[IN]formal:
Infrastructure and Citizenship in Manila's Undercity

by

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CONTENTS

ABSTRACT

The influx of rural migrants to urban centres in the developing world has resulted in a dichotomous urbanization and the proliferation of informal settlements. Manila, the capital of the Philippines, is no stranger to this narrative. In the socio-economically divided city of Manila, informal settlers are subject to the twin hostilities of miserable living conditions and city policies that advocate for demolition and relocation.

This thesis explores the antithetical approach to present exclusionary practices. It aims, through a series of architectural interventions that are visible, flexible, and democratic, to develop an infrastructural framework that is both a tangible improvement to life in the informal settlement and is emblematic of a legitimized place in the city. Baseco Compound, an enclave of informality within formal Manila, will be the testing ground for this thesis.

ACKNOWLEDGEMENTS

CHAPTER 1: INTRODUCTION

Thesis Question

How can an infrastructural strategy for the informal settlement provide basic services and social enablement to informal settlers in Manila?

The unfortunate truth is that poverty in Manila is not a sideshow - it is the main event. Decades of rural-to-urban migration and apathetic government policies have resulted in widespread poverty and a socio-economically divided city. Almost half of Manila's population lives on the margins of the city in completely unacceptable conditions. As a child growing up in Metro Manila, makeshift buildings, cascading illegally connected electrical cables, informal markets, squalor, and misery were common sights from my backseat window. My motivation for pursuing this thesis comes from an acknowledgement of my fortune to have been born in the crib I was born in as well as a desire to explore how architecture can tangibly improve the lives of Manila's most underprivileged people.

Figure 1: Manila is a city of contrasting urbanities. The rich and poor inhabit an entirely different version of "Manila"
(Note: all unsourced renderings and collages have been created by the author)

Global Inequality

The end of World War II and subsequent over-centralization of services, opportunities, and development in the world's urban centres has caused both the dramatic increase in rural-to-urban migration and the explosion of global urban populations. This migration mirrors the rural-to-urban migration of rural peasants in the industrializing nations of Europe but on a much grander scale.[1] By way of example, London in 1910 was seven times larger than what it was in 1800, but cities like Lagos and Dhaka are forty times larger today than they were in the early 1950s.[2] All of this leads to the year 2008 when the global community hit an unprecedented milestone: for the first time in history, more people in the world lived in cities than did in rural areas.[3] This has culminated in a world where a new urban condition known as the megacity - defined as an urban agglomeration with an excess of 10,000,000 people - has emerged. In 1950, New York City was the only megacity in the world but as of 2014, there are 33 such megacities. The majority of these cities are found in the "global south," broadly defined as the world's developing regions.[4]

1. Doug Saunders, *Arrival City: The Final Migration and Our Next World* (Toronto: Vintage Canada, 2011), 1-3.
2. Mike Davis, *Planet of Slums* (New York: Verso, 2006), 2.
3. UNFPA, "Urbanization: A Majority in Cities," *United Nations Population Fund*, last modified May 2007, http://www.unfpa.org/pds/urbanization.htm.
4. Davis, *Planet of Slums*, 2-6.
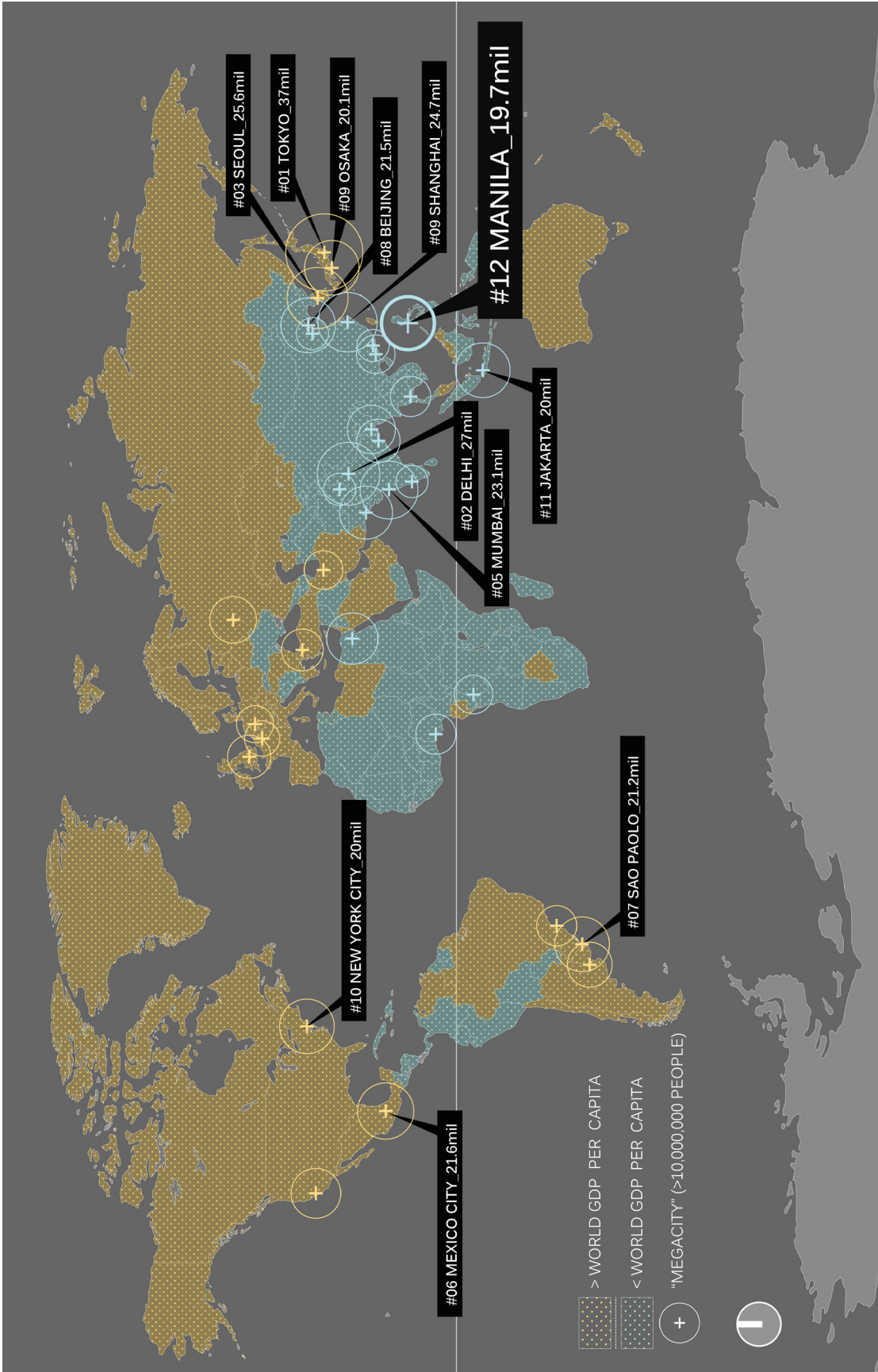
Figure 2: Map of the world's megacities (defined as >10,000,000 people) with the top 12 highlighted; data from United Nations Population Fund

Poverty

This wave of rural migrants has led to another problem that is not unlike what happened in 19th century Europe during the Industrial Revolution: widespread poverty. The vast majority of the cities that are experiencing this rural-to-urban migration are unable to satisfactorily house this flood of migrants while the rural migrants themselves are almost universally unable to afford legal housing in the city. As a result, migrants in these countries end up building their houses on land that they do not own. This act of squatting is often seen as being illegal by city authorities and governments. This alternative type of urbanization has led to the development of the informal settlement - an unsanctioned, unplanned, and unregulated sector of the city.

Such informal sectors are the physical and architectural manifestations of socio-economic inequality and in some cities, this dichotomy could not be more blatant. Of the 3.3 billion people living in urban centres in 2014, 1 billion are poor. In 2030, it is projected that of the 5.5 billion people that will be living in cities, 2 billion will be poor.[5] Not only are urban populations growing at an alarming rate, but they are also getting more and more poor. Figure 3 shows the stark contrast in density and organization between "formal," legal districts and "informal," illegal districts in certain megacities of the global south.

Rio de Janiero, Brazil

Mumbai, India

Lagos, Nigeria

Manila, Philippines

Figure 3: Formal and informal districts in various cities; data from Google Maps

5.   Pedro Gadanho, "Displacing the Architect" (lecture, Dalhousie University, Halifax, NS, November 6, 2014).

Informal Settlements

Informal settlements in different cities take many forms, are very diverse, and go by different names (*favelas* in Brazil, *villa miserias* in Argentina, *barrios* in Latin America, *gecekondu* in Turkey, *bidonvilles* in France, *chawls* in India, etc)[6] so it is difficult to generalize. However, attempts have been made to standardize definitions in order to aid the study of informal settlements. According to UN-Habitat, the operational definition of a "slum" is a settlement that features, to various extents, the following characteristics:[7]

- Inadequate access to safe water.
- Inadequate access to sanitation and other infrastructure.
- Poor structural quality of housing.
- Overcrowding.
- Insecure residential status/land tenure.

The following is an explanation of each of these characteristics as well as a description of how each characteristic is observed in Manila, this thesis' site.

Figure 4: A water tender in a Manila slum; from Citylab, "The Woman Who Brought Water, Then Jobs, to a Manila Slum"

Inadequate Access to Water

Access to fresh and clean water is a basic human need and the unregulated nature of the informal settlement and the tendency of a slum's environment to deteriorate makes this a huge issue. This results in a situation where fresh water is treated as a commodity and is often be sold to informal settlers at higher prices than water would be sold to people living in the formal sector.[8]

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6. UN-Habitat, *The Challenge of Slums* (London: Earthscan Publications, 2003), 10.
7. Ibid, 12.
8. Davis, *Planet of Slums*, 143.

This is certainly the case in Manila's informal settlements, where slumdwellers have to pay close to $3 per cubic metre of drinkable water, which is greater than what a Londoner would have to pay.[9] Some of Manila's informal settlements have artesian wells but the majority of slumdwellers are forced to get their water at high prices.

Inadequate Sanitation

Related to the lack of water is the lack of sanitation services. For the most part, informal settlements are built on land that was either never intended to support urbanization or land that remains unconnected to a city's sewage system. This lack of sewage and sanitation leads to the gradual urban decay and the widespread proliferation of mosquito-borne diseases like dengue fever and malaria. It is estimated that 2.6 billion people in the world live with inadequate sanitation.[10]

In Manila, the informal settler either lives in a slum - where sanitation services exist but have deteriorated due to lack of maintenance - or an informal settlement - whose makeshift nature makes it so sanitation services do not exist at all.[11] In both cases, the end result is an environment that is terribly polluted and rife with disease.

Figure 5: Unsanitary living conditions found in many of Manila's slums; from BBC, "In Pictures: Manila Slum Life"

9. Anup Shah, "Water and Development," *Global Issues*, last modified June 2010, http://www.globalissues.org/article/601/water-and-development.

10. Ibid.

11. Independent Evaluation Group, "Sewerage and Sanitation: Jakarta and Manila," *World Bank Group*, last modified 2012, http://lnweb90.worldbank.org/oed/oeddoclib.nsf/DocUNIDViewForJavaSearch/4BE7A12A7DD3B01A852567F5005D897C.

Figure 6: Barong-barong houses in Baseco, Manila; from Bialobrzeski, *Case Study Homes*

Poor Structural Quality

Driven by necessity, the morphology of an informal settlement usually features haphazard building construction from appropriated scrap materials. Because of this, the houses in an informal settlement violate building codes and bylaws. This can be further compounded by governments that are either apathetic to informal sectors or are unwilling to deal with them, leading to a lack of supervision and safety standards.[12]

The majority of housing stack in Manila's informal sector is of the "barong-barong," or improvised house, type. Such structures are characterized by scrap-wood, corrugated metal, and breeze-block construction. These houses are often no match for the many tropical storms and floods that occur in Manila every year and constantly have to be rebuilt.

Overcrowding

Informal settlements have the highest densities in the cities that feature them, with several large families often inhabiting the same small house.[13] Houses in informal settlements have few rooms that effectively act as every room in the house as they transform from kitchen in the morning to bedroom in the evening. Worse still, as second-generation migrants mature and have their own families, they are usually unable to successfully find housing and are forced to remain in their parent's house.[14]

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12. Ananya Roy and Nezar Alsayyad, ed., *Urban Informality: Transnational Perspectives* (Oxford: Lexington Books, 2004), 90.
13. UN Habitat, *The Challenge of Slums*, 11.
14. Aprodicio Laquian, *Slums are for People* (Honolulu: East-West Center Press, 1971), 77.

Figure 7: Family crowded in their house in an informal settlement in Manila; from CBS, "Faces of Poverty"

In Manila, the poorest families often have the most children. As a predominantly Catholic country, the Roman Catholic Church is a huge influence on Filipino society and has actively fought against legislation that would allow universal access to contraception.[15] This has exacerbated the already crowded situation in Manila's informal settlements. Manila's informal sector contributes greatly to the city's high density.

Insecurity of Tenure

Squatters, by definition, lack any formal document that entitles them to the land that they are occupying. This is driven by the need to have an urban occupation while being unable to support an urban existence. Informal settlements around the world are constantly at risk of being demolished by city governments that see these settlements as either being non-compliant with land-use bylaws or inhibiting civic or private sector projects by occupying prime land.[16]

Figure 8: Slum-dwellers revolting against a demolition team in Quezon City; from Rappler, "Demolition Attempt Turns Violent in QC"

In Manila, many informal settlements occupy marginal land around railroads and waterways. This siting strategy exposes the informal settlers to disease and pollution but it offers them a certain security of tenure as such land is often not seen as valuable. That said, informal settlements along the Philippine National Railway were demolished in 2006-2007 and in 2012, President Benigno Aquino III announced the demolition of the shanty houses that flank Manila's main waterways.[17]

15. Alan C. Robles, "Bishops versus Majority," *Development and Cooperation*, last modified November 22, 2012, http://www.dandc.eu/en/article/catholic-church-opposes-reproductive-health-bill-philippines.

16. UN Habitat, *The Challenge of Slums,* 11-12.

17. T.J. Burgonio, Tarra Quismundo, and Marlon Ramos, "100,000 Slum Folk Must Go," *Philippine Daily Inquirer*, last modified
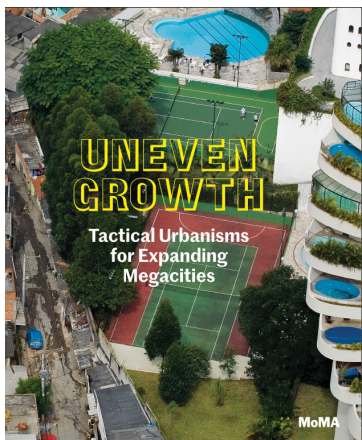
Figure 9: Uneven Growth exhibit; from Museum of Modern Art NY, *Uneven Growth*

This journey from the bottom up to the transformation of the top down is where I find the most hope today.

Figure 10: Teddy Cruz; from TED Talk, "How Innovations Migrate Across Borders"

Global Perspectives on the Urban Poor

The question of how to design for the informal settlement is seen by some contemporary architects and urban theorists as one of the most urgent questions of our time. In 2014, the Museum of Modern Art presented *Uneven Growth,* an exhibit that featured six architect-led exploratory proposals for six different and socio-economically diverse cities in the world. These proposals are, in curator Pedro Gadanho's words, "to counteract the dystopian outcomes that can be expected of the progression of current global trends."[18] In contrast to earlier perspectives that slums are to be demolished because of their inherent illegality, the informal sector is now seen as an architectural problem to solve, not one to destroy or relocate.

The many perspectives on the informal sector are as diverse as the materials used to make them. Some see the informal settlements as hotbeds of innovation and sustainability. Teddy Cruz, through his work in the highly dichotomous Tijuana/San Diego border region, is interested in the flows between this part of the Mexico/United States border and particularly in how the people on the Mexican side acquire and appropriate discarded material from the United States, literally building Tijuana from the waste of San Diego.[19] He argues that our solutions to sustainability lie in the emulation, but not romanticization, of the innovations that

March 2012, http://newsinfo.inquirer.net/250031/100000-slum-folk-must-go.

18. Museum of Modern Art, *Uneven Growth: Tactical Urbanisms for Expanding Megacities* (New York: Museum of Modern Art, 2014), 22.

19. Teddy Cruz, "How Innovations Migrate Across Borders," *TED Talk*, last modified June 2013, https://www.ted.com/talks/teddy_cruz_how_architectural_innovations_migrate_across_borders?language=en.

Considering the ideal condition is a waste of time; the point is to avoid catastrophe.

Figure 11: Alfredo Brillembourg & Hubert Klumper of Urban Think Tank; from McGuirk, *Radical Cities*

If we fail to incorporate the [now 1 billion] slumdwellers in our solutions, we fail to harness their intellectual capital.

Figure 12: Janice Perlman; from Harvard GSD, "Urbanization Seminar Series - Janice Perlman"

come the informal settlements.[20]

Other architects, arguing that the profession has largely ignored how the majority of the world's people live, have dedicated their practices to designing for the underprivileged. Urban Think Tank, based in Caracas, has built its career on architectural projects that aim to provide basic services, public space, and public transportation to Caracas' barrios. Rather than focusing on the why and the how, they argue that it is most important to consider the here and now and what design can do to help.[21]

Some take a structuralist view and believe that the prevalent stereotype of the urban poor is the biggest reason why informal settlements persist. Janice Perlman, in her seminal work *Myth of Marginality*, argues with empirical evidence of living in Rio de Janiero's favelas that the people living in those slums are highly qualified and capable people that are trapped by the stereotype of marginality.[22] It is the perception that they could never be incorporated into the polis that is the biggest hindrance to social change.[23] As important as it is to provide basic services, perhaps it is also vital to provide citizenship and agency to the informal settlers.

20. Garry Peterson, "Teddy Cruz - What Adaptive Architecture Can Learn From Shanty-Towns," *Resilience Science*, last modified March 15 2006, http://rs.resalliance.org/2006/03/15/teddy-cruz-what-adaptive-architecture-can-learn-from-shantytowns/.

21. Urban-Think Tank, *Torre David: Informal Vertical Communities* (Zurich: Lars Muller Publishers, 2013), 27.

22. Janice Perlman, "Urbanization Seminar Series - Janice Perlman," *Harvard GSD,* last modified April 2012, http://www.gsd.harvard.edu/#/media/urbanization-seminar-series-janice-pearlman-mega-cities-the.html.

23. Janice Perlman, *Myth of Marginality: Urban Poverty and Politics in Rio De Janiero* (Berkeley: UC Press, 1973), 91-98.

Radical change, desired by some utopian ideologies is at odds with the prudence and constraints of 'incremental change,' which in many ways is the only vehicle for change given the complexity of the city.

Figure 13: Edgar Pieterse; from Pieterse, *City Futures*

Others believe in the importance of the government in designing for informal settlements. Edgar Pieterse, urbanist, argues in *City Futures* that the only means of enacting change in a system as complex and interconnected as the modern megacity are the precepts of Radical Incrementalism – small, modest, but bold moves forward – and Recursive Political Empowerment – the notion that the participation of a non-benign state is crucial.[24] The informal sector is profoundly affected by the political actions and structures of the formal city and vice versa and it is important to be mindful of this.

The common denominator in these different perspectives is that informal settlements are not going anywhere. On the contrary, they are growing at alarming rates and often house the majority of the population in developing world megacities. The challenge now lies in how architects can design for, rather than deal with, the urban poor and their slums and shanty-towns.

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24. Edgar Pieterse, *City Futures*: *Confronting the Crisis of Urban Development* (Cape Town: UCT Press, 2008), 6-8.

CHAPTER 2: CONTEXT

Republic of the Philippines

Figure 14: The location of the Philippines in Southeast Asia

This thesis is sited in the Philippines, a nation state in Southeast Asia. It is an archipelago nation of 7,107 islands and is located just north of the equator. It has an average temperature of 26 degrees Celsius and an average rainfall of 2,500 mm/year.[25] It is the twelfth most populous country in the world with a population that passed the 100,000,000 people threshold in mid-2014.[26]

While the people of the Philippines are ethnically Indo-Malay, they owe much their cultural heritage to the Philippines' history as a colony of both the Spanish Empire and the United States of America.[27] Filipino historians have argued that these early colonial experiences have

25. Climate Change Knowledge Portal, "Average Monthly Temperature and Rainfall for Philippines from 1960-1990," *World Bank Group*, accessed November 6, 2014, http://sdwebx.worldbank.org/climateportal/index. cfm?page=country_historical_climate&ThisRegion=Asia&Th isCCode=PHL.

26. Agence France-Presse, "Philippines welcomes 100 Millionth Baby," *Philippine Daily Inquirer*, last modified July 27, 2014, http://newsinfo.inquirer.net/623749/philippines-welcomes-100-millionth-baby.

27. Ramon Zaragoza, *Focus on Old Manila* (Oxford: Oxford University Press, 1990), 14.

Figure 15: Spanish influences in the Philippines: the walled city of Intramuros, Catholicism, and a class-based social order; from Zaragoza, *Focus on Old Manila*
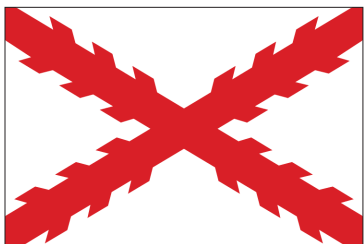
shaped the Philippines' religious and cultural environment and unequal social order.

Philippine Colonial History

1565-1898: Spanish Empire

The main contributions of the Spanish Empire's 300 year rule over the Philippines were the establishment of the Catholic Church. Converting the native population to Catholicism was one of Spanish colonizers' major goals and they were largely successful in this regard. The Philippines, once a predominantly Muslim country, became the largest Catholic nation in Southeast Asia.[28] The village of Manila, with a strategic location at the delta of the Pasig River, became the capital of the now Spanish Philippines and the seat of the Catholic Church in the country, the Manila Cathedral and the walled city of Intramuros, were built in the late 1600s.[29] With religion came a strict social hierarchy and some scholars have argued that the hierarchal system of early Filipino Catholicism - with the Spanish friars at the top, the landowners in the middle, and the rest of the population at the bottom - formed the foundation for the Philippines' hierarchal social order.[30] The Catholic Church is a major part of contemporary Filipino society and the religion commands a powerful political presence in the country.

Land, which prior to Spanish occupation was based on

28. Lawrence De Guzman, "Philippines Still Top Catholic Country in Asia," *Philippine Daily Inquirer*, last modified December 21, 2011, http://globalnation.inquirer.net/21233/philippines-still-top-christian-country-in-asia-5th-in-world/.

29. Manuel Caoili, *The Origins of Metropolitan Manila: A Political and Social Analysis* (Quezon City: New Day Publishers, 1988), 24.

30. Bernardita Calinao, "A Social-Environmental Approach to the Development of Informal Settlements in Metropolitan Manila" (PhD diss., State University of New York, 1990), 117-118.

Figure 16: US contributions include the Daniel Burnham plan for Manila, democratic government, infrastructural systems, and promotion of land ownership; from Caoli, *The Origins of Metropolitan Manila*

usufruct rights, became a commodity that could be privately owned. Land was first granted to those that helped in the conquest of the Philippines in what was known as the *ecomienda* system. Any non land-owners that were living on the now privatized land, known as *haciendas*, were considered squatters.[31] The ecomienda system is often believed to be the precursor to the current problems of land ownership and tenure among Manila's poorest people. As author Nicholas Cushner puts it: "The personal and economic insecurity that touched the Tagalogs of the sixteenth and seventeenth centuries was the harbinger of land problems beneath whose weight the Filipino peasantry is still struggling."[32]

1901-1946: United States of America

Perhaps in contrast to the Spanish, who offered religion to Filipinos, the United States provided the state. The Americans instituted to the Philippines a bicameral government modeled after the one in the United States.[33] The capital city of Manila was adopted from the Spanish and it was to become the showcase of the American occupation. The Americans brought technological innovation to the colony, establishing the Philippines' first public education, railway, highway, telegraph, and airline systems, slowly but spectacularly bringing Manila into modernity.[34] Many infrastructural investments, buildings, and planning schemes, most notably Daniel Burnham's implemented but unfinished Plan for Manila, were done by the United States.

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31. Caoli, *The Origins of Metropolitan Manila*, 43.
32. Nicholas Cushner, *Landed Elites in the Colonial Philippines* (New Haven: Yale University Press, 1976), 70.
33. Ibid, 54-55.
34. Caoli, *The Origins of Metropolitan Manila*, 51.

The Americans also encouraged the development and cultivation of Filipino land as a means of providing raw materials to the United States and fostering landownership among native Filipinos. Ultimately, this only empowered those that already held land and ended up strengthening the hacienda system that was inherited from the Spanish.[35] The poorer Filipinos were further locked out of getting land titles of their own - a sign of the housing problems to come.

Colonial Influence on Inequality

With the combination of a free market system that largely benefitted landed wealthy elites and the preservation of the hierarchal social system from the Spanish, the social divide in the Philippines began to grow. The first rural-migrants arrived in Manila during the American period and the districts of Tondo and San Nicolas became home to the city's first informal settlements. According to historian Manuel Caoili, "towards the end of the American regime, Manila's modern problems - congestion, poverty, slum dwelling, inadequate public services and others - were already evident and becoming critical."[36]

We can see that the Philippines' experience as a colony helped shape the country's current identity as an enclave of both Catholicism and US-style government in Southeast Asia. These colonial influences also profoundly influenced the Philippines' current social divide and widespread poverty. It can be argued that the Philippines' present socio-economic inequalities can be traced to colonization.

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35. Calinao, "Social-Environmental Approach," 120-121.
36. Caoili, *The Origins of Metropolitan Manila*, 53.

Figure 17: Borders of Metro Manila with the city of Manila highlighted; data from Google Maps

Metro Manila

The Philippines' main urban area is a megacity colloquially known as Metro Manila. The metropolis is situated between Manila Bay on the west, Laguna de Bay on the east, and is bisected by the Pasig River. Metro Manila grew from the capital and namesake city of Manila and, through decades of formal and informal urbanization following World War II and independence from the United States, expanded and sprawled north and south.

Metro Manila as an entity came into being in 1975, with Presidential Decree 772 by former president and dictator Ferdinand Marcos. At the time, only four of the 17 municipalities of Metro Manila had the population to be considered a city, defined in the Philippines as having an excess of 150,000 inhabitants. As of 2015, only one, Pateros, has yet to achieve city-hood.[37]

Metro Manila is infamous for having a vast socio-economic disparity. The rich live in gated communities and practice an "architecture of fear" by protecting themselves from the city and remaining in Metro Manila's few enclaves of mega-wealth. The poor, on the other hand, struggle daily to get by in a city that lacks social safety nets and practice an "architecture of survival" as they appropriate and encroach on the city in the interest of surviving. Today, there are 526 informal settlements in Metro Manila and they house 44% of Metro Manila's population (roughly 5,200,000 people).[38]

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37. GMA News, "Navotas Now a City," *GMA News*, last modified June 25, 2007, http://www.gmanetwork.com/news/story/48066/news/nation/navotas-now-a-city-despite-dismal-plebiscite-turnout.

38. UN-Habitat, *The Challenge of Slums*, 215-216.

METRO MANILA SPRAWL

1644   1948

1966   2014

CALOOCAN_1,489,000

QUEZON CITY_2,761,700

MARIKINA_424,100

VALENZUELA_575,300

MALABON_353,300

NAVOTAS_249,100

SAN JUAN_121,400

MANDALUYONG_328,700

PASIG_669,700

PATEROS_64,100

MAKATI_476,700

PASAY_392,800

TAGUIG_695,800

PARANAQUE_588,000

MUNTINLUPA_459,000

LAS PINAS_552,500

CITY OF MANILA
38.55 km²
1,652,171 people
43,079 persons/km²

METRO MANILA
638.55 km²
11,855,975 people (in the 17 cities)
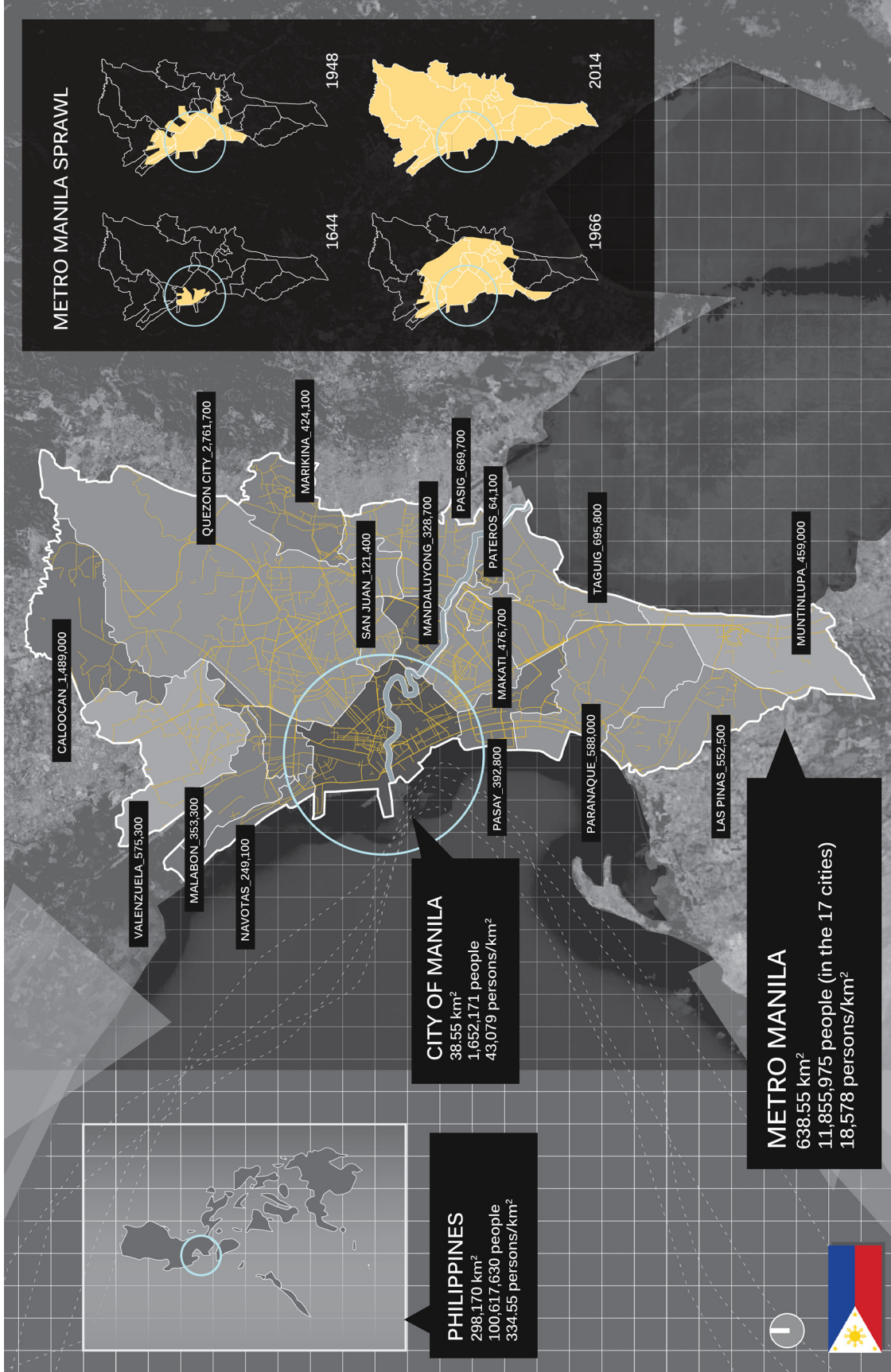18,578 persons/km²

PHILIPPINES
298,170 km²
100,617,630 people
334.55 persons/km²

Figure 18: Metro Manila's population, place, and pattern of sprawl; data from Philippine National Statistics Office

City of Manila

The City of Manila is the capital of Metro Manila and the Philippines. Located at the delta of the Pasig River, it has been the historical, political, and cultural centre of the country since the Spanish colonial period in the mid 1600s. Manila is 38.55km^2 in area and has a population of 1,652,171 people. With a density of 43,079 people/km^2, it is by some measures the densest city in the world.[39]

As the oldest part of Metro Manila, the city of Manila features many vestiges of the Philippines' rich colonial history. Manila is home to Binondo, the oldest Chinatown in the world; Intramuros, the historic walled city of seven churches and seat of the Catholic Church in Manila; and Luneta Park, the realized portion of architect Daniel Burnham's plan for the City of Manila.[40]

On the same token, Manila was also the first urban centre that the Filipino rural-urban migrants moved into, and as such also contains many of the most entrenched informal settlements in the metropolis. Tondo, the largest informal district in Southeast Asia, is located in the northern part of Manila. To the south is San Andres Bukid, an informal settlement that grew between the formal districts of the cities of Manila and Makati. Finally, Baseco Compound (the focus of this thesis) is a relatively new informal settlement located in the westernmost point of Manila.

