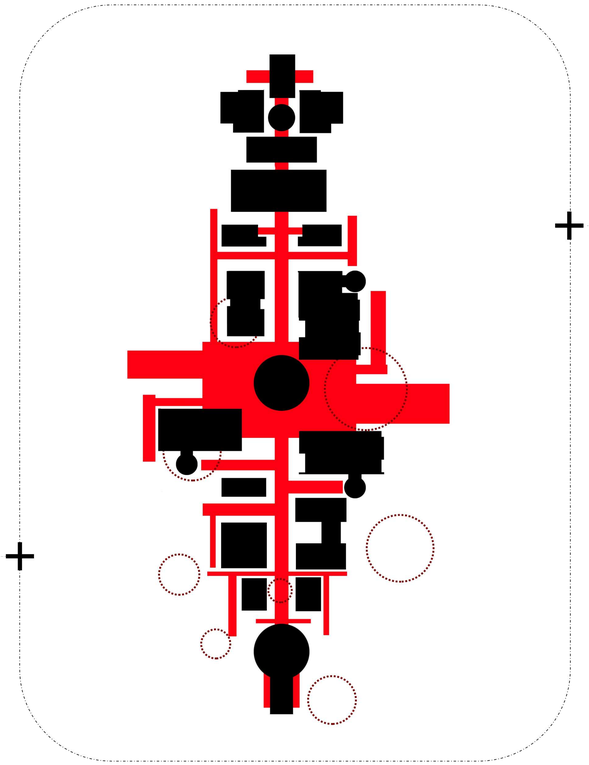
UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

PEOPLE • PLACE • TECHNOLOGY



FLAVIO DOS SANTOS
U18034960

CO-ORDINATOR – JAN HUGO
SUPERVISOR – COBUS BOTHMA
DPD 801

PROJECT SYNOPSIS

BUILT ENVIRONMENT REVITALIZATION HEADQUARTERS OF SOUTH AFRICA

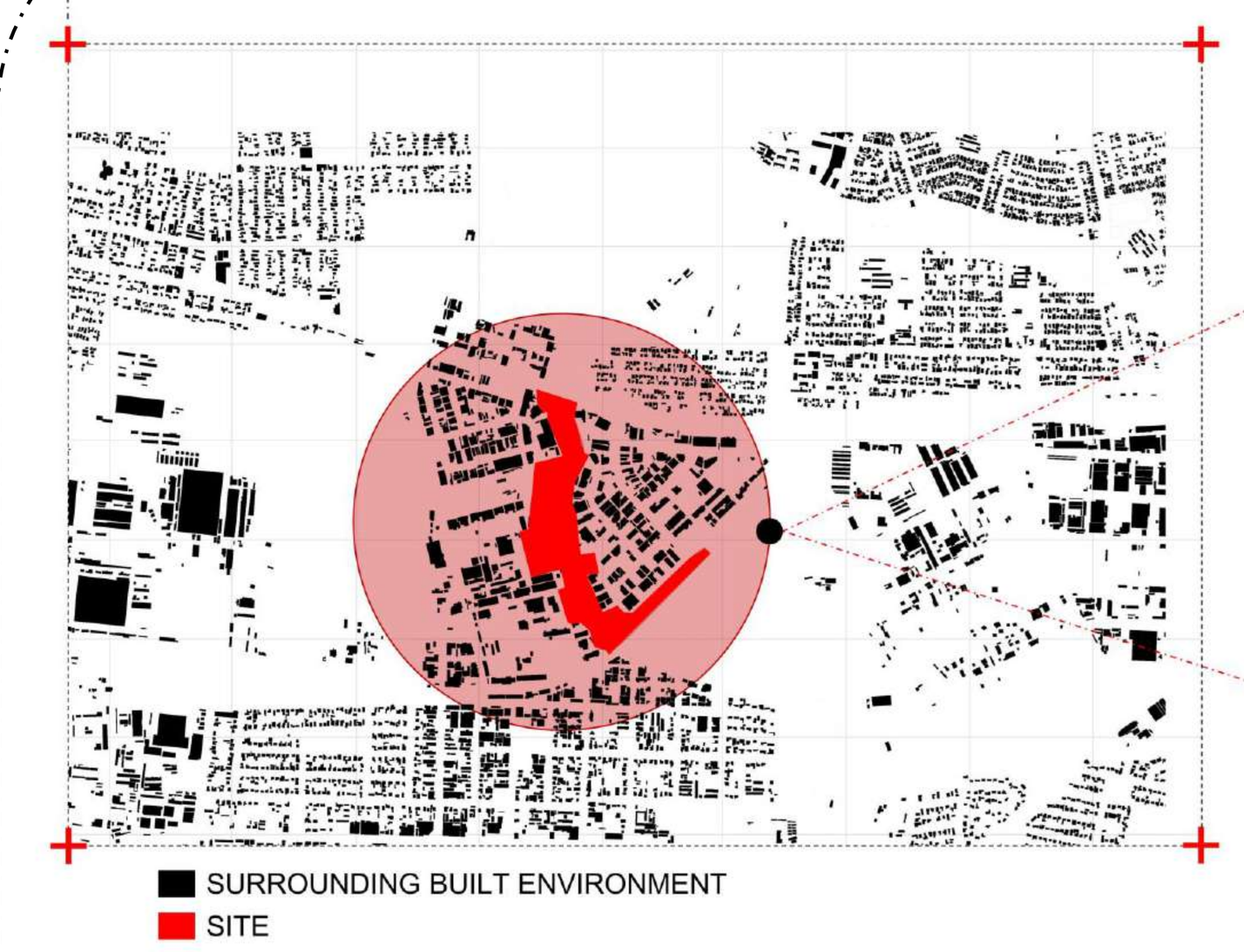
// ABSTRACT

This dissertation stands to explore the validity of introducing a headquarters for technological innovation and emergence for South Africa's built environment that makes deliberate connections with existing greenspaces and the surrounding social fabric.
South Africa's built environment has become slow in its technological development due to: the lack of required skills, existing research on the matter having a global focus, and an overall separation of design and construction processes. South Africa's built environment also seems to be becoming placeless and homogenized due to the lack of identity portrayal in correspondence with its places. With limited research on how the South African built environment could benefit from solving both problems simultaneously, the intention is for the proposed headquarters for technological innovation and emergence to become an alleyway for a possible solution. This dissertation aims to investigate what aspects of hybrid high-tech and low-tech emerging building technologies could become a catalyst for revitalizing the South African built environment while prioritizing the instantiation of a relevant local identity in accordance with its places.

With spheres of industry, ecology, and social fabric all being simultaneously present, Silvertondale presents an ideal opportunity for the development of a place that actively considers the integration of greenspaces, and the social realm within a mono-focused industrial setting. The intended headquarters for technological innovation and emergence focuses on generating a strong economic contribution through industrial processes similar to those within the surrounding context, however, its economic contributions will be heavily determined by how well social and ecological elements are integrated and utilized.

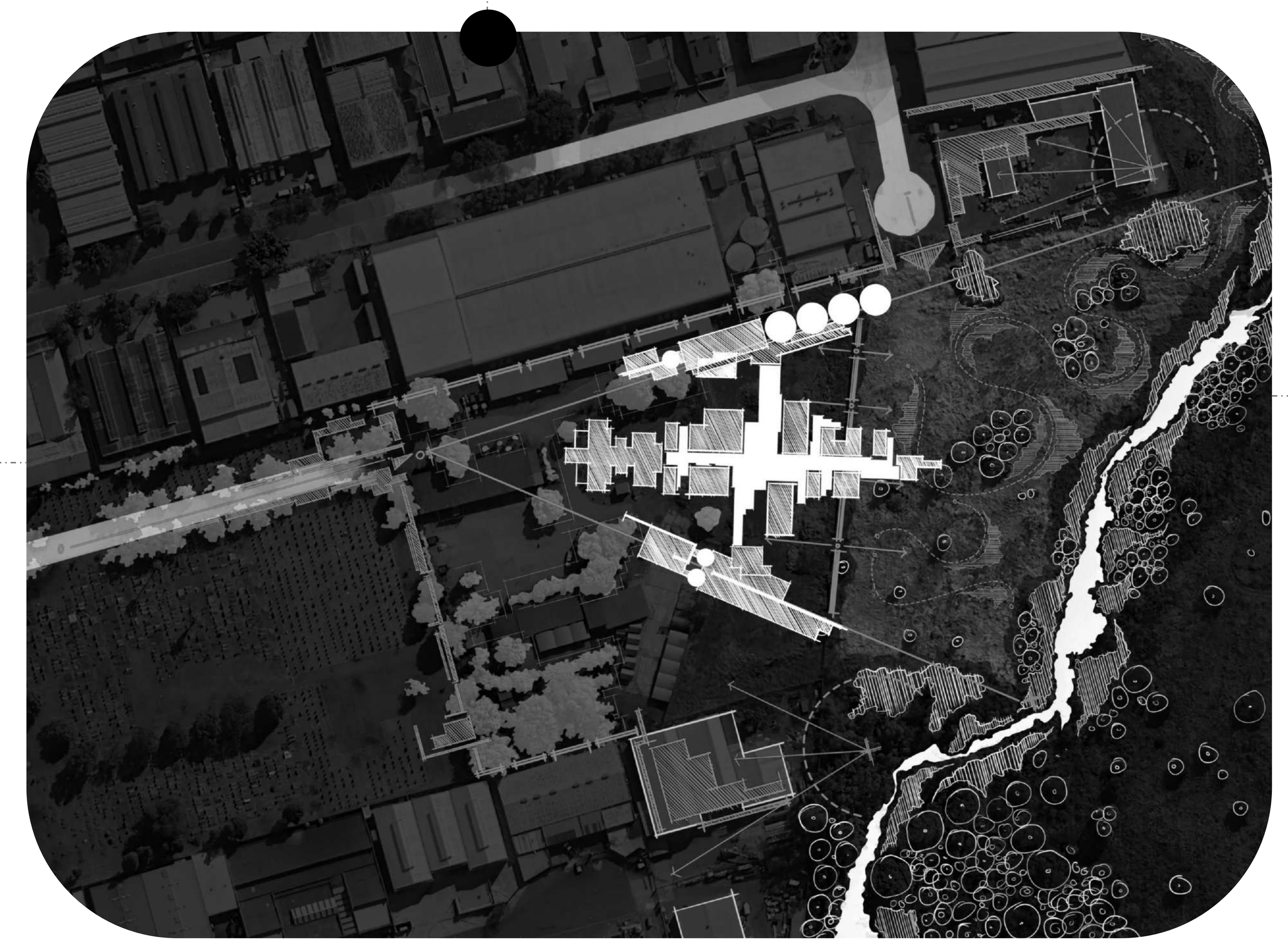
From a tectonic point of view, the final architectural intervention explores the realm of flexible and interchangeable spaces where each architectural element of the final intervention can be perceived and understood as a single entity. The collection of designed counterparts work together in order to create a system that allows for an array of programs to take place. The culmination of patterns and systems designed for are not entirely revolutionary and can sometimes be seen within the existing buildings surrounding the new intervention. The innovation comes through in the reconsideration for these single entities, and how reorganizing system patterns can result in a more pleasant environment for participants. Therefore, the final intervention becomes a collection of interchangeable processes and systems that work together to create a synergized architectural experience that simultaneously considers the industrial realm, as well as social and ecological integration.

