

ABSTRACT

Title of Document: RE-INHABITING AN INDUSTRIAL RUIN:
CASTELLAMMARE DI STABIA, ITALY

Degree candidate: Marek Hnizda, Master of Architecture, 2008

Directed by: Assistant Professor Michael A. Ambrose

Site is used as form determinant in a multi-faceted exploration of parametric modeling. The Industrial Site of in the city of Castellammare di Stabia is a case study for other sites around the region. The current site sits as a relic facing three different fronts: the water to the north, the industrial shipyard to the west, and the city, east and south.

Culture and contextual sustainability are other drivers of the manipulation of the site. Part of the culture in Castellammare di Stabia is to use the Bay of Naples for fresh seafood daily and natural spring water from twenty distinct springs. To integrate the site into the current culture programmatic uses that are domestic as apposed to industrial allows for the inhabitants to experience the waterfront all along the southern part of the coast, as they already do in the north.

The process of reinhabitation the site has been the primary focus. This thesis deals with the various components of this industrial ruin, reconnecting the city with its amenity. The pier as a leisurely passerella extending in to the bay of Naples, the elevated silos as a housing apartment complex, the ground floor as a plaza/market place, and the roof top as a public open terrace/ theater. Much like the various components of the complex in their original use had a specific purpose, in this transformation they serve a different but equally specific purpose.

RE-INHABITING AN INDUSTRIAL RUIN:
CASTELLAMMARE DI STABIA, ITALY

by

Marek Hnizda

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Advisory Committee:

Assistant Professor Michael A. Ambrose, Chair

Distinguished University Professor Richard A. Etlin, Ph.D., FAAR

Professor Karl F.G. Du Puy, AIA

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Table of Contents

List of Figures	iv
Introduction/ Value System	9
Chapter 1: Site	17
Chapter 2: Program	27
Chapter 3: Conceptual Explorations	33
Chapter 4: City Scale	38
Chapter 5: Building Scale	45
Chapter 6: Detail Scale	52
Chapter 7: Design Development	63
Chapter 8: Conclusions	83
References	89

List of Figures

Figure 1. Map of Italy, highlighting the Campania region.

Figure 2. Diagram of self-sustaining energy system

Figure 3. Diagram of parametric charting.

Figure 4. Diagram of current public/ private areas of the city

Figure 5. Aerial view of the city of Castellammare di Stabia

Figure 6. Plan Diagram of the City of Castellammare di Stabia

Figure 7. Diagram of early site parameters

Figure 8. Diagram of site massing

Figure 9. Diagram of local fisherman vessels

Figure 10. Diagram of maritime vessels

Figure 11. View of other silo sites

Figure 12. View South along current pier

Figure 13. Map of Italy highlighting Campania Region

Figure 14. Diagram of street adjacent to site.

Figure 15. Site section through Grain silos

Figure 16. Diagram of Street frontage and edge conditions in the city

List of Figures (cont.)

- Figure 17. Diagram of existing edge conditions along the coast
- Figure 18. Urban-scale diagram of the city of Castellammare di Stabia
- Figure 19. Plan diagram of the eighth floor of the grain silo complex
- Figure 20. Diagram of proposed land use on site
- Figure 21. Diagram of link to existing pier
- Figure 22. Proposal for the function and use of CMU
- Figure 23. Diagram of unit mobility and function
- Figure 24. Diagram of detailed unit layout and spatial conditions
- Figure 25. Detail of proposed use of CMU wall
- Figure 26. Existing abandoned area north of site with concrete wall to the south
- Figure 27. Image of typical first floor silo reconfiguration
- Figure 28. View of proposed ground floor fish market
- Figure 29. View of proposed fish market arcade
- Figure 30. Diagram of building cluster layout
- Figure 31. Diagram of proposal of unit layout early in design process
- Figure 32. Diagram of unit catalogue
- Figure 33. Sectional diagram of industry on the site

List of Figures (cont.)

Figure 34. Proposed “I” shape silo unit layout

Figure 35. Proposed “L” shape silo unit layout.

Figure 36. Proposed “I” shape silo unit layout

Figure 37. Proposed silo unit layout

Figure 38. Diagram of typical ortho. unit layout

Figure 39. Diagram proposals for re-inhabiting the silos

Figure 40. Diagram of current grain elevator process

Figure 41. Diagram of silo structural analysis

Figure 42. Sectional diagram through the city of Castellammare di Stabia

Figure 43. Aerial View of the City of Castellammare di Stabia

Figure 44. Plan proposal of the Immediate Site

Figure 45. Plan proposal of typical silo cluster A

Figure 46. Plan proposal of typical silo cluster B

Figure 47. Plan proposal of the ground level.

Figure 48. Plan diagram of unit and corridor relationship

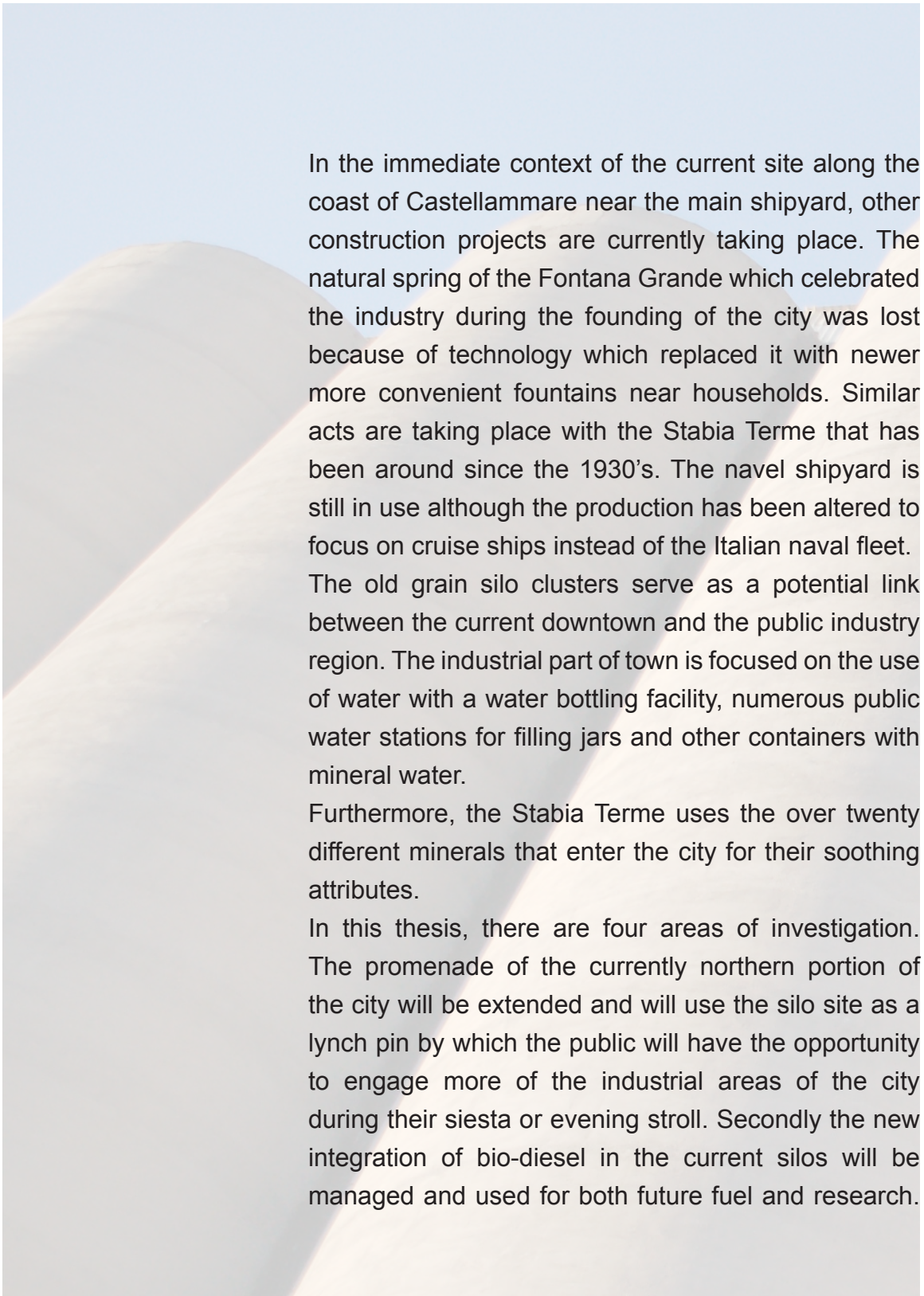
Figure 49. Aerial perspective of the city of Castellammare di Stabia



Figure 01. Map of Italy highlighting Campania Region

The propose of this thesis is to further understand process in architecture and its effect on the “product.” Parametric modeling has become an imbedded component to this process due to its facileness. In parametric modeling, parameters are given to define characteristics of systems or functions. Relationships between parameters in the entire model are tracked, in order to allow for change among variables. As was mentioned in the abstract, four primary foci structure the process investigation. Geometric transformations and manipulations applied to these four elements effect the inhabitation of this industrial concrete ruin along the coast with the surrounding inhabitants. This transformation is directly linked to the perception by people interacting in the vicinity. One of the over aching parameters is building as educational tool. However, this requires more then just a material specification on a construction document. Part of the goal of a design is to communicate clearly to its audience. Likewise, the transformation of this site in Castellammare will affect the culture of the city by educating people about a more sustainable means of living.

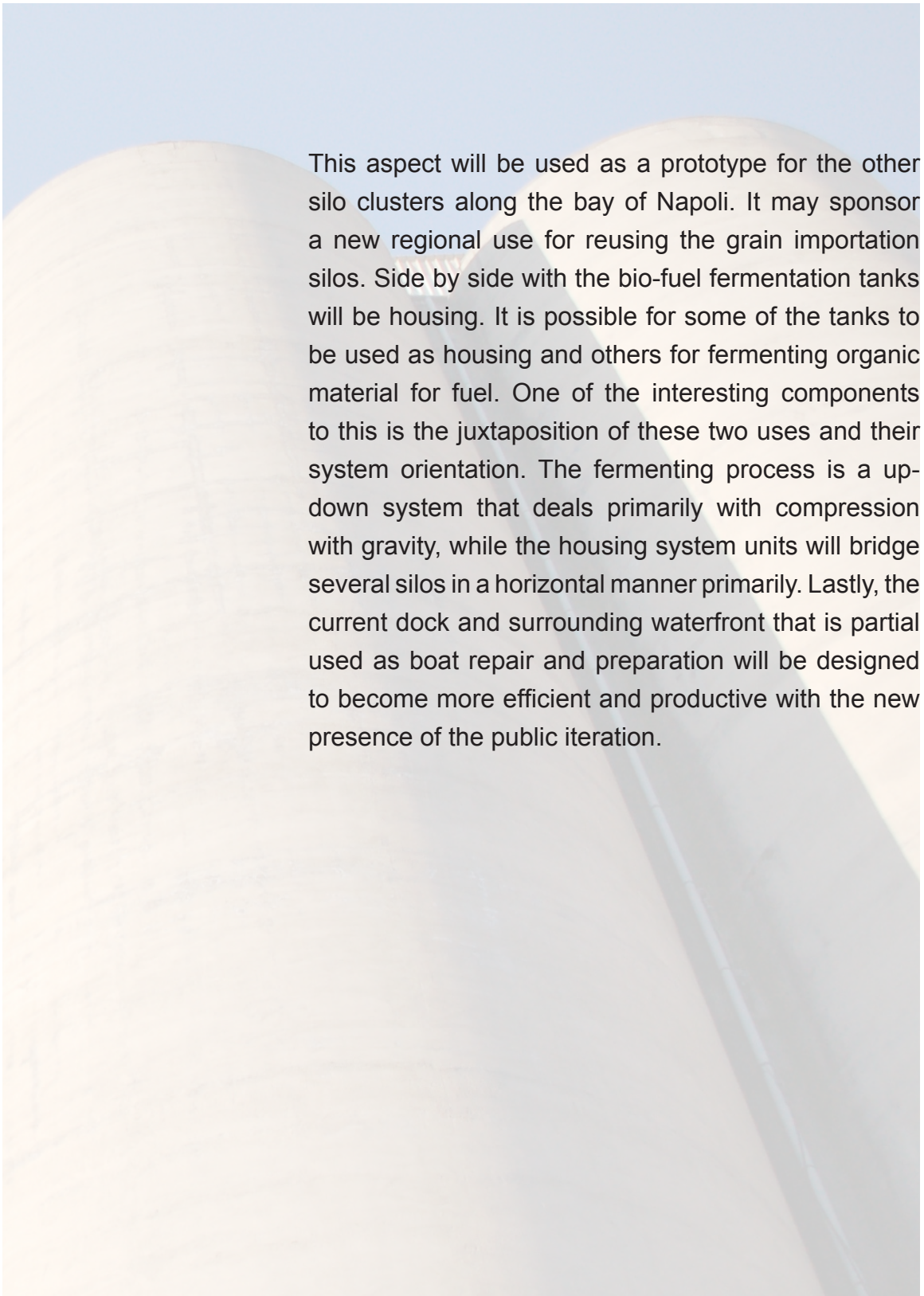
Living does not just constitute ones home, just as is not the case currently in the city. Rather it includes the daily ritual of each individual: activities within the home, traveling through the streets, errands, siesta, espresso breaks, etc.



In the immediate context of the current site along the coast of Castellammare near the main shipyard, other construction projects are currently taking place. The natural spring of the Fontana Grande which celebrated the industry during the founding of the city was lost because of technology which replaced it with newer more convenient fountains near households. Similar acts are taking place with the Stabia Terme that has been around since the 1930's. The naval shipyard is still in use although the production has been altered to focus on cruise ships instead of the Italian naval fleet. The old grain silo clusters serve as a potential link between the current downtown and the public industry region. The industrial part of town is focused on the use of water with a water bottling facility, numerous public water stations for filling jars and other containers with mineral water.

Furthermore, the Stabia Terme uses the over twenty different minerals that enter the city for their soothing attributes.

In this thesis, there are four areas of investigation. The promenade of the currently northern portion of the city will be extended and will use the silo site as a lynch pin by which the public will have the opportunity to engage more of the industrial areas of the city during their siesta or evening stroll. Secondly the new integration of bio-diesel in the current silos will be managed and used for both future fuel and research.



This aspect will be used as a prototype for the other silo clusters along the bay of Napoli. It may sponsor a new regional use for reusing the grain importation silos. Side by side with the bio-fuel fermentation tanks will be housing. It is possible for some of the tanks to be used as housing and others for fermenting organic material for fuel. One of the interesting components to this is the juxtaposition of these two uses and their system orientation. The fermenting process is a up-down system that deals primarily with compression with gravity, while the housing system units will bridge several silos in a horizontal manner primarily. Lastly, the current dock and surrounding waterfront that is partial used as boat repair and preparation will be designed to become more efficient and productive with the new presence of the public iteration.

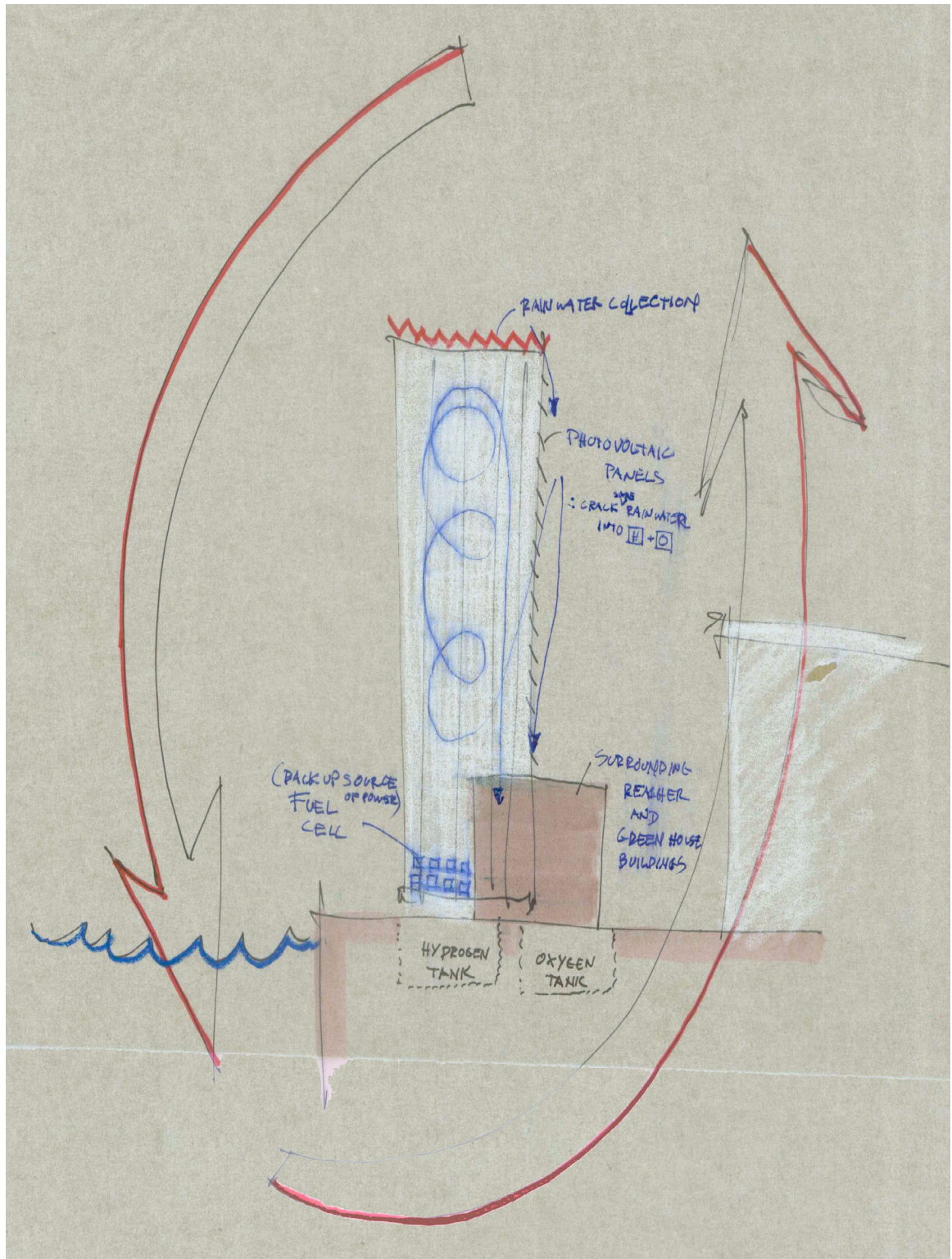


Figure 02. Diagram of self-sustaining energy system

Primacy of Geometry: Method of Parameter Adjustment (Over arching Idea)

Site is geometry. Place becomes site upon the application of boundary, geometry. Geometry relates to but is not synonymous with space. Geometric manipulations/transformations are the main design methodology.