Figure 19: Formal and informal urbanization in Manila

39. Joe Peach, "Megacities," *This Big City*, last modified May 14, 2012, http://thisbigcity.net/megacities-five-of-the-worlds-biggest-cities/.

40. Mauro Garcia and C.O. Resurreccion, ed., *Focus on Old Manila* (Manila: Philippine Historical Association, 1971), 10.

Figure 20: Plan of Manila, highlighting the various formal and informal districts; data from Philippine National Statistics Office

MANILA'S POPULATION

INVISIBLE INFORMAL

SAN ANDRES BUKID
1.68 km²
117,000 people
69,640 persons/km²

SITE

TONDO DISTRICT
9.11 km²
630,000 people
69,150 persons/km²

BASECO COMPOUND
0.52 km²
51,000 people
98,076 persons/km²

QUIAPO

BINONDO

INTRAMUROS

ERMITA

Invisible Undercity

The inherent problem with studying the informal sector is that there is a general lack of information about it. Census data is inconsistent, statistics are biased and inaccurate, and informal sectors are usually not drawn on maps. Informal settlements are something of a paradox of visibility in that sense. Informal settlements could not be more visible from the street or from satellite imagery but they are almost totally invisible on political maps and especially in policy.

Figure 21: Political maps often exclude or omit data on informal settlements, rendering these sectors blank; from Wikimedia Commons

WATCH

CAPTURE

COLLECT

Figure 22: Method

Phenomena Map

Although there is a lack of reliable statistical evidence on informal settlements in Manila, there is no shortage of documentary work on them. Broadcasting corporations like BBC, Al Jazeera, and Channel 4 have all made several documentaries on the informal settlements of Manila and each of them offers a close up glimpse of life in Manila's undercity. Inspired by a similar exercise done by Urban-Think Tank in the informal settlements of Caracas, I collected evidence of "ingenuities" from these film sources and gathered them into a catalogue.[41] This catalogue forms a Phenomena Map of Manila's undercity.

The documentary evidence was apportioned into categories of Form, Program, and Material, and the data was then organized into different conceptual structures for analysis. For form, the data was organized by scale; for program, the data was organized from work to play; and for material, the data was organized by material type. From there, the data was analyzed for patterns of clustering, repetition, and, most importantly, absence.

All evidence for the Phenomena Map (Figures 23-26) were taken from the following resources:

- *The Slum: Episodes 1-6,* Al Jazeera (2014)

- *Toughest Place to be a Bus Driver*, BBC (2011)

- *Our World Living with Slums*, BBC (2011)

- *Sex and Religion in Manila*, BBC (2011)

- *World's Biggest Maternity Ward*, BBC (2013)

- *Unreported World: Manila*, Channel 4 (2010)

- *Cemetery Slum*, Vice Japan (2014)

41. Urban-Think Tank, *Informal City: Caracas Case* (Munich: Prestel, 2007), 134-141.
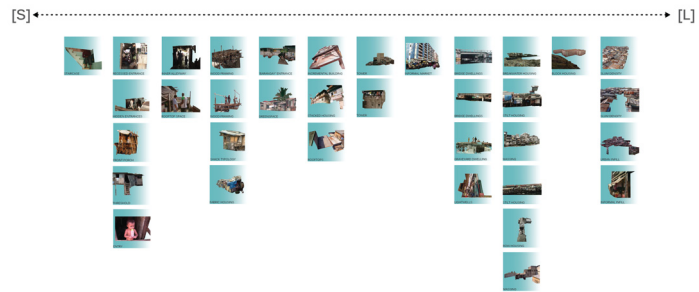
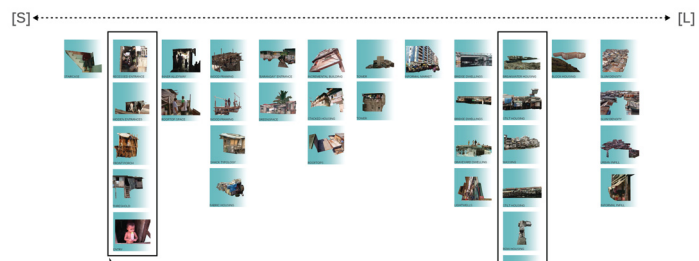Figure 23: Phenomena map of Manila's undercity: form, program, and material

MATERIAL

ELECTRIC WIRES
ELECTRIC FAN
INTERIOR CURTAINS
BREEZEBLOCKS
DEMOLITION
IMPROVISED STOVE
GARBAGE
BARRED WINDOW
CAGED ANIMALS
BAMBOO
ILLEGAL ELECTRICITY
ELECTRIC WIRES
ELECTRIC WIRES
G-BAG PLATFORM
CEILING ASSEMBLY
ROOF
FLOORING
THRESHOLD
TOILET
URBAN POOL
CLOTHESLINE
ELECTRIC METERS
HAMMOCK
BAMBOO FENCE
LIGHTING
NATURAL LIGHT
SHELVING
DISASTER SHELTER
STORAGE
ALLEYWAY ROOF
CLOTHES ON FENCE
DOOR FRAME
LIGHTING
TENSILE ROOF
LOT MARKING
CORRUGATED METAL
METAL ROOFING
TENSILE ROOFING
SHELVING
ANTENNA
CLADDING
NIGHT MARKET
CANVAS ROOF
TARPAULIN DOOR
CARPENTRY

PROGRAM

RECYCLING
JEEPNEY DRIVING
KARAOKE
KITCHENWORK
TRICYCLE
BOAT MOORING
CONSTRUCTION
FISHNET MAKING
SARI-SARI STORE
RICKSHAW
RAINWATER BATH
STREET GATHERING
INDOOR BATH
SCAVENGING
SOCIAL EVENT
SARI-SARI STORE
BASKETBALL
COCK FIGHTING
MATERNITY
MEAT PROCESSING
VEGETABLE PEELING
CARPET MARKET
MEALS ON FLOOR
CHILDCARE
BOATING
FISHING
COOKING
PLAYROOM
DINNER GATHERING
DISHWASHING
BOATING
OUTDOOR COOKING
SARI-SARI STORE
SACHETS
SAMPAGUITA
RURAL FARMING
STREETLIFE
VIDEOGAMES
BIRTH CERTIFICATES
TROLLEY

FORM

INFORMAL INFILL
BLOCK HOUSING
BREAKWATER
BRIDGE DWELLINGS
ENTRY
INCREMENTALISM
HIDDEN ENTRANCES
WOOD FRAMING
LIGHTWELLS
GRAVEYARD HOUSE
SLUM DENSITY
FABRIC HOUSING
ROOFTOPS
MASSING
BRIDGE DWELLINGS
STACKED HOUSING
STILT HOUSING
STAIRCASE
THRESHOLD
TOWER
SHACK TYPOLOGY
URBAN INFILL
TOWER
MASSING
'BARANGAY' ENTRY
INFORMAL MARKET
RECESSED DOOR
INNER ALLEYWAY
FRONT PORCH
STILT HOUSING
ROOFTOP SPACE
ROW HOUSING
WOOD FRAMING
SLUM DENSITY
GREENSPACE

Translation

[S] ◄--► [L]

ARCHITECTURAL FORM

Analysis

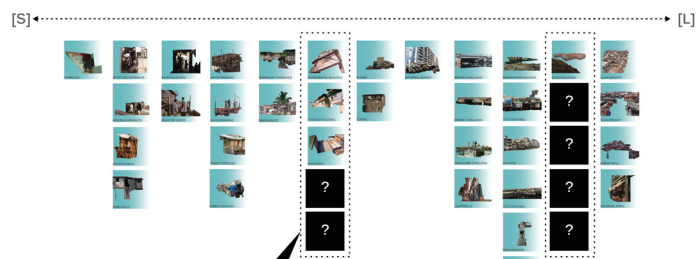[S] ◄--► [L]

THRESHOLD CONDITION IS EITHER PROLONGED
OR ABRUPT. "RIGHT SIZE" IS RARE

INFORMAL SETTLEMENTS ARE USUALLY
PORTRAYED AT THE SCALE OF A BLOCK
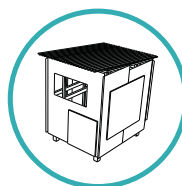
ARCHITECTURAL FORM

Cross-referencing

[S] ◄--► [L]

?
?
?
?
?
?

INFORMATION ON ASSEMBLY
OF SEMI-CONCRETE
INCREMENTAL HOUSING WAS
NOT FOUND. MORE RESEARCH
IS NECESSARY.

MASS HOUSING PROJECTS LIKE
BLISS HOUSING IS MISSING
(BERNER, 1997)

ARCHITECTURAL FORM

Conclusions

URBAN POOR HOUSING TYPOLOGY

"BARONG BARONG"
HOUSE
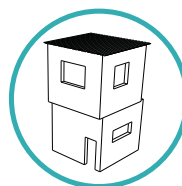
SEMI-CONCRETE
HOUSE
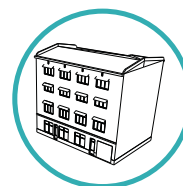
HOUSING BLOCK

Figure 24: Translation, analysis, cross-referencing, and conclusions: form

Translation

[WORK] ◄--► [PLAY]
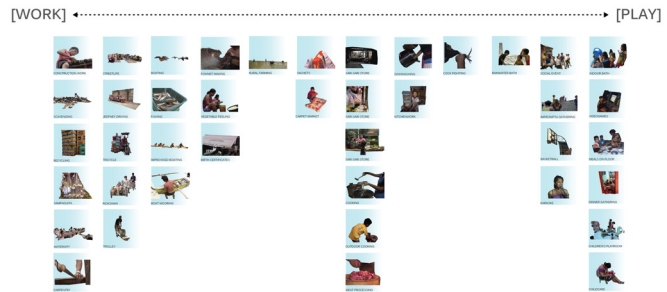
PROGRAM AND USE

Analysis

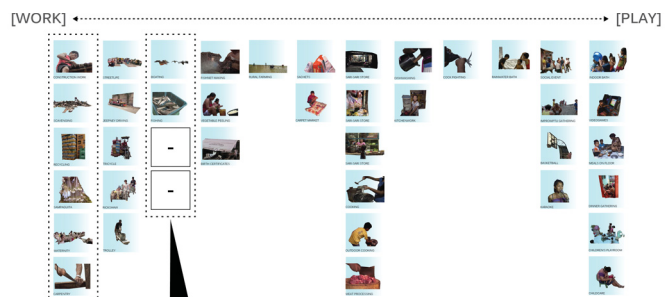[WORK] ◄--► [PLAY]
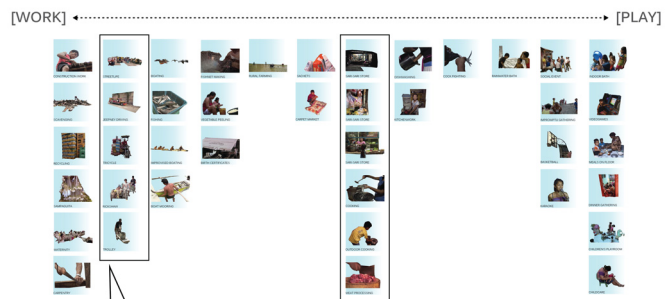
PUBLIC TRANSIT IN MANILA IS RUN
ALMOST EXCLUSIVELY BY THE POOR

SARI-SARI (CONVENIENCE) STORES ARE
UBIQUITOUS IN INFORMAL SETTLEMENTS

PROGRAM AND USE

Cross-referencing

[WORK] ◄--► [PLAY]

FISHING ACTIVITIES MAY BE OVERREPRESENTED.
PRESENT ONLY IN COASTAL SLUMS (UN-HABITAT, 2003)

NOT ALL OCCUPATIONS PRESENT (JOCANO, 1972)

PROGRAM AND USE

Conclusions

PROGRAMMATIC OPPORTUNITIES

SANITATION   EDUCATION   TACIT TRAINING

Figure 25: Translation, analysis, cross-referencing, and conclusions: program
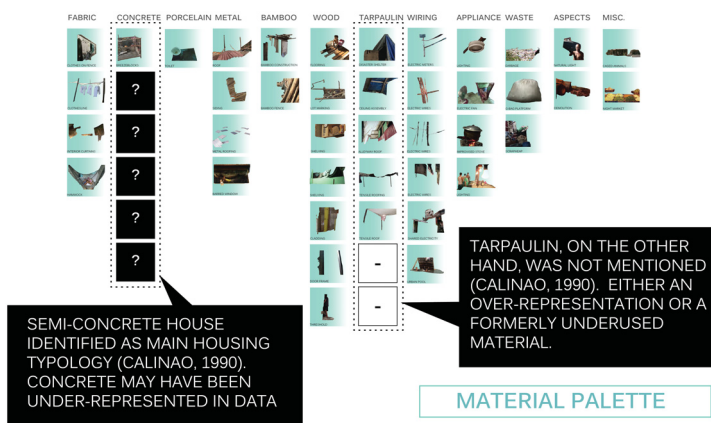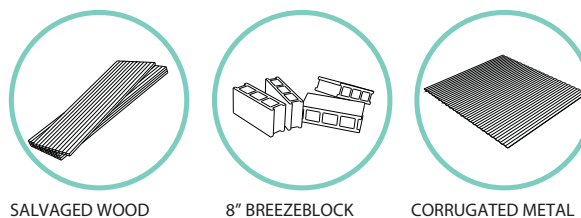
Translation

FABRIC   CONCRETE PORCELAIN METAL   BAMBOO   WOOD   TARPAULIN WIRING   APPLIANCE WASTE   ASPECTS   MISC.
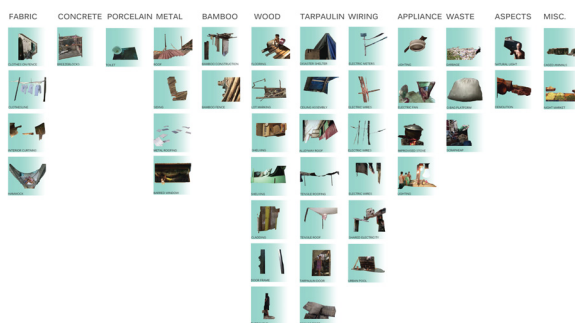
MATERIAL PALETTE

Analysis

FABRIC   CONCRETE PORCELAIN METAL   BAMBOO   WOOD   TARPAULIN WIRING   APPLIANCE WASTE   ASPECTS   MISC.

HANGING CLOTHES AS AN
EXTERIOR MATERIAL IS
EMBLEMATIC OF POVERTY

WOOD AND TARPAULIN ARE THE MOST
COMMONLY OBSERVED MATERIALS

MATERIAL PALETTE

Cross-referencing

FABRIC   CONCRETE PORCELAIN METAL   BAMBOO   WOOD   TARPAULIN WIRING   APPLIANCE WASTE   ASPECTS   MISC.

?

?

?

?

?

TARPAULIN, ON THE OTHER
HAND, WAS NOT MENTIONED
(CALINAO, 1990). EITHER AN
OVER-REPRESENTATION OR A
FORMERLY UNDERUSED
MATERIAL.

SEMI-CONCRETE HOUSE
IDENTIFIED AS MAIN HOUSING
TYPOLOGY (CALINAO, 1990).
CONCRETE MAY HAVE BEEN
UNDER-REPRESENTED IN DATA

MATERIAL PALETTE

Conclusions

MATERIAL PALETTE

SALVAGED WOOD   8" BREEZEBLOCK   CORRUGATED METAL

Figure 26: Translation, analysis, cross-referencing, and conclusions: material

CHAPTER 3: THESIS SITE

FORMAL CITY

ORIGINAL COASTLINE

RECLAIMED: 1937

RECLAIMED: 2002

INFORMAL CITY
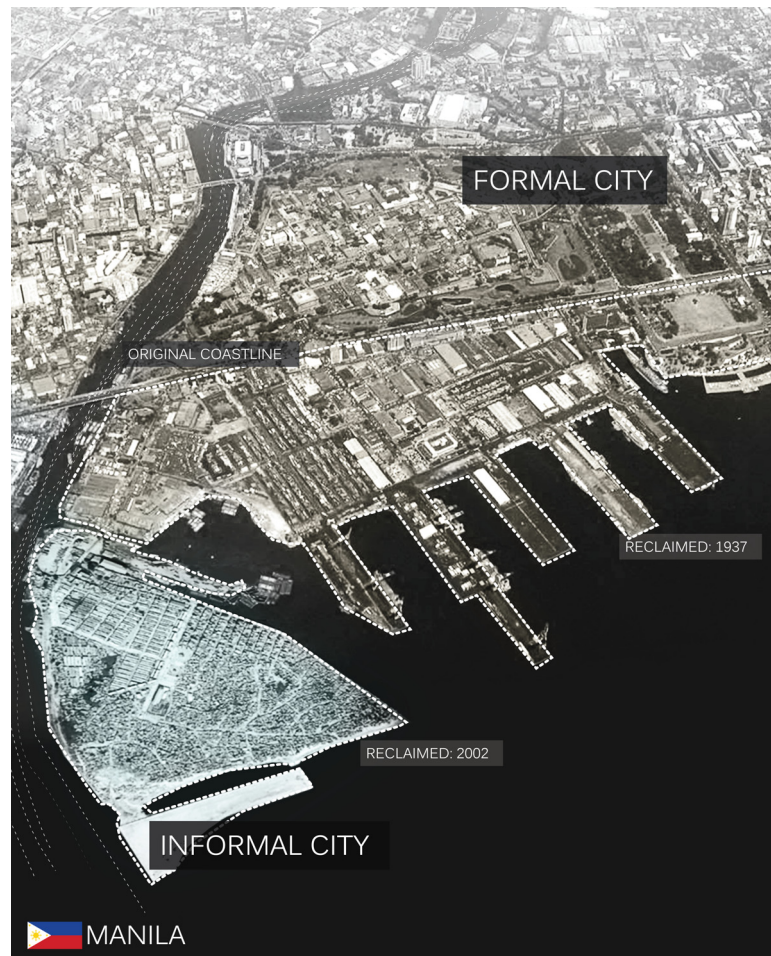
MANILA

Figure 27: Baseco Compound, an informal city on reclaimed land

Baseco Compound

The thesis site, Baseco Compound, is an informal settlement built on patch of reclaimed land located just off the coast of Manila Bay. Part of Manila's Port Area district, It is an enclave of informality within a more formal sector and is physically connected to the city only by a narrow street, further contributing to its invisibility. It is bordered by the Port of Manila to the east, Manila Bay to the south and west, and the Pasig River and district of Tondo on the north. It has a land area of 52 hectares and has a population of 51,000.[42]

42. Mapua Institute of Technology, *Baseco: 2011-2013 Update* (Manila: Mapua Institute of Technology, 2013), 2.
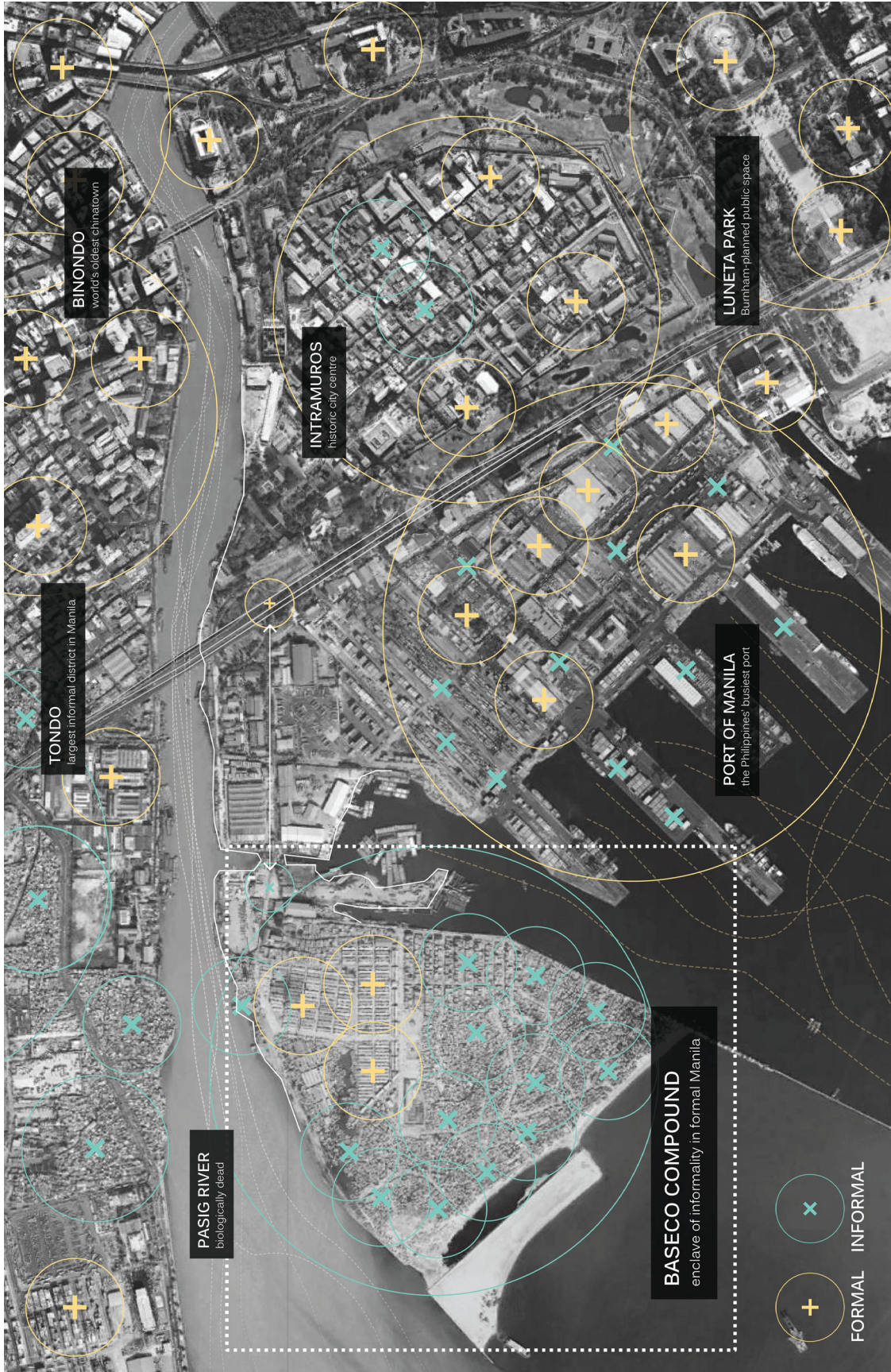
Figure 28: Baseco Compound, immediate context, and nearby formally and informally built buildings; data from NAMRIA

BINONDO
world's oldest chinatown

INTRAMUROS
historic city centre

LUNETA PARK
Burnham-planned public space

TONDO
largest informal district in Manila

PORT OF MANILA
the Philippines' busiest port

PASIG RIVER
biologically dead

BASECO COMPOUND
enclave of informality in formal Manila

FORMAL   INFORMAL

27

Figure 29: Collage showing images of various areas in the site and their corresponding levels of density. Baseco Compound highlighted in colour

Figure 30: 1:8000 plan of Baseco Compound; data from NAMRIA

BASECO COMPOUND

POLITICAL BOUNDARY

CIRCULATION ROUTE

NGO HOUSING

INSTITUTIONS

INFORMALLY BUILT

2001
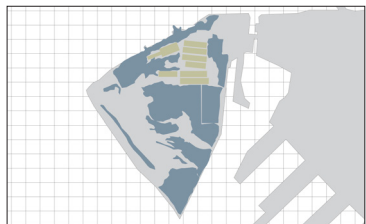
2005
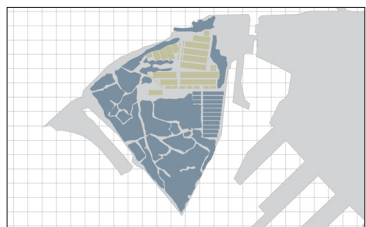
2009

2014

Figure 31: growth of Baseco's land and settlement. Informal housing highlighted in blue and NGO housing in yellow; data from Google Maps

Site History

Baseco Compound is named after the Bataan Shipping and Engineering Corporation, the institution that once owned the land.[43] The land, which was initially a dump site for the Port of Manila known as "Isla Buga" (spewed island), was already being inhabited in the late 1980s, with the first rural-urban migrants illegally building their houses on it in 1984.[44] The settlement continued to take in rural-urban migrants and other urban poor families from other demolished informal settlements from around Metro Manila and these people slowly expanded the land with stone infills, bridges, and other makeshift additions.[45]

It was not until 2002 that Baseco Compound received semi-official recognition as a settlement. Baseco was declared "Barangay 649" (town #649) by President Gloria Macapagal-Arroyo on January 18, 2002 and the government began to slowly infill the rest of what is now Baseco Compound. Ultimately, 52 hectares of land were allotted for Baseco's population, which in early 2002 consisted of around 6,000 urban poor families.[46]

Baseco experienced several devastating fires in the first years following recognition as a town. Four major fires blazed through Baseco Compound after 2002, the two worst ones occurring on March 2002 and March 2003, wiping out hundreds of homes in the central districts of

43. Mapua Institute of Technology, *Baseco*, 2.
44. Zelda D.T. Soriano, "Bagong Lupa: The Village Built from Garbage," *Bulatlat*, last modified 2003, http://www.bulatlat.com/news/3-34/3-34-bagonglupa.html.
45. Ibid.
46. Mapua Institute of Technology, *Baseco*, 3.

Figure 32: Chito Barquin, Lorna Pagtabunan, and Jennifer Parapina, three of the 51,000 people that call Baseco Compound home; from Al Jazeera, "The Slum," and Channel 4, "Unreported World: Manila"

Baseco.[47] These fires, officially ruled an accident by the government but suspected by residents to be planned arson, is unfortunately not without precedent in Manila's informal settlements.[48] NGOs like Habitat for Humanity Philippines and Gawad Kalinga came into Baseco and established housing projects on the now cleared sites of the fires. As of 2007 the two NGOs have built 4000 houses for the informal settlers.[49]

Today, Baseco Compound is a bricolage of makeshift shanty-houses, NGO housing blocks, Port of Manila warehouses, and few public institutions like schools and town halls. Central Baseco, with the NGO-developed housing, schools, paved roads, and evacuation center is the most developed portion while the fringes and waterfronts, most notably the Gasangan and Aplaya districts, remain underdeveloped and squalid. Baseco is a polluted settlement and stagnant water and trash remain ubiquitous sights.

47. Zelda D.T. Soriano, "Bagong Lupa: The Village Built from Garbage," *Bulatlat*, last modified 2003, http://www.bulatlat.com/news/3-34/3-34-bagonglupa.html.