SITE – SILVERTONDALE, PRETORIA



URBAN SCALE DEVELOPMENT

FOCUS AREA



TECTONIC CONCEPT

HYBRID TECTONIC

INSTANTIATING A RELATIONSHIP BETWEEN PEOPLE AND TECHNOLOGY

- ECOLOGICAL REVITALIZATION
- INTEGRATION OF SOCIAL FABRIC
- REPROGRAMMING OF INDUSTRIAL BUILT ENVIRONMENT

THE HYBRIDIZATION OF EMERGING LOW TECH AND HIGH TECH BUILDING TECHNOLOGIES

LOW –TECH HAND BASED CONSTRUCTION METHODS

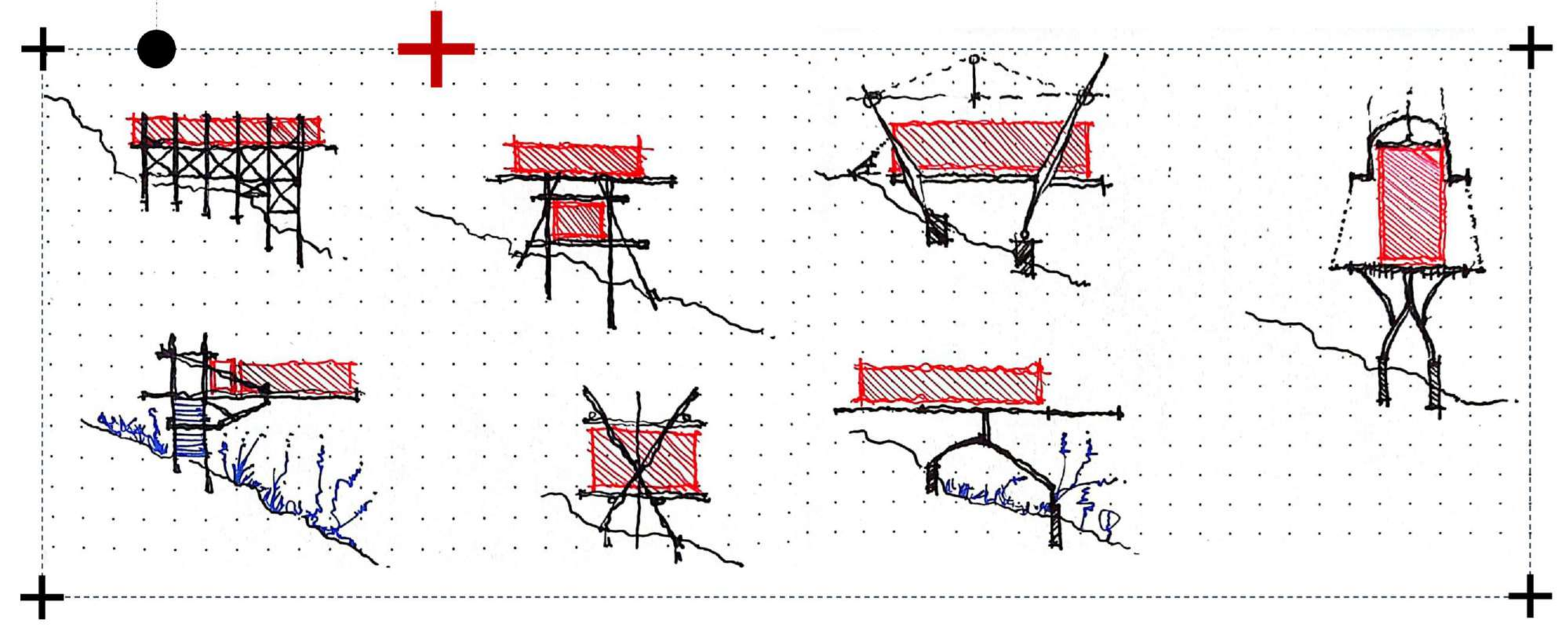
PREFABRICATED CONSTRUCTION

AUTOMATED CONSTRUCTION

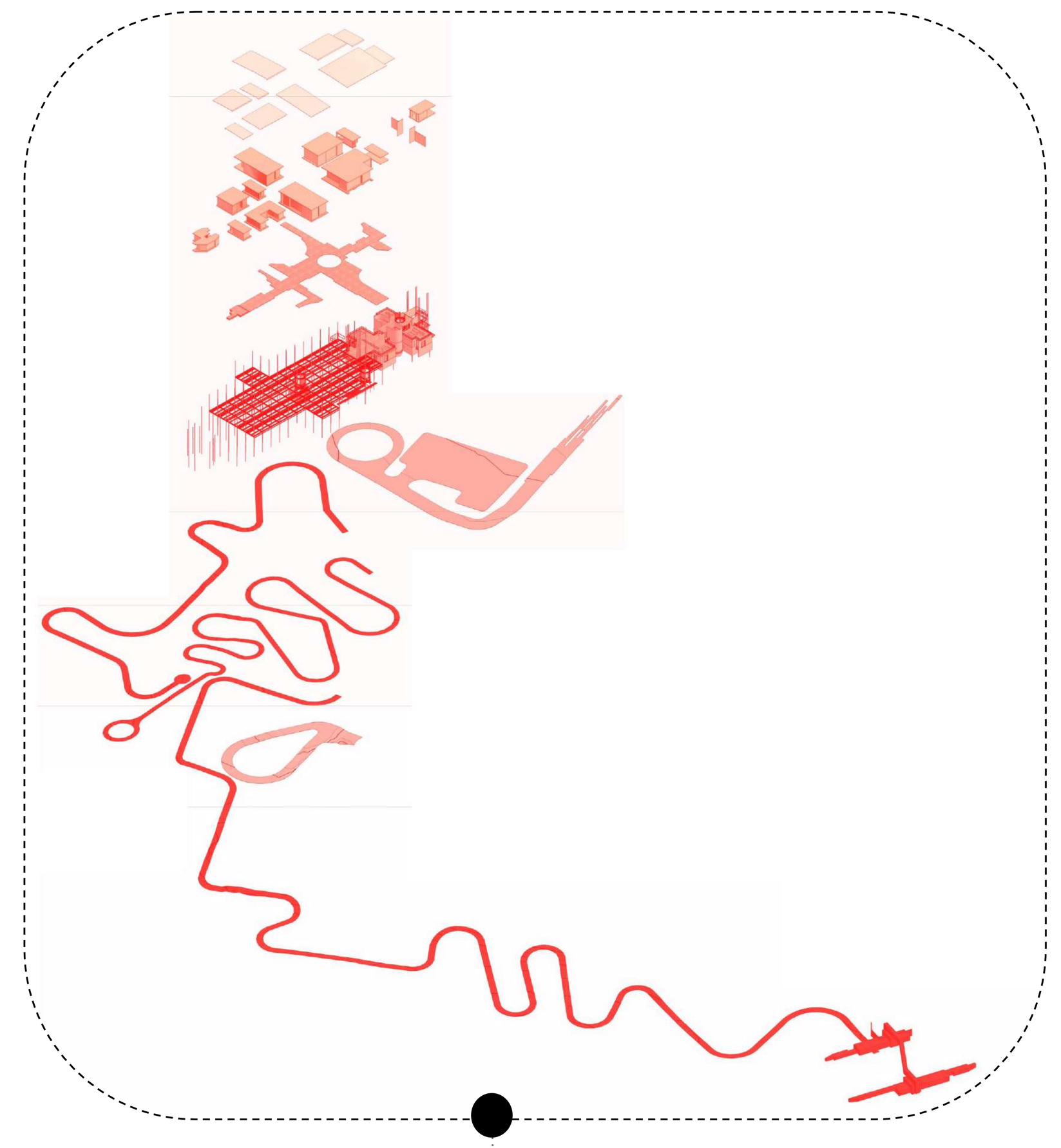
INSITU CONSTRUCTION

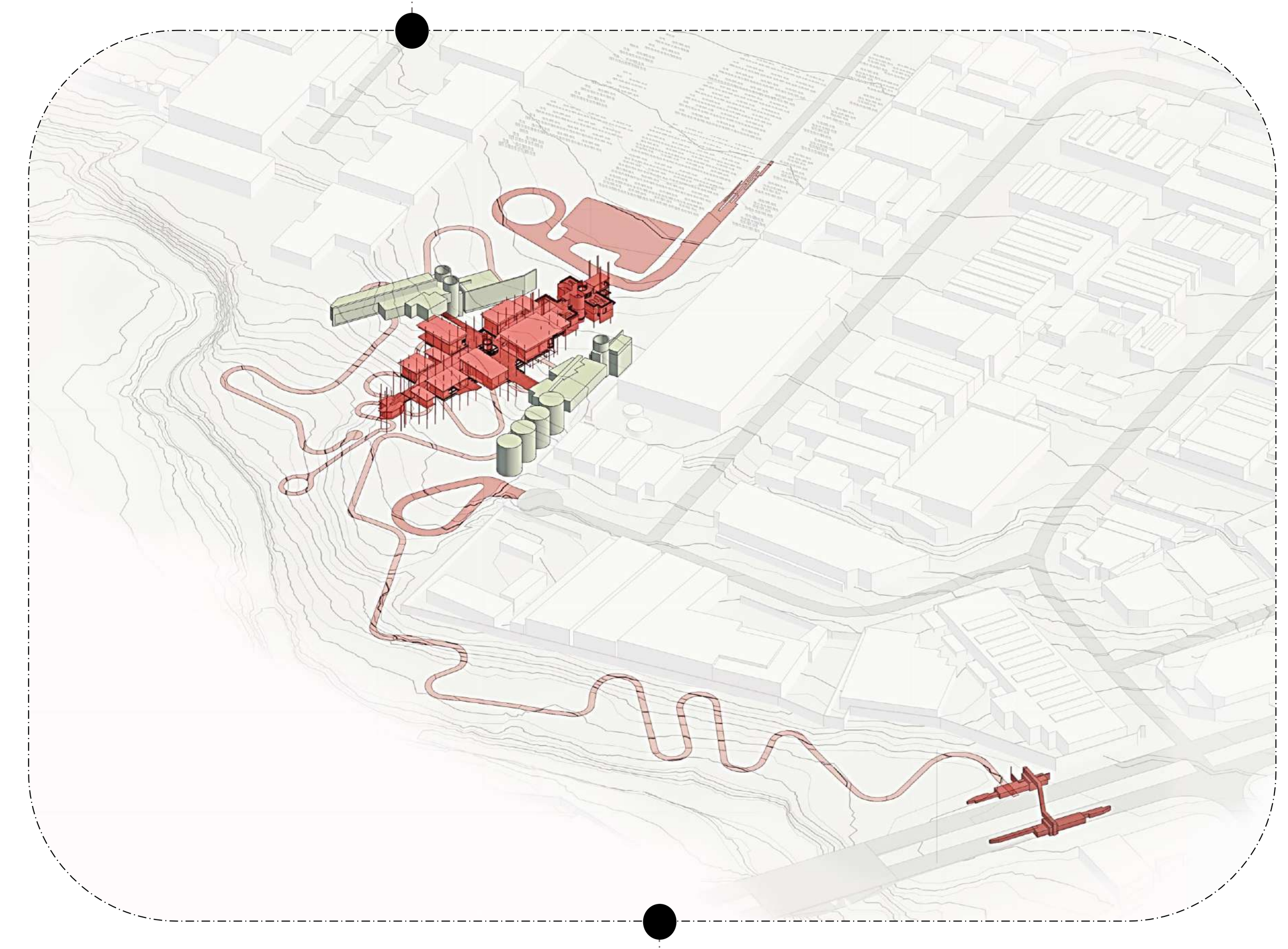
BIOLIGICALLY INTEGRATED MATERIALS AND PROCESSES

TECHNOLOGICAL IMPLEMENTATION



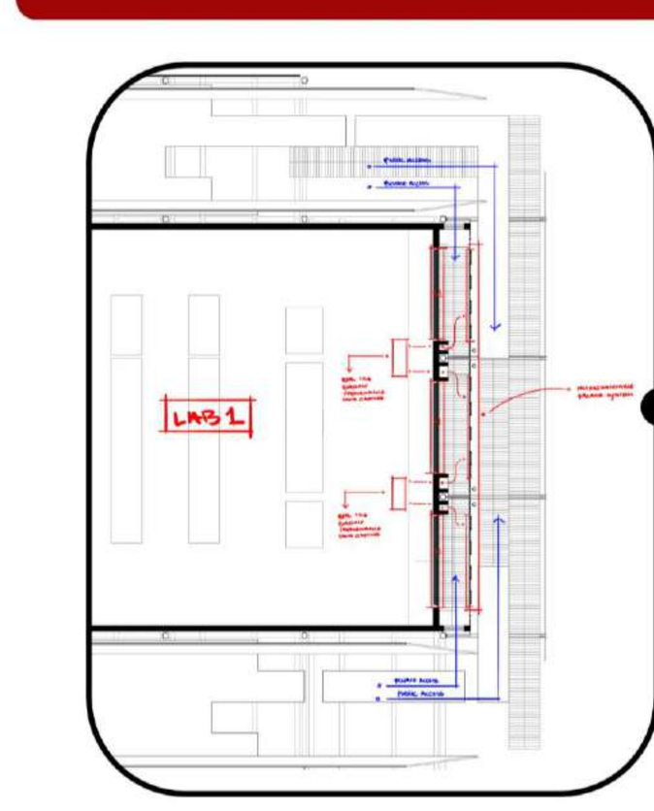
ISOMETRIC DEPICTIONS



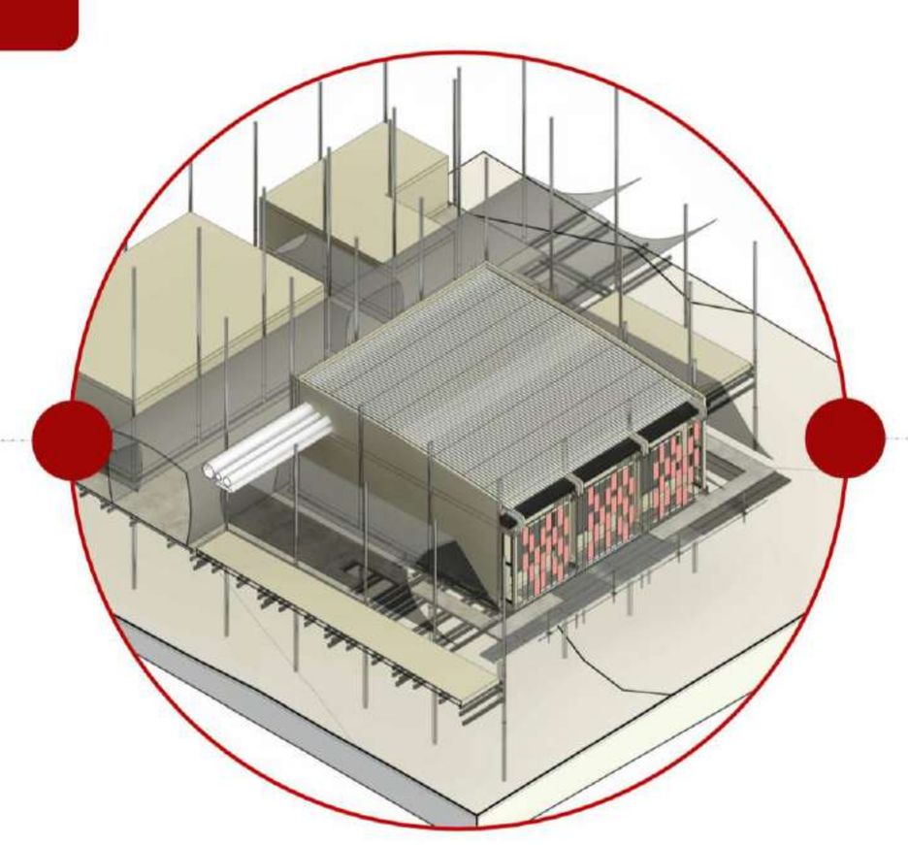


PERFORMANCE TESTING

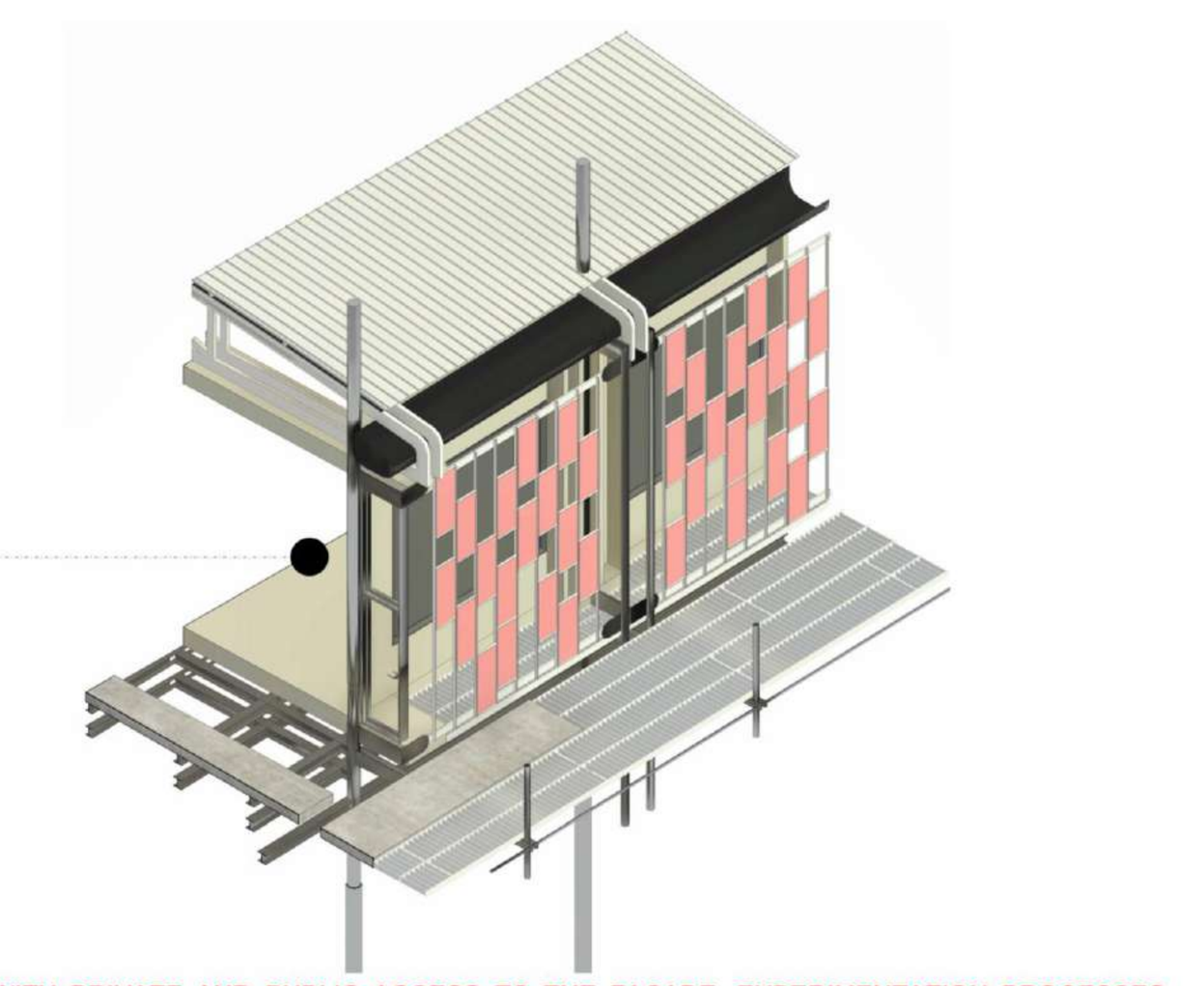
FLEXIBLE FAÇADE ITERATION - 02



ON PLAN ONE SEES THAT THE FAÇADE ACTS AS A FACILITY FOR BUILDING PERFORMANCE EXPERIMENTATION WHERE SENSORS AND OTHER TECHNOLOGIES CONNECT TO COMPUTER SYSTEMS ON THE INTERIOR VIA CLT DUCTS



THE FAÇADE SYSTEM IS COMPLETELY INTERCHANGABLE. THIS SYSTEM FEATURES REMOVABLE PANELS THAT ARE FULLY CUSTOMIZABLE



