AMERICAN UNIVERSITY OF BEIRUT

UNDERGRADUATE CAPSTONE PROJECT
IN
LANDSCAPE ARCHITECTURE

SUBMITTAL FORM

DE-DUMP ECOLOGICAL RESTORATION

by

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LDEM 242 - Advanced Design – 6 Credits

Spring 2015-2016

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DE-DUMP ECOLOGICAL RESTORATION

FINAL YEAR PROJECT

YASMINA YEHIA
2015 · 2016

AMERICAN UNIVERSITY OF BEIRUT
FACULTY OF AGRICULTURE AND FOOD SCIENCES

DEPARTMENT OF LANDSCAPE DESIGN &
ECO-SYSTEM MANAGEMENT

LANDSCAPE ARCHITECTURE CLASS OF 2016

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FINAL YEAR PROJECT

YASMINA YEHIA
2015 · 2016

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// INTRODUCTION

THE CHOSEN SITE FOR THE FINAL YEAR PROJECT IS LOCATED IN BOURJ HAMMOUD, LEBANON.
BOURJ HAMMOUD IS SITUATED ON THE EASTERN SIDE OF THE BEIRUT RIVER, REMAINING A PROXIMATE LOCATION TO THE CITY.

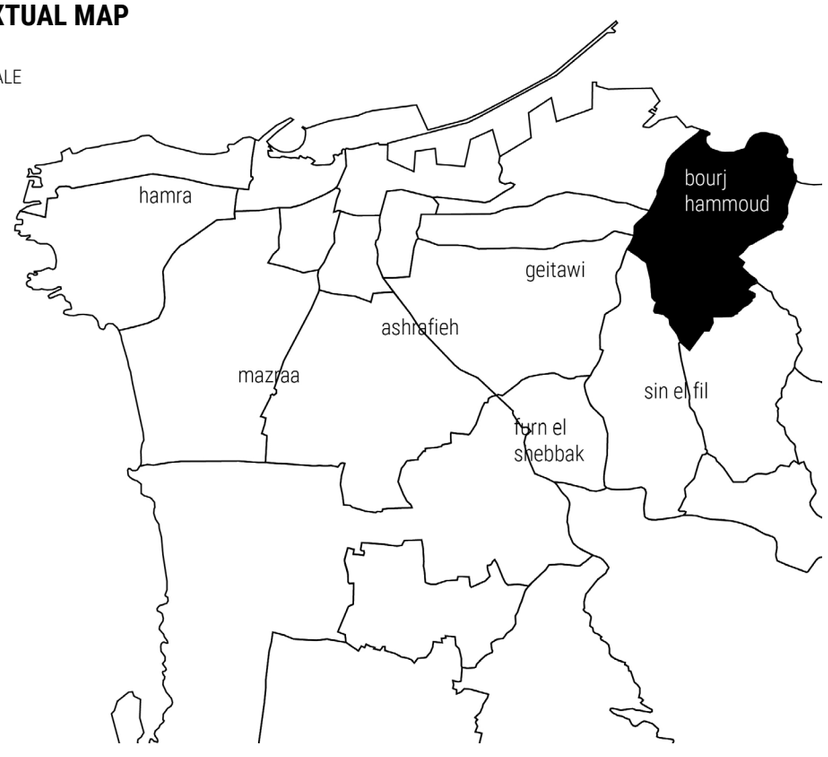
BOURJ HAMMOUD HAS ALWAYS BEEN ASSOCIATED TO A RESIDENTIAL NEIGHBORHOOD, TIED TO AN ARMENIAN IDENTITY. IT SEEMS THOUGH, THAT PEOPLE ARE UNAWARE THAT BOURJ HAMMOUD HOLDS A COASTLINE WHICH TODAY IS A HIGHLY INDUSTRIAL ONE.

THE FOCUS OF THE STUDY WAS TO UNDERSTAND THE COASTLINE OF BOURJ HAMMOUD IN RELATION TO ITS BACK BONE, BEING THE RESIDENTIAL QUARTERS.

THE STUDY CONSISTED OF ASSESSING THE FIRST IMPRESSIONS TO THE SITE. LATER, THE STUDY WAS ORIENTED TOWARDS THE UNDERSTANDING OF THE WHOLE AREA OF BOURJ HAMMOUD WITH EXTENSIVE SITE INVENTORY. THE SITE INVENTORY WAS BASED ON DIFFERENT SCALES RANGING FROM THE NEIGHBORHOOD SCALE TO THE LOCAL SCALE.
THE SITE ANALYSIS, WHICH WAS BASED ON RELATING THE SITE CRITERIA AND SITE INVENTORY PROVED SOME VERY CRITICAL ELEMENTS WHICH WOULD SURFACE DURING THE DESIGN PHASE.

// CONTEXTUAL MAP

NOT TO SCALE



// PROBLEM AND PROJECT STATEMENT

THE SITE PROPOSES SOME VERY CRITICAL ISSUES, SPLIT INTO THREE LAYERS:

THE FIRST LAYER WOULD BE TO ACKNOWLEDGE THAT THE SITE IS MIS-USED AND HAS LOST ITS HISTORICAL IDENTITY TO AN INDUSTRIAL ONE.

THE SECOND LAYER BEING THE ECOLOGICAL LAYER, IMPACTS SEA AND LAND HABITAT, AND AFFECTS ADJACENT ECOLOGICAL VALUES SUCH AS GROUNDWATER AND CHEMICAL POLLUTION, SOIL CONTAMINATION AS WELL AS ODOR POLLUTION.

THE THIRD LAYER WOULD BE ITS GEOGRAPHICAL LOCATION, THE SITE HAS NOT REACHED ITS CAPACITIES AS A FUNCTIONAL SITE AS IT IS DISCONNECTED FROM ITS MAIN NODE.

THE GOAL IS TO RECONNECT THE BOURJ HAMMOUD WATERFRONT BACK TO ITS RESIDENTIAL QUARTERS, WHILE FOCUSING ON RESTORING THE ECOLOGICAL VALUES OF THE SITE.

"LANDSCAPE (...) AS A METAPHOR FOR INCLUSIVE MULTIPLICITY AND PLURALISM, AS IN A KIND OF SYNTHETIC 'OVERVIEW' THAT ENABLES DIFFERENCES TO PLAY THEMSELVES OUT. IN THESE TERMS, LANDSCAPE MAY STILL EMBRACE NATURALISTIC AND PHENOMENOLOGICAL EXPERIENCE BUT ITS FULL EFFICACY IS EXTENDED TO THAT OF A SYNTHETIC AND STRATEGIC ART FORM, ONE THAT ALIGNS DIVERSE AND COMPETING FORCES (SOCIAL CONSTITUENCIES, POLITICAL DESIRES, ECOLOGICAL PROCESSES, PROGRAM DEMANDS, ETC., INTO NEWLY LIBERATING AND INTERACTIVE ALLIANCES" (CORNER, 2002)

BASED ON HIS ANALYSIS, JOERN LANGHORST BUILT HIS THEORY UPON JAMES CORNER'S THEORY OF RECOVERING LANDSCAPES.

ACCORDING TO LANGHORST, BROWNFIELDS AND POSTINDUSTRIAL SITES ARE VERY INTERESTING BECAUSE THEY CREATE AN OVERLAP BETWEEN HUMAN AND NON-HUMAN COURSES, WHICH ARE COMPRESSED AND LAYERED INTO ISSUES TACKLING THE CULTURAL, SOCIAL, ECONOMICAL, ECOLOGICAL, FRAGMENTATION LAYERS WHICH TIP-OFF INTERRELATIONS BETWEEN MAN AND HIS INTERACTION WITH THE ENVIRONMENT.

HE USED FOUR CASE STUDIES BASED ON POST INDUSTRIAL PARKS: LANDSCHAFTSPARK, DUISBURG-NORD, BYXBEE PARK AND GAS WORKS PARK. BASED ON HIS ANALYSIS ON THESE FOUR PARKS, HIS HYPOTHESIS SHOWED THAT DESIGN SOLUTIONS NEED TO TAKE INTO ACCOUNT THE HISTORY, PHYSICAL REMNANTS, SOCIO-CULTURAL AND ECONOMIC CONTEXTS. THE DESIGN BECOMES A SUCCESS ONCE THE PHYSICAL DESIGN AND THE CONTRIBUTION OF THE PROCESS OF THE PLACE ARE MERGED. BASICALLY, IT BECOMES IMPORTANT TO UNDERSTAND THE DESIGN OF SUCH A SITE AS A CHRONOLOGICAL INFRASTRUCTURE, WHICH USES A PARTICULAR WAY OF READING THE LANDSCAPE, PERCEIVING THE SURFACE OF IT WITH ITS CULTURAL, SOCIAL, ECONOMICAL, ECOLOGICAL IMPLICATIONS AS A RELATION ARRANGING ONTO THE SURFACE.

REFERENCES:

CORNER, J. (2000) RECOVERING LANDSCAPE AS CRITICAL CULTURAL PRACTICE, IN CORNER, J. (ED.) RECOVERING LANDSCAPE: ESSAYS IN CONTEMPORARY LANDSCAPE ARCHITECTURE. PRINCETON: PRINCETON ARCHITECTURAL PRESS, PP. 1-26.

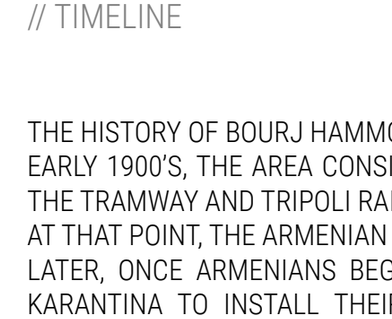
LANGHORST, JOERN W. "00127 RISING FROM RUINS: POSTINDUSTRIAL SITES BETWEEN ABANDONMENT AND ENGAGEMENT." (N.D.): N. PAG. OCT. 2015. WEB.

THE HISTORY OF BOURJ HAMMOUD IS VITAL TO THE UNDERSTANDING OF THE SITE TODAY.
EARLY 1900'S, THE AREA CONSISTED OF MARSHLANDS AND AGRICULTURAL FIELDS, ALSO HELD THE TRAMWAY AND TRIPOLI RAILWAY.
AT THAT POINT, THE ARMENIAN GENOCIDE TOOK PLACE.
LATER, ONCE ARMENIANS BEGAN TO EMIGRATE INTO LEBANON, THEY MOVED MAINLY INTO KARANTINA TO INSTALL THEIR CAMPS WITH GRAND CAMP SAINT MICHEL AND CAMP OF KARANTINA.
WITH THE HELP OF THE FRENCH MANDATE, THE ARMENIANS MOVED INTO NOR MARACH, WHICH WAS THE START OF THE URBAN FABRIC OF BOURJ HAMMOUD.
IN THE 1930'S, OTHER AREAS LIKE NOR ADDANA, GULABACHENE ALSO JOINED THE URBAN FABRIC.
IN 1939, CAMP SANDJAK WAS INSTALLED.
AT THAT POINT, BOURJ HAMMOUD HAD BEGUN ITS EXPANSION, THE WATERFRONT WAS USED AS A PUBLIC SANDY BEACH AND NAHR BEIRUT WAS USED FOR SWIMMING.
IN 1951, THE MUNICIPALITY WAS CREATED. AND THEN WITH THE LEBANESE CIVIL WAR IN 1975, AND THE LAND RECLAMATION IN 1983, THE COASTLINE HAD BECOME A WASTE ACCOMODATING AREA. ALTHOUGH THE DUMP WAS CLOSED AND MONITERED EVER SINCE 1997, THE AREA HAD BECOME HIGHLY INDUSTRIALIZED AND WAS CHARACTERIZED AS A DUMP.
IN 2009, THE LAST REMANING CAMP, CAMP SANDJAK WAS DEMOLISHED.
TODAY, BOURJ HAMMOUD SERVES AS AN AREA OF IDENTITY AND RESILIENCY.

ARMENIAN GENOCIDE
ARMENIANS SEEK REFUGE IN SYRIA AND LEBANON

BOURJ HAMMOUD CONSISTED OF AGRICULTURAL FIELDS AND SERVED AS A PASSAGE-WAY TO OTHER AREAS IN LEBANON SUCH AS TRIPOLI.

AREA CONSISTED OF MARSHLANDS AND SWAMPS

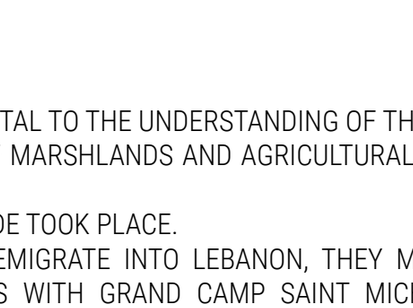


1915//1916

ARMENIAN EMIGRATION TO SYRIA, LEBANON, EUROPE AND USA

WITH THE HELP OF THE FRENCH MANDATE, THE ARMENIAN REFUGEES WERE ABLE TO MOVE FROM THE NORTH OF LEBANON TO BEIRUT.

1921: GRAND CAMP SAINT MICHEL IN KARANTINA
1924: CAMP OF KARANTINA
1927: ARMENIANS MOVE INTO PAVILLONS BLANCHES HILLS IN ACHRAFIEH
1929: MOVE OF ARMENIANS INTO NOR MARACH
GLOBAL ECONOMIC CRISIS



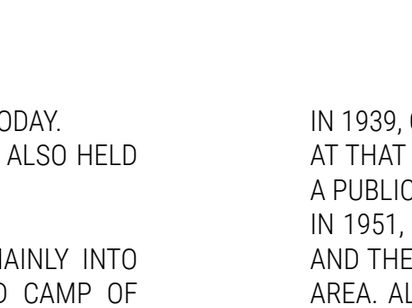
1920's

1930: MOVE OF ARMENIANS INTO NOR HADJIN, KHALIL BADAOUI AND LES PENTES (TODAY KARM EL ZEITOUN)
EARLY 1930'S: MOVE OF ARMENIANS INTO PARECHENE, NOR SIS, GULABACHENE, TRAD AND NOR ADANA.
1939: CAMP SANDJAK IS ESTABLISHED

1943: LEBANESE INDEPENDANCE

1945: EXPANSION OF BOURJ HAMMOUD
INFLUX OF SHIITE TO BOURJ HAMMOUD

WATERFRONT IS USED AS PUBLIC SANDY BEACH, NAHR BEIRUT IS ALSO USED FOR SWIMMING AND PICNICKING.



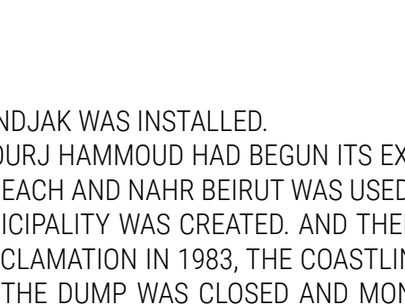
1930's//1940's

1951: CREATION OF BOURJ HAMMOUD MINICIPALITY
1968: CANALIZATION OF BEIRUT RIVER
1975: LEBANESE CIVIL WAR, IMMIGRANTS MOVED INTO ARMENIAN QUARTER
COASTLINE IS USED FOR WASTE DISPOSAL

1983: COASTLINE STARTS CHANGING, BEGINNING OF LAND RECLAMATION PURPOSED TO ACCOMODATE WASTE DISPOSAL

1988: OIL TANK EXPLOSION IN THE COASTLINE AREA

1990: END OF LEBANESE CIVIL WAR



1950's//1980's

1997, JULY 20TH: BOURJ HAMMOUD DUMP WAS CLOSED AND NAAMEH DUMP WAS OPENED.
BOURJ HAMMOUD DUMP WAS COVERED IN SOIL AND KEPT INTACT, THE AREA WAS FENCED AND MONITERED TILL TODAY BY THE MUNICPALITY

2009: DEMOLITION OF CAMP SANDJAK, ONLY REMAINING AMERNIAN CAMP

TODAY BOURJ HAMMOUD SERVES AS AN AREA WITH A VARIETY OF CULTURES, RELIGIONS AS WELL AS ACTIVITIES.

1990's//today

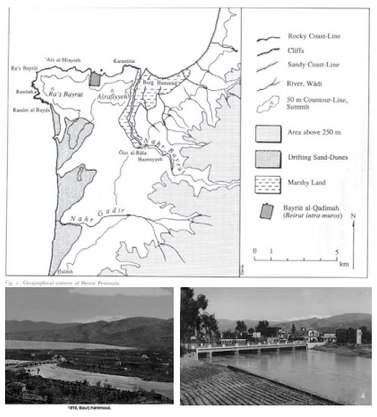


Fig. 1: Geographical context of Beirut Peninsula

1910, Bourj Hammoud.

BEFORE ZOOMING INTO THE SITE, IT WAS IMPORTANT TO UNDERSTAND THE RESIDENTIAL QUARTERS OF BOURJ HAMMOUD.

THE NEIGHBORHOOD PROVED TO BE VERY DENSE ESPECIALLY ONCE COMPARED TO BEIRUT.

BOURJ HAMMOUD
2,4 square kilometres
150'000 estimated inhabitants
62'500 inhabitants per square kilometre

BEIRUT
85 square kilometres
1'700'000 inhabitants
20'000 inhabitants per square kilometre

// FIGURE GROUND DENSITY MAP

NOT TO SCALE

THE FIGURE GROUND DENSITY MAP IS MAIN PROOF OF THE HISTORY OF THE URBAN FABRIC OF BOURJ HAMMOUD.
IT IS IMPORTANT TO UNDERSTAND THAT THE PEOPLE ARE THE ONES RESPONSIBLE FOR SUCH A DENSE URBAN SETTING.