Implications for/of Stabia Culture (Cultural Risk)

Castellammare di Stabia has always had industrial roots: shipbuilding and repairing, grain transportation, naval storage. Furthermore, the city is currently under repair with several public works including, the Fontana Grande (public fountain), and the Stabia Terme (public spa). Culture has a great impact on the determinate interaction of a building with its context. On the other hand, a building may also have a great impact on the determinate interaction of the culture and its context. By understanding not only the context but also the culture, this thesis runs parallel with the current ongoing efforts to reconnect the city with its identity, roots. The current site where the old grain silos reside is the canvas for a potential link between the current downtown and the public industry region.

Sustainability of a Ruin (Cultural Risk)

The use of an existing building in a “new way” enables one to receive, digest, and re-present the implications of an inviting method of living. Passive and active environmental strategies tied with the adaptive preservation of the embodied “reason for being” of Castellammare, endorse coastal remediation.

Program as Overlay: Emergent Link (Architectural Risk)

Contextual use relationships effect the transformation of the coastline in Castellammare di Stabia. By promoting unity and porosity simultaneously, this thesis engages the current everyday nautical events in and around the coastline to respond to the fragments of the city. Links between the perception of common senses, sight, smell, taste, touch and hearing, allow unifying threads for the program to embody.

Relationship of Part/Whole (Architectural Risk)

Exploring various levels of intervention is critical to the development of new relationship of one site to its surrounding context and to the greater region.

- I. Culture
 - A. Ritual- Language
 - B. Place - Climate
 - C. People- Reason for being (Raison D' Etre)
 - D. Time- History

 - II. Experience
 - A. Design
 - i. Personal Experience
 - 1. Italy Trips
 - 2. Construction
 - 3. Studio Competition/ Collaboration: failures and success
 - 4. Daily Routine/Lifestyle
 - ii. Knowledge based
 - 1. Investigating how to educate yourself
 - a. Site analysis
 - b. Drawing
 - c. Photo
 - d. Video
 - e. Talking to locals
 - f. Observing
 - g. Mimicking:
 - 2. Walking the walk (psychology?)
 - 3. Talking the talk (sociology)
-
- III. Why keep Existing Structure?
 - A. Historical Integrity- Iconic Value
 - i. Through design we can effect the usefulness of an iconic site
 - B. The most sustainable building already stands.
-
- IV. Why This Site?
 - A. Case Study (experience & culture)
 - i. Specific conditions: lacks experience & culture; opportunity to explore experience & culture.
 - B. Outside the U.S.
 - i. Interest in understanding the metric system
 - ii. Interest in unfamiliar culture
 - 1. Including language barriers
 - 2. Acute to other ways of learning
 - C. Familiarity
 - i. Past trips to same location
-
- V. Objective for site?
 - A. Proposition: strength the connection of the site to the city
 - i. Building needs to physically sustain itself
 - ii. Requires city to survive
 - 1. As opposed to grain, the 'reason for being on the site' must be people
 - 2. Because people are necessary to bring place (site) into the existing and evolving culture.

Figure XX. Diagram of parametric charting.



Figure 03. Diagram of current public/ private areas of the city.



Figure 04. Aerial View of the City of Castellammare di Stabia

One of several sites along the coast of the bay of Naples, the silo complex of southern Castellammare di Stabia is located in an the industrial region of the city. In route to the main port of Genoa, the bay of Naples serves as a secondary port for importing goods form the surrounding mediterranean. Recently, due to the increase of land tranasportation, the grain elevators housing grain mostly wheat and barley for food have lost their reason for being. These eight to ten story monolithic concrete structures served southern italian regions with goods, while acting as icons for the waterfront. Now, with out a purpose, silo compex sites such as the one in southern Castellammare break the composite fabric of the city.

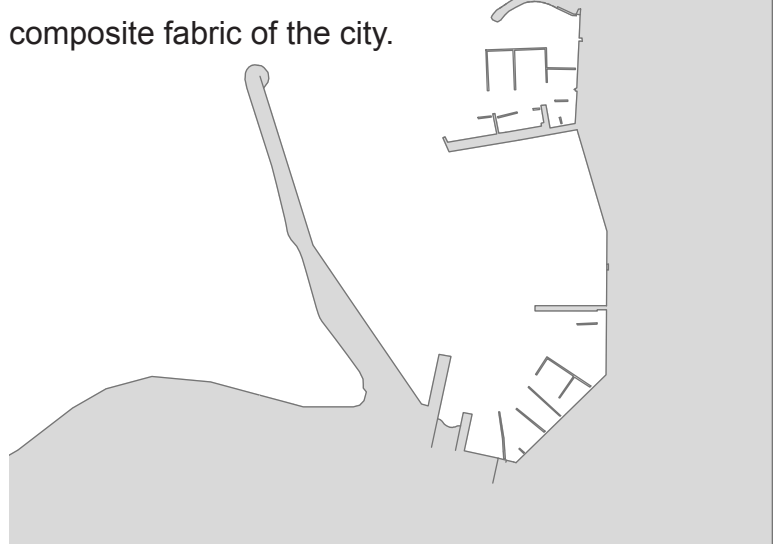


Figure 05. Aerial View of the City of Castellammare di Stabia

Access to the site exists from the main street, via giuseppe bonito, running along the coast or from the water, via the peir extending out from between the silo clusters. The six buildings of the complex are contained by a three meter wall allowing for limited access from the north when exporting grain. The city as a result is fragmented, disconnected from the northern portion of the city and the waterfront to the north.

Currently small business flank the streets with fresh local goods to be sold, but many of them are temporary structures that cannot remain as storefronts for extended periods of time. The storefronts are often extensions of the ground floor seller: a butcher or grocer stand enticing locals to come by. As a result, each vendor needs to publicize his or her product throughout the day, taking more time out of the day for production. Overall, a more centralized location for all consumers to go to, and vendors to display their goods and wears would both benefit each individual coming daily to buy, as well as the buyers; a common market center for commercial produce and seafood. This site already is in direct connection to several public springs and one major fountain, currently under reconstruction.

This fountain, known as the Fontana Grande dates back

throughout the city, extending out onto a plaza to the north but currently disconnected from the waterfront due to a gas station.

Positioned between the waterfront, the city's main street, and among other buildings re-fitted for domestic use, this monolithic concrete ruin is ripe with potential. Possibilities that will help re-connect the community of Castellammare with the waterfront. The potential opportunities for people to re-interact on the site are fundamental for commerce and cultural growth to exist.

Currently the city ground floor extends throughout the streets between the buildings and out into the Bay of Naples, until the grain silo complex is reached. Here the concrete wall limits access from concentrated points. Not only do the walls inhibit human movement on the site, they prevent the wind from flowing out of the city into the bay year round.

The city of Castellammare di Stabia, although it uses modern technology to improve life, still uses traditional methods of construction to structure the design each building in relationship to the whole coastline. Each building faces Vesuvius to the north with the sun rising in the east and hitting the back side throughout the

day. As a result, the orientation corresponds to the approach and use of each architectural manifestation. This is reflected in the facade, whether facing a street, walkway, waterfront, alley, hillside, or plaza.

As a result, the each facades surrounding the grain silo complex reflects a specific use: housing, store, cafe, plaza, public fountain, shipyard, warehouse, etc. Part of the responsibility of re-inhabiting a building is to address the context. In the following design chapters the dialogue between the surrounding buildings and the new program and function of the silos will be investigated.

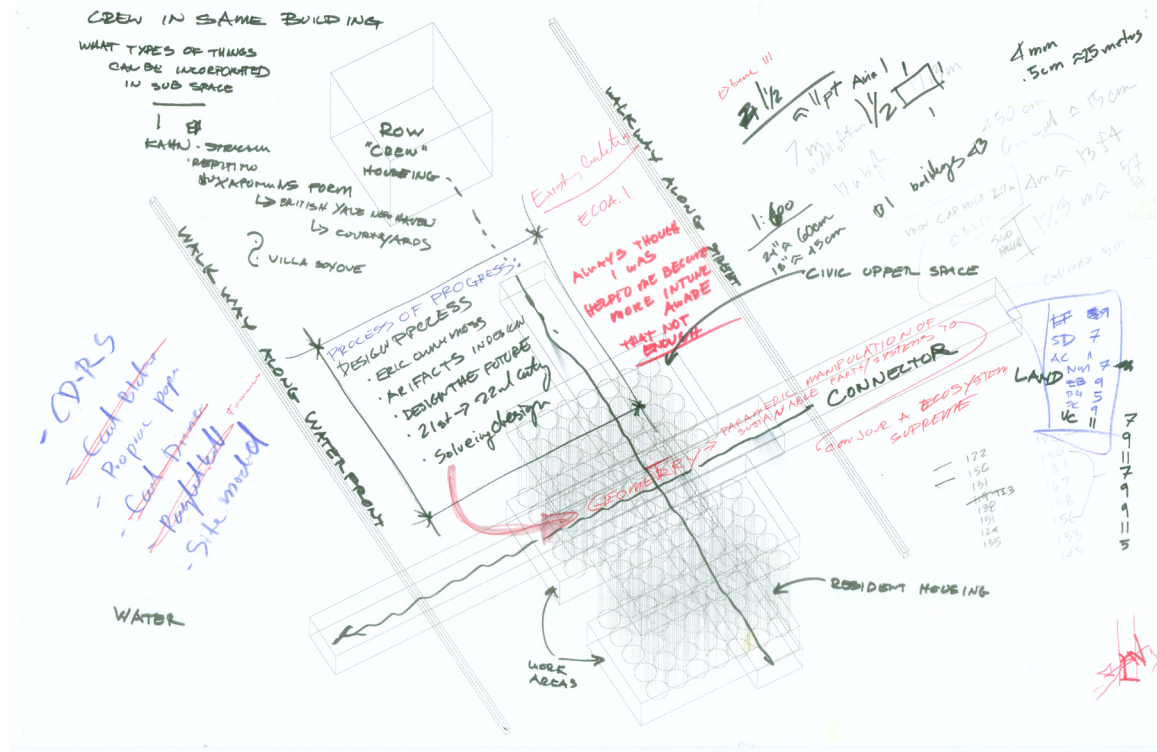


Figure 06. Diagram of early site parameters.

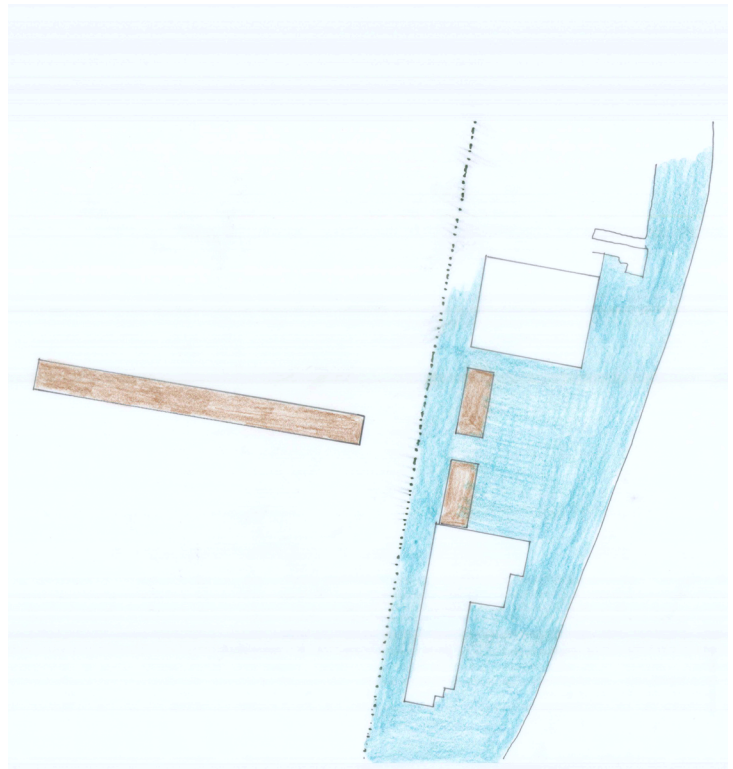
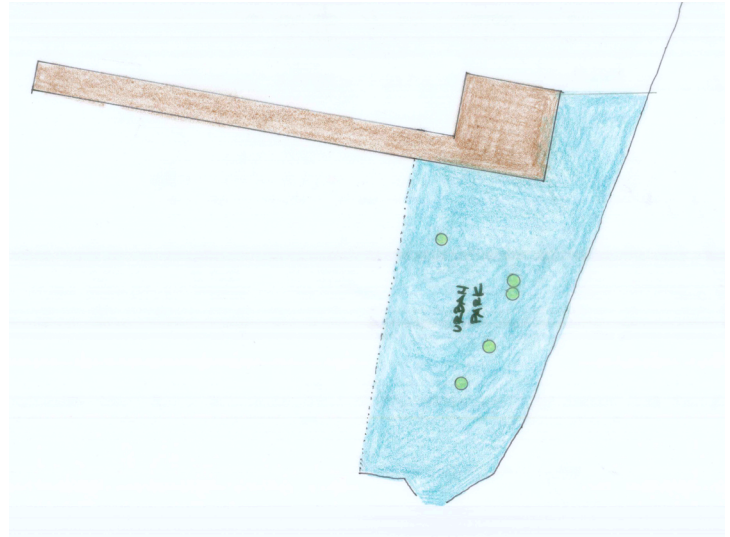


Figure 07. Diagram of site massing.

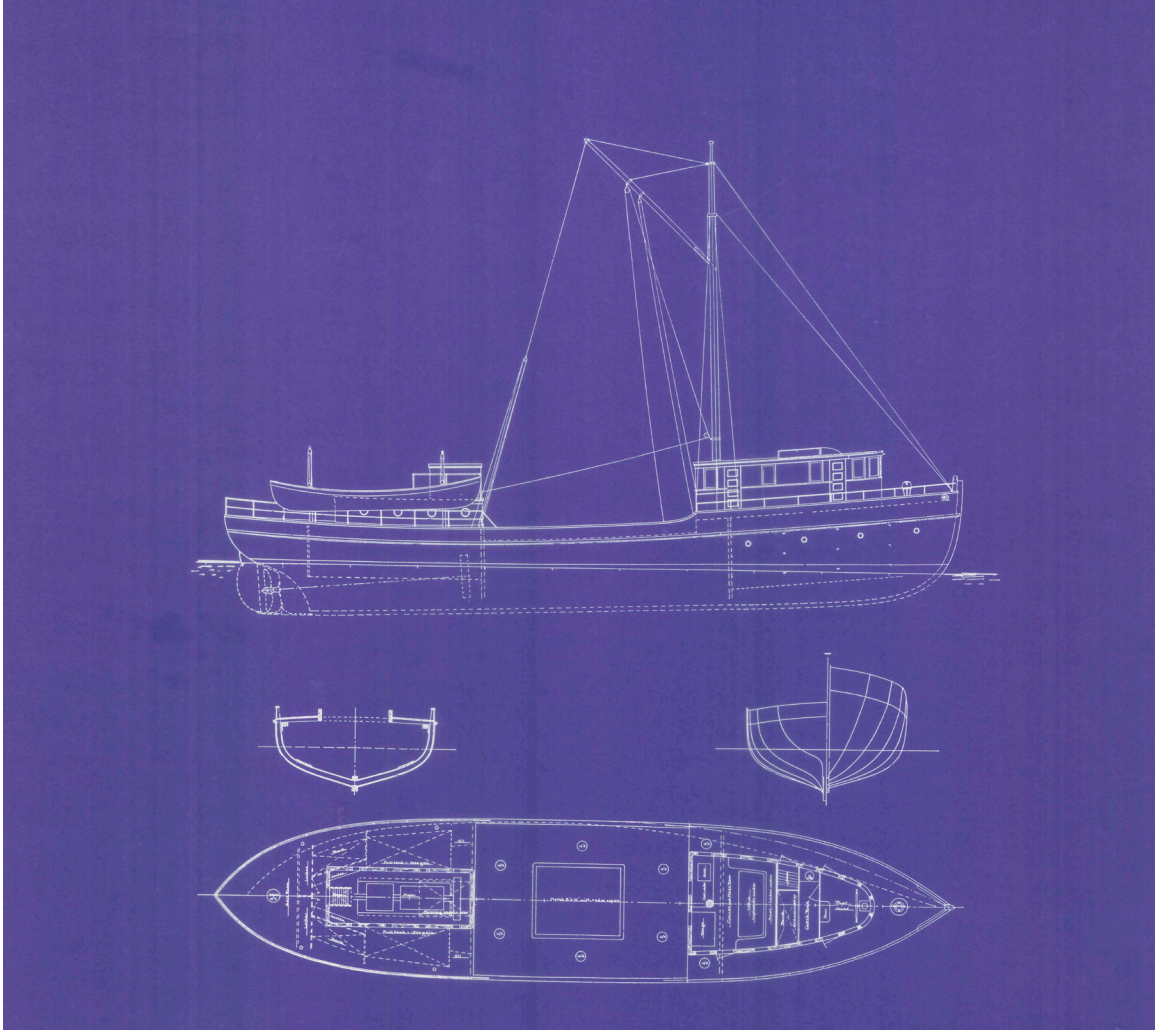


Figure 08. Diagram of local fisherman vessels.