WITH PRIVATE AND PUBLIC ACCESS TO THE FAÇADE, EXPERIMENTATION PROCESSES ARE TRANSPARENT TO ALL USERS, AND THE FLEXIBILITY THIS FAÇADE SYSTEM OFFERS ALLOWS FOR RAPID TECHNOLOGICAL EXPERIMENTATION. VISITORS WILL ALWAYS BE EXPOSED TO THE LATEST BREAKTHROUGHS IN EXPERIMENTATION DUE TO THE FAÇADE MAKEUP.

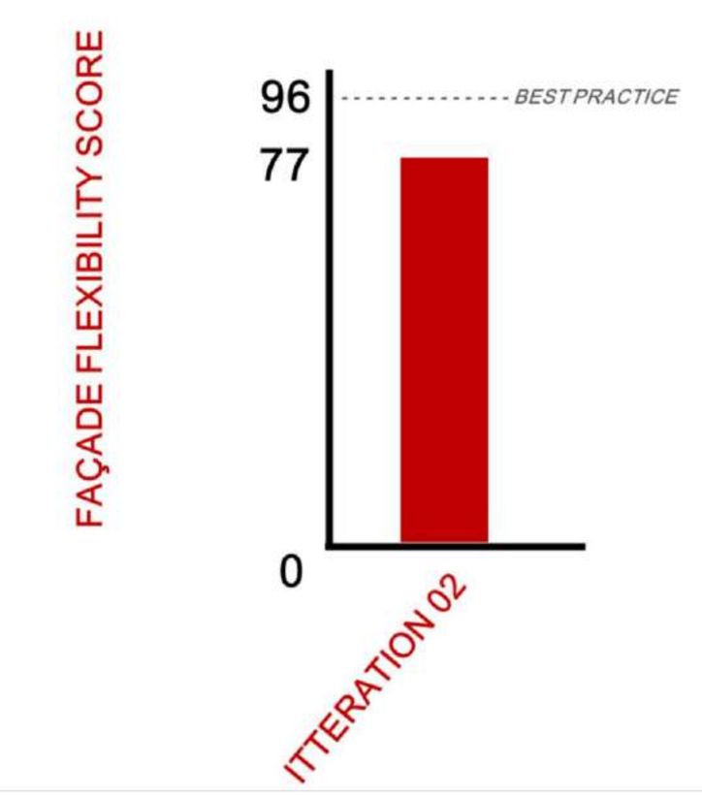
ADAPTIVE FAÇADE INDICATOR TEST - PRECEDENT - 03

TESTING FOR A SOCIO-TECHNOLOGICAL RELATIONSHIP

LAYER	SUB-LAYER	NR.	FLEXIBILITY PERFORMANCE INDICATOR	Weighting	1-Bad	2-Normal	3-Better	4-Best	FINAL SCORE	Adapted from
SKIN	Façade	08(42)	Dismountable façade	3			3		9	(Geraedts 2015)
		24	Day light facilities	2			3		6	(Geraedts et. al., 2016)
		25	Location and shape of day light facilities	2			3		6	(Geraedts et. al., 2016)
		26	Façade insulation	1		2			2	(Geraedts et. al., 2016)
FACILITIES	Measurement & Control	09(53)	Customisability and controlability of facilities	3				4	12	(Geraedts 2015)
	Dimensions	12(65)	Disconnection of facilities components	3			3		9	(Geraedts 2015)
		10	Modularity of facilities	2			3		6	(Carlebur 2015)
SPACE PLAN/ FINISHING	Access	14(73)	Access to building: horizontal routing, corridors, gallery	3			3		9	(Geraedts 2015)
	Technical	15(77)	Removable, relocatable units in building	3			3		9	(Geraedts 2015)
		17(79)	Disconnecting/ detailed connection interior walls: hor/vert.	2			3		9	(Geraedts 2015)