THE MAIN REFERENCE BEHIND THE UNDERSTANDING OF THEIR IDENTITY WAS *PORTRAITS OF SURVIVAL: THE ARMENIANS OF BOURJ HAMMOUD,* A BOOK BY PHOTOGRAPHER ARIANE ATESHIAN DELACAMPAGNE.
THE BELOW PICTURES ARE FROM HER BOOK, THE TEXT IS A SUMMARY OF HERS.

// PROFILE OF PEOPLE

AVAK SISILIAN , 1933

born in Syria, his parents were from Hadjin/Tomarza from Turkey.
Avak specializes in shoe making, using very old machines dating back to 1946.

TANIEL TSUNGULIAN, 1933-2009

born in Lebanon, his parents were from Kayseri, Turkey.
he excelled at repairing oriental rugs and kilims, he eventually opened his own shop which he worked in until he died.

BOGHOS SVAJIAN, 1951

born in Lebanon, he was called the Kalashnikov because he used russian rifles to protect his neighborhood durinf the war.
he fishes off Bourj Hammoud coast which he sells on Marash Street.
he also acted in plays like the Honorable Beggars by Hagop Baronian.

CHAHE YEREVANIAN, 1971

born in Beirut, his grandfather fled from Kharput, Turkey.
he took over his father's company which consisted of building affordable housing for the residents of Bourj Hammoud.
the company is very large is successfull till today.

HARUTIUN TOROSSIAN, 1933

born in Beirut, his father was one of the only people to survive the genocide.
he studied at ALBA and teaches painting of landscapes and intimate scenes.
he chose to move to Bourj Hammoud rather than stay in Paris where his family resides.

YEGHISSAPET APIKIAN, 1926

born in Tripoli, descending from Siverek/Kharput, Turkey.
studied literature at AUB, she helps her husband with a bridal boutique store for fitting and renting.

THE RESIDENTS OF BOURJ HAMMOUD PROVED TO BE RESILIENT, HARDWORKING AND CREATIVE. NONETHELESS IT WAS STILL IMPORTANT TO UNDERSTAND THE SPACES THEY USE, HOW THEY ARTICULATE THEIR NETWORK.

A LAND USE MAP WAS CRUCIAL FOR THAT.
TOWARDS THE COASTLINE, THE USE IS MAINLY INDUSTRIAL. TOWARDS THE CORE OF BOURJ HAMMOUD; THE MAIN USES ARE RESIDENTIAL, COMMERCIAL, COMMERCIAL MANUFACTURING. THERE ARE LOTS OF SCHOOLS, CHURCHES, A FEW MOSQUES TOWARDS THE SOUTHERN AREA OF BOURJ HAMMOUD.
BOURJ HAMMOUD IS VERY DYNAMIC, WITH MOST OF ITS COMMERCIAL ACTIVITIES HELD ON THE STREET LEVEL.

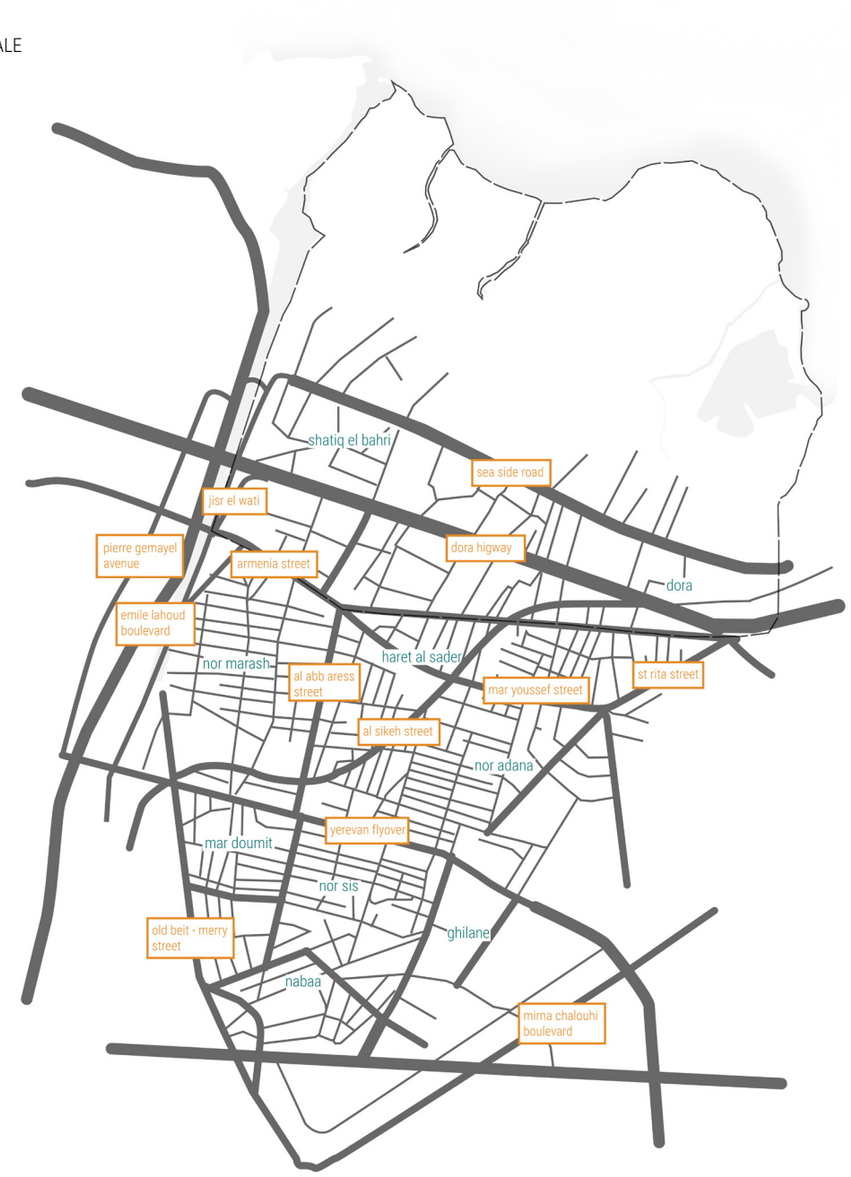
// LAND USE MAP

NOT TO SCALE

IT WAS ALSO IMPORTANT TO UNDERSTAND HOW THE RESIDENTS USE THE STREET NETWORKS THAT SURROUND THEM.
BOURJ HAMMOUD IS SURROUNDED BY MAJOR CONNECTORS SUCH AS DORA HIGHWAY, EMILE LAHOUD BOULEVARD, PIERRE GEMAYEL AVENUE, MIRNA CHALOUHI AVENUE, YEREVAN FLYOVER.
ALOT OF THE STREETS IN BOURJ HAMMOUD ARE NAMED AFTER ARMENIAN CITIES: YEREVAN FLYOVER AND ARAX STREET FOR EXAMPLE. DISTRICTS AND STREETS ARE ALSO NAMED AFTER TURKISH ARMENIAN CITIES LIKE MARASH, SIS, ADANA, CILICIA ETC.

// ROAD NETWORK AND NEIGHBORHOODS

NOT TO SCALE



BOURJ HAMMOUD HAS A CHARACTER OF ITS OWN BELONGING TO A VERY ACTIVE ONE. ONE OF THE MAIN ISSUES WITH BOURJ HAMMOUD IS THAT DESPITE ITS VERY DENSE AND ACTIVE NEIGHBORHOOD, IT LACKS PUBLIC SPACES. IT IS ALSO AN AREA WHERE ITS WATERFRONT IS DISCONNECTED FROM ITS RESIDENTIAL AREA.

WALKING AROUND BOURJ HAMMOUD IS WALKING THROUGH ALL OF THE DIFFERENT ACTIVITIES RANGING FROM JEWELRY WORKSHOPS, SHOE MAKING WORKSHOPS, AS WELL AS SANDWICH KIOSKS, JUICE KIOSKS, TO ELECTRONICS SHOPS. OCCASIONALLY, GRAFFITI APPEAR, WHETHER STENCILS OR SPRAY PAINTED, SHOWING LOTS OF RESILIENCY.

// CHARACTER COLLAGE

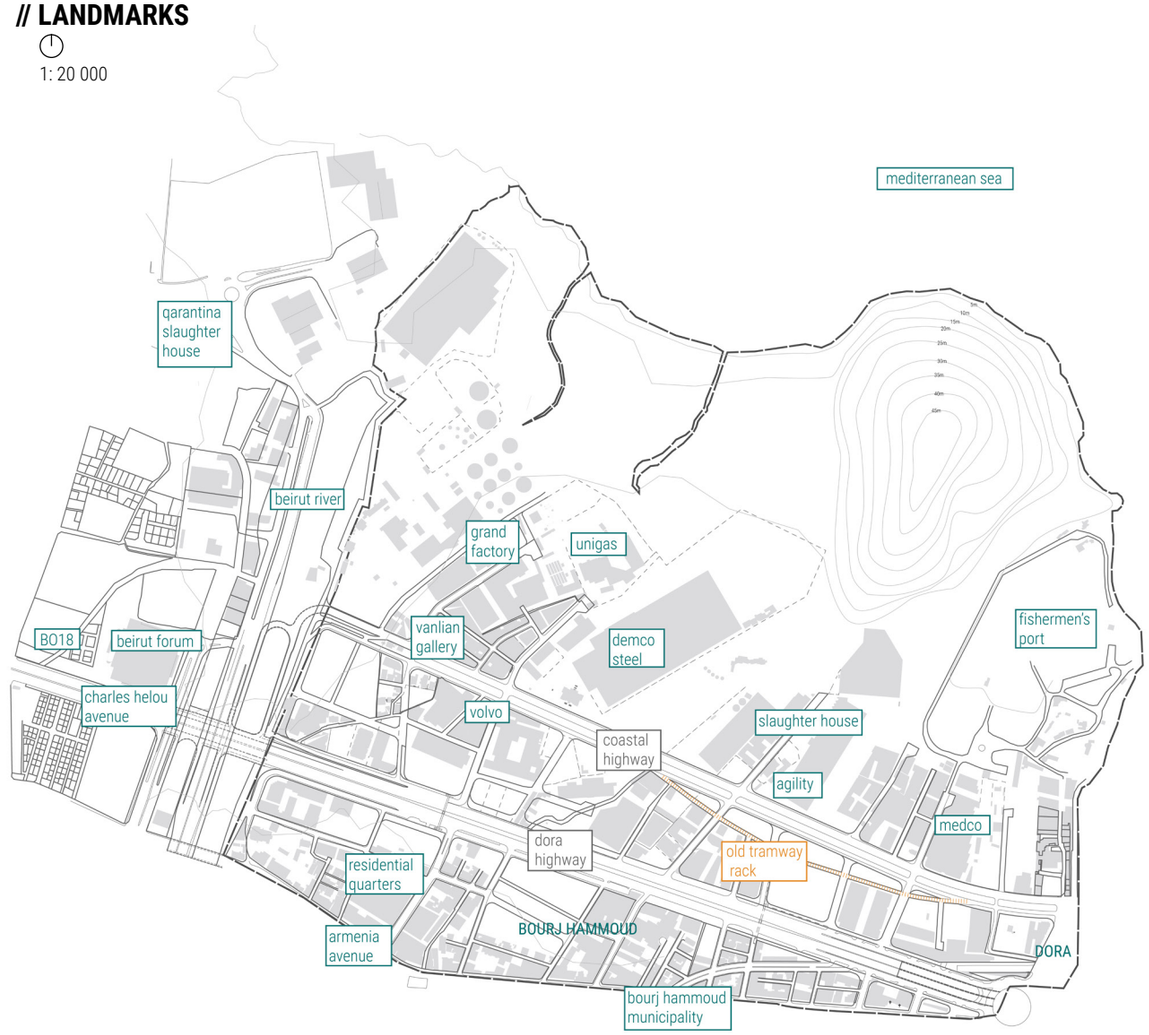
AFTER LOOKING INTO THE GENERAL CHARACTER OF BOURJ HAMMOUD, IT WAS IMPORTANT TO START ZOOMING INTO THE SITE OF STUDY - CIRCLED IN BLACK DASHED LINES

IT WAS ESSENTIAL TO IDENTIFY THE LANDMARKS WITHIN THE CHOSEN SITE. THE MAIN ELEMENTS ON SITE ARE THE TWO MAIN ARTERIES BEING THE DORA HIGHWAY AND THE SEA SIDE ROAD, NAHR BEIRUT ON THE LEFT. NAHR BEIRUT IS MAIN FRONTIER BETWEEN BEIRUT AND BOURJ HAMMOUD.

TOWARDS THE COASTLINE, THERE ARE SOME HIGH IMPACT INDUSTRIES LIKE UNIGAS, DEMCO STEEL. THERE ARE ALSO PLACES FOR LEISURE SUCH AS THE GRAND FACTORY, AND MYU.
IN BETWEEN THE SEA SIDE ROAD AND THE DORA HIGHWAY, ARE OFFICES AND SHOWROOMS LIKE VOLVO AND VANLIAN GALLERY.
BENEATH THE DORA HIGHWAY, BEGIN THE RESIDENTIAL QUARTERS OF BOURJ HAMMOUD, MAINLY REACHING INTO ARMENIA STREET AND THE MUNICIPALITY SQUARE.

// LANDMARKS

1: 20 000

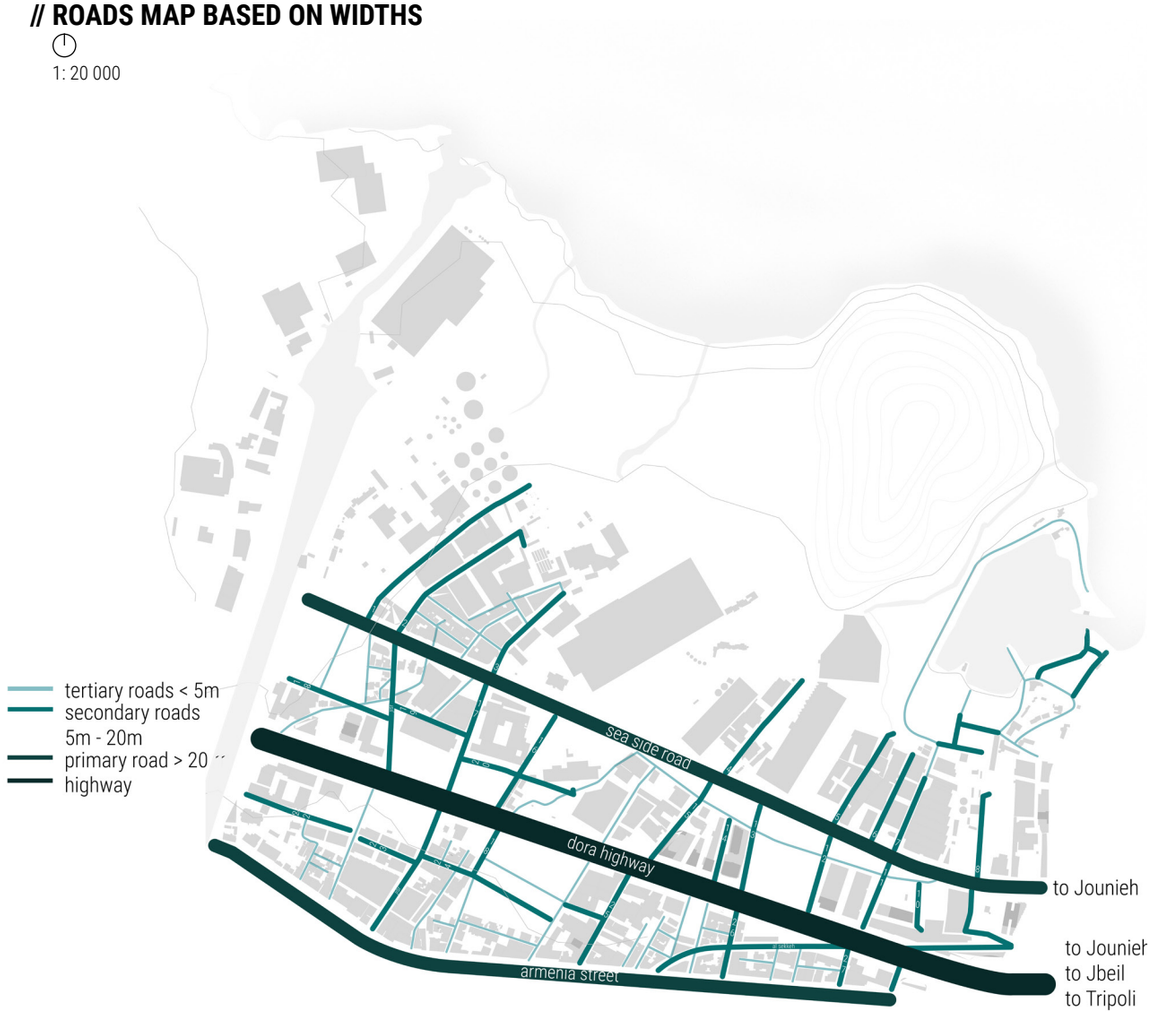


AFTER LOOKING INTO THE DIFFERENT LANDMARKS, IT WAS IMPORTANT TO START LOOKING INTO THE DIFFERENT COMPONENTS OF THE SITE.

