intensive in its impact on the beholder... From the standpoint of age-value, one need not worry about the eternal preservation of monuments... Age-value manifests itself immediately through visual perception and appeals directly to our emotions." (Riegl, 32-3)

b. William Lipe called a very similar category 'associative/symbolic value'. The emerging contradiction between age-value, which supports the decay of monuments, and historical value, which supports their preservation, is avoided by Riegl in a lengthy (and ultimately unconvincing) argument abo ut the interrelations and dependence of both values upon each other (Riegl, 34-8).

c. Unlike Riegl, some assume that, in principle, age appealed to some people in other periods, too. Hence they would use the concept of age-value also in respect to the later prehistoric

roles of ancient monument such as megaliths in Mecklenburg-Vorpommern.

d. While both historical and age value are considered "commemorative values or values of the past", Riegl contrasts these with the two "present-day values" of use-value and art-value (31).

use value:

1. alois reigl

a. Use-value refers to the benefits to people actually using monuments for utilitarian purposes.

i. "use-value is indifferent to the treatment of a monument so long as the monument's existence is not affected and no concessions whatsoever are made to age-value... On the other hand, use-value may also require the destruction of a monument; for instance, if decay endangers human life" (Riegl, 39).

b. There is no doubt that such use-value of ancient monuments has also been appreciated by later prehistoric and historic populations, which is reflected in the evidence for their re-uses.

modern Kunstwollen (riegl):

1. cultural artistic sensibility

dwelling: (merriam webster)

1. a building or place of shelter to live in; place of residence; abode; home.

dwell: (merriam webster)

i. to live or stay as a permanent resident; reside.

ii. to live or continue in a given condition or state: to dwell in happiness.

2. a shelter (as a house) in which people live

home: (merriam webster)

1 a : one's place of residence : domicile b : house

2 : the social unit formed by a family living together

3 a : a familiar or usual setting : congenial environment; also : the focus of one's domestic attention <home is where the heart is> b : habitat

4 a : a place of origin <salmon returning to their home to spawn>; also : one's own country <having troubles at home and abroad> b : headquarters 2 <home of the dance company>

5 : an establishment providing residence and care for people with special needs <homes for the elderly>

6 : the objective in various games; especially : home plate

— at home 1 : relaxed and comfortable : at ease <felt completely at home on the stage>

2 : in harmony with the surroundings

3 : on familiar ground : knowledgeable <teachers at home in

their subject fields>

tradition:
1. (merriam webster)

1 a : an inherited, established, or customary pattern of thought, action, or behavior (as a religious practice or a social custom)
b : a belief or story or a body of beliefs or stories relating to the past that are commonly accepted as historical though not verifiable
2 : the handing down of information, beliefs, and customs by word of mouth or by example from one generation to another without written instruction
3 : cultural continuity in social attitudes, customs, and institutions
4 : characteristic manner, method, or style <in the best liberal tradition>

2. (american heritage college dictionary)

1 a : a limited extent in one, two, or three dimensions : distance, area, volume b : an extent set apart or available c : the distance from other people or things that a person needs in order to remain comfortable
2 : a set of mathematical elements and especially of abstractions of all the points on a line, in a plane, or in physical space
3 a : the opportunity to assert or experience one's identity or needs freely b : an opportunity for privacy or time to oneself

hurricane: (merriam webster)
1 : a tropical cyclone with winds of 74 miles (119 kilometers) per hour or greater that occurs especially in the western Atlantic, that is usually accompanied by rain, thunder, and lightning, and that sometimes moves into temperate latitude.

invasion: (merriam webster)
an invading or being invaded; specif.,
1. an entering or being entered by an attacking military force
2. an intrusion or infringement
3. the onset, appearance, or spread of something

invade: (merriam webster)
1. to enter forcibly or hostilely; come into as an enemy
2. to crowd into
3. to intrude upon; infringe; violate
4. to enter and spread through with harmful effects

wall: (merriam webster)
noun - 1. an upright structure of wood, stone, brick, etc., serving to enclose, divide, support, or protect; specif.,
a. such a structure forming a side or inner partition of a building
b. such a continuous structure serving to enclose an area, to separate fields, etc.
c. such a structure used as a military defense; fortification
d. such a structure used to hold back water; levee; dike
2. something resembling a wall in appearance or function, as the side or inside surface of a container or body cavity
3. something suggestive of a wall in that it holds back, divides, hides, etc.
transitive verb - 1. to furnish, line, enclose, divide, protect, etc. with or as with a wall or walls to wall a room with books, to wall off the old wing, a mind walled in by fears
2. to close up (an opening) with a wall: usually with up

habitat: (merriam webster)
1. the region where a plant or animal naturally grows or lives; native environment
2. the place where a person or thing is ordinarily found

key terms

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