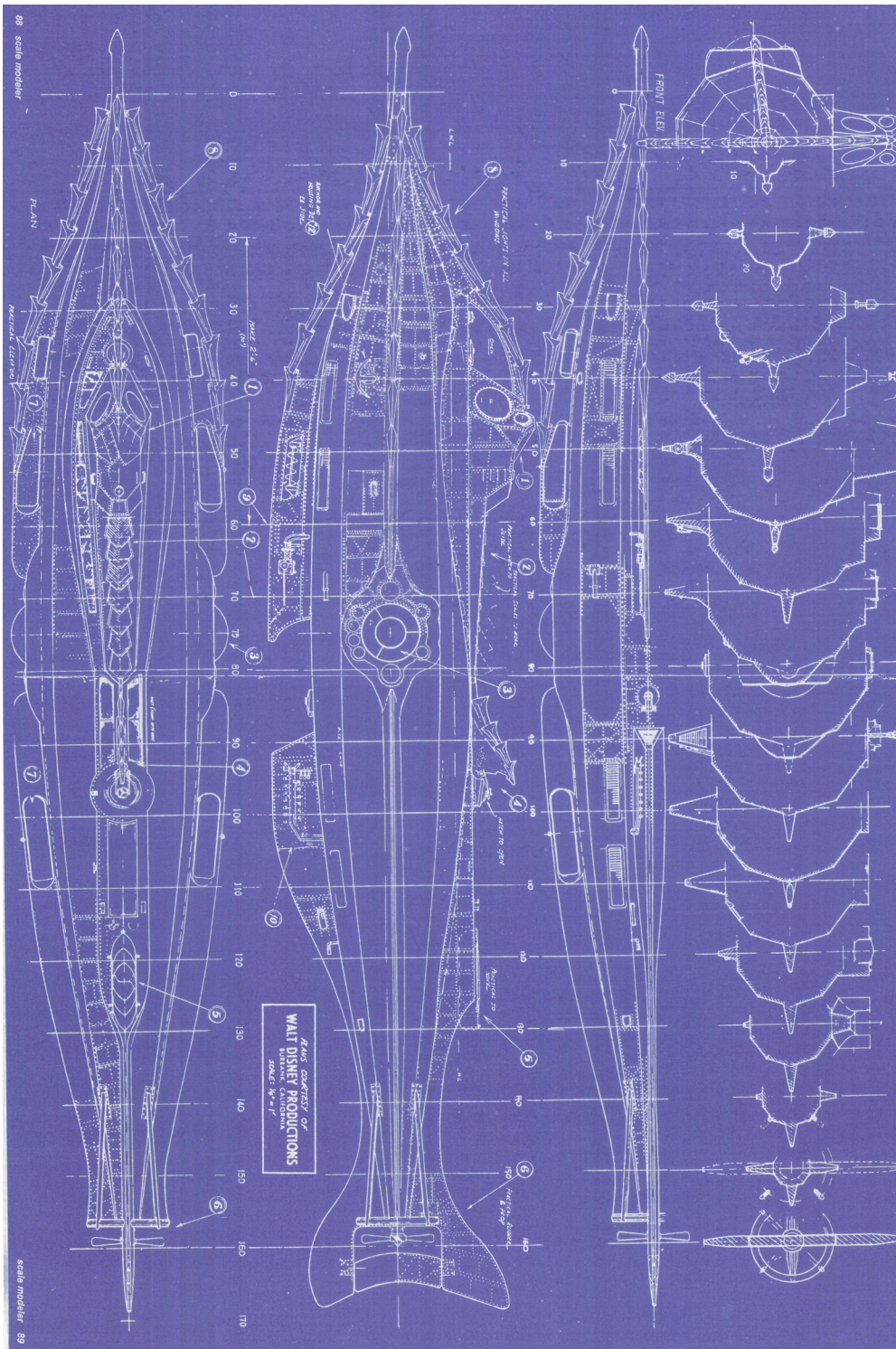


Figure 09. Diagram of maritime vessels.



Figure 10. View of other silo site



Figure 11. View South along current pier

When responding to the task of building renewal, investing the previous use is as important to the new function. On the site of the grain silo in Castellammare, industry flourished and expanded to accommodate a salt importing facility alongside the grain clusters. However, due to the recent change in grain importing and exporting from other countries via land, the need for the several silo sites along the bay of Naples has decreased. Furthermore, the massive concrete structures are not structured or organized to adjust to this change and become industrial ruins.

While the site is ripe for a multitude of program types, only certain functions can exist and adjust to the ever-changing city and its inhabitants. Therefore, the program can no longer exist as an industrial entity, requiring external sources of materials from other countries. Rather, it must remain self-sustaining; the focus on grain in the past must switch over to a focus on people.

With a new use where the inhabitation of people is a primary goal, the function may be altered overtime, but the usability will be constant, something the industrial ruin could not fulfill. The building needs to be self-sufficient and require the inhabitation of people to function. Therefore, uses such as parks, hospitals, research facilities can be appropriate. However, the



Figure 12. Map of Itlay highlighting Campania Region

body of water beyond. It is this move, to invite the public on the ground floor, that continues the culture in Italy of having “the city as a living room.”

To experience yet another perception of the site, a bird’s eye view from higher up on the site at the silo level or even above on the roof top, an observer can witness the a view above all adjacent buildings and out onto the city lining along the bay facing Vesuvius to the north.

Part of the design strategy for this program is to allow for a variety of perceived undertandings of space, depending on the vantage point. To this extent, the silos themselves, including the interstital or residueal space, need not be used for a public program but rather

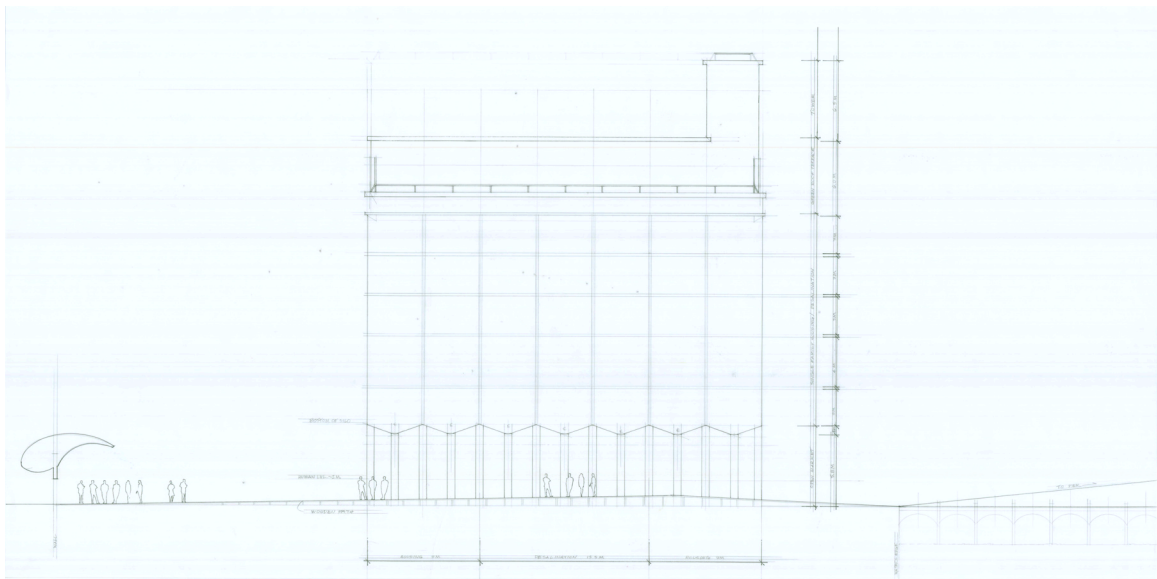


Figure 14. Map of Italy highlighting Campania Region

above and below. Several possibilities are possible including fermentation tanks, a desalination process, housing, and/or urban park. Each of these is appropriate to introduce on the site since it will support a culture where an element, in this case a concrete ruin, can undertake a multitude of life cycles; each of these options can be re-adapted to another use in the future. Fermenting tanks placed in the silos would create another industrial function to the complex supporting the city with a currently useful product. This process, much like the previous option is vertical, with injection of fluid in the top of the silo and extraction from the bottom for exporting. The result still allows for a public ground and roof level. However, is limited due to the safety issue.

Desalination tanks instead of a fermentation system also places an industrial use to the seventy clustered concrete cylinders. It is a useful function for the silos given the contaminated water in the immediate bay region, due to the pollution from the sewage runoff. Part of the reason for Castellammare's founding is the abundance of fresh spring water. Having a desalination center within the city supports this purpose of the city. Introducing a housing apartment in the silos part of the complex would increase the population density in the area. This is also a program that keeps a constant flow

of people in and around the site. Those engaging with the ground floor can escape to the more private areas of the silo levels or overlook the city on the roof top. This program is also more integrated with the surroundings of the site; the site overlooks the bay to the north and the plaza of the Fontana Grande to the southwest.

Finally, installing an urban park onto the site will draw a different crowd. Unlike the housing option, those who use the silo urban park will leave after some point. This program can produce the most public experience. However, there may be periods of time when the site is abandoned. Using this program would emphasize the current view of the site as an industrial ruin.

In the following chapters, each of these proposals is investigated and compared to other parameters.

When transforming “dead spaces” or uninhabited areas of a city and reintegrating them once again into the knitted urban fabric, the cultural influence and reaction is of great importance. This examination is conceptually explored both before and after a change.

Change is thought to be a transformation or evolution of a given parameter. With both a before and after analysis, an assessment can be made with a given set of parameters. This then helps facilitate an objective understanding of how a change might influence the surrounding area.

Functioning as a grain silo complex, little to no connection occurs between the life on the ground floor of the shops and streets to the south of the wall and that of the importing and exporting of grain to the north side. Part of the current disconnection is the CMU wall extending four meters high and blocking any view or connection to the water. One necessary parameter to re-inhabiting the site is to promote a prominent attitude about porosity on the ground floor. This includes re-thinking the purpose of the wall. Rather than using it as a deterrent blocking access, the wall can become threshold connecting and inviting activity throughout the site and surrounding area.

If the program and purpose of the concrete structure were to change to a desalination plant, or even a fermentation refinery, the current industrial aspect would still remain. However, as was mentioned earlier, the ground floor could now be occupied with pedestrians with wall bordering the site redesigned to allow for fluid access to and from the waterfront. Having further access to the rooftop would initiate a series of sequences, similar to that of the previous movement of grain. These views and experiences associated with the movement and placement of grain, now people, place new parameters to consider. Once only a movement system used purely functional reasons, now is a series of movement systems integrated with unique perceptions of the site and its surroundings. A change in industrial function contained within the actual silo shells will be discussed a bit later with time, methodology, and function as parameters promoting common resolutions.

Introducing an industrial park inside of the silos would continue the public realm throughout the entirety of the site. Allowing each person to take his or her own journey through the empty clusters via passageways, is an architectural idea about reflection and remembrance. The ability to decide one's own path of travel, just as

The ability to create one's own path of travel, just as locals do along the waterfront passageway in the city, through the concrete structure extends a common ritual already in existence to the southern extent of the city. This site with an extending pier into the bay, a vertical cluster of silos, and a rooftop plaza level covers a multitude of options for each experience throughout the day and night.

Careful incisions through the industrial ruin creates a layered composition of spaces that can juxtapose or coincide with the already existing rigid geometry of the clusters. Depending on the use the incisions can vary in magnitude and frequency.

Looking at the two industrial applications, carving from the shells of the silos would need to be concentrated to only certain silos as the remaining shafts would contain either soilage or contaminated water. With this in mind, the idea behind passageway through the extent of the complex would be focused on outward and peripheral areas.

Unlike the previous use, an urban park infusion into the silo clusters would enable the craft of an addition and subtraction of the concrete material to take place throughout the entire seventy silos. This would

thus become a vertical version of the long horizontal passageway to the north.

Examining the third type of use, primarily housing as a function in the re-inhabiting of the grain silos, the public and private realms are altered once again.

In the housing integration, an open ground floor still exists and is more useful as inhabitants use this area a lobby floor, locals use it for another gathering place. But what is interesting is the vertical circulation and promenade that is really permanent with all types of people using this vertical system to access interstitial floors between the public roof and the ground floor. Having a constant source of movement invites interaction to new areas of the waterfront. Furthermore, the pier acting as an extension outward from the site continues the public passageway.

What once was strictly used for moving massive amounts of grain from a boat through a conveyor belt system into silos, now can exist as a direct connection to the bay, a space to experience. The pier extends one hundred thirty meter from the bulkhead line of the city. It is also elevated above the water by about ten meters during high tide. It is currently a docking platform for locals to store their boats when not in use. Fortunately,

a new marina has been opened up the coast and many of the vessels are being moved to this new location. This then results in an empty area surrounding the pier, reinforcing the vacant current nature of the site. Next, the various scales of the site are investigated. By focusing on each component separately, maximizes the efficiency of each. This then results in a systems that can successfully re-inhabit this industrial ruin.

In an Urban realm, one element, one architectural building fills in a gap, makes a gesture, draws attention either to itself or to other elements.

Part of using an existing structure for making an architectural statement was to start with a common current understanding of the site. One of several sites along the coast, the grain silo complex along the southern part of Castellammare stands as an industrial ruin. To some it is an icon or location piece in the city. because it is one of the tallest erections, it can be seen from all around. However, this is all it is, as it can not be accessed or used since its final year of operation in 1998. Although it has been around since mid-20th century, it has lost its reason for being and is currently shut down.

Currently in the area, many of the industrial operations have either seized or relocated to other areas, except for the shipyard to the west refurbishing cruise ships. In their place, apartments and other residential units have converted the large warehouse spaces or multiple stories to units. The ground floor workspace are now foyers and entrances to courtyards for the surrounding units.

Inserting another industrial use into the silos may not

work in favor of the current transition of this region of the city. Regardless of the industrial function, the use would be unlike the surroundings continue a disconnect of the city to the Bay of Naples.

In place of an industrial plant, an urban park would at least give the possibility for human interaction. However, just like the industrial system, the urban park would still block the views of the water from the residential buildings to the south. It also may not be as efficient of a use along the water, as having a source of job and income for the city.

Crafting housing units within the silo clusters “A” and “B,” permanently places residencies directly on the water, extending the growing residential district. However, unlike the northern region that has storefronts flanking the ground floor of the streets, this amenity does not currently exist in new housing developments. Rather, ground floor units sell their local produce under tents in the street. Unlike current buildings re-used for housing, with apartments extending to the roof level, a public roof-top terrace supplements the private units throughout the floors of the silos. With a composite structure, what once was a purely functional system, can now accommodate a multitude of needs.

stretching across the site, fundamental access exists from the bay to the surrounding residences. A series of private housing units for immediate access to various jobs including the shipyard, supports the ever growing city along the coastline. Finally, a public area on the top level enables views up and down the city.



Figure 15. Diagram of street frontage and edge conditions in the city.



Figure 16. Diagram of current edge conditions along the coast.

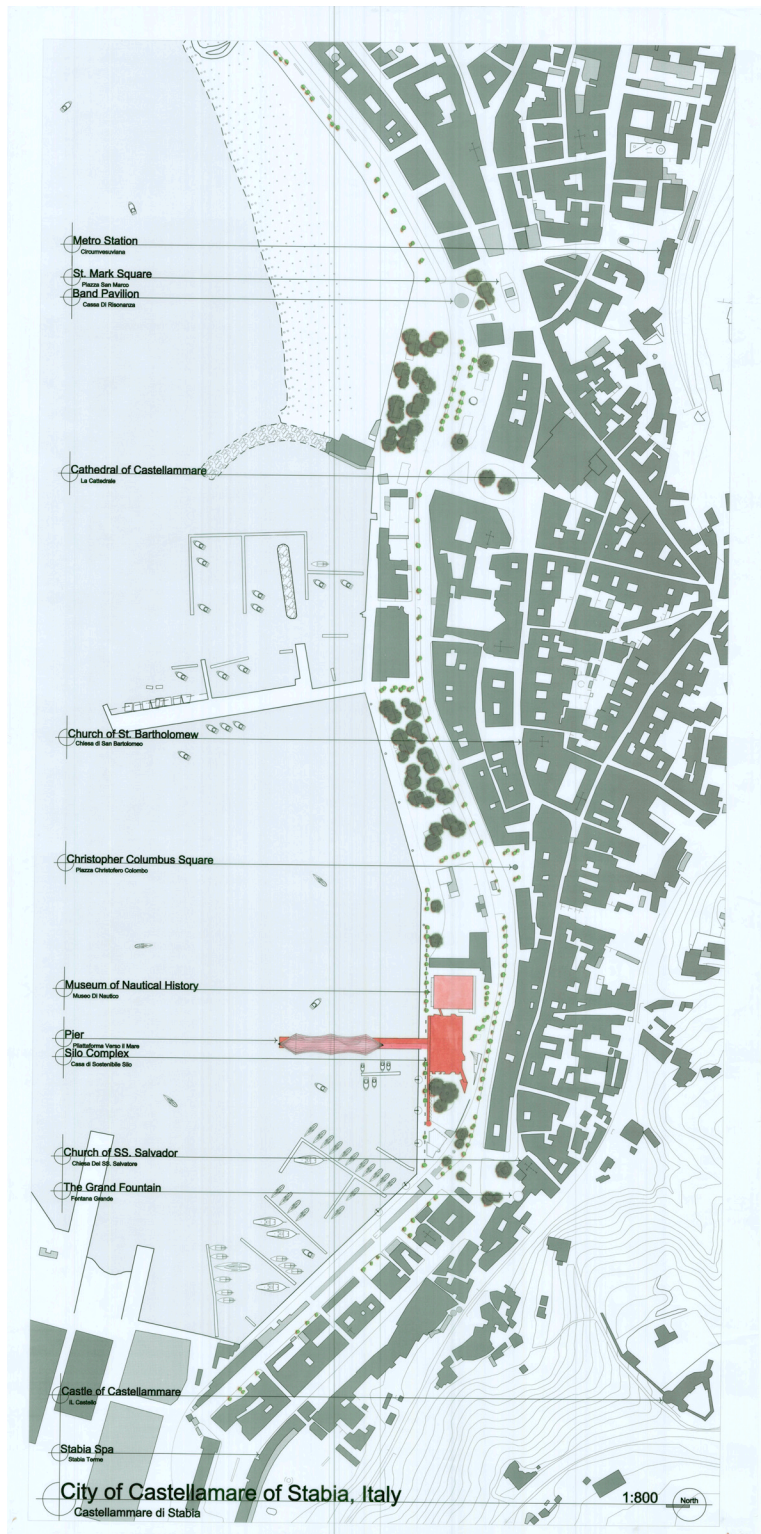


Figure 17. Urban scale diagram of the city of Castellammare di Stabia.