48. Davis, *Planet of Slums*, 127.

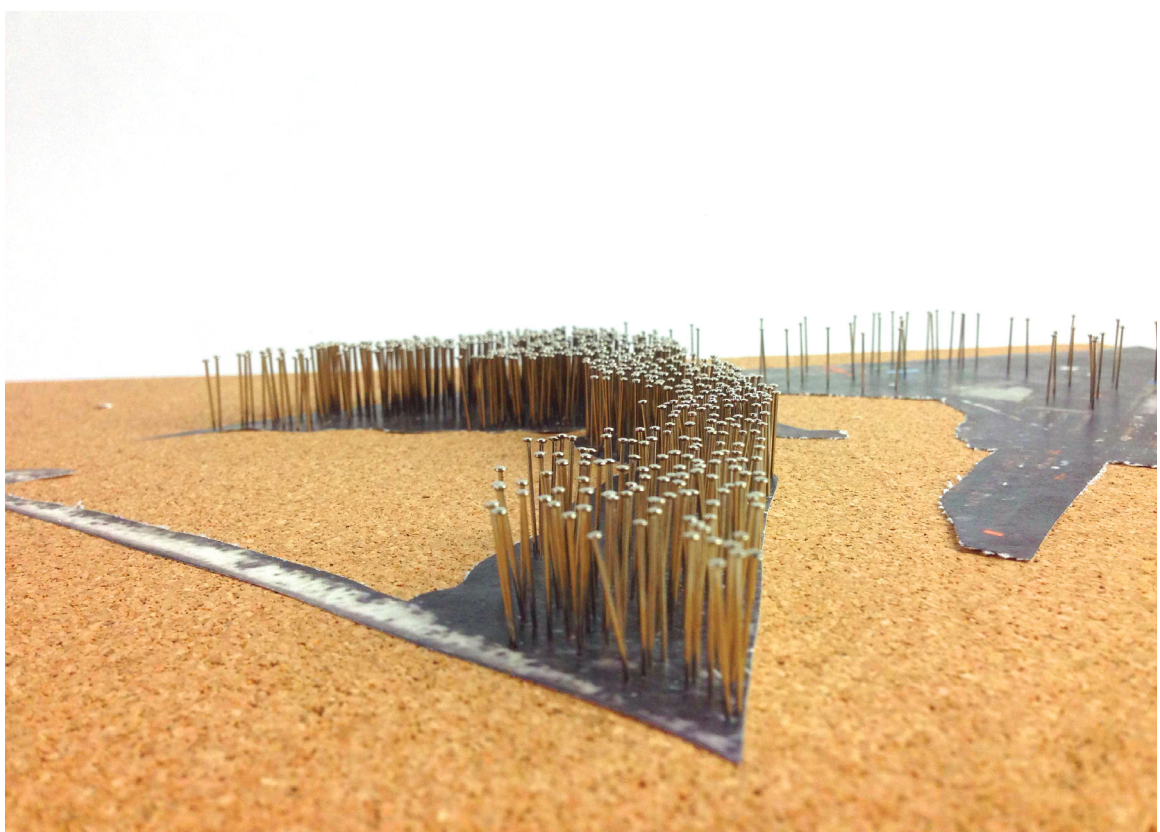49. Maria Gehander and Eva Mornhed, "From Slum to Adequate Homes" (PhD diss., Lunds Universitet, 2006), 13.
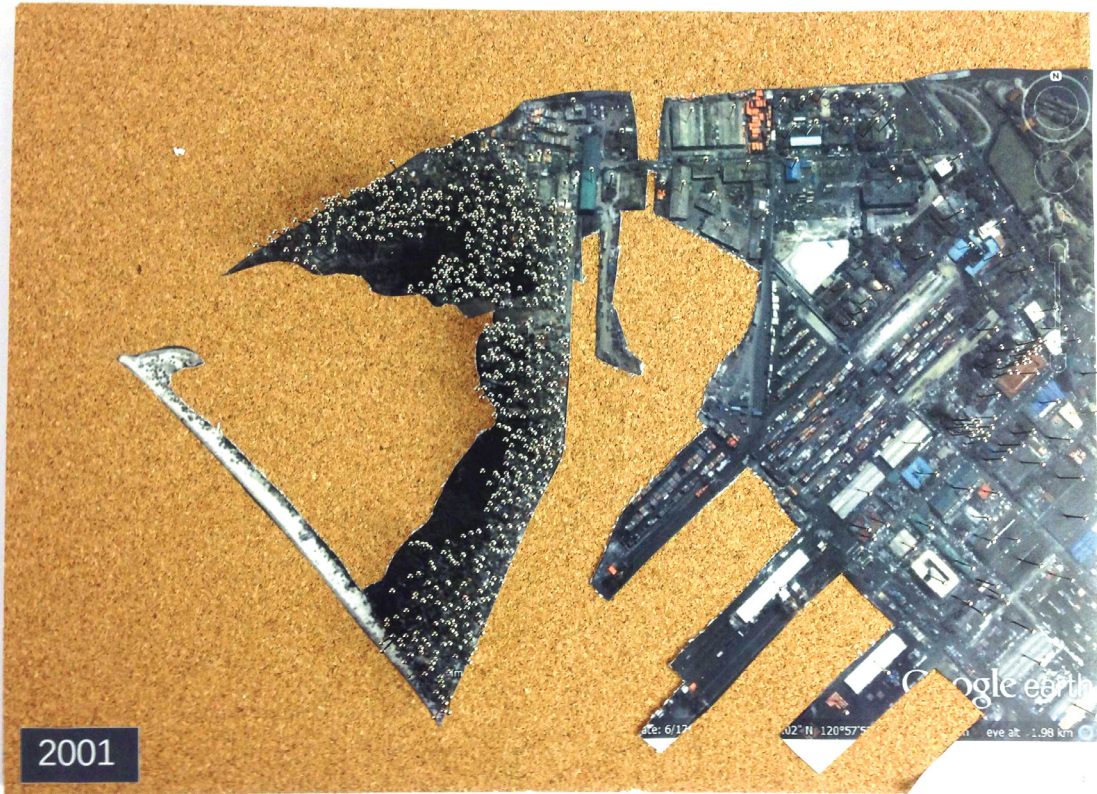
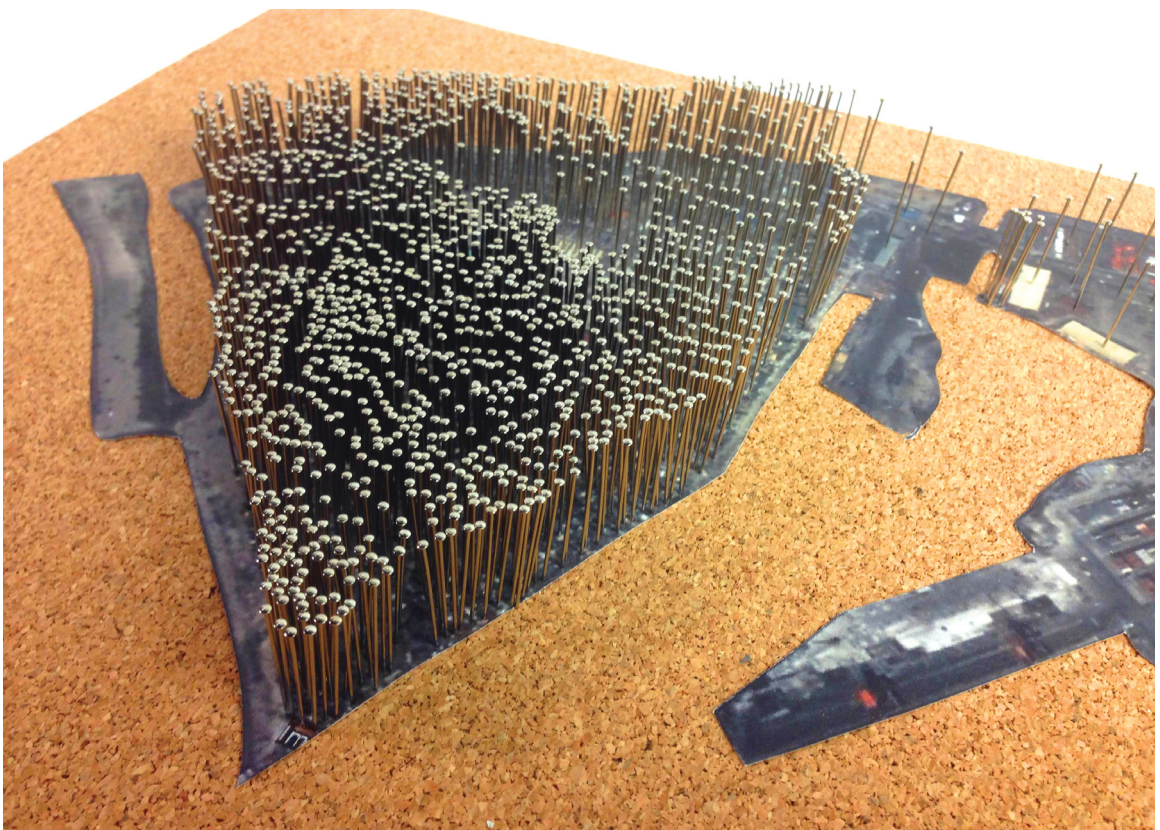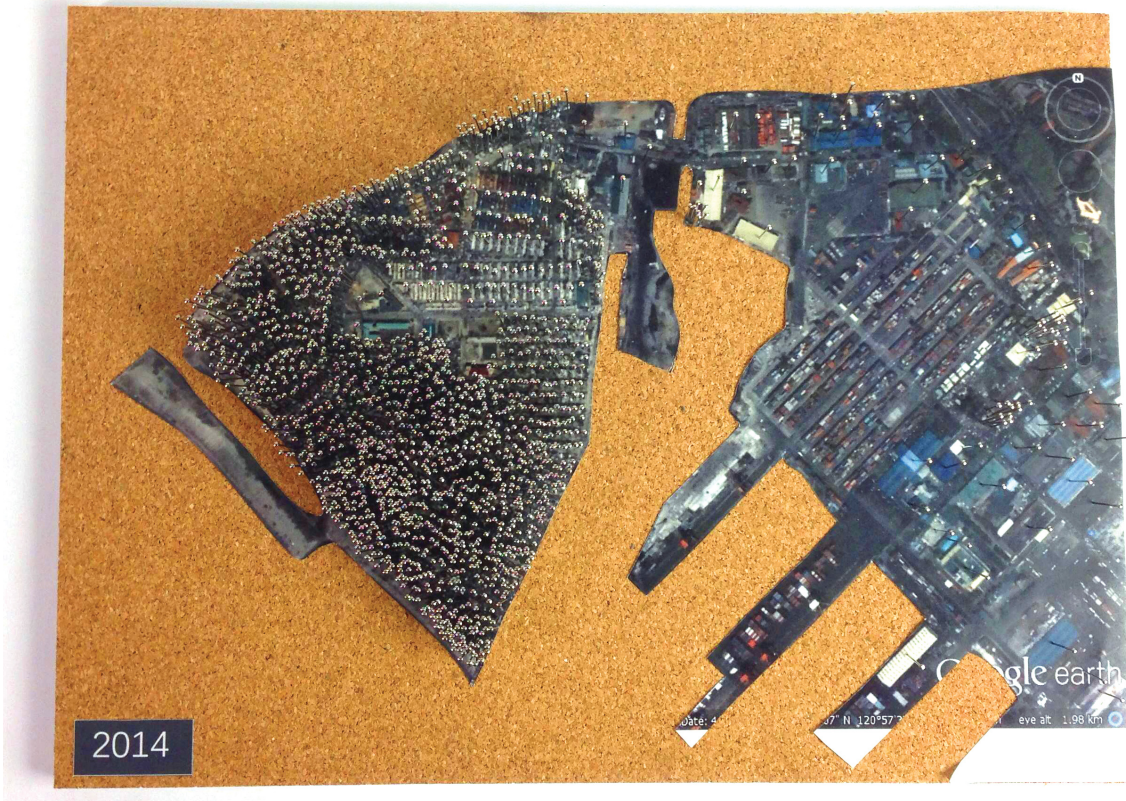Figure 33: Interpretive density map/model of Baseco Compound in 2001

2014

Figure 34: Interpretive density map/model of Baseco Compound in 2014

Site Analysis

Figure 35: Baseco's circulation paths, revealing very diverse urbanization patterns and developed and underdeveloped roads
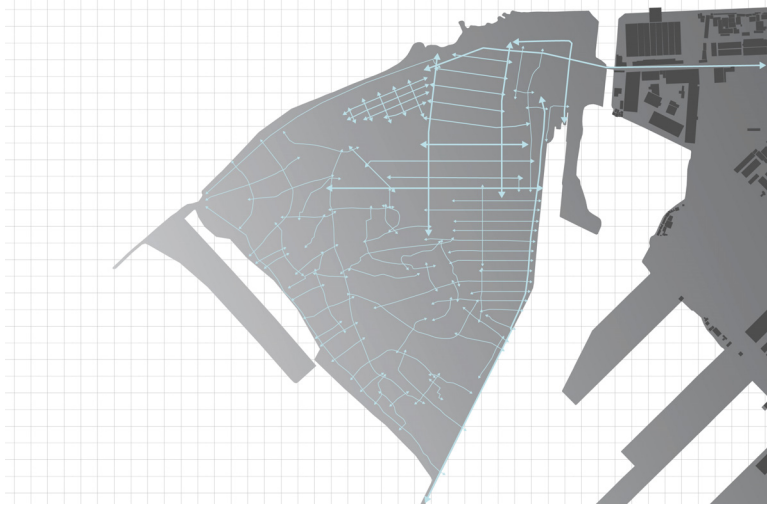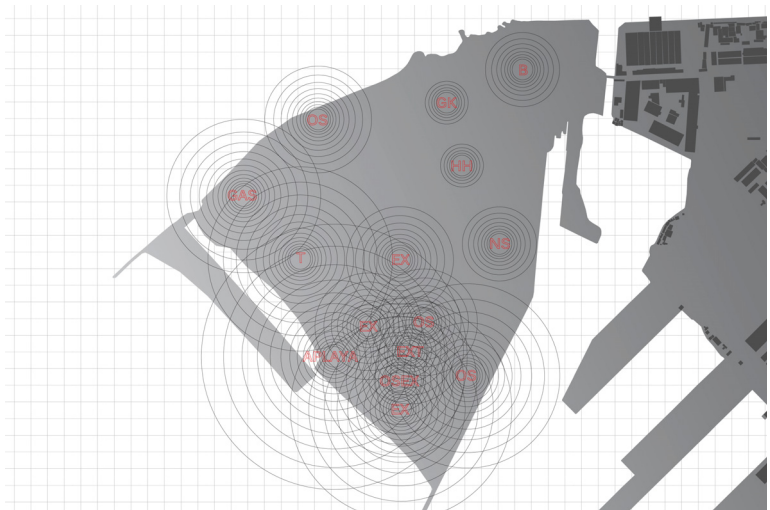

Figure 36: Political districts. GK and HH districts in the central area were developed by the NGOs Gawad Kalinga and Habitat for Humanity, respectively

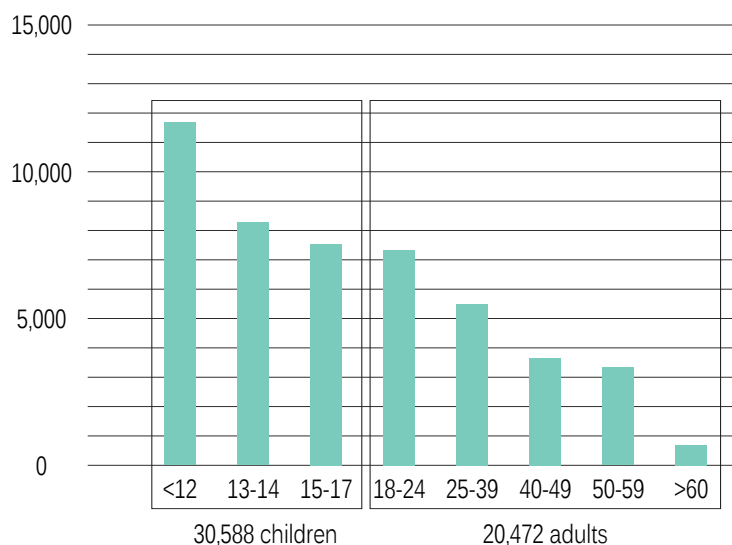Figure 37: Relative poverty levels of each district based on house morphology, amount of free space, stability of land, and levels of pollution
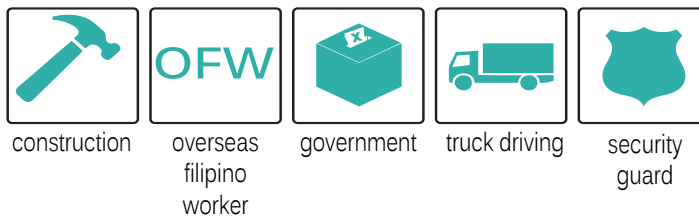
Demographics and Activities

General:

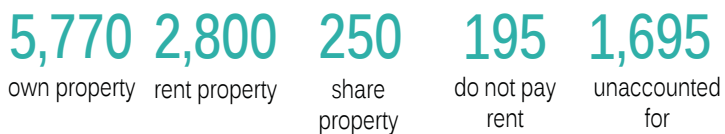8,984 structures   10,712 families

Demographics:

30,588 children   20,472 adults

Primary Occupation:

fishing | vending | scavenging | pedicab/tricycle driving | stevedoring

Secondary Occupation:

construction | overseas filipino worker | government | truck driving | security guard

Tenure Status:

5,770 own property | 2,800 rent property | 250 share property | 195 do not pay rent | 1,695 unaccounted for

Housing Condition:

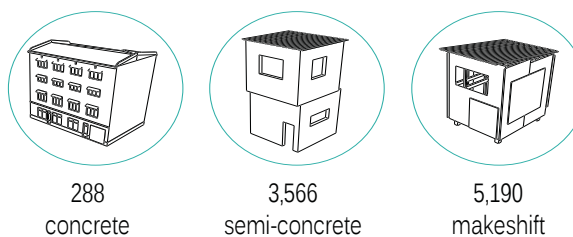288 concrete | 3,566 semi-concrete | 5,190 makeshift

Figure 38: Demographics for Baseco Compound; data from Mapua Institute of Technology

Figure 39: Interpretive collage of typical "barong-barong" housing in Baseco Compound; data from Bialobrzeski, *Case Study Homes*

Productive Waterfronts

Figure 40: Collage showing the productive activities of scavenging and fishing on Baseco's polluted waterfront

Baseco's sandy waterfronts are incredibly polluted because the trash from the rest of the city that is thrown into the Pasig River ends up being deposited on Baseco's shores.[50] Nevertheless, the garbage-strewn beaches are productive landscapes for scavenging - which children often help with - and water-based occupations like boating and fishing.

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50. Richard Cookson, *Unreported World: Manila*, Documentary, reported by Jennifer Kleeman (London: Channel 4, 2010).
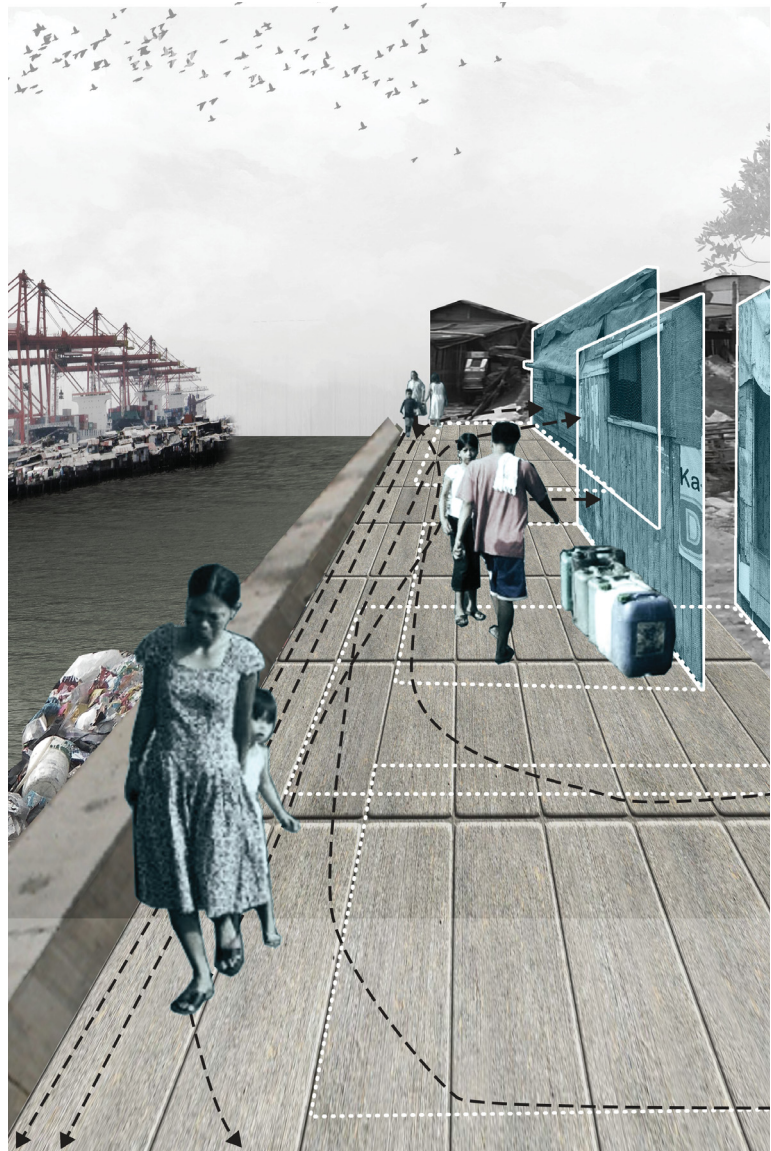
Appropriated Breakwaters

Figure 41: Collage showing the breakwater as an important circulation corridor, linear market, and borrowed space

Baseco is situated between two solid concrete breakwaters on the northwest and eastern ends of the settlement. These narrow breakwaters have been appropriated by the residents as stable land for circulation corridors and linear markets.[51] Space is scarce in Baseco and public space on these breakwaters is sometimes borrowed by adjacent storefronts and houses for private functions.

_____

51. Paul Roy, *The Slum: Episode 1*, Documentary, directed by Paul Roy (Doha: Al Jazeera, 2014).

Ubiquitous Markets

Figure 42: Collage showing a typical "street" in Baseco, revealing the omnipresence of sari-sari stores

Families in impoverished communities in Manila often engage in small-scale market activity to provide an additional but meager source of income for the household. These stores, called "sari-sari stores" in Filipino, are inserted directly into already crowded houses and are usually operated by the women in the family. Because of the popularity of this activity, most streets in Manila's informal settlements are lined with storefronts and informal markets.

Land

The biggest constraint to building on Baseco Compound is the nature of its land. As discussed earlier, Baseco began its life in the early 1980s as a dumping ground for the waste and dredged materials of Port of Manila operations. In the next 30 years the informal settlers, the Pasig River, and the City of Manila would slowly contribute to Baseco's land mass. Baseco's land is a mixture of decades-old Port of Manila waste, makeshift infill of soil and stone done by informal settlers, sediment and waste deposits from the Pasig River, and earth and waste materials from government-sanctioned infill.

Soil tests done in 2004 and 2007 have shown that the land, a part of which was underwater as recently as 2001, is hazardous to build on due to the top layers of the land being easily liquefiable sand/garbage and clay mixes. Citing these soil tests, the City of Manila began discouraging NGOs from building more housing on Baseco and also tried to temporarily relocate Baseco's large population in order to rectify the issue.[52]

52. Jam Sisante, "PRA: Manila reclamation of Baseco being done without its approval," *GMA News*, last modified March 2008, http://www.gmanetwork.com/news/story/110663/news/nation/pra-manila-reclamation-of-baseco-being-done-without-its-approval.

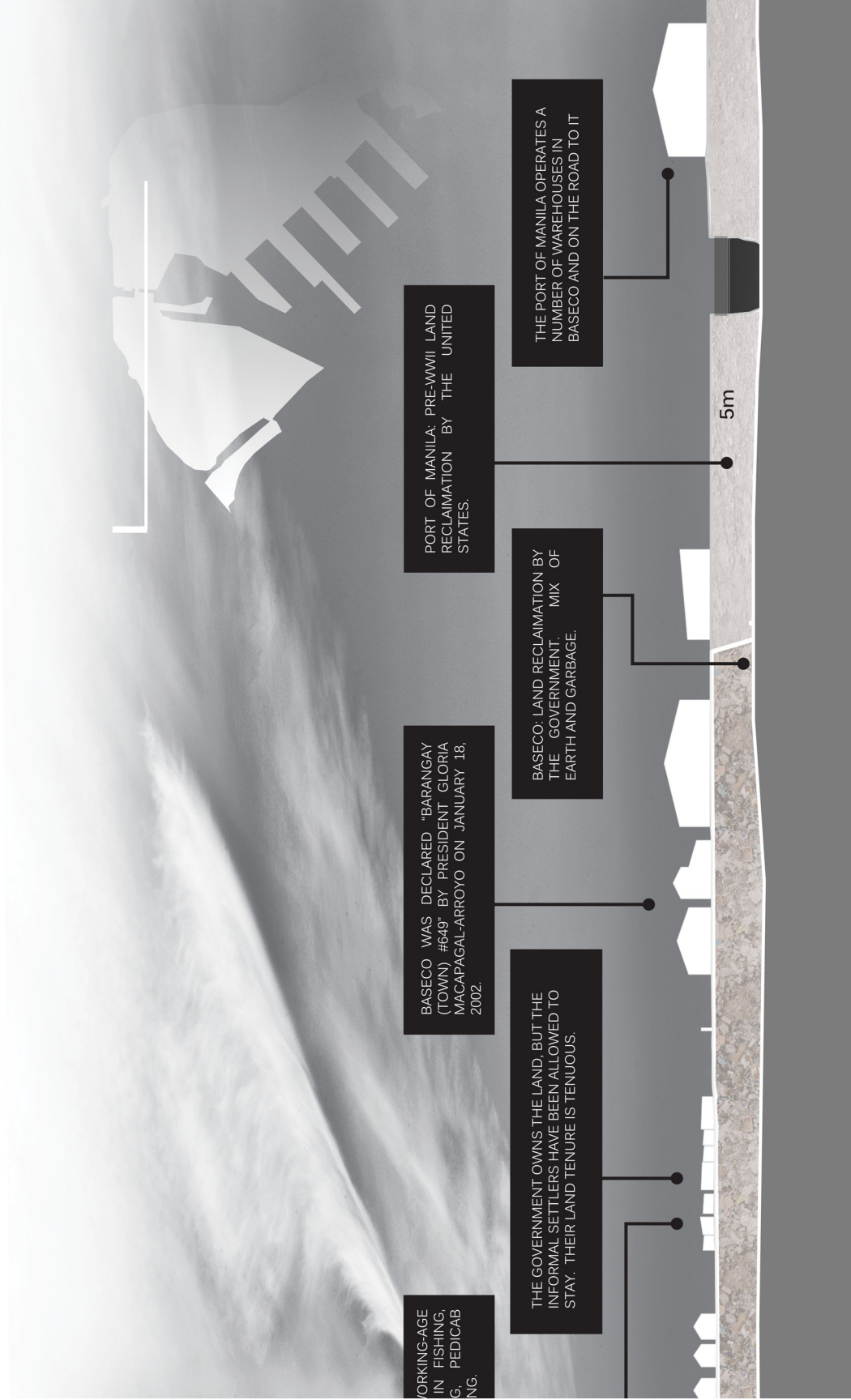Figure 43: Soil study of Baseco Compound's reclaimed land; data from Urban Poor Associates

SILTY SAND + GARBAGE
- Extends down 2m
- mix of compacted earth and waste

ORGANIC SILTY CLAY
- Depth of roughly 1m
- Shell fragments
- Vulnerable to liquefaction

SOFT GREY CLAY
- Depth of roughly 1.2m
- Shell fragments/no sand
- Decayed organic material

HARDPAN
- 4.20m underground
- Extends until bedrock
- Increased stiffness

BEDROCK
- 90m underground
- unobserved from soil surveys

SEA LEVEL

GROUND WATER (SALIENT)

...WORKING-AGE
IN FISHING,
G, PEDICAB
...NG.

THE GOVERNMENT OWNS THE LAND, BUT THE INFORMAL SETTLERS HAVE BEEN ALLOWED TO STAY. THEIR LAND TENURE IS TENUOUS.

BASECO WAS DECLARED "BARANGAY (TOWN) #649" BY PRESIDENT GLORIA MACAPAGAL-ARROYO ON JANUARY 18, 2002.

BASECO: LAND RECLAIMATION BY THE GOVERNMENT. MIX OF EARTH AND GARBAGE.

PORT OF MANILA: PRE-WWII LAND RECLAIMATION BY THE UNITED STATES.

THE PORT OF MANILA OPERATES A NUMBER OF WAREHOUSES IN BASECO AND ON THE ROAD TO IT

5m

Figure 44: Section of Baseco Compound highlighting the various urban conditions, historical milestones, and nature of land

BASECO'S RELATIVELY LOW ELEVATION MAKES FLOODING A HUGE CONCERN.

SITING AT THE DELTA OF THE POLLUTED PASIG RIVER RESULTS IN TRASH ACCUMULATING ON BASECO'S BEACHES

AS THE WESTERNMOST SETTLEMENT IN MANILA, IT IS THE MOST VULNERABLE TO TYPHOONS AND STORMS

THE MAJORITY OF BASECO'S RESIDENTS ARE SLUM-DWELLERS WHO HAVE BEEN EVICTED FROM OTHER INFORMAL SETTLEMENTS IN METRO MANILA.

AS OF 2011, 10,712 FAMILIES LIVE IN BASECO'S 8,984 STRUCTURES. TOTAL POPULATION: 51,060.

HABITAT FOR HUMANITY AND GAWAD KALINGA ESTABLISHED HOUSING PROJECTS AFTER THE FIRE OF 2004.

MOST OF BASECO'S WORKING-AGE POPULATION ENGAGE IN FISHING, VENDING, SCAVENGING, PEDICAB DRIVING, OR STEVEDORING.

1m

Figure 45: Section of Baseco Compound highlighting the various urban conditions, historical milestones, and nature of land (continued)

CHAPTER 4: PRE-DESIGN

Design Goals

Infrastructure

This thesis aims to design an architecture that provides the physical need of infrastructure - defined as water, sanitation, and electricity - to the residents of Baseco Compound. This approach comes from the understanding that basic human needs are the first things that must be addressed and the critical position of designing the infrastructure that the informal settlers do not have, rather than the housing that they do have. The infrastructure will be designed with Baseco's challenging terrain in mind, utilizing various strategies that build around, within, or above the existing houses.

Citizenship

The thesis also aims to provide the more intangible need of "citizenship," or spaces for enablement and agency. The design proposal is to provide the informal settlers with much needed spaces for education, creation, training, and collaboration while also augmenting existing public space and other activities in Baseco. The tactical siting and provision of these spaces within Baseco's urban fabric is intended to provide the informal settlers with a renewed sense of civic identity.

Design Principles

Visibility

Part of the reason why poverty persists is because the undercity is seen as either a blight on the urban fabric or is not seen at all. The intervention in the informal settlement must be perceived by the rest of the city as a marker of the problems of poverty and to the informal settlers themselves as a sign of change. How can the intervention act as an "agitator" of the issue of poverty?

Flexibility

Aware of the nature of informal settlers to innovate, appropriate, modify, and make ad-hoc improvements, I am most interested in designing an infrastructural framework that harnesses this creative intelligence and is conducive to existing networks and habitation patterns. The proposal seeks to preserve the valuable existing social and familial networks rather than demolishing them. How can the intervention act as a scaffolding that fits the existing informal settlement?

Democracy

The main goal of this thesis is to provide both basic needs and citizenship to the slumdwellers. The infrastructure must be designed in a way that it is available to those that most need it. It must have several points of access and be capable of reaching the 51,000 people that live in Baseco. The first priority is to provide.

Figure 46: Design principles, keywords, and metaphors

Preliminary Design Explorations

Three preliminary design explorations were produced to explore possibilities for inserting infrastructure and citizenship in the informal settlement. Mindful of the fact that the house is the culmination of the informal settler family's capital investment into a place in the city, the interventions were designed to be built around the existing houses rather than clearing them. Each intervention was designed to be emblematic of one of the three design principles of visibility, flexibility, and democracy.

UTILIDOR PLATFORM

SERVICE WALL

CANOPY
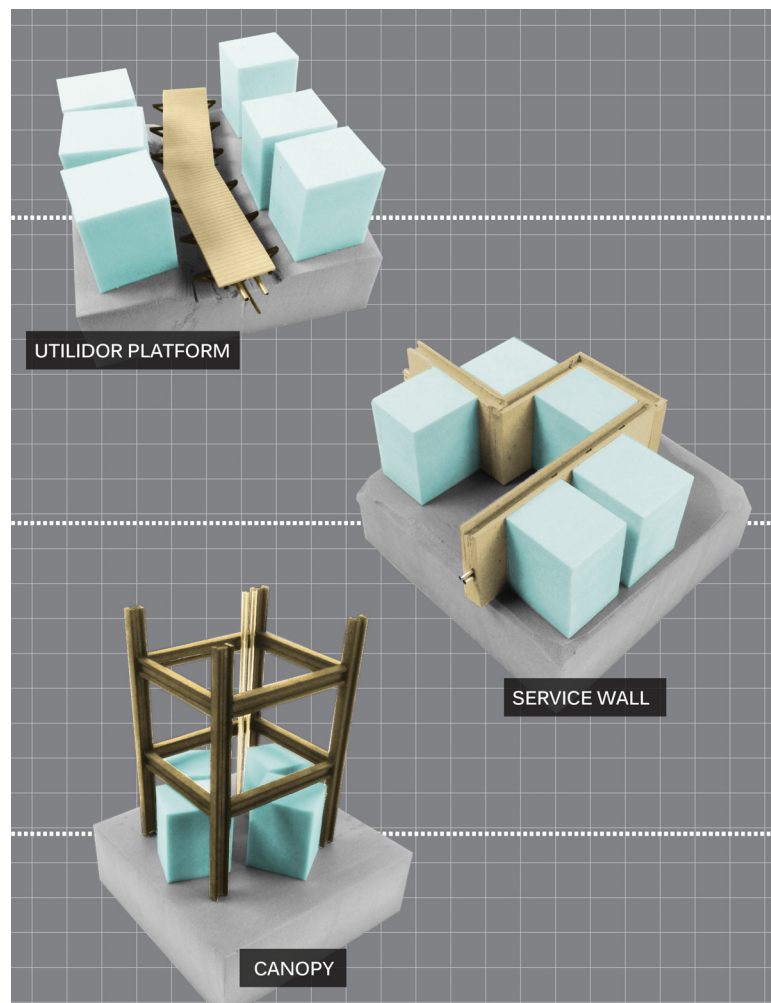
Figure 47: Design explorations

Utilidor Platform

The first intervention, the utilidor platform, explores the design principle of *flexibility* and designing for the seemingly chaotic urban fabric of the informal settlement. Based on steel space frame construction, the utilidor provides basic services to even the most inaccessible houses in the informal settlement. A walkable platform is placed on top of the utilidor and can act as a formal street. The elevated platform can also help prevent the spread of disease by letting people walk above stagnant water.
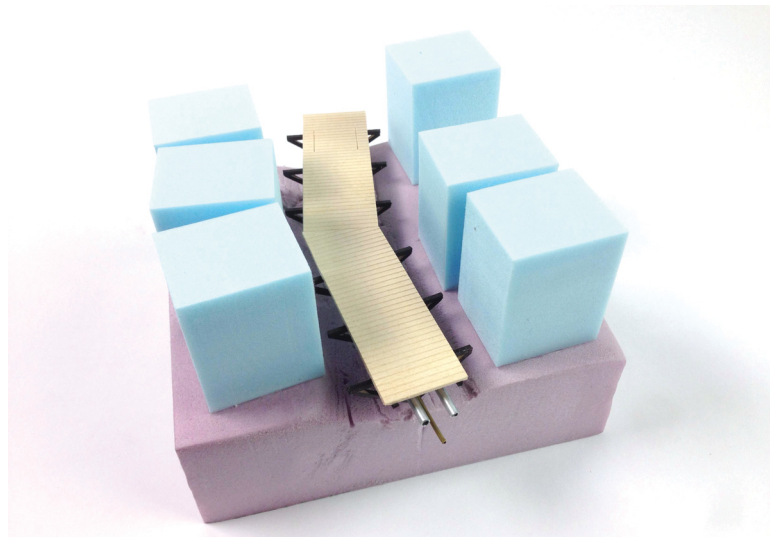
Figure 48: 1:50 utilidor platform model

Figure 49: Visualization of utilidor platform

Service Wall

The Service Wall intervention is an investigation into providing *democratic* access to basic services. The Service Wall is a continuous concrete structure that snakes around the existing slum houses and has a combined rainwater-catchment and services system. The informal settlers can then build their houses right up to the service wall to provide security, stability, and direct access to services. Spigots can be placed on the wall to provide potable water to residents whose houses are not directly attached to the service wall.
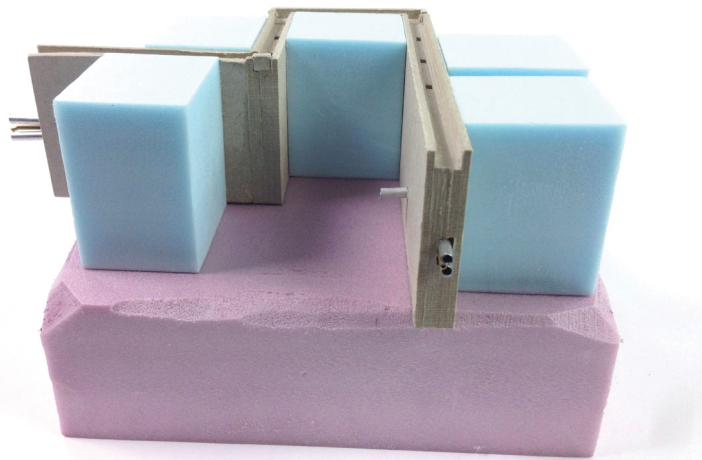
Figure 50: 1:50 service wall model

Figure 51: Visualization of service wall

Canopy

Finally, the Canopy intervention is designed as a *visible* and performative architecture for the informal settlement. The Canopy is a large building on stilts that is built directly on top of existing houses and the services to the canopy building can be diverted to the houses below. The canopy building can then feature various public programs like schools, studios, workshops, sports facilities, and other uses. Through building above, the building can act as an visible wayfinding tool and symbol for the community.
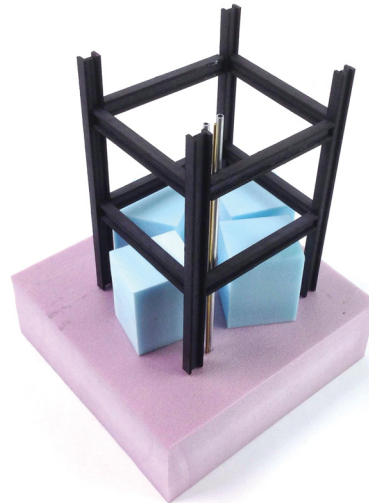
Figure 52: 1:50 canopy model

Figure 53: Visualization of canopy

CHAPTER 5: DESIGN PROPOSAL

Master Plan

The final proposal is an incremental and phased strategy of architectural interventions in Baseco Compound. The master plan takes aspects from the preliminary design explorations and synthesizes them into a complete infrastructural network for the informal settlement. The proposal operates on the concept of "Radical Incrementalism" and uses the accumulation of bold and sustained architectural moves as a strategy for greater social change.[53]

Each stage of the master plan explores the concept of infrastructure at three different types and scales: physical, social, and societal. *Physical infrastructure* entails the provision of services - water, sanitation, and electricity - that the informal settlement lacks and greatly needs. *Social infrastructure* refers to the construction of public spaces and community hubs for enablement, activity, and safety. Finally, *societal infrastructure* is explored through the introduction of public transportation, allowing for greater access between Baseco and Manila and connecting the formal and informal cities.

