Mississippi River Adventure

A Design Thesis by **Thomas D. Erickson** with Faculty Advisor **Darryl Booker**

Mississippi River Adventure

A Design Thesis Submitted to the
Department of Architecture and Landscape Architecture
of North Dakota State University

by Thomas D. Erickson

In Partial Fulfillment of the Requirements
for the Degree of
Master of Architecture

Primary Thesis Advisor

05/12/11
Thesis Committee Chair

May 12, 2011
Fargo, ND

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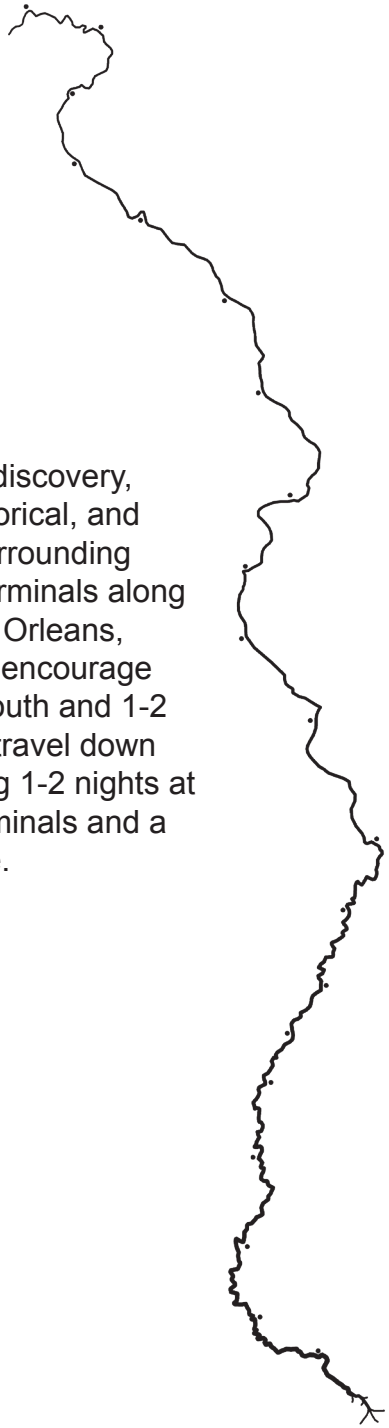


Abstract

My project will provide a means of adventure, discovery, and heightened awareness of the cultural, historical, and physical nature of the Mississippi River and surrounding area. The typology will be a “watercraft and terminals along the Mississippi River from Bemidji, MN to New Orleans, LA.” The fundamental goal of this project is to encourage learning through experience. A group of 6-8 youth and 1-2 adults will continuously learn together as they travel down the Mississippi River over one month, spending 1-2 nights at each “terminal.” My challenge is to design terminals and a watercraft that will help to enrich the adventure.

Problem Statement

How can design provide a means of adventure, discovery, and heightened awareness of the cultural, historical, and physical nature of the Mississippi River and surrounding area?

Summary

Mississippi River Adventure is a High Adventure program for groups of Boy Scouts and Girl Scouts. It is a month-long long boat trip from Bemidji, MN to New Orleans, LA. Scouts and their leaders will be exposed to a gradient of nature, culture, and living history along the United States' most important river.

Project Typology

watercraft and terminals along the Mississippi River from Bemidji, MN to New Orleans, LA

Claim

Exposure to diverse cultures, histories, and places helps build self-confidence, knowldege, and lifelong curiosity.

Premises

Actor: adventurers
Groups of 6-8 youth and 1-2 adults will constantly learn together as they travel down the Mississippi River.

Object: exposure
The design will be a reliable constant that provides assurance in the midst of unfamiliar experiences and constant discovery.

Action: help
Although my design will provide a means to make adventure happen, the focus must be on a more important aspect: experience itself.

Project Justification

The fundamental goal of this project is to encourage learning through experience. A group of 6-8 youth and 1-2 adults will continuously learn together as they travel down the Mississippi River over one month, spending 1-2 nights at each “terminal.” My challenge is to design terminals and a watercraft that will help to enrich the adventure.

Narrative

Growing up, I had many experiences camping through the well-known organization, Boy Scouts of America. It was in the serenity of the wilderness of Minnesota and Wisconsin and the majesty of the mountains of New Mexico that I developed a deep respect for nature. I consider myself fortunate to have spent so much time in natural places that, today, many people never experience.

My hiking adventure in New Mexico took place at Philmont Scout Ranch, a 137,000 acre camp near the city of Cimarron in the northeast part of the state. The 12-day experience took place as a part of Scouting's "High Adventure" program, which has two locations, or "bases" in addition to Philmont. They are Florida Sea Base in the Florida Keys and Bahamas, and Northern Tier in the Boundary Waters Canoe Area in northern Minnesota into Canada (Boy Scouts of America, 2011). The value of High Adventure experiences, of course, are that youth are able to learn new skills, like hiking, boating, or wilderness survival, and discover a new place.

The project I am proposing is similar to these, but over a longer distance rather than a broad area. Because of this, the adventurers will be exposed to a variety of cultures and a gradient of climate change as they venture southward through the United States on the muddy Mississippi.

Florida Sea Base

Camping, sailing, fishing, and scuba diving in the Florida Keys

Northern Tier

Boundary Waters Canoe Area in Canada and the northern U.S. Features camping, canoeing, hiking, snow shoeing, skiing, dog sledding

Philmont Scout Ranch

Near Cimmaron, NM. Backpacking, rock climbing, camping

Mississippi River Adventure

1 Month
Crews of 6-8

User/Client Description

Owner

Boy Scouts of America

Staff

A program director (on or off site), a programs coordinator (on or off site), base camp counselors (on site), remote site counselors (at remote sites), administrative staff at Headquarters

Campers

Groups of 6-8 Boy Scouts accompanied by 1-2 adult leaders will be given a number of week-long time periods to choose from throughout the year. Orders will be processed by Headquarters on a “first come, first serve” basis.

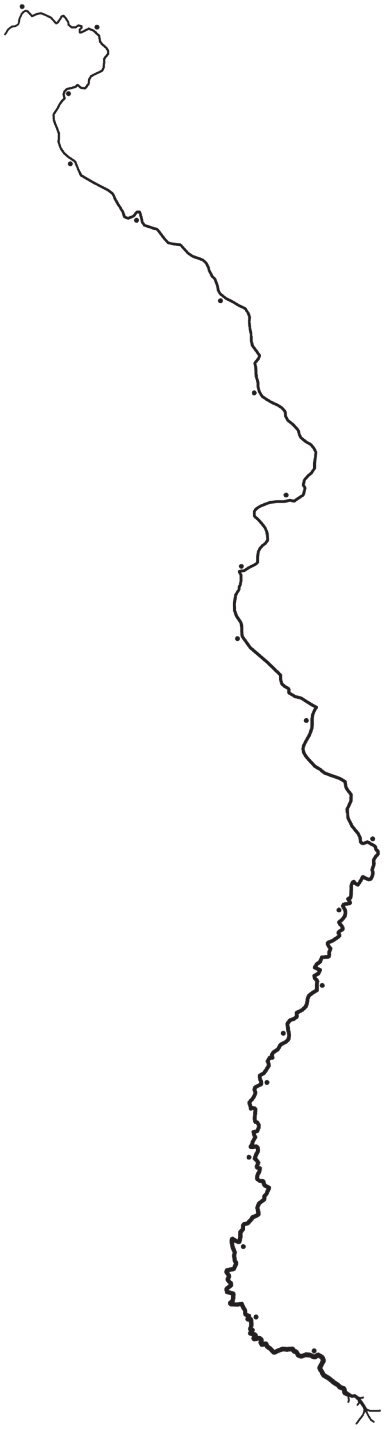
Site Information

Region:

There are 20 proposed terminals, all located adjacent to the Mississippi River. All distances are estimates.

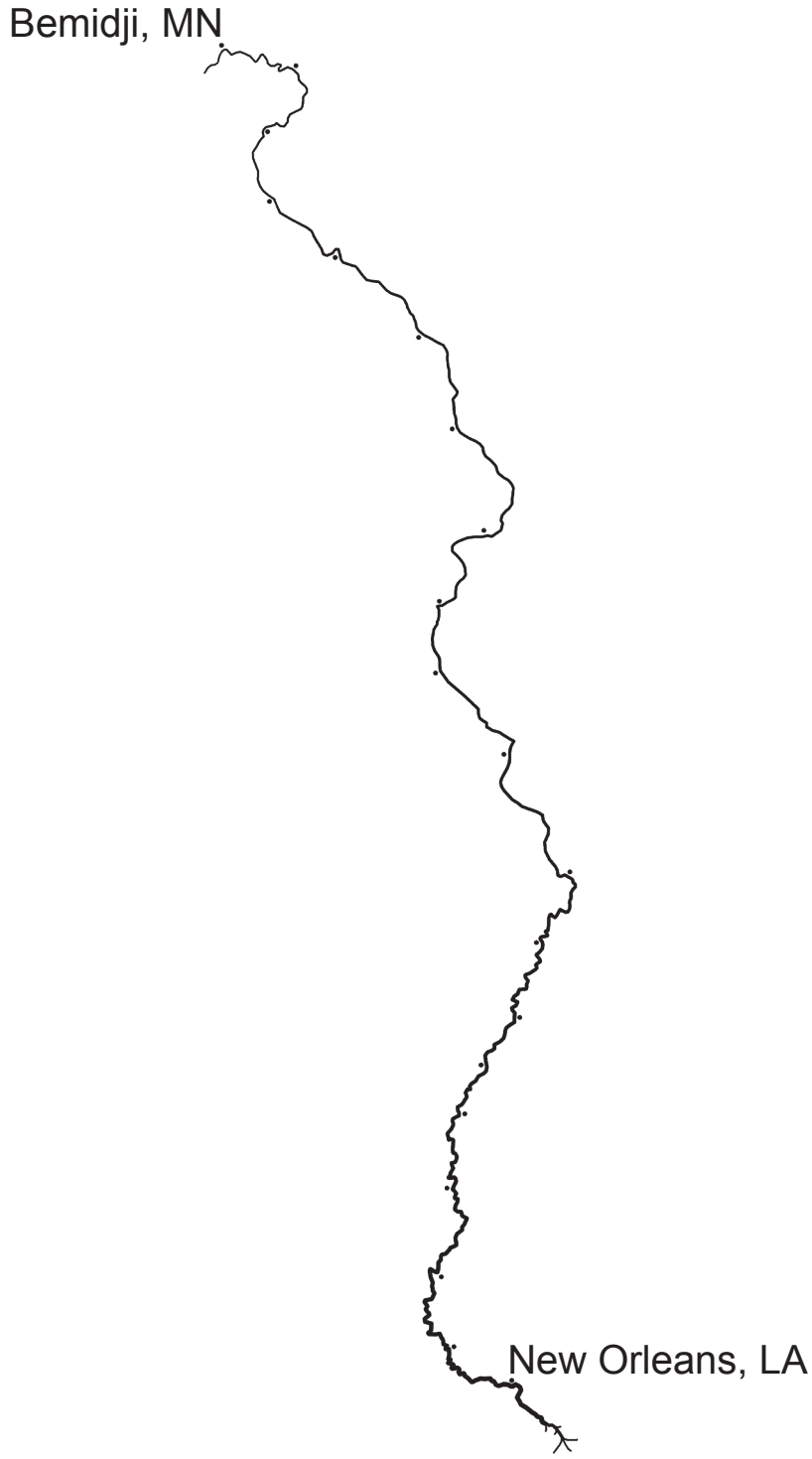
Cities:

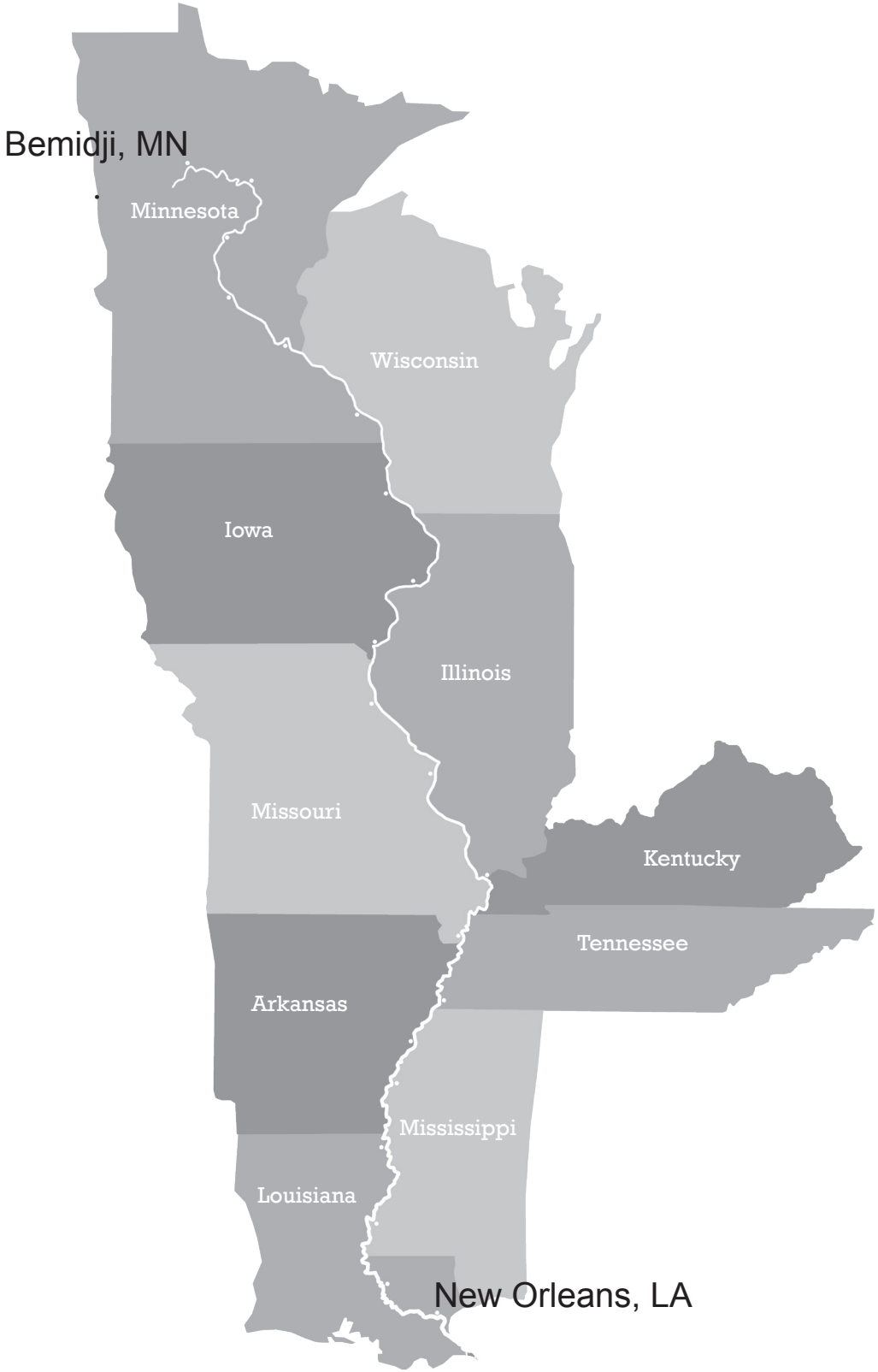
Bemidji, MN; 75 miles from
Grand Rapids, MN; 75 miles from
Brainerd, MN; 100 miles from
St. Cloud, MN; 70 miles from
South St. Paul, MN; 100 miles from
Winona, MN; 110 miles from
Guttenberg, IA; 150 miles from
Quad Cities; 110 miles from
Fort Madison, IA; 130 miles from
Clarksville, MO; 100 miles from
St. Louis, MO; 70 miles from
Cairo, IL; 110 miles from
Caruthersville, MO; 100 miles from
Memphis, TN; 70 miles from
Helena, AR; 70 miles from
Rosedale, MS; 70 miles from
Lake Providence; 120 miles from
Natchez, MS; 100 miles from
Baton Rouge, LA; 100 miles from
New Orleans, LA



Why do these places matter?

Although the most important part of this design problem is the boat, the places along the river are even more important to the project. It is through experiencing these places that the real learning happens.


Bemidji, MN
New Orleans, LA


Bemidji, MN
Minnesota
Wisconsin
Iowa
Illinois
Missouri
Kentucky
Tennessee
Arkansas
Mississippi
Louisiana
New Orleans, LA


Bemidji, MN
Grand Rapids, MN
Fargo, ND
Minnesota
Brainerd, MN
St. Cloud, MN
South St. Paul, MN
Wisconsin
Winona, MN
Guttenberg, IA
Iowa
Quad Cities (IA & IL)
Fort Madison, IA
Illinois
Hannibal, MO
St. Louis, MO
Missouri
Cairo, IL
Kentucky
Caruthersville, MO
Tennessee
Memphis, TN
Arkansas
Helena, AR
Rosedale, MS
Mississippi
Lake Providence, LA
Louisiana
Natchez, MS
Baton Rouge, LA
New Orleans, LA

A broad expanse of land in South St. Paul was once the site of a Dakota tribe, before they were driven out in the 1820's. Their village was called "Kaposia." The river-front in South St. Paul was industrialized, and was an important stop for processed meat on the way to Chicago. Current plans for Kaposia Landing Park include a large breed dog park (already existing), walking paths (some of which exist now), river overlooks (exist), four softball fields, a baseball field, three bocce courts, two volleyball courts, three horseshoe courts, a picnic area and parking.


South St. Paul, MN


St. Louis, MO

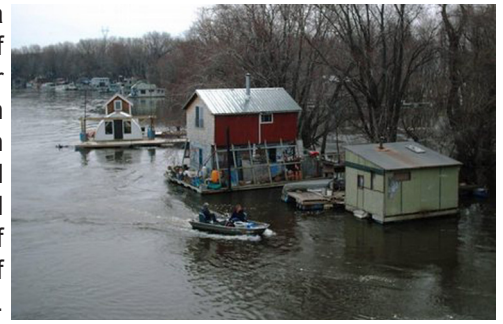
Three views of the St. Louis arch from varied distances.

Cairo, IL ("kay-row") rests on a tip of land formed by the meeting of the Mississippi and Ohio rivers. It is a town plagued by delapidation nearly from its conception. Charles Dickens called it "a breeding-place of fever, ague, and death" in 1842. My parents and I could not speak much better of it after passing through in March. Although we saw enough life to know it was inhabited, downtown was nothing but vacant buildings with crumbling bricks and shattered windows.

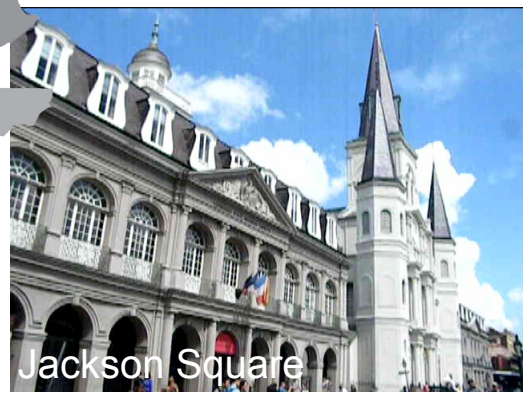

Cairo, IL

Bemidji, MN is the first site. The open water of Lake Bemidji will provide a safe testing area where the crew can get used to the boat. It is 60 miles downstream from the headwaters at Lake Itasca.

Winona, MN hosts the Winona Boathouse Association, a group of people dedicated to preserving their right to live in their floating homes on the Mississippi. "The odd collection of funky floating shacks, substantial floating homes and little boat docks and shelters seemed like somethhing out of a Kerouac novel" said one resident of the Latsch Island neighborhood.



Lock & Dam No. 15


Jackson Square

New Orleans (a.k.a. the Big Easy or the Crescent City) is perhaps the most geographically significant city on the Mississippi, as its location at the mouth of the river makes it a port of international trade and a rich cultural melting pot (Ambrose 2002). The city is the birthplace of jazz, and is renowned for its cuisine.

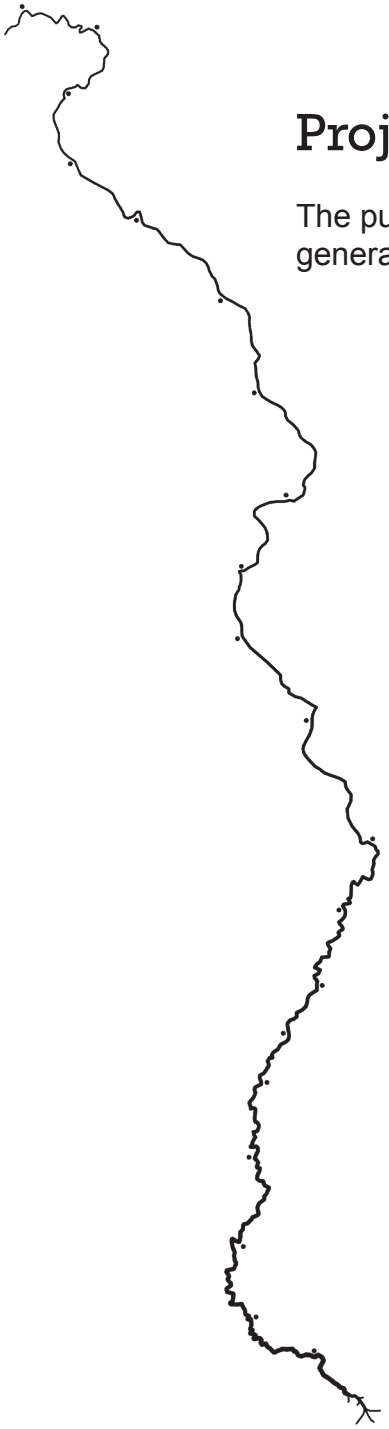
Major Project Elements

The Boat

A boat will be the means of adventure. It will have a kitchen, sleeping area, navigation room, bathroom, paddlewheel, and bicycles (for operating the paddlewheel).

The Dock

A simple dock will be designed. It will be adaptable to each of the 20 proposed sites.



Project Emphasis

The purpose of the camp is to teach members of an upcoming generation:

1. that the things in our stores come from nature, by:
    a. eating plants that come from nature.
    b. seeing how many cities' wellbeing is dependent on the river.
2. how to reuse materials, such as:
    a. 2-liter bottles to float a raft, or a sunken steamboat engine to power one.
3. how to have a frontier-like exploration in an urban environment by:
    a. camping amongst major infrastructural elements.
    b. rafting down the Mississippi on something they made themselves.
    c. accomplishing a feat like none they have accomplished before.
4. how cities have developed because of the river by
    a. studying historical aspects of each place.
    b. observing levels of natural/human environments along the river.
5. the history of their country by
    a. visiting Native American historical locations.
    b. discussing historical events like Lincoln's trip to New Orleans.

Plan for Proceeding

Definition of a Research Direction

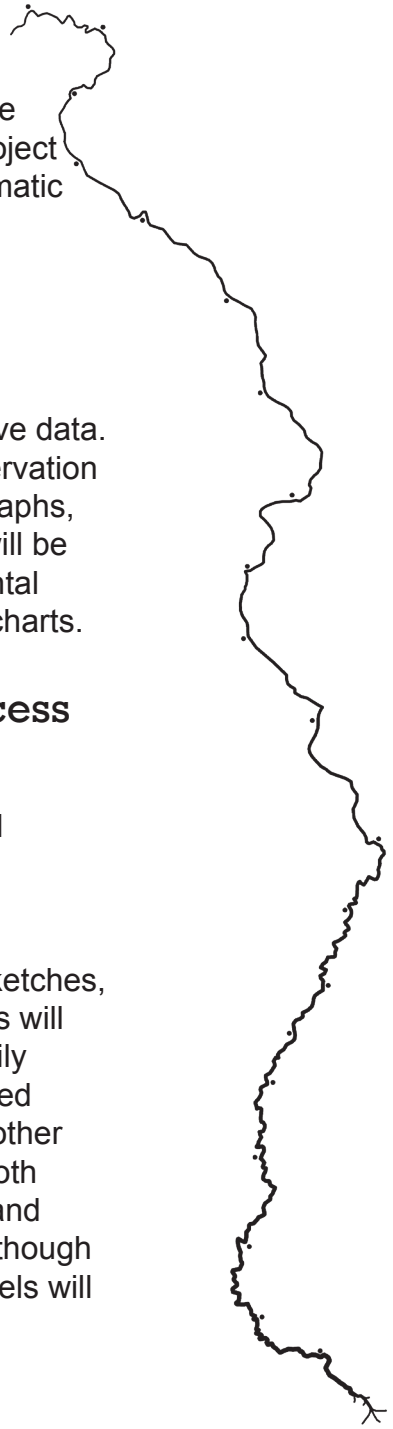
The research of this thesis will be guided by the following: theoretical premise/unifying idea, project typology, sustainability, site analysis, programmatic requirements, and historical context.

Design Methodology

Research will be done using a mixed-method approach, combining qualitative and quantitative data. Qualitative data will be obtained by direct observation and experience, as well as analysis of photographs, and reactions to readings. Quantitative data will be gathered from books, journals, and governmental agencies, and represented graphically and in charts.