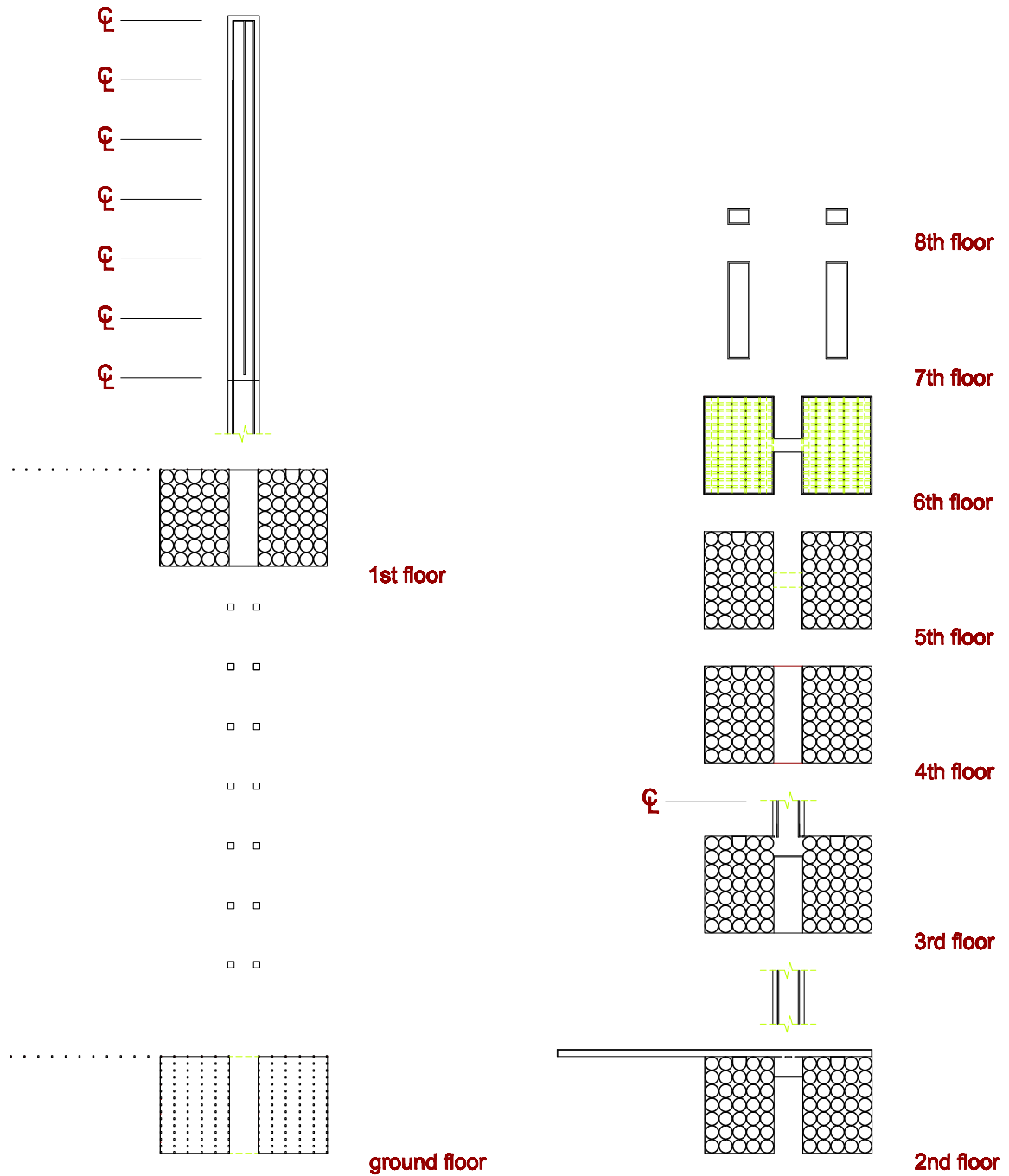


Figure 18. Plan diagram of the eight floors of the grain silo complex.

Starting with an empty shell, both the inside and outside of the concrete silos are the same. Neither side is treated with any special care, thus both can be considered residual space. Both side are equally valid for investigation and even create canals for reinhabitation.

Residual architectural is different from terminal architecture, as most design projects are prone to focusing on. Terminal architecture exists with projects that ignore designing several key elements such as the rear facade, stairwells, fire escapes roof tops, equipment storage places. These areas are not thought about until the end of the project, the termination of the commission.

Rather, the residual space should refer to the confidence in the absolutely unpredictable “residue” of overlapping conditions. It is this moment that can support an idea about the architectural discipline. Parameters once again have influence on the intentions. It is these parameters that should be carried out thought the residual space.

When adapting to a new use, in this situation a housing complex, common parameters or local standards are important to address. Comparing a catalog of unit sizes

in common apartment developments, establishes a range of possible arrangements and configurations in apartment sizes and locations.

Average apartment sizes throughout the region average to 700sq. ft. With this as an common size, the challenge still remains to insert a usually square unit into a curvilinear space with the same size. Another parameter in need of addressing is the configuration in the building as a whole. Each unit requires access, light, air, and fluid unity. There is also a need for central courtyard for all units to access.

With the three cell unit module, three different configurations are possible: “L” shape, “I” shape, and “C” shape. This allows for independent functions to occur in a giving space without losing the connectivity of the whole.

Another conventional module to apartment dimensions is the height of a space. Applying a three meter, plus or minus .3 meters, allows for 5 stories of housing units per silo cluster. Both concave and convex shapes define unit boundaries. While fulfilling a new use for this industrial ruin, the monolithic shafts of the silos are maintained.

On the ground floor a much needed market can take

place with an open column grid supporting the structure above. This is now a communal gathering space for locals to both sell and buy fresh seafood and produce daily. The once exporting network of metal pipes and ducts moving grain in and out of the silos themselves, now acts as a skeleton for vendors to set up table and sell fish, clams, mussels, and other seafood.

It is a ritual, like in most city apartment buildings with low dueling storage capacity, to get daily produce. With a market in the middle of this portion of the city, this industrial ruin can once again support the city.

Ultimately above on the roof terrace level, both residence and the public are invited to experience a view of the city and surrounding regions. On the top level, the column grid that holds up the roof is now functioning as a trellis system shading against the scorching sun in the middle of the day.

With the pier connecting to the silo clusters resting on top of the water, it acts both as a termination point and an extension of the passageway. It now can function as a passageway for pedestrians to access from the ground floor and a importing dock for fisherman to bring in seafood form the bay. Part of the last investigation of this thesis is to test wether units can actually function

within the silos. Part of this test is to see explore if the architectural details implemented can sufficiently create a dwelling worth living in.

With this investigation, there is a need to design both the regular circular spaces and the irregular interstitial areas.

I am interested in this residual architecture approach two fold: because it is increasingly becoming a needed priority in designing and refocusing efforts in architecture, and because it is an exercise in experiencing or perceiving contradictions in language, which cannot be harmonized dialectically on both sides simultaneously.

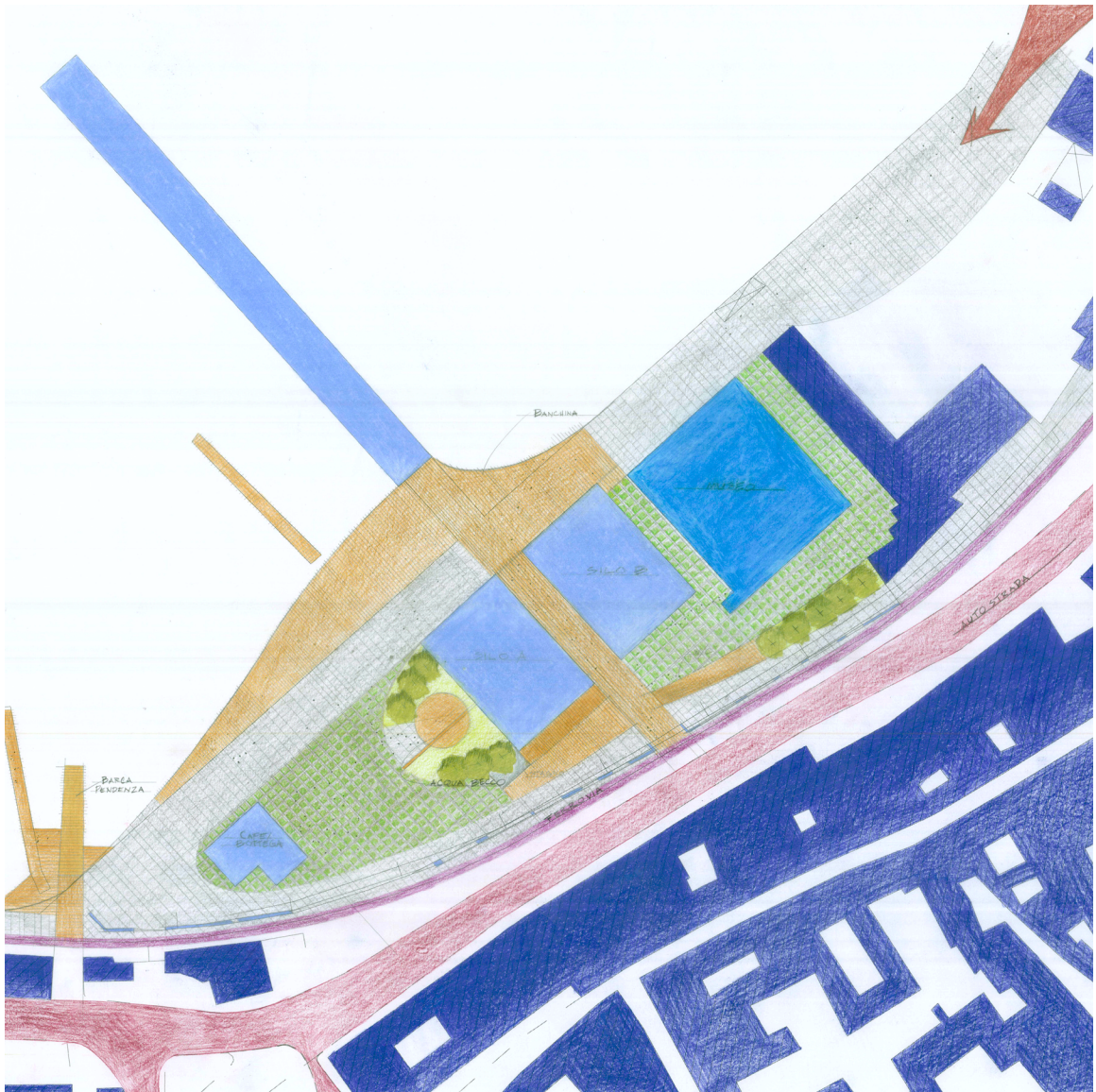


Figure 19. Diagram of proposed land use on site.

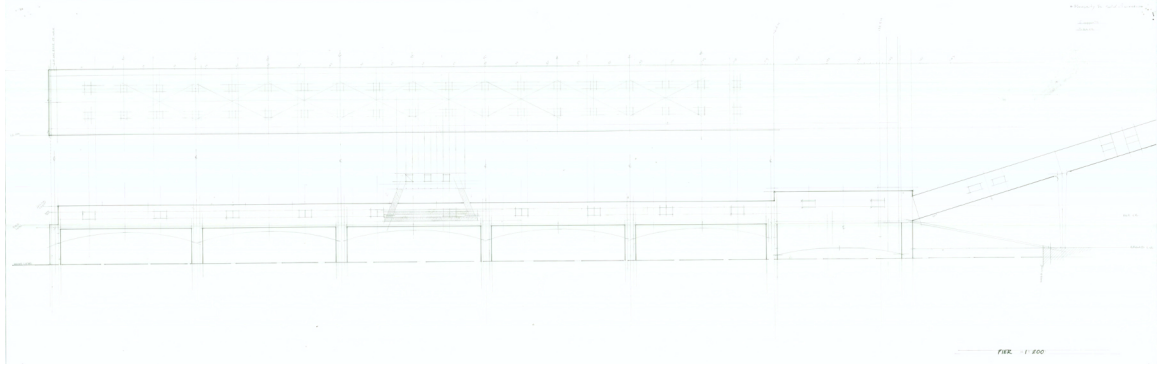


Figure 20. Diagram of existing pier structure.

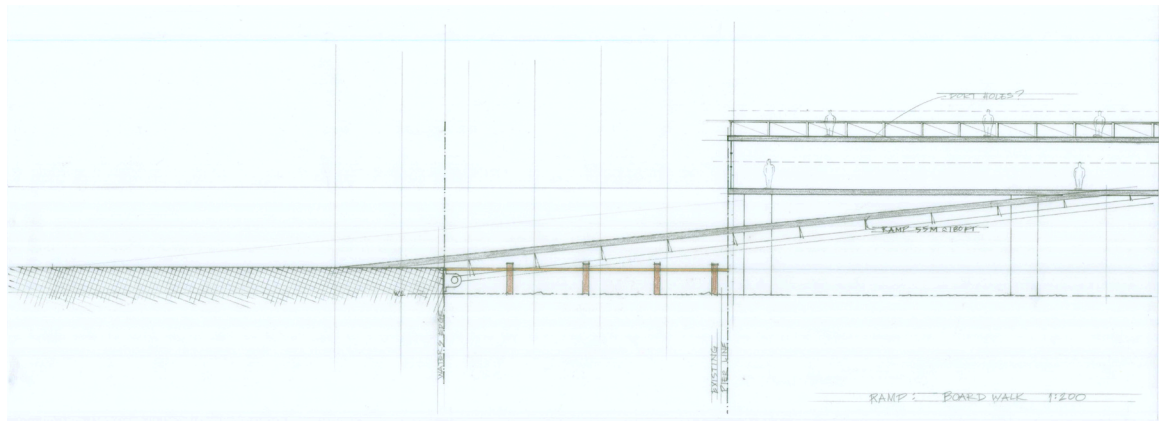


Figure 21. Diagram of link to existing pier.

Important to the introduction of a new use to a building is the physical makeup of the structure, organization, purpose, perception, etc. This extends to the details: the material inside and out of each unit, the common spaces and courtyards, and even the overhangs and shading devices in public areas.

The curvilinear concrete forms used to retain dry dead weight excreting mostly lateral loads now is used to support five stories of units. To make these empty shafts inhabitable, cuts into and through cylinders of the same unit are designed to accommodate both light and air. Each unit is arranged along the periphery to gain direct sunlight throughout the course of the day. With both public and private portions of each unit in a sixty/fifty ratio, as is common, light and fresh air is necessary to all parts.

The idea behind the introduction of new materials into the site is to juxtapose against the current concrete structure. With the white concrete walls acting as cold harsh surfaces for living, wood, glass and metal create a playful touch. Windows along the outside of units add color with red, blue, and orange pigmented solar emitting panel window units. With wood floors extending from the units to the surrounding balconies

that each unit contains, a fluid warm aspect integrates the apartment as a whole. Recessing the walkways throughout the complex a meter lower than each unit floor allows the ability for placing windows around the entirety of each unit without worrying about privacy.

Much like other modular designs such as ships and vessels, the spaces in each unit need to accommodate various uses and functions throughout the course of the day and night. Combinations in uses depending on whether public or private increases the efficiency of each unit. For example a kitchen/bath space contains all of the plumbing needed for the unit in one area, freeing up the other spaces to transform and change depending on requirements of the individual. Furthermore, when having units in the same organization stacked, all of the plumbing can be channeled in the same space simplifying the construction and modification needed.

A private bedroom at night can be transformed during the day to be a living room overlooking the bay. With the main features of each unit existing in the circular spaces, the in-between spaces or interstitial ones can accommodate bathroom and even light shafts for each unit to circulate air.

In order to access each unit a central courtyard needs

to exist at each floor with a connection system of corridors. In this design, the corridors correspond to the sun angles coming in each day lighting up the inside during two important hours of the day: 8-9 am for the beginning of each day, and 4-5 pm when the city is reborn from siesta and becomes alive with shopping and dining.

Public areas gain similar attention to detail for the pedestrian use. Adding a tensile structure to cover the concrete pier as well as the rooftop continues the canopies and trellis systems throughout the rest of the city. The current pier is a container for the movement of grain. By carving openings into the pier grants view along the coast and out into the bay while still being protected by a canopy above. This takes the place of the trees that grow along the coast in the north for shading.

Each implementation and addition to the site takes into consideration the already existing rituals, traditions, and understandings, makes use of them and/or creates an appropriate replacement. What is important in this re-inhabitation of this industrial ruin is the parameters that will be discussed next, creating a structure to the network of systems at play.