The three phases are introduced in this order because subsequent phases necessarily build off previous phases. More importantly, earlier phases provide the type of infrastructure that is both needed first and is more important to fulfill.
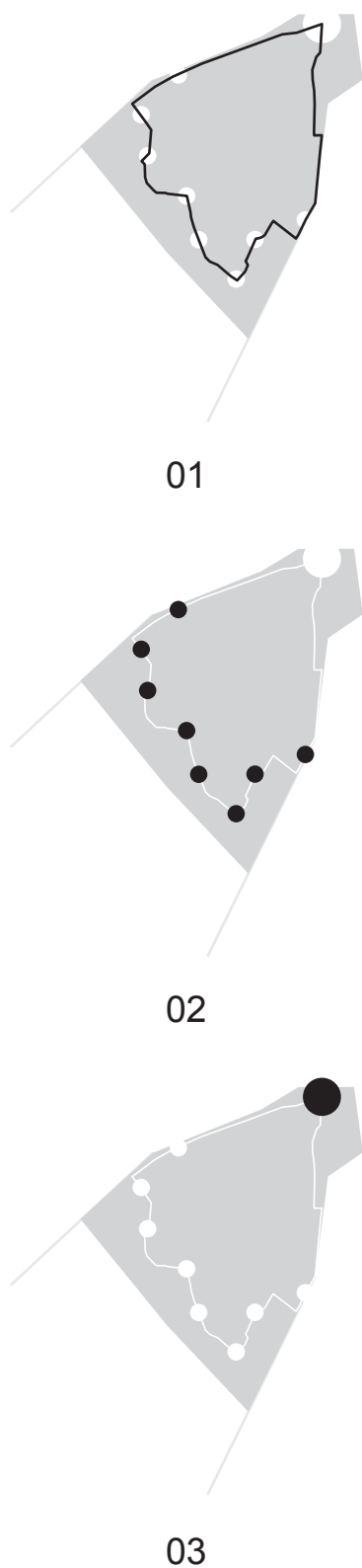
01

02

03

Figure 54: Diagrams of each phase in the master plan

53. Pieterse, *City Futures*, 6-7.

Phase One - Utilidor Network

Figure 55: Visualization of the utilidor network as physical infrastructure

The 'public' is thrown under the bus. as it were, in [the question of infrastructure.] Ironically, it is exactly in the area of infrastructure that tactical strategies become relevant for populations that do not receive plumbing, electricity, services, transportation, and for public space that is kept in the margins of architectural and urbanistic representation.[54]

54. Museum of Modern Art, *Uneven Growth*, 61-62.
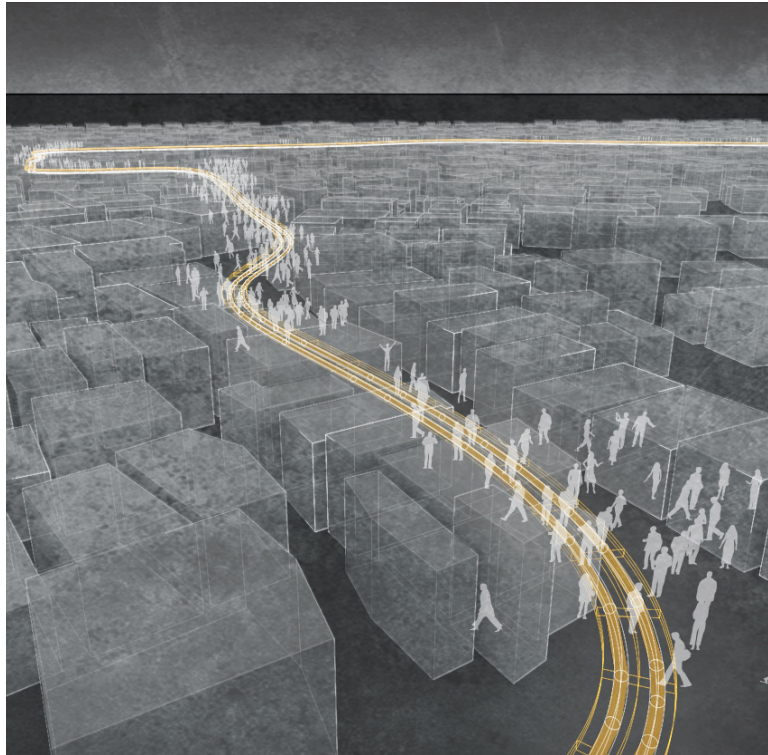
Concept

Basic Services + Circulation

Figure 56: Concept rendering of the service utilidor as a passable road through the informal settlement

As explained earlier, informal settlements need reliable access to basic services like potable water, electricity, and sanitation. Perhaps less known than this is that informal settlements also need improved pedestrian corridors and means of circulation. Informal settlements generally lack planning and developed roads, leading to a stem-based urban fabric that is difficult to navigate. Worse still, the lack of a hierarchical "main street" and the large number of possible paths, alleyways, and dead ends leads to a general lack of security and safety. If the *physical infrastructure* is to be designed to provide basic services to informal settlers, could the need for improved circulation corridors also be met with an integrated design solution?

The utilidor network is a combined basic services and walkway system for the informal settlement. Inspired in part

Figure 57: Above grade utilidor for basic services in Inuvik, Canada; from Morin, "Life in Inuvik, Northwestern Territories"

by interventions done in the Canadian Arctic, where difficult terrain makes the placement of service lines underground impractical, the utilidor network is an above grade provision of basic services to Baseco's residents. The flexibility of the utilidor allows it to snake its way through Baseco's unconventional grids, extending infrastructural reach to more residents.

Atop the utilidor is a walkable platform for pedestrian and small-scale vehicular traffic. This design move turns the utilidor into an important circulation corridor, increasing the informal settlement's navigability and safety through its role as a main road. The utilidor network is both a continuous service corridor and perimeter road scheme, combining both infrastructure and citizenship in one design.

Situating the Path

Baseco's urban fabric is socio-economically diverse. The central districts feature NGO-built housing, the barangay (town) hall, and government built schools while the districts on the periphery are comparatively underserviced. The proposed path for the utilidor through Baseco was designed to focus on the most underdeveloped districts on the margins of the settlement and to reach as many of these districts as possible.

Furthermore, the utilidor's path was based on the circulation paths and roads that already exist in Baseco. This minimizes the need to remove existing housing stock and displace families to make way for the utilidor. This also helps preserve the valuable social and familial networks already established by the residents.
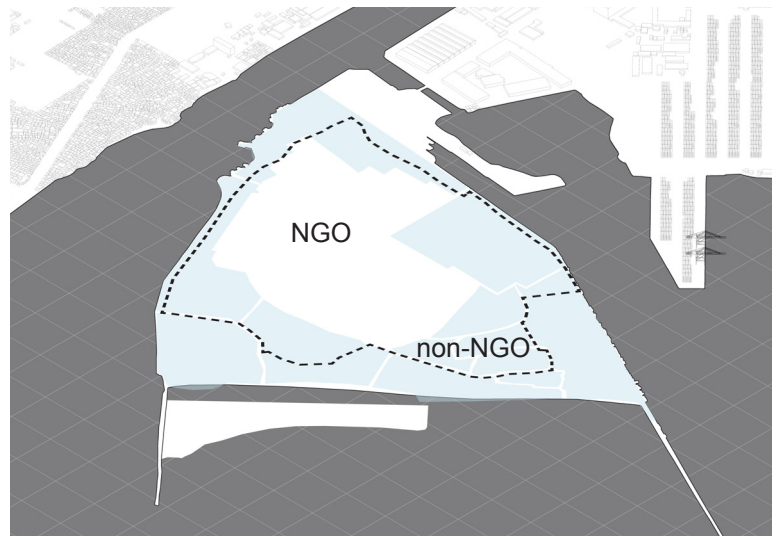
Figure 58: Utilidor path is focused on districts not developed by NGOs
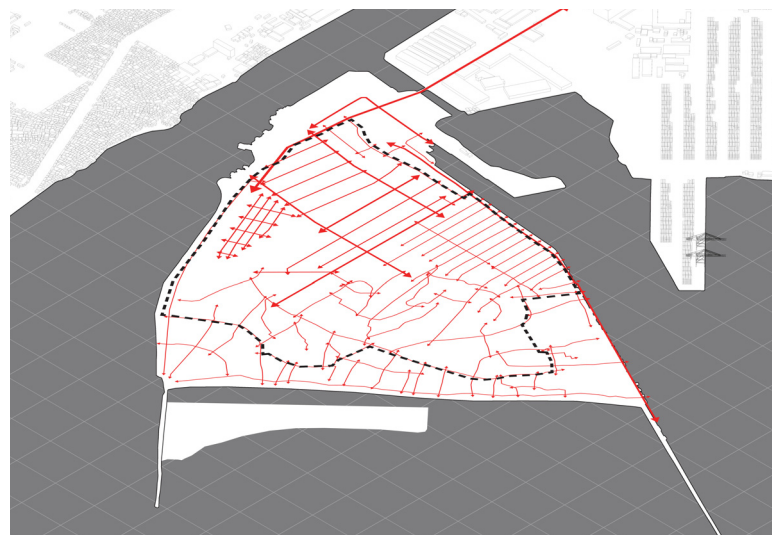

Figure 59: The utilidor aligns itself with existing circulation patterns, roads, and paths

Figure 60: The utilidor aligns itself with existing political divisions and district lines

UTILIDOR NETWORK

UTILIDOR ROUTE

POLITICAL BOUNDARY

BRANCHING PATH

SIDEWALK

BREAKWATER

STABLE ROAD

WATERFRONT ACCESS

SERVICES IN NGO AREA

MANGROVE AREA

Figure 61: 1:8000 plan of the utilidor network's path through Baseco and its adjacent site features

Figure 62: Concept image of the utilidor weaving its way through Baseco Compound

Systems

Water and electricity flow through the utilidor in a concealed pipe and wire system. These services emerge for public access in faucet and spigot walls and small-scale buildings. Sanitation is handled through small community-run public dry toilets sited within individual housing clusters. Informal settlers can be employed to collect waste for disposal, where the utilidor road allows for easier access to a local composting station or disposal facility.

Figure 63: Dry toilet precedent as implemented in the barrios of Caracas, Venezuela; from Urban-Think Tank, "Core Sustainable Unit: Dry Toilet"
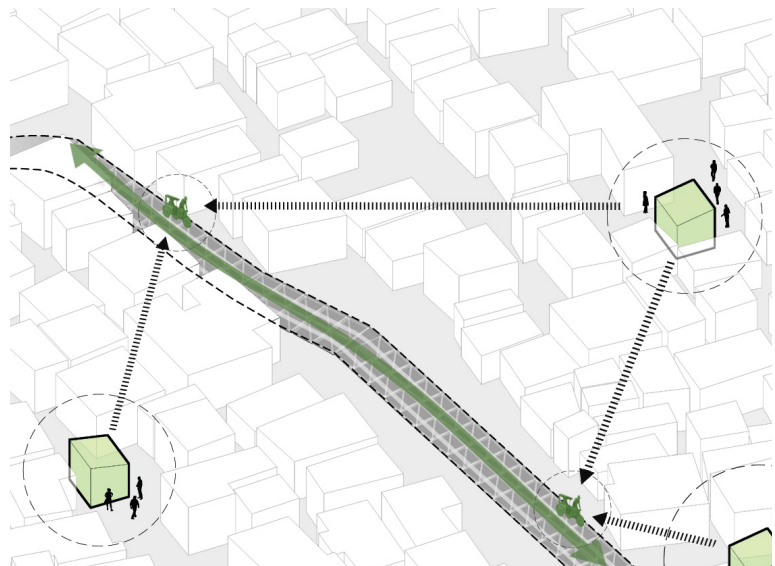
Figure 64: Diagram of community-run dry toilets and waste collection system through the utilidor network
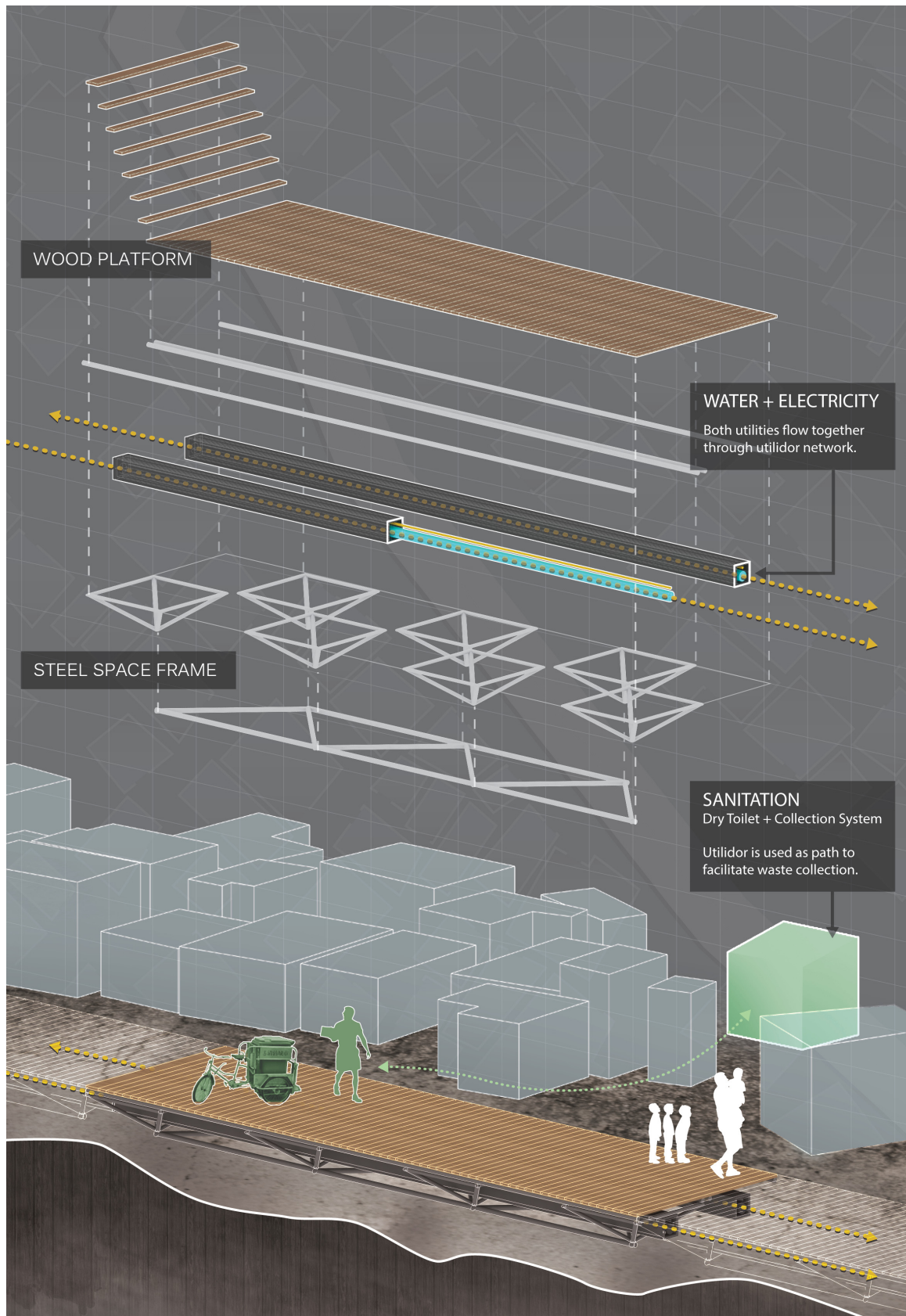
WOOD PLATFORM

WATER + ELECTRICITY
Both utilities flow together through utilidor network.

STEEL SPACE FRAME

SANITATION
Dry Toilet + Collection System

Utilidor is used as path to facilitate waste collection.

Figure 65: Exploded isometric diagram of the utilidor's construction and systems

DEVELOPED ROADS

UNSTABLE TERRAIN

BREAKWATER REGIONS

Figure 66: Baseco sites identified for different forms of the utilidor network

Morphing Road

Baseco's topology varies between districts. Some areas of the settlement feature developed roads and concrete structures and other areas feature unstable terrain and makeshift housing. Given this, the utilidor network is designed to be responsive to context and assume forms that are most appropriate to its surroundings.

For Baseco, three main utilidor "types" were designed, each responding to a different urban condition. In Baseco's northeastern and central regions where paved roads exist, the utilidor is an augmented sidewalk condition. In the southwestern districts where paths are improvised and soil quality is poor, the utilidor is a solid space frame structure that provides stable ground for a public road. Finally, at Baseco's edges and breakwater regions, the utilidor takes the form of an expanded boardwalk, using the breakwater as scaffolding and providing increased space for pedestrian activity and linear markets.

While the utilidor takes many forms, the structure remains architecturally consistent in its steel frame and wood platform construction, aiding wayfinding and providing an important point of reference for those travelling on the road.
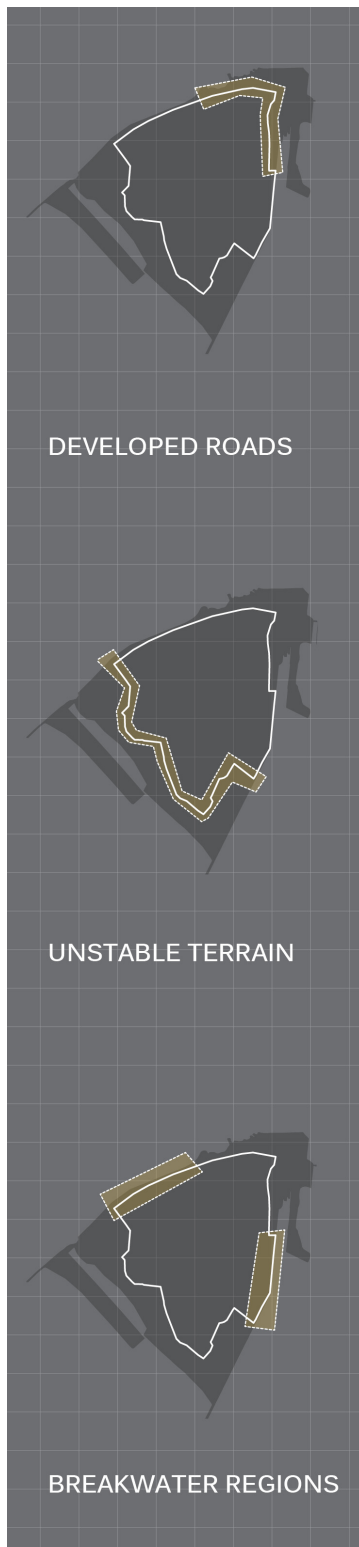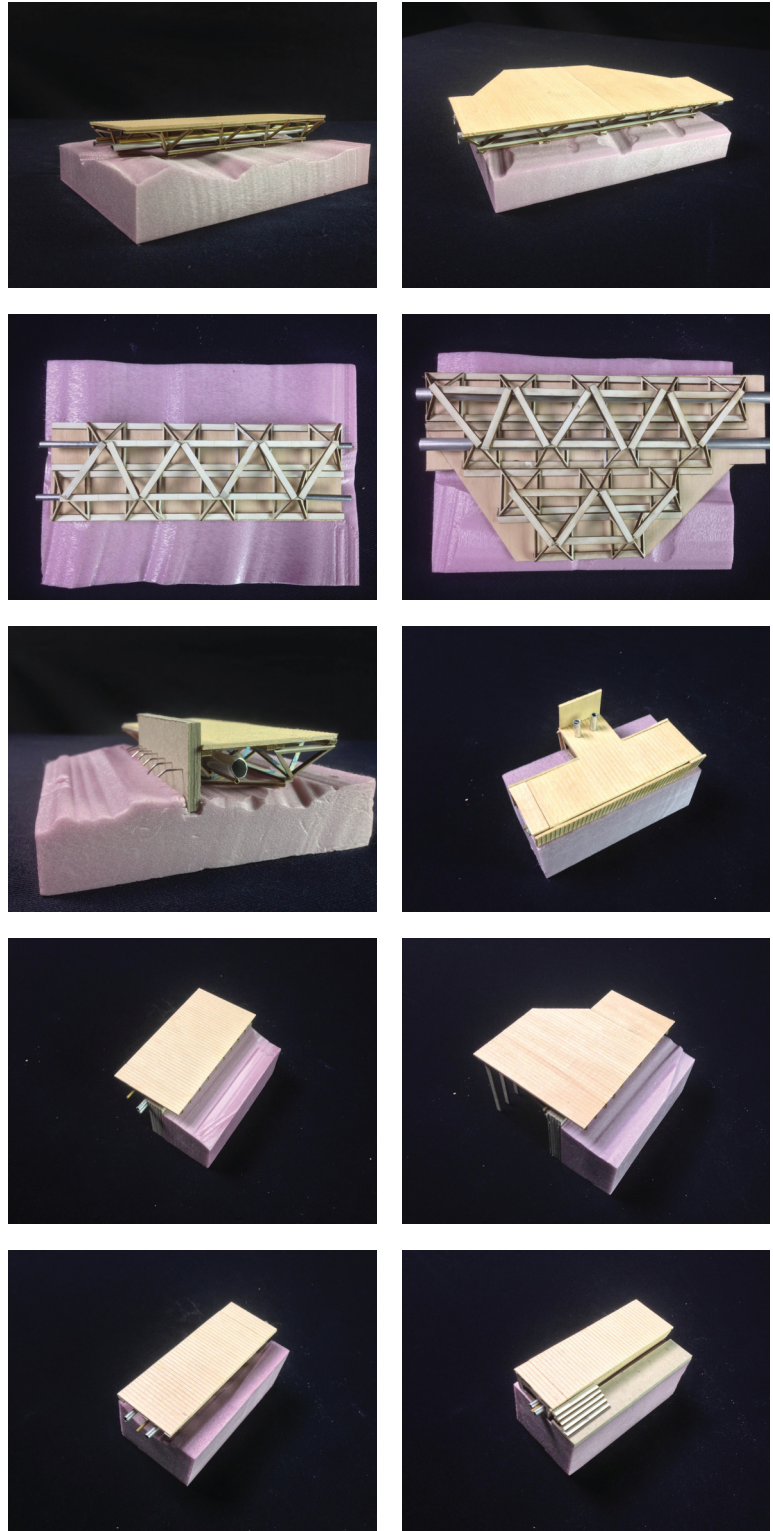
Figure 67: 1:100 study models for the various forms of the utilidor network
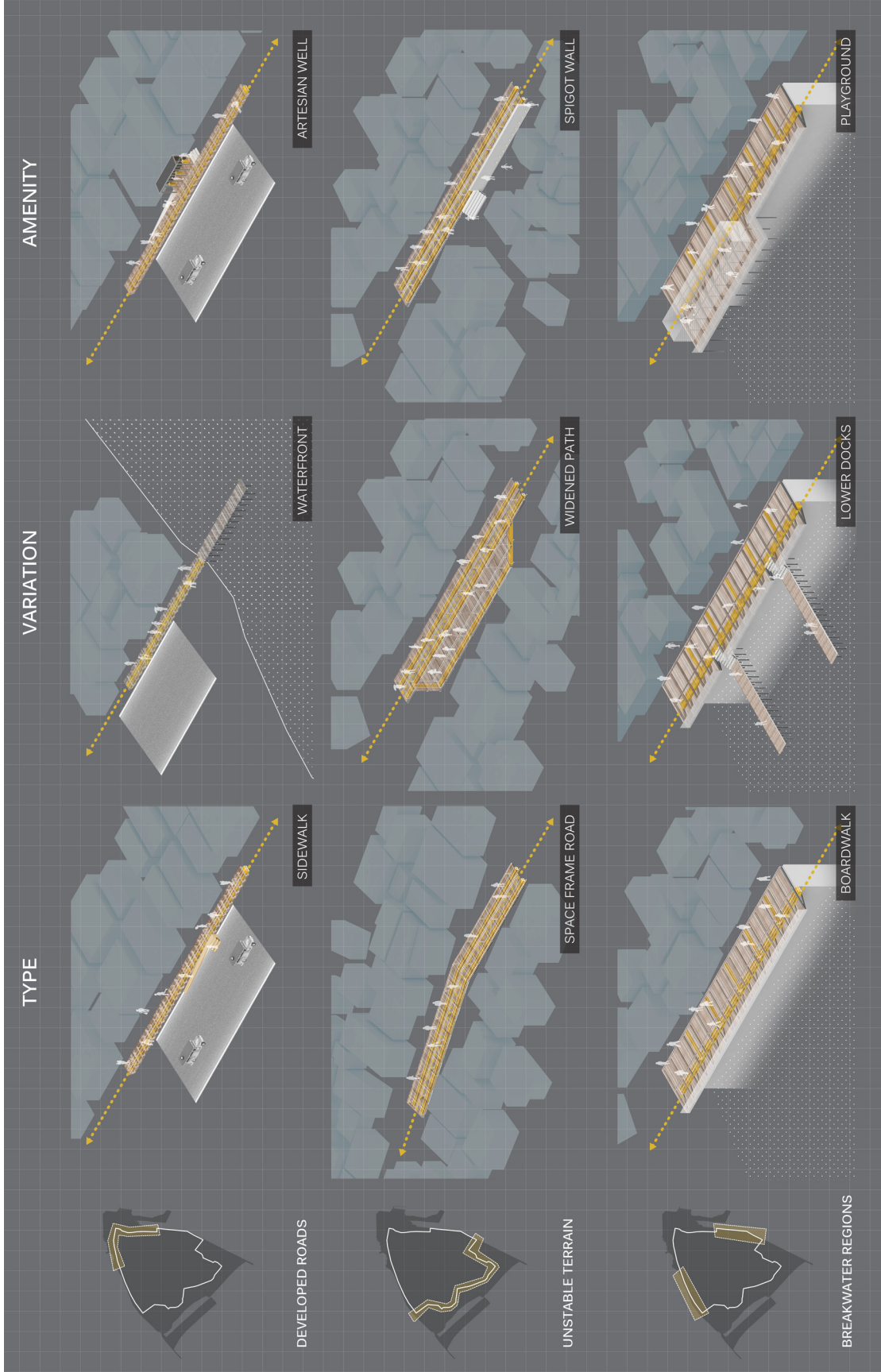
Figure 68: Diagram matrix showing the three main types of the utilidor network and other design options for each utilidor type

TYPE

VARIATION

AMENITY

DEVELOPED ROADS

SIDEWALK

WATERFRONT

ARTESIAN WELL

UNSTABLE TERRAIN

SPACE FRAME ROAD

WIDENED PATH

SPIGOT WALL

BREAKWATER REGIONS

BOARDWALK

LOWER DOCKS

PLAYGROUND

Utilidor Type 1 - Sidewalk

Figure 69: Diagram of the sidewalk utilidor
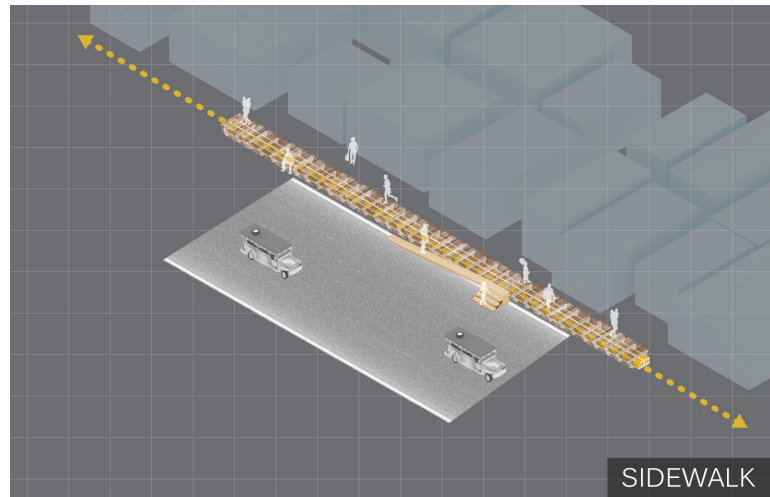
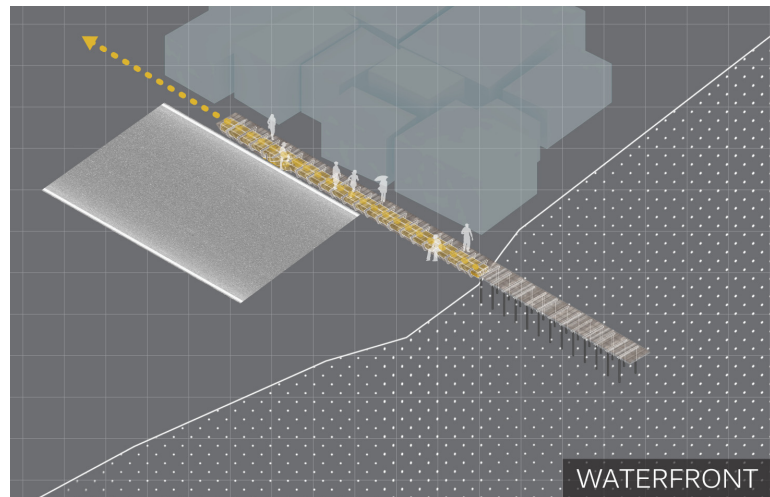Figure 70: Diagram of the sidewalk utilidor connecting to Baseco's waterfronts