Unit Flexibility Score: 77

Maximum possible score: 96



PROJECT VALIDATION

THEORETICAL FRAMEWORK

PROJECT ESSENCE

WHAT ASPECTS OF HYBRID HIGH-TECH AND LOW-TECH EMERGING BUILDING TECHNOLOGIES COULD BECOME A CATALYST FOR REVITALISING THE SOUTH AFRICAN BUILT ENVIRONMENT WHILE PRIORITISING THE INSTANTIATION OF A RELEVANT LOCAL IDENTITY IN ACCORDANCE WITH ITS PLACES

SA CONSTRUCTION INDUSTRY

LACK OF CLEAR IDENTITY

PROBLEM CONTEXT

SOLUTION STRATEGY

TECTONIC THEORY

HYBRID HIGH-TECH AND LOW-TECH ARCHITECTURAL LANGUAGE

PRACTICAL GAP

- Limited range of accessible building materials
- Cost of building materials
- Low rate of technological advancement in construction industry due to technological lag throughout African continent
- Mismatch between available skills and required skills

PLACELESSNESS

STRONG SENSE OF COMMUNITY OWNERSHIP THREATENED AND LESS CHANCE OF ARCHITECTURAL LONGEVITY

THEORETICAL GAP

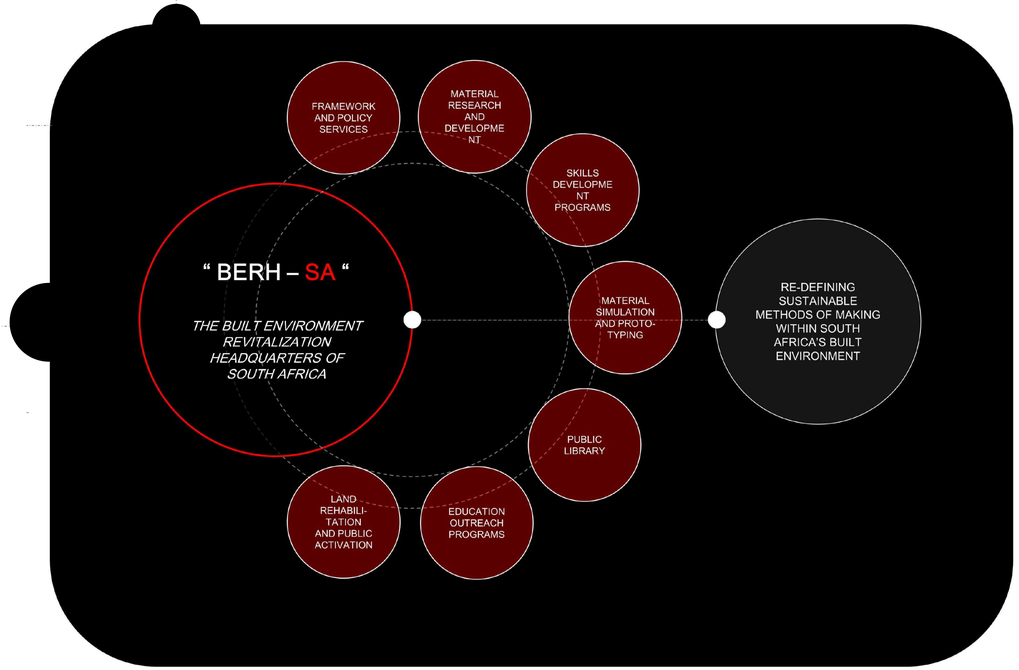
- Research literature has global focus resulting in reluctance in implementing available theory through practice

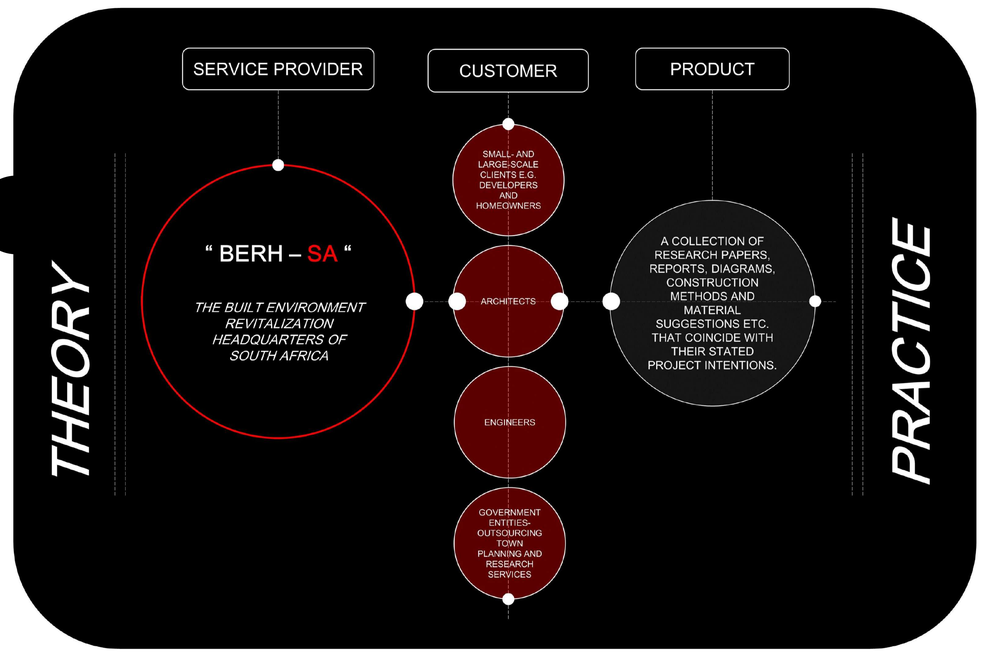
BERH-SA AS PRACTICAL ARCHITECTURAL SOLUTION

- Consider people in relation to technology
- Consider historical narrative
- Consider physical topographical environmental factors
- Consider appropriate technological innovation and reinterpretation based on context

PROMOTES DESIGN INFORMED BY CREATING RELATIONSHIPS BETWEEN PEOPLE, CONTEXT AND IMPLEMENTED BUILDING TECHNOLOGIES TO ATTAIN ARCHITECTURAL LONGEVITY