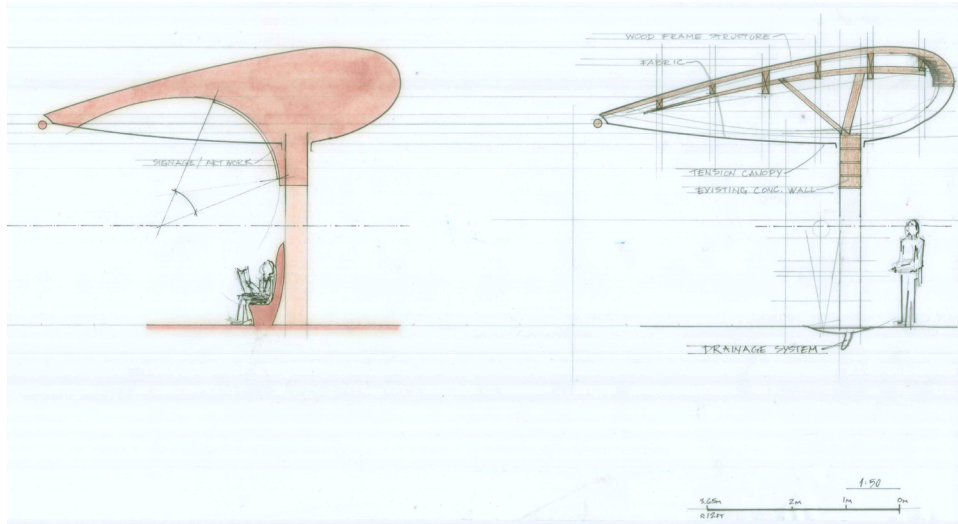


Figure 22. Proposal of CMU wall function and use.

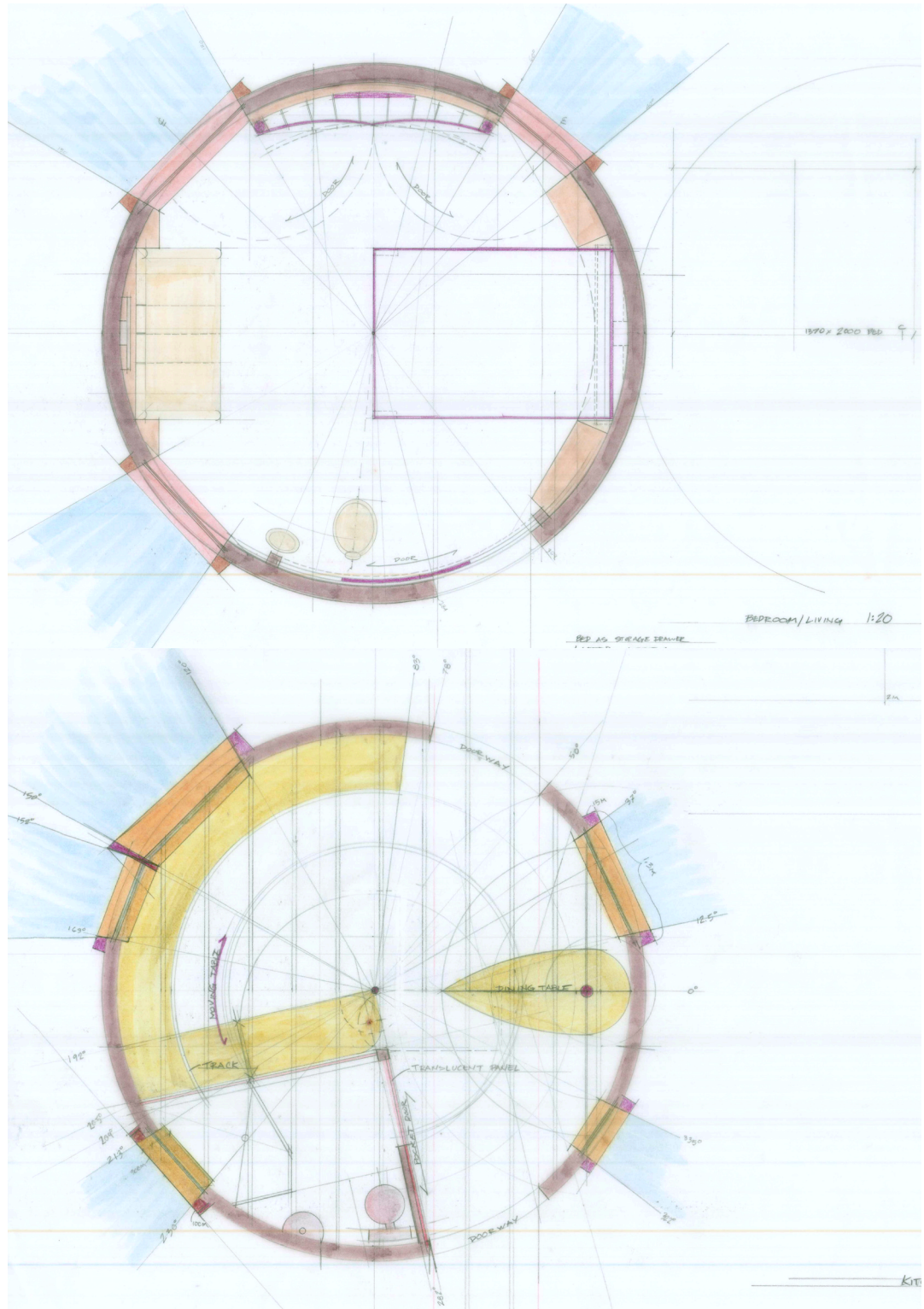


Figure 23. Diagram of unit mobility and function.

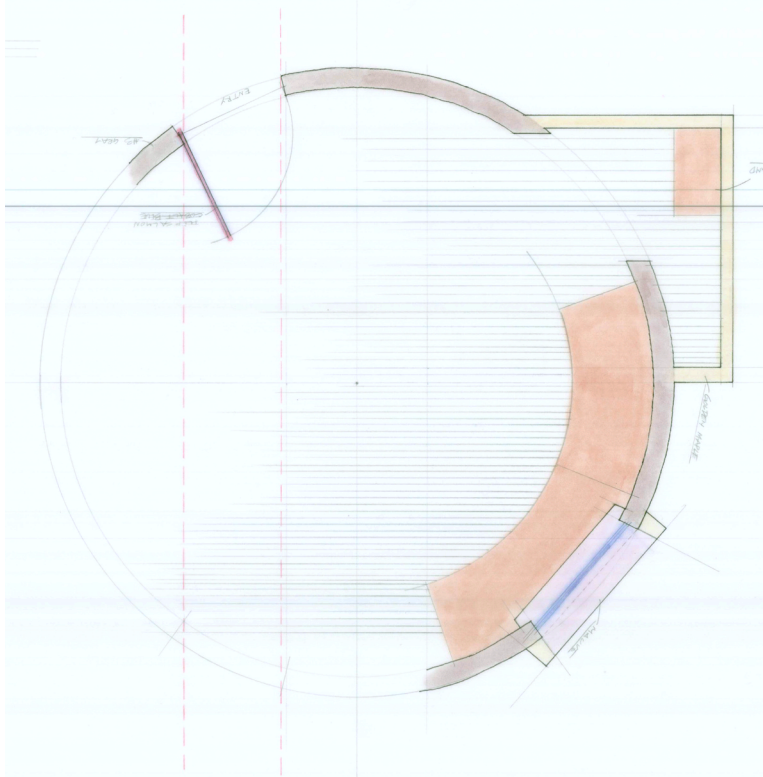


Figure 24. Diagram of detailed unit layout and space.

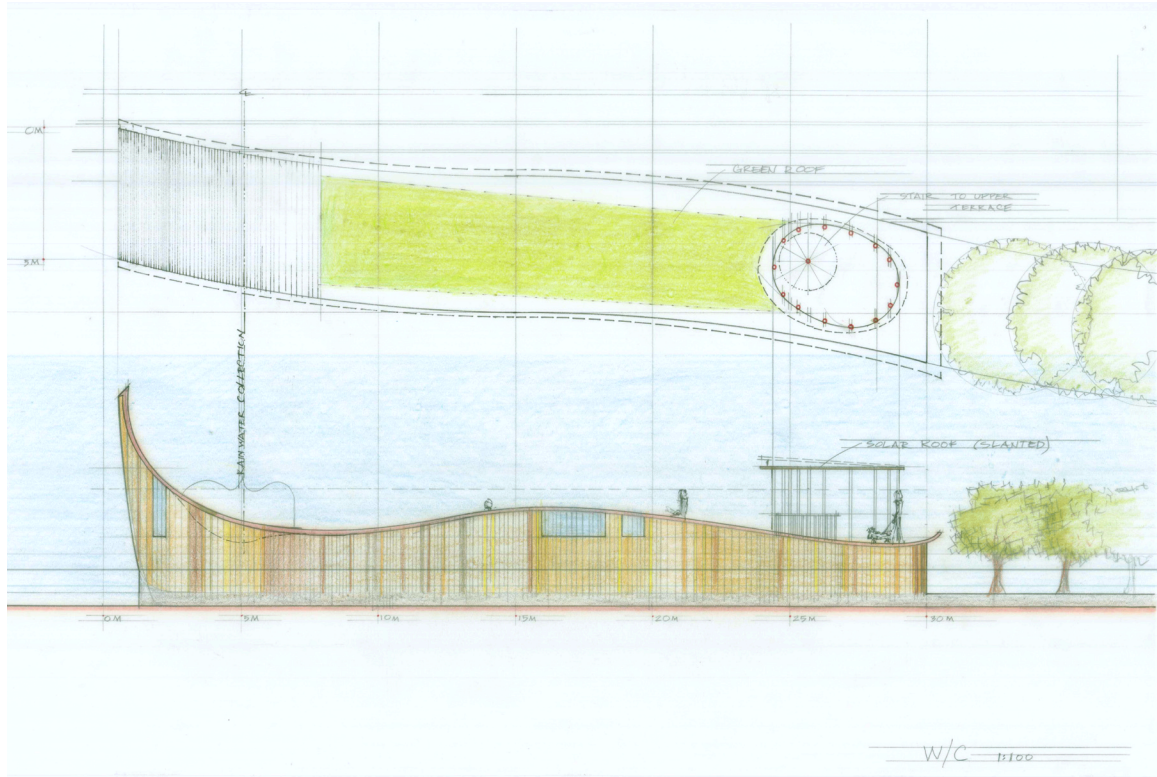


Figure 25. Detail of proposed use of CMU wall.



Figure 26. Existing abandoned area north of site with concrete wall to the south



Figure 27. Image of typical first floor silo reconfiguration



Figure 28. View of proposed ground floor fish market



Figure 29. View of proposed fish market arcade

Using a catalogue of common traits to compare all the parameters used to compile this composite product, each part is individually examined. Parameters such as functionality over time are important to consider. Unlike the previous use of the grain importing and exporting, the new apartment complex can exist as long as the city remains along the coast.

Other parameters or forces come into play besides the physical attributes of materials or tangible elements. Time is one example. Although mostly tangible, when designing sustainable or long-term the effect of time on a building can not always be understood. Therefore, understanding current structures and time's effect on them can help facilitate the needed information.

Looking at other aspects of the design that are important to the more general sense of design, such as sustainable design, can influence the ultimate result. Unlike most other materials that can be considered sustainable, concrete requires a vast amount of energy before it can even be used. However because this concrete structure already exist it is quite sustainable because it will outlast most other materials. This is part of the reason for its prominent use in and around the region and country.

With a thought process that integrates both the environmentally friendly sustainable aspects with the needs and necessities of the site, a successful re-integration can be manifested.

Currently there is an industrial ruin along the coast of Castellammare di Stabia. Introducing a combination of public and private uses into the building serves the city with a building that can become useful again.

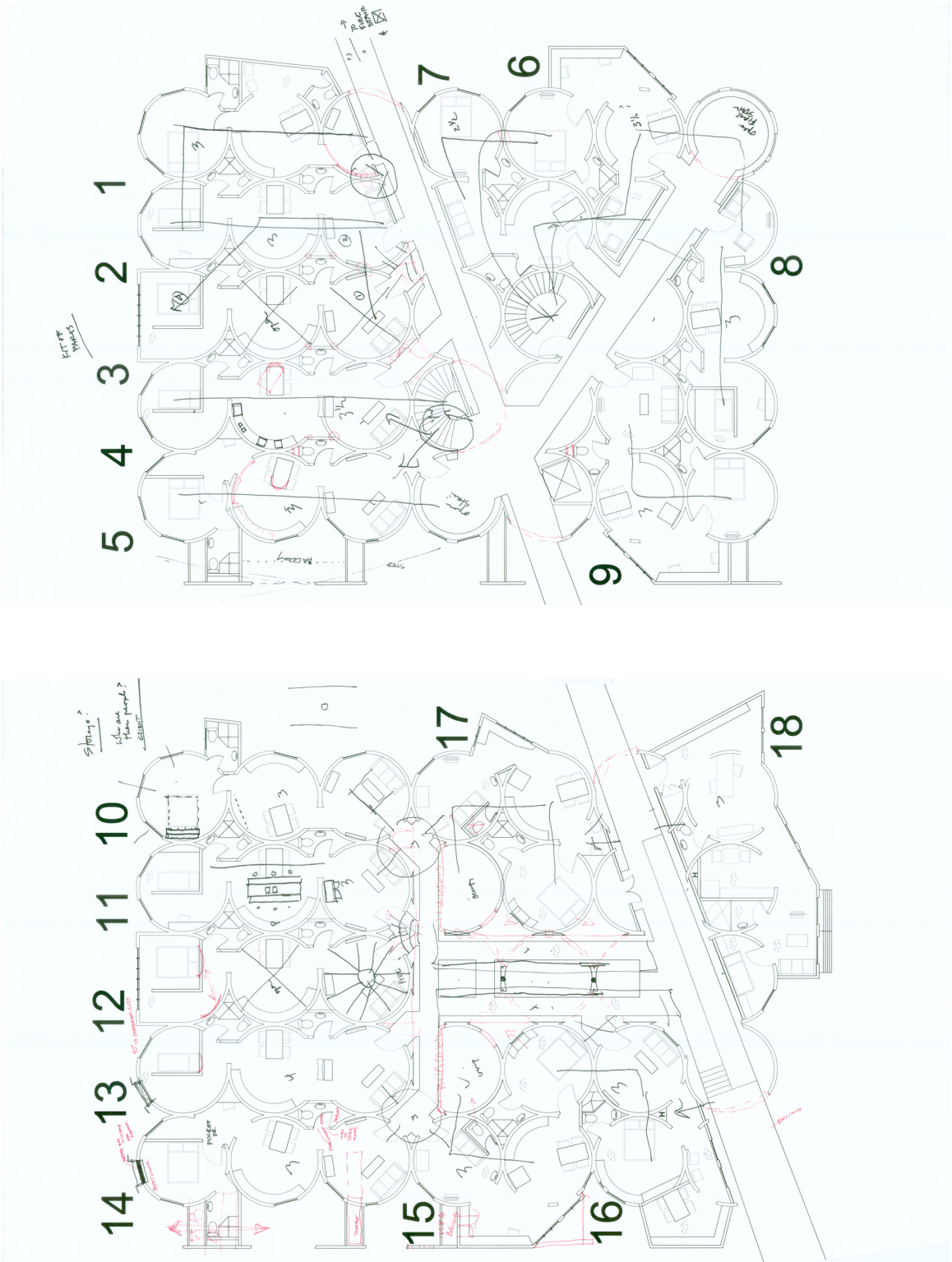


Figure 30. Diagram of building cluster layout.

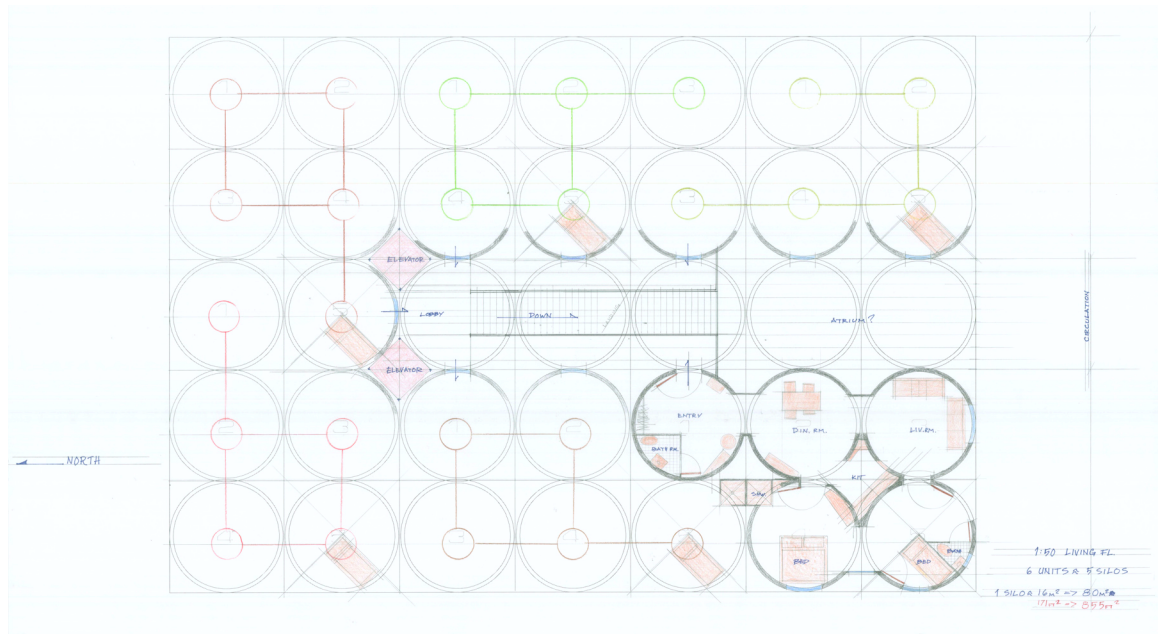


Figure 31. Diagram of early proposal of unit layout.