Documentation of the Design Process

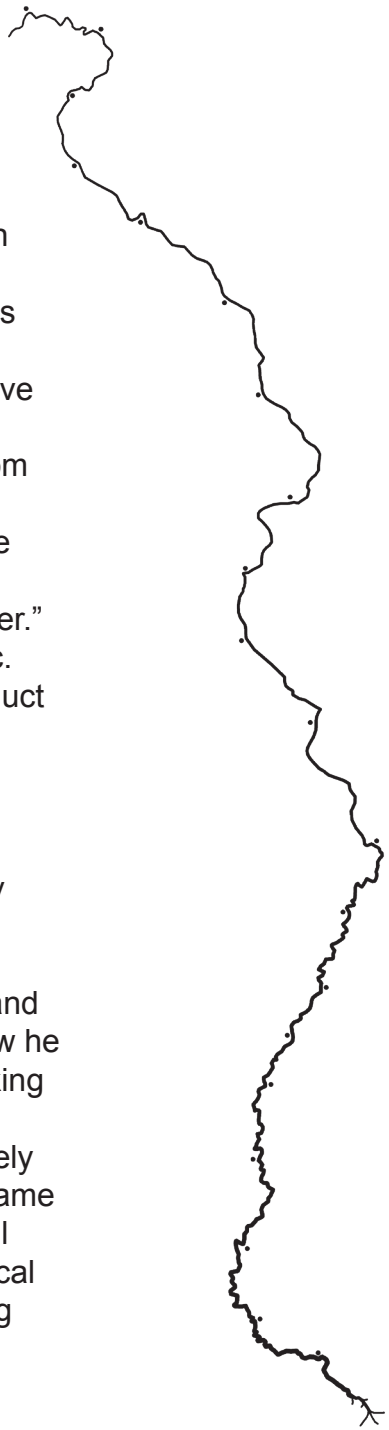
All digital media, including but not limited to photographs, digital models and drawings, and graphics, will be saved and stored in folders corresponding to the appropriate category (i.e. “Theoretical Premise/Unifying Idea,” “Project Typology,” etc.). Non-digital media, such as sketches, material and soil samples, and physical models will be stored or displayed so that they can be easily accessed for reference, as well as photographed and/or scanned and stored in folders with the other digital media. All digital media will be stored both on a personal lap-top and external hard drive and backed up on a CD-R or DVD-R bimonthly. Although organization of digital media and physical models will be ongoing, they will be “tidied up” biweekly.



The Program

Theoretical Premise Research

The research in the following pages describes general information that I wish to keep close during the design of my thesis.



The book I would like to discuss first is Cradle to Cradle by authors William McDonough, an architect, and Michael Braungart, a chemist. In the opening chapter they describe some of the harmful products that exist in our everyday lives which we have become so accustomed to that we don't even think about where they might have come from. For example, upholstery that you might find on a chair or couch in your living room is likely to contain "mutagenic materials, heavy metals, dangerous chemicals and dyes that are often labeled hazardous by regulators - except when they are presented and sold to a customer." Perhaps worse are the toxic gases, metals, etc. contained in something like a computer, a product that becomes obsolete in no more than a few years and is then disposed of.

McDonough described his experience with sustainable architecture in the 80's as, in many cases, "ugly and obtrusive," resulting from architects "tacking new technology onto the same old model." He bacame frustrated with and exhausted by such attitudes and wondered how he might make improvements: "I was tired of working hard to be less bad. I wanted to be involved in making buildings, even products, with completely positive intentions." Michael, the chemist, became active in protesting irresponsible use of harmful chemicals. He was interested not only in political activism, however, but also in actually changing processes to rid of certain harmful chemicals and the way that they were used. The two met in 1991, and that year co-authored *The Hannover Principles*, sustainable design guidelines for EXPO 2000 The World's Fair in Hannover, Germany. There are nine points to *The Hannover Principles* that are named and described here:

The Hannover Principles:
Insist on rights of humanity and nature to coexist
Recognize interdependence
Respect relationships between spirit and matter
Accept responsibility for the consequences of design
Create safe objects of long-term value
Eliminate the concept of waste
Rely on natural energy flows
Understand the limitations of design
Seek constant improvement by the sharing of knowledge

The errs of the "less bad" attitude is a theme in both *Cradle to Cradle* and *The Hannover Principles*. In James Kunstler's book, *The Long Emergency*, he strongly warns that humanity is coming to a head regarding some serious environmental issues: "We have walked our of our burning house and we are now headed off the edge of a cliff." Among other things, Kunstler states that our way of life will be drastically altered as oil becomes rarer and more expensive: "Central heating, air conditioning, cars, airplanes, electric lighting, cheap clothing, recorded music, movies, supermarkets, power tools, hip replacement surgery, the national defense, you name it -- owe their origins or continued existence in one way or another to cheap fossil fuel." He goes on to say that the illusion of a gapless transition into other energy sources such as wind, solar, hydrogen, etc. is a "dangerous fantasy."

Careful attention must be paid to the environment, and nowhere is the environment more active than on a large river like the Mississippi. The Ecological Society of America published an article in 1997 describing the ways in which human societies benefit from the systems of nature. It describes the ways in which natural ecosystems purify air and water, mitigate droughts and floods, cycle nutrients, etc. Nature of course is a source of food, both for on-land hunting and fishing (ESA 1997). The freshwater of the Mississippi is home to much wildlife and provides a migratory path for around half of North American birds.

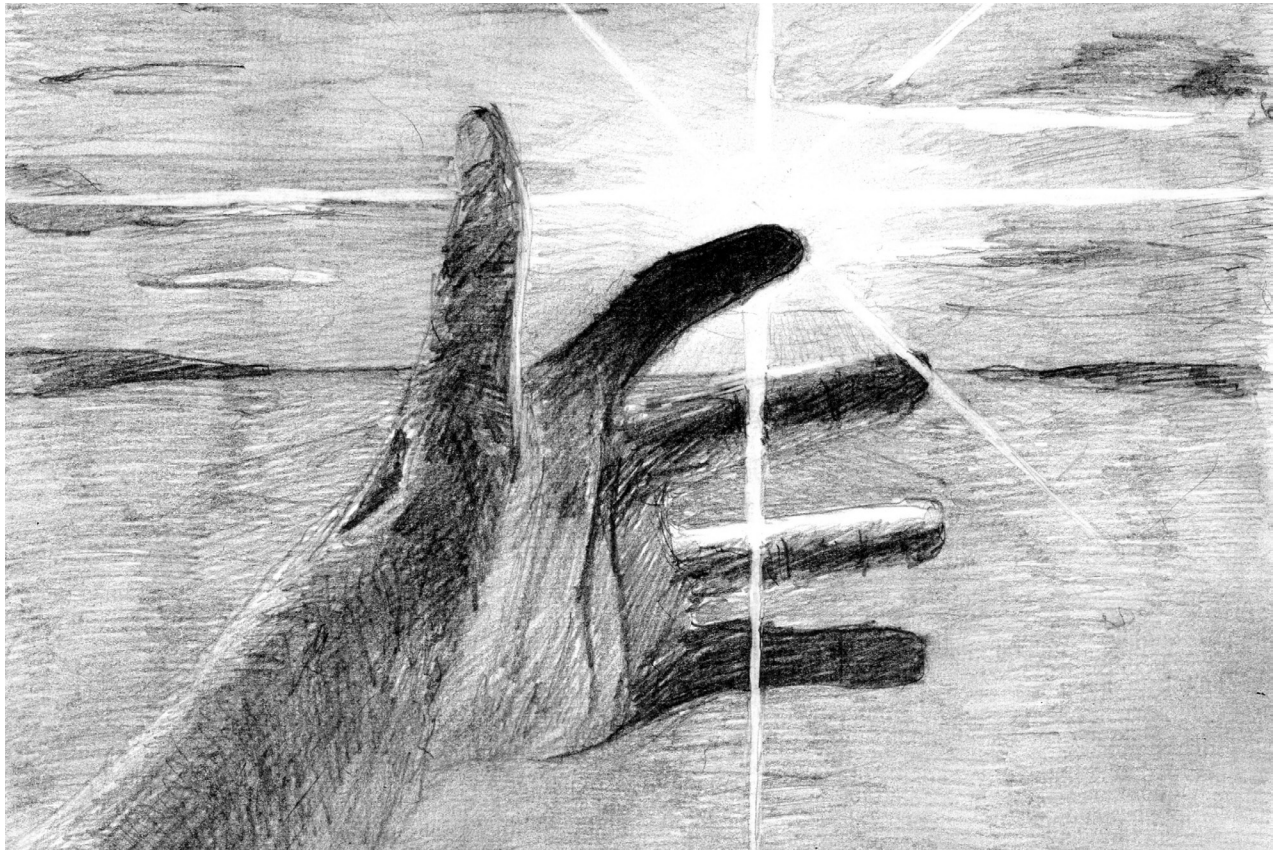
The next topic I wish to touch on requires the reader to switch metaphorical gears. The book that addresses the next issue is one whose information is perhaps useful to all types of design. The topic is a basic human behavior: play. Author Diane Ackerman (1999) wrote a book called *Deep Play*, which describes the importance that humans do just that, and often. Ackerman states, "every element of the human saga requires play. We evolved through play. Our culture thrives on play." Many animals play -- chimpanzees, dolphins, even sometimes birds. Ackerman explains that some creatures, like ants, do not play because they are preprogrammed to do certain tasks. Humans on the other hand, must learn these things, and "the more an animal needs to learn in order to survive, the more it needs to play." And although play is used for the purpose of learning, it is a conscious choice made on the part of the creature. It can be funny or it can be serious. A month-long adventure down the length of the Mississippi would probably contain those two types of play as well as a third that Ackerman describes -- transcendental. This is the type that she refers to in the title of the book. "Creativity, psychotherapy, sensation-seeing--are all playgrounds for deep play." The everyday physical demands of basic survival in combination with the constantly changing sensory information involved with travel would create a useful platform for this.

Very closely related to play is adventure. Someone who is familiar with that concept is a writer who is perhaps the most important literary figure pertaining to the Mississippi River: Mark Twain, American writer born Samuel Langhorne Clemens. Twain's love of the Mississippi is evident in the first two sentences of his book *Life on the Mississippi*: "The Mississippi is well worth reading about. It is not a commonplace river, but on the contrary is in all ways remarkable." Twain spent an uncommon amount of time on the river, eventually obtaining his boat pilot's liscence. One of his most famous tales is *The Adventures of Huckleberry Finn*, a story told from the point-of-view of the young Huck Finn. In order to escape the clutches of his abusive, alcoholic father and his adopted caretakers' attempts to "sivilize" him, Huck faked his own death and took off down the Mississippi.

Huck's journey is in many ways similar to that of explorers like Marquette, Joliet and La Salle, even if their motivations were different. The Mississippi journey has been made by countless groups and individuals throughout its history for a variety of reasons. Even Abe Lincoln spent some time on the Father of Waters. His first of two journeys was in 1828 when he was a farmer at the ripe age of 19, and the second and more significant was in 1831. During the latter, Abe witnessed a slave auction in New Orleans; it was because of this experience that he decided he would end slavery if ever he got the chance.

The tradition of the Great River adventure continues to live on today; the authors of many of the books referenced in this document spent substantial time travelling the river. Jon Kral, whose spectacular photographs of river life are showcased in the book *Live Steam* (published in 2000), spent time on numerous paddlewheel steamboats with writer Jon Ward, documenting day-to-day activities of the boats and crews. Authors of *The Mississippi and the Making of a Nation*, Stephen Ambrose and Douglas Brinkley traveled the length "by boat and helicopter and car." Countless blogs can be found online of peoples' adventures down the great United States artery. In my research, I came across a book documenting a young man's trip from the headwaters to

New Orleans. Matthew Mohlke's account of his travels reveals that the trip for him was, in part, about a search for something he couldn't quite define. "Somehow, I thought three months alone on the river would show me the way" (Mohlke 2001). The daydream-turned-reality was a mental escape he had used throughout his life. These observations are not so dissimilar from Huck Finn's, who is restless by nature: "Living in a house, and sleeping in a bed, pulled on me pretty tight, mostly, but before the cold weather I used to slide out and sleep in the woods, sometimes, and so that was a rest to me" (Twain 1884). My guess is that there are many more people out there like Huck, Mohlke and the others, just aching to bust out of the chains of everyday demands and embark on an unforgettable voyage. Perhaps you know someone like that. Or perhaps that someone is you.



Living in a culture so innundated with visual stimuli, it is important to remember that architecture engages all the human senses, not just one. Steven Holl writes about how his senses were engaged in different ways on two visits to the Zen Gardens of the Ryoanji Temple and a nearby restaurant in drastically different seasons. In frigid January, the cold was a startling sensation: “I realized how cold it was as I moved through the paper-screened walkway and felt the cold boards through my thin cotton socks with two icy holes.” Six years later, when he visited during a time of heat and humidity, the cool was a welcome friend: “The sumi ink paintings, which were now exposed, seemed part of the breeze blowing through the building and cooling the spaces in the August heat.” He observes that the transluscent paper screens that delicately filtered light through them in the winter were pulled up in summer, revealing “overlapping views.” The sounds of “roaring cicada and ringing gongs” were present in summer, whereas in the silence of the winter “only the vapor of our breath broke the stillness.” Obviously, these descriptions come from an experience that Holl had. On the other hand, how can written descriptions such as these be made to describe an experience that has yet to be had? How can such descriptions be used in the design of a floating camp or river terminals?

Historical Context Part 1: The Site in South St. Paul

Pierre “Pig’s Eye” Parrant, or “Old Pig’s Eye” was the first settler of St. Paul in 1838, and the city became known as Pig’s Eye Landing (Breining 2006). Parrant, a bootlegger, got his nickname due to the absence of one of his eyes. The town got a new name, however, when Reverend Lucian Galtier arrived in 1840, established a church, and named the city after his favorite saint. An important character in the architectural history of St. Paul is General Henry H. Sibley, who erected Minnesota’s first stone dwelling in the year1836.

The riverfront saw great development starting in 1883 when Alpheus B. Stickney founded the Minnesota and Northwestern Railroad, which later became known as the Chicago Great Western. The railroad cut through the place that is now South St. Paul on its way to Chicago. In 1886, Stickney started the St. Paul Union Stockyards, which were located south of the site near the Interstate 494 bridge (Dakota County Historical Society).

Atop a hill to the northeast of the site is Indian Mounds Park. The land for the park was slowly aquired for the city from multiple owners by Joseph A. Wheelock starting in 1893 (Peabody 1913). It is the site that a Dakota tribe was forced to move to from their previous site, where the future park is proposed. Their village was called “Kaposia.” The forced move was in the 1820s; in 1851 they signed the Treaty of Mendota, which helped give the U.S. Government 24 million acres of their land, and were finally moved to reservations as the result of the Conflict of 1862 (Minnesota Historical Society).

Historical Context Part 2: The Mississippi River

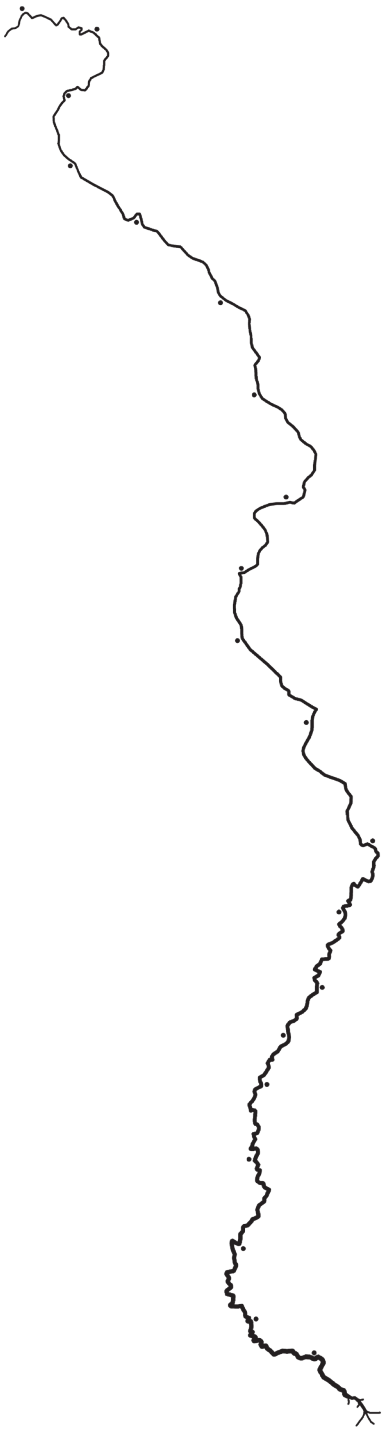
The Mississippi River has a history much longer than its 2,350 miles and more complex than its many intricate bends. The "historical context" presented here is a simple overview of some of the important people and events that have become a part of the river's lore as well as the forces that, in some cases, literally shaped it.

Nicknames

Sources vary on where the name "Mississippi" came from, but it is generally said that the Native Americans had a name that sounded quite similar. According to one source, to the Ojibway the name meant "great river." "Missi" meant great, and is "akin to the modern Chippewa word, Kitchi" and "sippi" came from one of three Ojibwe words, "sipi," "sebe" or "zibi" which all mean "river" (Petersen 1968). Other sources say the word meant "Father of Waters" to the Native Americans (Severin 1967, Twin Cities Tours 2010, Davis 1982).

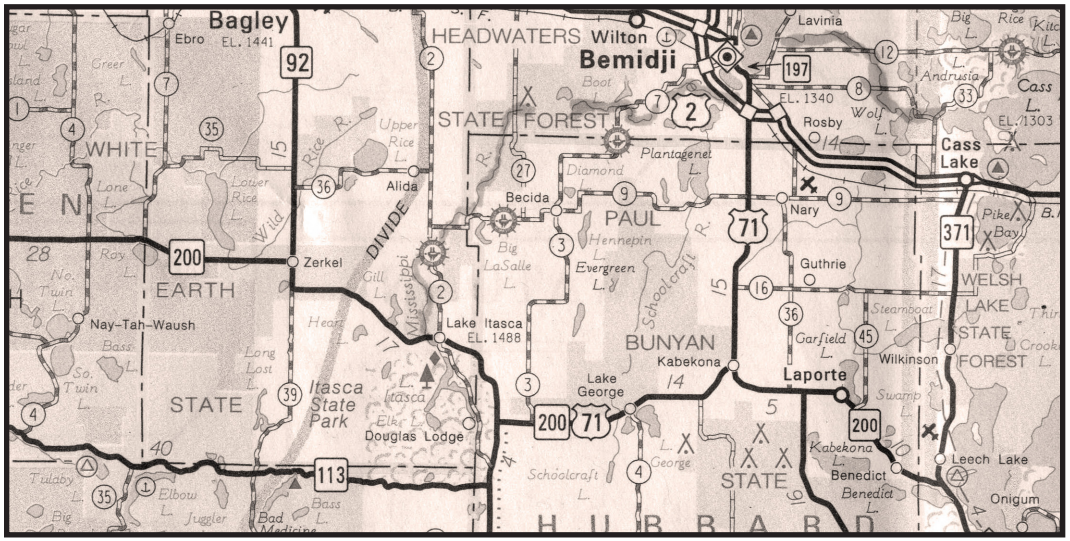
The Length and Speed

It is generally agreed upon that the Mississippi is roughly 2,350 miles long, although it is changing all the time and different sources say slightly different things. (Ambrose 2002, Davis 1982, Shaffer 2000, Twin Cities Tours 2010). Near the headwaters at Itasca State Park, say the authors of *The Mississippi and the Making of a Nation*, "a brown wooden sign with bright yellow lettering reads: 'The Mighty Mississippi Begins To Flow On Its Winding Way 2,352 Miles To The Gulf Of Mexico.'" However, the DNR's Itasca State Park website gives it a full 200 miles more (Itasca, see website in this word document). Mark Twain calls it the "crookedest river in the world" in his book Life on the Mississippi (Twain 1883). The average speed of the Mississippi is 1.2 miles per hour at the headwaters and 3.0 miles per hour at the mouth in New Orleans (Twin Cities Tours 2010). It is said that a drop of water entering the Mississippi at Lake Itasca would reach the Gulf of Mexico in 90 days (MARB , see EPA link in Word file to cite source).



Lake Itasca is the source of the Mississippi

More commonly agreed upon is the origin of the name for Lake Itasca, the water body from which the Mississippi flows. Upon discovering the source in 1832 with the help of Chippewa Chief Ozawindib, historian Henry Rowe Schoolcraft named the water body using the Latin words “veritas,” meaning truth, and “caput,” meaning head. Taking the last two syllables of the former and the first syllable of the latter, he got Itasca (verITAS CAput) (Ambrose 2002). In his book about his 1999 adventure down the Mississippi, Matthew Mohlke describes having to walk his canoe frequenly through shallow waters for the first few hundred yards. He said, “One look at that little crick they tried to call the Mississippi, and my invincibility left me completely.”

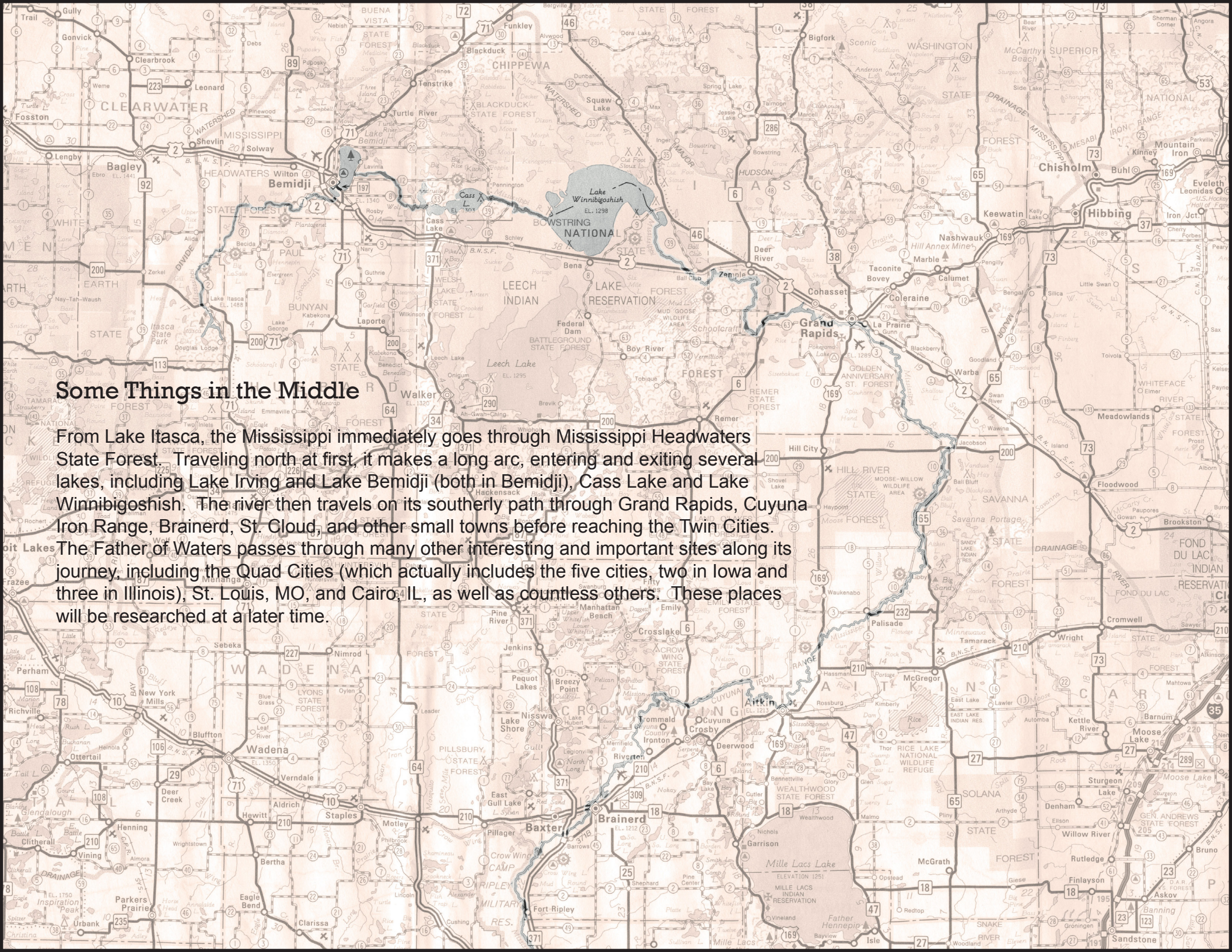


Early Explorers

Evidence of an early Native American city called Cahokia lies on the Mississippi just east of St. Louis, MO (Pauketat). The "Mississippians," as they have since been named by archaeologists (Ambrose 2002), existed in Cahokia from the mid 11th century A.D. to around the beginning of the 15th century, when they mysteriously disappeared. Some remains are now preserved, although many of them have suffered excessive damage or have been destroyed (Pauketat 3). The Mississippians, however, never encountered European explorers, who didn't arrive at the Mississippi for another century and a half.

In 1541 (Timothy Severin, in Explorers of the Mississippi cites it as Sunday, May the 8th of that year), the Spaniard Hernando de Soto became the first "white man" to lay eyes the Mississippi River just south of what today is Memphis, TN (Severin 1967, Larson 1998, Ambrose 2002). Although in awe, de Soto and his men viewed the initial contact as more of an obstacle than the historically significant event that it came to be. Over a hundred years later, in 1673, French Explorers Jacques Marquette and Louis Joliet traveled the Mississippi from the mouth of the Wisconsin River to the mouth of the Arkansas River. Then in 1682, only 9 years later, another Frenchman, Robert de La Salle, took the Mississippi all the way to the Gulf of Mexico where he laid claim to a large chunk of land for his home country, and named it Louisiana (Ambrose 2002, Severin 1967). The next significant event concerning the Mississippi was the Louisiana Purchase of 1803, in which the United States bought that land back from France. In that same year, Lewis and Clark embarked on a three year exploration of the newly purchased and unexplored land west of the Mississippi (Ambrose 2002).