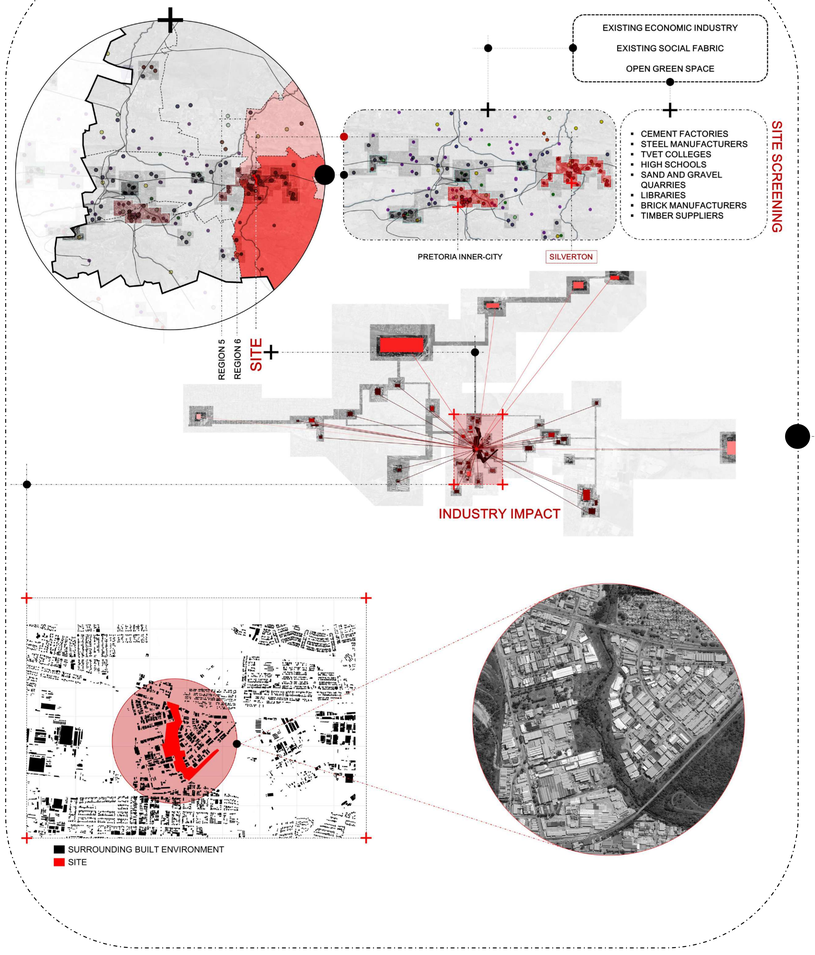
PROGRAMATIC CONSIDERATIONS

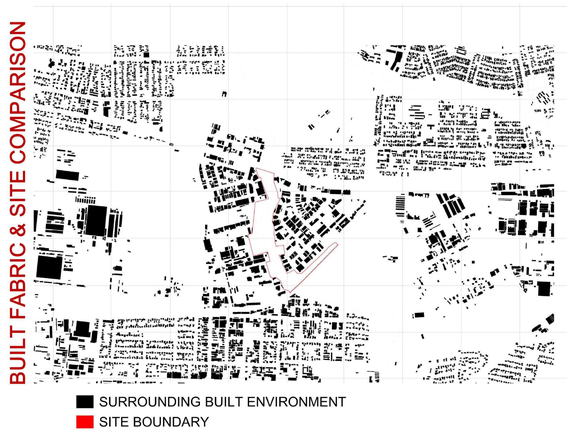


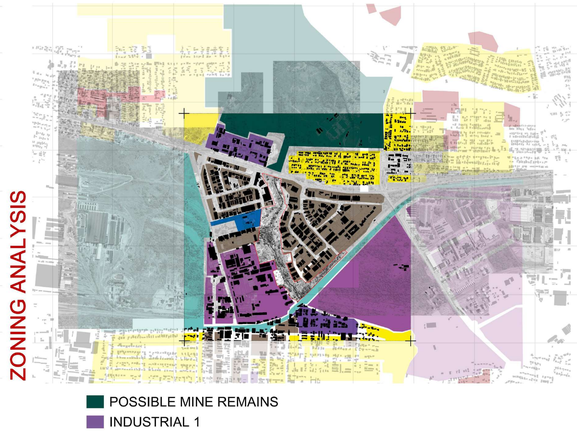


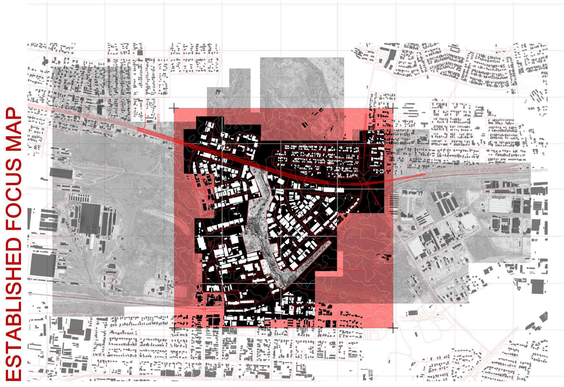
SITE FABRIC

SITE SCREENING PROCESS AND LOCATION









PRELIMINARY SITE ANALYSIS

URBAN VISION

BERH-SA

URBAN VISION INFORMANTS

RIVER BOUNDARY

- SITE BOUNDARY
- 20M RIVER BUFFER
- RIVER SHAPE AND BIODIVERSITY

MOBILITY

- PROPOSED BRT ROUTE
- PROPOSED ACCESSIBILITY SPINE
- MOBILITY ROADS
- EXISTING ACTIVITY SPINE
- EXISTING RAIL LINE

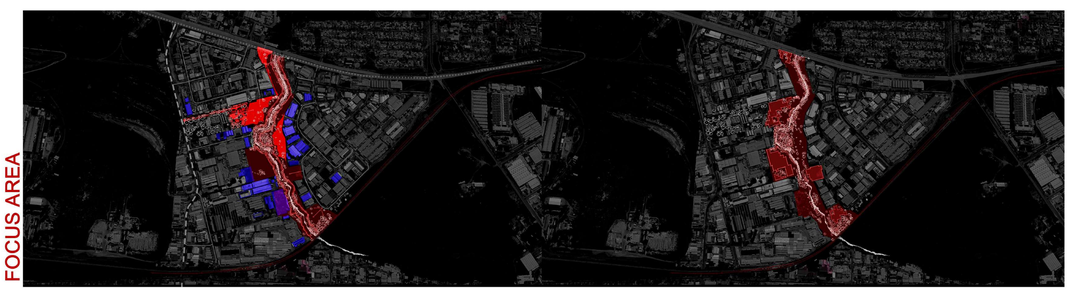
INDUSRTY EDGE

- SITE BOUNDARY
- 20M RIVER BUFFER
- RIVER SHAPE AND BIODIVERSITY
- INDUSTRIAL EDGE

EDGE SIGNIFICANCE

- SITE BOUNDARY
- 20M RIVER BUFFER
- RIVER SHAPE AND BIODIVERSITY
- INDUSTRIAL EDGE
- INDUSTRIAL EDGE SIGNIFICANCE

FOCUS AREA

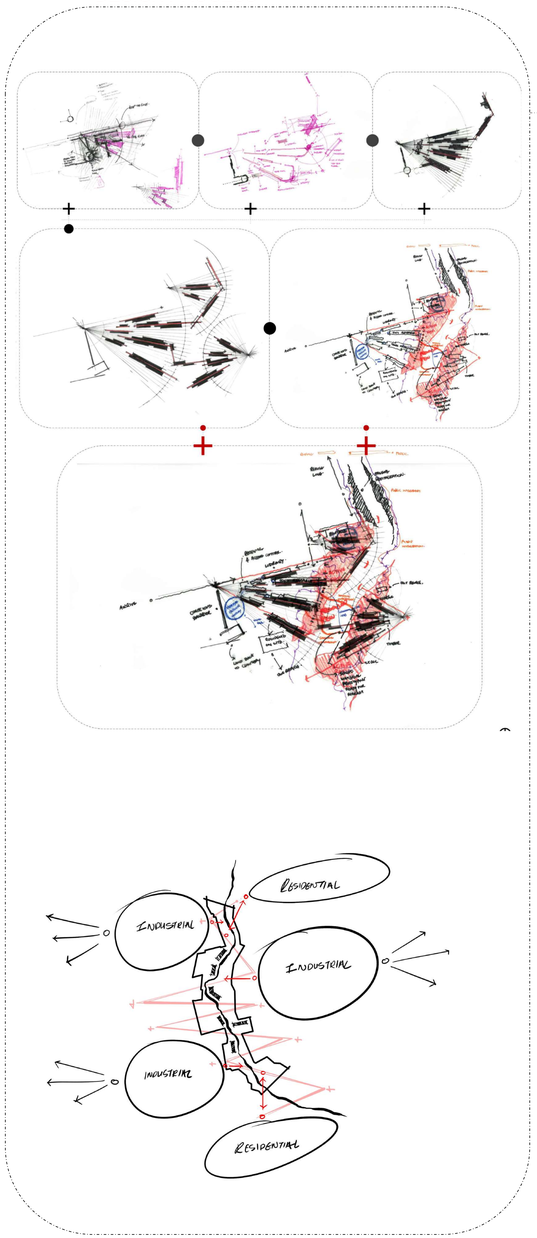


- SITE BOUNDARY
- 20M RIVER BUFFER
- RIVER SHAPE AND BIODIVERSITY
- FOCUS POLYGON
- INDUSTRIAL EDGE SIGNIFICANCE

DEVELOPMENT AREAS

- SITE BOUNDARY
- 20M RIVER BUFFER
- RIVER SHAPE AND BIODIVERSITY
- OPPORTUNITIES FOR DEVELOPMENT

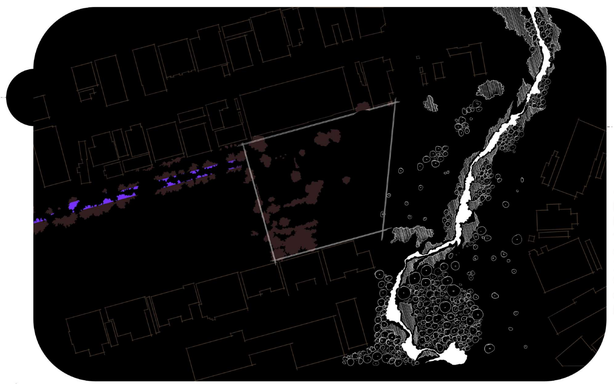
DESIGN PROCESS



FINAL EXPLORATION

FOCUS AREA

URBAN VISION



FOCUS AREA

SITE FABRIC

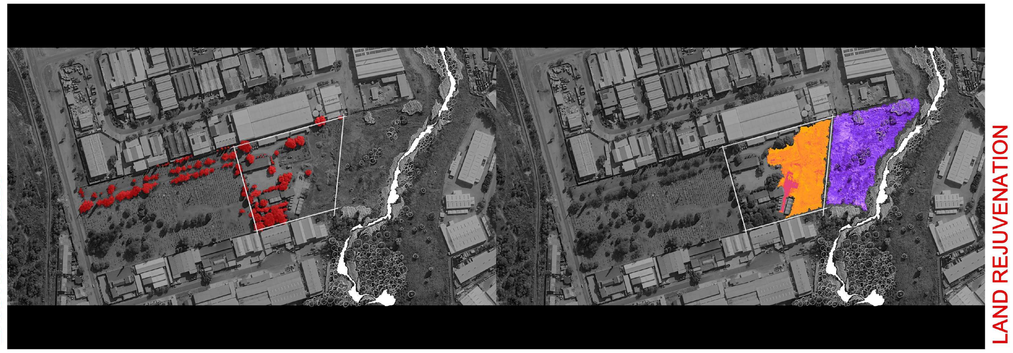
SITE BOUNDARY AND RIVER

EXISTING BUILDINGS

SITE BOUNDARY AND RIVER

SITE BOUNDARY AND RIVER

EXISTING BUILDINGS



EXISTING TREES

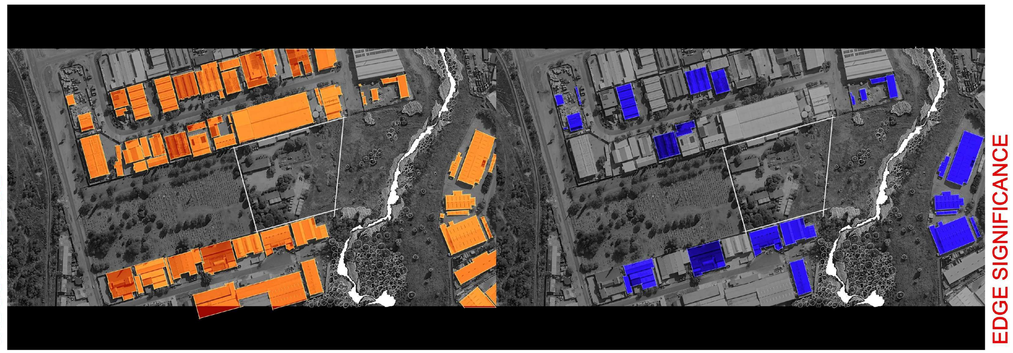
LAND REJUVENATION

SITE BOUNDARY AND RIVER

EXISTING TREES

"DEAD" LAND

REJUVINSTED LAND



INDUSRTY EDGE

EDGE SIGNIFICANCE

SITE BOUNDARY AND RIVER