THE ROADS, BEING MAIN ELEMENTS WERE SPLIT INTO FOUR CATEGORIES:
1. TERTIARY ROADS WHICH RANGE FROM 0 TO LESS THAN 5 METERS
2. SECONDARY ROADS WHICH RANGE FROM 5 TO 20 METERS
3. TERTIARY ROADS WHICH EXCEED 20 METERS
4. HIGHWAYS

// ROADS MAP BASED ON WIDTHS

1: 20 000



BASED ON THE DIFFERENT ROAD WIDTHS, IT WAS IMPORTANT TO SET THE DIFFERENT CRITERIA ON SITE TO FIGURE OUT WHICH ROADS ARE ACCESSIBLE AND WHICH ARE NOT.
THE CRITERIA WAS BASED ACCESSIBILITY WHICH WAS ASSESSED THROUGH DEAD ENDS AND BARRIERS.

// ROADS MAP BASED ON **ACCESSIBILITY**

1: 20 000

ONCE THE SITE APPEARED TO BE UNACCESSIBLE IN CERTAIN AREAS, IT BECAME IMPORTANT TO UNDERSTAND THE OWNERSHIP OF THE LAND.
THE LAND IS OWNED BY :
1. PRIVATELY
2. PUBLICLY
3. MARITIME DOMAIN

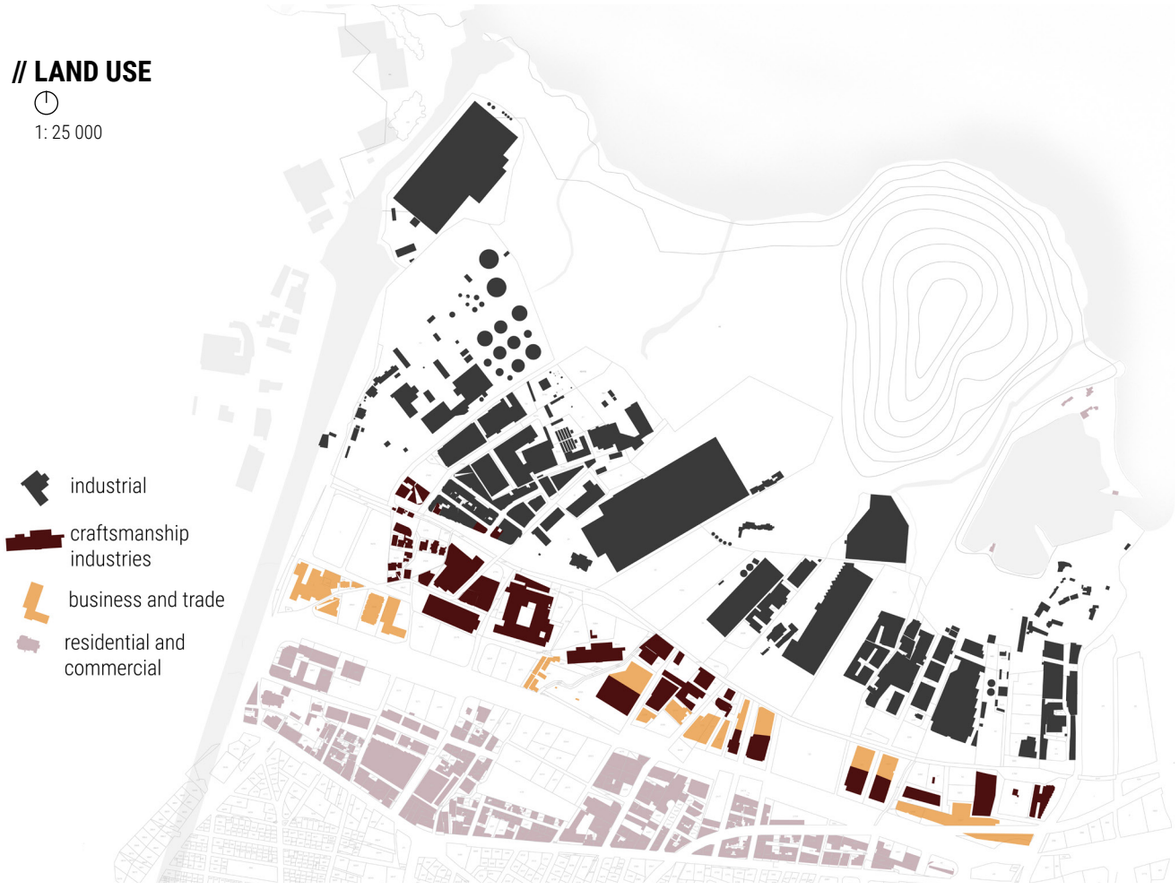
// OWNERSHIP MAP

1: 20 000

LOOKING INTO OWNERSHIP WOULD MEAN LOOKING INTO LAND USE OF THE SITE. THE SITE IS USED FOR INDUSTRIAL, CRAFTSMANSHIP INDUSTRIES, BUSINESS AND TRADE, AND RESIDENTIAL COMMERCIAL.
WHILE THE INDUSTRIAL USE SEEMED QUITE DOMINANT, IT WAS IMPORTANT TO UNDERSTAND ITS RESPECTIVE ZONING.
THE INDUSTRIAL ZONING REVEALED TO BE SPLIT INTO THREE CATEGORIES BEING:
1. CI : COMMERCIAL INDUSTRIAL
2. LI : LIGHT INDUSTRIES
3. GI: GENERAL INDUSTRIES

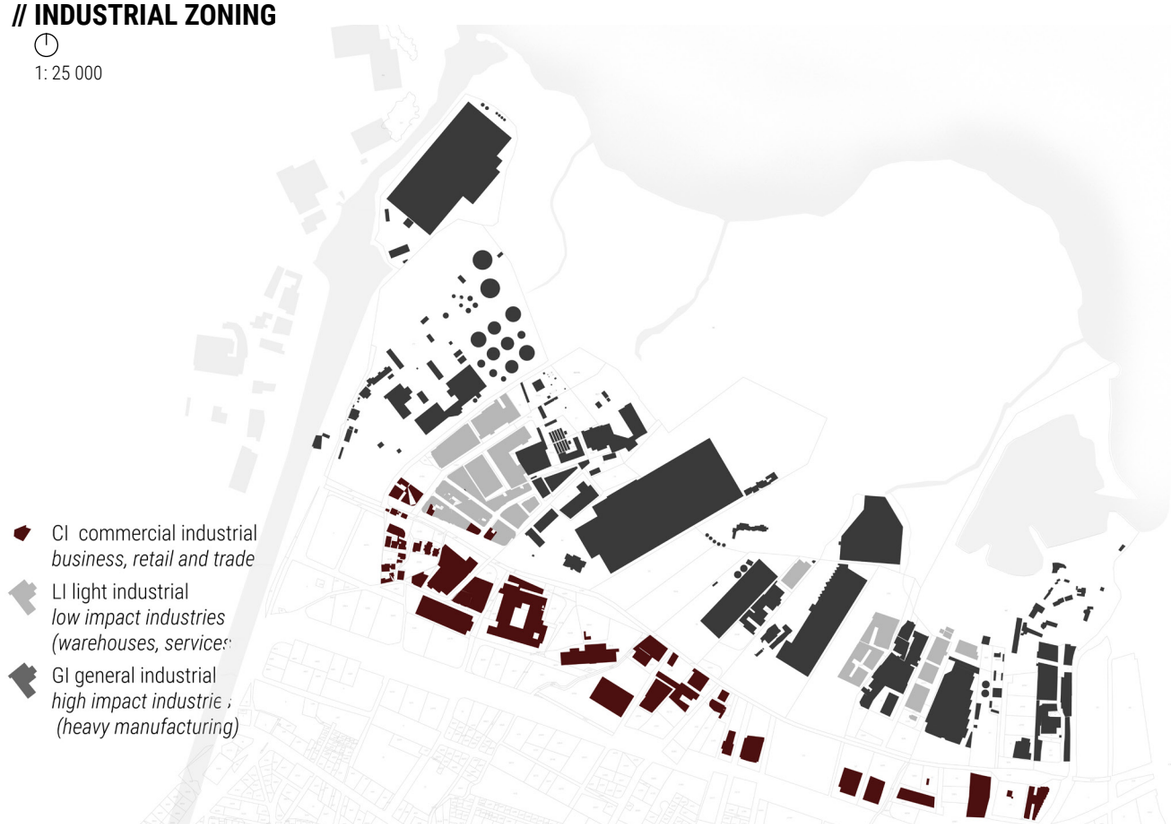
// LAND USE

1: 25 000



// INDUSTRIAL ZONING

1: 25 000



THE SITE, HOLDING DIFFERENT USES, ALSO COMPRISES BUILDINGS THAT RANGE FROM SEVEN TO TEN FLOORS.
THESE BUILDINGS ACT AS VISIBILITY BARRIERS, BEING THE MAIN REASON BEHIND THE DISREGARDING OF THE COASTLINE. PEOPLE WHO ARE NOT FROM THE AREA ARE NOT AWARE OF THE DUMP OR THE FISHERMEN'S PORT FOR EXAMPLE.

// BUILDING HEIGHTS MAP

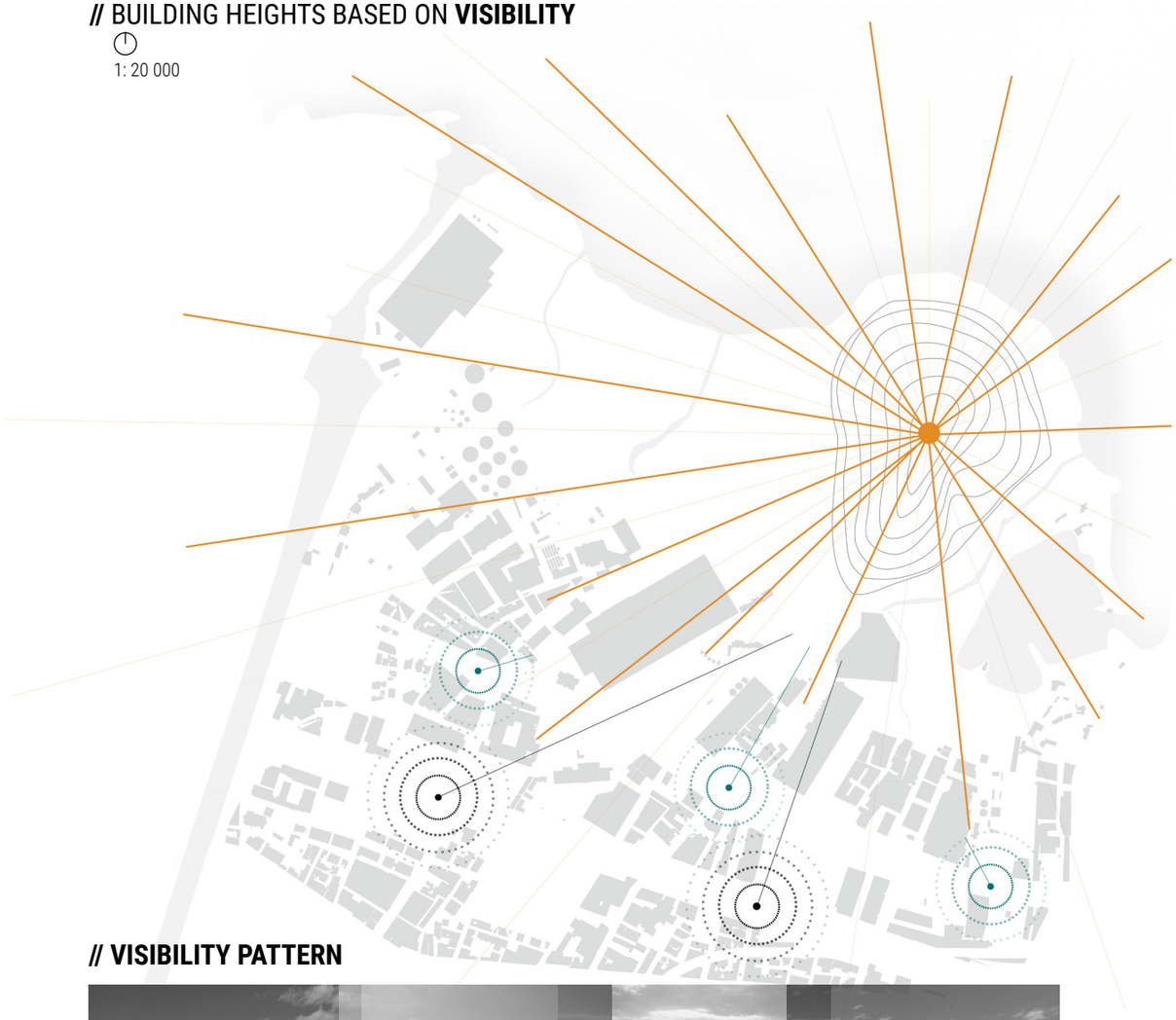
1: 20 000

TO ANALYZE THE VISIBILITY SPAN BASED ON THE BUILDING HEIGHTS, IT WAS IMPORTANT TO SET A COUPLE OF VISIBILITY NODES:
1. THE TWO PEDESTRIAN BRIDGES ON THE DORA HIGHWAY - IN BLACK
2. TWO MAIN POINTS ON THE SEA SIDE ROAD - IN TURQUOISE
3. THE DUMP AS THE HIGHEST LEVEL OF VISIBILITY

THE PEDESTRIAN BRIDGES ON THE HIGHWAY ALLOWED FOR A INCOHERENT VIEW SPAN WHEREAS THE VIEW ON THE SEA SIDE ROAD WAS MUCH MORE DETACHED.
THE VIEW OF THE DUMP WAS MORE CONSISTENT.

// BUILDING HEIGHTS BASED ON **VISIBILITY**

1: 20 000

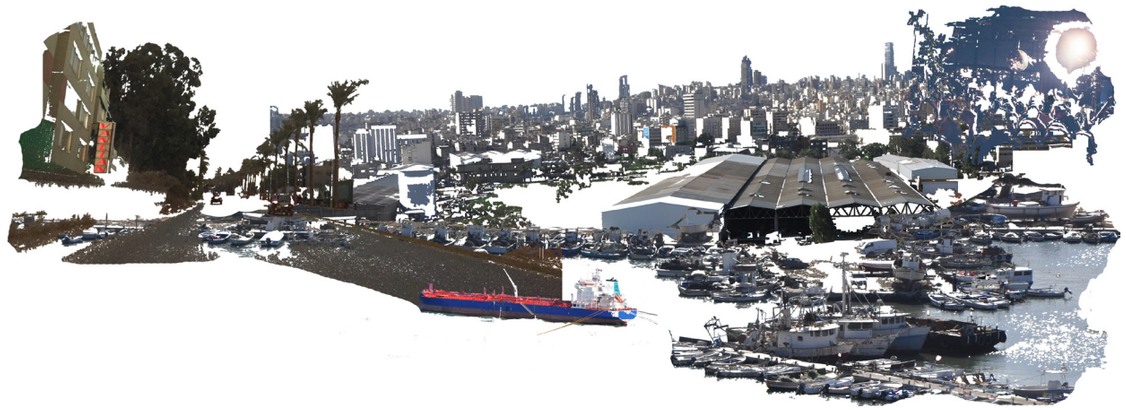


// VISIBILITY PATTERN

THE LAND USE AND ITS CONSTITUENTS SUCH AS THE BUILDINGS EXPOSE THE SITE TO DIFFERENT ACTIVITIES.
THE MAIN ACTIVITIES ON SITE ARE FISHING, LEISURE, FURNITURE SHOPPING, AND UNSURPRISINGLY BASED ON PETROLEUM CIRCULATION.