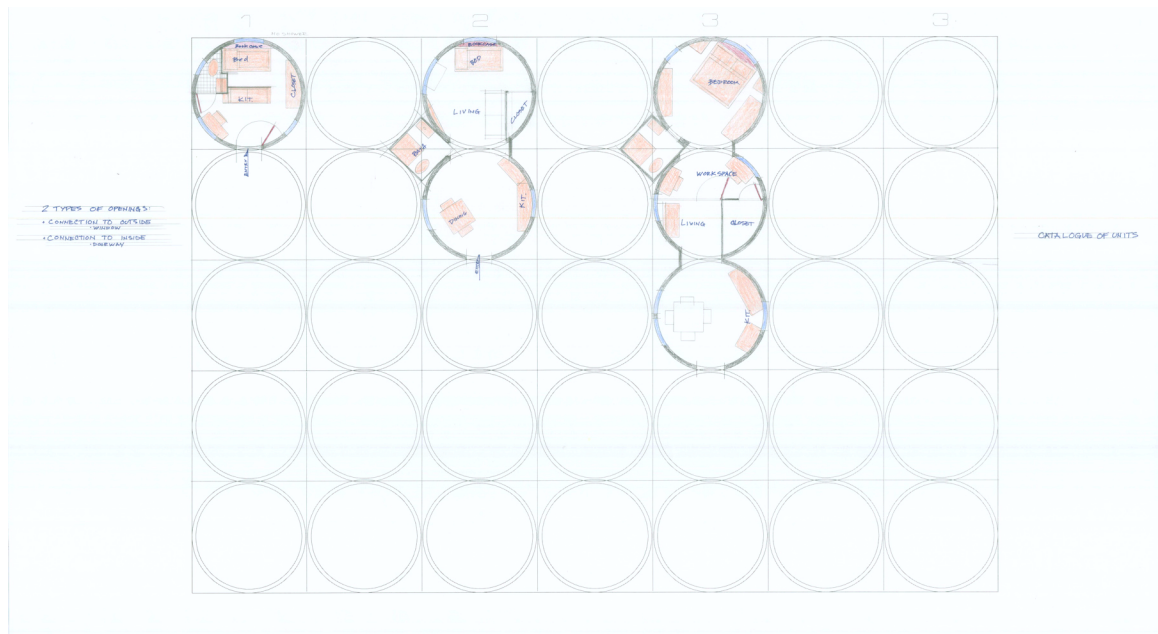


Figure 32. Diagram of unit catalog.

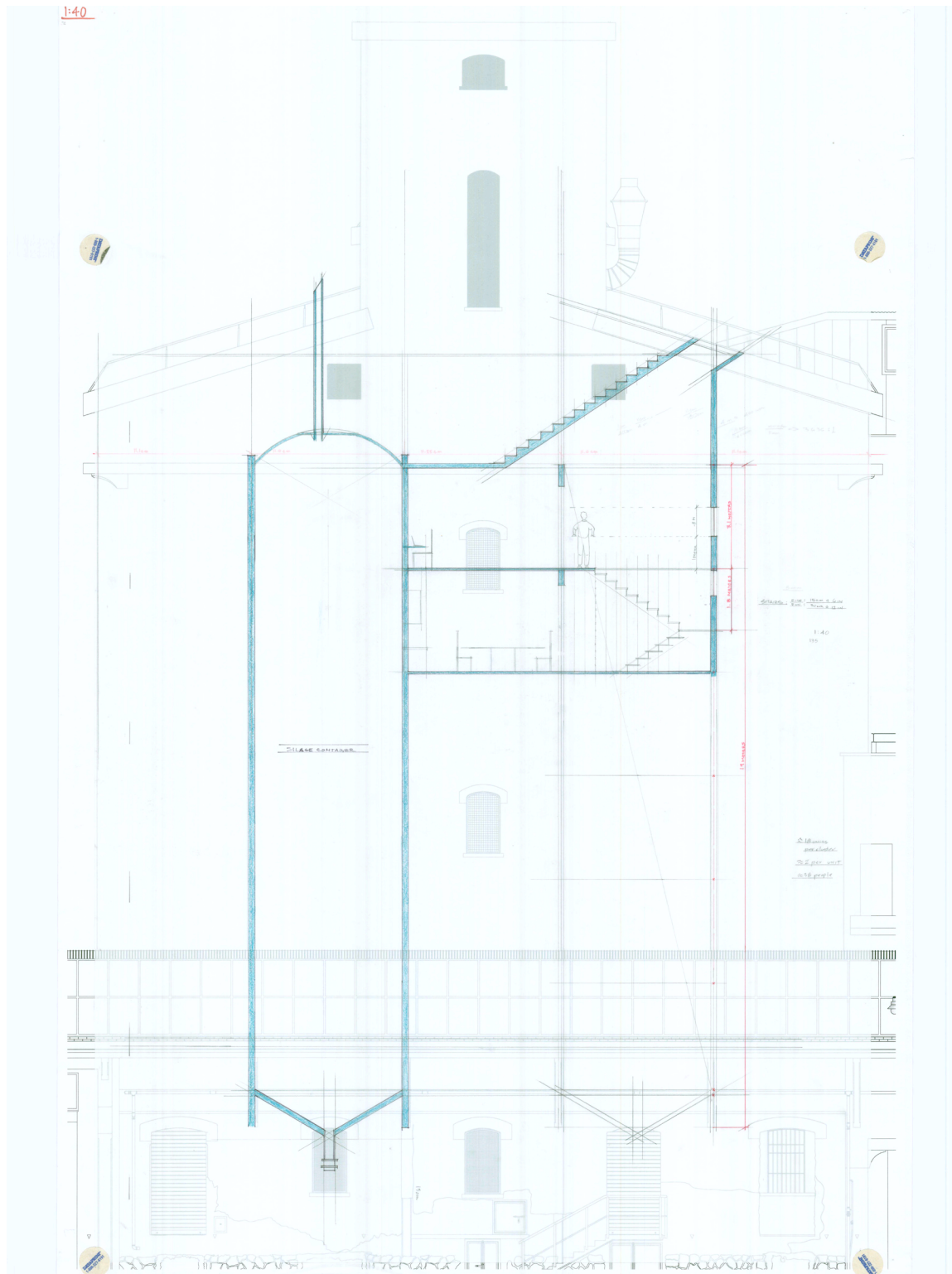


Figure 33. Sectional diagram of industrial implementation to site.

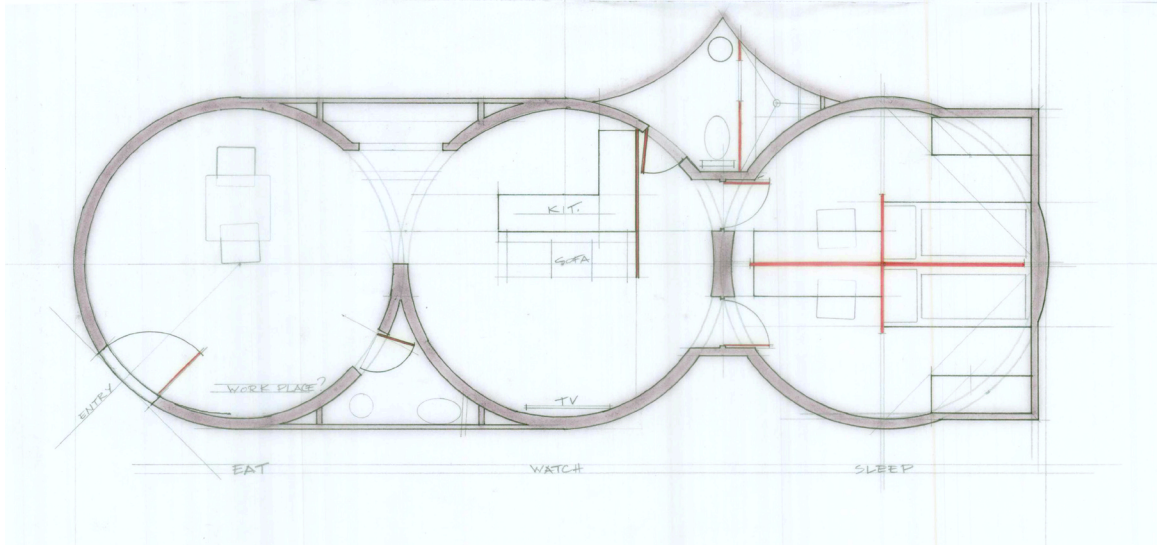


Figure 34. Proposed "I" shape silo unit layout.

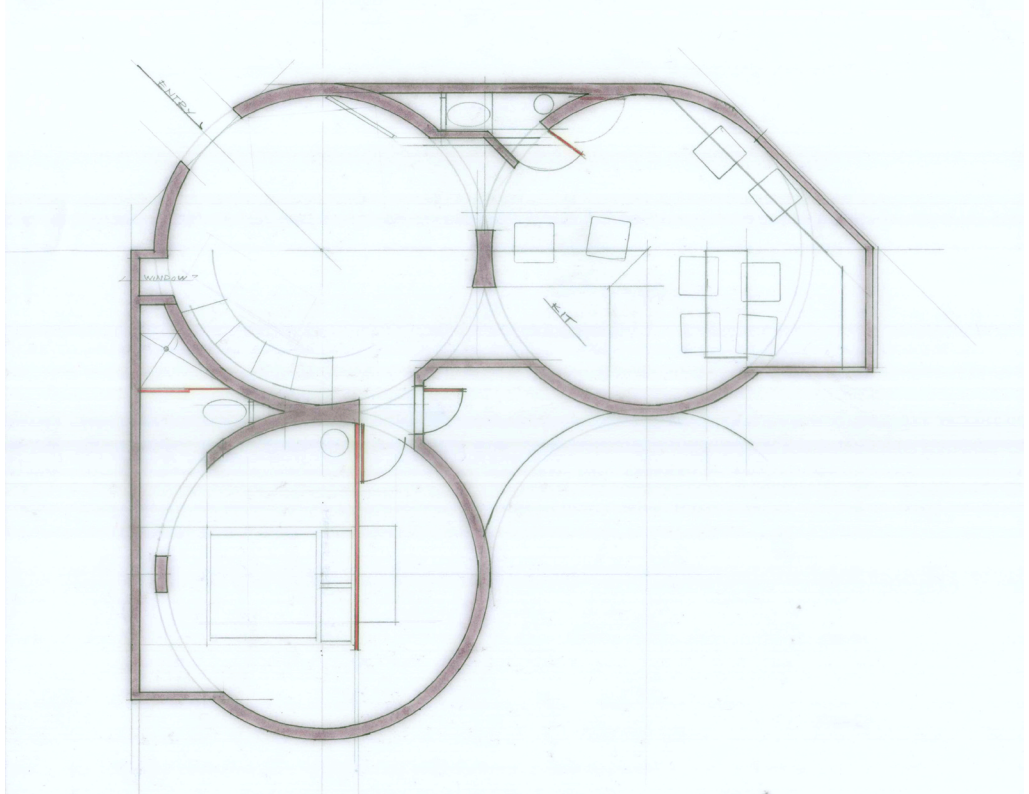


Figure 35. Proposed "L" shape silo unit layout.

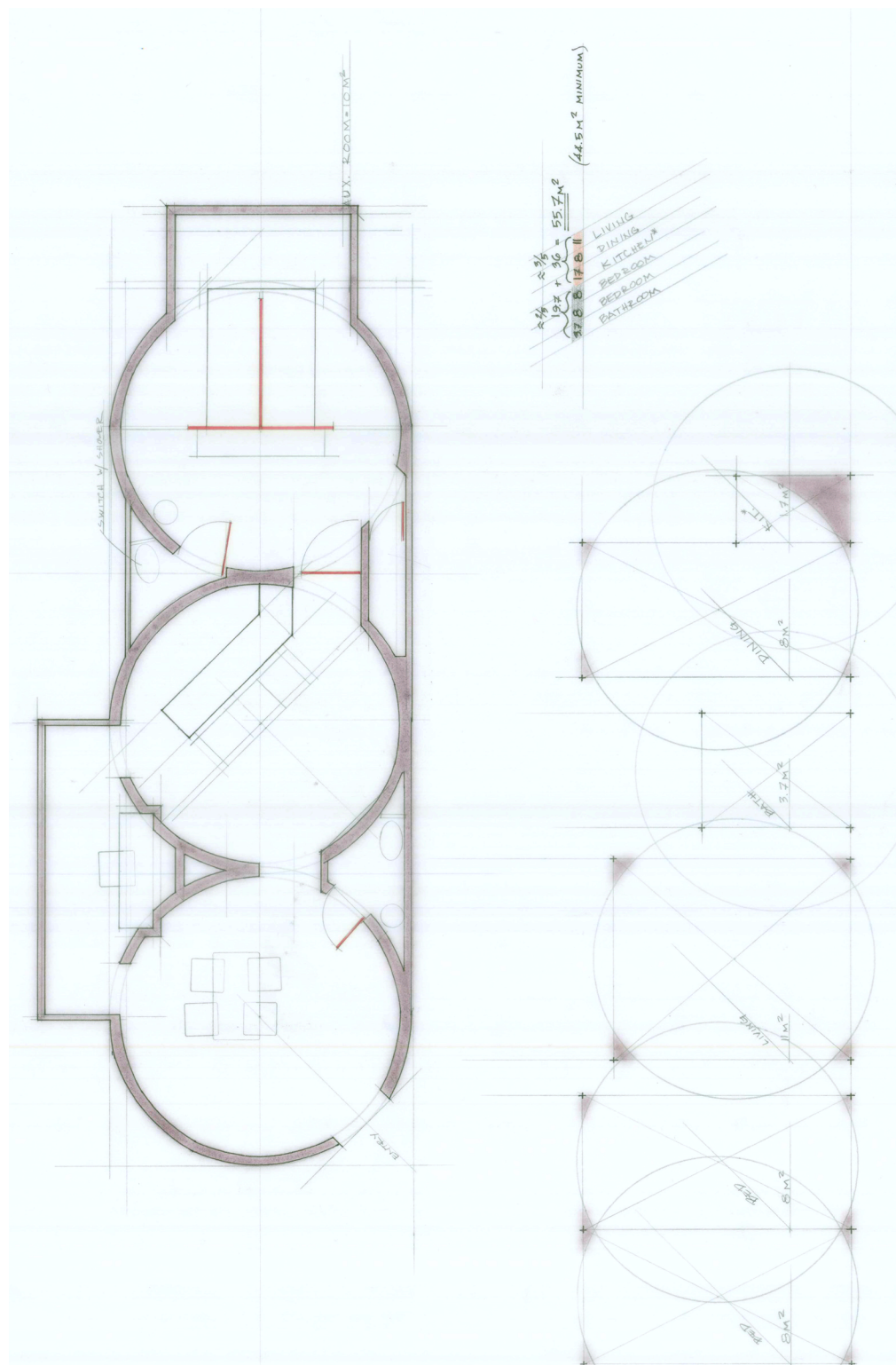


Figure 36. Proposed “I” configuration of sillo unit layout.

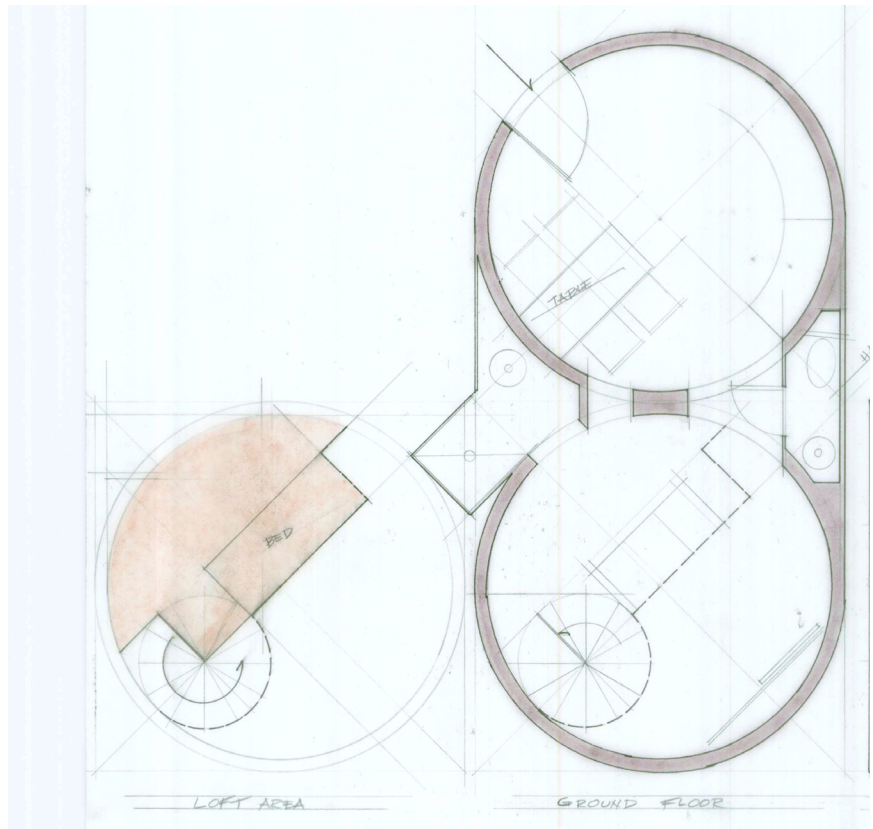


Figure 37. Proposed silo unit layout.