William H. Powell's painting, "Discovery of the Mississippi" of de Soto seeing the river for the first time is an extreme exageraagion. There were no Native Americans, and the river was likely flanked by thick trees, obstructing the vista.



Some Things in the Middle

From Lake Itasca, the Mississippi immediately goes through Mississippi Headwaters State Forest. Traveling north at first, it makes a long arc, entering and exiting several lakes, including Lake Irving and Lake Bemidji (both in Bemidji), Cass Lake and Lake Winnibigoshish. The river then travels on its southerly path through Grand Rapids, Cuyuna Iron Range, Brainerd, St. Cloud, and other small towns before reaching the Twin Cities. The Father of Waters passes through many other interesting and important sites along its journey, including the Quad Cities (which actually includes the five cities, two in Iowa and three in Illinois), St. Louis, MO, and Cairo, IL, as well as countless others. These places will be researched at a later time.

Cairo is a town that has been plagued by delapidation nearly from its conception. Seemingly trapped in an eternal cycle of decline, the bad press repeatedly given to it by writers has in part kept the city from rejuvinating its livelihood or its reputation. Wrote Charles Dickens (1842): “At the junction of the two rivers, on ground so flat and low and marshy, that at certain seasons of the year it is inundated to the housetops, lies a breeding-place of fever, ague, and death... A dismal swamp, on which the half-built houses rot away: cleared here and there for the space of a few yards; and teeming, then, with rank, unwholesome vegetation, in whose baleful shade the wretched wanderers who are tempted hither droop, and die, and lay their bones...” And as much as Mark Twain writes so lovingly of the Mississippi River itself, Dickens does not share this admiration as he describes his observations travelling upriver to St. Louis after passing Cairo: “The banks low, the trees dwarfish, the marshes swarming with frogs, the wretched cabins few and far apart, their inmates hollow-cheeked and pale, the weather very hot, mosquitoes penetrating into every crack and crevice of the boat, mud and slime on everything: nothing pleasant in its aspect, but the harmless lightning which flickers every night upon the dark horizon.”

Cairo, IL (continued)

Powers, writing in 1991, gives an account of a city still dwindling as he ventured there, not by steamboat as Dickens had, but by car: "Cairo had in fact been dying for a hundred seventy years, dying since the moment of its breech birth in 1818, and dying of every disease, human and economic and elemental, that could be conjured and called down upon a town."

Powers (1991) tells a grim but fascinating story as he came across this intersection on his drive into Cairo: "Eighth [Street] and Commercial [Avenue]. I looked at the desolate intersection and recalled something I'd read about from Cairo's history. A man had been lynched here once. A black man, in 1909." The man, accused of killing a white woman by strangulation, was siezed by a mob who tried to hang him from steel arches spanning the intersection. Without immediate success, the mob took the expedient method of killing him by gunshot. His corpse was then dragged a mile to the site of the crime where it was burned.

At the Mouth, We Find New Orleans

New Orleans (a.k.a. the Big Easy or the Crescent City) is perhaps the most geographically significant city on the Mississippi, as its location at the mouth of the river makes it a port of international trade and a rich cultural melting pot (Ambrose 2002). It was first established as an outpost in 1718, and early inhabitants included groups from Spain, France, and Portugal. The demographic included a large number of Roman Catholics and French speakers, while the majority of people in the united states were Protestant English-speakers (Hasse 2000). At the time of the Louisiana Purchase in 1803, the Crescent City had a population of around 10,000. New Orleans grew rapidly; by 1848, their population had grown to 160,000. In recent years, New Orleans suffered greatly from Hurricane Katrina (their population dropped from 455,188 in 2005 to 221,997 in 2006). However, recovery has led to many people moving back, and in 2009, the population had climed up to 354,850 (U.S. Census 2009).

Jackson and Congo Squares

Jackson Square, an open plaza next to the river, is an important spot in New Orleans. At the side furthest from the river is the St. Louis Cathedral, “the oldest active cathedral in the country.” It is surrounded on three sides by the French Quarter and connects to a path that leads to an intimate encounter with the river, something that is impeded upon by industrial buildings and railroad tracks in many places (Davis 1982). Congo Square, located five blocks inland, was the site of Abraham Lincoln’s speech, the Emancipation Proclimation. It now holds a statue of the musician discussed on the following page.

This image, taken from Bing Maps, show Jackson Square and surrounding French District next to the Mississippi.

More About the Big Easy

Origins of Jazz

New Orleans and Jazz go hand-in-hand. Pick up a book about one, and at some point you will read about the other. There is a statue of Louis Armstrong, New Orleans native, at Congo Square. Some say that it is the spot where jazz was born (Ambrose, 2002), although the origins of jazz, says Hasse (2000) are not quite so clear. Two styles of music preceding jazz would have strong influences on it: blues and ragtime. The blues, derived from traditional African music, influenced jazz with its "three-chord structure," and "bent and slurred notes." Ragtime, at its most basic, is made by altering and syncopating existing music, or "ragging." This style emerged in the mid to late 1800s and could be heard in the Midwest as early as the 1880s. Ragtime pieces were rarely played as written, in keeping with the style, though this irritated many composers. By the 1910s, the style had all but died out.

The origination of jazz was perfectly suited to happen in New Orleans, a place populated with African slaves as well as European immigrants. Jazz combines european instruments (cornet, trumpet, trombone, saxiphone, clarinet, piano, bass, guitar), written musical notation, and "harmonic system" with African "call-and-response" style of music, rhythm and percussion. Although it is not known when the first jazzy notes were played, we do know that the first Jazz recordings were made in 1917 (Hasse, 2000).

Legendary buildings of jazz (those marked with * had been torn down by the end of the 21st century):
Economy Hall*
Funky Butt Hall*
Lulu White's Mahogany Hall*
Odd Fellows Hall, 1116 Perdido
Bolden's haunt/Eagle Saloon, 410 South Rampart
Red Onion ("the notorious"), 762 South Rampart
Perseverance Hall ("more recently a church"), 1644 Villere (Hasse, 2000)

It is no coincidence, given New Orleans' thick roots in jazz, that one of its greatest ambassadors was born in the Crescent City. Louis "Pops" Armstrong was born on August 4, 1901, and was loaned a cornet at the age of 11. Ten years later, he moved to Chicago and joined a band, and thereafter became well-known for his stunning ability to play the cornet and trumpet. He was also known for his lively stage presence, a unique gravelly singing voice, and cheeks that puffed up as he belted on his horn (his other nickname, "Satchmo," came from the British "satchel mouth") (Ambrose 2002). An additional European influence was channelled through Armstrong as he was exposed to Italian opera. "It can be heard in Armstrong's improvised quotations from various operas and , moreover, in his dramatic bursts of melody; florid embellishments; operatic, bravura musical gestures; and way of theatrically placing himself, as soloist, in the sonic foreground" (Hasse 2000). Armstrong lived until he was 60 years old, and remained connected to his hometown throughout his life. On the 100th anniversary of his birthday, the city paid homage to this important musician by renaming the New Orleans International Airport as the Louis Armstrong International Airport (Ambrose 2002).

Pollution

Traveling in some places on the Mississippi, you wouldn't even know that you were in the 21st century. Cutting through sparkling water, all you can see are lush trees, soaring hawks, playful squirrels and skittish deer. In sharp contrast, the Mississippi in New Orleans is unfortunately quite dirty. By the time the river reaches the delta, it has been polluted by wastewater and power plants, water runoff containing fertilizers, and harmful bacteria like fecal coliform bacteria and E. coli. In addition, great amounts of water are routed into agricultural fields, reducing the flow in New Orleans. This, in combination with drought, can cause residents' drinking water to taste like salt (Davis 1982).

Summary of Results of Theoretical Premise Research and Historical Context

The research has opened many doors for how the design could progress. I think of each of these sections as a mere introduction to the large worlds that lie behind each of them. I have printed a copy of McDonough's *The Hannover Principles* that I plan to keep close by so that it becomes integrated into the process. I have reserved some of Louis Armstrong's albums at the library. I have planned a day trip to the headwaters and have started to fantasize about descending on the steps in front of Jackson Square to the dirty waters of the Mississippi in New Orleans.

Case Studies

Case Study One: Paddlewheel Steamboats

The first paddlewheel steamboat was built in 1811. It was called the *New Orleans* and referred to its eventual destination rather than the city in which it was built. It was built on the Ohio River in Pittsburgh (Gillespie 2000) and was roughly 150 feet long and 30 feet wide; steamboats would evolve to become longer and narrower (Hunter). Many sources described the early boats unfavorably. Drago (1957) called them "crude and ugly"; Davis (1982) said they were "small, awkward, and often decrepit." It was also agreed upon that the steamboats went on to be things of beauty, evolving into "the famous Mississippi River style of steamboat architecture" (Drago 1957). Larson (1998) and Drago both used the word "romantic" in their descriptions of the later steamboats. It is said that the "Golden Age" of boats such as these was from around 1840 until the Civil War, which started in 1861 (Larson 1998).

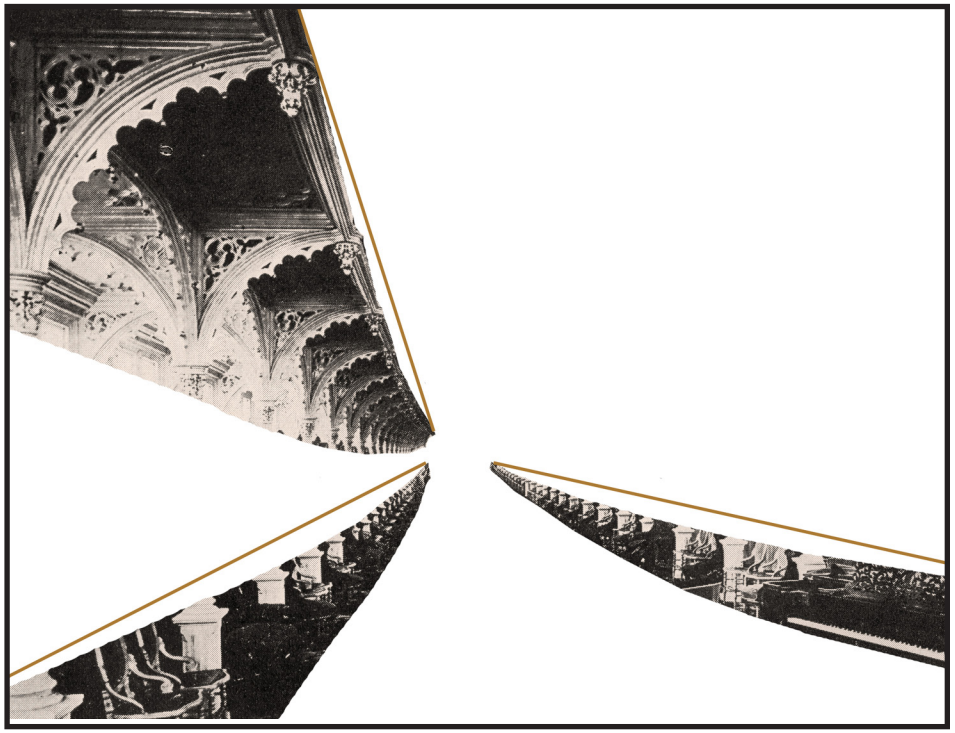
Seamboats were subjected to many dangers during their travels on western waters. The boats were subject to "groundings, snags, fires, mechanical breakdowns, and Indian attacks" (Casler 1999). In fact, in the first 40 years of their use, they caused 4,000 deaths (Davis 1982). To alleviate at least one of these dangers, snagboats were designed specially with a double hull and crane to take out "snags" such as downed trees and other debris that might pierce the hull of a steamboat and cause it to sink (Larson 1998). Gillespie explains the process of removing a snag: "A single snagboat would straddle the offending log, hook onto it, and yank it out, like a dentist extracting a tooth. Then the crewmen would saw up the log and let it drift harmlessly away or deposit it on shore." The government-issued boats helped ease steamboat travel immensely, and they were so in demand in the changing river that there scarcely seemed to be enough of them. Because of the wear on the boats by smaller debris, the paddlewheel was really the best method of propulsion for the river steamboats; while steamships on the ocean changed to screw propellers, the large paddlewheel, although it had to be constantly maintained, was much more resistant to damage by the large quantities of debris that lay below a river's surface (Gillespie 2000).

Paddlewheel steamboats declined as the 19th century came to a close, largely due to railway trasport (Larson 1998). Drago (1957) recalls the day of the steamboat nostagically, "When a steamboat announced its coming with a long, mellow blast of its whistle, there was something personal about its arrival that was missing when a train of steam cars chuffed up to a depot and, after pausing momentarily to discharge its passengers and express, was off on its way." Luckily for those who sympathize with Drago, a few steamboats still grace Mississippi waters.

In the following pages, I will analyze some drawings and photographs of steamboats. Although not many drawings or models of the steamboats were made (Hunter 1947), many of the boats were quite similar, says Eskew: "They sat flat on the water; they were surmounted by tall black smokestacks set side by side; and to the cabin and superstructure of each there was that graceful dip and sheer so greatly to be desired in the eyes of the Western River steamboatmen" (Eskew 1927).

Structure

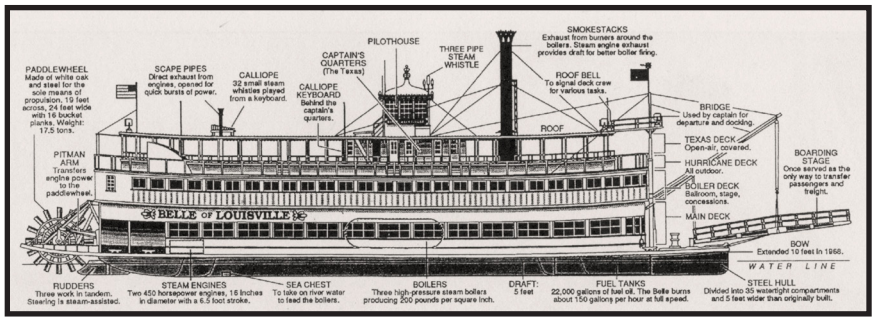
The structure of a paddlewheel steamboat, in this case as seen from inside the cabin of the steamboat “Grand Republic,” showcases 300 feet of intricate craftsmanship (Eskew 1929). The longest of the steamboats were as long as 350 feet, although even at that length they were only about 12-18 feet wide; it was found that the longer the boat was, the faster it was (Hunter 1949). Because of the length, the boat bows in the middle, as can be clearly seen when compared to the reference lines in the image on the right.

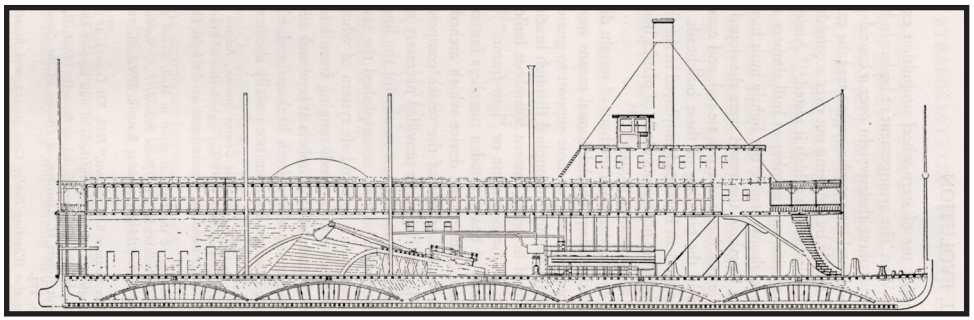


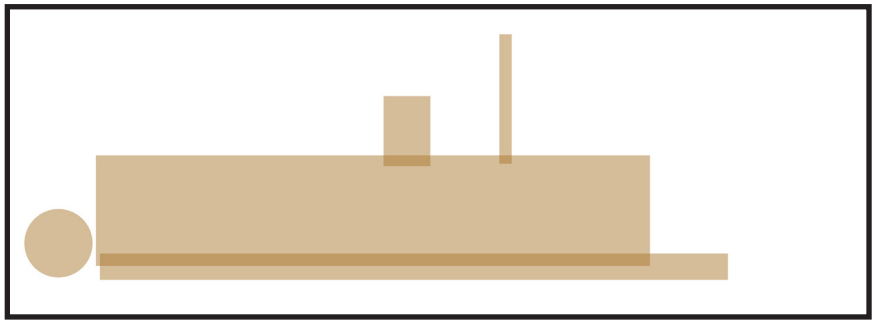
Builders preferred to use light materials so that the amount of cargo taken on each ship could be maximized. According to Hunter (1949), in the superstructure, one inch thick boards were laid in the boiler room (first story) and 3/4 inch on the hurricane deck. Heavier white oak was used to make the framework and planking, but lighter woods like pine, poplar and cedar were used to construct the rest of the hull (Hunter 1949).

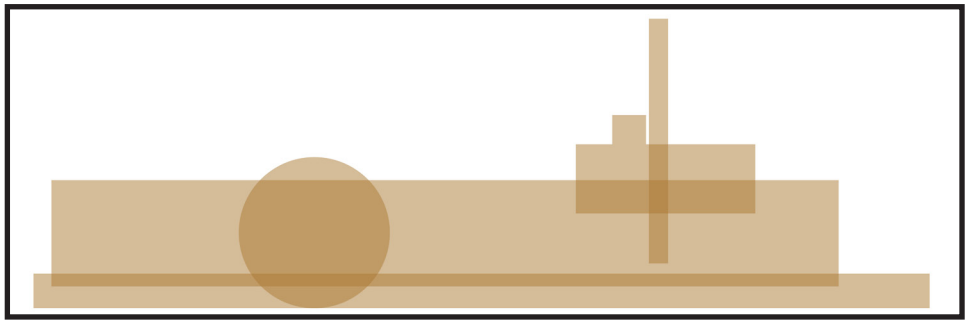
Massing

Most paddlewheel steamboats can be massed using four or five rectangles and a circle. The elements represented are the hull, the paddlewheel, the superstructure, the pilothouse and the smokestack. Below is one examples of both a stern and a side paddlewheel.





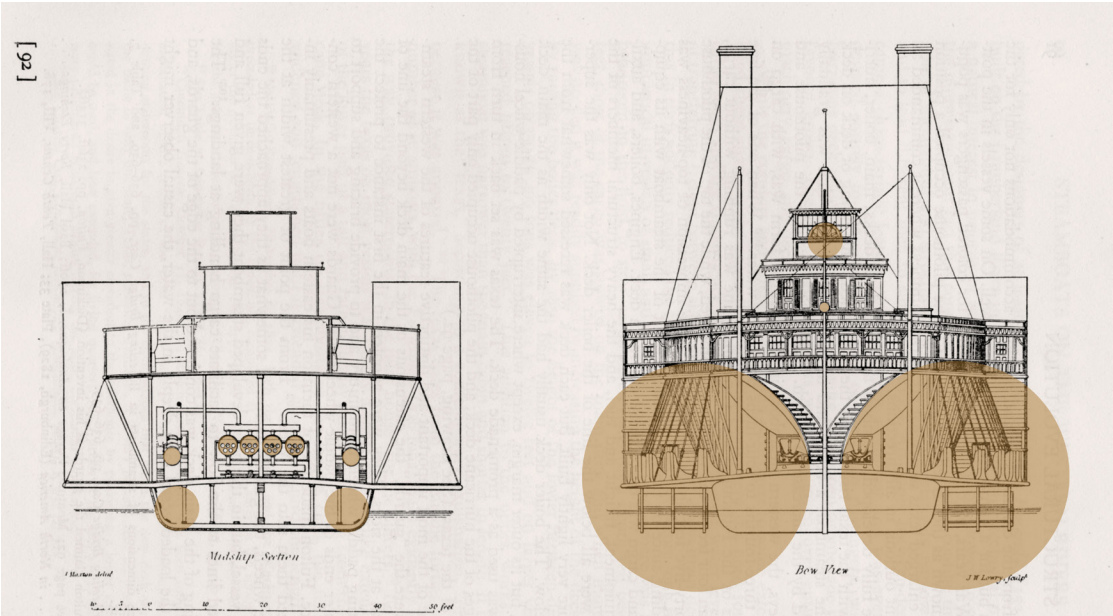




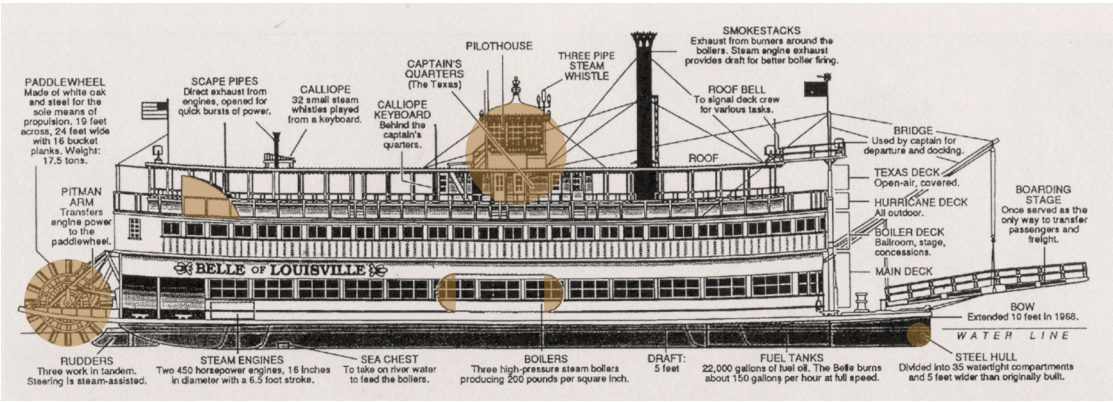
Here is a verbal description of the general layout of steamboats from Larson (1998): “Of light draft, many drawing less than eighteen inches, these paddlewheel steamboats were open and had wide decks. The boilers and engines were mounted on the main deck with the rest of the space open for cargo and cord wood... These boats usually had a second deck (called the boiler deck) and also a third deck (called Texas deck) where the crew’s quarters were loacted. Topping the whole craft were two tall smokestacks and a twelve-by-twelve cubicle called the Pilot House.”

Hierarchy

Because of the rectangle's dominance in the geometry of the ship, the circle becomes hierarchical. It not only stands out as a shape, but it also helps define funcional features like the paddlewheel, the boilers, the hull and the pilot house.

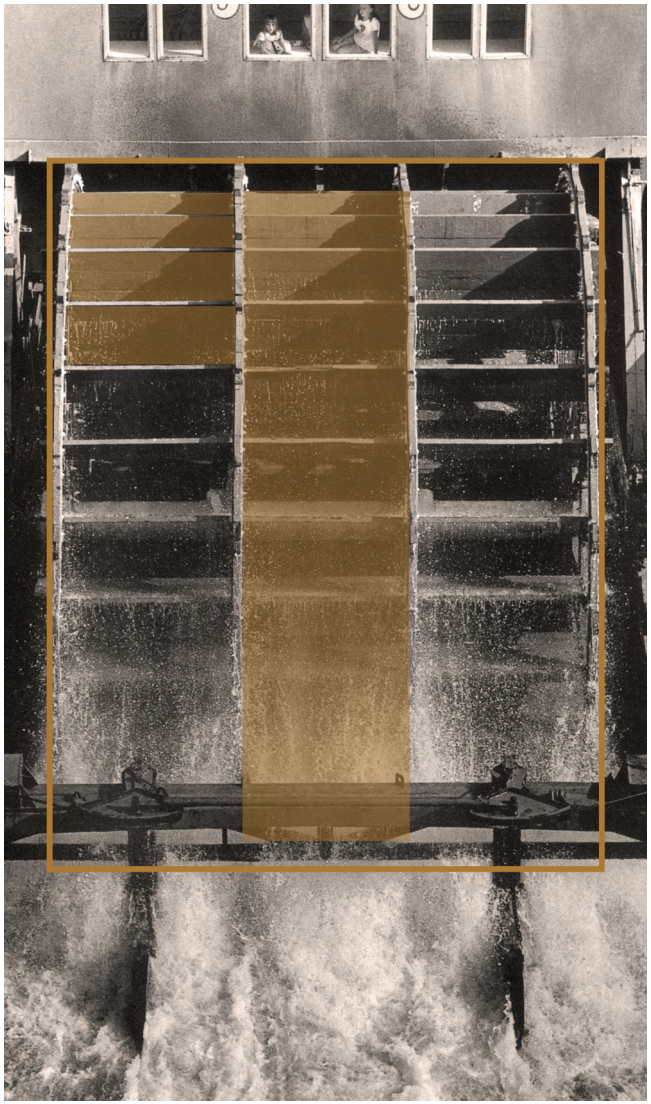


Midship Section and Bow View of a Typical Western River Steamboat of the 1850's
(*Transactions of the Institution of Naval Architects,* London, 1861)



Geometry

The steamboat is basically composed of different sizes of rectangles. Even the paddlewheel, which takes on a heirarchitacl circular shape in elevation, becomes a series of rectangles when veiwed from behind.



Case Study Two: Photovoltaic Energy

Introduction

Author S.V. Szokolay, writing in 1975, predicted that "photoelectric devices" would become integrated into buildings. At that time, they had been used primarily in expensive satellite projects and small pocket calculators. When W. Brown wrote the book *Alternative Sources of Energy* in 1994, Photovoltaic systems had made it into water-related structures and communication systems such as "lighthouses, signal buoys, and power-remote radio, television, and telephone relay stations for the communications industry." Seven years later, L.R. Brown (2001), reported "by the end of 2000, about a million homes worldwide were getting their electricity from solar cell installations." To date, not only have they become a part of many buildings, but they have been used to power cars, boats and planes. The potential for this technology continues to become more important as it gets cheaper and increasingly reliable. Chris Goodall (2008), speaking of the extraordinary amount of energy that the sun offers, stated that the sunlight which reaches the earth every day has about 7,000 times the energy consumed by humans in fossil fuels. He also points out their convenience as they are best utilized in essentially unusable spaces, like rooftops and deserts, which means they do not conflict with crops on agricultural land. They are "non-polluting and almost noiseless, and they require little maintenance" (Goodall, 2008).