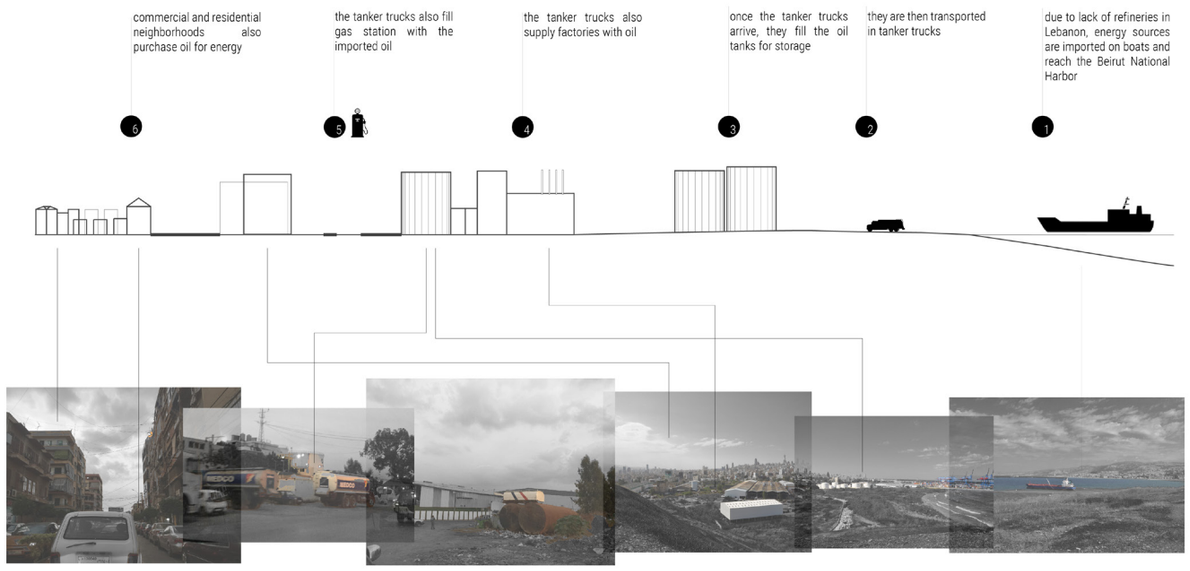
TO ASSESS THE ACTUAL DAILY CIRCULATION, THE INFORMATION WAS ALSO BASED ON THE LAND USE MAP AND INDUSTRIAL ZONING MAP (REFER TO PAGES)

// ACTIVITIES ON SITE



// INDUSTRIAL ZONING BASED ON **DAILY PETROLEUM CIRCULATION**

1: 15 000



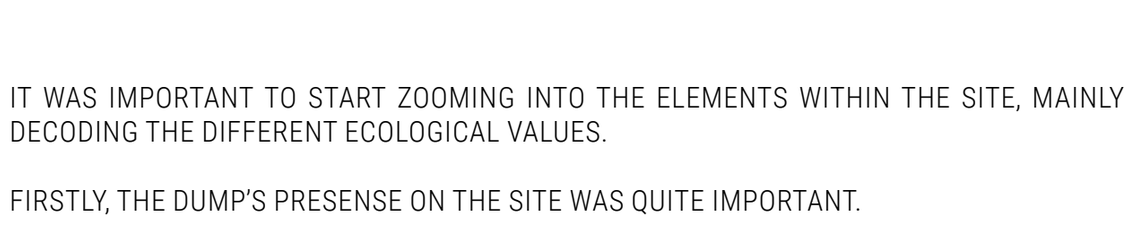
IT WAS IMPORTANT TO START ZOOMING INTO THE ELEMENTS WITHIN THE SITE, MAINLY DECODING THE DIFFERENT ECOLOGICAL VALUES.

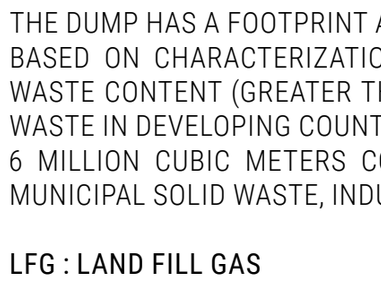
FIRSTLY, THE DUMP'S PRESENSE ON THE SITE WAS QUITE IMPORTANT.

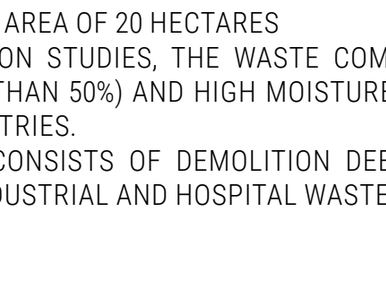
THE DUMP HAS A FOOTPRINT AREA OF 20 HECTARES
BASED ON CHARACTERIZATION STUDIES, THE WASTE COMPOSITION IS HIGH ON FOOD WASTE CONTENT (GREATER THAN 50%) AND HIGH MOISTURE CONTENT (38%), TYPICAL OF WASTE IN DEVELOPING COUNTRIES.
6 MILLION CUBIC METERS CONSISTS OF DEMOLITION DEBRIS, EXCAVATION MATERIAL, MUNICIPAL SOLID WASTE, INDUSTRIAL AND HOSPITAL WASTES.

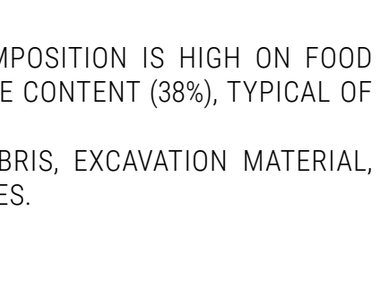
LFG : LAND FILL GAS
LFG RATES FOR THE BOURJ HAMMOUD DUMP ARE 0.24L/M^2 PER HOUR.
CLOSED LANDFILL CRITERIA FALLS WITHIN 0.06-0.66L/M^2 PER HOUR WHILE *ACTIVE LANDFILL CRITERIA FALLS WITHIN 0.42-2.46L/M^2PER HOUR.*
THIS PROVES THAT **THE BOURJ HAMMOUD DUMP IS CONSIDERED A CLOSED LAND FILL AS IT FALLS WITHIN THE CLOSED LANDFILL CRITERIA**.

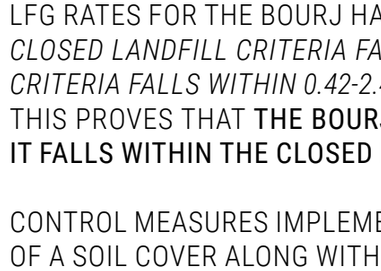
CONTROL MEASURES IMPLEMENTED AT THE SITE HAVE BEEN LIMITED TO THE DEPLOYMENT OF A SOIL COVER ALONG WITH DRILLING OF SEVERAL PENETRATING GAS VENTS.

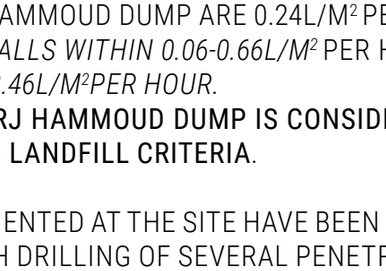


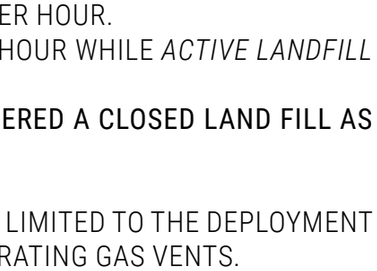












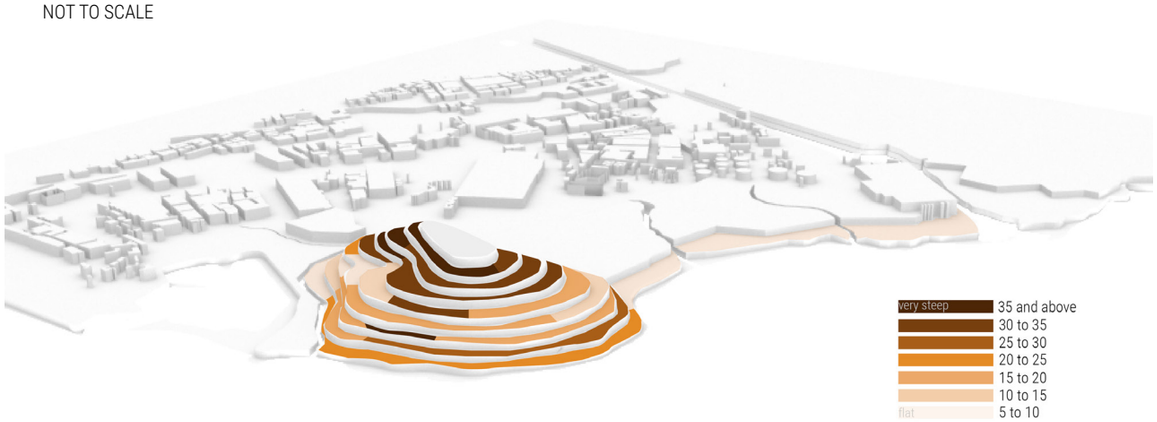
THE LANDFORM OF THE DUMP WAS IMPORTANT TO UNDERSTAND, THE TOPOGRAPHIC LINES WERE MAIN HELP TO FIGURING OUT THE SLOPES.
THE SLOPES ARE IMPORTANT TO LOOK INTO IN CASE THE DUMP WAS GOING TO BE USED FOR THE DESIGN PHASE.
THE SLOPE ANALYSIS PROVED TO BE QUITE STEEP.

// TOPOGRAPHIC LINES MAP

NOT TO SCALE

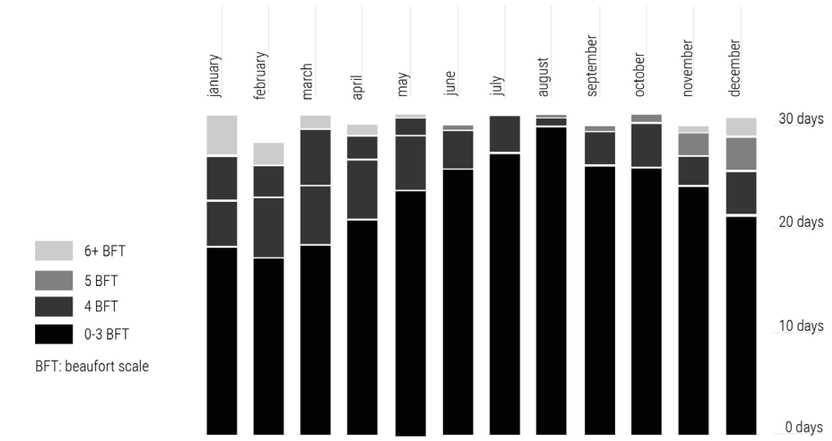
// TOPOGRAPHY BASED ON **SLOPE ANALYSIS**

NOT TO SCALE

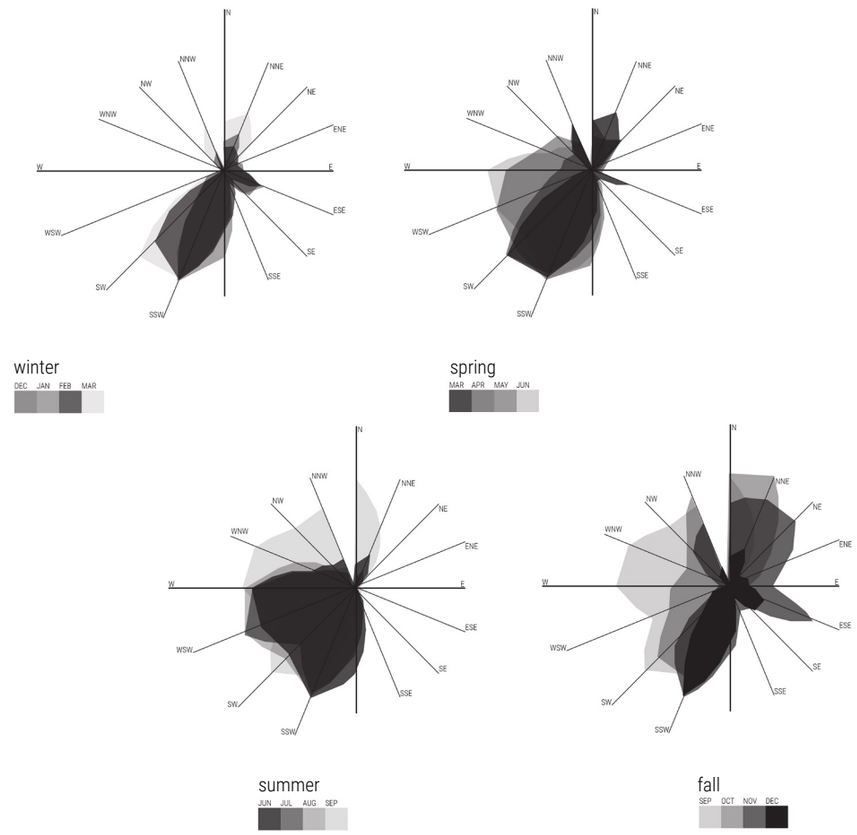


DUE TO THE GEOGRAPHICAL LOCATION OF THE SITE, WHICH HOLD A LARGE STRIP OFF THE MEDITERRANEAN SEA, WIND ANALYSIS WAS IMPORTANT FOR POTENTIAL FUTURE INTERVENTIONS.
TO BE ABLE TO ANALYZE WIND VELOCITY BASED ON SEASONS, IT WAS IMPORTANT TO LOOK AT THE WIND SPEEDS.
WIND SPEED WAS BASED ON THE BEAUFORT SCALE RANGING FROM 0 TO 6 BFT ACCORDING TO EVERY MONTH OF THE YEAR AND BASED ON DAYS.

// WIND SPEED



// WIND SPEED AND DIRECTION BASED ON **SEASON**



ONCE GIVEN AUTHORIZATION TO ACCESS THE SITE OFF THE COASTLINE NEARBY THE DUMP, IT WAS VERY SURPRISING TO DISCOVER THE LUSH VEGETATION THAT WAS PRESENT.
THE VEGETATION COVER CONSISTED OF SHRUBS, GRASSES, SOME TREES LIKE ACACIA AND EUCALYPTUS, FICUS NITIDA.
THE FAUNA CONSISTED OF A FEW WHITE BUTTERFLIES, LOTS OF GRASSHOPPERS AND SOME SNAILS

// VEGETATION MAP

1: 20 000

// FAUNA - FLORA PALETTE

TREES

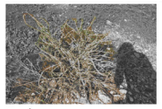
Washingtonia robusta

Acacia cyanophylla

Eucalyptus sp.

Ficus nitida

SHRUBS AND GRASSES



Polyganum venantianum

Arundo donax

Muscai

Oenanthe prolifera

Arundo plinii

Ricinus communis

Aesteraceae sp.

Daucus carota

Innula viscosa

SOIL

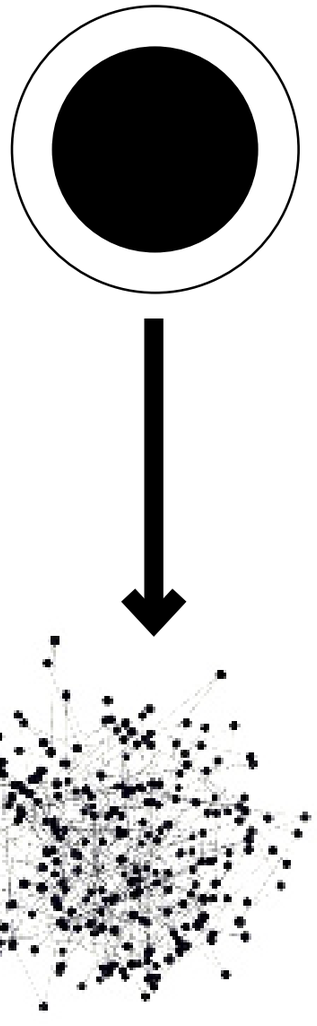
FAUNA

THE LAVISH VEGETATION COVER WAS VERY INTRIGUING, ESPECIALLY IN AN AREA SURROUNDED WITH HIGH IMPACT INDUSTRIES AND A LARGE DUMP.

THE OBSERVED ABUNDANT VEGETATIVE COVER IS CONSISTENT WITH LOW LFG GENERATION RATES, SINCE EXCESSIVE GAS EMISSIONS WOULD INHIBIT THE GROWTH OF PLANTS.
THE LOW LFG GENERATION LEVELS ARE ALSO CONSISTENT WITH THE OCCURRENCE OF VARIOUS DEEP-SEATED FIRE EVENTS OBSERVED DURING ON-SITE INSPECTIONS, INDICATING A DECREASED LEVEL OF LFG GENERATION THAT IS CONSEQUENTLY ALLOWING THE ENTRY OF OXYGEN INTO THE WASTE MASS AND ULTIMATELY BREAKING OUT IN THE FORM OF LOCALIZED FLAMES.