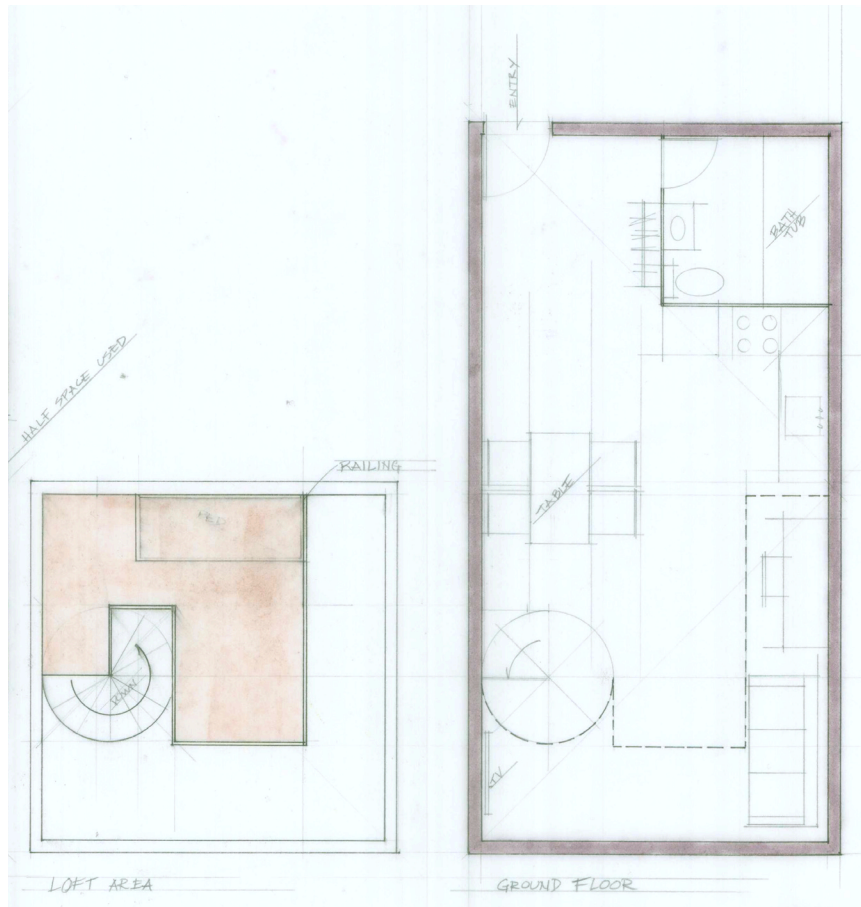


Figure 38. Diagram of typical orthogonal unit layout.

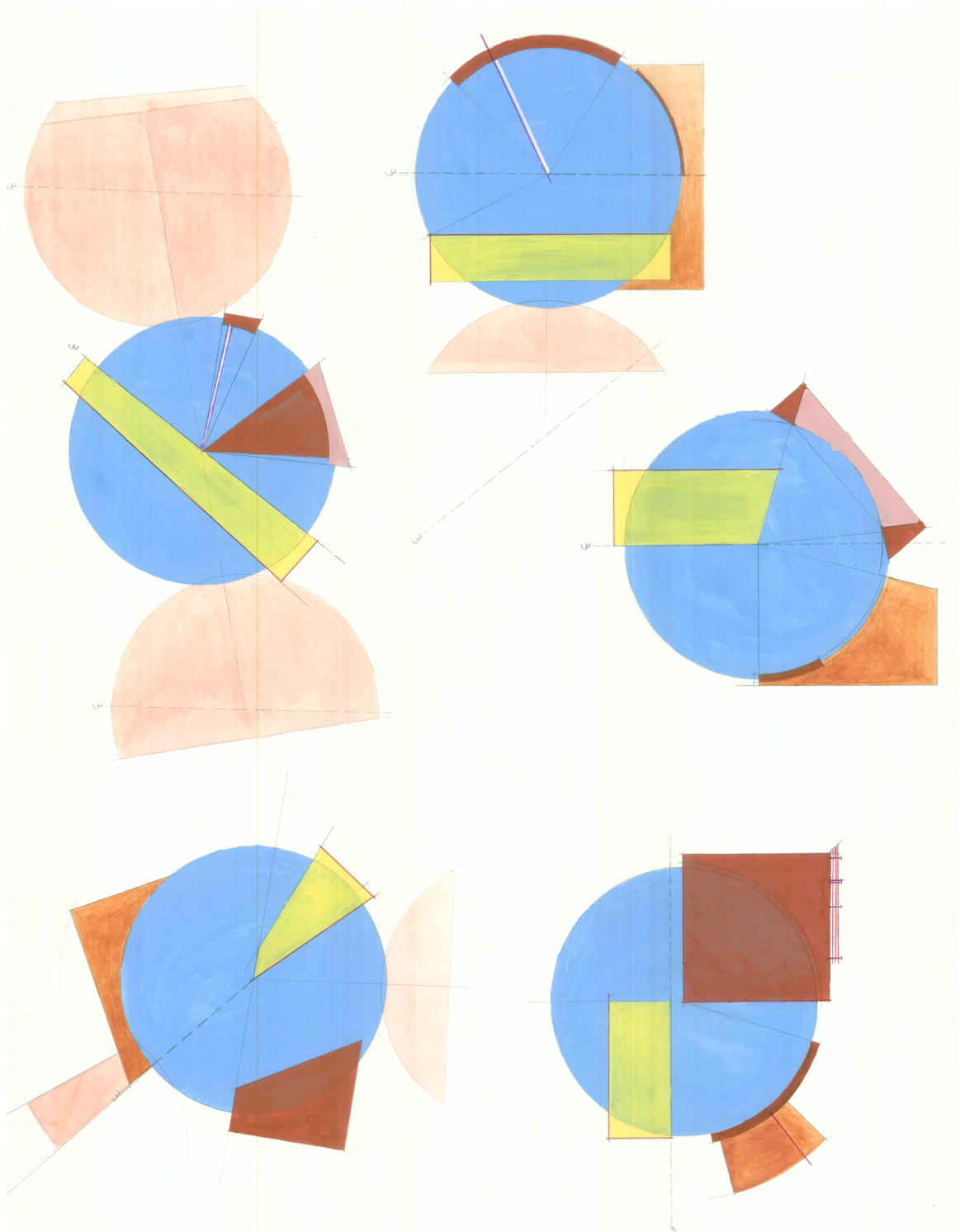


Figure 39. Diagram proposals for re-inhabiting the silos.

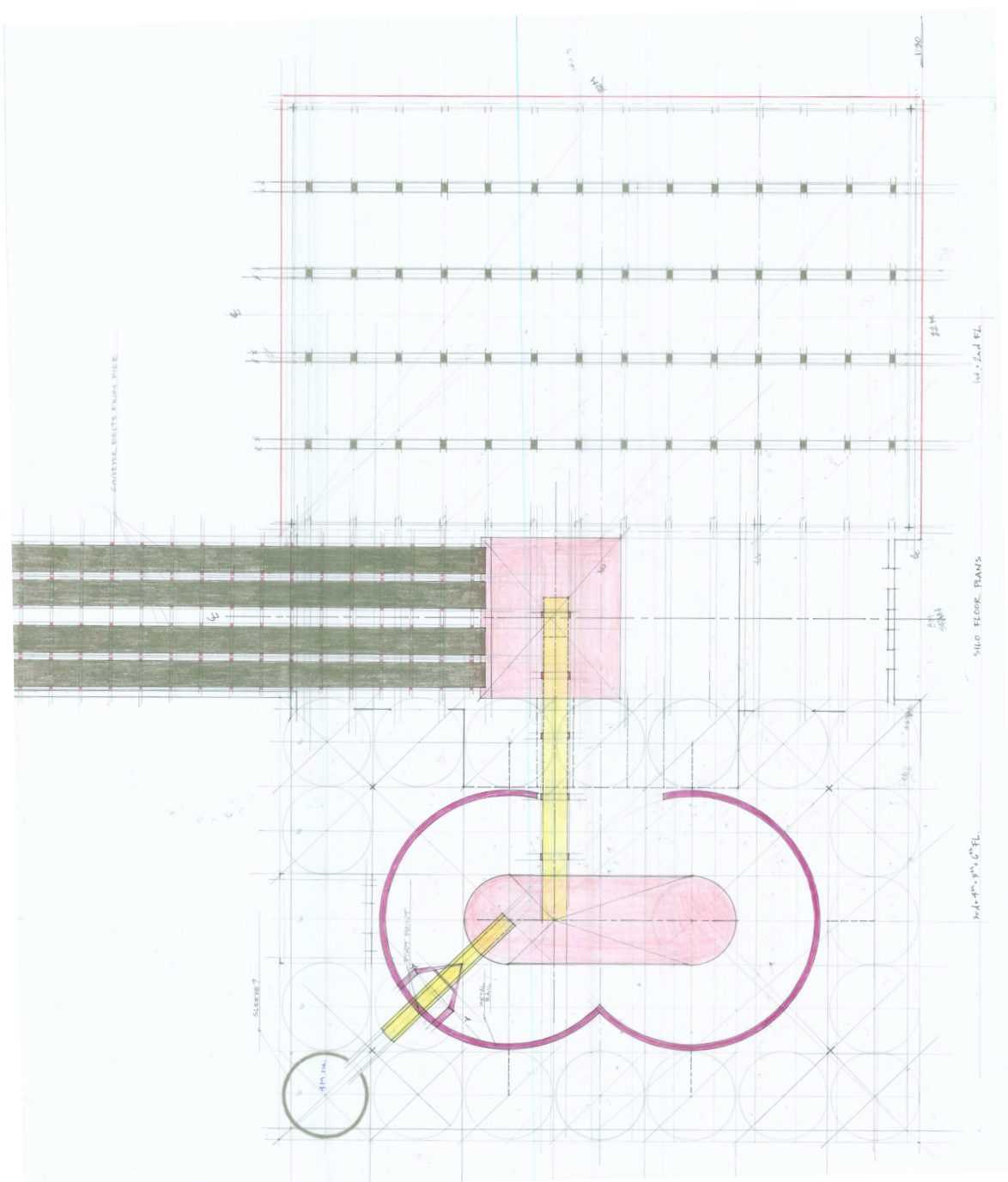


Figure 40. Diagram of current grain elevator process.



Figure 42. Sectional diagram through the city of Castellammare di Stabia.



Figure 43. Aerial View of the City of Castellammare di Stabia

7: Design Development (Images)

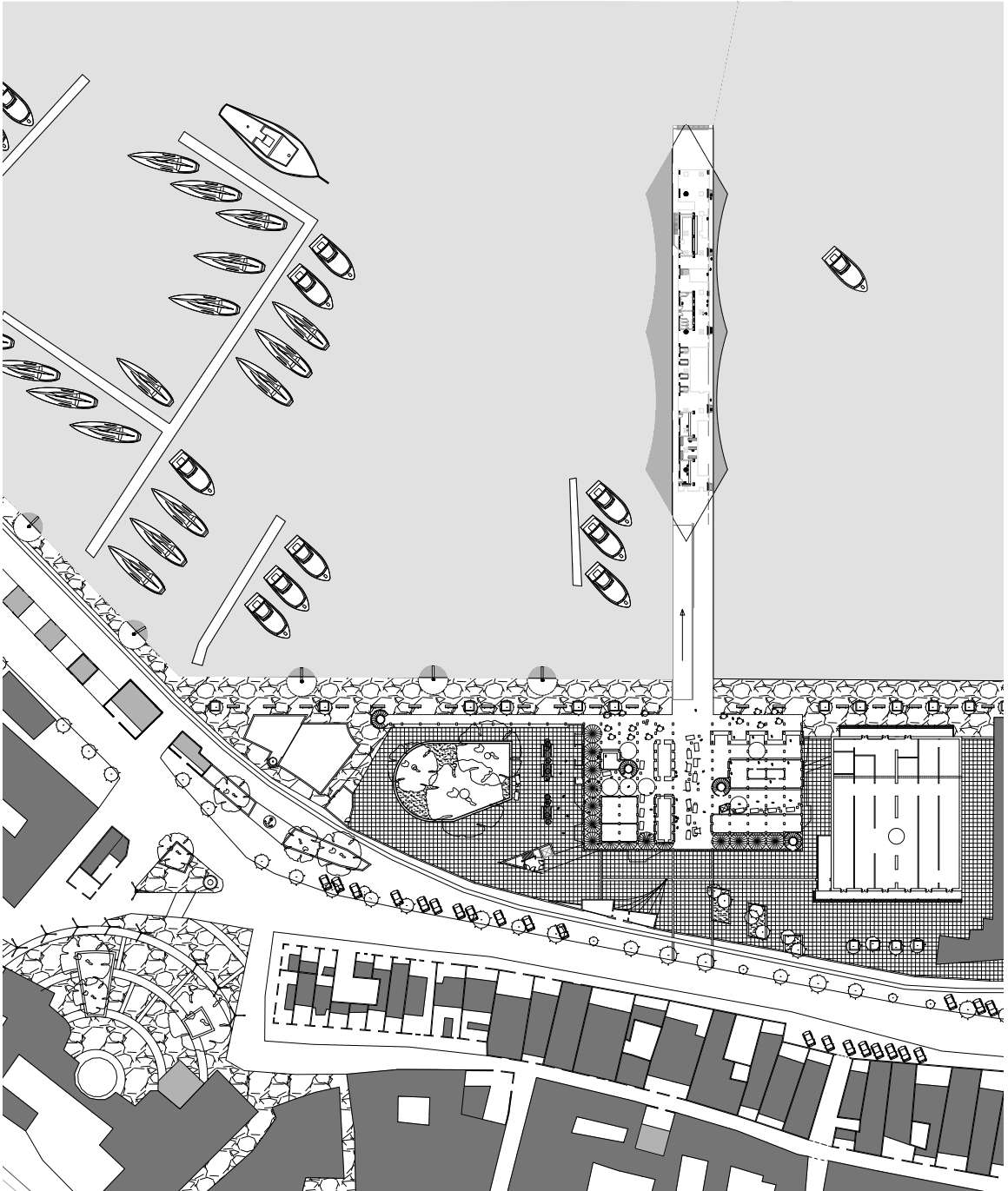


Figure 44. Plan Proposal of the Immediate Site

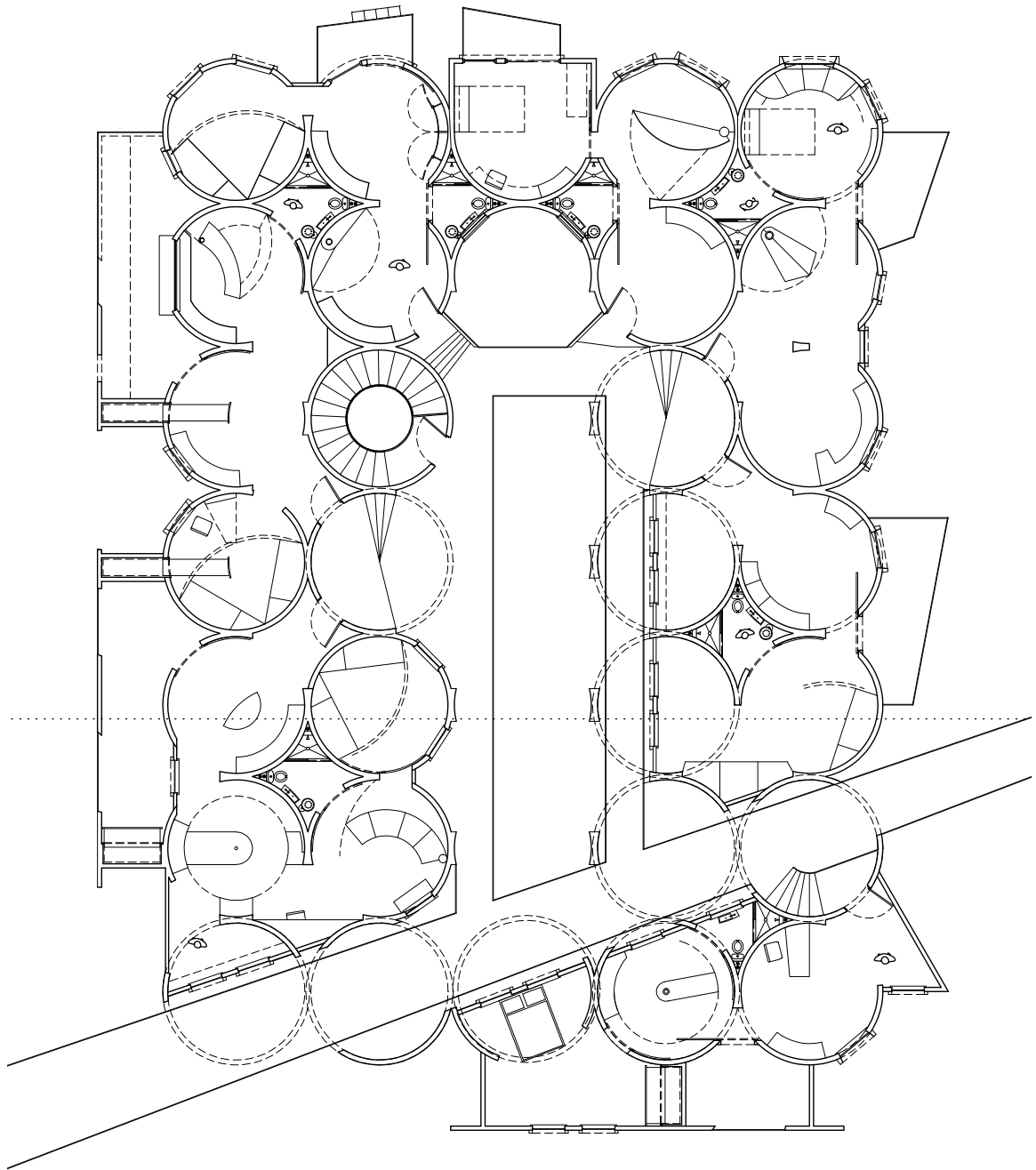


Figure 45. Plan Proposal of typical silo cluster "A."