This case study will focus on photovoltaic (PV) technology and how it is (and can be) used in buildings as well as boats as it relates to the project typology ("floating camp with Mississippi terminals"). Before doing so, however, there are some other sun-related technologies that should be recognized here. Passive technologies include Trombe walls, thermal massing systems, roof ponds, greenhouses, and others. Active technologies include solar water heaters and solar concentrators. These are all valuable, but will not be covered in depth here.

Photovoltaic Cells - Overview

The idea of Photovoltaic (PV) cells was concieved more than a hundred years before they were first made. "In 1839, the French scientist Edomd Bacquerel noticed that when light striked thin crystals of certian elements, some of the light knocks electrons loose from the element's atoms, causing an electric current" (W. Brown, 1994). Major development was made in 1952 at Bell Labs in Princeton, New Jersey, when three scientists found that silicon could produce electricity in reaction to sunlight (L.R. Brown, 2001). Their first cell was able to convert 4% of light into electricity. At first, it was expensive, as most technologies are, but due to interest in the development of it by both the United States and Soviet Union during the space race, progress with it continued (W. Brown, 2001). PV panels were used in satellite (W. Brown, 1994; L.R. Brown, 2001; Szokolay, 1975). Additional non-space related experimentation was done in the 80's, and in result, the cost of PV electricity dropped from $60 per kilowatt-hour to 30 cents per kilowatt-hour between 1970 and 1990 (W. Brown, 1994). Another of their early uses was in pocket calculators, and they became a reliable replacement for calculator batteries (L.R. Brown, 2001).

Photovoltaic Cells - Description

Disclaimer: in my discussion of photovoltaic technology, the terms "solar module," "solar panel," "Photovoltaic (PV) panel" are used interchangeably.

Author Neil Kaminar (2009) offers a simple description of a "solar module" in his book, *Solar Basics: The Easy Guide to Solar Energy*. Solar module, as he uses it, is interchangable with the more common term, *solar panel*. As they are often used in multiples, Kaminar calls the module "the basic building block of a solar system." Modules are "made from a collection of solar cells that are bonded to a sheet of

glass. The entire module is encapsulated, which means sealed to prevent water and air getting inside the module. Molecules usually have an aluminum frame surrounding the glass that is used for mounting and to protect the edge of the glass" (Kaminar, 2009). Three things differentiate modules from one another: cell material, glazing material, and hardware/ frame/electrical connections. Each individual cell, before it is wired together to form a module, it surfaced with a coating to make it anti-reflective, therefore maximizing absorbtion (Solar Energy International, 2004). On the back side of each module either a "junction box" are to connect to the larger system by wires, or, depending on the model, just wires without a junction box. Although quite durable, Kaminar gives a practical list of how a solar panel could be broken:

Bullet from a gun
Impact from a "ball peen hammer"
"Very large hail"
Hurrican force winds
Immersion in fire
Point stress on the edge of the tempered glass

He says that, although not recommended, a person would be able to stand on a solar module without breaking it. They are designed to withstand freezing and extremely hot temperatures, and are tested for torque created by uneven surfaces. Although "very large hail" would break one, as stated above, they are subjected to a test in which one-inch iceballs are launched at its surface, and must remain intact in order to pass. Kaminar gets even more specific: "They are designed to withstand 50 pounds per square foot (psf) pressure, equivalent to a wind speed of about 130 miles per hour. Special modules can be purchased that are designed to withstand a load of 112 psf."

Photovoltaic Cells - Use

This is a great sustainable technology that should be put to use in my project, and it is being appropriately proliferated. In 2001, PV cells were "the second fastest growning source of energy," after wind power (L.R. Brown, 2001). Chiras (2010) discusses three main structures of PV systems:

1. Grid-connected (batteryless)
2. Grid-connected with battery backup
3. Off-grid

Grid-connected systems output to two places; one, to the building or house on or near the PV system location, and two, to the "grid" (a.k.a. "utility grid"), or nation-wide system of wires that provides electricity houses, buildings, neighborhoods, and cities. The electricity goes first to the building or house. When there is excess electricity, it goes back into the grid. The meter outside of most houses counts up when electricity from the grid is consumed. When excess electricity is generated, the meter simply counts down, possibly going negative, and the homeowner is reimbursed. The main drawback of such a system is that it is "vulnerable to grid failure unless a backup generator or uninterruptible power supply is installed."

One such uninterruptible power supply is a battery, which leads us of course to the grid-connected system with battery backup. In fact, the presence of a battery is the only major difference from a grid-connected system. So, why not go with a battery backup regardless? Well, its drawbacks include expense (30% more cost than a non-battery system), efficiency ("topping off batteries will consume about 5 to 10% of a system's output," or in some cases up to 50%), environmental friendliness (because batteries are not easily disposed of), and additional maintenance.

Off-grid systems are a smart choice for those in remote locations or rebellious city-dwellers. However, in addition to requiring a battery, often this system requires supplemental electrical needs because of intermittant sun-exposure. This can be provided by a wind or hydro turbine or a gas or diesel generator. Naturally, this is the most expensive, least efficient, and highest maintenance system of the three, but can be worth it if one wants or needs to be independent from the utility grid (Chiras

2010).

Stein (2008) gives examples of how photovoltaic panels can be used practically in his book, *When Technology Fails: A Manual for Self-Reliance, Sustainability, and Surviving the Long Emergency*. He describes three methods of mounting: fixed orientation, manually adjustable orientation, and tracker orientation. In the case of fixed orientation, Stein recommends tilting it "to latitude plus 15 degrees for winter optimization." The idea is that extra sun in the summer will make up for a less than optimal angle.

Even very small shadows can greatly affect the output of a PV panel (Kaminar, 2009; Stein, 2008). Because of this, it is a good idea to get a solar module with internal cutoff diodes (Stein, 2008).

Japan developed a photovoltaic roofing material (L.R. Brown, 2001). The Solar Impulse is a solar powered aircraft scheduled to fly around the world pollution free in 2009 in order to educate about the renewable resource (Kodis, 2009).

Other Case Studies

New Orleans Gumbo

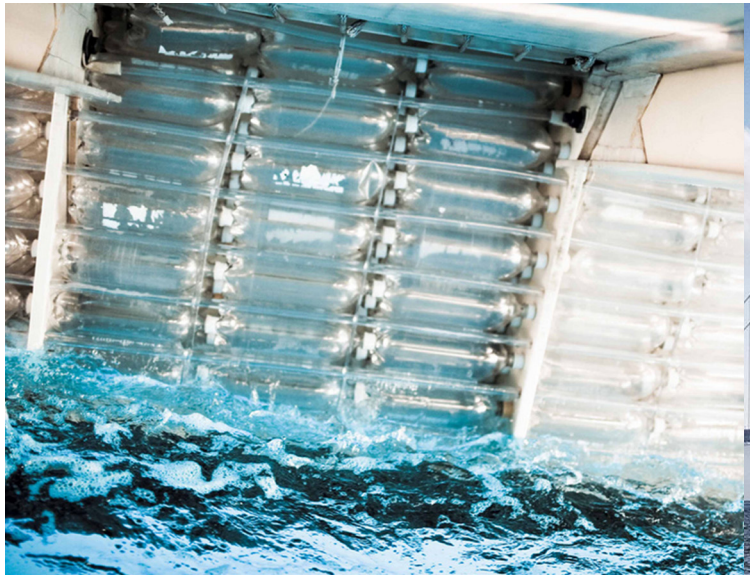
The gumbo study was concieved due to the convergence of a piece of my Theoretical Premise Research and a piece of my Historical Context. Reading one of Steven Holl's portions of *Questions of Perception*, I came across his beautiful comparison of two different experiences at the Zen Gardens of the Ryoanji Temple and a nearby restaurant in Kyoto, Japan. Holl had first visited in a cold January, then six years later on a hot and humid August day. He recalls his experience at the restaurant in January: "A clay pot and burner were placed at the center of our table. As women in kimonos boiled the tofu before us, steam rose toward the cieling in the winter cold." The tofu was prepared differently in the heat on his second visit, and this time he even sees similarities between the food and the architecture: "Now we sat outside in the summer heat, and the tofu was served on a block of ice... I sensed the same poetry of the simple paper and wood architecture in this modest material of tofu, so carefully and inventively transformed." Holl observed a similarity that may not have been intentional, but, to him, so clearly existed. Does this similarity between food and architecture exist in other places? Could the design of a terminal on the Mississippi River reflect this connection?

The topic of food came up multiple times in my research of New Orleans. Although there are many dishes that are somehow unique to New Orleans, gumbo, as I learned in my Historical Context research, is one of their staples. It seemed to me like a good place to start.

Not knowing much about Gumbo, I looked online for recipes and video demonstrations. A source of good cooking advice turned out to be Chef Poppy Tooker, a native of New Orleans who teaches visitors how to cook traditional food. She simplified the process by saying "In New Orleans, everything we cook starts off the same way; first you make a roux, and then you add your seasonings." The "roux" (pronounced "roo"), I learned, is simply a mixture of oil and flower heated on the stove (InSearchOfRealFood, 2007). Some recipes call for butter or margerine instead of oil (Seafood Gumbo, n.d., Thibodeaux, n.d.). The particular Seafood Creole Gumbo she was preparing called for the roux to be heated until it was "milk chocolate brown." It starts off with a gentle carmelly color, and some will stop there (DocNOProductions, 2007).

I looked at several recipes - some for seafood gumbo, some for cajun gumbo, some for chicken and sausage gumbo - and printed off four to take to the grocery store. I looked for the things that the recipes had in common. Most called for onion, green pepper, garlic, bay leaves, thyme, rice, etc. Not being near a major source for fresh seafood, I left out crab, but decided to buy frozen shrimp. A simple but less common ingredient that I had to search a little harder for was okra (Cajun Seafood Gumbo, n.d., Chicken and Sausage Gumbo, n.d., Seafood Gumbo, n.d., Thibodeaux, n.d.). (At Cub Foods in Rochester, according to the man stocking, they had supplied it when people had continually asked for it, but it would end up going bad on account of not enough people buying it, so they no longer carry it.)

Plastiki



The sailboat “Plastiki,” gains its buoyancy from roughly 12,500 plastic bottles. In 2010, it was sailed 8,300 nautical miles from San Fransisco to Sydney to raise awareness about plastic marine waste (www.theplastiki.com). Photographer Chris Johnson travelled to the North Pacific Gyre (north of Hawaii) and found heartbreaking evidence of the negative effects of this type of pollution (below).


Spring Cleaning in Fargo, ND


12,000 LB CAPACITY

Site Analysis

The site in South St. Paul is located on a plot of land which has been subjected to a master plan that will turn it into Kaposia Landing Park, which will include a large breed dog park (already existing), walking paths (some of which exist now), river overlooks (existing), four softball fields, a baseball field, three bocce courts, two volleyball courts, three horseshoe courts, a picnic area, a picnic and performance building and parking. The relatively large chunk of land is beautifully positioned on the west edge of the river, flanked on the west and north sides by several sets of railroad tracks, one of which leads to an elegantly brutal rotating bridge, composed mainly of steel and concrete. Directly across the river to the east is Pig's Eye Island Number One which does its best to screen Pig's Eye Water Treatment Plant, the largest of the Metropolitan Area's seven wastewater plants.

The park is connected by a pedestrian bridge over Concord Boulevard to Simon's Ravine, a forested area with a pedestrian path. The ravine also contains the existing Kaposia Park. The future Kaposia Landing Park hooks up with Riverfront Trail, which follows what the name suggests. On my site visit I followed the trail south about four miles until its abrupt termination immediately north of the 494 bridge. I had a powerful experience at the bridge earlier in the day, as the massive structure kept a section of land a lush, summery green while the rest of the region became a blustery winter wonderland as wet, heavy snow blasted its way in from the north.

Since this project is set on the Mississippi River, water is obviously one of the most important elements to consider. Therefore, I have devoted the following pages to different aspects of water.

Water Quality

Because much of the information obtained in the following section was obtained from The Metropolitan Council Environmental Services (MCES), I will briefly describe who they are. The MCES "monitors water quality in the region to protect public health and the environment, in compliance with the state laws and the federal Clean Water Act (CWA)." The CWA's purpose is to eliminate pollution throughout navigable waters and support wildlife and recration. The MCES has several stations on the Mississippi, Minnesota and St. Croix rivers at which water samples are taken four times a month from March to October (open-water season), and bi-monthly during the rest of the year (MCES, 2005, 2009).

Phosphorus

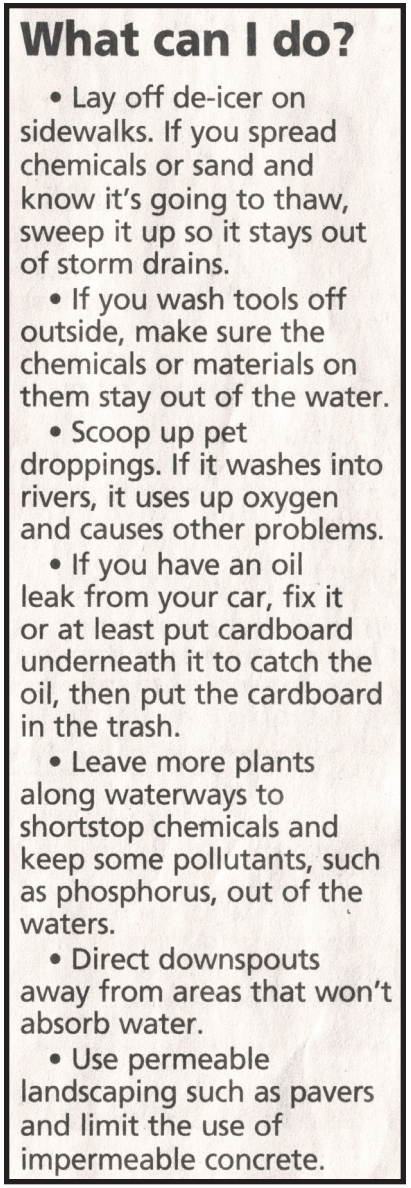
Phosphorus is an element that stimulates plant growth. Commonly added to rivers by runoff and discharge from farms and water treatment plants, an excess buildup can occur. The problem with excess levels of phosphorus is that it can lead to the growth of “unsightly algae blooms,” which, upon their decay, deplete oxygen levels and release unpleasant odor. This can hinder other aquatic life and make the water unpleasant for recreation (MCES 2005).

Dissolved Oxygen in Water

In order to support aquatic life, an oxygen level of at least 5 mg/l must be present. Decomposing organic matter like that introduced by wastewater treatment plants and runoff from farms or urban areas reduces dissolved oxygen levels. Even if a water body contains a level of 5 mg/l or more, consumption of fish may not be advised if the water contains contaminants such as PCBs or mercury (MCEP 2005).

Bacteria in Water

The measurement of bacteria in water is the method used by the Metropolitan Council Environmental Services to determine whether a water body is “swimmable.” The specific type of bacteria considered dangerous is fecal coliform bacteria, because it can contain “potentially dangerous pathogens such as typhoid fever, hepatitis and dysentery” (MCEP, 2005). In 2009, the MCEP changed from measuring fecal coliform bacteria to measuring a specific subgroup of it, called Escherichia coli, or E. Coli. In 2009, the measurement for the Mississippi River, below the Minnesota river where my site is located, was around 20 colonies/100ml, which is well below the proposed standard of 126 organisms/100 ml (MCEP 2009).



Runoff

Runoff from urban and agricultural areas are a big contributer to pollution of water bodies like the Mississippi. The United States Environmental Protection Agency (EPA) states, "People and their actions are the most significant sources and causes of urban runoff and pollution." Dangerous pollutants include "sediments, pathogens, fertilizers/nutrients, hydrocarbons and metals" (EPA 2010). Lisa Eadens, director of Cascade Meadows wetlands and Science Center and coordinator of the Zumbro Watershed Partnership, was interviewed by John Weiss for a newspaper article in Rochester, MN. She advised that the public plays a big role in preventing unnecessary runoff. Weiss listed several things that individuals can do, which are displayed in the image on this page (Weiss, 2010). Increased runoff also can cause erosion and chanel incision, which can raise river and stream temperatures and increase flow, which, in combination with pollusion, negatively affect aquatic life (EPA, 2010).

Turbidity (Suspended Solids)

The turbidity, or cloudiness of water, is measured by the MCES as total suspended solids (TSS) in mg/l. Another way to think about suspended solids is as partiles in the water. There is no lawful guide regulating a minimum measurement of suspended solids, so the MCES set their standard at 98 mg/L. The Mississippi below the Minnesota river measured at about 20 TSS in 2009. Turbidity decreases admittance of light, which hinders plants' ability to grow. It can also harm fish and similar aquatic animals by clogging their gills. Thirdly, turbidity causes an increase in water temperature, which can upset natural cycles (MCES, 2005, 2009).

Site Buildability

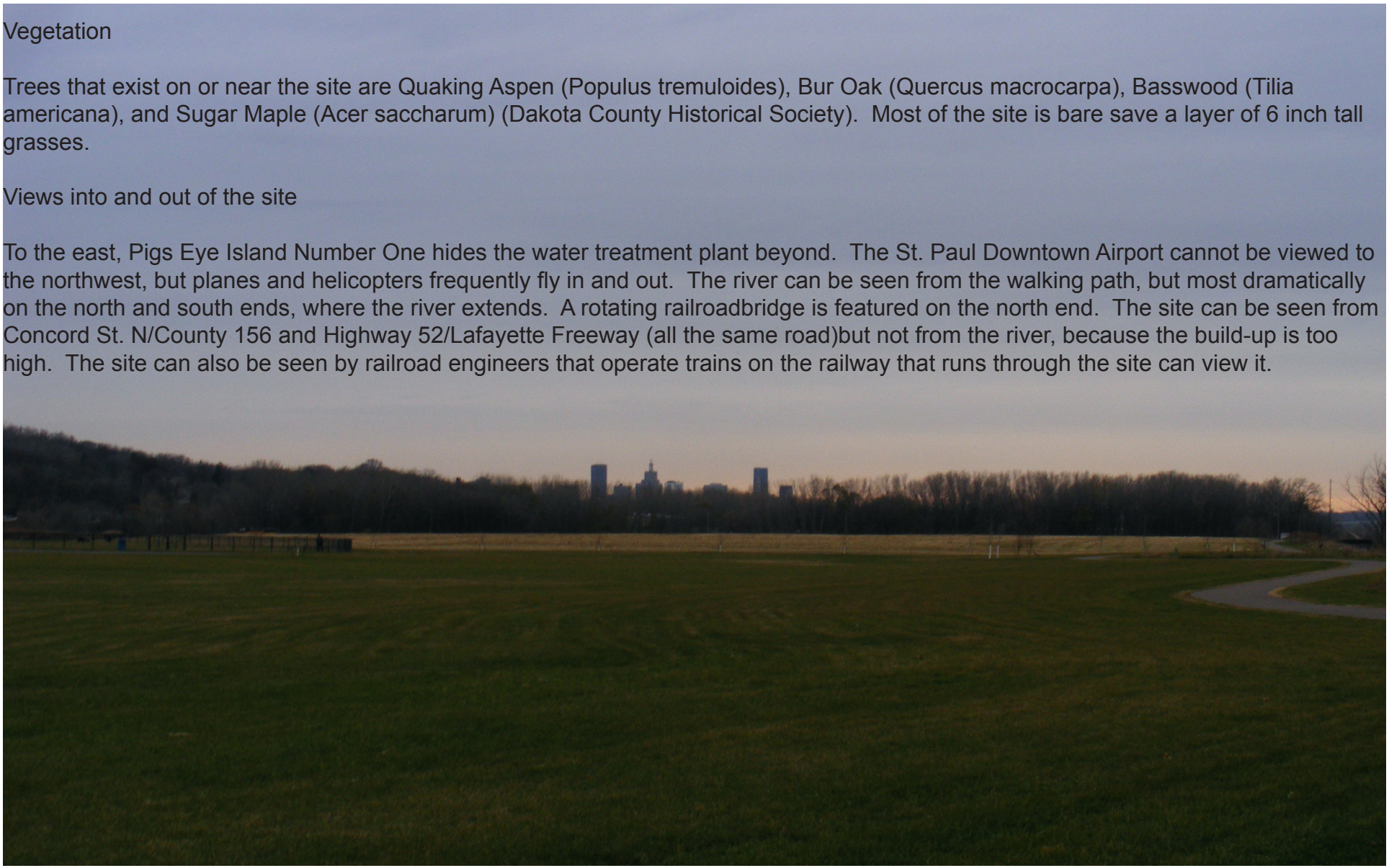
The site is stable and fit for building. There is a park going in soon with a small structure and baseball/softball fields. The campsite that I am proposing could go in on the northwest edge near the softball fields. St. Peter Sandstone is Near, but not directly under the site. Directly below the site is Alluvium, below which is rock from the Prairie du Chien Group, then is Jordan Sandstone, and finally St. Lawrence Formation (Dakota County Historical Society).

Vegetation

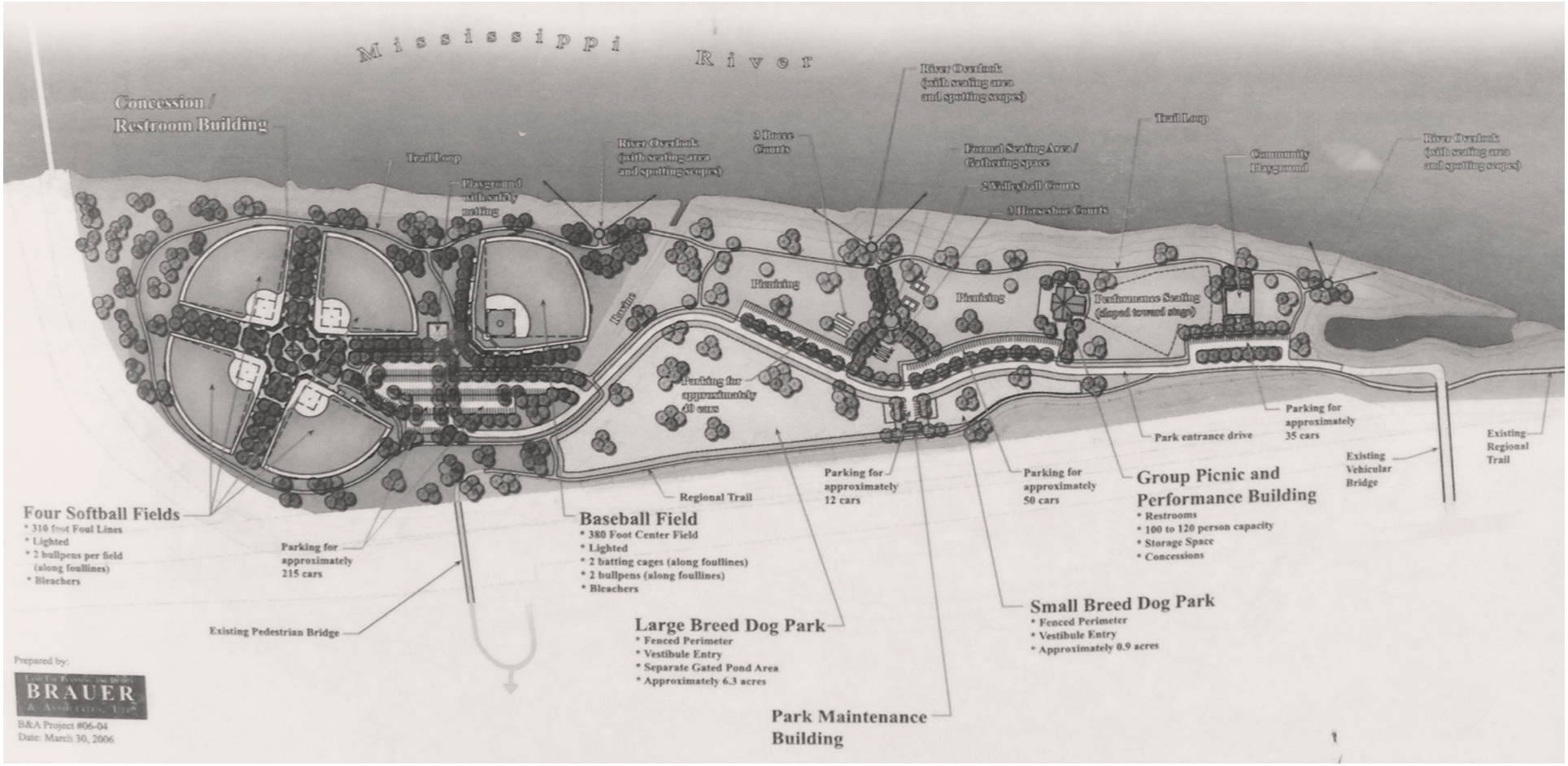
Trees that exist on or near the site are Quaking Aspen (Populus tremuloides), Bur Oak (Quercus macrocarpa), Basswood (Tilia americana), and Sugar Maple (Acer saccharum) (Dakota County Historical Society). Most of the site is bare save a layer of 6 inch tall grasses.