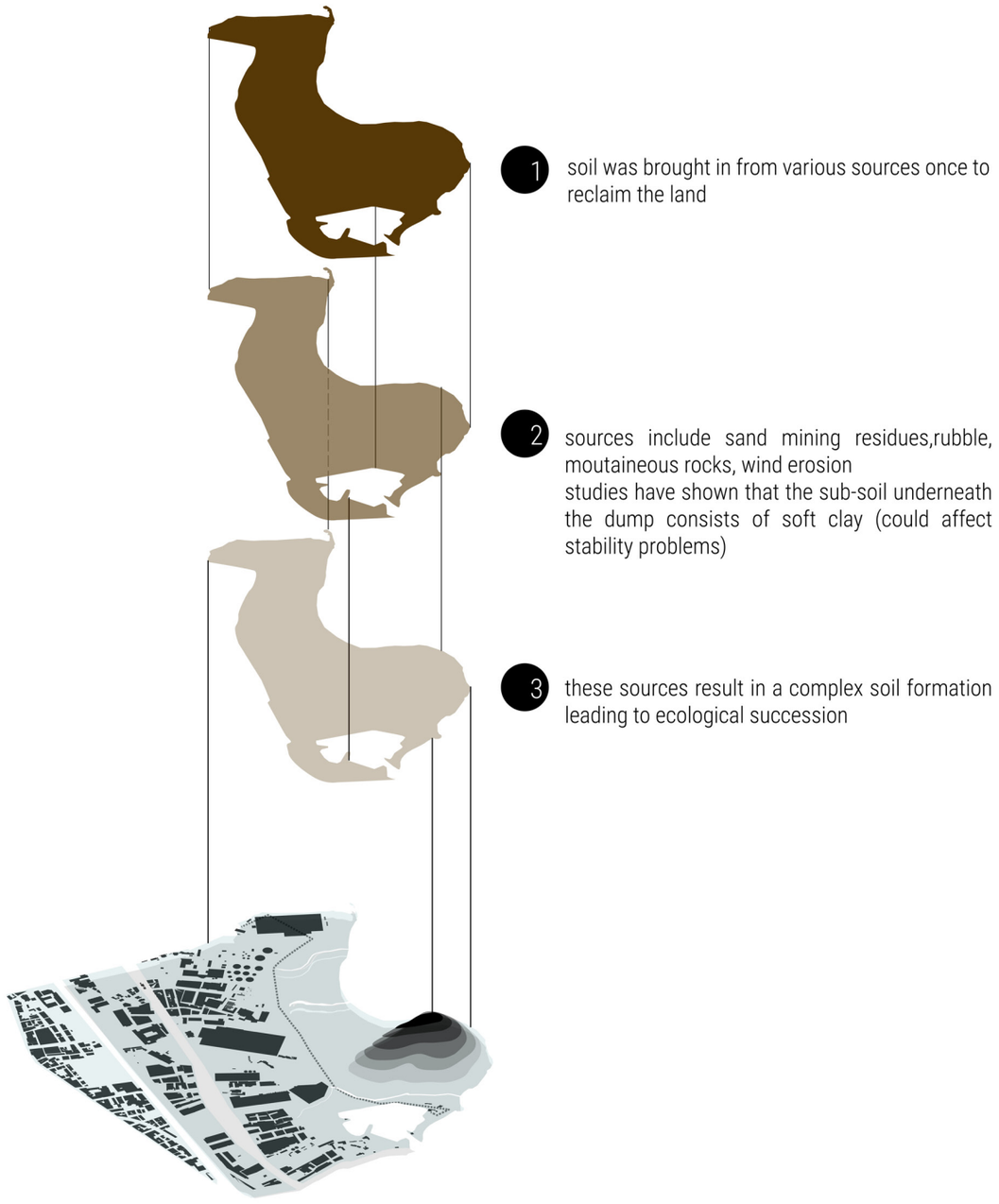
VEGETATION OBSERVED BELONG TO RUDERALS
DEFINITION OF RUDERAL ACCORDING TO THE OXFORD DICTIONARY :
"A PLANT GROWING ON WASTE GROUND OR AMONG RUBBISH"

AS FOR THE SOIL, WHICH HAS BEEN BROUGHT IN FROM DIFFERENT SOURCES WHEN RECLAIMED, HAS REACHED AN ECOLOGICAL SUCCESSION.



// SOIL CHARACTERISTICS DUE TO LAND RECLAMATION

NOT TO SCALE



1. soil was brought in from various sources once to reclaim the land

2. sources include sand mining residues,rubble, moutaineous rocks, wind erosion
studies have shown that the sub-soil underneath the dump consists of soft clay (could affect stability problems)

3. these sources result in a complex soil formation leading to ecological succession

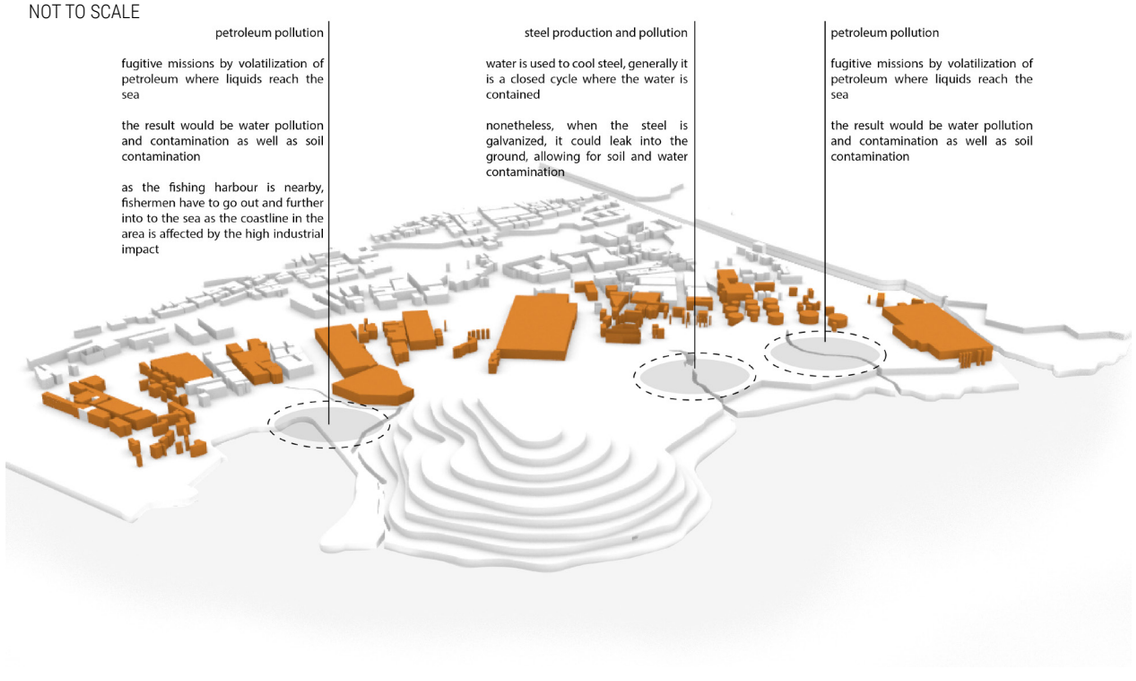
WITH THE WATER BEING BASE AND MOST EXPOSED TO POLLUTION, PROVED TO BE HIGHLY POLLUTED DUE TO PETROLEUM VOLATILIZATION AND STEEL GALVANIZATION. BOTH ACTIVTIES ALSO CONTAMINATE THE SOIL.

// WATERWAYS

NOT TO SCALE

// INDUSTRIAL ZONING AND WATERWAYS BASED ON POLLUTION

NOT TO SCALE



LASTLY, THE SITE HAS PROVED THE FOLLOWING ISSUES:

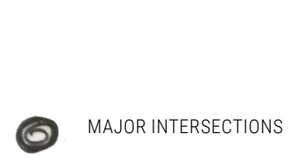
1. IT IS HIGHLY CONTAMINATED
2. IT IS HIGHLY ECOLOGICALLY DISTURBED
3. IT IS UNACCESSIBLE - VISUALLY AND PHYSICALLY
4. IT IS MISUSED
5. IT IS DISCONNECTED FROM ITS BACKBONE, BEING THE RESIDENTIAL CORE OF BOURJ HAMMOUD

THE SITE, LOCATED IN A VERY STRATEGIC AREA, HAS A LOT OF POTENTIAL. AS SAID EARLIER, IT HAS NOT REACHED ITS CAPACITY AS A COASTLINE OR EVEN AS A WATERFRONT.
IT IS IMPORTANT FOR THE SITE TO BECOME A WELL DESIGNED SITE THAT LINKS BACK TO ITS CORE.

THREE CONCEPTS WERE DEVELOPED BEFORE MATURING INTO THE FINAL CONCEPT. THE MAIN PURPOSE IS AGAIN **TO RECONNECT THE BOURJ HAMMOUD WATERFRONT BACK TO ITS RESIDENTIAL QUARTERS, WHILE FOCUSING ON RESTORING THE ECOLOGICAL VALUES OF THE SITE.**
THE MAIN GOAL IS FOUND IN THE THREE CONCEPTS, BUT EACH CONCEPT FOCUS ON A DIFFERENT WAY OF RECONNECTING THE WATERFRONT TO THE RESIDENTIAL QUARTERS.

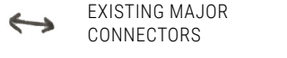
THE FIRST CONCEPT TACKLES THE LARGER SCALE OF THE SITE, MAINLY FOCUSING ON OFFERING ORGANIZATION TO THE AREA WHILE LOOKING AT THE URBAN FABRIC AND URBAN SETTINGS WITHIN THE EXISTING LAND.

// CONCEPT 1 LANDSCAPE PLANNING

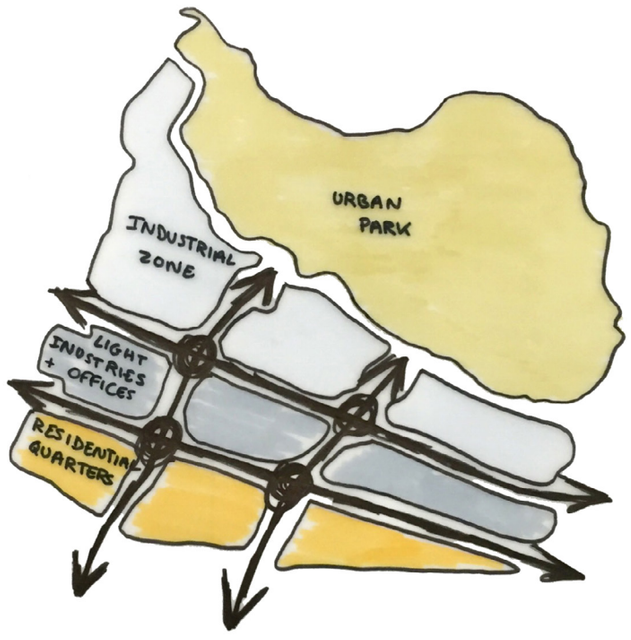


MAJOR INTERSECTIONS

CREATION OF MAJOR CONNECTORS



EXISTING MAJOR CONNECTORS

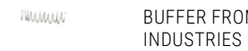


THE SECOND CONCEPT IS FOCUSED ON THE COMMUNITY SCALE AS A POTENTIAL OPEN PUBLIC SPACE FOR THE PEOPLE. IT IS ABOUT LOOKING AT THE URBAN INFRASTRUCTURE AS AN ATTRACTIVE AREA. THE ECOLOGY WOULD BECOME A SECOND LAYER IN THIS OPTION. THE FLOW OF DIRECTION IS ABOUT BRINGING THE RESIDENTS INTO THE ATTRACTIVE OPEN PUBLIC SPACE.

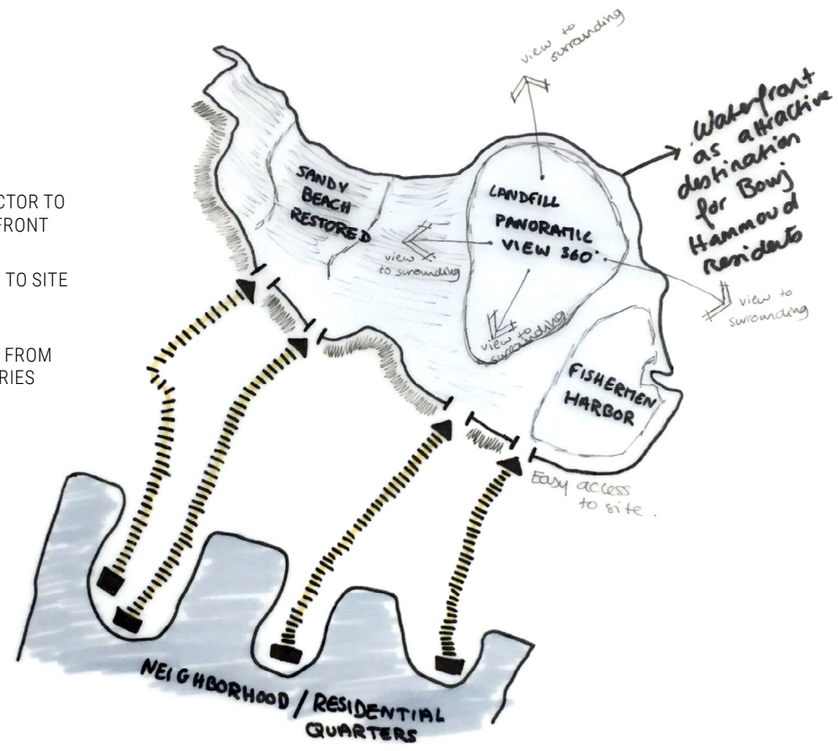
// CONCEPT 2 CELEBRATING THE WATERFRONT

CONNECTOR TO WATERFRONT

ACCESS TO SITE



BUFFER FROM INDUSTRIES

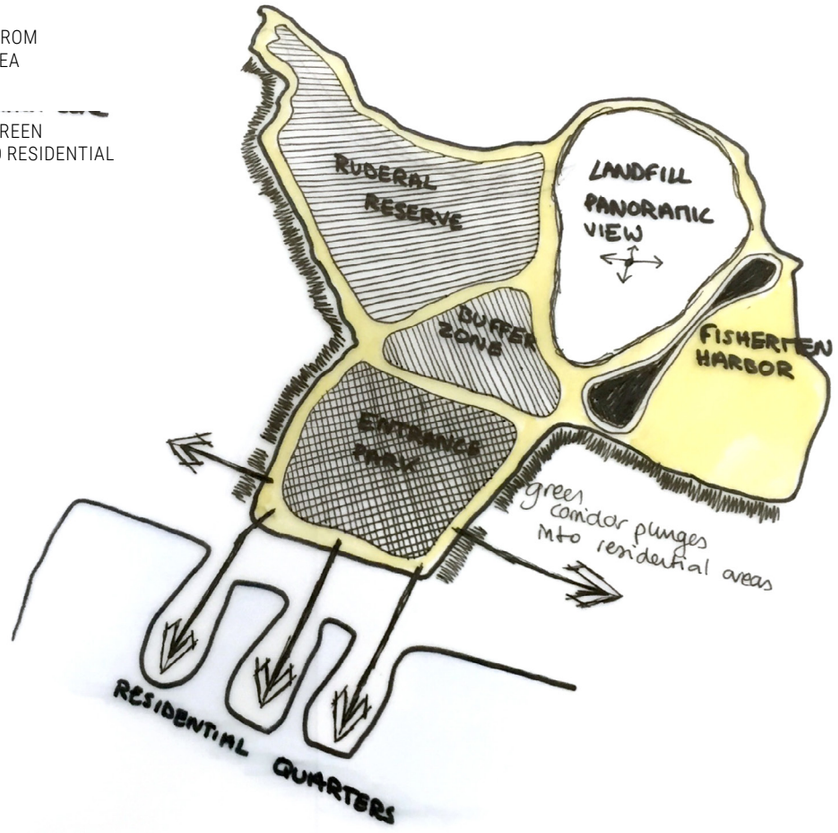


THE THIRD CONCEPT IS FOCUSED ON CREATING A SORT OF A GREEN CORRIDOR WHICH INSTEAD OF BECOMING AN ATTRACTIVE SITE, WOULD ACTUALLY BECOME PART OF THE URBAN FABRIC PLUNGING INTO THE RESIDENTIAL AREA. IT WOULD HAVE THE PURPOSE OF MERGING THE WATERFRONT WITH THE RESIDENTIAL AREAS OF BOURJ HAMMOUD, TARGETING ALSO THE ECOLOGICAL VALUE.

// **CONCEPT 3** GREEN CORRIDOR

BUFFER ZONE FROM INDUSTRIAL AREA

CONNECTING GREEN CORRIDOR INTO RESIDENTIAL QUARTER



THE CHOSEN CONCEPT WAS THE THIRD CONCEPT, THIS CONCEPT WAS DEVELOPED INTO A NEXUS.
THE GOAL REMAINS TO RECONNECT HE NEIGHBORHOOD OF BOURJ HAMMOUD TO ITS RESPECTFUL COASTLINE THROUGH A GREEN STRIP GATHERING A SERIES OF PARKS.
THE SEQUENCE OF PARKS BELONG TO THE LOCATION THEY ARE IN, CONSEQUENTLY THE DIFFERENT PARKS INVOLVE ECOLOGICAL PARKS, PLAZA AND MARKETS.

THE BENEFITS OF THIS PROPOSAL ARE:

- SOLVE THE MISSING LINK BETWEEN THE RESIDENTIAL QUARTER AND THE MIS-USED COASTLINE
- TREAT THE ECOLOGICALLY DISTURBED COASTLINE
- OFFER THE RESIDENTS GREEN SPACES
- OFFER THE WORKERS, WHETHER INDUSTRIAL OR CORPORATE, GREEN SPACES AS WELL

// FINAL CONCEPT **THE LOCAL NEXUS**

TO APPLY THE FINAL CONCEPT ONTO THE ACTUAL SITE, IT WAS IMPORTANT TO DELINEATE THE OPEN SPACES ACCORDING TO THE CORRIDOR. THE STRIP WHICH FORMED ITSELF, WAS SUCCESSFULLY PLACED WITHIN THE SERIES OF PARK SHOWN BELOW.

FROM NORTH TO SOUTH RESPECTFULLY BEGINNING WITH THE ECOLOGICAL PARK, FOLLOWED BY THE PLAZA ACROSS THE SEA SIDE ROAD WHICH IN FACT BECOMES A MAJOR NODE. CROSSING AGAIN THE DORA HIGHWAY, THE NEXUS LANDS INTO WHAT WAS THE OLDEST REMAINING REFUGEE CAMP. BY THE END, THE NEXUS SUCCESSFULLY REACHES THE CORE OF THE RESIDENTIAL QUARTER: THE MUNICIPALITY SQUARE.

// SITE PICTURES CONNECTING THE VARIOUS SITES

ACCORDINGLY, THE LINK EVOLVED INTO A MULTIFUNCTIONAL DIMENSION ANCHORED BY THE THREE MAIN NODES: (1) THE LANDFIIL, (2) THE URBAN PLAZA, (3) THE BOURJ HAMMOUD MUNICIPALITY. THESE THREE NODES, CONNECTED BY THE SOFT AND FUNCTIONAL LINK LOOP THROUGH THE DESIGN AND END UP BECOMING A SINGLE PLATFORM CONNECTING ALL OF THE DIFFERENT ELEMENTS ALL TOGETHER.