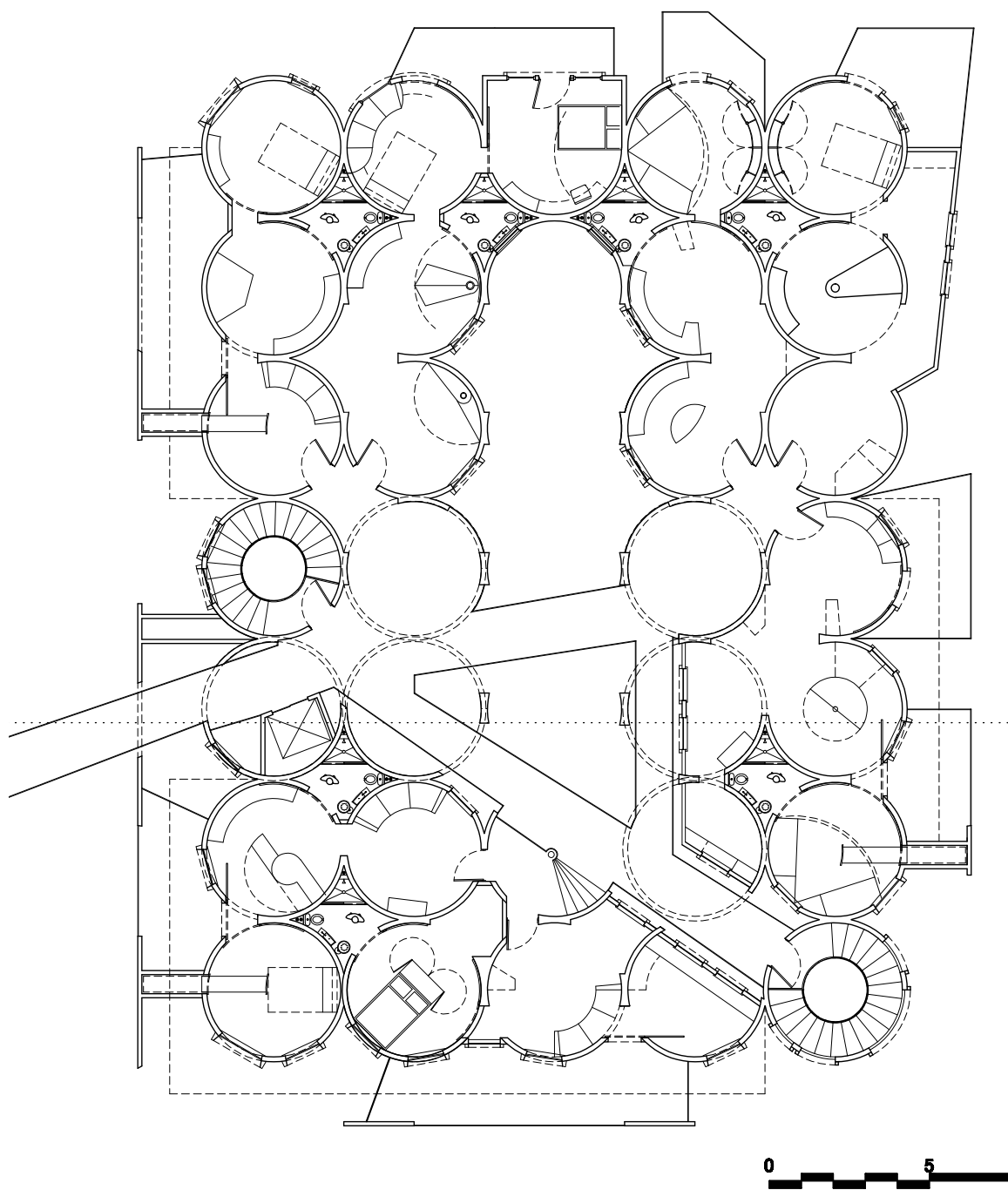


Figure 46. Plan Proposal of the typical silo cluster “B”

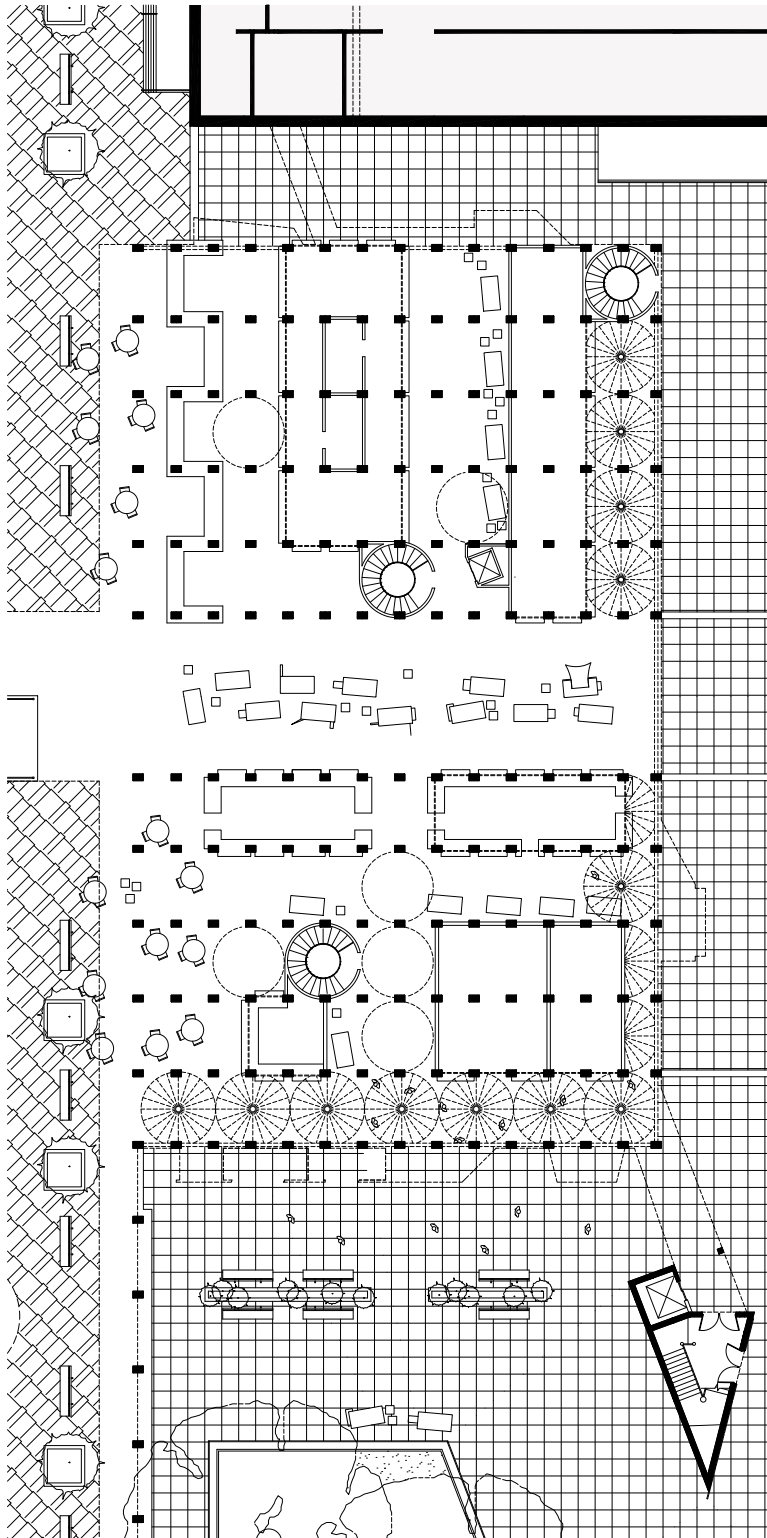


Figure 47. Plan Proposal of the Ground Level.

The design research conducted through the adaptive reuse of the Silo Complex is a composite of many complex geometric parameters, cultural influences, and environmental initiatives. The result of this process has proven to be a useful investigation of architectural design process focusing on possibilities and continual versioning rather than a linear path leading to one answer.

Standards, often used as parameters, create a common understanding of key aspects to the design development. Using these common design standards as benchmarks for new explorations enables a comparison of importance and consequence to occur between parameters. Such parameters often come from the context and the culture involved. In this case the culture of the southern part of Italy, Castellammare di Stabia, allowed for multiple interpretations and perceptions to evolve. It is this very aspect, which inherently has led to more holistic proposition in this thesis inquiry, it is vital to explore existing nuances along side the design development process: grain silo clusters, pier, structure, etc. These components provide fruitful insight about current conditions that might be improved, while fine-tuning the focus of investigation. Throughout the process it may be altered or amended with new discoveries or perspectives.

Although the design research of this investigation

in Castellammare has produced an apartment-housing complex with a market and roof terrace, the focus was fundamentally about the process of investigating relevant parameters. Synthesizing and testing have been integral to the development of re-inhabitation of the site and primarily the silo themselves. The modes, by which these test and analysis have occurred, directly correspond with the individual outcome, and ultimately the current iteration.

The success and failure of the product from such a process can easily become biased with unfamiliarity, reinforcing the usefulness of a common “standard,” and list of intensions. For this list is inherently a component in the final test, the reaction to the re-inhabitation of the ruin on the site. The interpretation of the “standard” characteristics led to narrow views and misconceptions about new possible “standards.” As a result, a multitude of modes of investigations is critical for establishing a new acceptable equivalent.

Due to the previous use of the site as an industrial complex with mostly a vertical movement system, introducing a horizontal system of domestic housing became a challenge. The previous functions too became parameters for the design, either promoting harmony or contradiction with juxtaposition. This methodology was useful throughout the variety of scales of the design: urban passaggio, open ground market, and individual units with balconies, screens and courtyards.

Just as the tools used to develop an idea or design affect the resultant, they respond to the cur-

rent understandings at the time. An advantage to this particular study is the immersion in the culture of the surroundings to the site. Throughout the course of the design development, the explorations of site occurred several times: interaction with the site via water, land, car, train, bike, foot, and air. This element has become ever prominent in the standards that have emerged.

It is important to ask how this process fits in design process pedagogy. How is the outcome useful for varying scales of interventions? Initially, the cultural aspect was perceived as a vital component of inspiration to the types of investigations manifested, but it is necessary to continue with this involvement through to the end?

Inherent to any architectural design, there are basic principles to guide design intentions, and addressing these principles in a fashion deemed appropriate or not, provides a method by investigation. Although digital parametric modeling was not a major influence to the initial approach, it was knitted into smaller scale studies with inhabitation. This digital development was more prevalent in the later reflecting on the process; the computational method of manipulating and versioning aspects of the design mostly occurred manually. Had this process been repeated, the practicality of more of a digitally robust process would both alter the explorations and resultants. It is interesting to catalogue when one type of development is more fruitful and malleable to the design process.

Integral to the site Castellammare di Stabia,

Italy, the culture promotes a certain attitude toward thought process as it is applied to design. As a result, this has too become a parameter to confront. This and the other parameters, geometric, functional, perceptual or otherwise, have become standards addressed in this thesis. The overall design process is a synthesis of a multitude of investigations probing the parameters as conditional entities. Although there is a bias to what is primary, secondary, tertiary to the influence of a design, a standard of principles still exist, parameters that govern that very purpose of design.

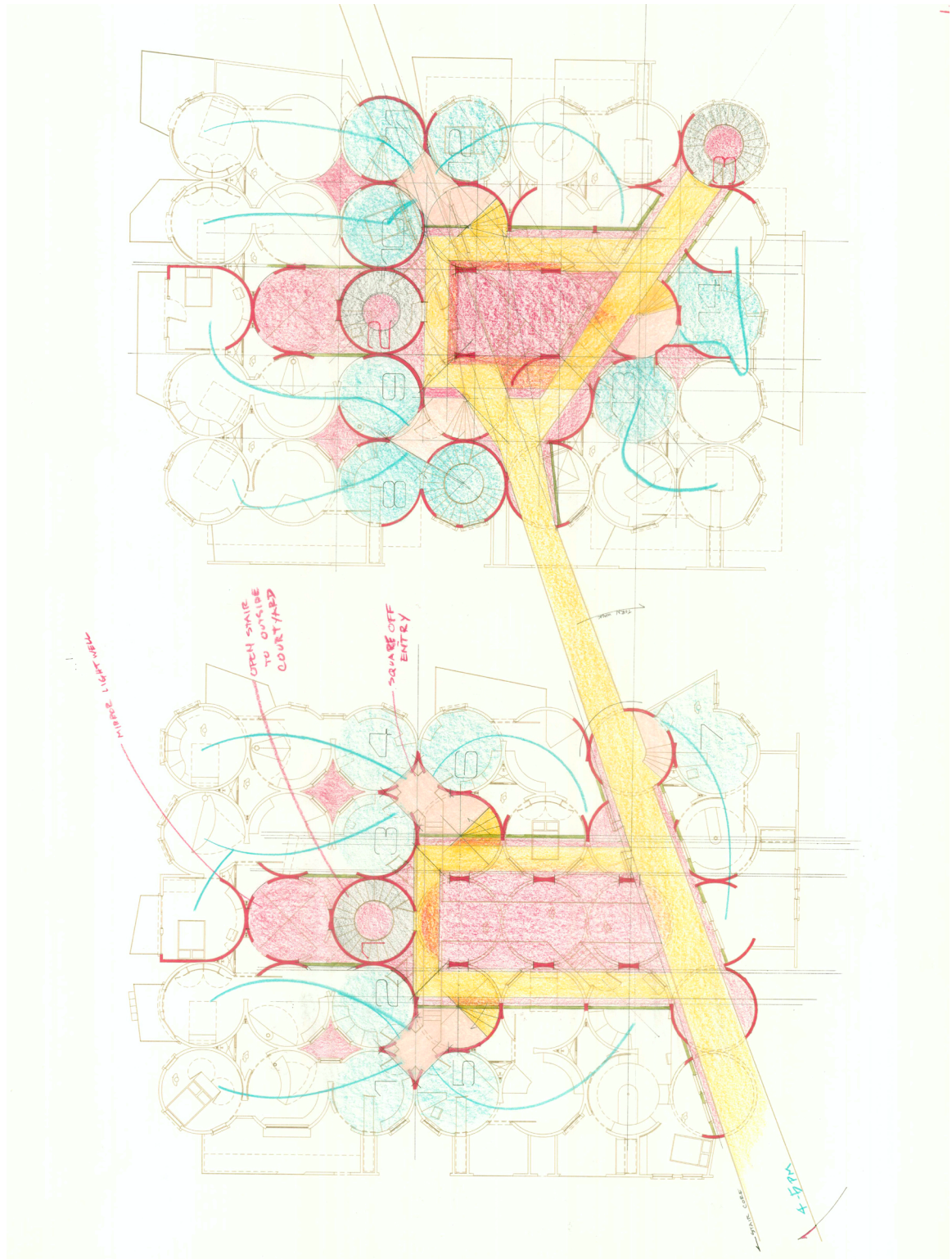


Figure 48. Plan Diagram of Unit and Corridor Relationship



Figure 49. Aerial Perspective of City of Castellammare di Stabia

Garofalo, Angelo, "Le vostre fotografie (Castellammare ritratta dai nostri visitatori)," 2002, <<http://www.liberoricercatore.it/levostrefotografie.htm>>

Terzidis, Kostas, "Algorithmic Architecture," Elsevier Ltd., Oxford, United Kingdom, First edition, 2006

Moss, Eric Owen, "Building and Projects 3," Rizzoli International Publications, Inc. New York, New York, 2002

Bennett, Robert, "Sun Angles for Design," Robert Bennett, United States, 1978

Libeskind, Daniel, "Radix- Matrix Architecture and Writings," Prestel-Verlag, Munich, 1997

Eisenman, Peter, "Barefoot on white-hot walls," MAK, Vienna, 2004-2005

Pappalardo, Umberto, "The Gulf of Naples: Archaeology and History of an Ancient Land," EBS Editoriale Bortolazzi-Stein, Verona, First Edition, 2006

Koolhaas, Rem, "Rem Koolhaas: Urban Projects (1985-1990)," Quaderns d'Arquitectura i Urbanisme, Barcelona, 1990

Terzidis, Kostas, "Expressive Form: A Conceptual Approach To Computational Design," Spon Press, New York, New York, 2003

Torres, Ana Maria, "Carre Pinos: An Architecture of Overlay," Monacelli Press, Inc., New York, New York, 2003

McKay, Lauchlan, "The Practical Ship-BUILDER," Collins, Keese and Co., New York, New York, 1940

Cohen, Preston Scott, "Contested Symmetries and Other Predicaments in Architecture," Princeton Architectural Press, New York, New York, 2001

Cameron, Kristi, "Metropolis Magazine: Architecture < Culture < Design," September 2007, pp. 128-131

Imer, Aldo, "Rassegn Architettura: verso una biennale di architettura territoriale: Castellammare di Stabia," Nicola Longobardi Editore, Via Napoli, Castellammare di Stabia, 2006

Bussi, Raffaele, "Il Fotografo E La Citta: Castellammare di Stabia nell'archivio di Mimi Paolercio," Nicola Longobardi Editore, Via Napoli, Castellammare di Stabia, 2003

Becom, Jeffrey, "Mediterranean Color: Italy, France, Spain, Portugal, Morocco, Greece," Abbeville Press Publishers, New York, New York, 1990

Otto, Frei, "Frei Otto Complete Works: Lightweight Construction, Natural Design," Birkhauser- Publishers for Architecture, Basel, Switzerland, 2005

Buchanan, Peter, "Renzo Piano Building Workshop Complete Works: Volume Two," Phaidon Press Limited, New York, New York, 1995

Richardson, Phyllis and Dietrich, Lucas, "XS: Big Ideas, Small Buildings," Universe Publishing, New York, New York, 2001

Schittich, Christian, “ In Detail: High-Density Housing: Concepts, Planning, Construction,” Karl Dorfel Reproduktions- GmbH, Munchen, Germany, 2004

Schittich, Christian, “ In Detail: Solar Architecture: Strategies, Visions, Concepts,” Karl Dorfel Reproduktions- GmbH, Munchen, Germany, 2003

Jones, David Lloyd, “ Architecture and the Enviroment: BioClimatic Building Design,” The Overlook Press, Peter Mayer Publishers, Inc. New York, New York, 1998

Reed, Peter, “Groundswell: Constructing the Contemporary Landscape,” The Museum of Modern Art, New York, New York, 2005

Adler, David, “ Metric Handbook: Planning and Design Data, Second Edition,” Architectural Press, Oxford, United Kingdom, 1999

Altarelli, Lucio, “ Residual Architecture,” Diagonale s.r.l., Rome, 1999

Aranda, Benjamin and Lasch, Chris, “Pamphlet Architecture 27: Tooling,” Princeton Architectural Press, New York, New York, 2006

Smout, Mark and Allen, Laura, “ Pamphlet Architecture 28: Augmented Landscapes,” Princeton Architectural Press, New York, New York, 2007

Reeser, Amanda and Schafer, Ashely, “ Praxis: Journal of Writing + Buiding: New Technologies:// New Architectures,” Issue 6, Garrity Printing, USA, 2004