Views into and out of the site

To the east, Pigs Eye Island Number One hides the water treatment plant beyond. The St. Paul Downtown Airport cannot be viewed to the northwest, but planes and helicopters frequently fly in and out. The river can be seen from the walking path, but most dramatically on the north and south ends, where the river extends. A rotating railroadbridge is featured on the north end. The site can be seen from Concord St. N/County 156 and Highway 52/Lafayette Freeway (all the same road)but not from the river, because the build-up is too high. The site can also be seen by railroad engineers that operate trains on the railway that runs through the site can view it.



Site Plan of Future Park



Looking south from the pedestrian bridge, I observed an engine in the process of connecting to a line of cars. According to nearby sign, some of the engines in the area are operated by remote control.

On the walking path just south of the site, I watched two trains go by, side by side, in the snow.

Site challenges and opportunities

Since the site is near the Mississippi River, the rise and fall of the water is an obvious challenge. In reaction, the following techniques will be investigated: buildings that rest on the ground, but are able to float if water rises to a certain level; elevated buildings; buildings that are “floodable,” meaning, they retain their integrity after the river has submerged them, either partially or entirely and then subsided. How then can camp staff and visitors still appreciate the natural environment if the building is floatable, elevated, or floodable?

The airport, railroad tracks, river, and water treatment plant are high-energy stimuli because they all are responsible for moving something very powerful, be it man-made or natural. The design of the camp and buildings must acknowledge these aspects. How will the site acknowledge and react to sound/noise or light from planes, trains, boats, and buildings?

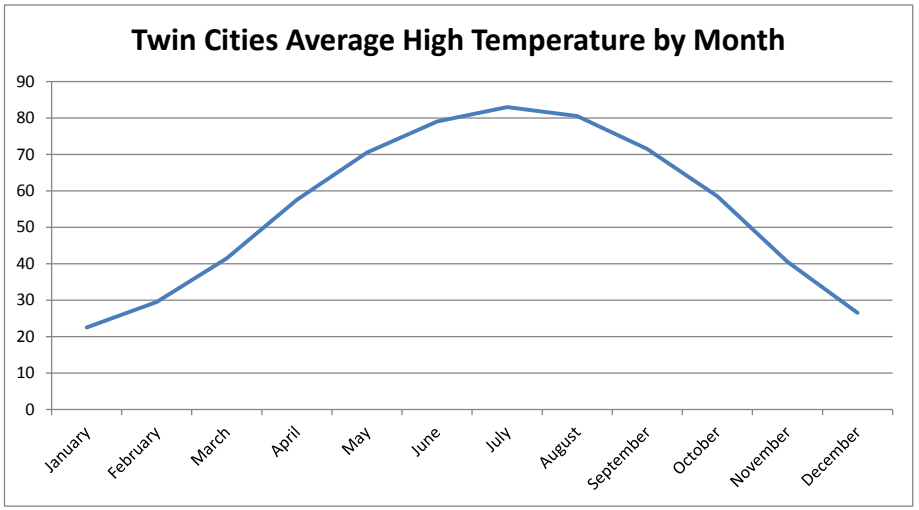
View of bridge and trees, looking north.

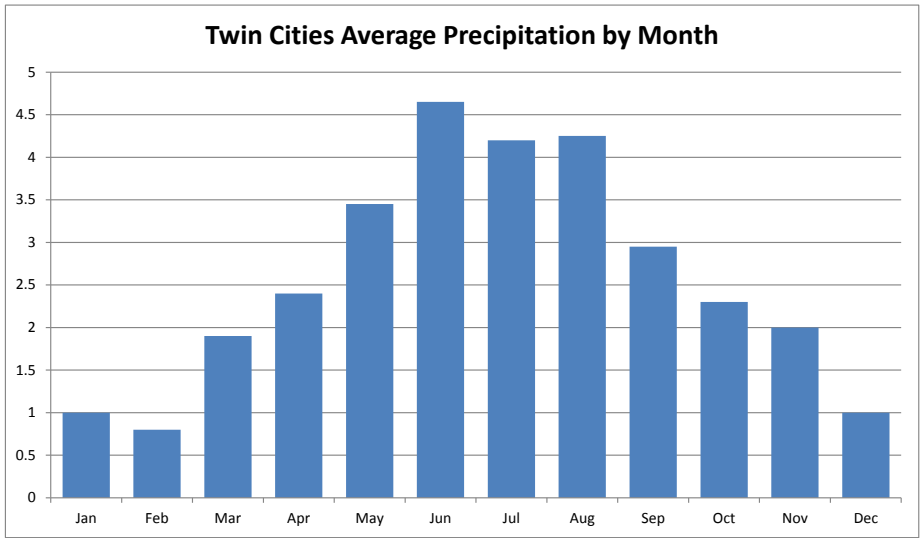
Weather Patterns

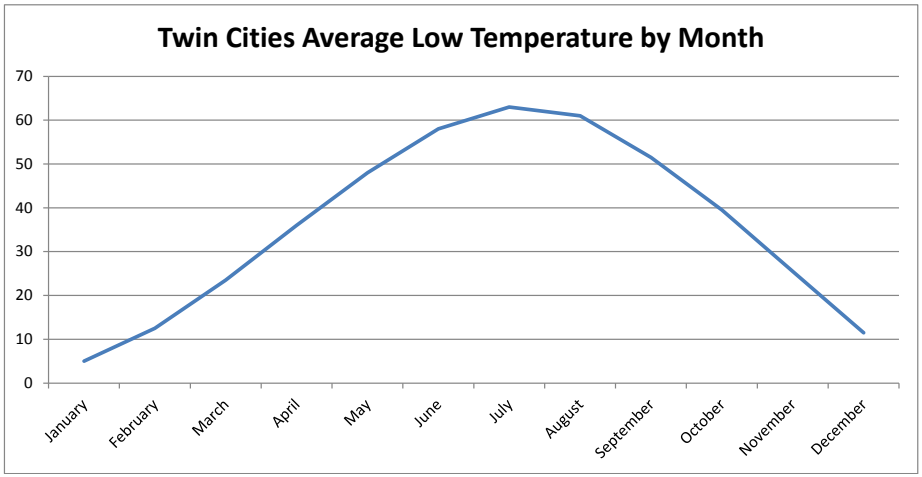
The graphs on this page are of averages gathered from data of Minneapolis and St. Paul at weather.com.

Noise

Although one can hear trains from the west side, cars from the southwest, and the occasional plane from above, the grasses, river, and trees do a good job of sucking up most of it. On the water, one is likely to feel peaceful because the river to the east is quieter relative to the rushing water coming from the water treatment plant.







Programmatic Requirements (Space Allocation)

Floating Camp
- Main Deck (100 sq. ft.)
- Texas (50 sq. ft.)
- Pilot House (20 sq. ft)

St. Paul
- Fire Ring (40 sq. ft)
- Dining (120 sq. ft)
- Restroom (20 sq. ft)
- Sleeping (80 sq. ft.)
- Social Context Space (150 sq. ft.)

Quad Cities
- Fire Ring (40 sq. ft.)
- Restroom (20 sq. ft.)

Cairo, IL
- Fire Ring (40 sq. ft)
- Dining (100 sq. ft)
- Restroom (20 sq. ft)
- Sleeping (80 sq. ft.)
- Social Context Space (150 sq. ft.)

New Orleans
- Fire Ring (40 sq. ft)
- Dining (120 sq. ft)
- Restroom (20 sq. ft)
- Sleeping (80 sq. ft.)
- Social Context Space (150 sq. ft.)

Previous Studio Experience

First Year 2006 – 2007
Spring Semester – Stephen Wischer
- Space Studies
- Designing with Metaphor
- Dwelling for the Indecisive

Second Year 2007 – 2008
Fall Semester – Stephen Wischer
- House of Tea
- Boathouse
- House for Twins

Spring Semester – Mike Christenson
- Case Study and Plaster Casting Spatial Study
- Mixed-use development in group of 6 classmates

Third Year 2008 – 2009
Fall Semester – Ron Ramsay
- Future Housing Development
- Moorhead Public Library

Spring Semester – Steve Martens
- Science Museum
- Native American Cultural Renewal Center

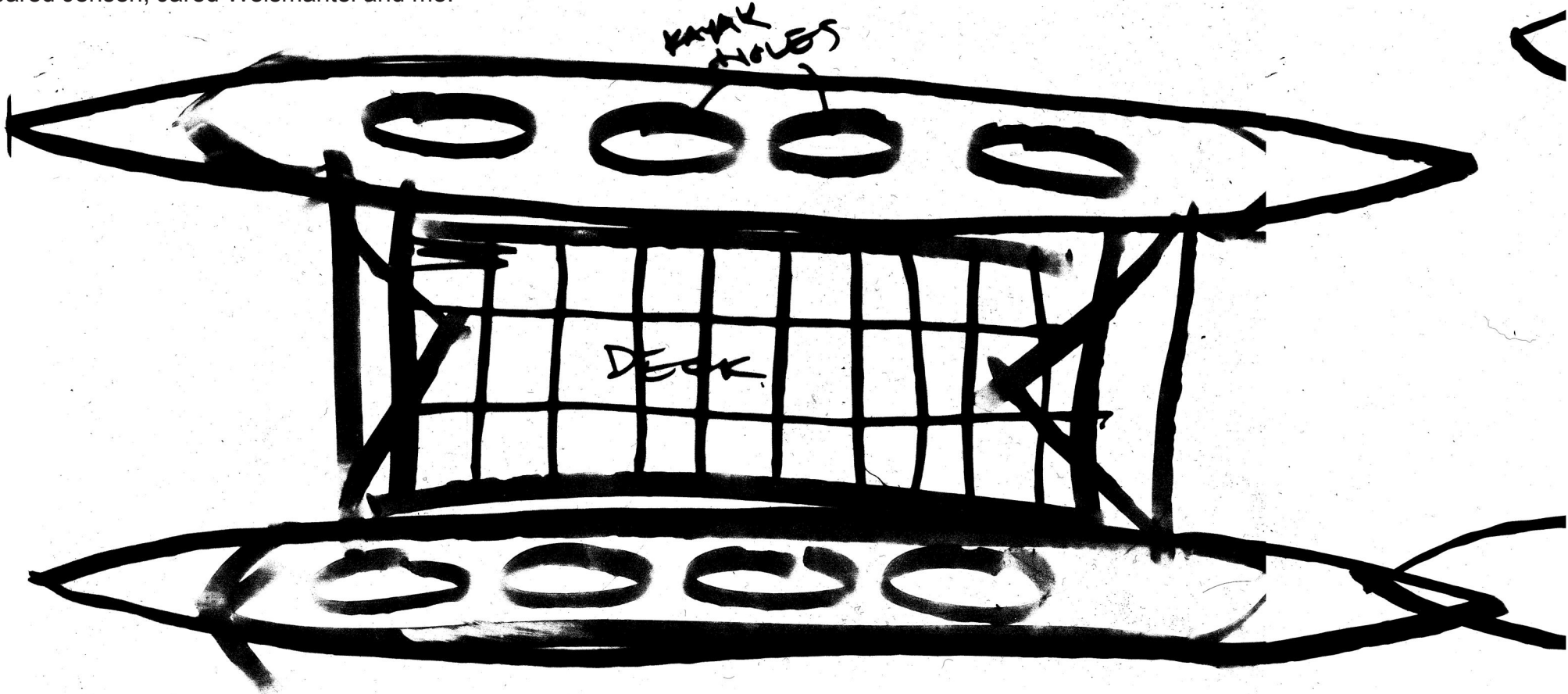
Fourth Year 2009 – 2010
Fall Semester – Darryl Booker
- High Rise in San Francisco

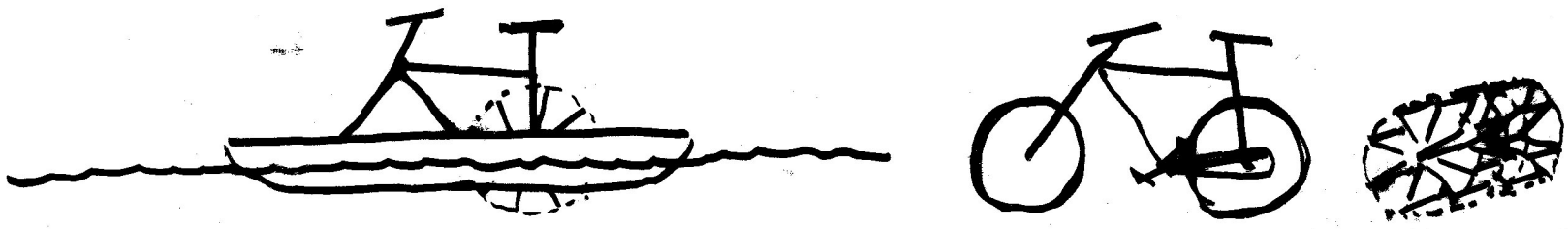
Spring Semester – Mike Christenson and David Crutchfield
- Study Abroad: India
- Viewing Pavilions in Jaipur, India

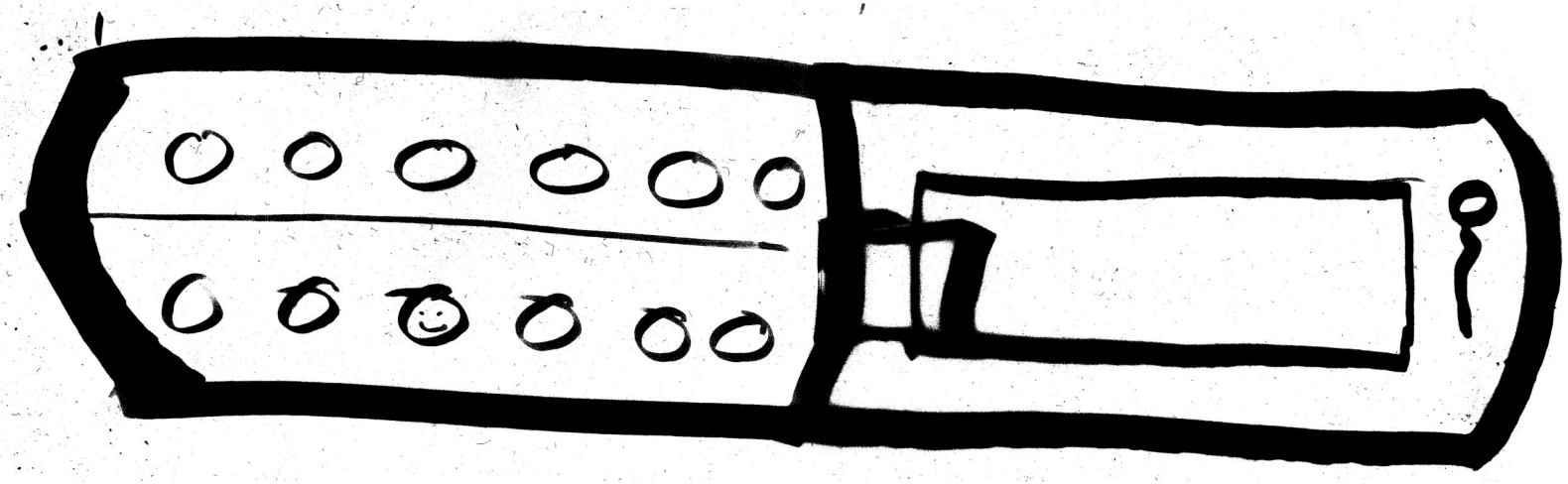
Fifth Year 2010 – 2011
Fall Semester – Cindy Urness
- MXC Housing Development

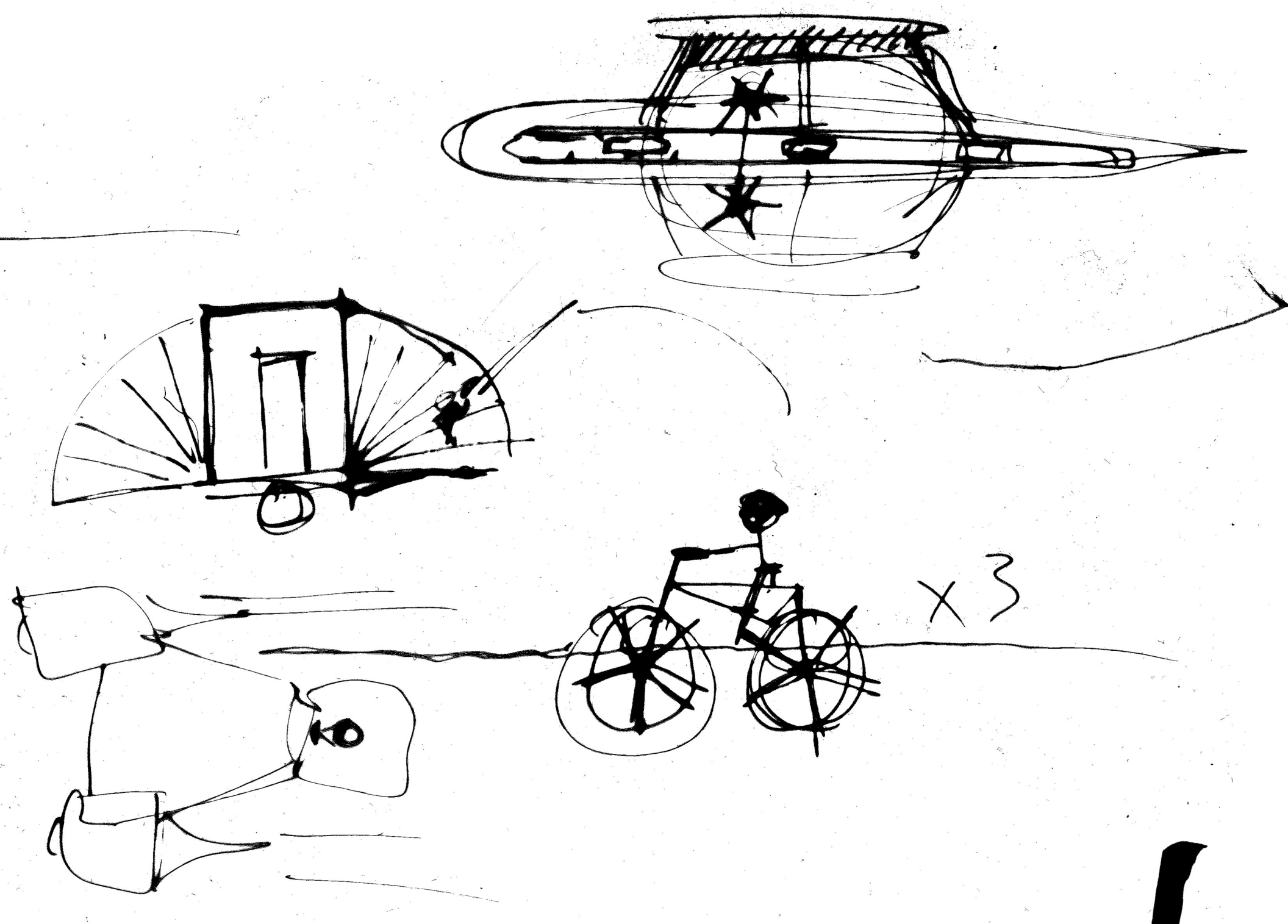
Process Drawings

Note: The drawings on this and the following two pages were done by Molly Bausman, Jared Jensen, Jared Weismantel and me.





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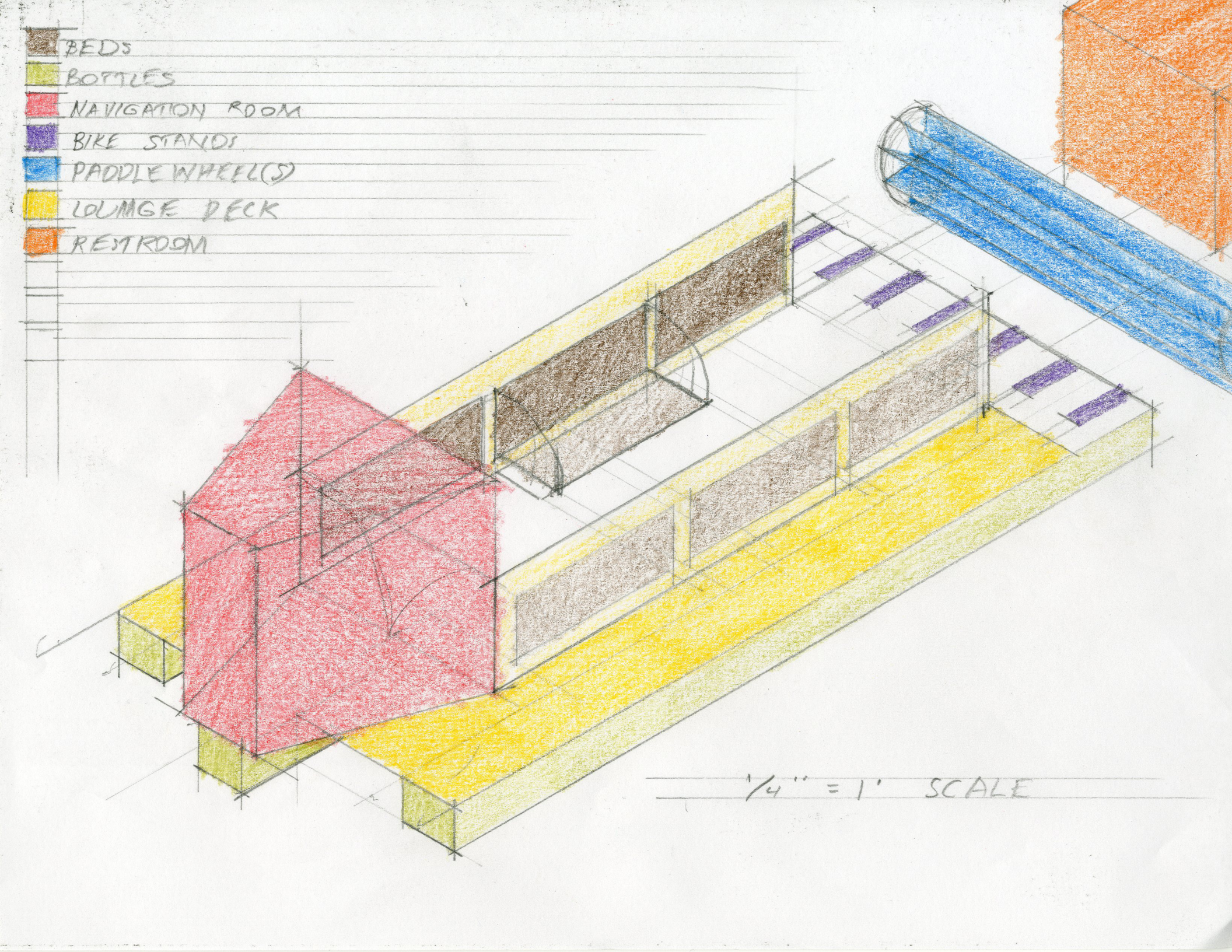
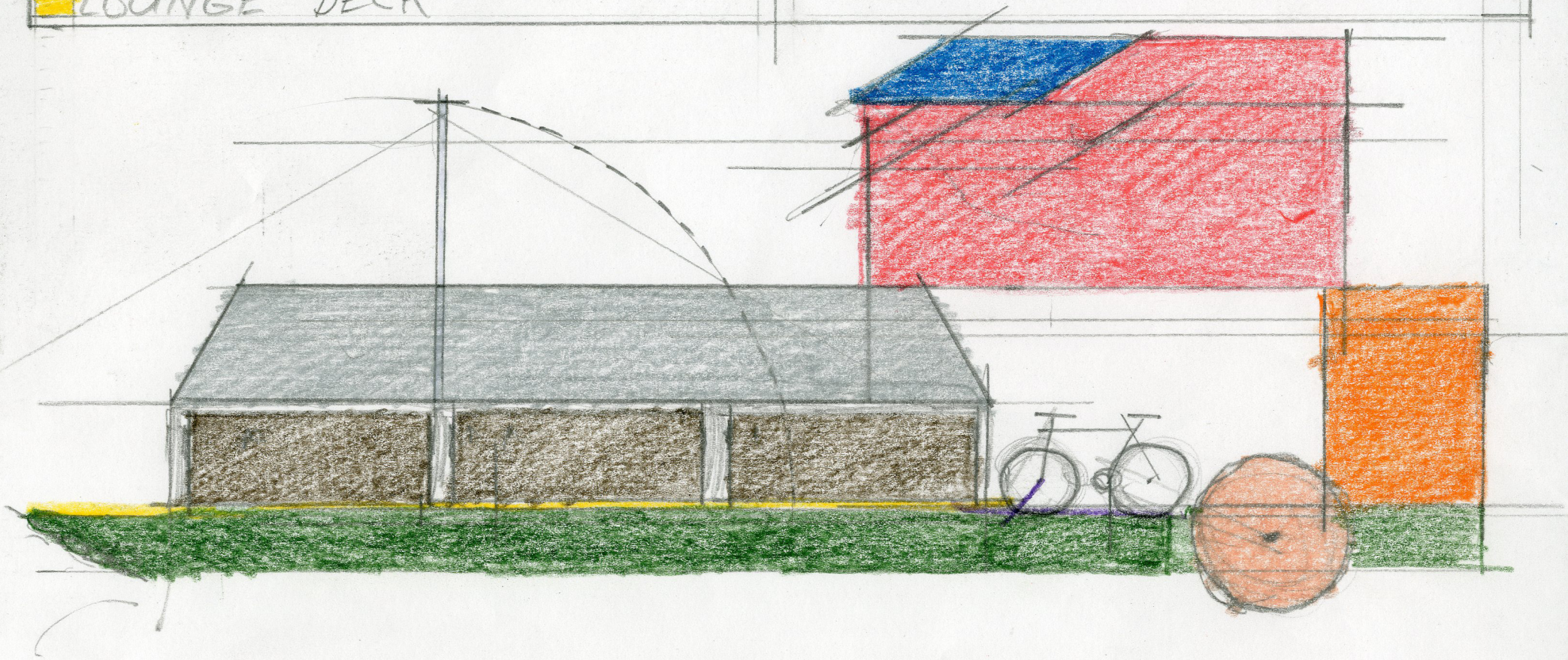
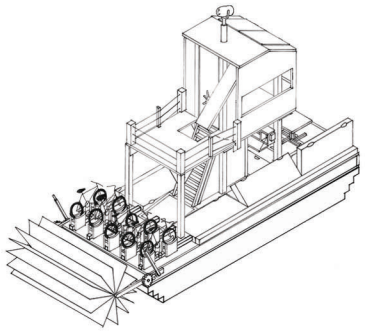