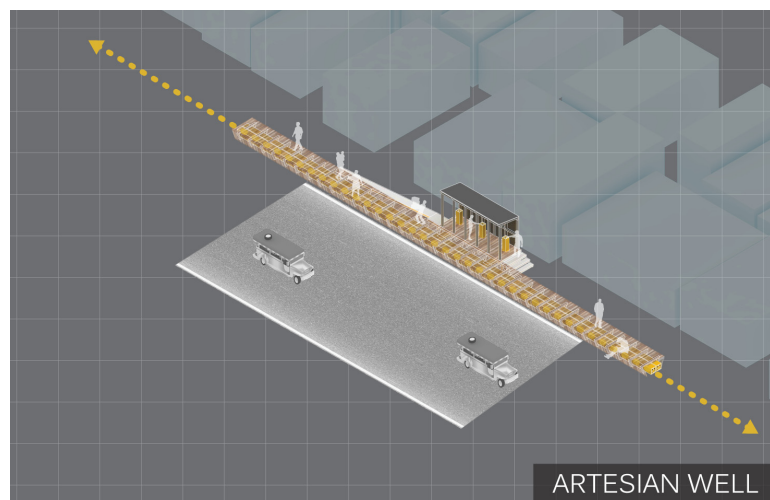Figure 71: Diagram of a small public water access point on the sidewalk utilidor

Figure 72: Section of utilidor network as an augmented sidewalk condition on a more developed area

Utilidor Type 2 - Space Frame Road

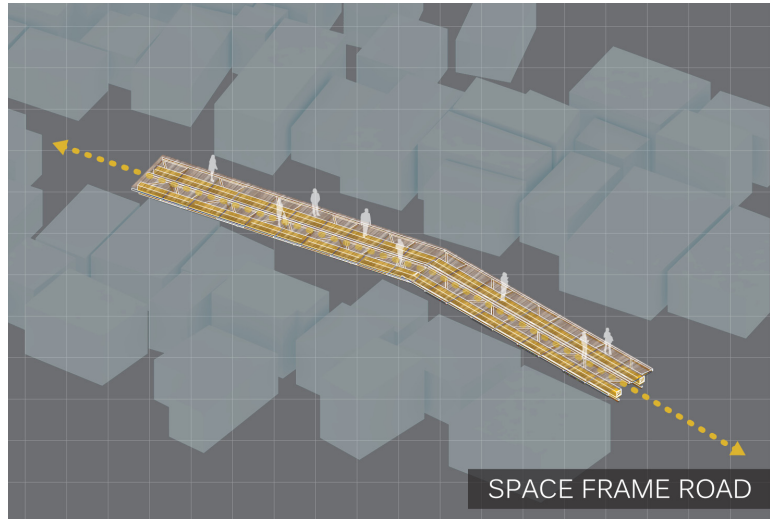Figure 73: Diagram of the space frame road

Figure 74: Diagram of a widened space frame road acting as a public square
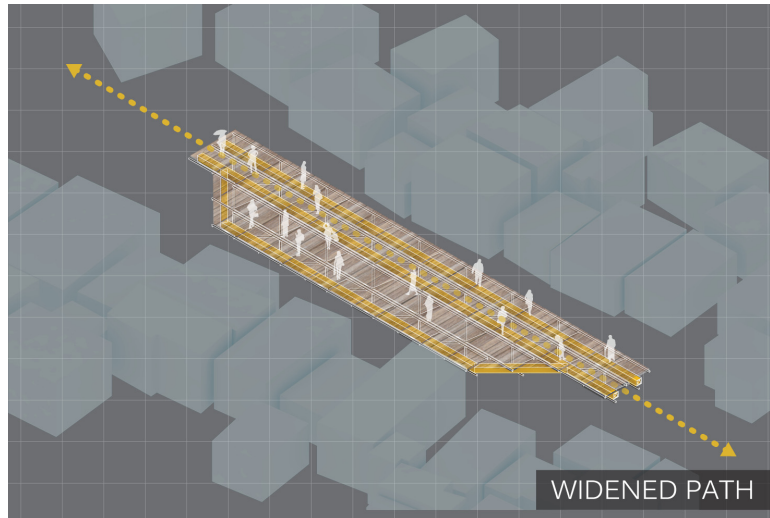

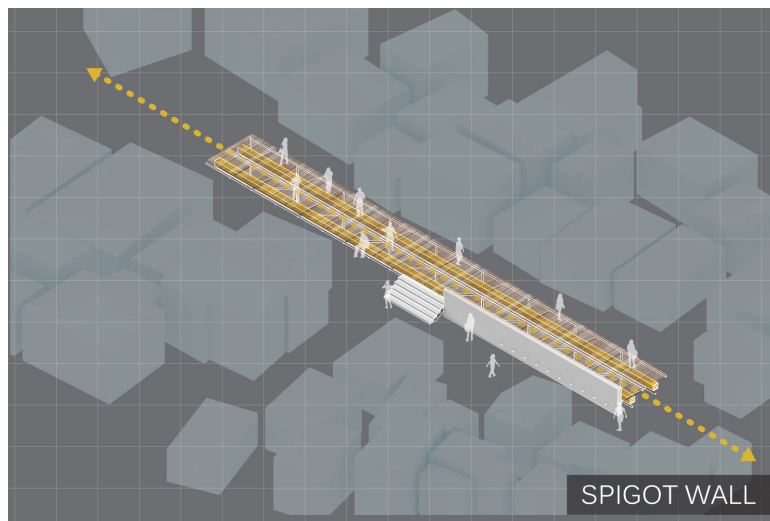Figure 75: Diagram of public water source along the space frame road

Figure 76:   Section of utilidor network as space frame road on Baseco's topologically unstable southwestern districts

Utilidor Type 3 - Boardwalk
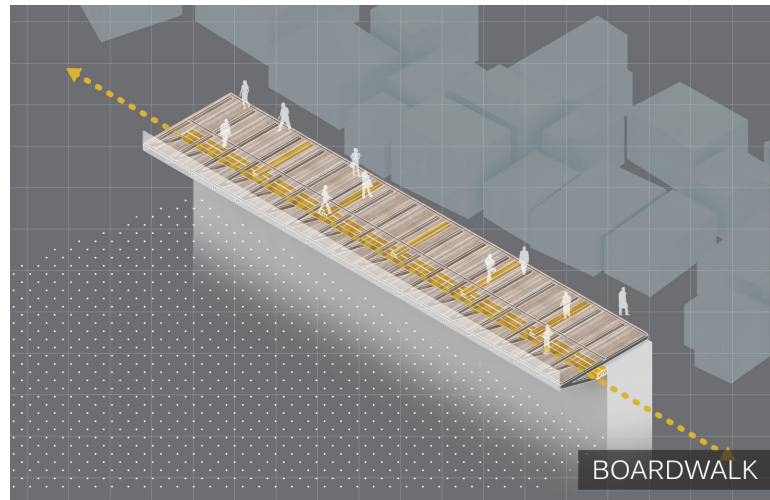

Figure 77: Diagram of the boardwalk utilidor

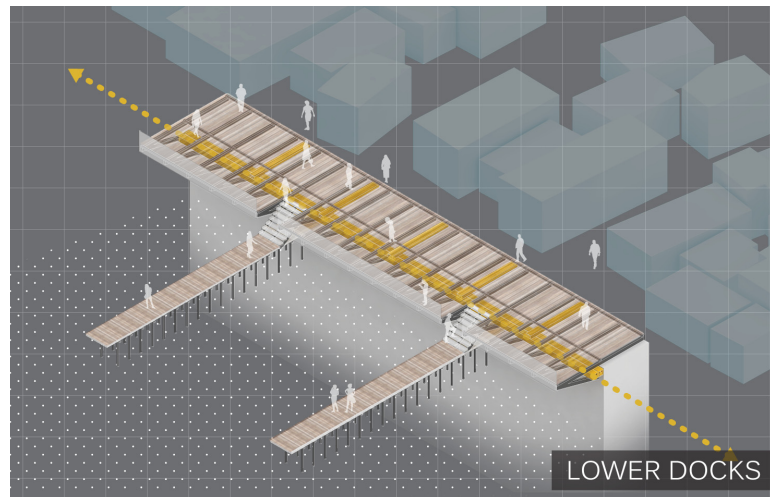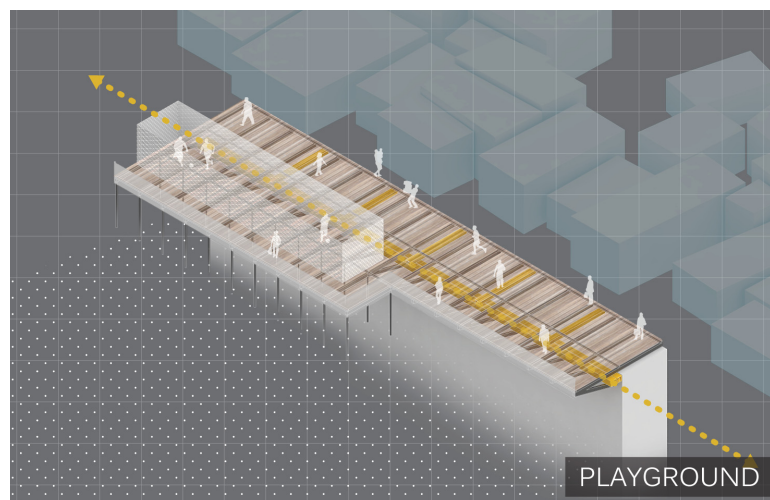Figure 78: Diagram of docks connecting to the boardwalk utilidor

Figure 79: Diagram of the boardwalk utilidor expanding outward to accomodate public space
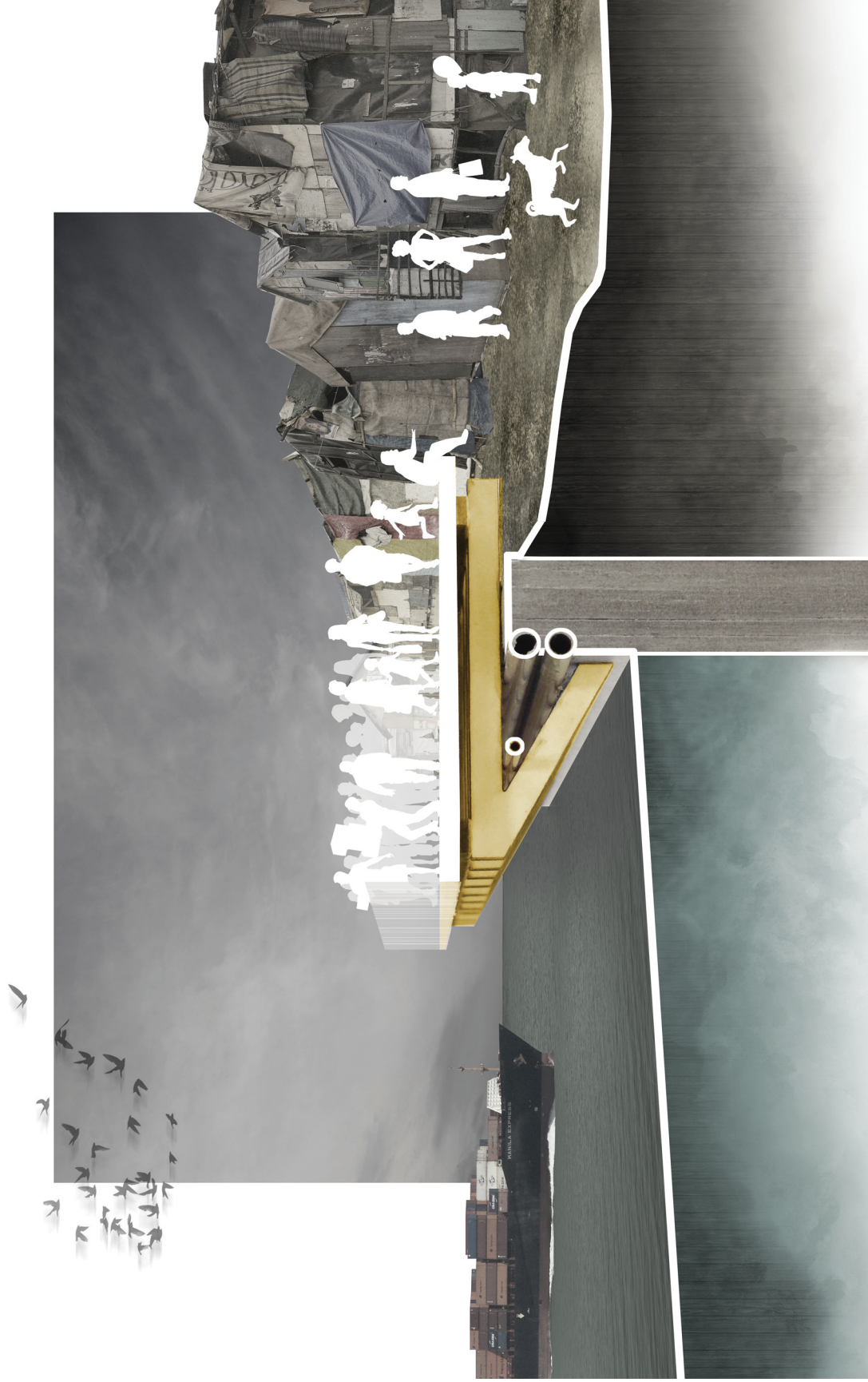
Figure 80: Section of utilidor network as a boardwalk on either of the two solid breakwaters

Phase Two - Elevated Hubs

Figure 81: Visualization of the elevated hub as social infrastructure

Designated public spaces are rare in these dense informal agglomerations but, once again, it is possible to build on and transform what exists. After all, people everywhere are drawn to spatial incongruencies, irregularities, and improvisations. A space can bring together citizens whose 'urban rights' have been denied, reaffirming their pride and resistance.[55]

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55. Urban-Think Tank, *Informal City: Caracas Case*, 81.

Figure 82: Urban-Think Tank's public space prototype for Caracas' slums: the vertical gym; from Urban-Think Tank, *Torre David: Informal Vertical Communities*

Concept

Public Buildings

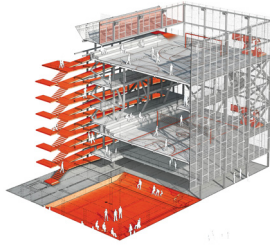Public space is in many ways what defines citizenship and community. Due to a lack of either buildable space or the capability to fund or create public buildings, informal settlements rarely feature any spaces for community engagement or activity. Public space in the informal settlement is "homeless" and space for these uses are appropriated and negotiated away from private housing space. With basic services and circulation needs met with the utilidor network, the second intervention in the design proposal aims to provide *social infrastructure* in the form of dedicated public buildings.

Figure 83: Design proposal for Mumbai's slums - lightweight structures built on top of existing informal urban fabric; from Museum of Modern Art NY, *Uneven Growth*

Air as New Territory

Given the existing density in Baseco, acquiring the space necessary for a public building on the ground would require the removal of existing houses. The air, as a new frontier for buildings in the dense informal settlement, is seen as a solution to this constraint. This approach was inspired from a similar design explored in Mumbai, where the air was seen as territory where "live-work conditions and public infrastructures recover their rightful place, thus liberating the excessive pressure on the land."[56] Through building above the ground, the required space is found without infringing on the space already taken up by existing houses.

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56. Museum of Modern Art, *Uneven Growth*, 116.

Figure 84: Process rendering of building above existing makeshift housing, exploring the possibilities of this new territory

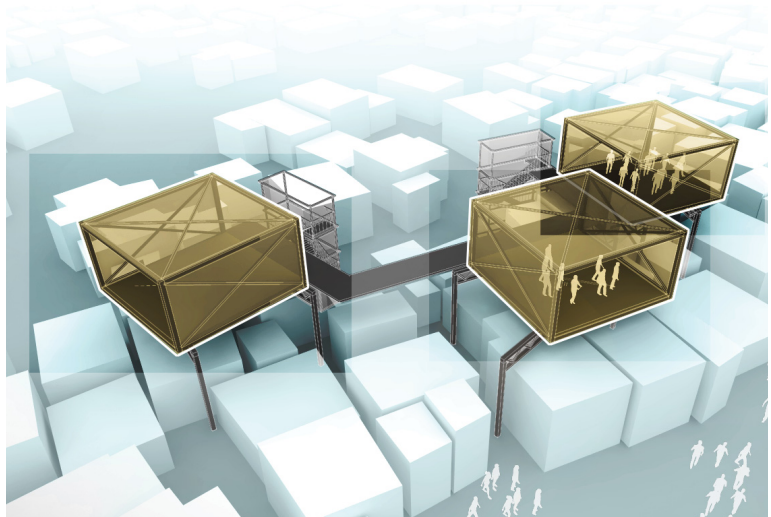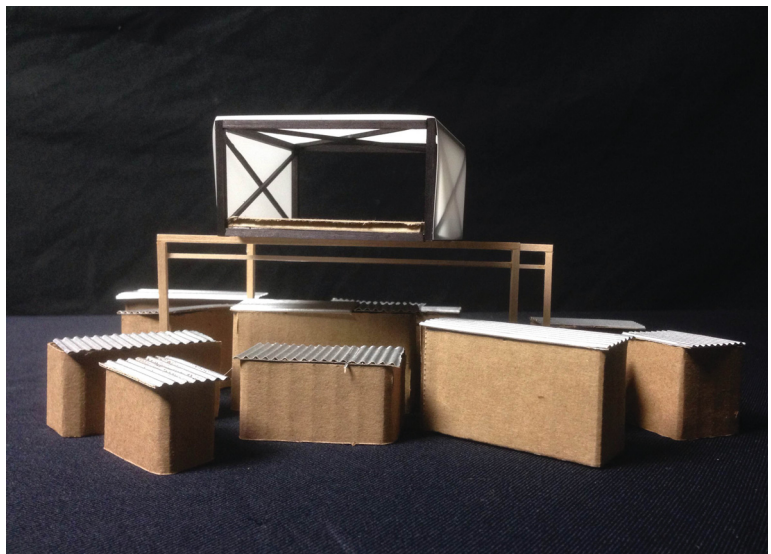Figure 85: Process rendering - aerial view of initial elevated public building design

Figure 86: Process model of initial elevated public building design

Siting the Public Buildings

This phase builds upon the infrastructure of the previous phase. The elevated public buildings are sited directly above the utilidor's path, allowing the elevated buildings to "plug in" to the utilidor's services and become wayfinding "points" along the main road. The buildings themselves are tactically sited at the intersections of the district borders of the more impoverished districts, with larger districts to the west receiving one or more elevated buildings and smaller districts in the south sharing them. This siting strategy allows these buildings to act as social hubs for the communities, promoting gathering and community activities.   The buildings are also spaced according to walking distances, with the buildings located 200m to 400m (2.5 to 5 minutes by foot) apart from each other, ensuring that the informal settlers have easy access to at least one elevated hub.
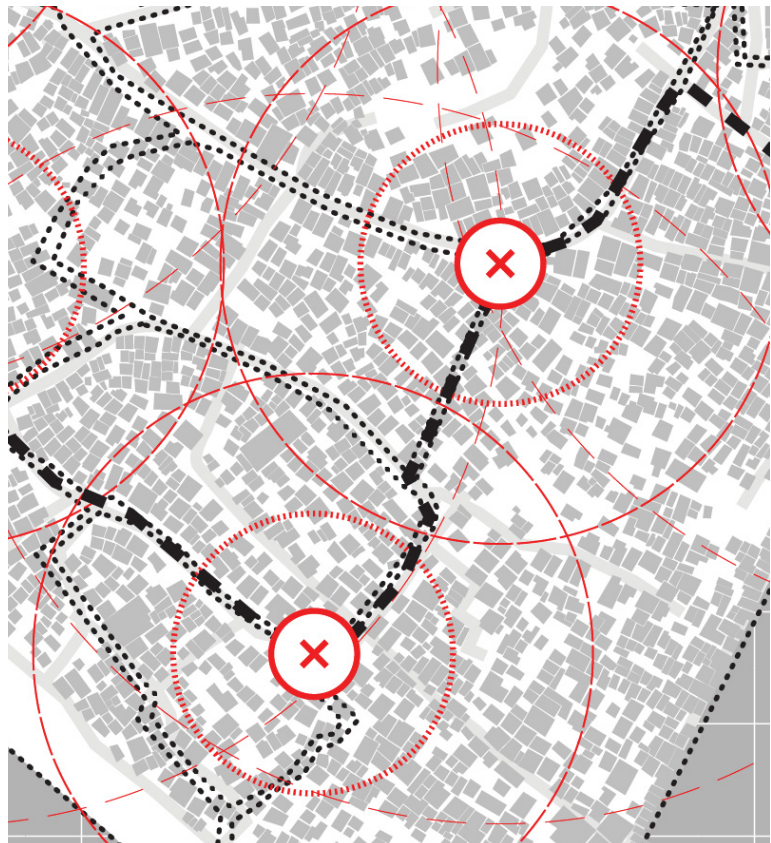
Figure 87: Siting the public buildings based on the utilidor's path, district lines, and walking distances

ELEVATED HUBS

- **- - -** UTILIDOR ROUTE
- ‖‖‖ POLITICAL BOUNDARY
- ⊗ ELEVATED HUB SITE
- ○ 100m DISTANCE
- ○ 200m DISTANCE
- ○ 400m DISTANCE
- ⊞ FERRY TERMINAL
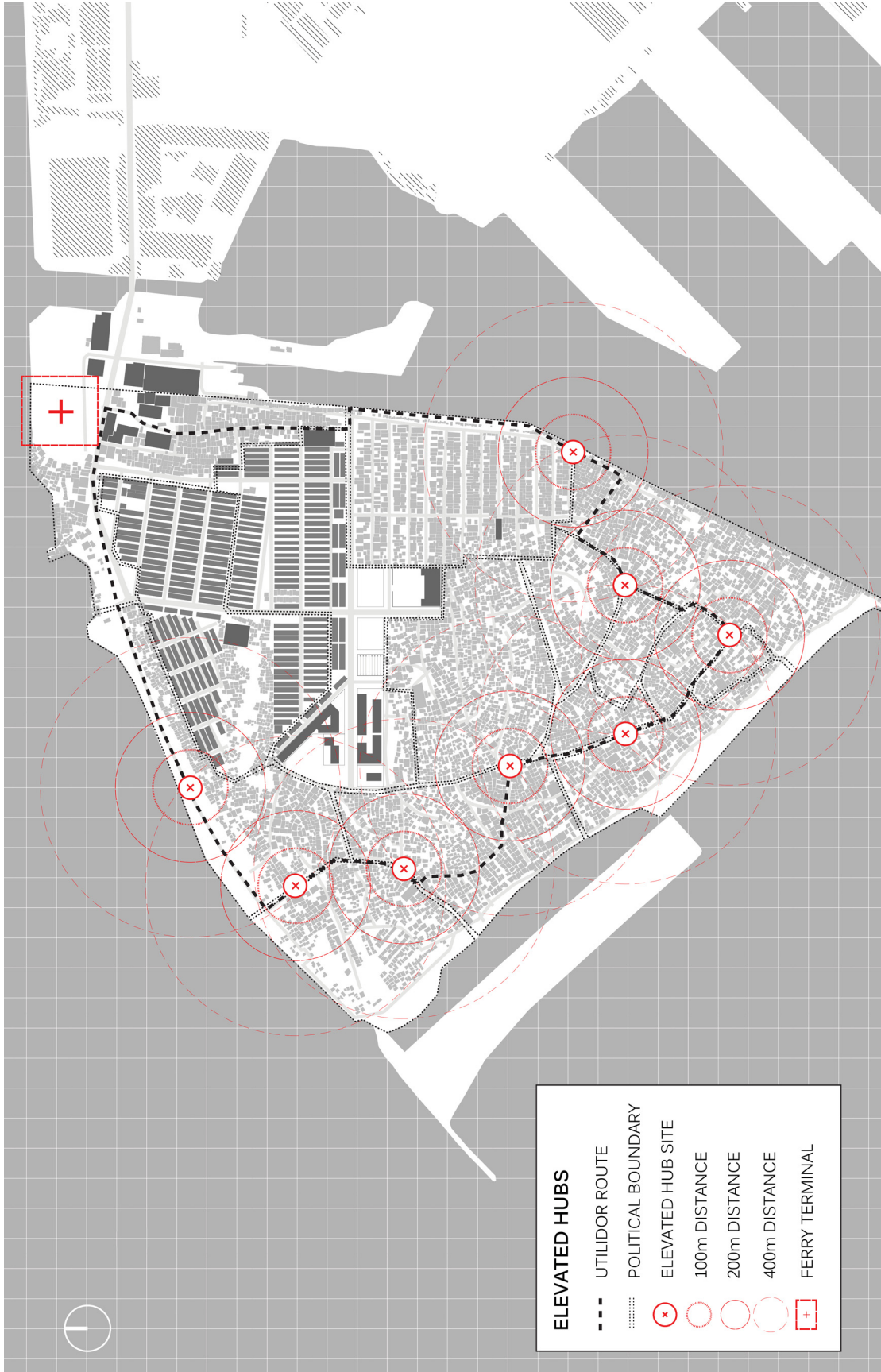
Figure 88: 1:8000 plan of the elevated hubs' siting on Baseco Compound

Figure 89: Public buildings are elevated above the informal settlement, providing visible wayfinding points and a sense of community identity

Building Design

The elevated hub is a small-scale public building lifted 6m off the ground and the existing informal urban fabric. It features two floors with a floor area of 350m^2 each, resulting in 700m^2 of public space for the informal settlers. The building is conceptualized as an elevated public House Domino, with flexible spaces that the informal settlers can do with as needed (more on this later).

Figure 90: View of formal and informal Manila from the elevated hub's vantage point

The elevated hub's structural frame is made of lightweight steel construction, allowing it to be built on Baseco's challenging land. The building touches the ground on two concrete frame stair towers constructed next to the utilidor road and steel columns that negotiate Baseco's urban condition and place themselves around the existing houses.

The choice of materials for the elevated hub is intended to be a contrast to the existing morphology of Baseco's "barong-barong" houses, which are and appear makeshift and are the physical manifestation of tenuous land tenure. By building with concrete and steel, the building is not only physically stable, but it provides a sense of permanence to a population so accustomed to temporary living conditions and the fear of the bulldozer. The elevated hub becomes emblematic of urban resiliency and more importantly, of the informal settlers' right to the city.