// MASTERPLAN

THE LINK IS PURPOSED AT ENGAGING PEOPLE WITH THE LANDSCAPE, OFFERED AS AN ACCESS. IT IS IMPORTANT TO NOTE THAT THE TARGET IS STRICTLY PEDESTRIAN, ALLOWING ANYONE TO REACH EITHER ENDS IN 15 MINUTES.

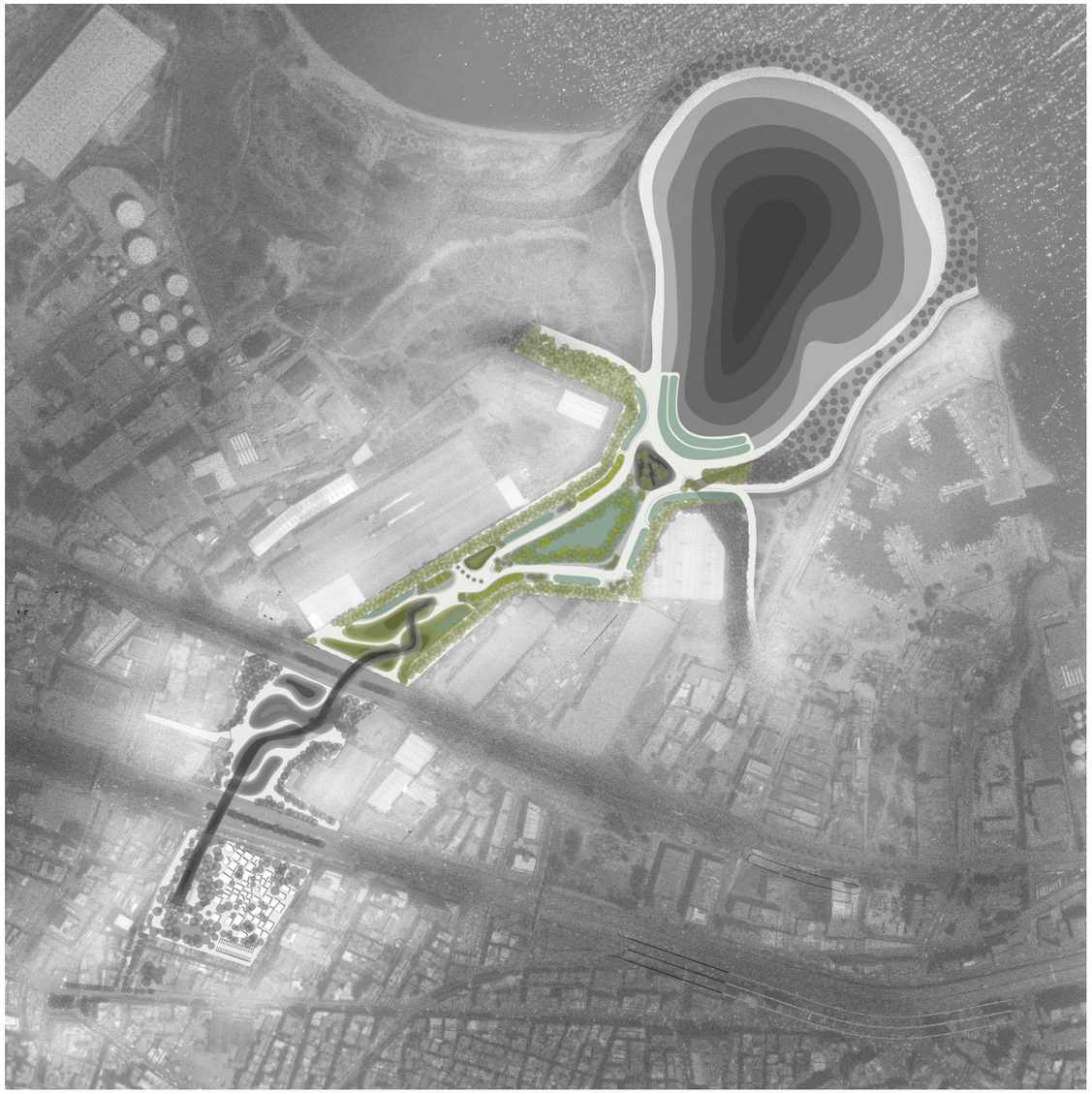
// **BIRD'S EYE VIEW** MASTERPLAN

// **PEDESTRIAN NEXUS FLOW** MASTERPLAN

// **BUFFERS** MASTERPLAN

MY FOCUS AREA IS LOCATED AT THE BEGINNING OF THE LINK. IT IS A BROWNFIELD WHICH HAS BEEN ISOLATED FROM THE URBAN FABRIC. THE SITE SPECIFIC APPROACH BELONGS TO RE-INTEGRATING ISOLATED INDUSTRIAL BROWNFIELDS BACK INTO THE URBAN ENVIRONMENT. THE APPROACH TACKLES THE REMEDIATION OF ECOLOGICAL LANDSCAPES WHICH CONNECT FROM THE REGIONAL SCALE INTO THE LOCAL SCALE.

// SITE LOCATION ON MASTERPLAN



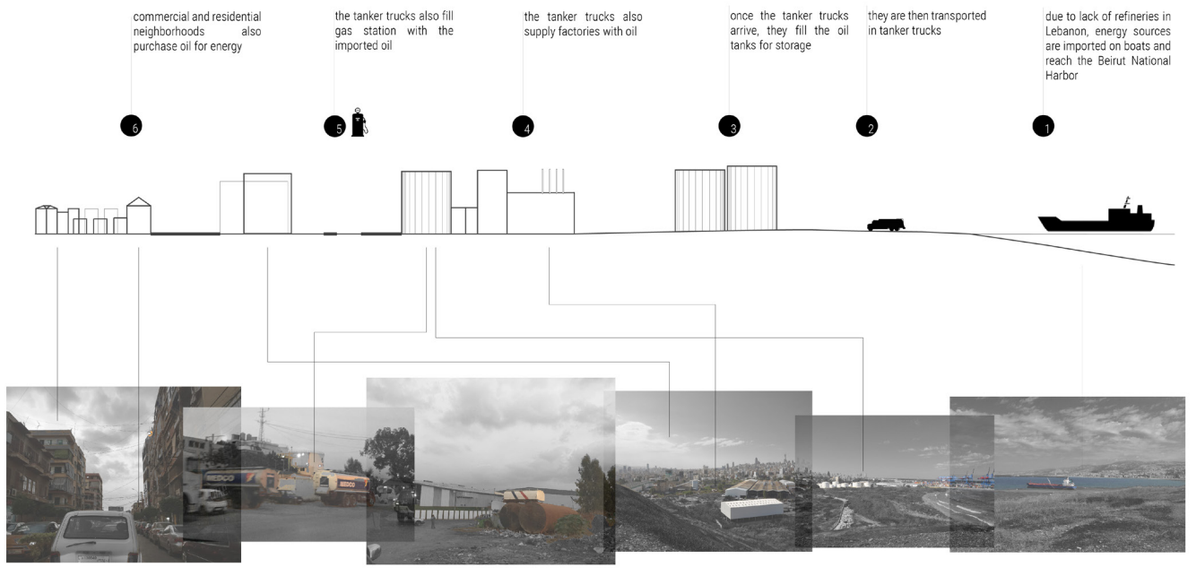
THE REASON WHY THE SITE PLAN WAS CHOSE WAS BECAUSE OF THE SITE ISSUES IT OFFERS. ITS LOCATION IS ALSO AT THE STARTING POINT OF THE LINK FROM THE WATERFRONT

THE FIRST STEP TO UNDERSTANDING REMEDIATING LANDSCAPES WAS TO LOCATED THE SITE SPECIFIC ELEMENTS, WHICH WERE IDENTIFIED AS AN OPPORTUNITY. THESE ELEMENTS CAN BE VISIBLE SUCH AS INDUSTRIAL REMAINS OR INVISIBLE LIKE WATER AND SOIL POLLUTION, TOPOGRAPHICAL LINES - OF THE EXISTING DUMP. *(REF: PHYTOREMEDIATION AS GREEN INFRASTRUCTURE AND A LANDSCAPE OF EXPERIENCES - FRANK SLEEGERS)*

// INDUSTRIAL ELEMENTS
GOAL • PRESERVE ON SITE

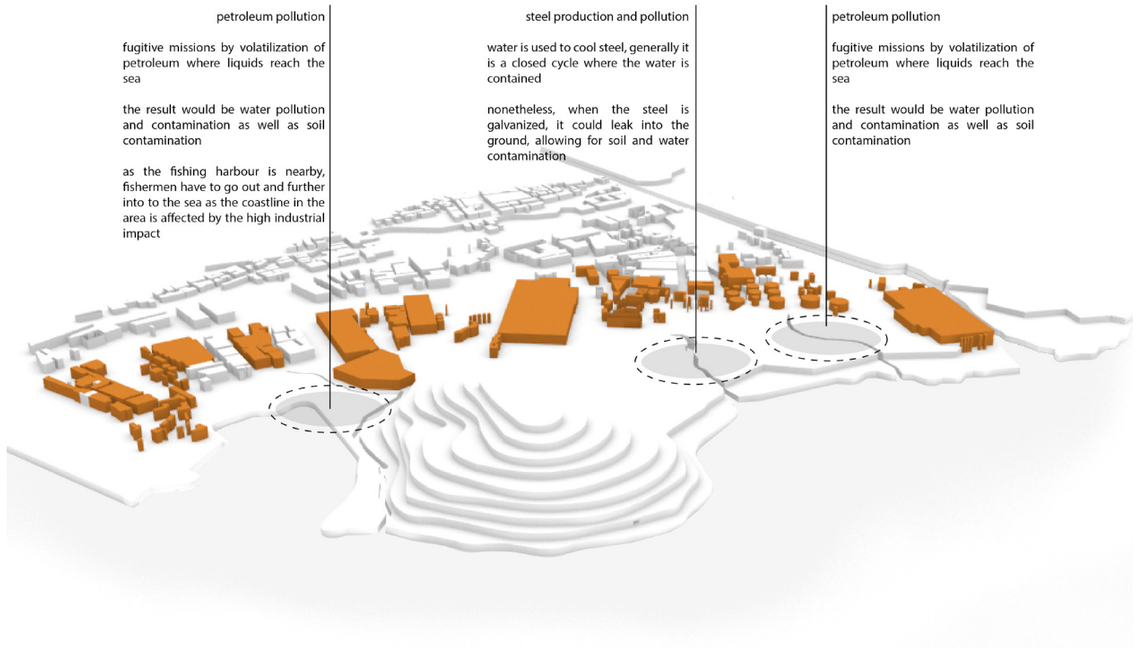
·GRAIN SILOS
·SHIPPING CONTAINERS
·WATER & GAS TANKS

// WATER POLLUTION PETROLEUM CIRCULATION ON SITE
GOAL • SOLVE WATER POLLUTION



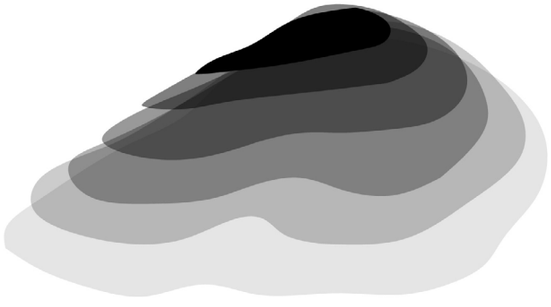
// **WATER AND SOIL CONTAMINATION** INDUSTRIAL ZONING AND WASTE DISPOSAL

GOAL • SOLVE WATER AND SOIL POLLUTION



// **THE DUMP AS A LANDFORM**

GOAL • DE-DUMP THE SITE AND USE THE LANDFORM OF DUMP AS INSPIRATION



ONCE THESE TANGIBLE AND INTANGIBLE ELEMENTS HAVE BEEN SPOTTED ON THE SITE, THE DESIGN GOALS ALSO SURFACED.
IT WAS IMPORTANT TO SOLVE ISSUES THAT HAD SURFACED DURING SITE ANALYSIS SUCH AS ACCESSIBILITY, VISIBILITY AND WALKABILITY

// **VISIBILITY DESIGN DIAGRAM**

// **ACCESSIBILITY DESIGN DIAGRAM**

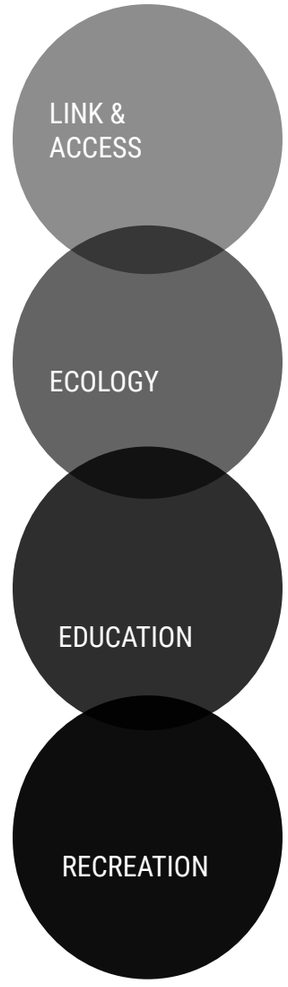
// WALKABILITY DESIGN DIAGRAM

// SOIL AND WATER REMEDIATION DIAGRAM

THE KEY PRINCIPLES OF LANDSCAPE ECOLOGY TO URBAN ENVIRONMENTS CONFORMING TO A MULTILAYERED APPROACH IS TO PROVIDE A GREEN INFRASTRUCTURE DERIVING FROM ECOLOGICAL AND SOCIAL RELATIONSHIPS WITH AN EMPHASIS ON CONNECTIVITY.

THE HUMAN LEVEL, FITTING INTO SUCH SOLUTIONS BECOMES KEY FACTOR.

CONSEQUENTLY, THE MAIN THEMES DEVELOPED FOR THE SITE PLAN BECOME **LINK&ACCESS, ECOLOGY, EDUCATION AND RECREATION.**



// SITE PLAN


to the observatory on the landfill
to the coastal beach reserve
SECTION A
BIOSWALES
BUFFER ZONES
PHYTOREMEDIATION BEDS
RESEARCH CENTRE
to the coastal promenade
to the fishermen's harbor
SEA LINKED CANAL
SECTION B
WETLAND
OUTDOOR AMPHITHEATRE
BRIDGE
SECTION A

// SITE PLAN

THE GOAL WAS TO MERGE ALL OF THE THEMES TO AIM FOR A MULTI-FUNCTIONAL LANDSCAPE. DESIGN LINES SURFACED WITH THE DE-CONSTRUCTION OF THE TOPOGRAPHY OF THE DUMP, EXTENDING THE LANDFORMS INTO A PLATFORM. **THAT PLATFORM WOULD MOLD THE SHAPE OF THE WATER, ORGANIZE THE VEGETATION AND GUIDE PEOPLE TO A UNIFIED LANDSCAPE. THE PLATFORM BECOMES THE HEART OF EXPERIENCING LANDFORMS.**

THE DIFFERENT ELEMENTS ON SITE BECOME ***MULTI-FUNCTIONAL***, FOR EXAMPLE:

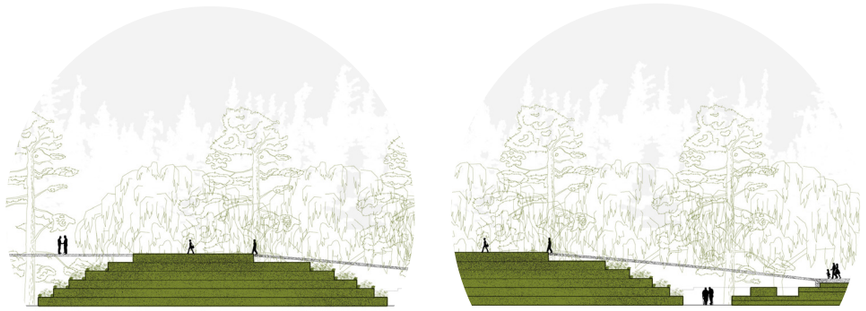
THE PHYTOREMEDIATION BEDS SERVE AS:
- SOIL REMEDIATIORS
- SERVE ALSO AS AN AESTHETIC EXPERIENCE ENJOYED BY THE VISITOR
- TEACH THE VISITOR ABOUT THE REMEDIATION

THE OUTDOOR AMPHITHEATER SERVES AS:
- LECTURE AREA FOR LECTURES ABOUT REMEDIATION INNOVATIONS
- LARGE RECREATIONAL SEATING AREA
- AESTHETIC EXPERIENCE AS A GREEN INTRUSION
- SMALL CONCERTS OR ANY EVENTS CAN BE HELD AS WELL