BEDS
BOTTLES
NAVIGATION ROOM
BIKE STANDS
PADDLE WHEEL(S)
LOUNGE DECK
RESTROOM
1/4" = 1' SCALE

NAVIGATION ROOM
BOTTLES
BEDS
BIKE STANDS
PADDLE W/HEEL
LOUNGE DECK

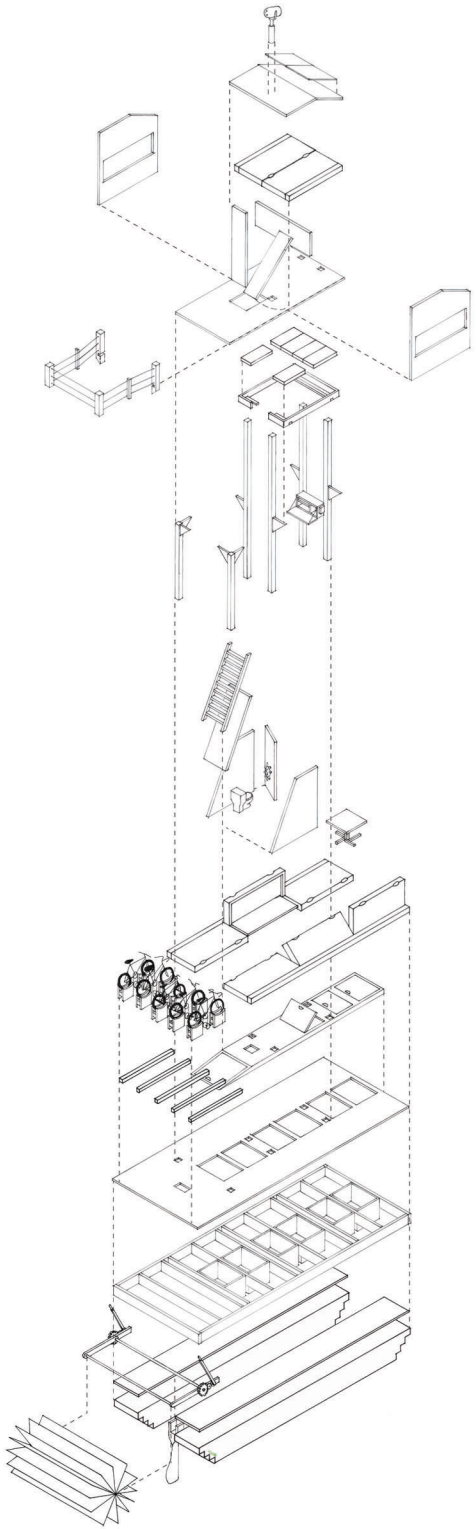
RESTROOM
SOLAR PANELS
MAST
SLEEPING 'SHELTER'
LIFT MECHANISM

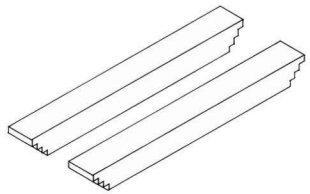


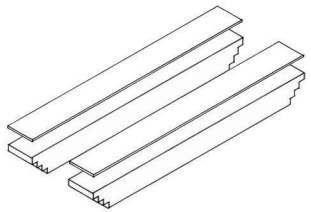
The Boat

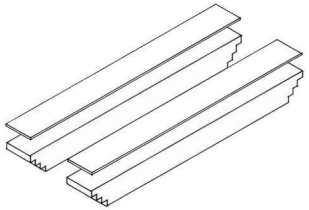


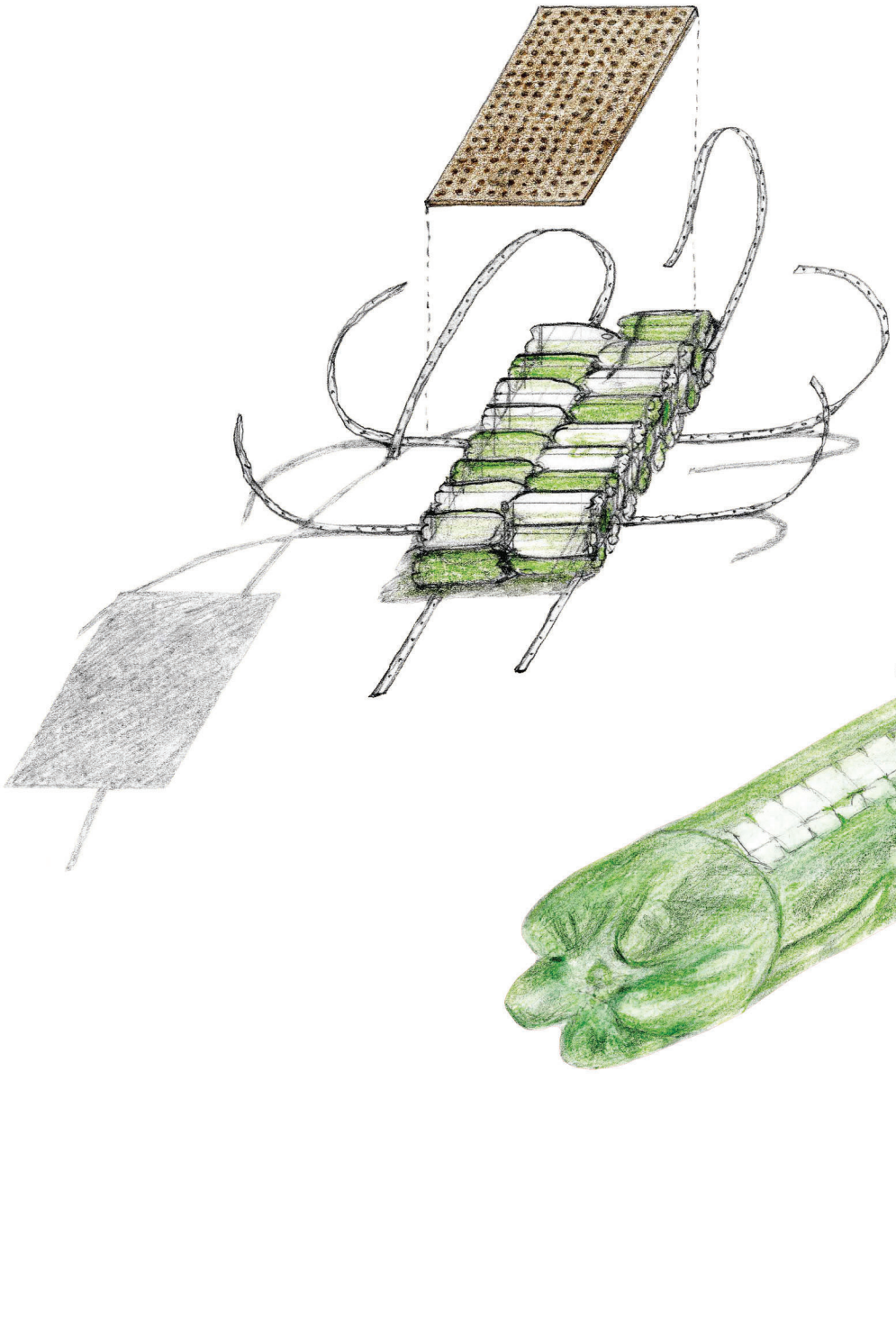
The Boat

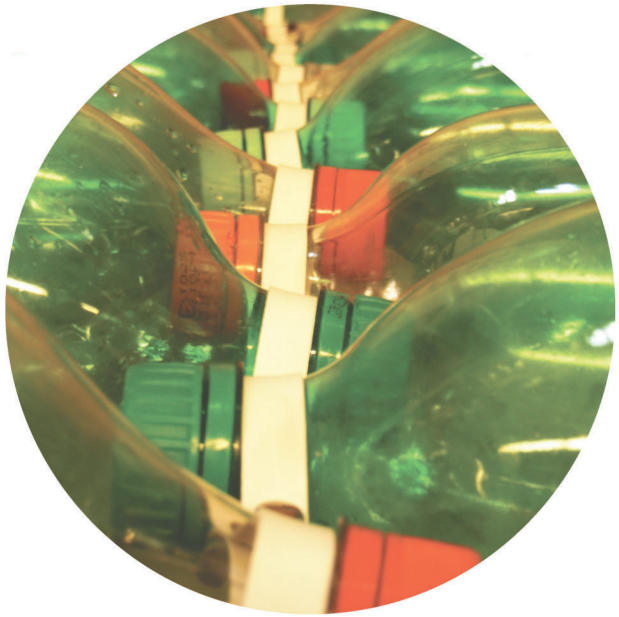


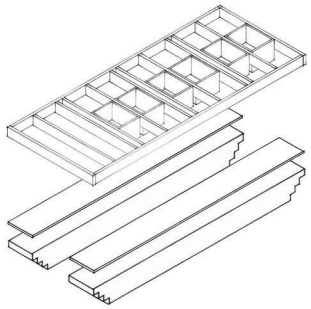


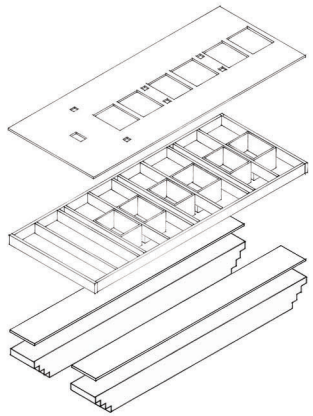


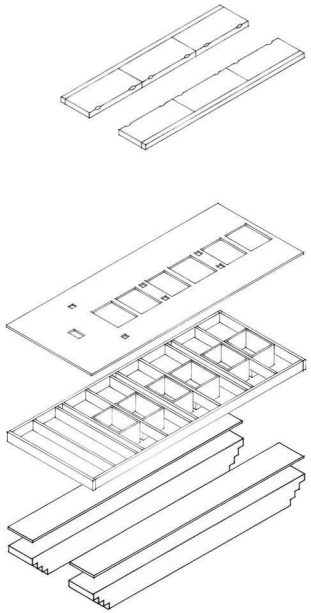


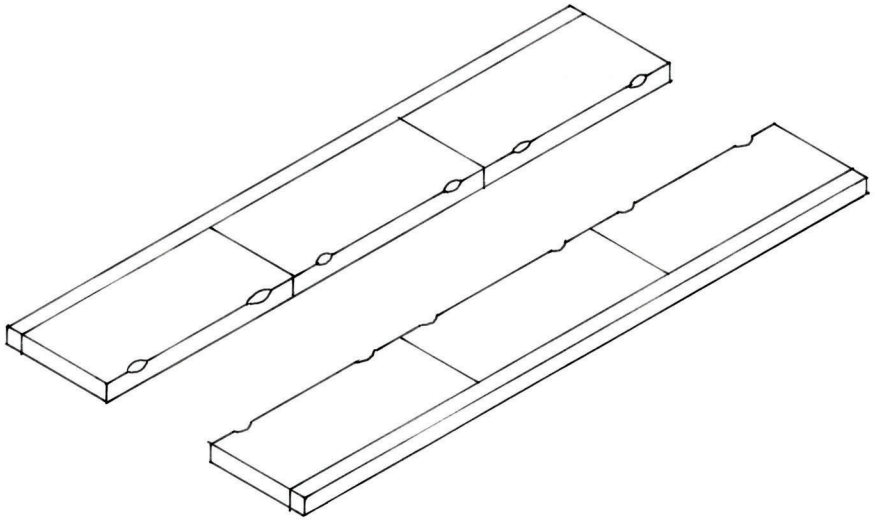


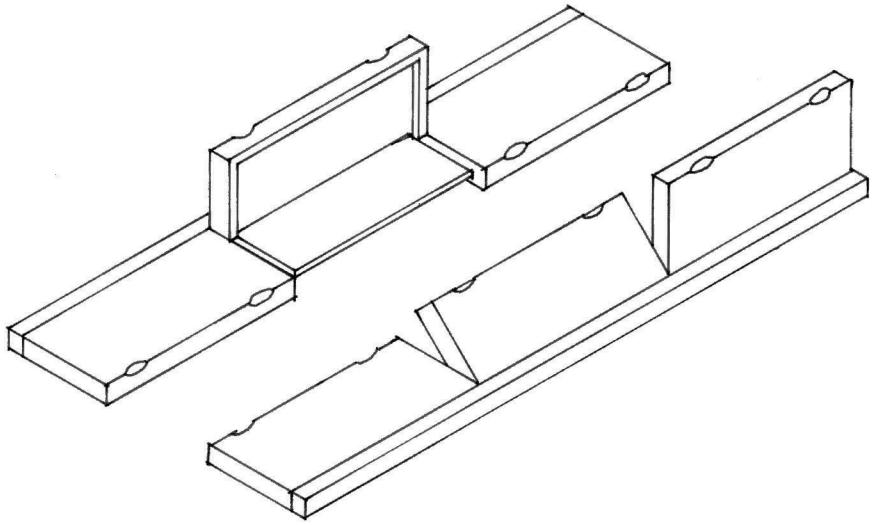