Figure 91: Process rendering of the elevated hub building nearing final design

Roof

Facade + Fenestration

Secondary steel
structure

Primary steel
structure

Configurable
room layout

Steel frame
supports

Stair towers
+ assembly

Utilidor network
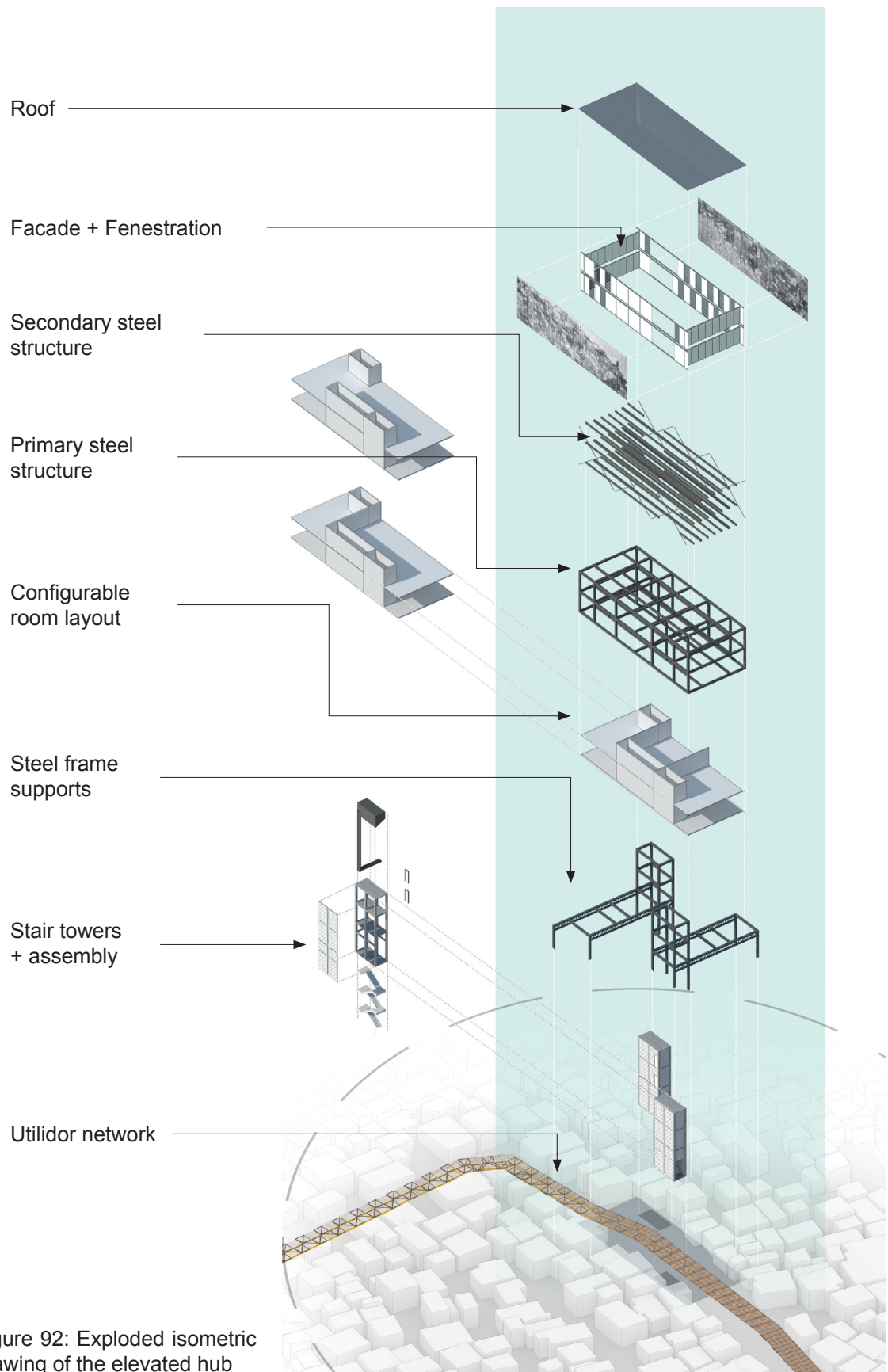
Figure 92: Exploded isometric
drawing of the elevated hub
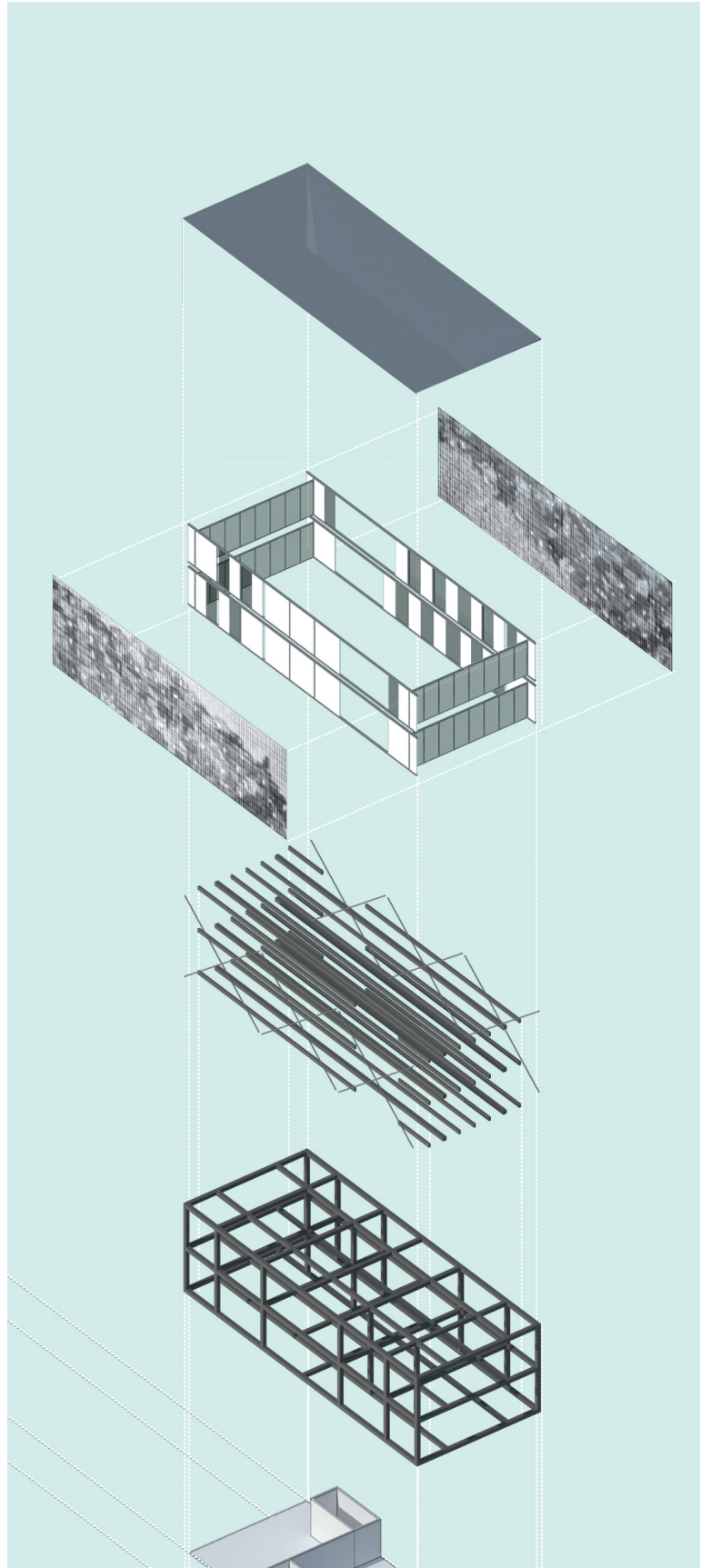
Figure 93: Detail of the exploded isometric drawing, highlighting the roof, fenestration and facade, secondary steel structure, and primary steel structure
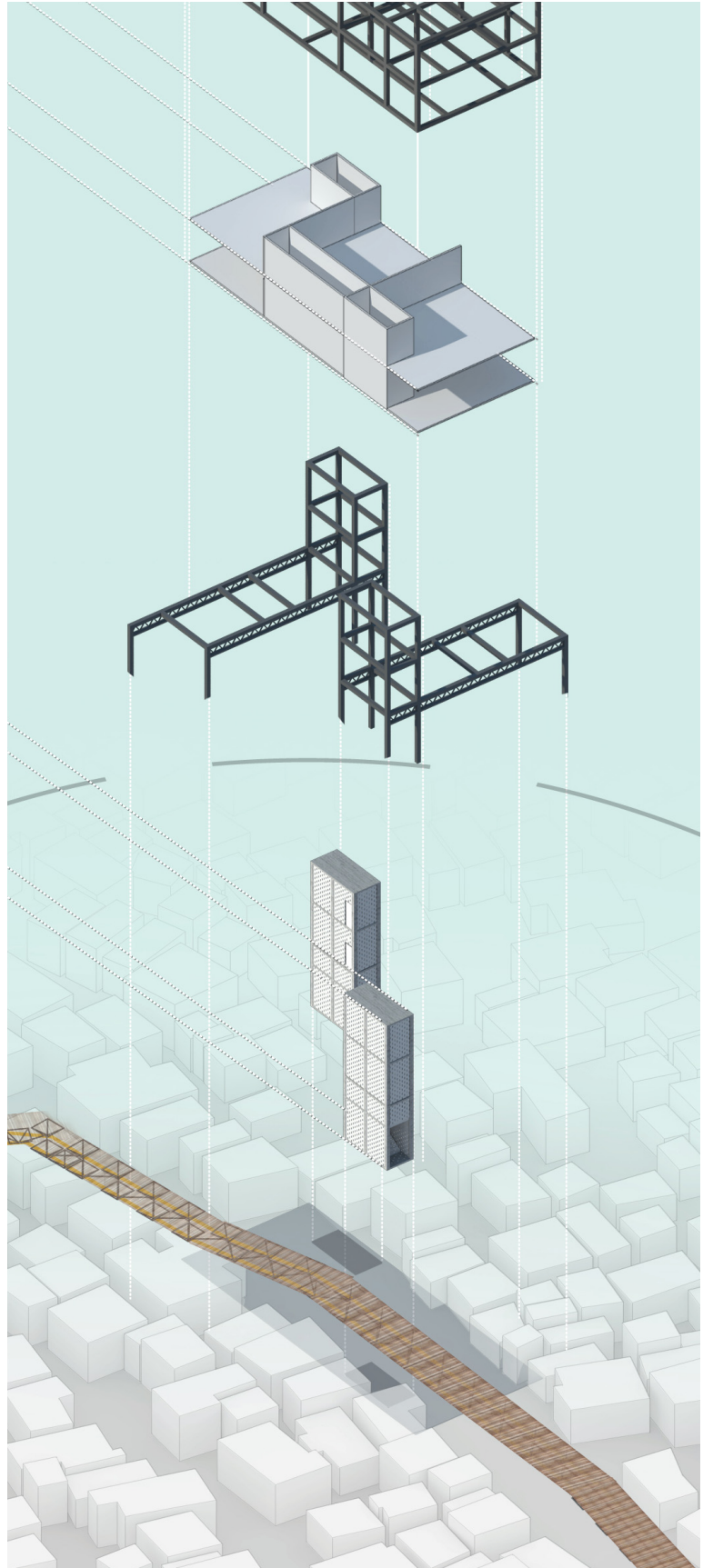
Figure 94: Detail of the exploded isometric drawing, highlighting the interior walls, steel frame supports, concrete frame stair towers, and utilidor network
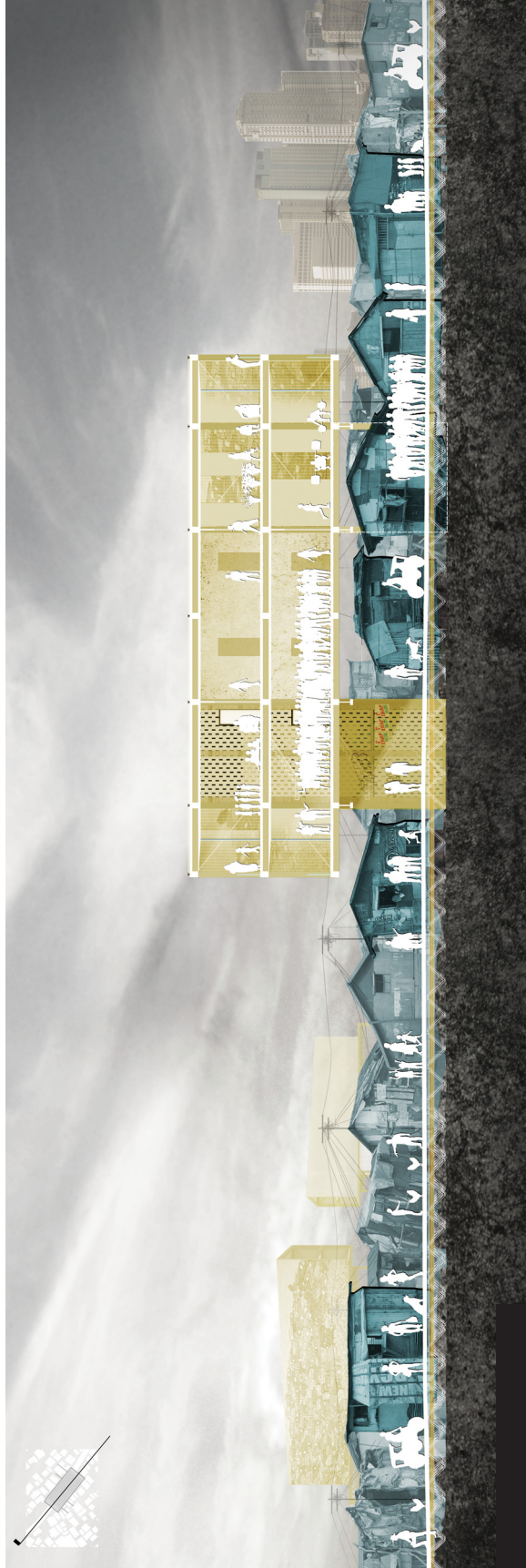
Figure 95: Longitudinal section of an elevated hub, showing activities at ground level and within the building

Figure 96: Detail of longitudinal section

Building Systems

The elevated hub is intended to be a performative architecture, with building systems designed to make it an effective and functional public building that suits Manila's climate. More importantly, the building is designed to be a conduit for the provision of basic services. The elevated hub connects to the utilidor network and facilitates the distribution of water, electricity, and sanitation to the informal settlers around the building. With this important role, the elevated hub not only becomes a building for public gatherings and events, but it becomes a vital part of the community as an infrastructure that actively improves life in the informal settlement. The elevated hub, with this dual role, provides both infrastructure and citizenship to the residents of Baseco.

Figure 97 on the following page describes both the elevated hub's building systems and how the elevated hub acts as a distributor of basic services.

ELEVATED HUB
BUILDING SYSTEMS

1 POTABLE WATER TANKHOUSE
2 ELECTRICITY FROM UTILIDOR
3 PHOTOVOLTAIC PANELS
4 PLUG-IN FOR HOUSES
5 DRY TOILET WASTE COLLECTION
6 BREEZEBLOCKS AIR FLOW
7 WATERPROOFING
8 SHADING SYSTEMS (VARIES)
9 VENTILATION
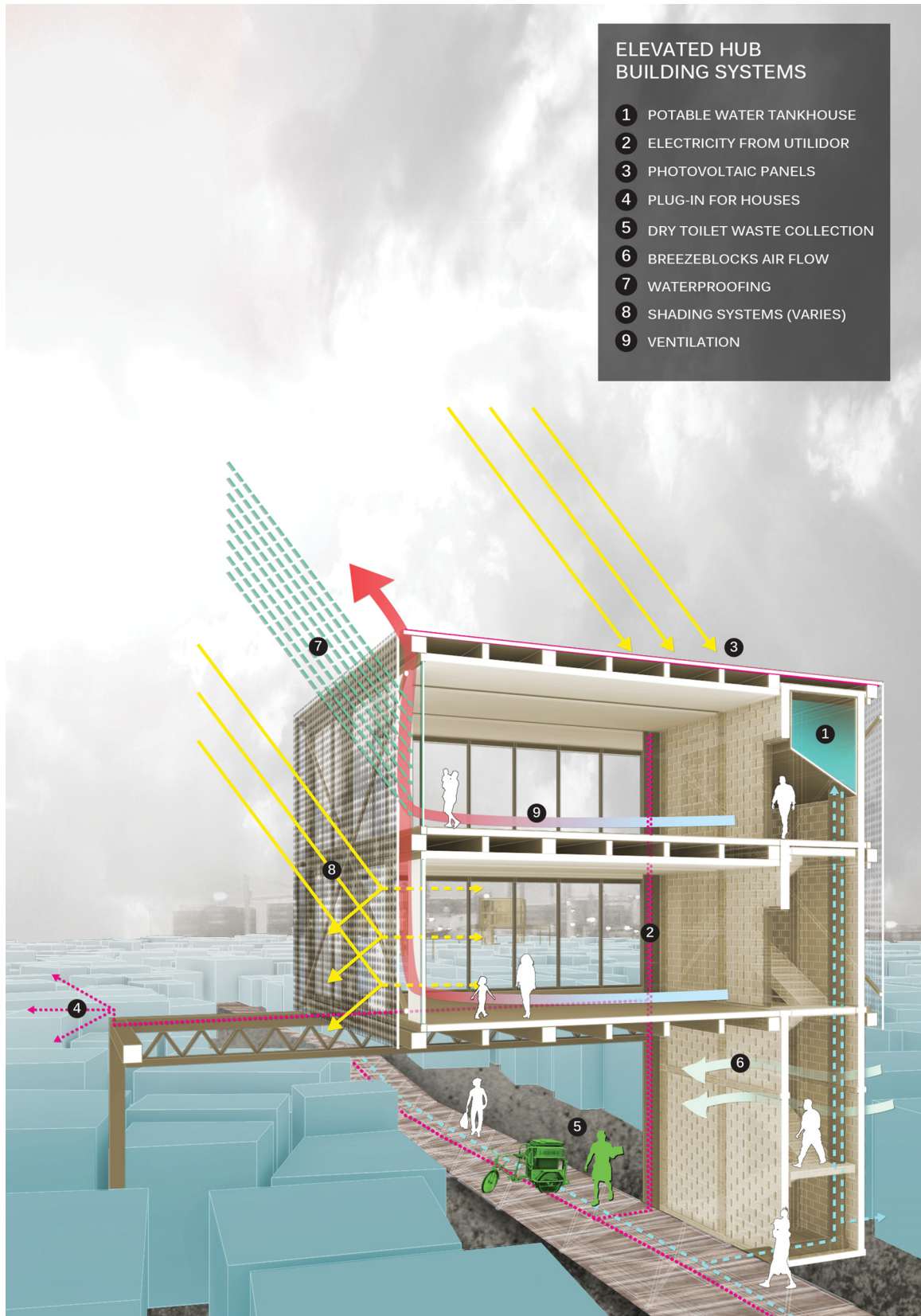
Figure 97: Sectional perspective of the elevated hub, highlighting the building systems and basic service distribution systems

Water Tankhouses
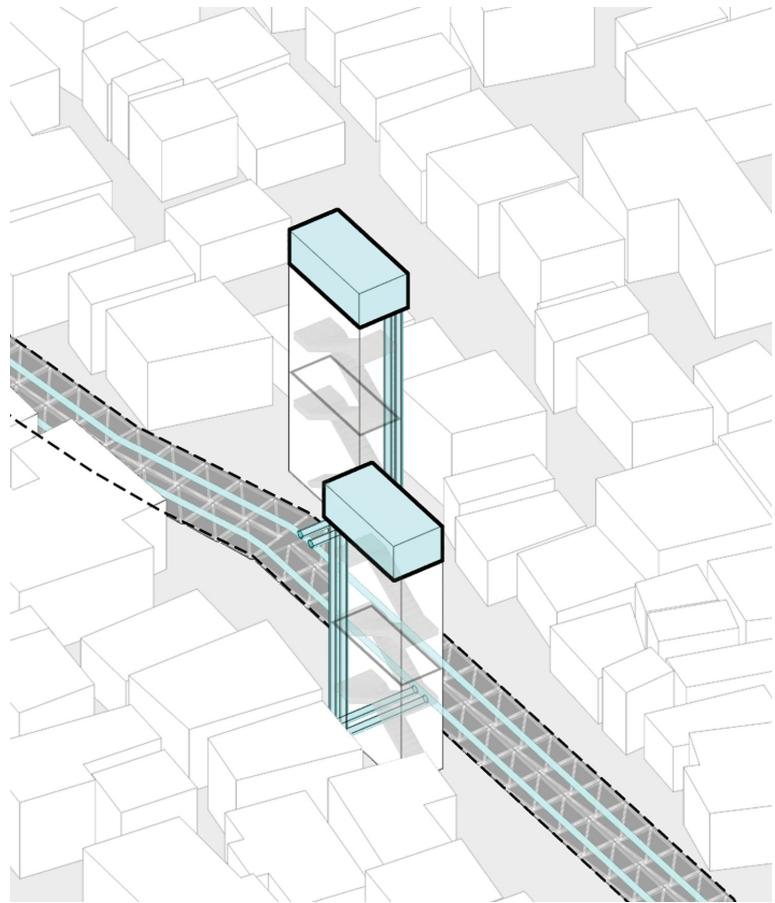
Figure 98: Diagram of the stair towers that show how they double as potable water tankhouses for the communities

Potable water is taken directly from the utilidor and is pumped up into a small reservoir on top of the concrete stair towers of the elevated hub. This system forms a tankhouse where drinkable water is stored above and is distributed to slumdwellers in pressure-fed public faucets at the base of the stair towers. As will be explained later, the concrete stair towers are constructed, and are to be operable, before the rest of the building is finished. This allows the potable water system to be in place as soon as possible. The stair towers themselves act like water towers in other communities, becoming a point of reference, visible infrastructure, and source of essential drinking water.

Figure 99: Concrete stair towers plug directly into the utilidor, providing a source of fresh water for Baseco's residents

Figure 100: Transverse section, showing the elevated hub as a conduit for the distribution of basic services

Figure 101: Detail of transverse section

INCREMENTAL CONSTRUCTION

UTILIDOR PLATFORM

CONCRETE TOWERS

STEEL SUPPORTS

Figure 102: First phases of the elevated hub's incremental construction

Incremental Construction

Acknowledging the slow and intermittent nature of humanitarian projects in informal settlements as well as the potential difficulties of bureaucratic state processes, the elevated hub is designed to be built incrementally, with each phase contributing to life in the informal settlement well before the entire building is completed. Figures 103-117 show a construction sequence that visualizes how the elevated hub is to be built by the community and the social impact that each piece has upon completion.

The elevated hubs are also intended to be built by the residents themselves. This comes from an understanding that informal settlers are incredibly capable builders and that some members of Baseco's population already engage in construction work for the city of Manila. Using local labour creates a sense of commuinity ownership of the elevated hub, potentially ensuring that the building becomes well-maintained and taken care of by the residents.

Finally, the elevated hubs are designed to have a degree of personalization and customization. The outer facade of the building is intended to be constructed from available local materials, letting each building become a visible and aesthetically unique symbol for each of the communities served by an elevated hub.

Figure 103: Baseco Compound site and "street"

Figure 104: Daily life in Baseco

Figure 105: Politician visits the community and announces the project

Figure 106: Residents discuss siting, training, and labour

Figure 107: Space frame utilidor being constructed by the residents

Figure 108: Space frame road in use. The new circulation corridor allows for improved access to the neighbourhood

Figure 109: Concrete stair towers under construction

Figure 110: Stair towers built. Towers function as tankhouses and wayfinding nodes for the local community

Figure 111: Steel frame supports for future building under construction

Figure 112: The steel frames, as threshold markers, define a public space. The area underneath now functions as a public square or procession stop

Figure 113: The rest of the building, a lightweight steel frame structure, is under construction

Figure 114: Local materials used for the facade/shading system. Facade materials vary between elevated hubs, creating a unique building for each community

Figure 115: The building is completed and acts as an important elevated public space for the community

Figure 116: The elevated hub is a well-lit landmark at night, increasing safety and providing opportunities for night-time markets and festivals

Figure 117: Arguably the building's most important role, the elevated hub is an evacuation centre in the event of a flood

MARKET
GATHERING PLACE
PROCESSION STOP
PUBLIC SQUARE

WATER TOWER
WAYFINDING LANDMARK
SCAFFOLDING
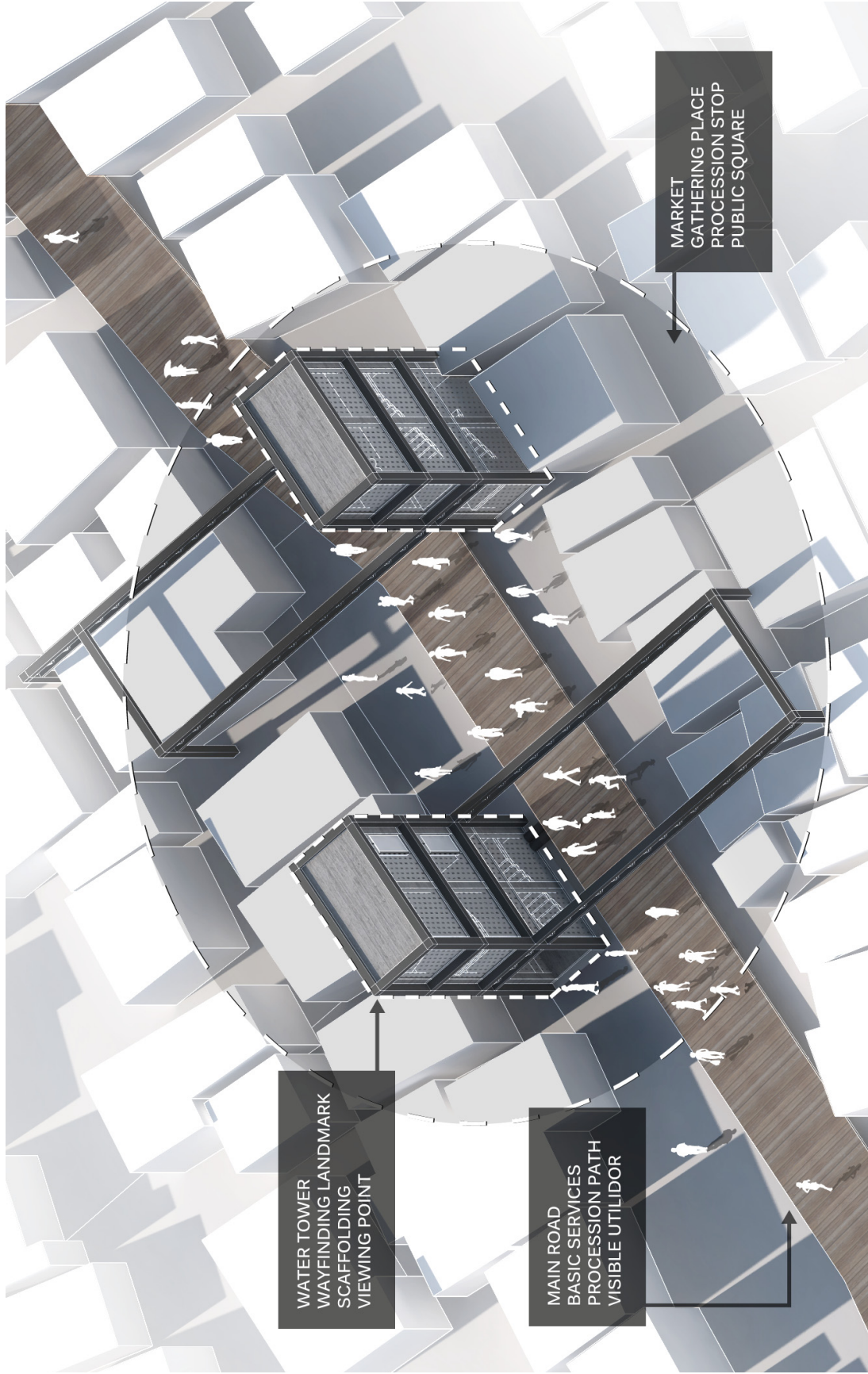VIEWING POINT

MAIN ROAD
BASIC SERVICES
PROCESSION PATH
VISIBLE UTILIDOR

Figure 118: Isometric drawing of the elevated hub's ground level, showing the utilidor path, concrete towers, and steel frame supports

SELECT PROGRAMS:

RELIGIOUS SERVICE

POLITICAL OFFICE

EXHIBITION SPACE

WORKSHOP

DAYCARE

EDUCATION

COMMUNITY COOKING

LEARNING COMMONS

CLINIC

EVACUATION

Figure 119: Possible programs in the elevated hub building

Program

The elevated hub features two floors, each equipped with an open plan. The building's plan is designed to be partitioned into three, two, or one room/s per floor. This flexible scheme enables each community to decide for themselves what public programs would be best suited to their needs and can create or remove walls accordingly. In addition to providing the labour force for the elevated hub, the communities also provide instruction on what programs the elevated hub building is to have, which may involve spaces for religious service, political rallies, workshops, exhibition space, community cooking, and other uses. Regardless of the chosen program, the building's elevated position allows it to be an effective evacuation centre. In the event of a flood or storm, the entire floor area can be used as an emergency evacuation centre for the community.

In contrast to the first phase's utilidor network, which was a top-down provision of physical infrastructure, the second phase is much more bottom-up. The building must be elevated off the ground to provide the necessary space and the building must function as an evacuation centre in case of floods, but the building's programs are left entirely to the community to decide, providing them agency and allowing them to modify the building as their spatial and programmatic requirements change.

Figure 120: The elevated hub as a space for religious rituals like Catholic mass

Figure 121: The elevated hub as a meeting space for politicians and their constituents

Figure 122: The elevated hub providing space for community cooking and events

Figure 123: The elevated hub's full floor area used as an evacuation centre in the event of a flood or storm

PERFORATED METAL

CORRUGATED METAL

BAMBOO

RUBBER TIRES

SHADING/FACADE - DIFFERS BASED ON COMMUNITY'S AVAILABLE MATERIALS

90m²
110m²
90m²

90m²
210m²

300m²

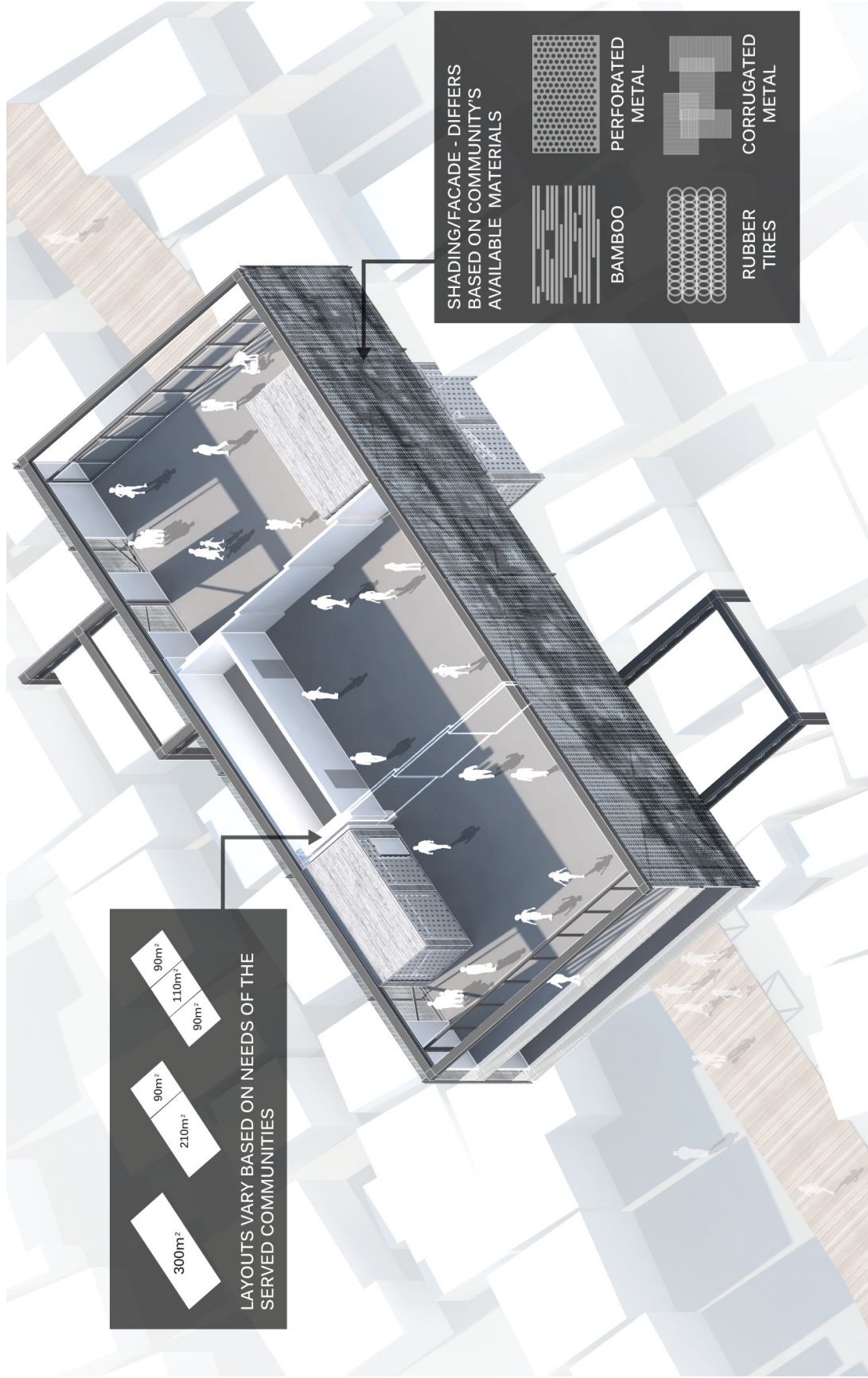LAYOUTS VARY BASED ON NEEDS OF THE SERVED COMMUNITIES

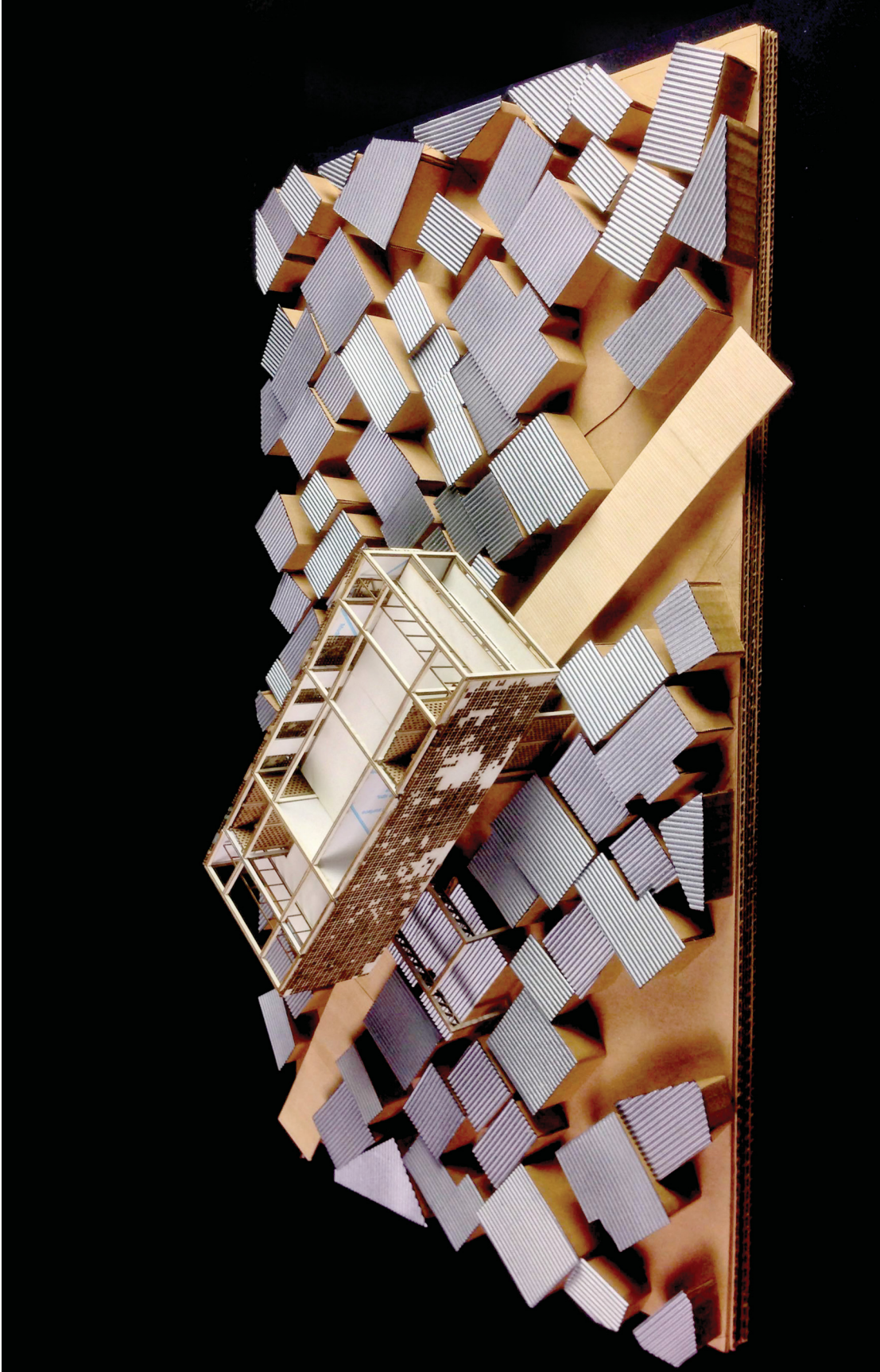Figure 124: Isometric drawing of the elevated hub's floor space, revealing the configurable room layout