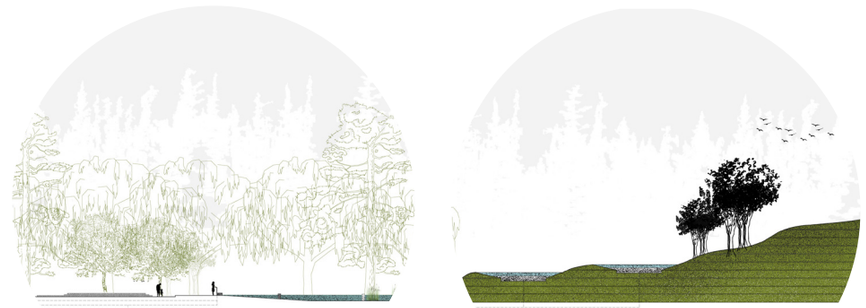
WETLANDS SERVE AS:
- WATER REMEDIATORS
- SERVE AS AN ENJOYABLE EXPERIENCE- PEOPLE LOVE WATER
- TEACHES PEOPLE ABOUT WATER REMEDIATIONS
- WATER BRINGS PEOPLE TOGETHER

THE RESEARCH CENTERS SERVE AS:
- RESEARCH AREAS FOR INNOVATIVE SOLUTIONS
- RECYCLING OF SHIPPING CONTAINERS - BECOME RESEARCH LABS
- OPEN FOR THE PUBLIC TO WATCH
- VISITORS CAN WALK BY AND THROUGH

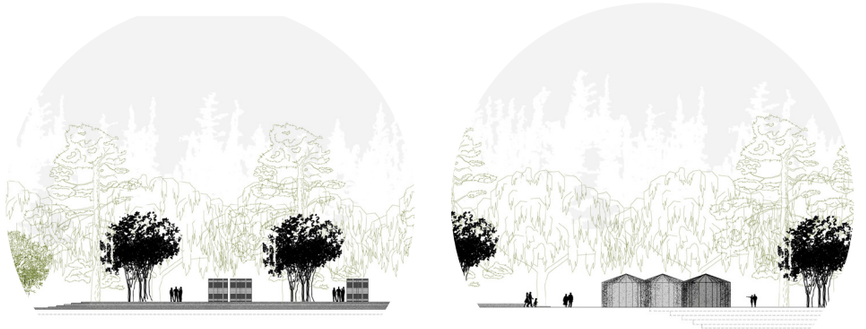
LINK&ACCESS: THE LANDFORMS RISE ENOUGH TO CONNECT TO THE BRIDGE - 5 METER CLEARANCE OFF THE ROADS



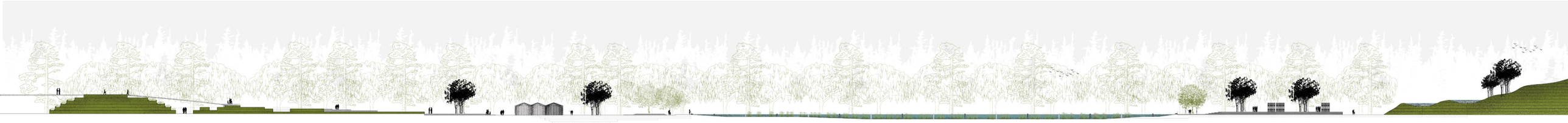
ECOLOGY: THE GOAL WAS TO INTENSIFY THE USE AND EXPERIENCE OF ECOLOGICAL SOLUTIONS



EDUCATION: THE RESEARCH LABS BECOME PART OF THE SITE AND THE SEATING AREA, PEOPLE LEARN WHILE TAKING A WALK



// SECTION A-A

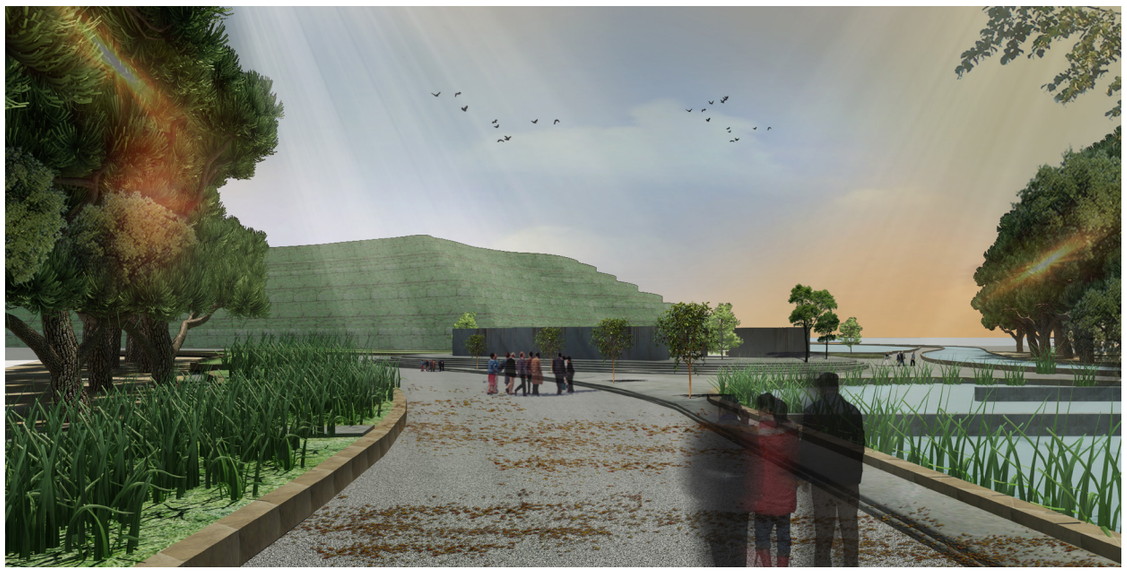


// LINK & ACCESS

THE SITE OFFERS A LINK FROM THE WATERFRONT ALL THE WAY INTO THE NEIGHBORHOODS OF BOURJ HAMMOUD

// ECOLOGICAL

THE SITE OFFERS WATER AND SOIL TREATMENTS BUT ALSO TEACHES THE VISITOR ABOUT ITS PROCESS

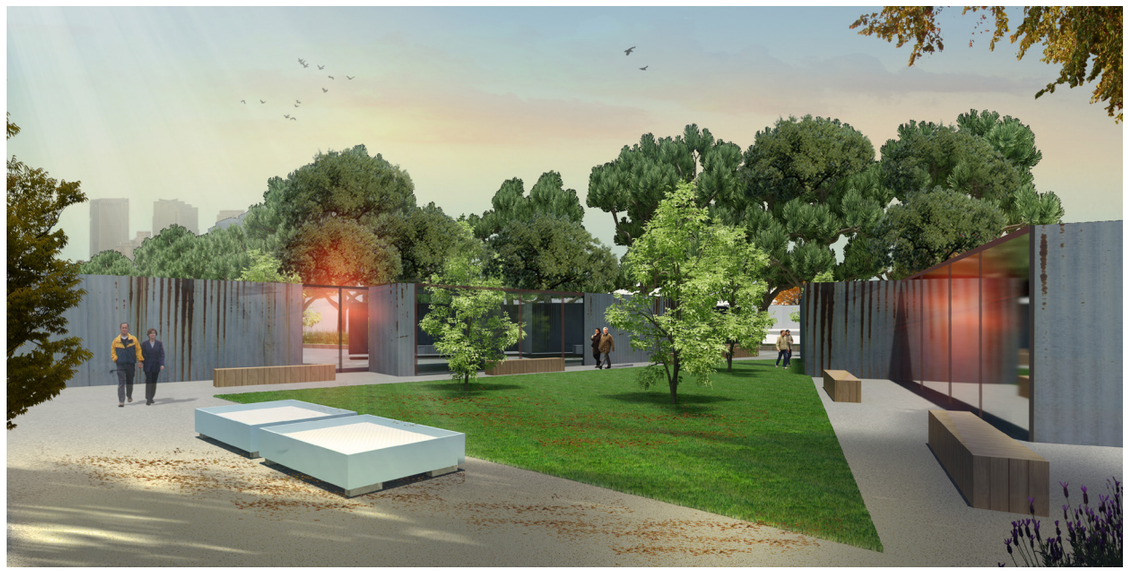


// RECREATIONAL

THE ECOLOGICAL PARK OFFERS VARIOUS TYPES OF EXPERIENCES WHETHER WALKING, JOGGING, AND LEARNING

// EDUCATIONAL

OUTDOOR RESEARCH CENTERS WHICH INVEST IN INNOVATIVE SOLUTIONS FOR REMEDIATION LECTURES ABOUT THESE SOLUTIONS WILL BE GIVEN IN THE OUTDOOR AMPHITHEATRE



// **SOFTSCAPE** PHYTOREMEDIATION AND PLANT SELECTION

PHYTOREMEDIATION *IS AN EMERGING TECHNOLOGY, WHICH USES PLANTS AND THEIR ASSOCIATED RHIZOSPHERIC MICROORGANISMS TO REMOVE POLLUTANTS FROM CONTAMINATED SITES.*

phytoremediation

rhizofiltration: use of plant roots to remove toxic metals from polluted waters

Agropyron elongatum

Height: 1-2m
Spread: 0.5-1m

Scirpus americanus

Height: 2-3m
Spread: 1-2m

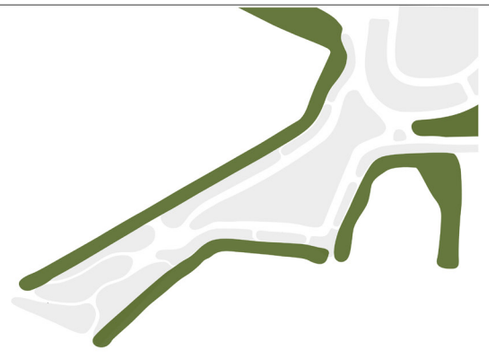
Schizachyrium scoparium

Height: 1-2m
Spread: 0.6m

Miscanthus sinensis

Height: 2m
Spread: 0.5-1m

buffer zones



phytostabilization: use of plants to eliminate bioavailability of toxic metals in soils

phytoextraction: use of metal accumulating plants to remove toxic metals from soils

Salix babylonica

Height: 8-15m
Spread: 10-15m

Pinus pinea

Height: 8-15m
Spread: 8-10m

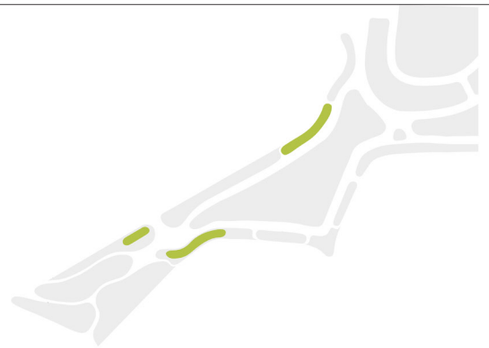
Morus alba

Height: 8-10m
Spread: 10-15m

Populus nigra

Height: 15-23m
Spread: 10-15m

phytoremediation beds



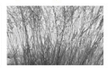
phytostabilization: use of plants to eliminate bioavailability of toxic metals in soils

phytoextraction: use of metal accumulating plants to remove toxic metals from soils

phytovolatilization: evaporation of certains metals from aerial parts of plants as gas

Helianthus annuus

Height: 3m
Spread: 0.5m



Festuca arundinacea

Height: 0.5-1m
Spread: 0.5-1m

Brassica juncea

Height: 0.6m
Spread: 0.3-0.6cm

Thlaspi caerulescens

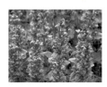
Height: 0.5m
Spread: 0.5m

landforms vegetation

phytostabilization: use of plants to eliminate bioavailability of toxic metals in soils

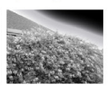
phytoextraction: use of metal accumulating plants to remove toxic metals from soils

phytovolatilization: evaporation of certains metals from aerial parts of plants as gas



Ajuga reptans

Height: 1m
Spread: 0.5m-1m



Lonicera japonica

Height: 1-1.5m
Spread: 1-1.5m

Berberis julianae

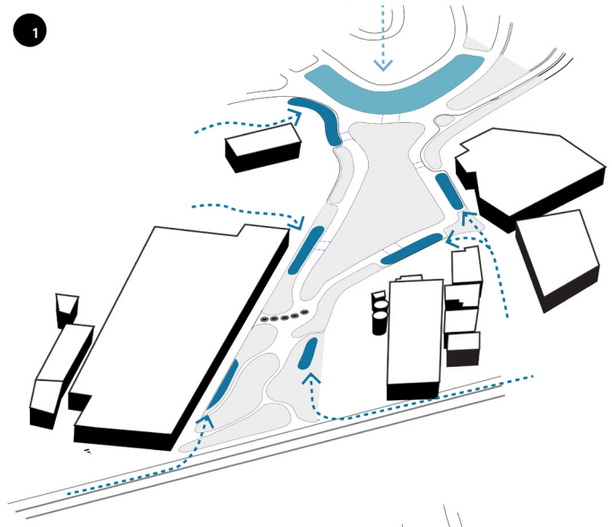
Height: 1-1.5m
Spread: 0.5-1m

Cistus salvifolius

Height: 1-1.5m
Spread: 0.5-1.m

// **SOFTSCAPE** WATER REMEDIATION AND ITS PROCESS

CONSTRUCTED WETLANDS *ARE ARTIFICIAL WETLANDS PURPOSED AT TREATING ANTHROPOGENIC DISCHARGE (MUNICIPAL WASTE/ INDUSTRIAL WASTE AND STORMWATER RUNOFF)*



bioswales

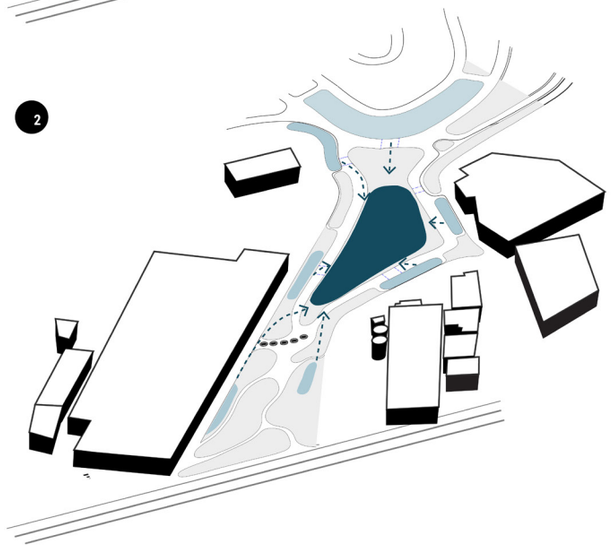
depth at 0.4 meters

total volume = 1199.88 m³

wetlands level 1

depth at 1.5 meters

total volume = 1384.2 m³

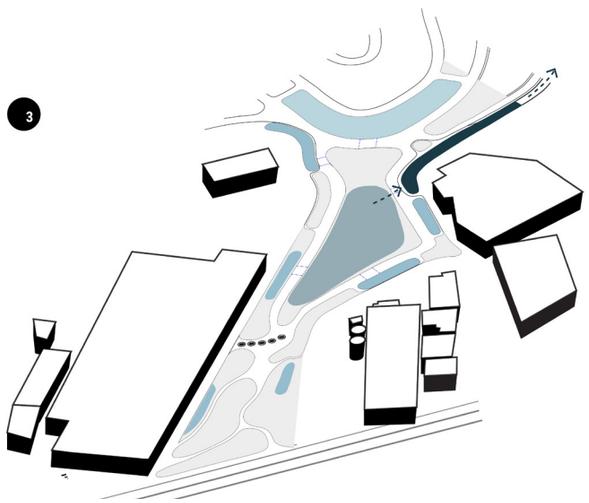


wetland level 2

depth at 1.5 meters

total volume = 9670.8 m³

use of baffles to increase water residence time



canal to sea

total of 325 000 m3 per day of cleaned water at full capacity with 0.3m/s to allow for the rhizofiltration process

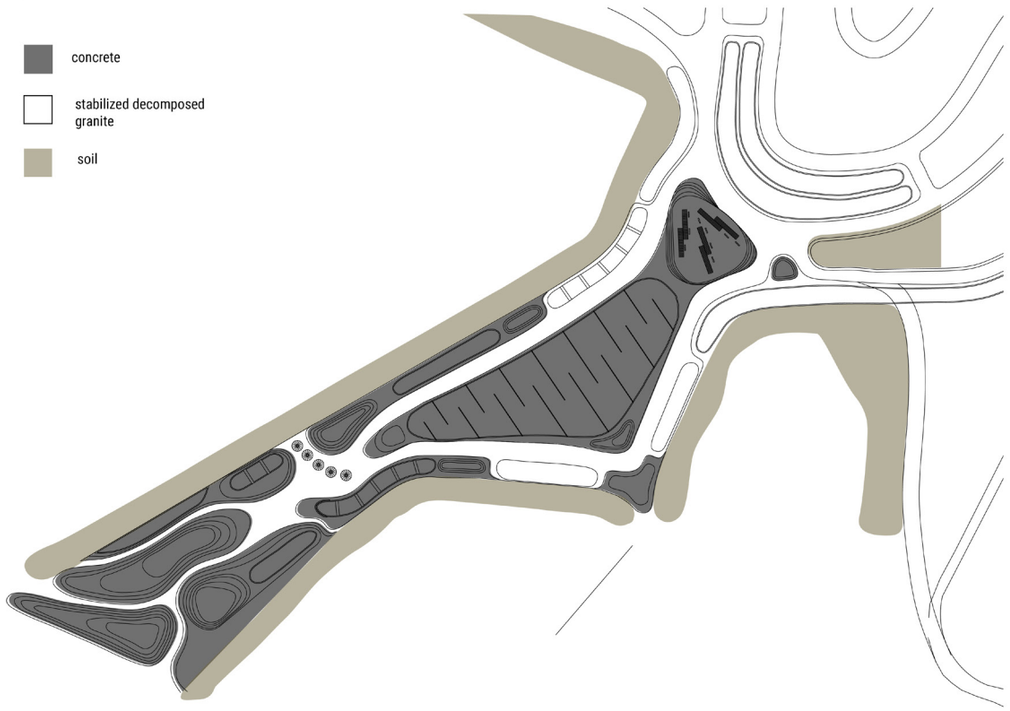
// HARDSCAPE

*THE CHOICE FOR **THE GROUND SURFACES**: THE MAIN PATHWAY IS STABILIZED DECOMPOSED GRANITE, WHICH IS THE MOST NATURAL REPLACEMENT TO CONCRETE. IT IS A PERMEABLE ALTERNATIVE. THE COLOR CHOSEN IS A WHITISH GREY.THE DIFFERENT PROTRUSIONS/ LANDFORMS WILL BE STRUCTURED WITH CONCRETE AND THE REST WILL BE EITHER SOIL OR VEGETATION.*
FINALLY THE BUFFER AREAS WHICH ARE NOT ACCESSIBLE WILL BE PLANTED IN SOIL, IT WOULD OFFER THE VISITOR A VERY NATURAL SETTING AND A BETTER UNDERSTANDING AT THE REMEDIATION OF THE SOIL.