EXISTING INDUSTRIAL BUILDINGS

SITE BOUNDARY AND RIVER

EXISTING INDUSTRIAL BUILDINGS WHERE POTENTIAL SERVICES CAN BE OUT-SOURCED

EXISTING CEMETERY

EXISTING ACCESS

DESIGN APPROACH

SITE ATTITUDE

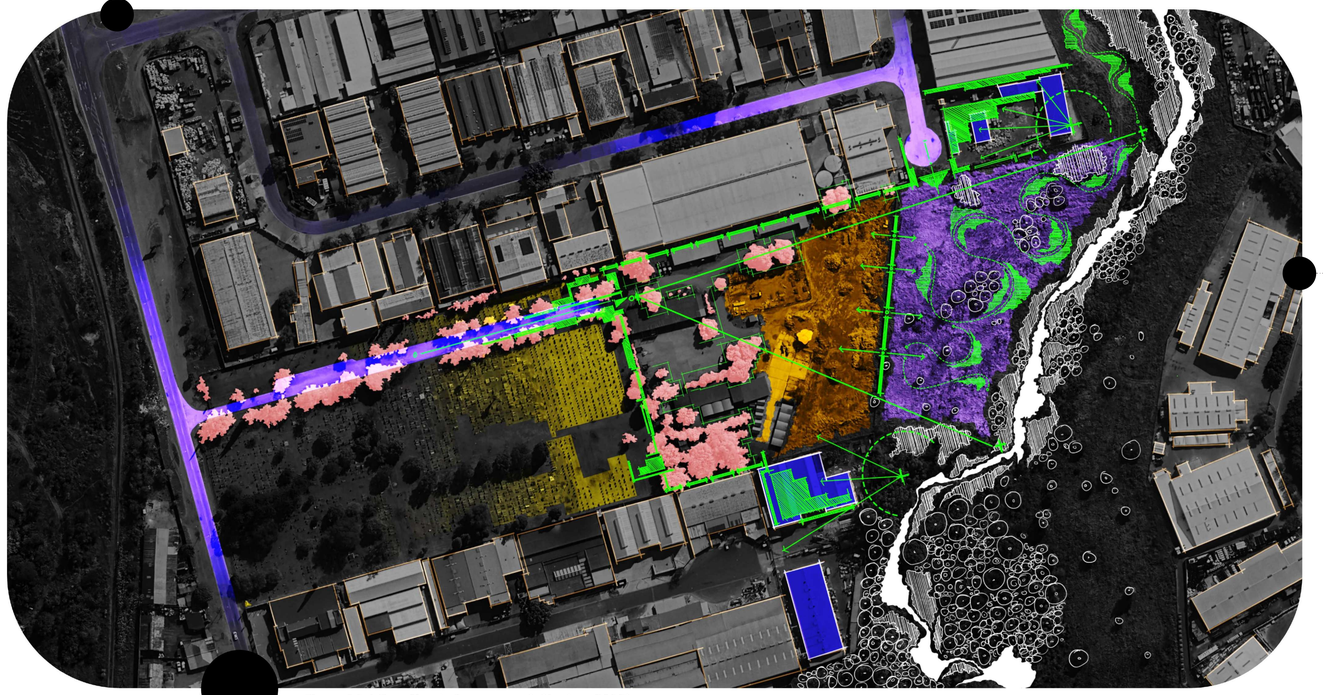
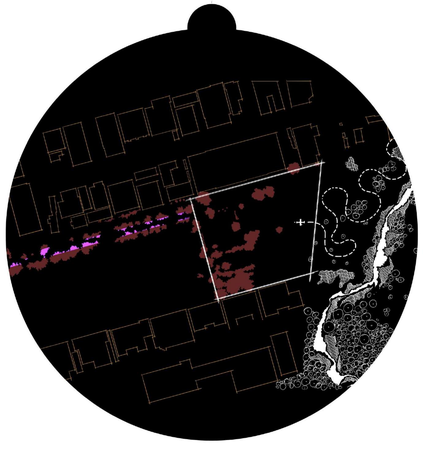
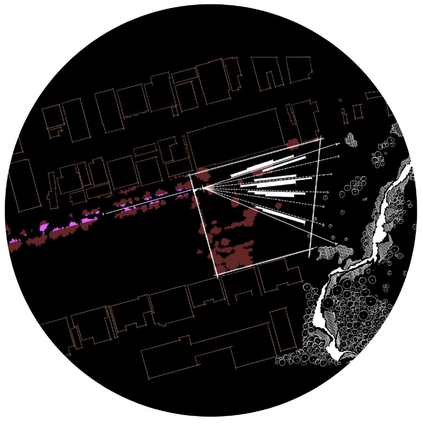


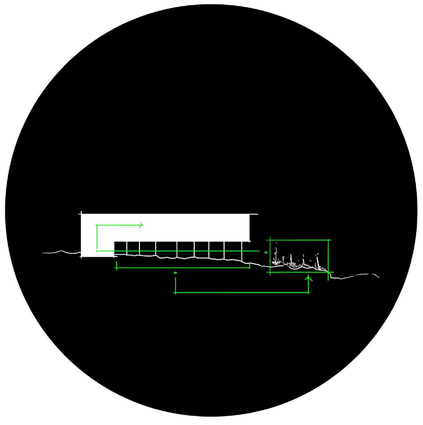
Figure 24: Micro Site design approach (Author, 2023)



SINUOUS LINE



FEATHERING BUILDINGS

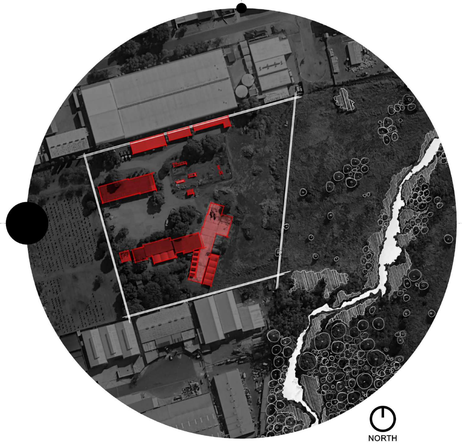


ECOLOGICAL INTEGRATION

DOCUMENTED RIVER CHANGES

+

HERITAGE STANCE

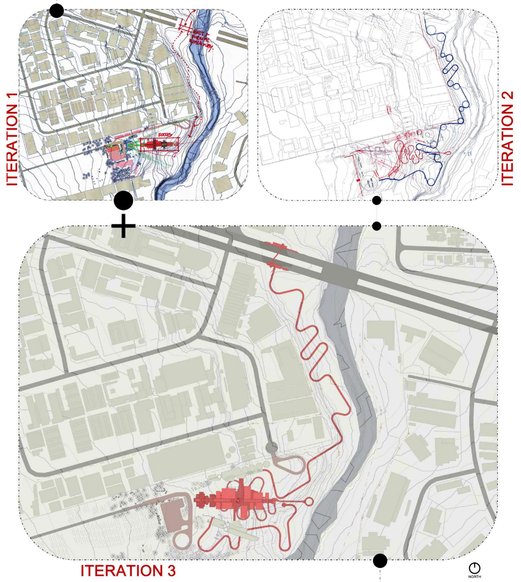


OVERALL VALUE IN BRICK AND TIMBER

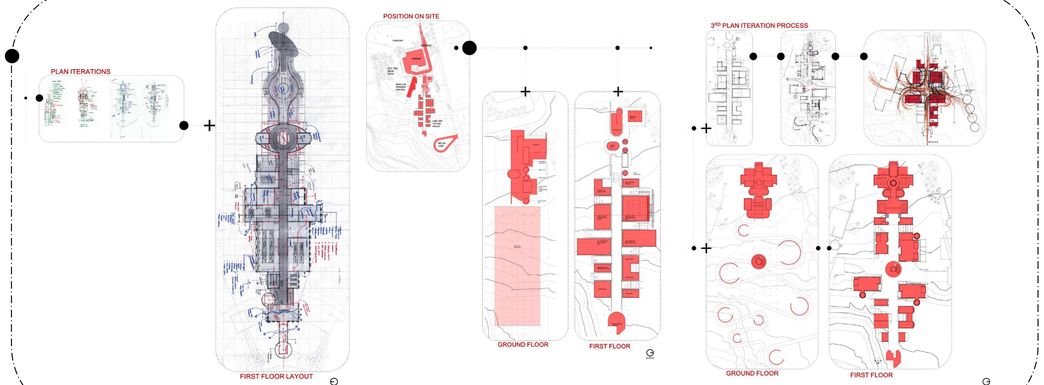
EXISTING BUILDINGS TO BE DEMOLISHED

ITERATIVE DESIGN

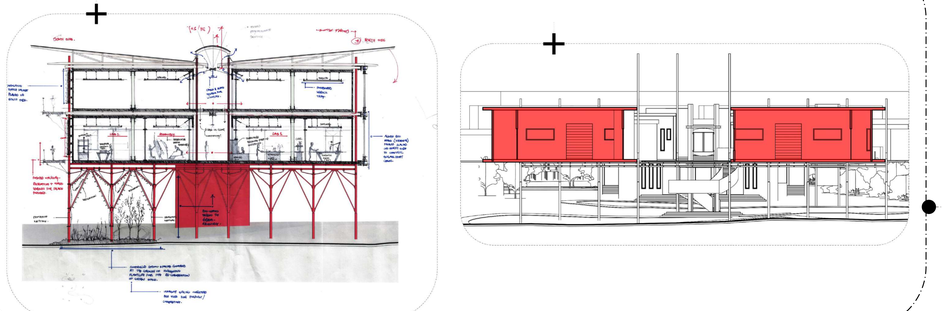
DEVELOPMENT OF MOVEMENT PATTERNS



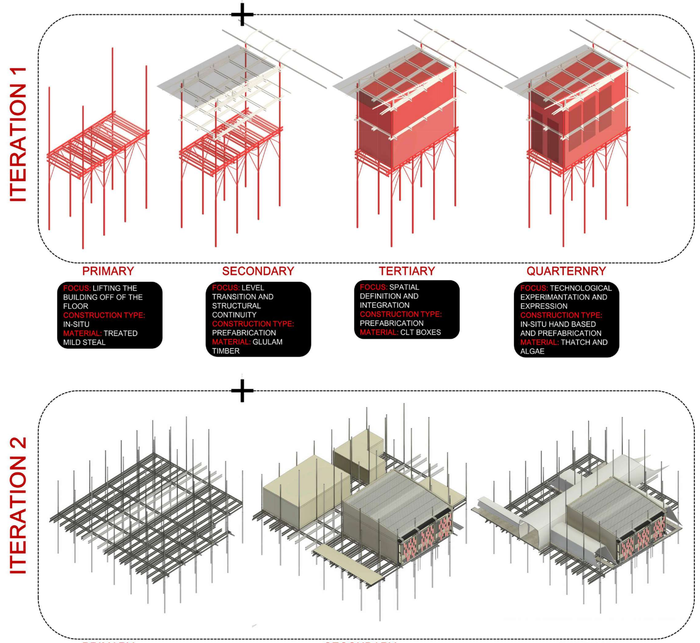
PLAN DEVELOPMENT



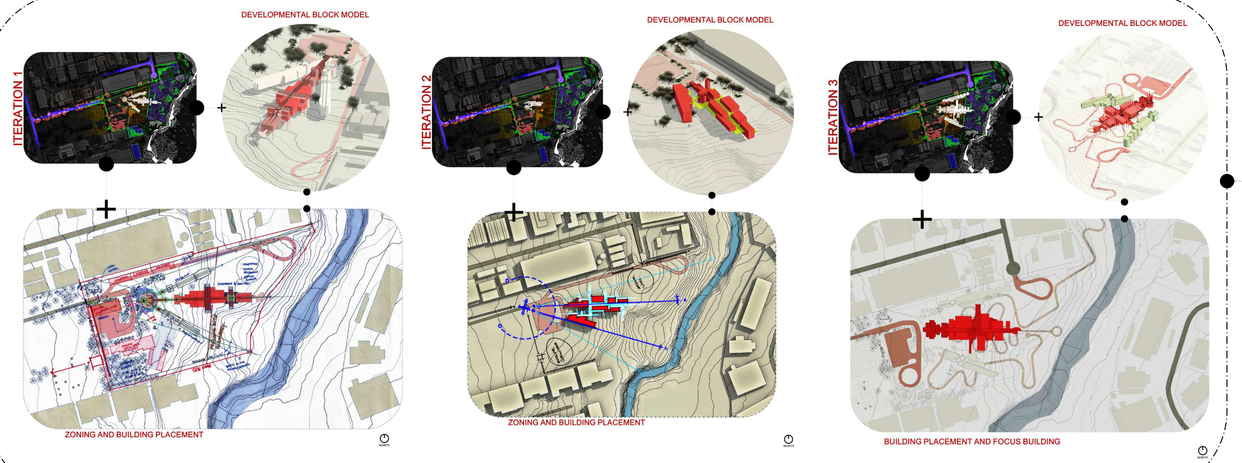
SECTION DEVELOPMENT



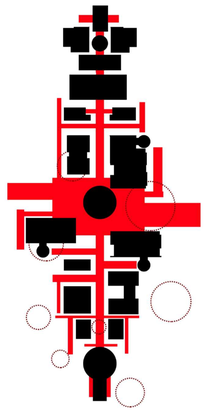
TECTONIC DEVELOPMENT



SITE PLAN DEVELOPMENT



IDEOGRAMATIC PORTRAYAL



ISOMETRIC DEPICTIONS

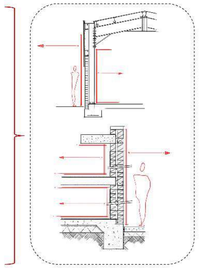
PERFORMANCE TESTING

BASE CASE

IN TERMS OF A BASELINE FOR ADAPTIVE FAÇADE FLEXIBILITY TESTING – CONTEXT AROUND THE SITE WAS DEFINED AS THE BASE CASE

CHOSEN FOCUS CONTEXT ADJACENT TO SITE

THE MOST PROMINENT CONTEXT IS DEFINED BY A TYPICAL WAREHOUSE TYPOLOGY WITH A STATIC MONOFUNCTIONAL FAÇADE SYSTEM



TYPICAL CONSTRUCTION DETAILS ASSOCIATED WITH THE CONTEXT SHOW HOW INTERIOR SPACE, EXTERIOR, AND THE USER ALL BECOME SEGREGATED DUE TO A STATIC FACADE