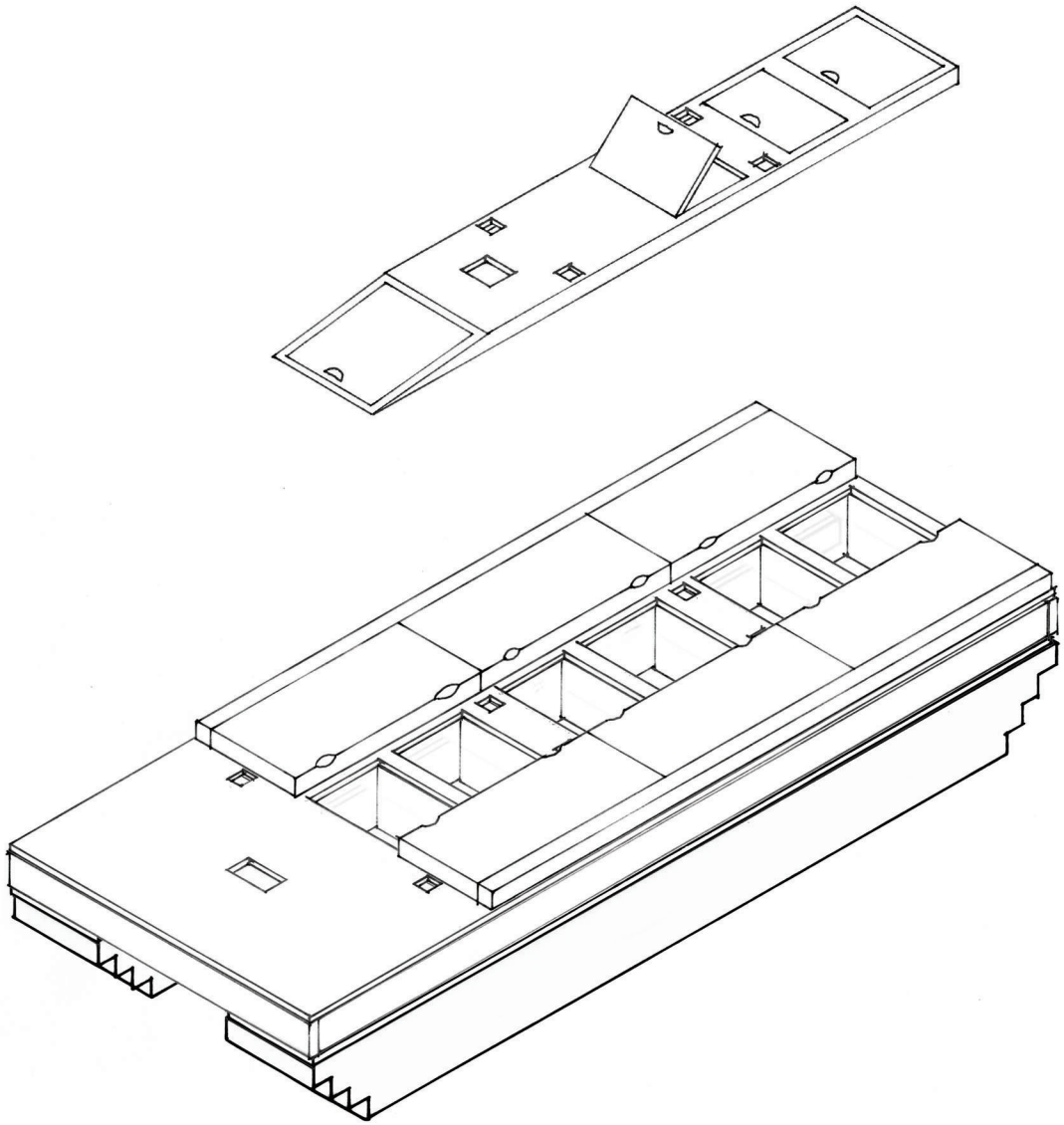


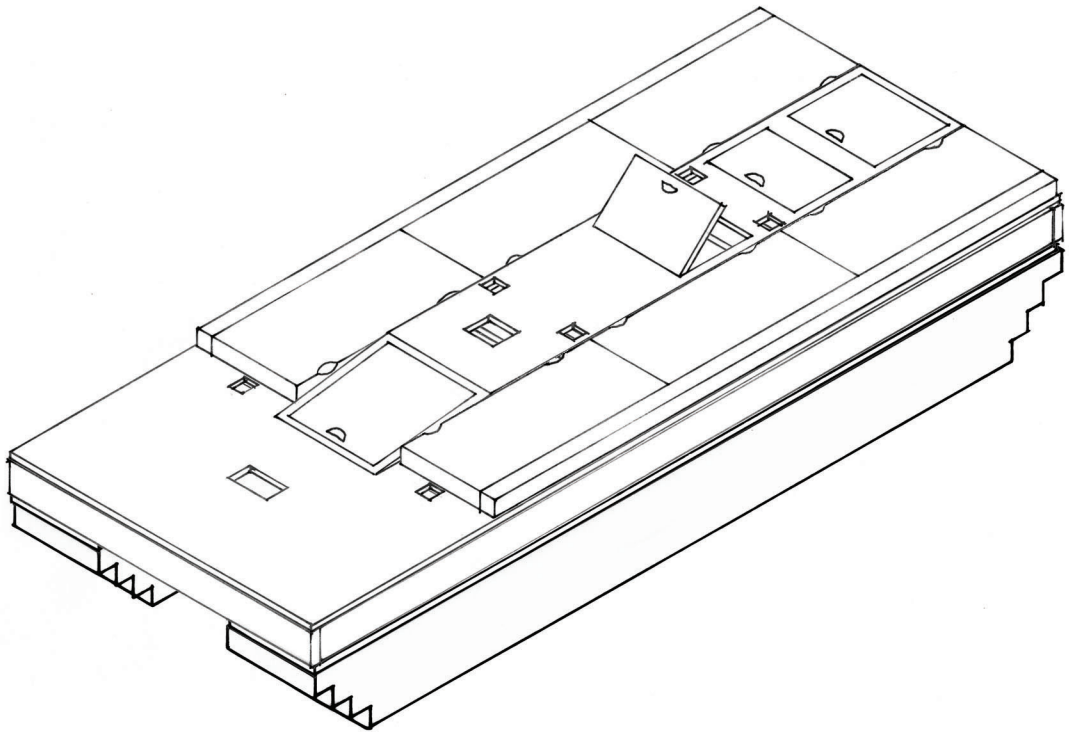


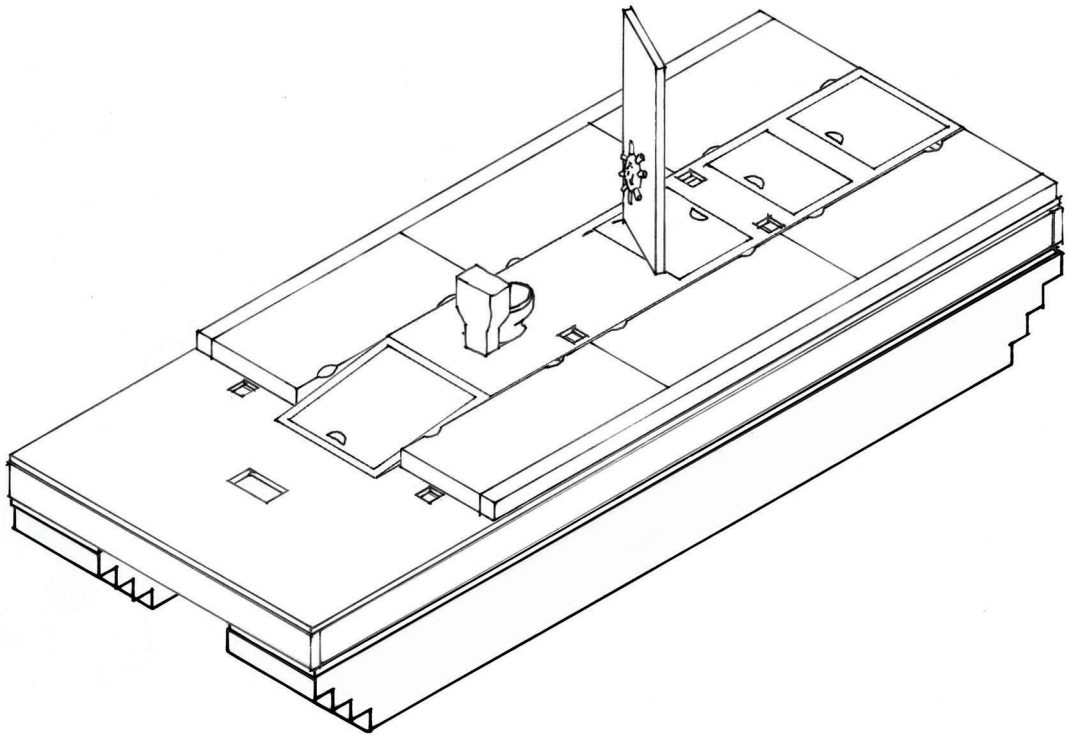


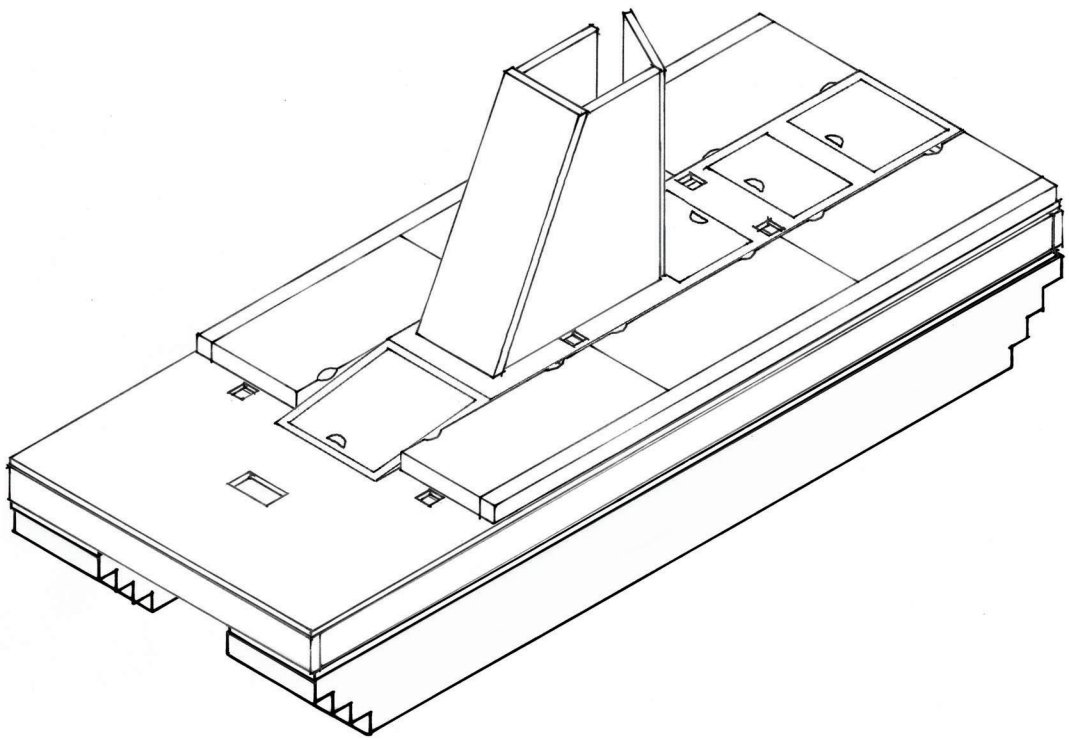


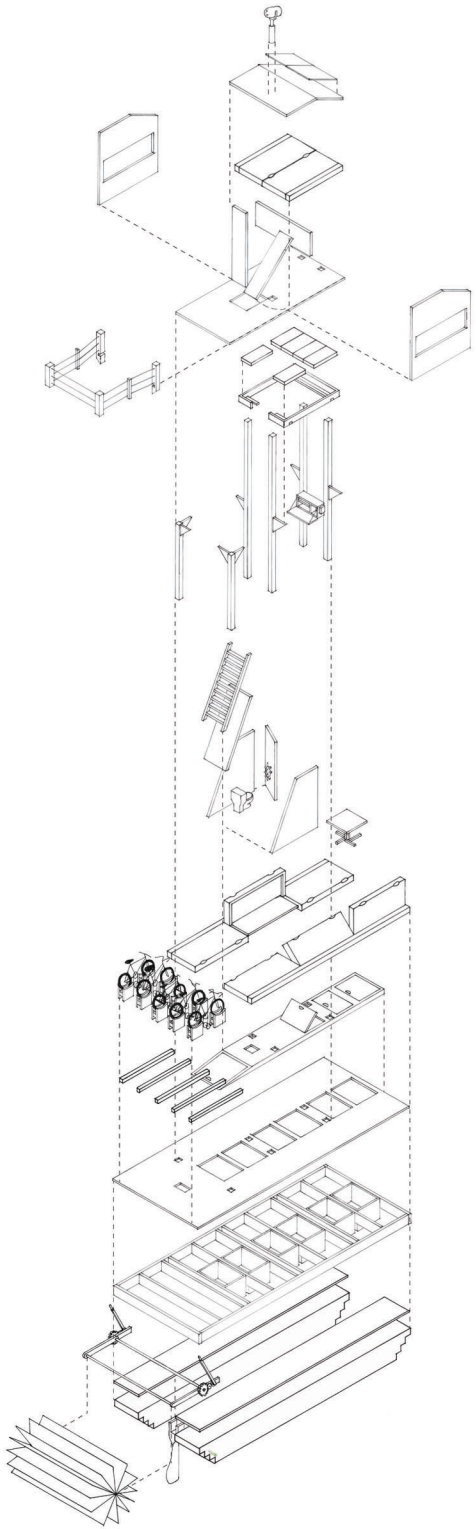


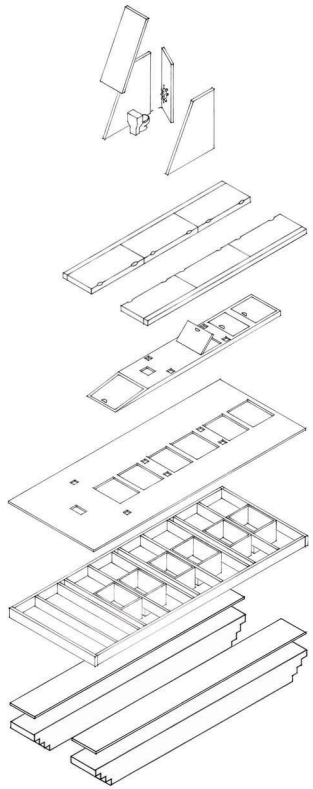


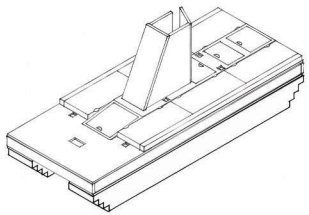


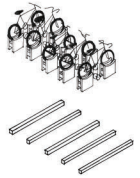


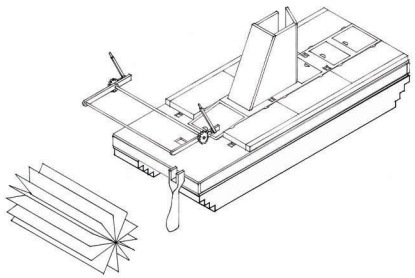


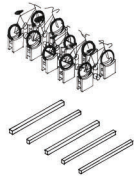


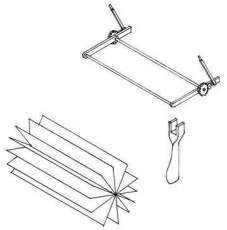


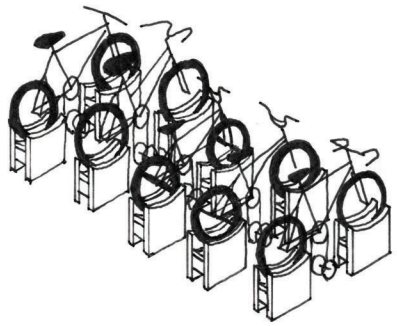


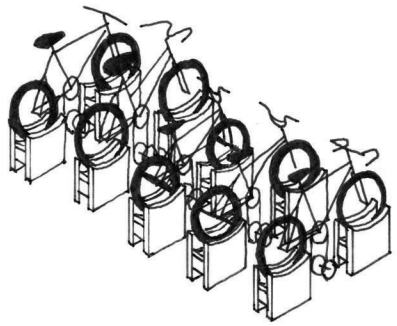


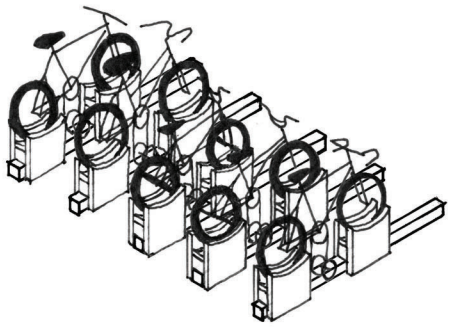


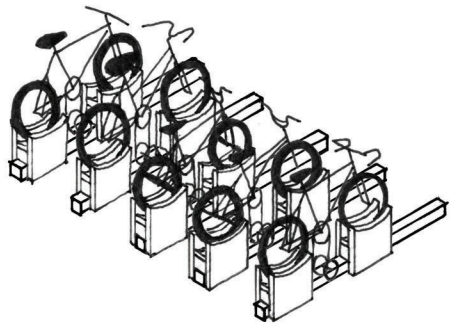


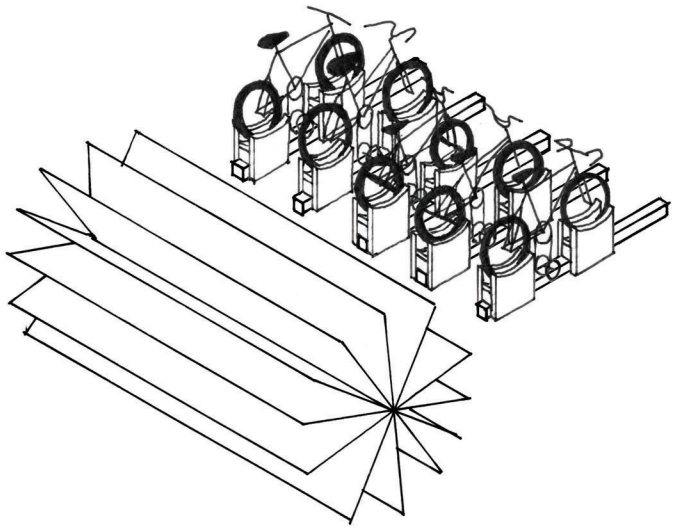


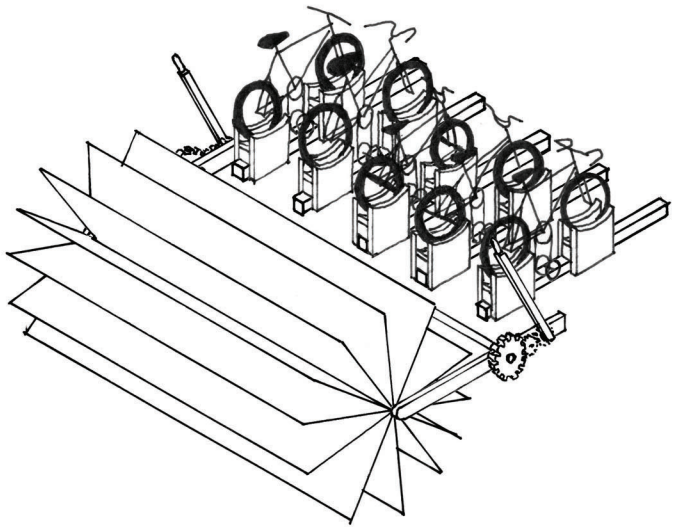