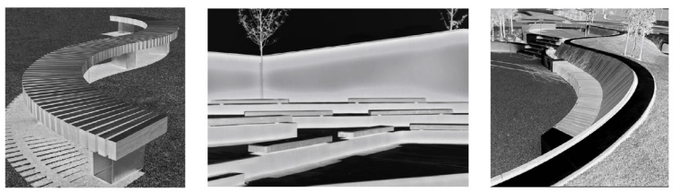
*THE CHOICE FOR **THE BENCHES**: USE RECYCLABLE WOOD AND MOLD IT WITH THE SHAPE OF THE LANDFORMS, THE BENCHES ALSO BECOME PART OF THE LANDSCAPE. (REFER TO THE PERPECTIVES OF THE SITE)*

AS FOR THE RAILING BECAUSE OF THE DIFFERENCE IN LEVELS, THE GOAL WAS TO APPLY DIFFERENT TYPES OF RAILING DEPENDING ON THE SETTING. IF THE GOAL IS TO HAVE SECURITY MEASURES THEN THE RAILS BECOME METAL, IF THE GOAL IS TO CREATE TRANSPARENCY OF VISIBILITY THEN THE RAILS BECOME GLAZED.

ground surfaces



benches



handrails

// SECTION B-B

// CONCLUSION

BEFORE

AFTER

THREE MAIN CASE STUDIES WERE VERY RELEVANT TO THE UNDERSTANDING OF THE SITE. THESE CASE STUDIES TACKLE DIFFERENT THEMES APPLICABLE RANGING FROM LANDFILL RESTORATION TO WATERFRONT REVITALIZATION AND REHABILITATING DISUSED PLACES

CASE STUDY 1 // **VALL D'EN JOAN WASTE DUMP , SPAIN, 2001 TILL NOW**
THEME: LANDFILL RESTORATION

LANDSCAPE ARCHITECTURE: BATLLE I ROIG (ENRIC BATLLE AND JOAN ROIG AS ARCHITECTS TERESA GALÍ AS AGRICULTURAL ENGINEER)
LOCATION: EL GARRAF NATURAL PARK, BARCELONA, SPAIN
DESIGN: 2002
CONSTRUCTION: 2003-2010
AREA: 85 HA
COST: 26.000.000 €

SINCE 1974, THE LANDFILL WAS THE URBAN WASTE PRODUCED BY BARCELONA AND THE CITIES AROUND IT. LOCATED IN A VALLEY, THE LANDFILL WAS MADE OF STEEP SLOPES COVERING THE WHOLE VALLEY. THE RESTORATION PROJECT'S AIM WAS TO USE "SINGLE OPERATION" TO TACKLE THREE ASPECTS ON THE SITE:
1. SOLVE A COMPLEX TECHNICAL PROBLEM
2. CREATE A NEW PUBLIC SPACE
3. CREATE A NEW LANDSCAPE

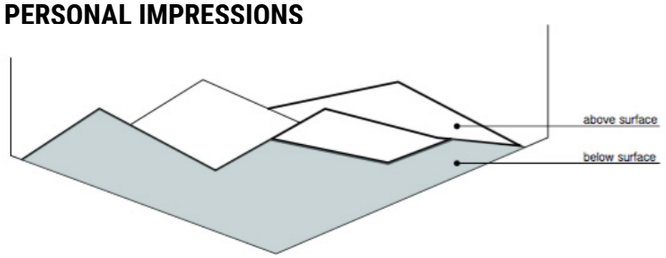
THE SITE WAS TACKLED FROM DIFFERENT DISCIPLINES: ENVIRONMENTAL ENGINEERING, GEOLOGY, LANDSCAPE ARCHITECTURE AND AGRONOMY. THE MAIN ISSUE DERIVED WAS OF STABILIZING THE LANDFILL WITH TERRACES AND EMBANKMENTS. THIS MAIN ISSUE CREATED THE GEOMETRY OF THE DESIGN AND OF THE LAYOUT OF THE PIPING WHICH HAD A PURPOSE OF COLLECTING AND CONDUCTING BIOGAS TO AN AREA WHERE IT WOULD BE TURNED INTO ELECTRICAL ENERGY // DRAINING AND STORAGE OF LEACHATE // COLLECTING RUN OFF.
THE DESIGN AND INCORPORATION OF THE TERRACES WERE INSPIRED BY AGRICULTURAL SYSTEMS OF THE AREA: TOPOGRAPHY//HYDRAULICS//VEGETATION. THESE SYSTEMS PROVED TO BE VERY EFFECTIVE IN RESTORING DAMAGED LANDSCAPES BECAUSE OF THE WAY THEY ARE ORGANIZED AND MAINTAINED.
THE VEGETATION CONSISTED OF USING NATIVE SPECIES; SUCH AS TREES, SHRUBS, MAQUIS, NATIVE LEGUMINOUS OF THE SURROUNDING FARM AREAS-THAT ARE RESISTANT AND THAT REQUIRE LITTLE WATER. THE AIM IS TO EVENTUALLY INTEGRATE THE LANDFILL SITE TO THE PROXIMATE GARRAF NATURAL PARK.

// MASTERPLAN OF THE SITE

THE POINT OF THE RESTORATION WAS NOT ONLY TO INTEGRATE THE DESIGN INTO THE LANDSCAPE, BUT ALSO TO SENSITIZE SOCIETY TOWARDS THE ENVIRONMENT. TO ALLOW THE PUBLIC TO UNDERSTAND THE RESTORATION OF THIS LANDSCAPE, THEY'VE INSTALLED INFORMATION CENTERS TO EXPLAIN THE WORK CARRIED OUT AND THE WORK THAT IS STILL ONGOING.
FOR EXAMPLE, WALLS OF WASTE (PICTURE TO THE LEFT) AND PATHS OF EARTH WERE INSTALLED TO REMIND THE PUBLIC OF THE LANDSCAPE'S ORIGIN, THE ROLE THAT IT PLAYED.

// PICTURES THE SITE

// PERSONAL IMPRESSIONS



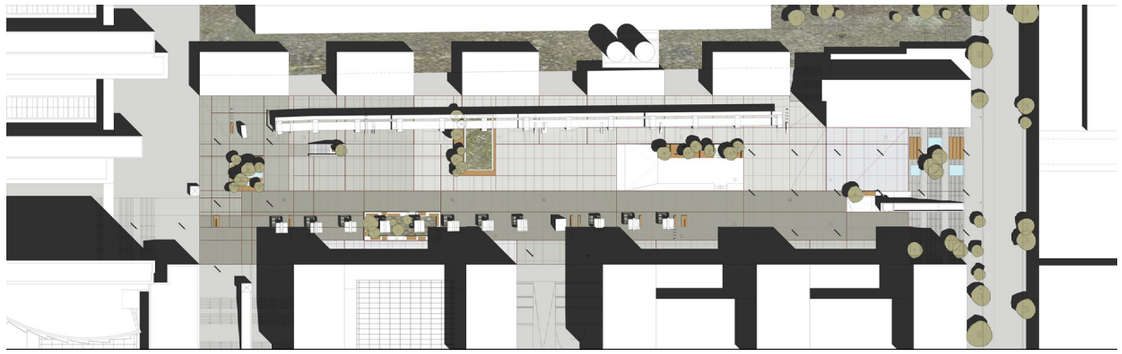
THE WAY THE SITE HAS BEEN HANDLED HAS SHOWN COMPLETE INTEGRATION WITHIN THE SPACE.
THE WAY TO LOOK AT IT WOULD BE TO CONSIDER TWO ENTITIES. ONE WHICH IS ABOVE THE SURFACE, WHERE THE RECOVERING LANDSCAPE
BECOMES AN AESTHETIC ELEMENT INTERACTING WITH ITS SURROUNDING AND WITH THE PUBLIC. AND THE OTHER WHICH IS UNDER THE SURFACE, WHICH WOULD BE THE ACTUAL SYSTEM BEHIND THE RESTORATION.
IT IS IMPORTANT TO NOT DISSOCIATE BETWEEN THE AESTHETIC VALUE AND THE ECOLOGICAL VALUE, ONLY BECAUSE THE DESIGN BECOMES AS A WHOLE.

CASE STUDY 2 // **CITY SQUARE DEVELOPING , LUXEMBOURG , 2011**
THEME: REHABILITATING DISUSED SPACES

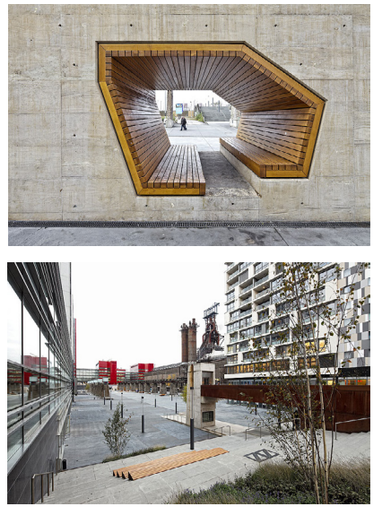
LANDSCAPE ARCHITECTURE: ALLESWIRDGUT
LOCATION: ESCH-SUR-ALZETTE, LUXEMBOURG
DESIGN: 2004
CONSTRUCTION: 2011
AREA: 11.000 M2

THE SITE WAS A NEGLECTED AND DISUSED INDUSTRIAL AREA. THE AREA WAS WIDE AND ROUGH, AND COVERED BY MOSS AND BIRCH. THE GOAL OF THE DESIGN IS TO UNCOVER THE HIDDEN QUALITIES OF THE SITE.
SEATING AREAS AND PLANTING OF NEW TREES WAS NECESSARY. THESE WERE INSTALLED INTO ISLANDS AND AS FOCAL POINTS IN THE VAST SPACE.
THE USE OF MATERIALS LIKE CONCRETE, UNTREATED STEEL AND WOOD GIVE THE SITE A ROUGH FEEL TO IT - JUST HOW IT USED TO BE.
THE 'STEEL COURT',WHICH USED TO BE A WORKING PARK WITH TRAIN TRACKS CROSSING IT WILL BECOME ONE OF THE MAIN SQUARE AREAS. (PICTURE BELOW). THE LONG SQUARE ALLOWS ACCESS TO THE NEW DISTRICT. IT IS A COMBINATION OF FORMS AND DIVIDE BETWEEN THE NEW OFFICE AREAS AND THE OLD INDUSTRIAL FACTORIES.
THE QUESTION ASKED BY THE LANDSCAPE ARCHITECT WAS THE BASE BEHIND THE DESIGN : 'HOW DO YOU COMBINE THE ABANDONED INDUSTRIAL YARD'S ATMOSPHERE – QUIET, MISTY, STONEHENGE-LIKE – WITH THE REQUIREMENTS OF A MODERN AND REPRESENTATIVE CITY-SQUARE?'
FIVE PRINCIPLES ALLOWED ALLESWIRDGUT TO PROPOSE THE FOLLOWING CONCEPTS:
1. KEEP IT SIMPLE : FORMS AND MATERIALS
2. MAKE THE MOST OF THE SITE'S EXISTING POTENTIAL : EDGES
3. CONCENTRATE THE DESIGN EFFORT IN DEFINED AREAS, PRESERVE THE SITE'S WIDENESS : ISLANDS
4. ONLY BUILD WHAT IS NECESSARY AT ONE TIME : JOINTS
5. UNOBTRUSIVELY REFINE THE USED ROUGH MATERIALS :PATTERNS

// MASTERPLAN OF THE SITE

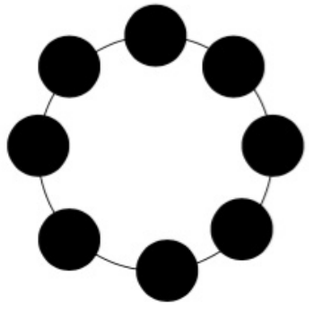


// PICTURES THE SITE



// PERSONAL IMPRESSIONS

BEFORE
NEGLECTED AREA, DISUSED SPACE



AFTER
MANAGED SPACE, RE-USED AND
REINTEGRATED WITHIN THE CITY

CASE STUDY 2 // **RED RIBBON IN TANGHE RIVER PARK, CHINA , 2011**
THEME: WATERFRONT REVITALIZATION

LANDSCAPE ARCHITECTURE: TURENSCAPE
LOCATION: QINHUANGDAO, CHINA
DESIGN: 2006
CONSTRUCTION: 2008
AREA: 20 HA
AWARDS: ASLA

THE SITE WAS COVERED WITH LOTS OF TYPES OF VEGETATION COMPLIMENTING THE HABITATS NEARBY THE RIVER. UNFORTUNATELY, IT WAS ALSO USED AS A GARBAGE DUMP. EVENTUALLY THE SITE BECAME A DESERTED AREA AND INACCESSIBLE.
THE IDEA IS THE REVERSE OF CONVENTIONAL URBAN PLANNING, WHICH GENERALLY ADDRESSES POPULATION GROWTH AND IS MORE FOCUSED ON A CITY'S ECONOMIC DEVELOPMENT. INSTEAD IT WAS TURNED INTO FOCUSING ON THE ONLY ELEMENT OF THE LANDSCAPE. THE SITE, CONSISTING OF SUCH LUSH AND WILD VEGETATION WAS DESIGNED BY TURENSCAPE. HE USED A VERY SIMPLE TECHNIQUE OF IMPLEMENTING A 'RED RIBBON' WHICH REPRESENTS A 500 METERS LONG MEANDERING STEEL STRUCTURE. THIS MINIMAL INTERVENTION FUNCTIONS AS A SEATING, LIGHTING AND VIEW POINT TOE THE SURROUNDING WILD LANDSCAPE.
COMPLIMENTING THE MEANDERING RED RIBBON, ALSO EXISTS BOARDWALKS AND BIKE LANES THAT FOLLOW THE SAME FORM.
THE RED RIBBON IS MADE OF FIBER STEEL AND GLOWS RED AT NIGHT. IT IS 60 CM HIGH WITH A VARYING WIDTH OF 30-150 CM.
TO ALLOW FOR ECOLOGICAL UNDERSTANDING, FOUR PAVILIONS HAVE BEEN DESIGNED ALONG THE RED RIBBON TO EDUCATE THE VISITORS OF THE PARK ABOUT THE NATIVE PLANTS AND ECOLOGY.
FOUR GARDENS OF WHITE, YELLOW, PURPLE AND BLUE FLOWERS HAVE BEEN SPREAD ALONG THE SITES THAT WERE USED AS DUMPS AND SLUMS.
THE PARK IS URBAN AND MODERN, BUT PRESERVES EXISTING ECOLOGICAL PROCESSES AND NATURAL SERVICES

// MASTERPLAN OF THE SITE

// PICTURES THE SITE

// PERSONAL IMPRESSIONS

POLLUTED RIVER BANKS,
AREA THAT IS NOT ACCESSIBLE

ECOLOGICAL EXPERIENCE ACCESSIBLE SITE WITH ACTIVITIES

// INSPIRATIONAL PROJECTS - DESIGN LINES








// REFERENCES

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Sleegers, Frank (2010) “Phytoremediation as Green Infrastructure and a Landscape of Experiences,” Proceedings of the Annual International Conference on Soils, Sediments, Water and Energy: Vol. 15, Article 13.
Available at: http://scholarworks.umass.edu/soilsproceedings/vol15/iss1/13

Phytoremediation of toxic metals from soil and waste water Vinita Hooda*
Department of Botany, Government College for Women, Rohtak-124 001, India (Received: October 28, 2005 ; Revised received: July 20, 2006 ; Accepted: August 29, 2006)

BIOFILTERS (Bioswales, Vegetative Buffers, & Constructed Wetlands)For Storm Water Discharge Pollution Removal Guidance for using Bioswales, Vegetative Buffers, and Constructed Wetlands for reducing, minimizing, or eliminating pollutant discharges to surface waters By Dennis Jurries, PE NWR Storm Water Engineer DEQ Northwest Region Document January 2003

// THANK YOU