ADAPTIVE FAÇADE INDICATOR TEST - BASE CASE

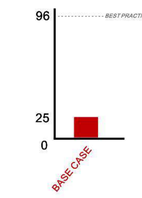
TESTING FOR A SOCIO-TECHNOLOGICAL RELATIONSHIP

LAYER	SUB-LAYER	NR.	FLEXIBILITY PERFORMANCE INDICATOR	Weighting	1-Bad 2-Normal 3-Better 4-Best	FINAL SCORE	Adapted from:
SKIN	Façade	08(42)	Dismountable façade	3	1	3	(Gerasidis 2015)
		24	Day light facilities	2	1	2	(Gerasidis et. al., 2016)
		25	Location and shape of day light facilities	3	2	6	(Gerasidis et. al., 2016)
		26	Façade insulation	1	2	2	(Gerasidis et. al., 2016)
FACILITIES	Measurement & Control	09(53)	Customizability and controllability of facilities	3	1	3	(Gerasidis 2015)
	Dimensions	12(65)	Disconnection of facilities components	3	1	3	(Gerasidis 2015)
		10	Modularity of facilities	2	1	2	(Cartelsur 2015)
SPACE PLAN/ FINISHING	Access	14(73)	Access to building; horizontal routing, corridors, gallery	3	1	3	(Gerasidis 2015)
	Technical	15(77)	Removable, relocatable units in building	3	1	3	(Gerasidis 2015)
		17(79)	Disconnecting/ detailed connection interior walls: horivert.	3	1	3	(Gerasidis 2015)

Unit Flexibility Score: 23

Maximum possible score: 96

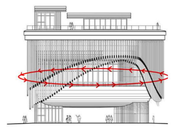
FAÇADE FLEXIBILITY SCORE



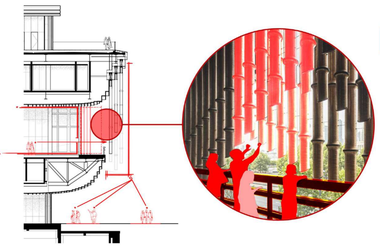
FLEXIBILE FAÇADE PRECEDENT - 02

BUND FINANCE CENTER – FOSTER AND PARTNERS

THIS BUILDING FEATURES A FAÇADE MADE UP OF 4 LAYERS THAT ALL MOVE IN OPPOSITE DIRECTIONS



THE FAÇADE SYSTEM MOVES IN ACCORDANCE WITH SOLAR SHADING AND HEAT GAIN REQUIREMENTS



ON DETAIL SECTION ONE IS ABLE TO SEE HOW THE FAÇADE BECOMES A SPATIAL ELEMENT THAT PEOPLE INSIDE AND OUTSIDE CAN INTERACT WITH

ADAPTIVE FAÇADE INDICATOR TEST - PRECEDENT - 02

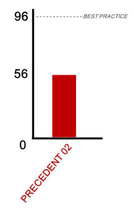
TESTING FOR A SOCIO-TECHNOLOGICAL RELATIONSHIP

LAYER	SUB-LAYER	NR.	FLEXIBILITY PERFORMANCE INDICATOR	Weighting	1-Bad 2-Normal 3-Better 4-Best	FINAL SCORE	Adapted from:
SKIN	Façade	08(42)	Dismountable façade	3	2	6	(Gerasidis 2015)
		24	Day light facilities	2	3	6	(Gerasidis et. al., 2016)
		25	Location and shape of day light facilities	3	3	9	(Gerasidis et. al., 2016)
		26	Façade insulation	1	3	3	(Gerasidis et. al., 2016)
FACILITIES	Measurement & Control	09(53)	Customizability and controllability of facilities	3	2	6	(Gerasidis 2015)
	Dimensions	12(65)	Disconnection of facilities components	3	2	6	(Gerasidis 2015)
		10	Modularity of facilities	2	2	4	(Cartelsur 2015)
SPACE PLAN/ FINISHING	Access	14(73)	Access to building; horizontal routing, corridors, gallery	3	3	9	(Gerasidis 2015)
	Technical	15(77)	Removable, relocatable units in building	3	2	6	(Gerasidis 2015)
		17(79)	Disconnecting/ detailed connection interior walls: horivert.	3	2	6	(Gerasidis 2015)

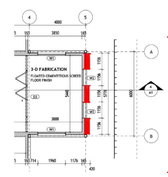
Unit Flexibility Score: 58

Maximum possible score: 96

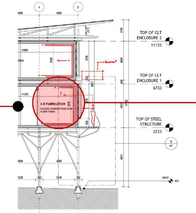
FAÇADE FLEXIBILITY SCORE



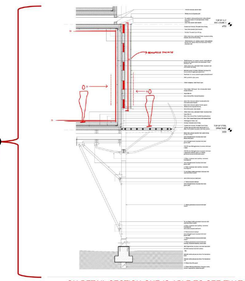
FLEXIBILE FAÇADE ITERATION - 02



ON PLAN THE FAÇADE SYSTEM READS AS AN INTEGRATED WALL ELEMENT WITH NO CONTRIBUTION TO HEAT GAIN AND LIGHT CONTROL



ON SECTION SOME INTERACTION WITH FAÇADE ELEMENTS ARE EVIDENT, HOWEVER, INTERIOR AND EXTERIOR SPACES ARE STILL SEGRIGATED



ON DETAIL SECTION ONE IS ABLE TO SEE THAT THE FAÇADE IS REMOVABLE TO AN EXTENT HOWEVER, IT IS NOT INTERCHANGABLE AND TRANSPARENCY BETWEEN INTERIOR AND EXTERIOR SPACES ARE LIMITED

ADAPTIVE FAÇADE INDICATOR TEST - ITTERATION - 01

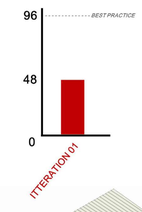
TESTING FOR A SOCIO-TECHNOLOGICAL RELATIONSHIP

LAYER	SUB-LAYER	NR.	FLEXIBILITY PERFORMANCE INDICATOR	Weighting	1-Bad 2-Normal 3-Better 4-Best	FINAL SCORE	Adapted from:
SKIN	Façade	08(42)	Dismountable façade	3	3	9	(Gerasidis 2015)
		24	Day light facilities	2	1	2	(Gerasidis et. al., 2016)
		25	Location and shape of day light facilities	3	2	6	(Gerasidis et. al., 2016)
		26	Façade insulation	1	2	2	(Gerasidis et. al., 2016)
FACILITIES	Measurement & Control	09(53)	Customizability and controllability of facilities	3	2	6	(Gerasidis 2015)
	Dimensions	12(65)	Disconnection of facilities components	3	2	6	(Gerasidis 2015)
		10	Modularity of facilities	2	3	6	(Cartelsur 2015)
SPACE PLAN/ FINISHING	Access	14(73)	Access to building; horizontal routing, corridors, gallery	3	1	3	(Gerasidis 2015)
	Technical	15(77)	Removable, relocatable units in building	3	2	6	(Gerasidis 2015)
		17(79)	Disconnecting/ detailed connection interior walls: horivert.	3	2	6	(Gerasidis 2015)

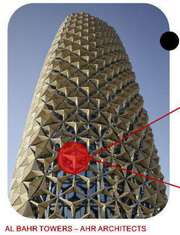
Unit Flexibility Score: 62

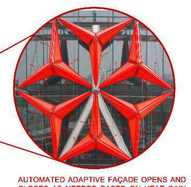
Maximum possible score: 96

FAÇADE FLEXIBILITY SCORE



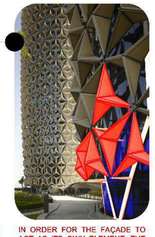
FLEXIBILE FAÇADE PRECEDENT - 01



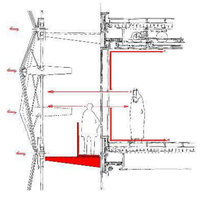


AL BAHR TOWERS – AHR ARCHITECTS

AUTOMATED ADAPTIVE FAÇADE OPENS AND CLOSES AS NEEDED BASED ON HEAT GAIN AND SHADING REQUIREMENTS



IN ORDER FOR THE FAÇADE TO ACT AS ITS OWN ELEMENT, THE TOWERS COMPRISE OF PRIMARY SECONDARY AND TERTIARY ARCHITECTURAL ELEMENTS



ON DETAIL SECTION ONE IS ABLE TO SEE HOW THE FAÇADE BECOMES A SPATIAL ELEMENT THAT PEOPLE INSIDE AND OUTSIDE CAN INTERACT WITH

ADAPTIVE FAÇADE INDICATOR TEST - PRECEDENT - 01

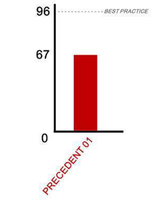
TESTING FOR A SOCIO-TECHNOLOGICAL RELATIONSHIP

LAYER	SUB-LAYER	NR.	FLEXIBILITY PERFORMANCE INDICATOR	Weighting	1-Bad 2-Normal 3-Better 4-Best	FINAL SCORE	Adapted from:
SKIN	Façade	08(42)	Dismountable façade	3	3	9	(Gerasidis 2015)
		24	Day light facilities	2	3	6	(Gerasidis et. al., 2016)
		25	Location and shape of day light facilities	3	3	9	(Gerasidis et. al., 2016)
		26	Façade insulation	1	3	3	(Gerasidis et. al., 2016)
FACILITIES	Measurement & Control	09(53)	Customizability and controllability of facilities	3	3	9	(Gerasidis 2015)
	Dimensions	12(65)	Disconnection of facilities components	3	2	6	(Gerasidis 2015)
		10	Modularity of facilities	2	3	6	(Cartelsur 2015)
SPACE PLAN/ FINISHING	Access	14(73)	Access to building; horizontal routing, corridors, gallery	3	3	9	(Gerasidis 2015)
	Technical	15(77)	Removable, relocatable units in building	3	3	9	(Gerasidis 2015)
		17(79)	Disconnecting/ detailed connection interior walls: horivert.	3	2	6	(Gerasidis 2015)

Unit Flexibility Score: 67

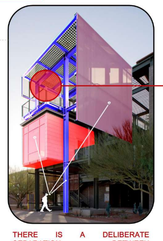
Maximum possible score: 96

FAÇADE FLEXIBILITY SCORE



FLEXIBILE FAÇADE PRECEDENT - 03

ASU POLYTECHNIC CAMPUS LAKEFLATO ARCHITECTS + RSP ARCHITECTS



THERE IS A DELIBERATE SEPARATION BETWEEN STRUCTURE, SPACE AND FACADE

DUE TO THE SEPARATION BETWEEN THESE ELEMENTS, THE BUILDING FAÇADE BEGINS TO ACT AS MORE THAN ONE THING, AND IN SOME CIRCUMSTANCES, THE FAÇADE ELEMENT STARTS TO DEFINE SPACE