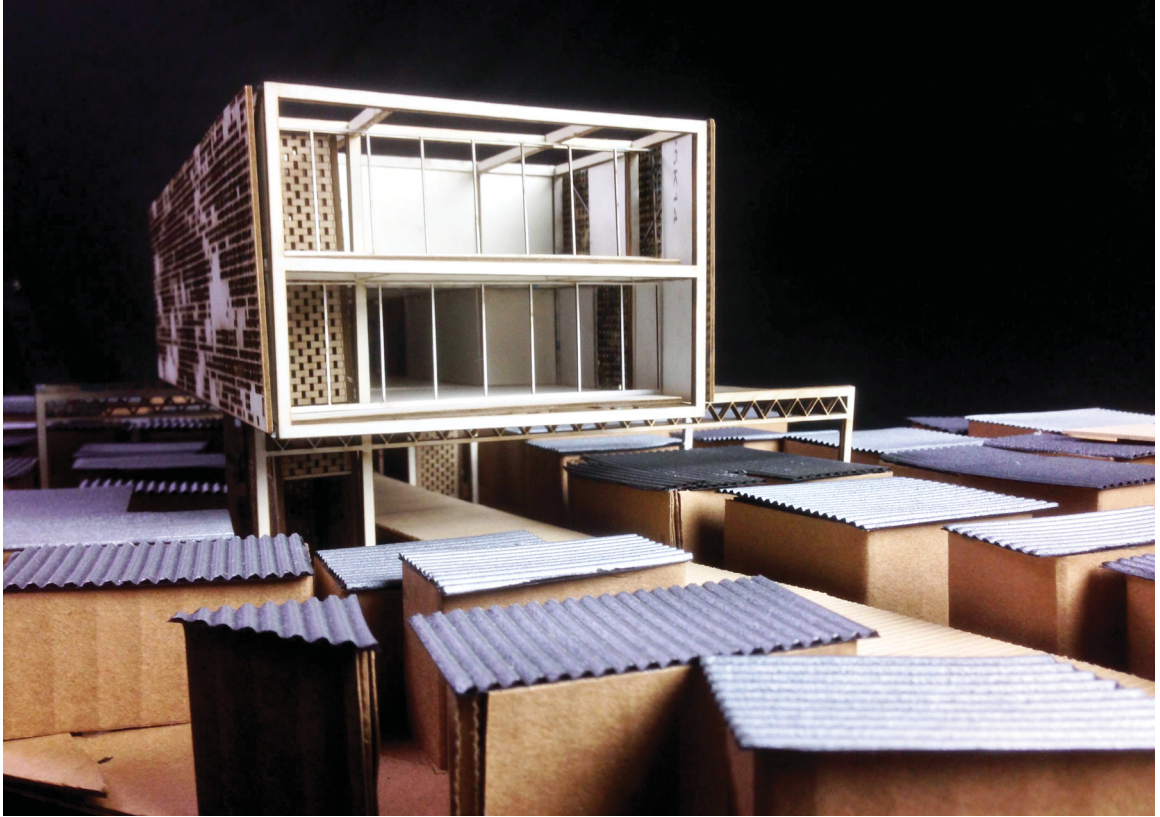Figure 125: 1:100 model of an elevated hub building in context

Figure 126: 1:100 model detail
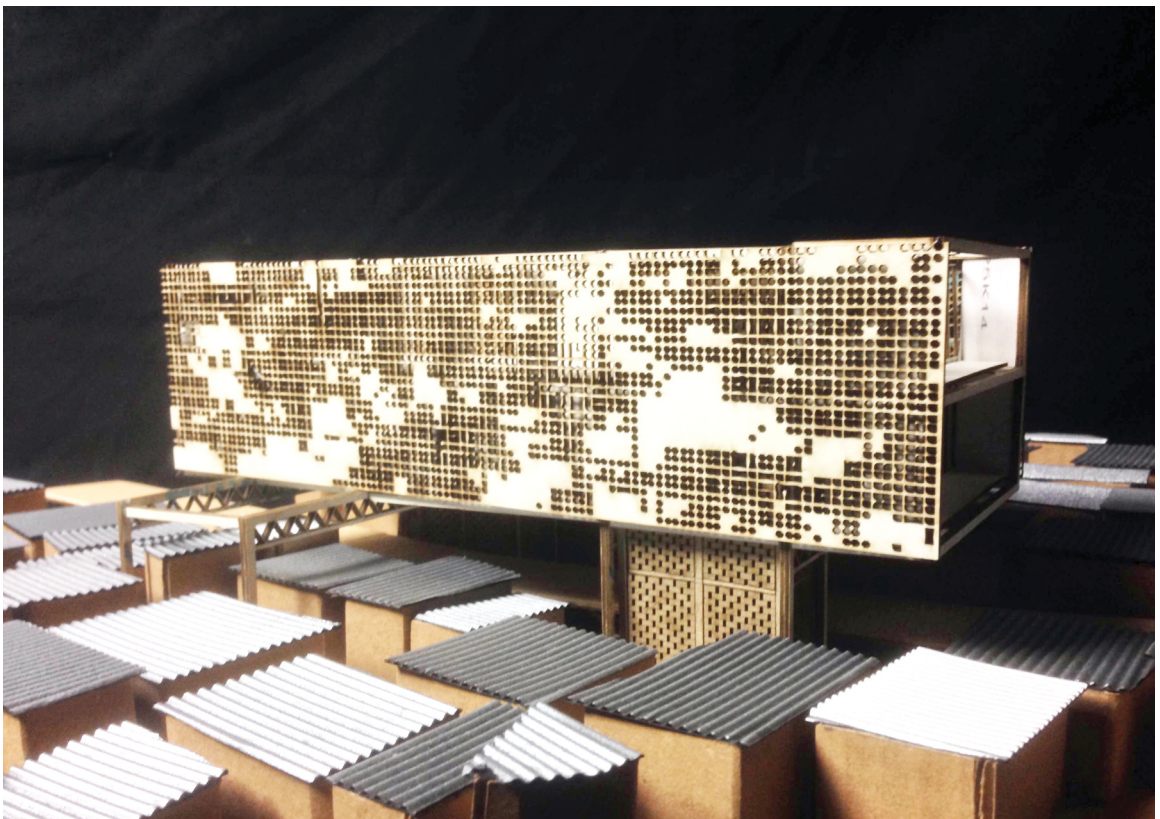
Figure 127: 1:100 model perforated facade

Phase Three - Ferry Terminal

Figure 128: Visualization of the ferry terminal building

The right to the city is not just a question of housing - as it stands, most of the residents have already met their own needs in that regard. The right to the city is also the right to mobility... For the barriers in segregated cities are not just social and psychological: they are marked as much by physical distance and journey times... The answer to a divided city is integration, and there is no integration without transport connections.[57]

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57. Justin McGuirk, *Radical Cities: Across Latin America in Search of a New Architecture* (New York: Verso, 2014), 166.

Concept

The proposal culminates in a symbolic connection between the formal city and the informal city. The third and final phase, *societal infrastructure*, involves the integration of Baseco Compound with Manila through public transportation. A large ferry terminal building, sited at the entrance to Baseco and the beginning of the utilidor network, is built as an extension of the existing Pasig River ferry system, providing the informal settlers with greater access to the city of Manila.

The first phase's utilidor network provides the informal settlers with improved circulation and easier access to northeast corner and entrance to Baseco, where the ferry terminal is to be sited. The ferry terminal is envisioned as a larger expression of the second phase's elevated hubs, designed as a building that both connects to the utilidor road and provides the vital public space of public transportation to Baseco.
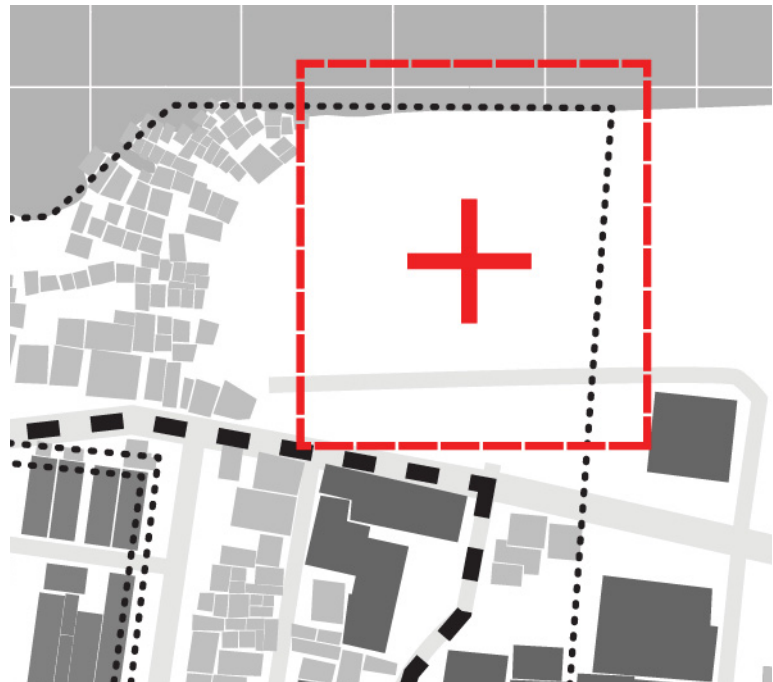

Figure 129: Ferry terminal building site at the northeastern tip of Baseco Compound

Pasig River

The Pasig River bisects Metro Manila and connects Laguna Bay in the east with the Bay of Manila in the west. It was the historic lifeblood of the city during the Spanish and American occupations, providing fishing and recreation for the city's residents and itself being an important symbol of Manila. Unfortunately, decades of neglect, industrial use along the river, and poor environmental policies have greatly damaged the Pasig, rendering it incredibly polluted and biologically dead.

While the river has lost much of its former use and status, it is still useful as a transportation corridor because of its proximity to many of Metro Manila's major cities and formal and informal districts. The ferry system makes productive use of the unproductive Pasig and provides a cost-effective means of transportation around the metropolis.

Baseco Compound's siting at the mouth of the Pasig River provides an opportunity for the settlement to link to this existing public transportation network. The proposed ferry terminal at Baseco, itself being the westernmost point and terminus of the ferry system's route, would greatly improve the informal settlers' access to the rest of the city and vice versa, also allowing non-slumdwellers access to Baseco.

Figure 130: Aerial view of the Pasig River as it flows through Manila. Satellite imagery reveals just how polluted the river has become; from Google Maps

FERRY SYSTEM

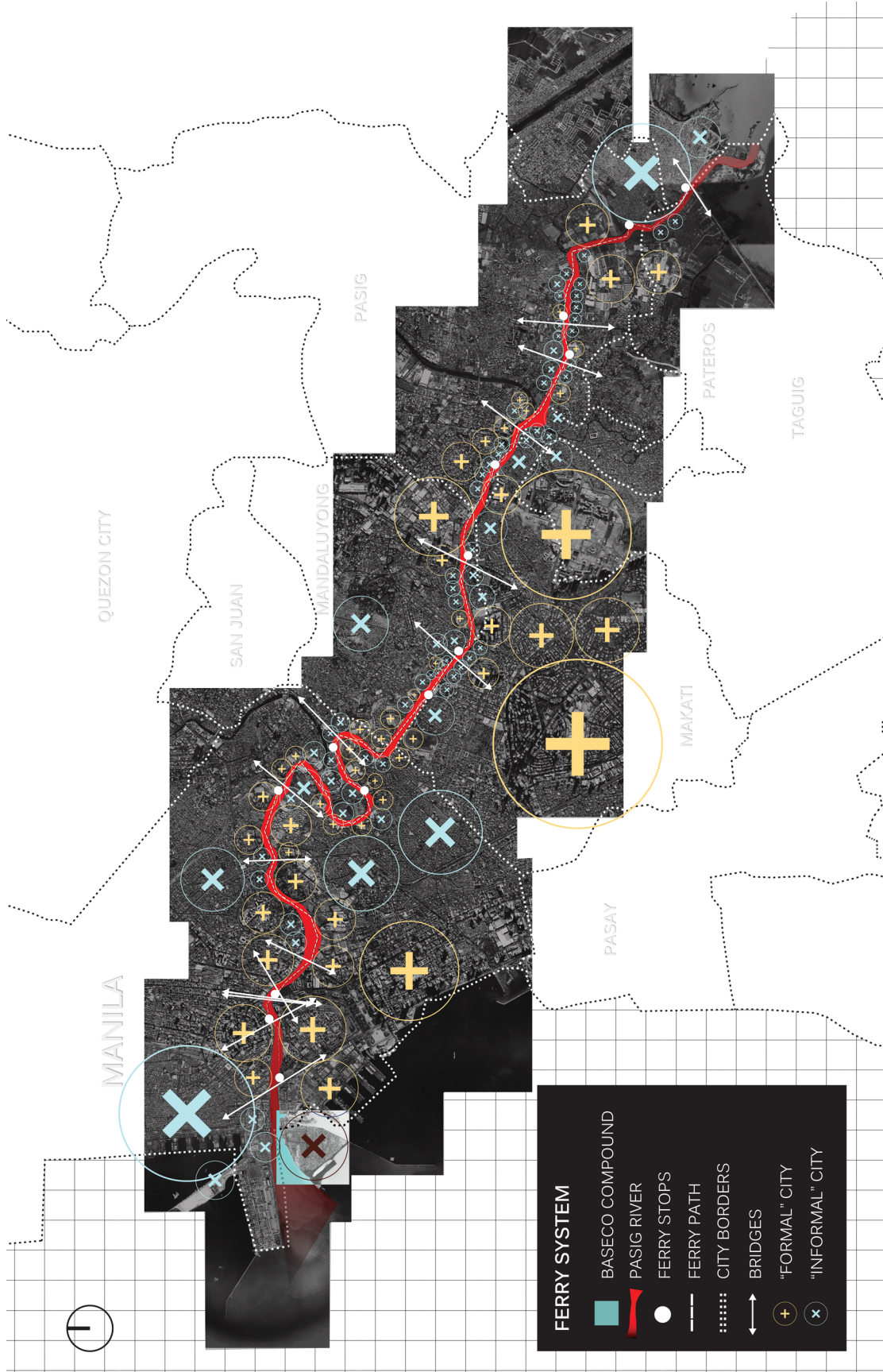|	
BASECO COMPOUND	◼
PASIG RIVER	
FERRY STOPS	●
FERRY PATH	‖
CITY BORDERS	⋮
BRIDGES	↕
"FORMAL" CITY	⊕
"INFORMAL" CITY	⊗

Figure 131: 1:80000 Pasig River plan and adjacent formal city sites and informal settlements; data from Google Maps
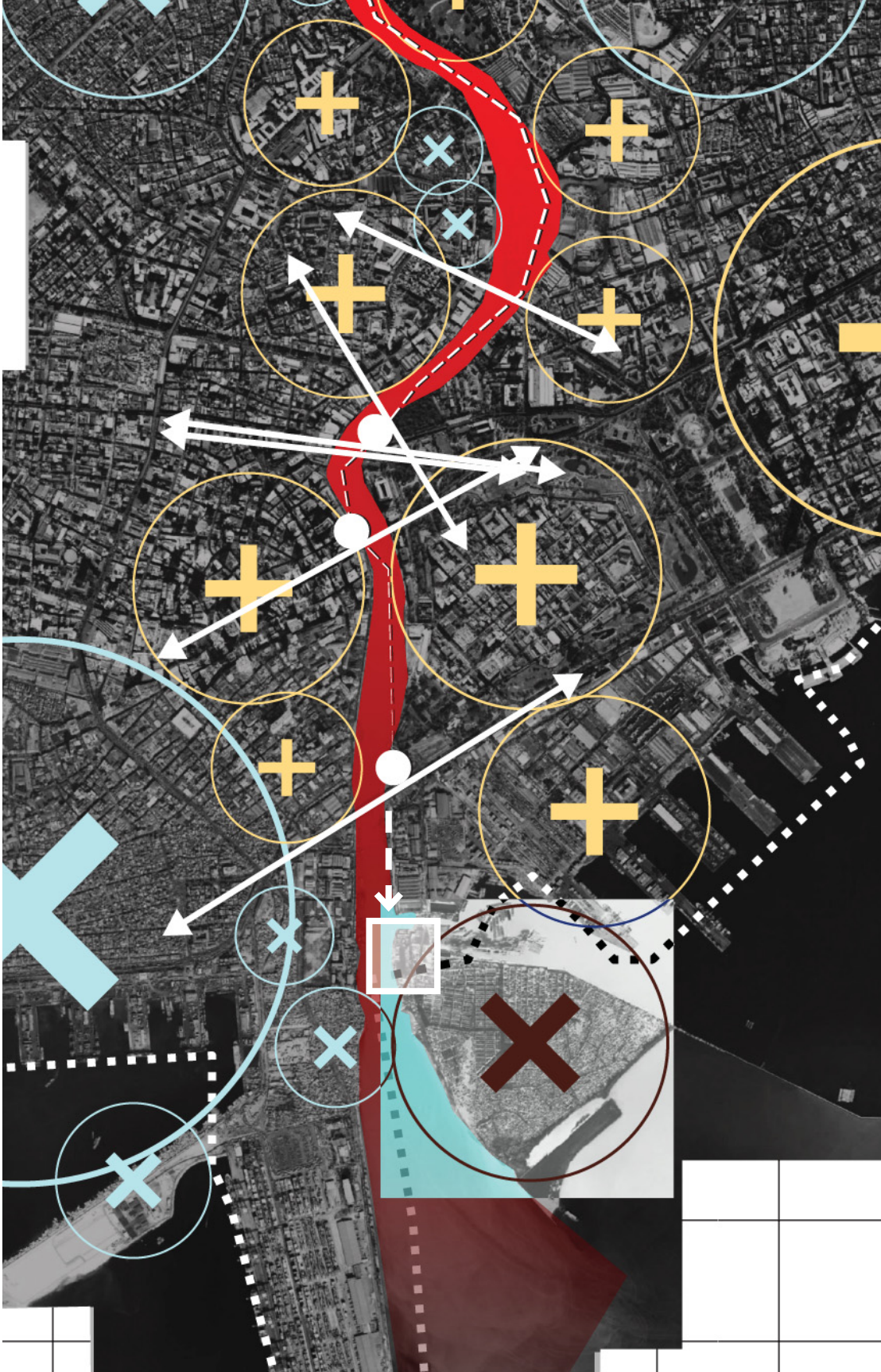
Figure 132: 1:20000 detail of the Pasig River plan, highlighting the site for the proposed Baseco ferry terminal

Terminal Design

The building is sited where the Pasig River meets Baseco. The utilidor network connects directly to the ferry terminal building and ferry docks, creating a seamless connection between the road of the informal settlement and the ferry route and between Baseco and Manila.

Figure 133: Ferry terminal connects the utilidor network to the ferry dock
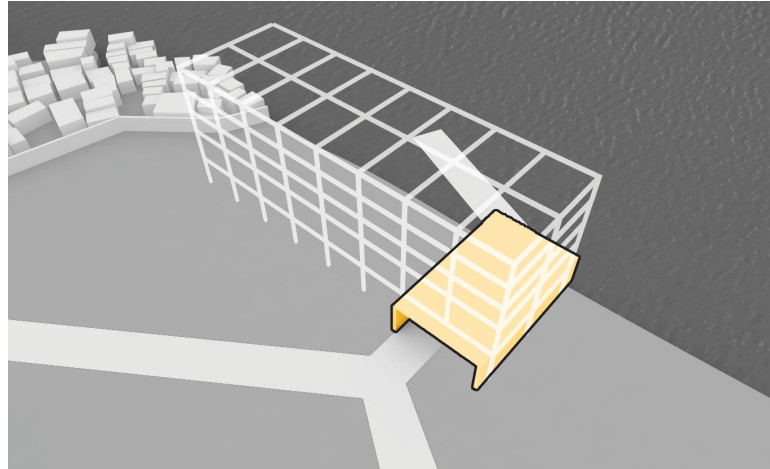
The building is a simple steel frame structure with an open ground level condition. The building is programmed as a trades school and learning commons, with classrooms, workshops, and library facilities located above. Like the elevated hubs, the building draws its basic services from the utilidor network that runs underneath it.

Figure 134: Workshop and learning commons
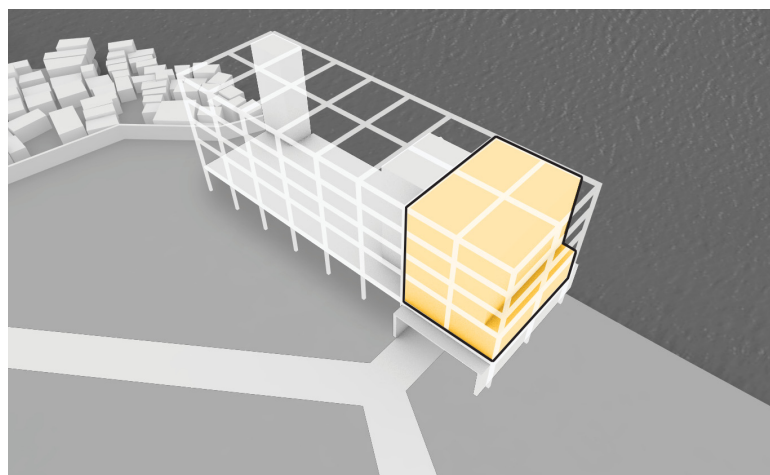
Figure 135: Administration and office space
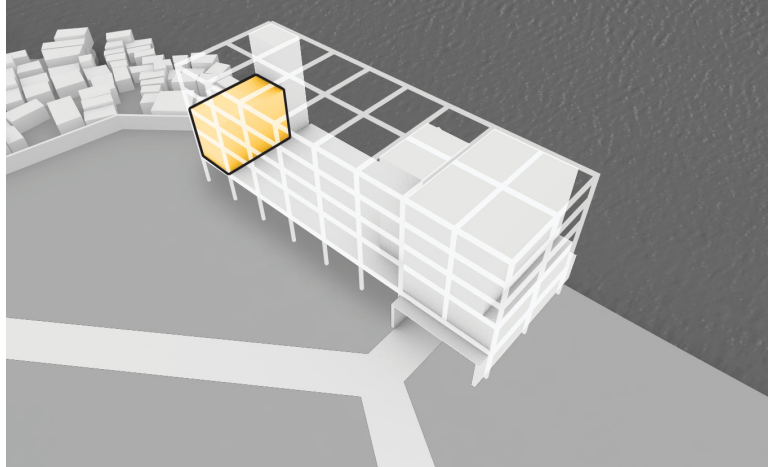
Figure 136: Classrooms located at the top two floors
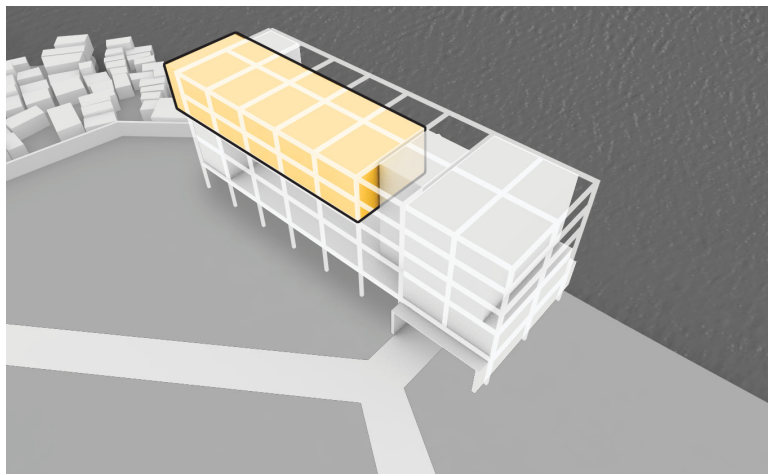
These programmatic volumes surround a central void in the building. In that open space is a multipurpose sports and exhibition space for both the school and for the public. Like in the elevated hubs, this large space doubles as an evacuation centre in case of emergency.

Figure 137: Large sports, exhibition, and evacuation space located at the centre of the building
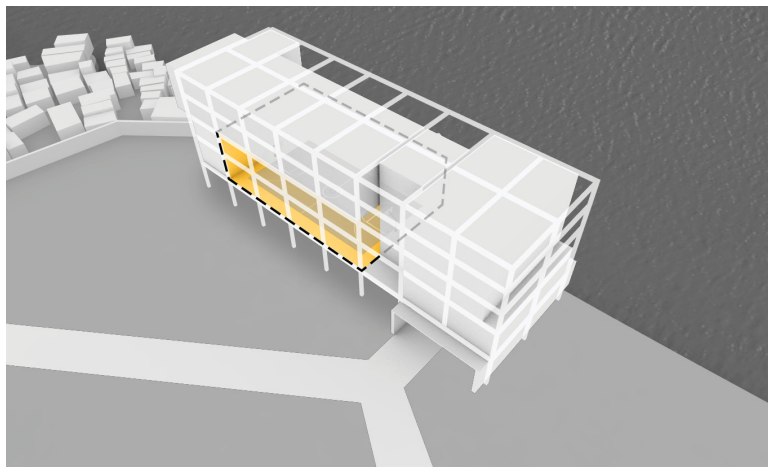
At ground level, the land under and around the building is left open to develop organically into an informal public market, providing an amenity to both the ferry terminal building as well as to people arriving to or departing from Baseco through the river. The public market also creates the opportunity for the immediate distribution of goods transported from other parts of the city through the ferry.
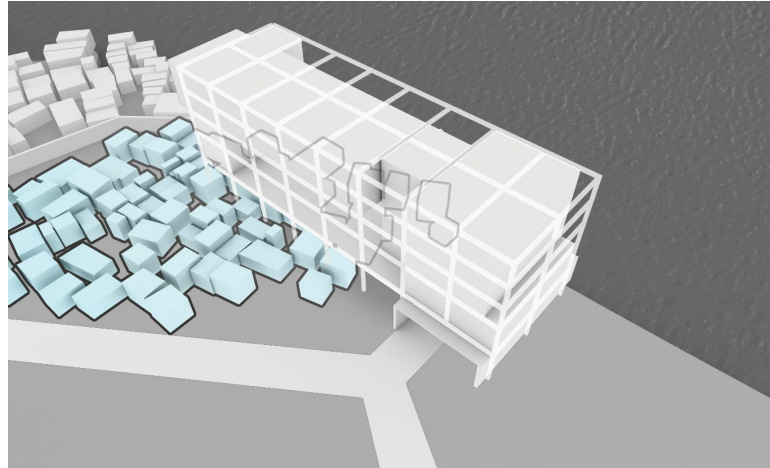
Figure 138: Ground under and around the building is allowed to develop into an informally-built marketplace

The ferry terminal, as a large public building, assumes the role of Baseco's "gateway," facilitating public transportation, exchange of goods, services, and ideas, and the expansion of the networks found in the informal settlement of Baseco onto the larger network of the city of Manila.

Figure 139: Diagram of the ferry terminal and distribution of program in the building

LEARNING COMMONS

WORKSHOP

FERRY TERMINAL

SERVICES

CLASSROOMS

EXHIBITION

MARKET

OFFICES
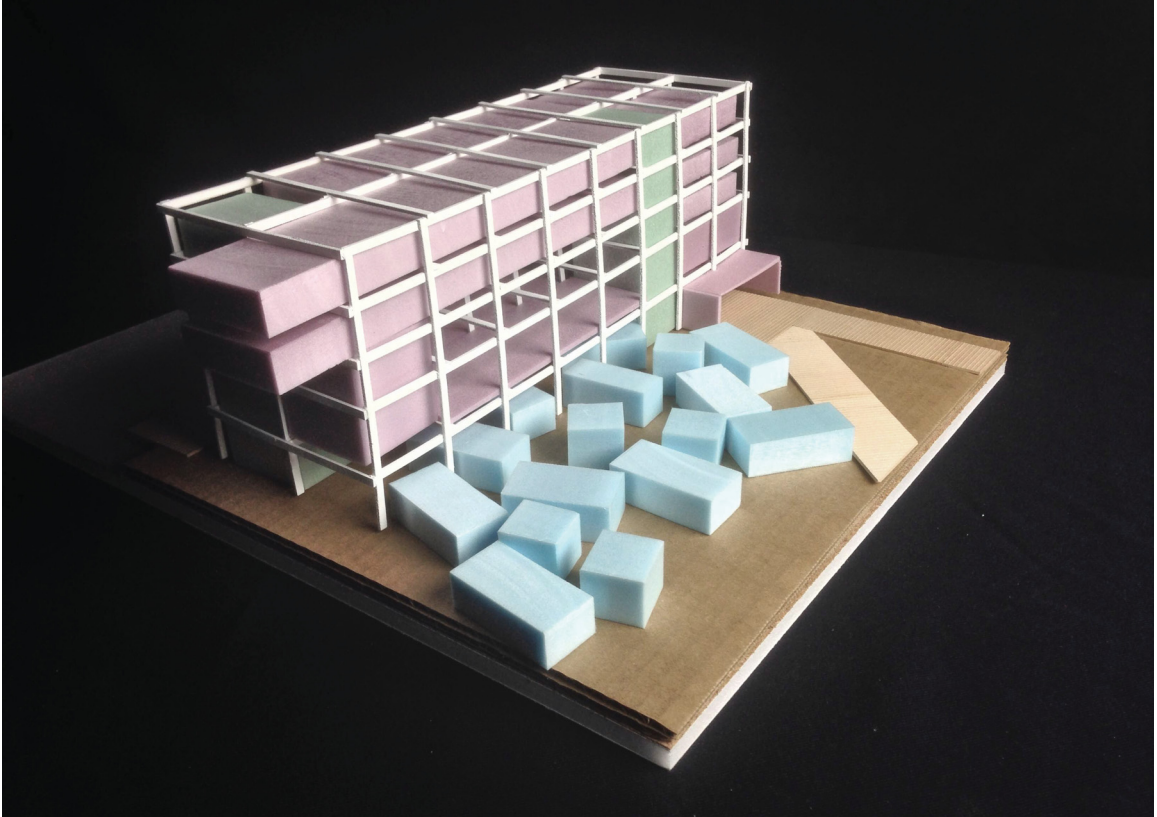
Figure 140: 1:200 study model of ferry terminal building: Baseco side
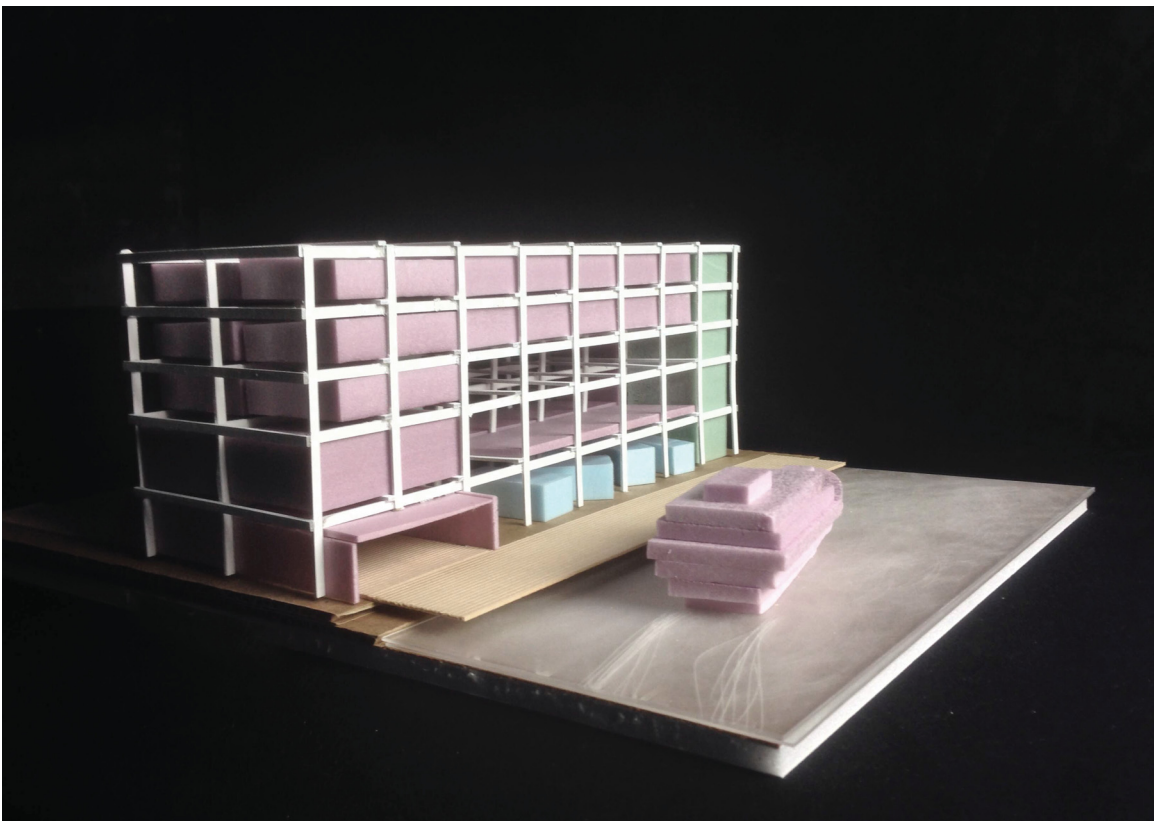
Figure 141: 1:200 study model of ferry terminal building: Pasig River side

Complete Network

With the ferry terminal, the infrastructural network for Baseco is complete and the three-part design proposal comes full circle. Through the *physical infrastructure* of the utilidor network, informal settlers are given access to the physiological needs of basic services and the top-down introduction of a main road helps define public and private space in the informal settlement. With the *social infrastructure* of the elevated hubs, urban poor communities are given a platform for public space, enabling them to conduct the gatherings and events vital to the promotion of bottom-up citizenship. Finally, with the *societal infrastructure* of the ferry terminal, the settlement of Baseco Compound, once a marginalized, unintegrated, invisible, and forgotten land, becomes a place in the city.