THE FLEXIBILITY BETWEEN FAÇADE STRUCTURE AND SPACE ALLOWS EACH BUILDING COMPONENT TO BECOME AN ACTIVE ROLE PLAYER IN GAINING ACCEPTABLE LEVELS OF PASSIVE THERMAL COMFORT

ADAPTIVE FAÇADE INDICATOR TEST - PRECEDENT - 03

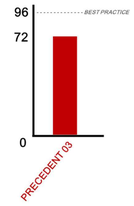
TESTING FOR A SOCIO-TECHNOLOGICAL RELATIONSHIP

LAYER	SUB-LAYER	NR.	FLEXIBILITY PERFORMANCE INDICATOR	Weighting	1-Bad 2-Normal 3-Better 4-Best	FINAL SCORE	Adapted from:
SKIN	Façade	08(42)	Dismountable façade	3	3	9	(Gerasidis 2015)
		24	Day light facilities	2	3	6	(Gerasidis et. al., 2016)
		25	Location and shape of day light facilities	3	3	9	(Gerasidis et. al., 2016)
		26	Façade insulation	1	3	3	(Gerasidis et. al., 2016)
FACILITIES	Measurement & Control	09(53)	Customizability and controllability of facilities	3	3	9	(Gerasidis 2015)
	Dimensions	12(65)	Disconnection of facilities components	3	3	9	(Gerasidis 2015)
		10	Modularity of facilities	2	3	6	(Cartelsur 2015)
SPACE PLAN/ FINISHING	Access	14(73)	Access to building; horizontal routing, corridors, gallery	3	3	9	(Gerasidis 2015)
	Technical	15(77)	Removable, relocatable units in building	3	3	9	(Gerasidis 2015)
		17(79)	Disconnecting/ detailed connection interior walls: horivert.	3	3	9	(Gerasidis 2015)

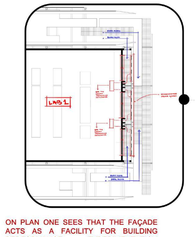
Unit Flexibility Score: 77

Maximum possible score: 96

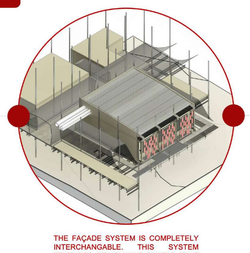
FAÇADE FLEXIBILITY SCORE



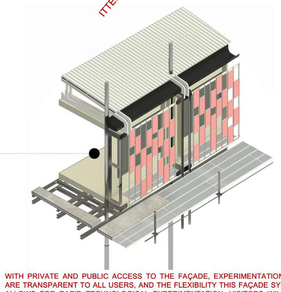
FLEXIBILE FAÇADE ITERATION - 02



ON PLAN ONE SEES THAT THE FAÇADE ACTS AS A FACILITY FOR BUILDING PERFORMANCE EXPERIMENTATION WHERE SENSORS AND OTHER TECHNOLOGIES CONNECT TO COMPUTER SYSTEMS ON THE INTERIOR VIA CLT DUCTS



THE FAÇADE SYSTEM IS COMPLETELY INTERCHANGABLE. THIS SYSTEM FEATURES REMOVABLE PANELS THAT ARE FULLY CUSTOMIZABLE



WITH PRIVATE AND PUBLIC ACCESS TO THE FAÇADE, EXPERIMENTATION PROCESSES ARE TRANSPARENT TO ALL USERS, AND THE FLEXIBILITY THIS FAÇADE SYSTEM OFFERS ALLOWS FOR RAPID TECHNOLOGICAL EXPERIMENTATION. VISITORS WILL ALWAYS BE EXPOSED TO THE LATEST BREAKTHROUGHS IN EXPERIMENTATION DUE TO THE FAÇADE MAKEUP.

ADAPTIVE FAÇADE INDICATOR TEST - PRECEDENT - 03

TESTING FOR A SOCIO-TECHNOLOGICAL RELATIONSHIP

LAYER	SUB-LAYER	NR.	FLEXIBILITY PERFORMANCE INDICATOR	Weighting	1-Bad 2-Normal 3-Better 4-Best	FINAL SCORE	Adapted from:
SKIN	Façade	08(42)	Dismountable façade	3	1	3	(Gerasidis 2015)
		24	Day light facilities	2	3	6	(Gerasidis et. al., 2016)
		25	Location and shape of day light facilities	3	3	9	(Gerasidis et. al., 2016)
		26	Façade insulation	1	2	2	(Gerasidis et. al., 2016)
FACILITIES	Measurement & Control	09(53)	Customizability and controllability of facilities	3	4	12	(Gerasidis 2015)
	Dimensions	12(65)	Disconnection of facilities components	3	3	9	(Gerasidis 2015)
		10	Modularity of facilities	2	3	6	(Cartelsur 2015)
SPACE PLAN/ FINISHING	Access	14(73)	Access to building; horizontal routing, corridors, gallery	3	3	9	(Gerasidis 2015)
	Technical	15(77)	Removable, relocatable units in building	3	3	9	(Gerasidis 2015)
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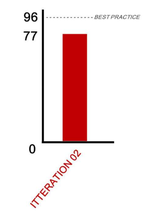
Unit Flexibility Score: 77

Maximum possible score: 96

FAÇADE FLEXIBILITY SCORE



PROJECT SYNOPSIS

BUILT ENVIRONMENT REVITALIZATION HEADQUARTERS OF SOUTH AFRICA

// ABSTRACT

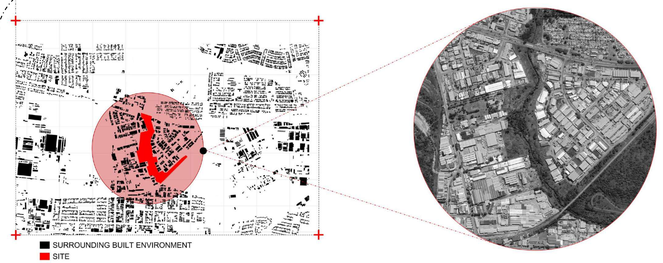
This dissertation stands to explore the validity of introducing a headquarters for technological innovation and emergence for South Africa's built environment that makes deliberate connections with existing greenspaces and the surrounding social fabric.

South Africa's built environment has become slow in its technological development due to: the lack of required skills, existing research on the matter having a global focus, and an overall separation of design and construction processes. South Africa's built environment also seems to be becoming placeless and homogenized due to the lack of identity portrayal in correspondence with its places. With limited research on how the South African built environment could benefit from solving both problems simultaneously, the intention is for the proposed headquarters for technological innovation and emergence to become an alleyway for a possible solution. This dissertation aims to investigate what aspects of hybrid high-tech and low-tech emerging building technologies could become a catalyst for revitalizing the South African built environment while prioritizing the instantiation of a relevant local identity in accordance with its places.

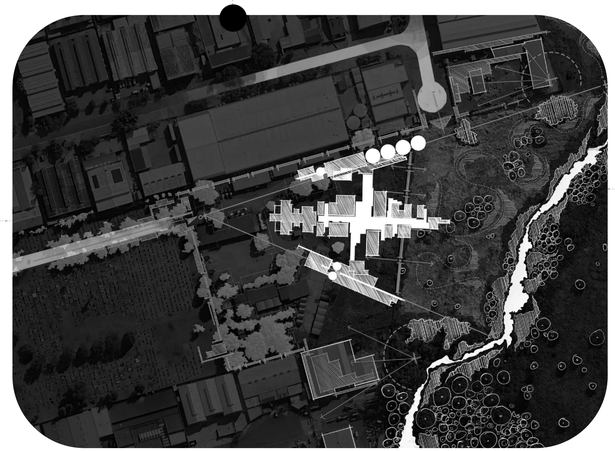
With spheres of industry, ecology, and social fabric all being simultaneously present, Silvertondale presents an ideal opportunity for the development of a place that actively considers the integration of greenspaces, and the social realm within a mono-focused industrial setting. The intended headquarters for technological innovation and emergence focuses on generating a strong economic contribution through industrial processes similar to those within the surrounding context, however, its economic contributions will be heavily determined by how well social and ecological elements are integrated and utilized.

From a tectonic point of view, the final architectural intervention explores the realm of flexible and interchangeable spaces where each architectural element of the final intervention can be perceived and understood as a single entity. The collection of designed counterparts work together in order to create a system that allows for an array of programs to take place. The culmination of patterns and systems designed for are not entirely revolutionary and can sometimes be seen within the existing buildings surrounding the new intervention. The innovation comes through in the reconsideration for these single entities, and how reorganizing system patterns can result in a more pleasant environment for participants. Therefore, the final intervention becomes a collection of interchangeable processes and systems that work together to create a synergized architectural experience that simultaneously considers the industrial realm, as well as social and ecological integration.

SITE – SILVERTONDALE, PRETORIA



URBAN SCALE DEVELOPMENT



FOCUS AREA

TECTONIC CONCEPT

HYBRID TECTONIC

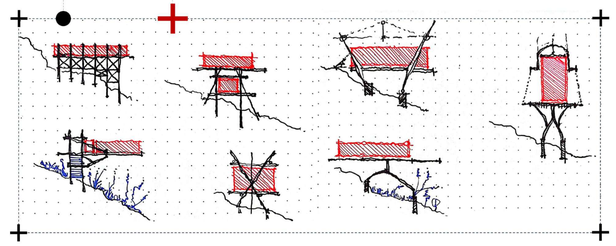
INSTANTIATING A RELATIONSHIP BETWEEN PEOPLE AND TECHNOLOGY

- ECOLOGICAL REVITALIZATION
- INTEGRATION OF SOCIAL FABRIC
- REPROGRAMMING OF INDUSTRIAL BUILT ENVIRONMENT

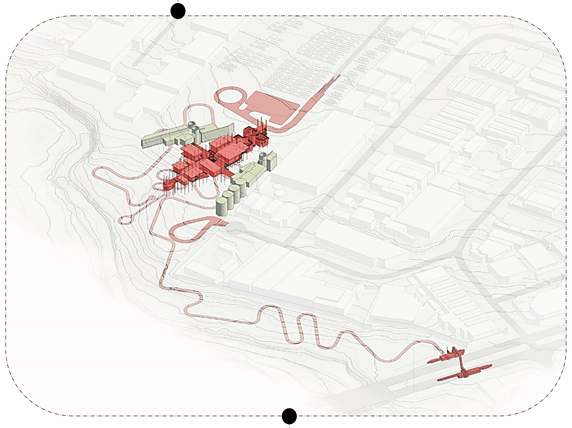
→ THE HYBRIDIZATION OF EMERGING LOW TECH AND HIGH TECH BUILDING TECHNOLOGIES

- *LOW –TECH HAND BASED CONSTRUCTION METHODS*
- *PREFABRICATED CONSTRUCTION*
- *AUTOMATED CONSTRUCTION*
- *INSITU CONSTRUCTION*
- *BIOLIGICALLY INTEGRATED MATERIALS AND PROCESSES*

TECHNOLOGICAL IMPLEMENTATION

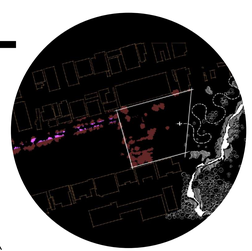


ISOMETRIC DEPICTIONS

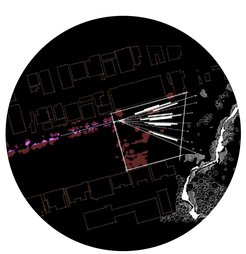


DEVELOPMENT PRINCIPLES

SINUOUS LINE



FEATHERING BUILDINGS



ECOLOGICAL INTEGRATION