EXISTING FERRY TERMINALS

PROPOSED BASECO FERRY TERMINAL BUILDING

UTILIDOR NETWORK AND ELEVATED HUBS

PASIG RIVER
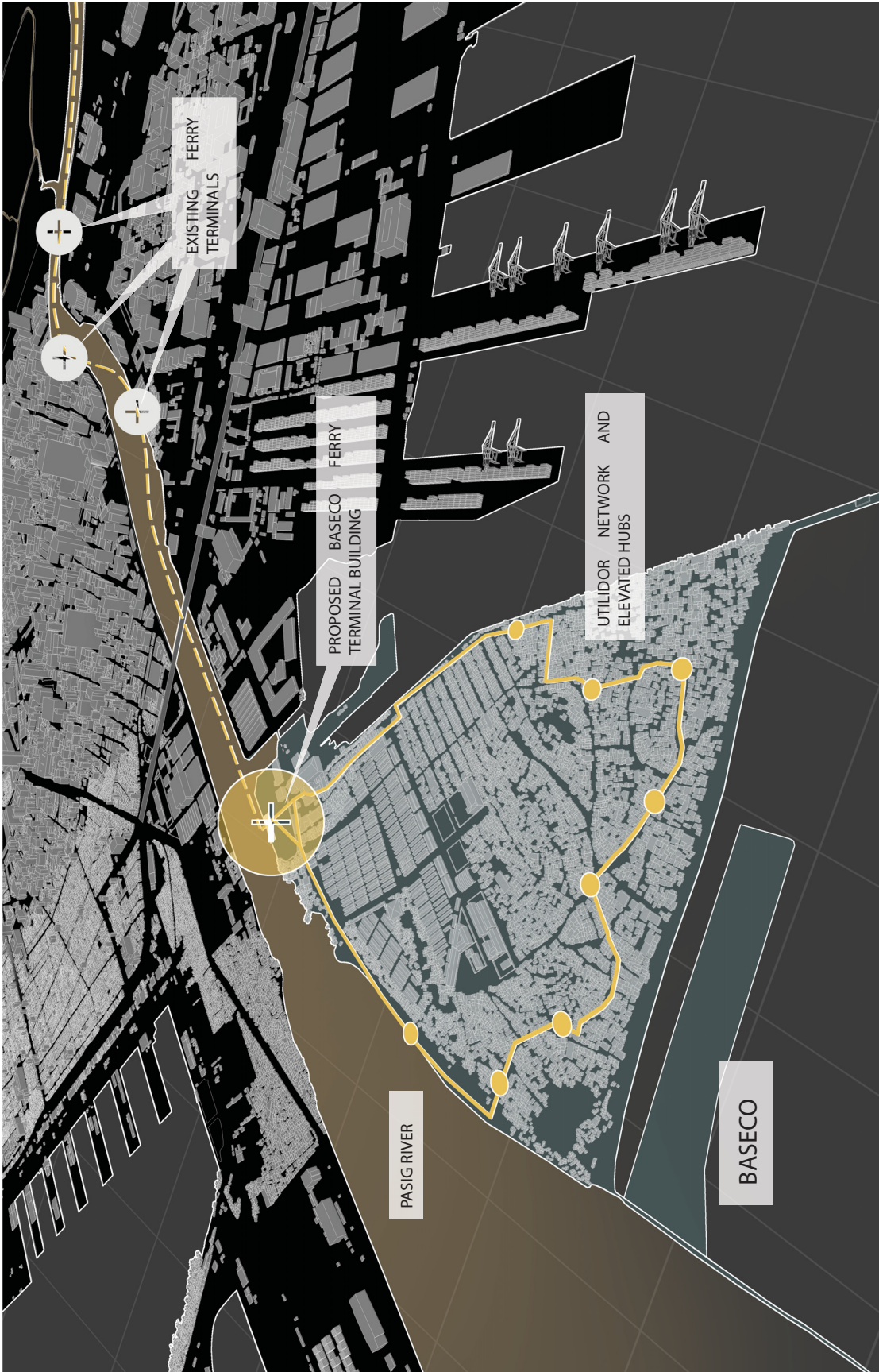
BASECO

Figure 142: Full infrastructural network for Baseco Compound

CHAPTER 6: CONCLUSION

This thesis on urban poverty involves a design proposal focused on infrastructural interventions and the public domain. The project began, however, with explorations into improved housing for informal settlers. That path was abandoned early in the thesis process when it became clear through research that housing is not what the urban poor need most. Informal settlers are the most capable people on the planet at building housing because they definitionally have had to build their own houses in their pursuit for a place in the city. While it is true that housing in the informal sector is inadequate, I believe that architects can provide greater social impact through designing what the informal settlers cannot build for themselves: infrastructure and citizenship.

Each phase in the thesis was designed to provide both infrastructure and citizenship in a single design proposal. After working on the thesis, this mode of thinking emerged as the best way to design for the informal settlement to provide true and lasting change. I believe that it is crucial to couple sites and services interventions with designs that improve the public realm. How can better access to potable water be provided while also creating a better public road? How can the construction of a dedicated public space building become a bottom-up event that involves the community? How can public transportation infrastructure also act as a beacon for the right to the city?

The proposal for Baseco Compound is a context-specific implementation of the thesis approach to a particular informal settlement. The utilidor network, the elevated hub,

and the ferry terminal are designs for Baseco's unique site characteristics and conditions. The three step process of designing physical, social, and societal infrastructure, in that order, is applicable to, with some modifications for context, other urban poor communities around the world. The key is to improve connections with each design move, whether that be to basic services, to public spaces, or to the rest of the city.

However, it is also important to consider possible impediments when designing for the undercity. While this thesis acknowledged factors like political will, funding, community involvement, and bureaucracy, the thesis project had the distinct advantage of being unbounded by such factors. In reality, these factors are unlikely to line up as nicely as they did in this utopian design experiment. It is the challenge for socially-minded architects to nimbly work with the multiplicity of complex urban forces to create real change for the impoverished.

As a word of caution, studying the urban poor can be inherently problematic because it is easy to fall into one of two ideological extremes. It is very tempting to either deify the urban poor, seeing them as resilient and enduring people that live more sustainably than those in the "formal" city do, or to demonize the urban poor, seeing them as uneducated criminals that illegally occupy urban space and add nothing of value to the city. Both of these views miss the full picture. The ingenuities that come from informal settlements can be quite fascinating, but these arise from terrible living conditions and socio-economic emergency. Informal settlements are illegal and and are a detriment to the beauty of the city, but they are the result of a larger

pattern of rural-to-urban migration and the rural migrant's pursuit for a better life. It is important to always keep oneself in check when working with the informal sector.

Poverty remains one of the greatest challenges facing the developing world and is, I would argue, the greatest challenge facing the Philippines. The thesis does not aspire to be a magical solution to poverty - such a solution is unlikely to exist - but it does aim to lend a voice to the discourse of providing tangible help to Manila's undercity. It is my hope that through architecture, the informal settlement can become a legitimate part of the city.
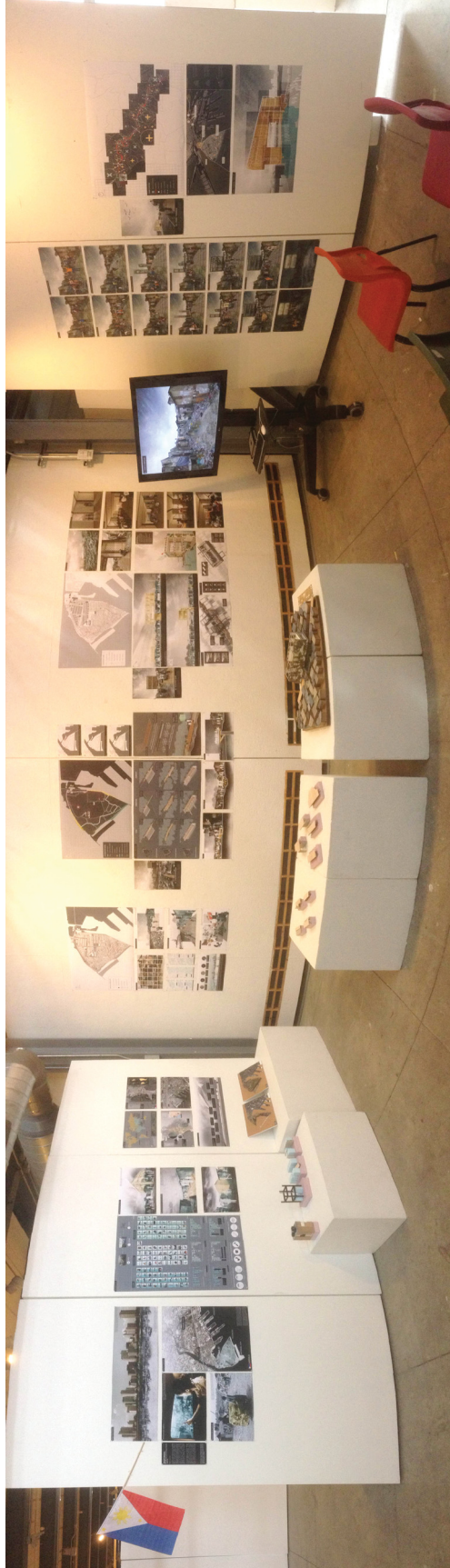
Figure 143: Manila and Manila

Figure 144: Thesis defence, March 17th, 2015, 2:00pm, Dalhousie University, Halifax, NS

APPENDIX A: RESEARCH PAPER

(The following is a short essay produced in Fall 2014 as a final assignment for my elective INTD 5006 - The Philosophy of Development in Dalhousie's Department of International Development Studies. This final assignment asked students to define what philosophical assumptions one should be armed with when studying a selected thesis topic.)

Rural-Urban Threshold: The Philosophy of Intervening in Informal Settlements

The 20th century has seen the mass exodus of rural peasants to the developing world's major urban centres. This global movement has caused the proliferation of informal settlements in those cities where the rural migrants are subject to the twin hostilities of miserable living conditions and city policies that advocate for their demolition and relocation. The rural migrants, euphemistically referred to as the "urban poor," are denied basic human services and recognition as legitimate members of the polis. Designing architectural interventions in informal settlements requires an intimate understanding of the urban poor – a complex population that is at the threshold of many perceived dichotomies. Through a description of the many ways in which the urban poor are caught in between, I aim to show that the urban poor are best studied through an understanding of both the structures that affect the urban poor and the unique standpoint epistemology that living in urban poverty provides.

The urban poor in the Two-Thirds World are sometimes called "marginalized" because they are socio-economically isolated and often live at the fringes of the city. This label has drawn criticism from scholars like Janice Perlman, who argues that this label is a stigma that only perpetuates inequality and that the urban poor are perfectly capable

people that are trapped by the perception of poverty.[58] While it is important to look beyond the label of "marginalized," it is still useful to consider the notion that the urban poor are found "in between" because it explains a lot about their situation. The rural migrants, as urban poor, straddle conventional definitions of rural and urban, illegal and legal, and poor and rich.

The informal settlement is at the threshold of country life and city life. Neither completely rural nor completely urban, the urban poor live in a transition zone between both realms as they are physically in the city but often maintain social and familial connections with those they have left behind in the hinterlands. Doug Saunders refers to informal settlements as an "arrival cities" because they are the physical manifestations of the rural-migrant's foothold in the city and are the spatio-temporal threshold between the rural family's former life in the country and the future life they hope for their children in the city.[59] In a way, one can view informal settlements as "villages within the city" because they physically deviate from the urban grid and have social networks similar to those found in the country. As Saunders says, "the culture of the arrival city is neither rural nor urban, though it incorporates elements of both – often in grotesquely distorted form – in its anxious effort to find a common source of security among its ambitious and highly insecure residents."[60] Under this view, one can see the informal settlement as an extension of traditional forms of living to the highly modernized landscape of the city.

The threshold experience of the urban poor also exists

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58. Perlman, *The Myth of Marginality*, 91-92.
59. Saunders, *Arrival City*, 10-11.
60. Ibid, 24.

on a structural level. Many of the "formal" city enclaves in developing world countries are the result of modern capitalist structures and are connected to global networks of capital. The urban poor, as "informal," are simultaneously excluded from this modern capitalist structure and are oppressed by it. The urban poor come to the city seeking modernity but the prohibitive nature of city structures prevents them from ever fully achieving modernity. According to Hernando De Soto, "[peasants] face an impenetrable wall of rules that bars them from legally established social and economic activities. It is tremendously difficult for these new city people to acquire legal housing, enter formal business, or find a legal job."[61] The rural migrants exist in the cracks of the city's modern capitalist structure and are between definitions of illegal and legal. De Soto argues that the urban poor are "extra-legal" in that their means – squatting and land-invading – are considered criminal but their ends – housing in the city and access to jobs – are considered desirable.[62] This extra-legal use of the city's land, resources, and utilities without ever fully being part of the city's formal system is the only urban life afforded to the urban poor.

Finally, the urban poor are at the middle of "poor" and "rich." While they often live in poverty and squalor, the rural migrants' move to the city is still a marked improvement to life in the countryside, where rural poverty is a bigger killer than urban poverty.[63] Despite this, the capital gains that the urban poor make often go unrecognized. Investments that the urban poor make into their untitled households and unlicensed livelihoods are effectively invisible to city

61. Hernando De Soto, *The Mystery of Capital* (New York: Basic Books, 2000), 18.
62. Ibid, 30.
63. Saunders, *Arrival City*, 23.

governments because the urban poor neither own the land they live on nor exist in the capitalist city structure.[64] This "dead capital," as De Soto puts it, is the biggest paradox of the urban poor. The urban poor are arguably not poor in physical or intellectual capital but are rendered poor by the modern structure of the cities they are in.[65]

From this we can gather two crucial ideas to consider when intervening in informal settlements. First, the urban poor are found at these thresholds of rural/urban, illegal/legal, and poor/rich because of the modern capitalist structure of the city. While the urban poor are legally excluded from the city structure, the urban poor continuously migrate to it and get oppressed by it. Second, this experience of living in thresholds has given the urban poor both a unique identity and viewpoint. Neither traditional nor modern, intervening for the urban poor in the informal settlement requires a mode of thinking that takes the urban poor's unique perspective – their informal standpoint epistemology – into account.

For this first point we draw from Marxist and Postcolonial theories to understand how the exclusionary urban structure was directly caused by the drive to modernization and uneven patterns of development. According to Andre Gunder Frank, "underdevelopment is not due to the survival of archaic institutions and the existence of capital shortage in regions that have remained isolated from the stream of world history. On the contrary, underdevelopment was and still is generated by the very same historical process which also generated economic development: the development of capitalism itself."[66] With this insight, one can say that the

64. De Soto, *The Mystery of Capital*, 30-35.
65. Ibid, 28-30.
66. Richard Peet and Elaine Hardwick, *Theories of Development*

introduction of modern capitalist structures to developing countries is at once the cause of the rural migrants' move to the city and is at the same time the structure that excludes and exploits them. As Gita Verma writes, "the root cause of urban slumming seems to lie not in urban poverty but in urban wealth."[67] Urban poverty is a structural and systemic social problem and adopting a Critical Realist paradigm is important both in understanding the structures that affect the urban poor and in navigating through top-down city policies and structures to make a meaningful intervention for the urban poor.

Second, the urban poor's experience of being in between traditional and modern, illegal and legal, and poor and rich creates for them a distinct identity that requires avoiding essentialism – labelling them as "poor and helpless" – and reductionism – analyzing them as "urban survivors." To that end, I advocate for Asef Bayat's Interpretivist "Quiet Encroachment of the Ordinary" model as a mode of understanding the urban poor because it explains their actions without succumbing to these pitfalls. Under this model, the urban poor are not seen in direct conflict with modern city structures but instead make subtle and protracted trespasses on the "formal" city in order to better their living conditions and establish a sense of security outside of the system.[68] Land, water, electricity, food, and other necessities are taken not from other urban poor but from the propertied and powerful in the city. These extra-legal encroachments, with the goals of acquiring

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(New York: Guilford Press, 1999), 160.

67. Davis, *Planet of Slums*, 95.

68. Asef Bayat, "Politics of the Informal," in *Urban Informality: Transnational Perspectives*, edited by Ananya Roy and Nezar AlSayyad (Oxford: Lexington Books, 2004), 90-91.

social goods and autonomy from modern institutions, are nevertheless different from other political movements such as those from labour unions because the urban poor are outside of the formal system.[69] This illustrates the unique condition of the urban poor's being out of modernity in a modern environment and explains why being open to their standpoint, ingenuities, and way of life is vital to any design proposals for the informal settlement.

Urbanist Edgar Pieterse writes that "while it is a highly complex and tricky affair to intervene in slums without making the situation even worse, it is also clear that interventions are required."[70] By understanding that the urban poor in informal settlements exist at the thresholds of several categories, definitions, and structures, we can see how crucial it is to look at the urban poor more complexly and resist simple dichotomous readings. Studying the urban poor through both a Critical Realist paradigm – to acknowledge how the urban poor are related to and affected by the modern structures of the city – and an Interpretivist paradigm – to acknowledge the unique viewpoint and epistemology that come from the experience of living in marginality – helps provide a clearer and complete picture of the urban poor. A two-pronged philosophical approach, one that encompasses both the forces of top-down policy and bottom-up grassroots movements, is the best way to study the urban poor and find potential solutions that can better the human condition of the informal settlement and provide citizenship to its invisible inhabitants.

69. Bayat, "Politics of the Informal," 92-94.
70. Pieterse, *City Futures*, 34.

APPENDIX B: DESIGN PRECEDENTS

For the purposes of this thesis, I was interested in looking at interventions in impoverished communities in two ways: through tectonics - in terms of the architecture - and through process - how the project was realized and what social impact the project had upon realization.

Case Studies - Tectonics

Quinta Monroy - Elemental (2003-2005)

Figure 145: Quinta Monroy; from Museum of Modern Art NY, "Small Scale Big Change"

This on-site housing project in Iquique, Chile was led by renowned architect Alejandro Aravena. Quinta Monroy was designed with the scheme of building the "half of a house" with infrastructure and services and leaving space for the residents to build the rest of the house as they see fit.[71] This approach solved both the problem of budget - the government could only pay for smaller and inadequate housing units - and the problem of the residents feeling too constrained with more fixed housing typologies.[72]

71. Alejandro Aravena, "Quinta Monroy," *Elemental*, last modified 2011. http://www.elementalchile.cl/en/proyecto/quinta-monroy-2/.

72. Museum of Modern Art, "Quinta Monroy," *Small Scale Big Change*, last modified October 2010, http://www.moma.org/interactives/exhibitions/2010/smallscalebigchange/projects/quinta_monroy_housing.

Quinta Monroy is inspiring as a clear example of a design solution that merges top-down intervention with bottom-up ingenuity. The government could provide the infrastructure but not the entire house while the informal settlers lacked the infrastructure but could easily build their own houses off of that framework.

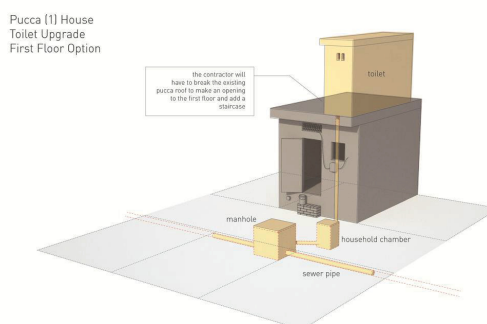***Savda Ghevra Sanitation - Julia King (2010-present)***

Figure 146: Toilet addition diagram; from Julia King, "The Potty Project"

Architect Julia King, while pursuing her PhD by practice in Delhi, India, observed that slumdwellers are perfectly capable of building their own houses but were missing important basic services like water and sanitation.[73] She decided to, as a first step, intervene in the Savda Ghevra slum by designing a sewage system. Her largest project is a decentralized sewage system that provided 322 households access to adequate sanitation services.[74]

This project was influential in seeing physical infrastructure as the important first step. It is one thing to provide informal settlers with a well-designed and well-intentioned building, but it all amounts to nothing if the basic needs are not

73. Vanessa Quirk, "Introducing 'Potty-Girl,' The Architect of the Future?," *ArchDaily*, last modified July 24, 2014, http://www.archdaily.com/529934/introducing-potty-girl-the-architect-of-the-future/.

74. Julia King, "The Potty Project," *Julia King*, last modified January 2013, http://www.julia-king.com/research/the-potty-project/.

met. A sewage system may not be "architecture" in the conventional sense but it can have the biggest potential to do good.

Arena De Morro - Herzog & De Meuron

Figure 147: Arena De Morro; from Herzog & De Meuron, "354-1 Arena De Morro"

Arena De Morro by Herzog & De Meuron is the first building built in a larger master plan for the Mãe Luiza informal settlement in Natal, Brazil. The project required a careful reading of site and finding of "gaps" in order to develop a siting strategy.[75] Arena De Morro makes use of local knowledge and materials (particularly terrazzo) and existing typologies and combines it with the global technology of steel construction. The end result is a public building that features the "sacred space" of football as well as dance and education rooms, workshops, and public washrooms.[76]

Arena De Morro is noteworthy both as an example of the architectural juxtaposition of global construction and traditional construction and as a case study of how public space can be effectively designed in an informal settlement. Public space is what defines citizenship and the provision of such spaces is very important.

75. Herzog & De Meuron, "354-1 Arena de Morro," *Herzog & De Meuron*, last updated 2014, http://www.herzogdemeuron. com/index/projects/complete-works/351-375/354-1-arena-do-morro.html.

76. Herzog & De Meuron, "Arena De Morro," *ArchDaily*, last modified May 22 2014, http://www.archdaily.com/509030/arena-do-morro-herzog-and-de-meuron/.

Case Studies - Process

Makoko Floating School - NLE Architects

Makoko is a floating informal settlement on the waterfront of Lagos, Nigeria. Its residents are constantly being threatened with eviction and demolition because Makoko sits on prime Lagos city waterfront property and the settlement has been in the way of many Lagos city master plans. The Floating School, designed by Kunle Adeyemi of NLE Architects, uses local knowledge of building on the water and satisfies the local need of schooling while also providing added public space after school hours. The Floating School is an illegal structure but its performative success and existence as an icon for Makoko has changed the demolition rhetoric on a top down level.[77]

The Makoko Floating School was very influential on my research on how architecture can have the power to requalify troubled sites and effect change in political rhetoric. While I would argue that it is unlikely that a major architectural icon can be placed in an informal settlement and have a "Bilbao Effect," I do believe that a visible architecture can act as an agitator of the problems and a catalyst for legitimization.

Antigonish Movement

In the mid-19th century, residents of the economically stagnating Antigonish/Cape Breton region of Nova Scotia were encouraged, by Moses Coady and James John Tompkins, to form cooperatives to share the burden of teaching and work. It started with credit unions to facilitate

77. Jonathan Glancey, "Learning from Lagos - Floating school, Makoko, Nigeria, Kunlé Adeyemi, NLÉ," *Architectural Review*, last modified January 1, 2014, www.architectural-review.com/buildings/8652311.article#.

coal mining, fishing, and farming cooperatives but the cooperatives eventually purchased land, materials, and builders to form other initiatives. The residents were helped to help themselves.[78]

While the Antigonish Movement does not involve either informal settlements or "architecture" in the traditional case study sense, it is a very interesting example of how poor communities can be encouraged to work together to enable advancement and development. The Antigonish Movement was influential in my research into how slumdwellers might be encouraged to do the same.

In-Situ Slum Rehabilitation - Filipe Balestra Sara Goransson

In contrast to the traditional notion of "slum upgrade" being equated with "slum removal," the In-Situ Slum Rehabilitation in Pune, India explored the notion of intervening in the informal settlement without harming the existing houses. The design makes use of standardized, flexible housing typologies and were mixed and matched to meet the needs of the urban poor.[79] Slumdwellers were involved in the planning of housing extensions that were to be done on site. In making an intervention that leaves the footprints of the shanty houses intact, conditions in the informal settlement were improved without adversely affecting the existing social and cultural networks.[80]

78. James R. Sacouman, "Underdevelopment and the Structural Origins of Antigonish Movement Co-operatives in Eastern Nova Scotia," *Journal of the History of the Atlantic Region* 7, no. 1 (1977): 81-84.

79. Architecture for Humanity, *Design Like You Give a Damn [2]* (New York: Abrams, 2012), 276.

80. Ibid, 277.

This project was an important case study because it shows how interventions in the informal settlement can be done without demolition or relocation. There is a lot of hidden value in both the slumdwellers' houses - which the slumdwellers have put a lot of capital into - and the social networks that have formed over time. I believe that it is important to respect both when intervening in the informal settlement.
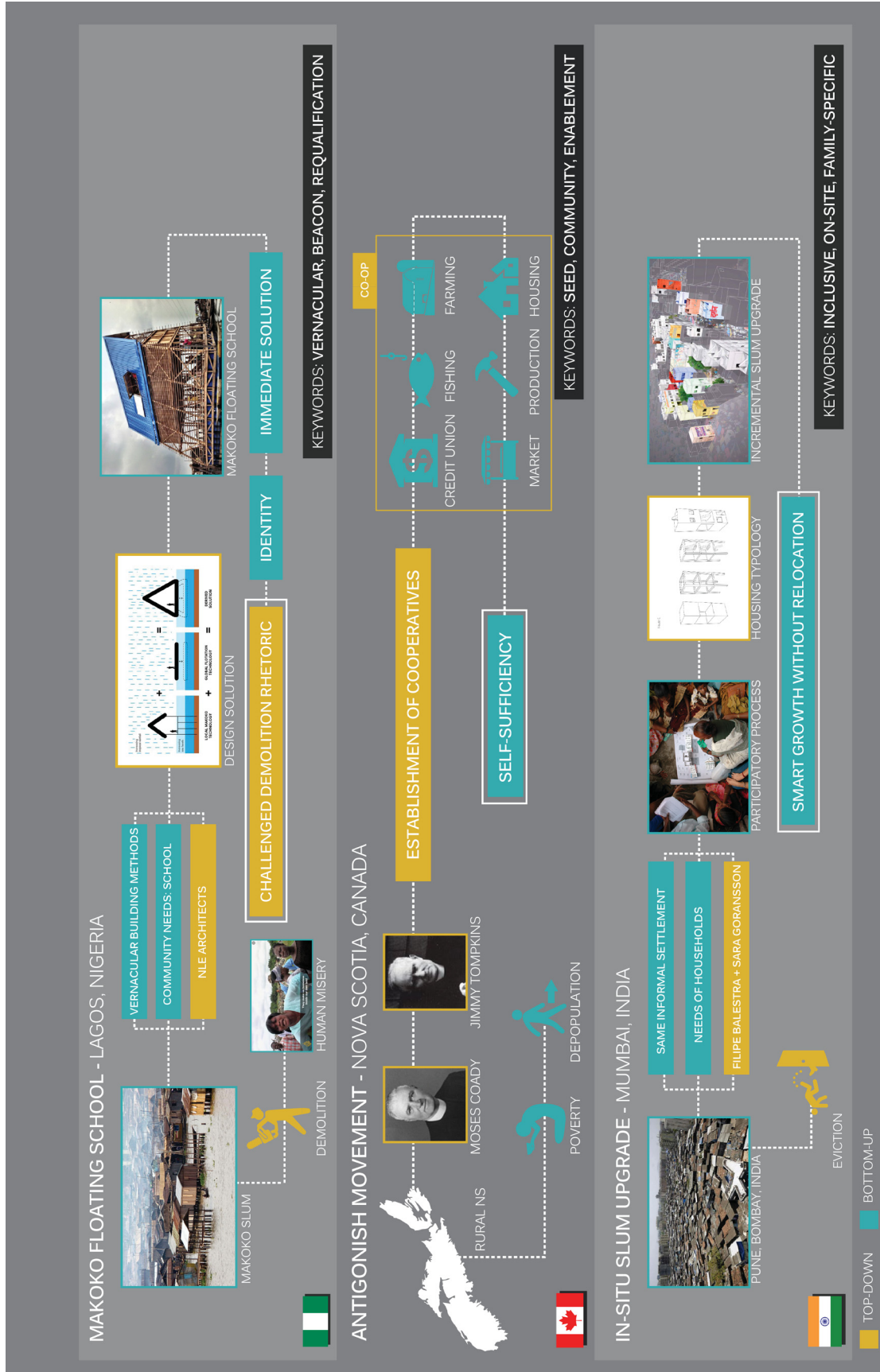
MAKOKO FLOATING SCHOOL - LAGOS, NIGERIA

MAKOKO SLUM

DEMOLITION

HUMAN MISERY

VERNACULAR BUILDING METHODS

COMMUNITY NEEDS: SCHOOL

NLE ARCHITECTS

DESIGN SOLUTION

LOCAL MAKOKO TECHNOLOGY

GLOBAL FLOTATION TECHNOLOGY

DERIVED SOLUTION

CHALLENGED DEMOLITION RHETORIC

IDENTITY

MAKOKO FLOATING SCHOOL

IMMEDIATE SOLUTION

KEYWORDS: VERNACULAR, BEACON, REQUALIFICATION

ANTIGONISH MOVEMENT - NOVA SCOTIA, CANADA

RURAL NS

POVERTY

DEPOPULATION

MOSES COADY

JIMMY TOMPKINS

ESTABLISHMENT OF COOPERATIVES

SELF-SUFFICIENCY

CO-OP

CREDIT UNION   FISHING   FARMING

MARKET   PRODUCTION   HOUSING

KEYWORDS: SEED, COMMUNITY, ENABLEMENT

IN-SITU SLUM UPGRADE - MUMBAI, INDIA

PUNE, BOMBAY, INDIA

EVICTION

SAME INFORMAL SETTLEMENT

NEEDS OF HOUSEHOLDS

FILIPE BALESTRA + SARA GORANSSON

PARTICIPATORY PROCESS

HOUSING TYPOLOGY

SMART GROWTH WITHOUT RELOCATION

INCREMENTAL SLUM UPGRADE

KEYWORDS: INCLUSIVE, ON-SITE, FAMILY-SPECIFIC

TOP-DOWN   BOTTOM-UP

Figure 148: "Storyboards" of the processes that three case studies went through

APPENDIX C: METABOLIST MOVEMENT

The Metabolist movement began in Japan in the mid 20th century. It was an architectural response to the devastation of Tokyo and other cities of Japan after the Second World War, the impending rise in population, and the limited buildable space in Japan.[81] The Metabolist movement was characterized by explorations into architecture that could incrementally grow and shrink, had mobility and modularity, had an uneasy relationship with the ground, constructed artificial terrain, and could made use of unusual sites like the water and the sky.[82]

What I found most appealing in this study are the many parallels between the narrative and characteristics of the Metabolist movement and informal urbanization in Manila. Both Tokyo and Manila were destroyed in the Second World War, both cities experienced massive population growths, and the informal settlement's organic growth mirrors the Metabolist tenets of modularity and expansion. While the circumstances surrounding the Metabolist movement and the Manila's informal sector are markedly different, these commonalities show me that there may be design cues in many of the built and theoretical Metabolist projects that might be applicable to this thesis' design.

81. Zhongjie Lin, "Nakagin Capsule Tower and the Metabolist Movement Revisited," *Journal of Architectural Education* 62, no. 98 (2011): 515-517.

82. Rem Koolhaas and Hans Ulrich Obrist, *Project Japan: Metabolism Talks* (Cologne: Taschen, 2011), 336-369.

Figure 149: Diagrams of the various tenets of Metabolism that were the most influential; adapted from Koolhaas and Obrist, *Project Japan*

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