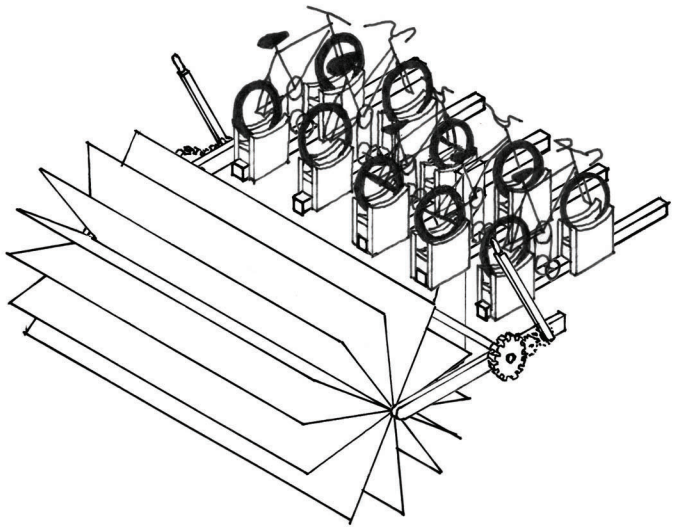


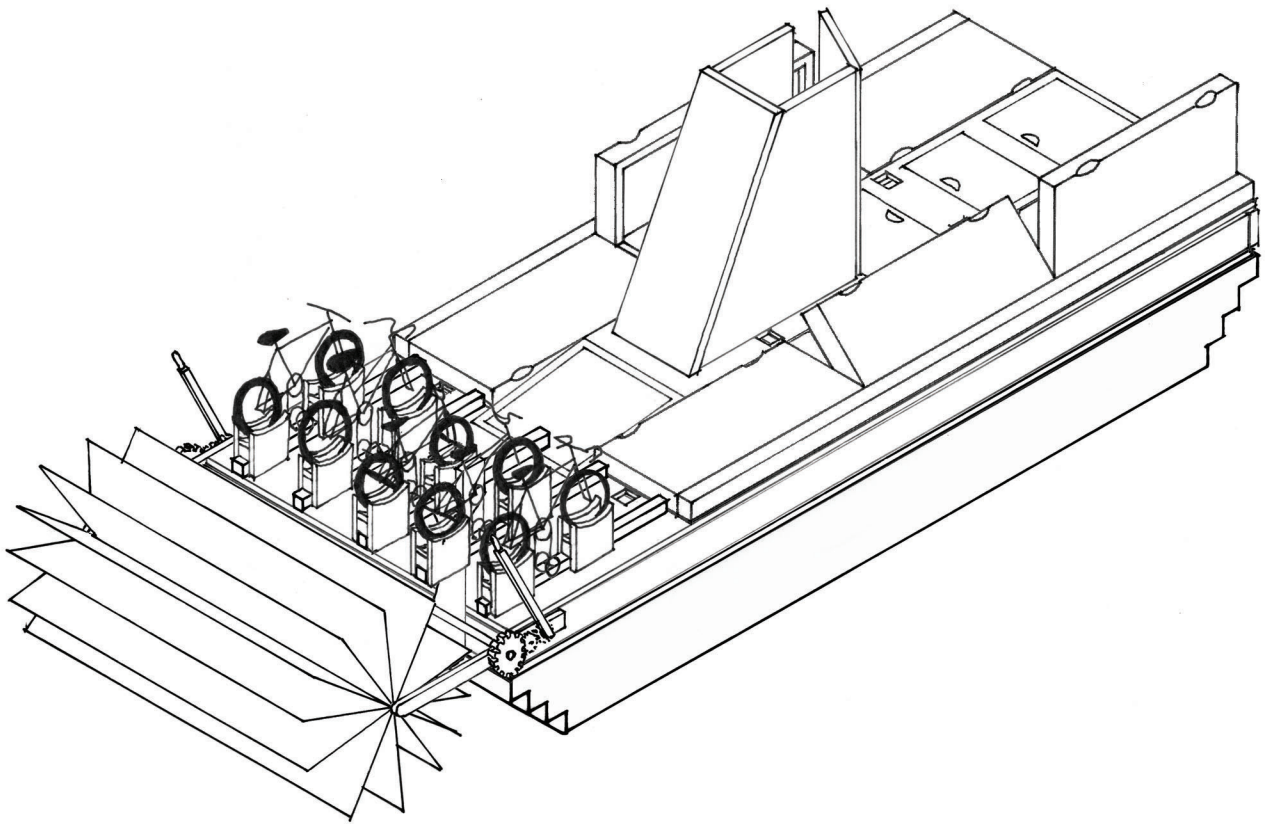


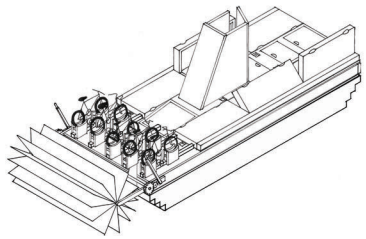


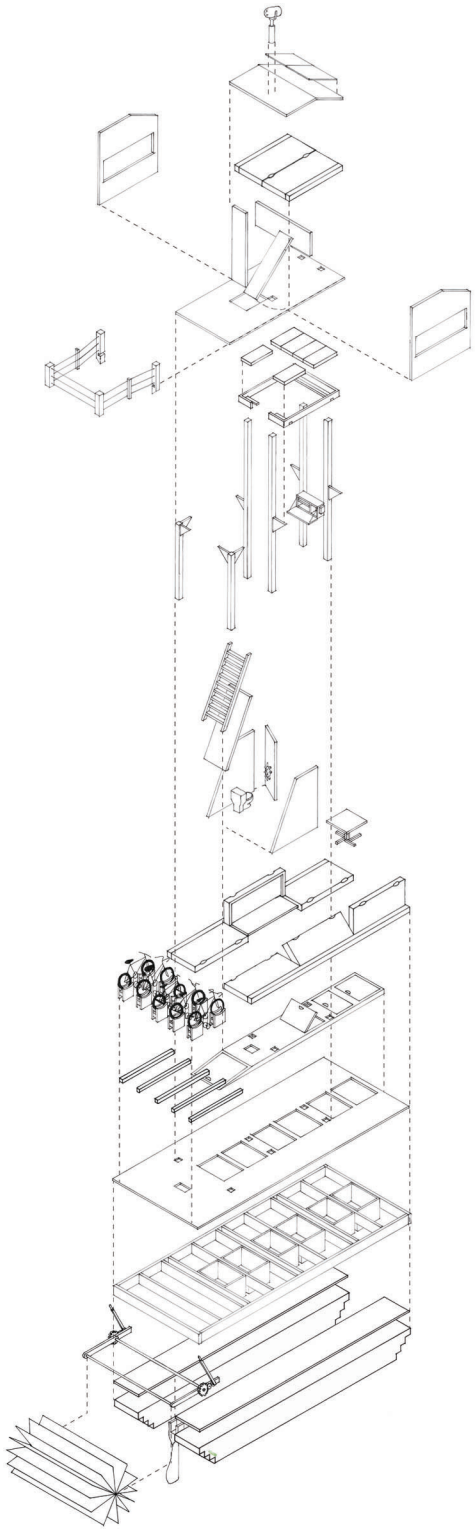


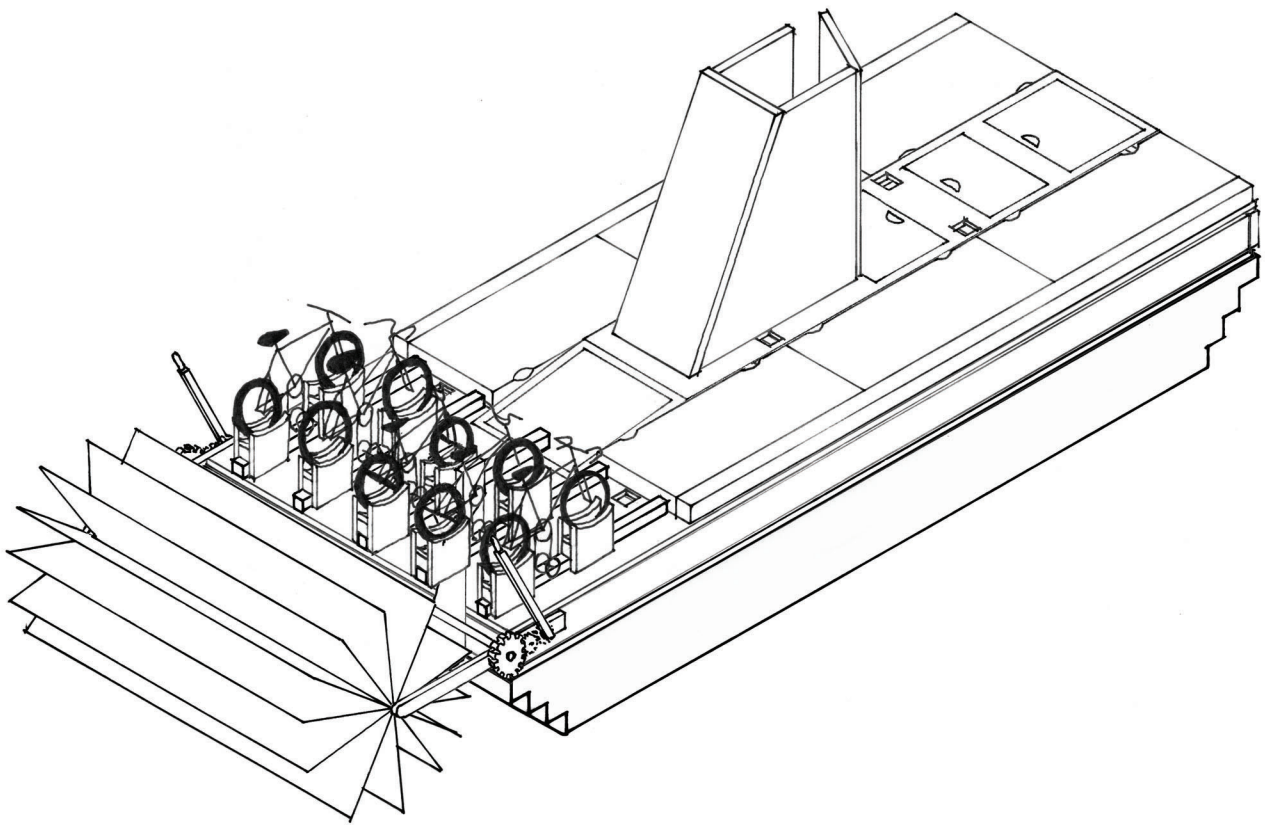


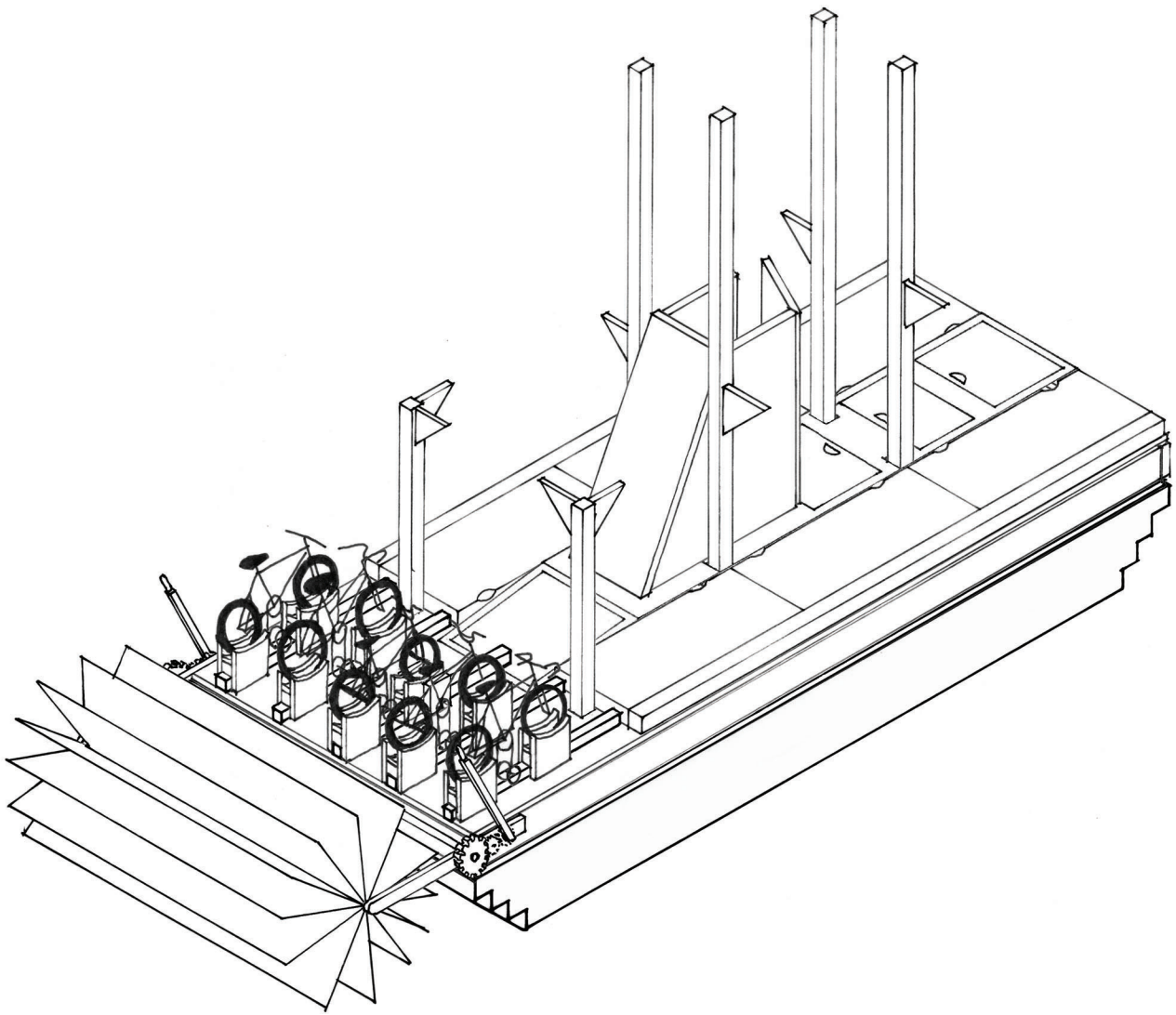


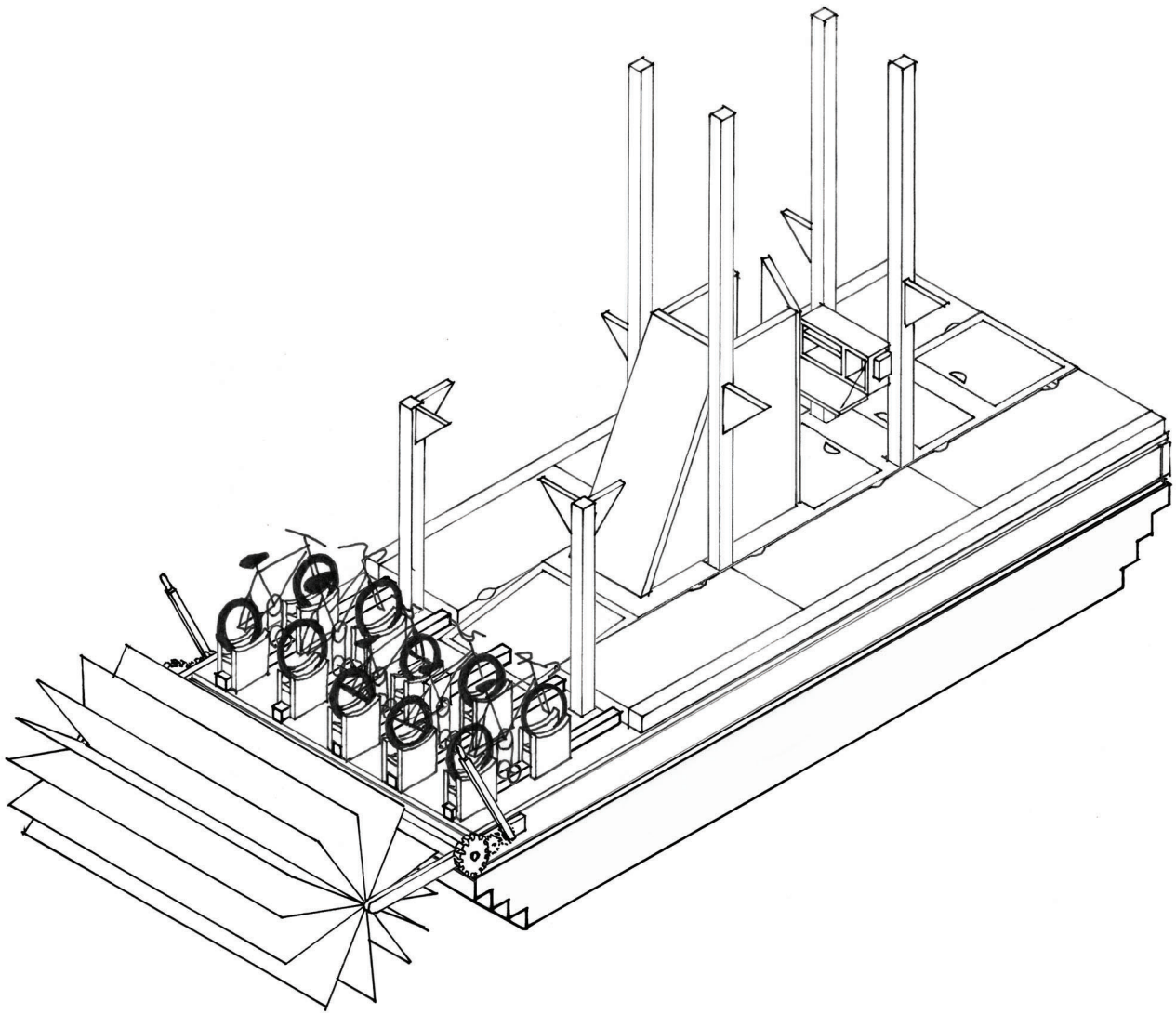












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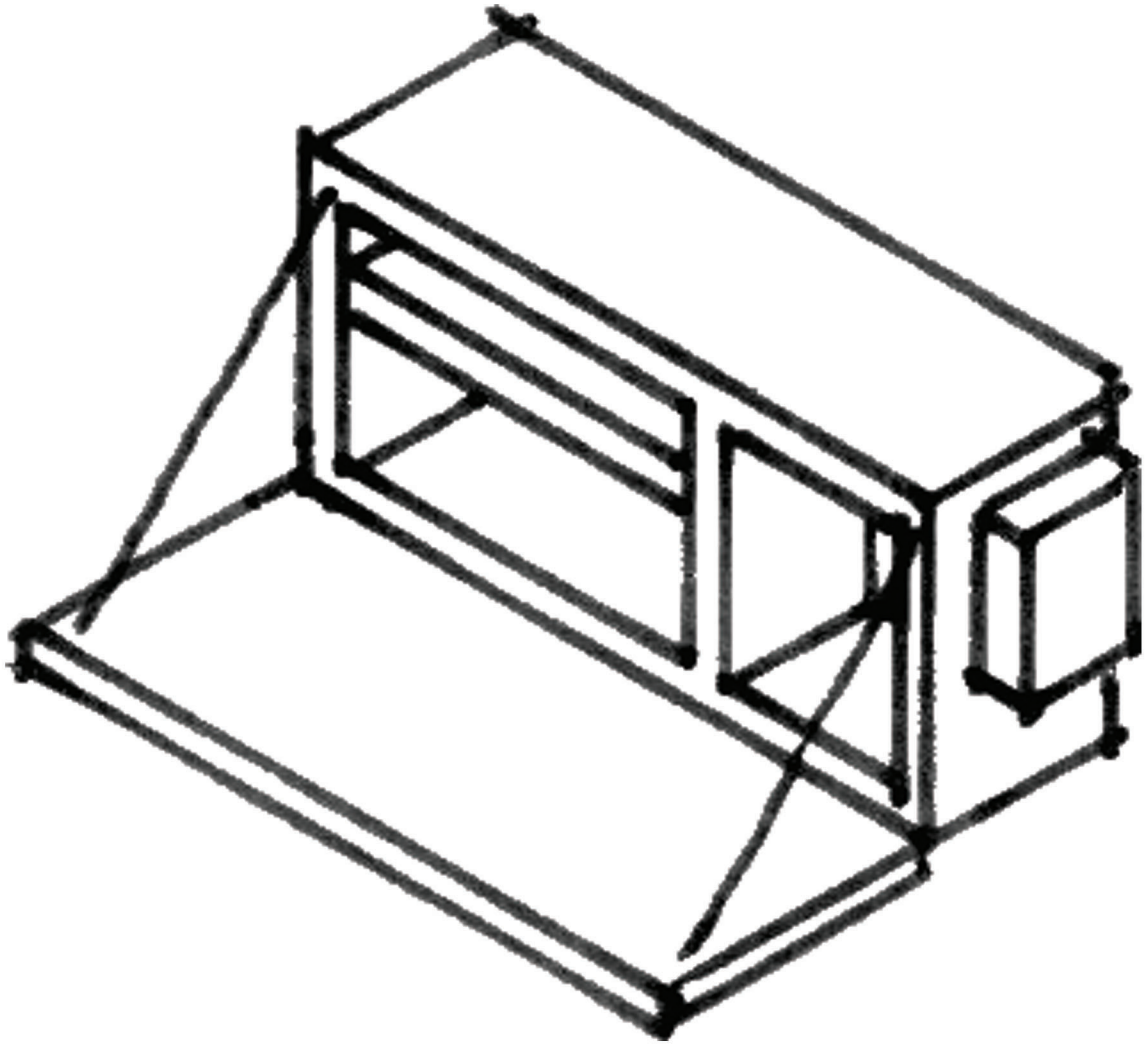

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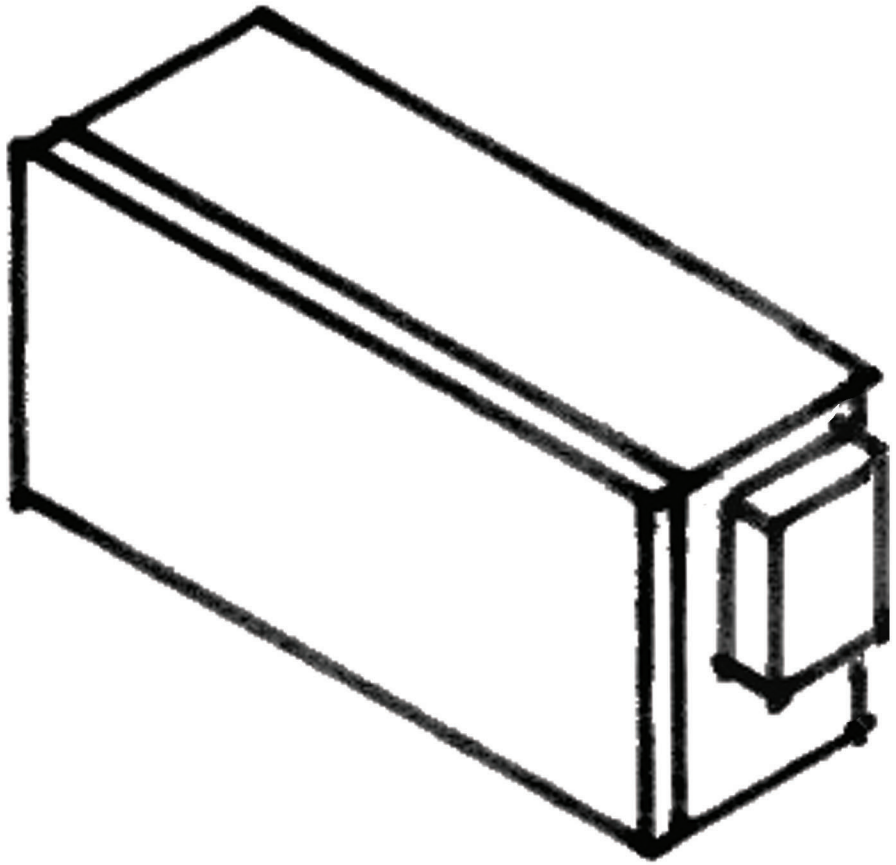

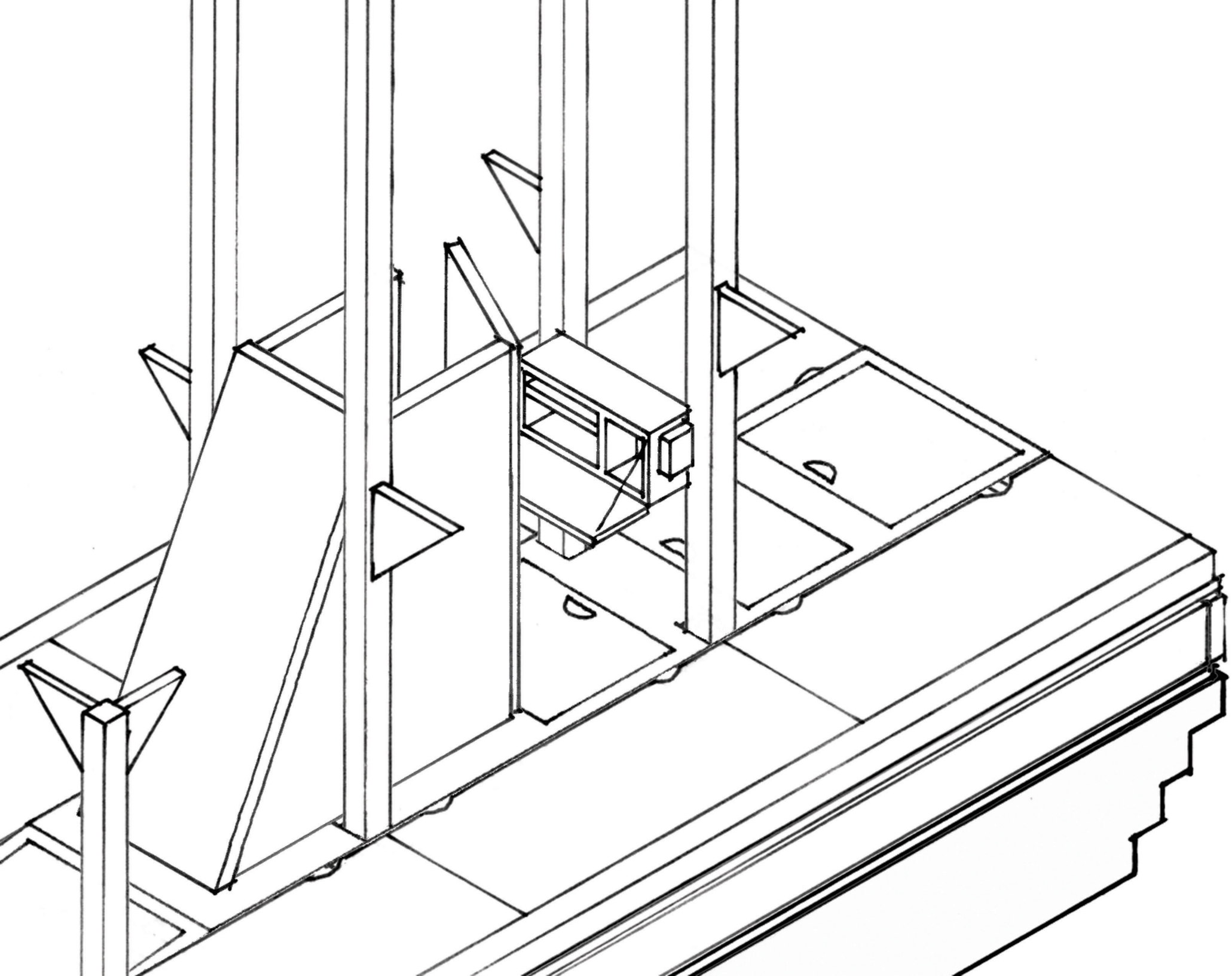

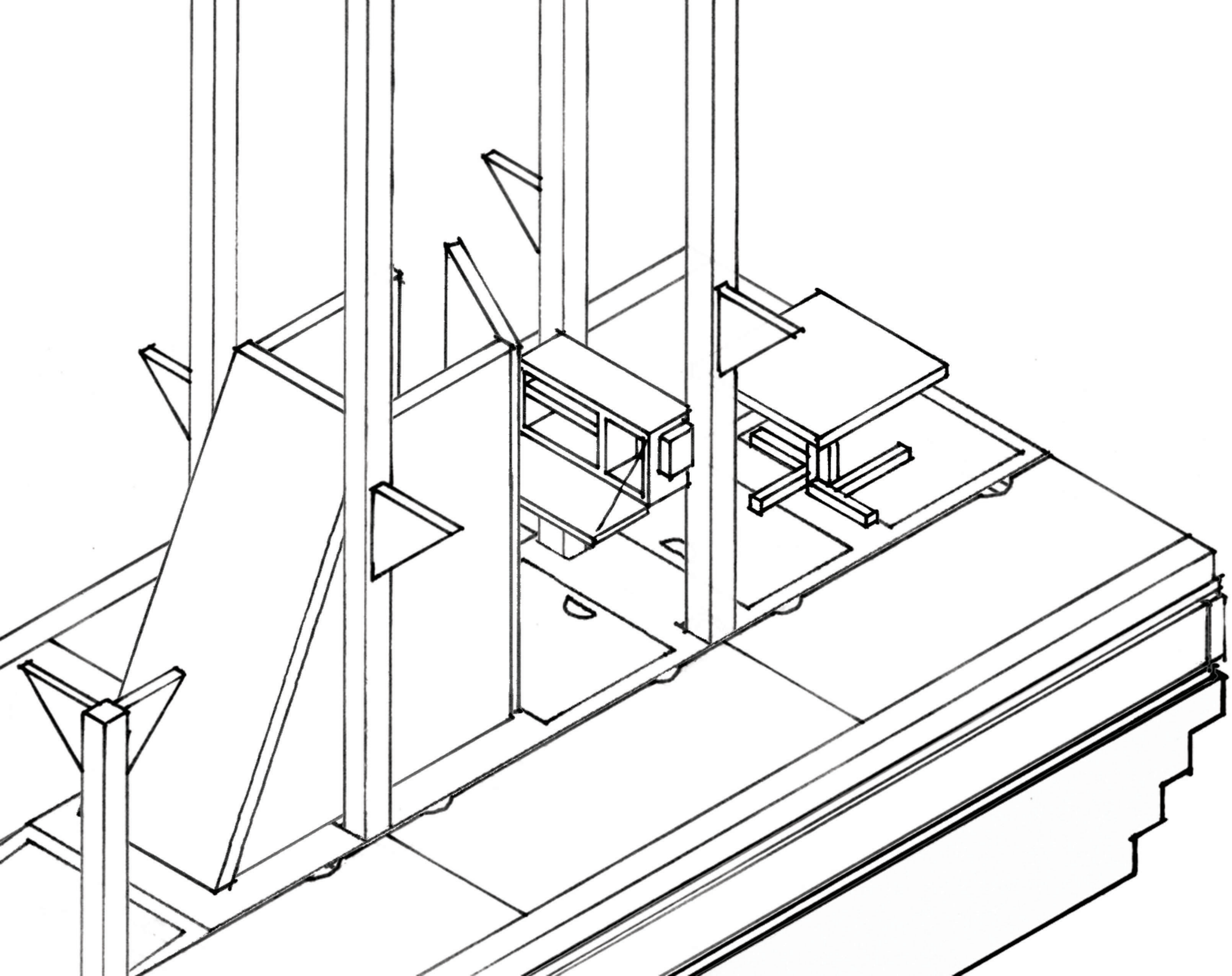

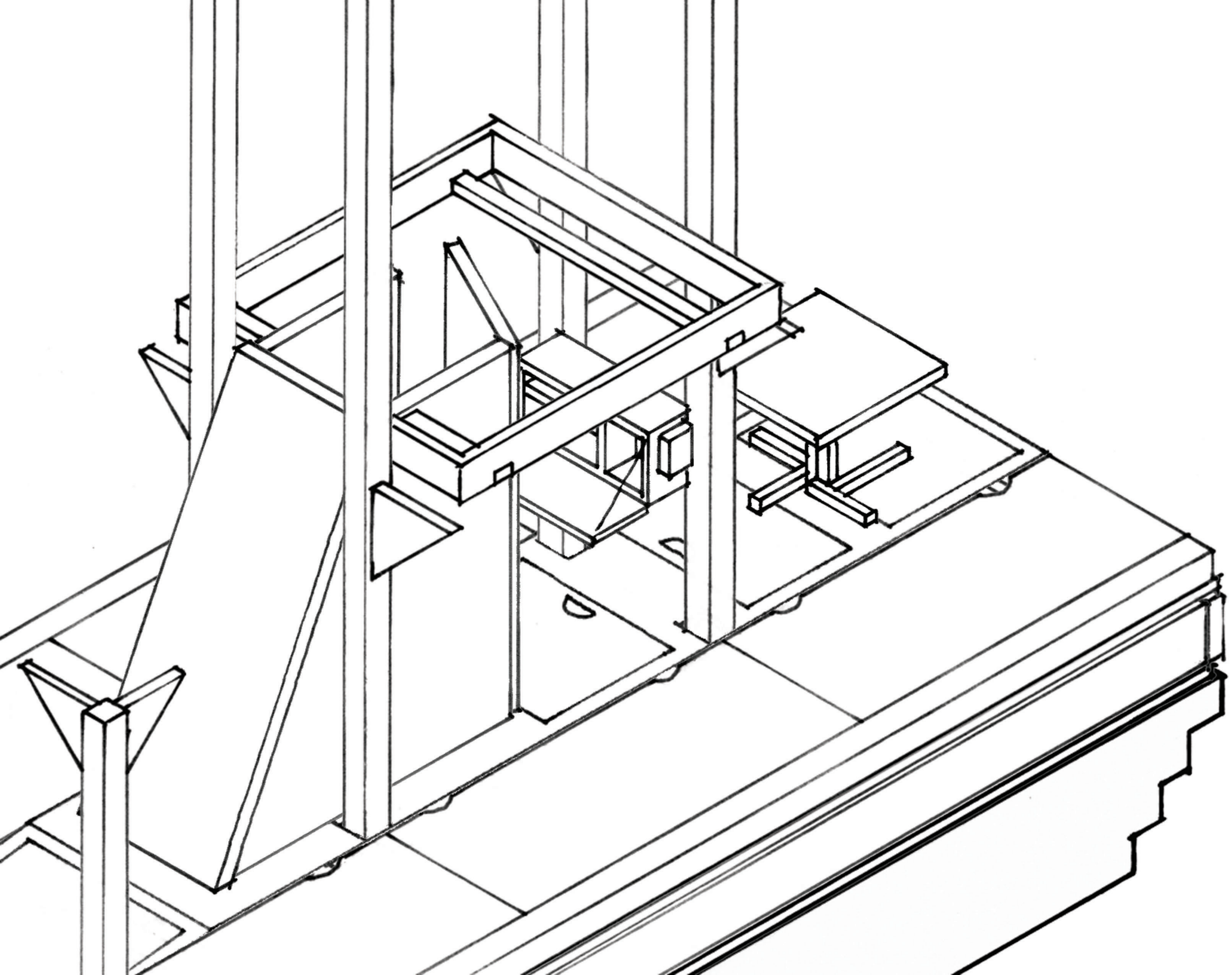

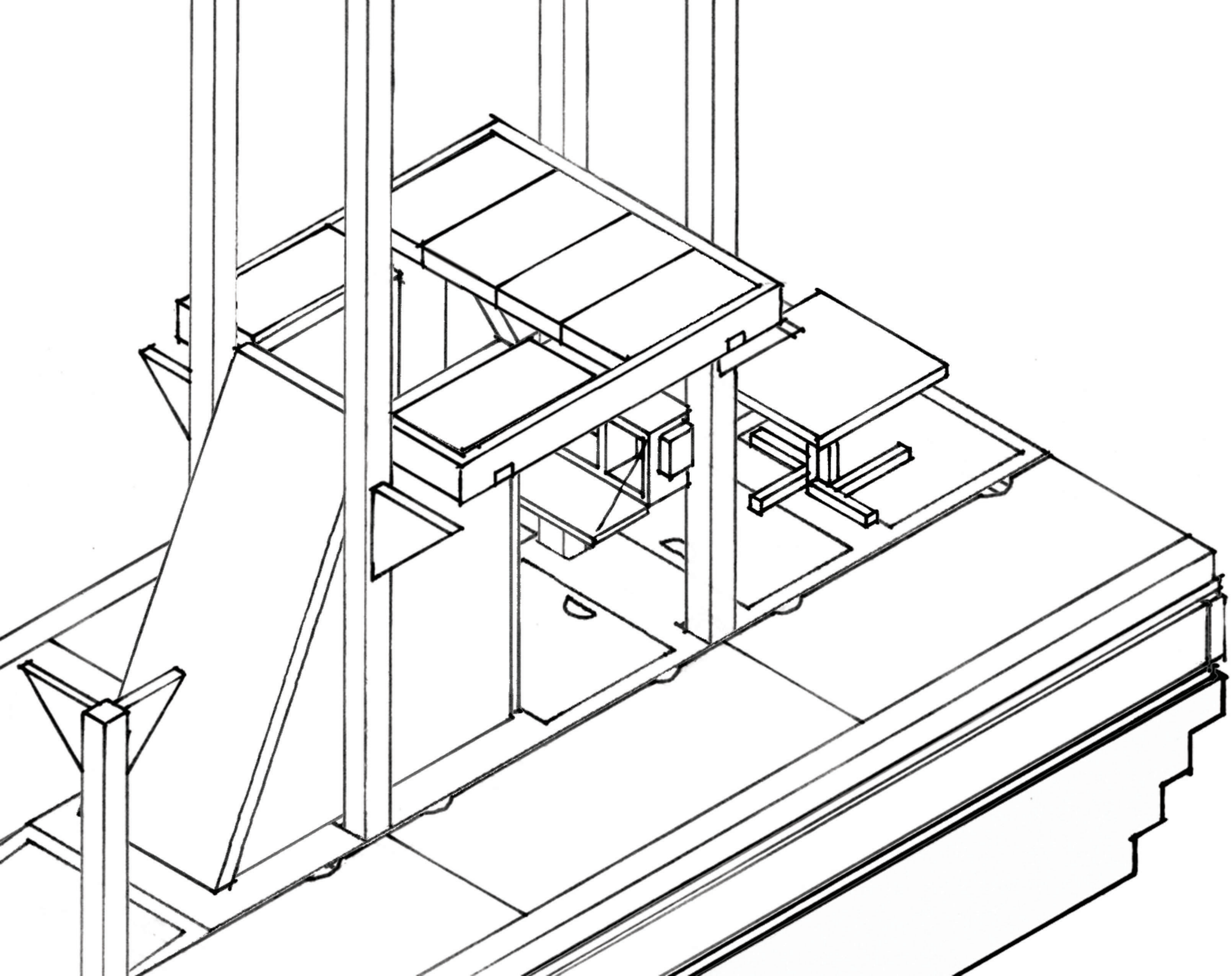

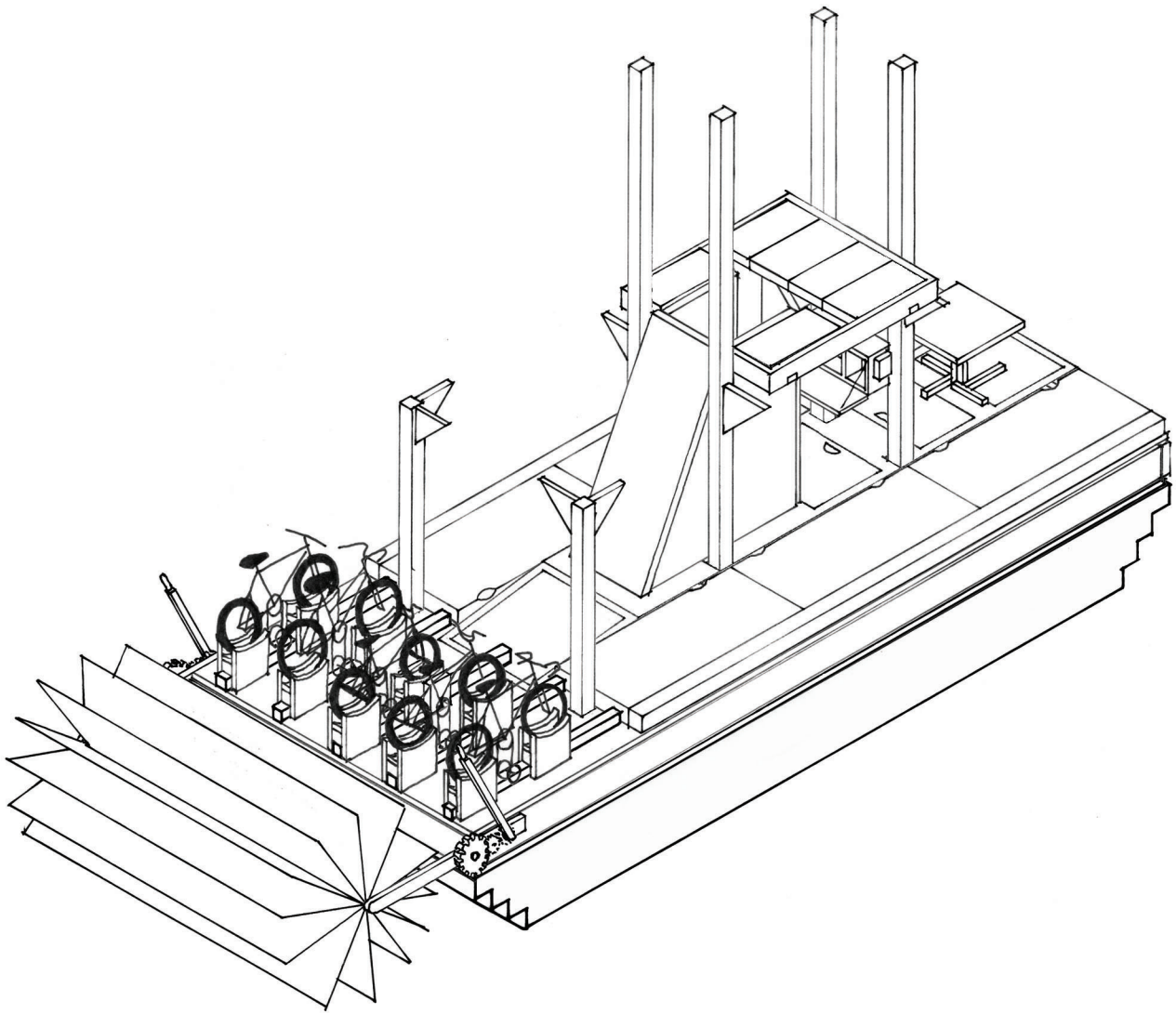

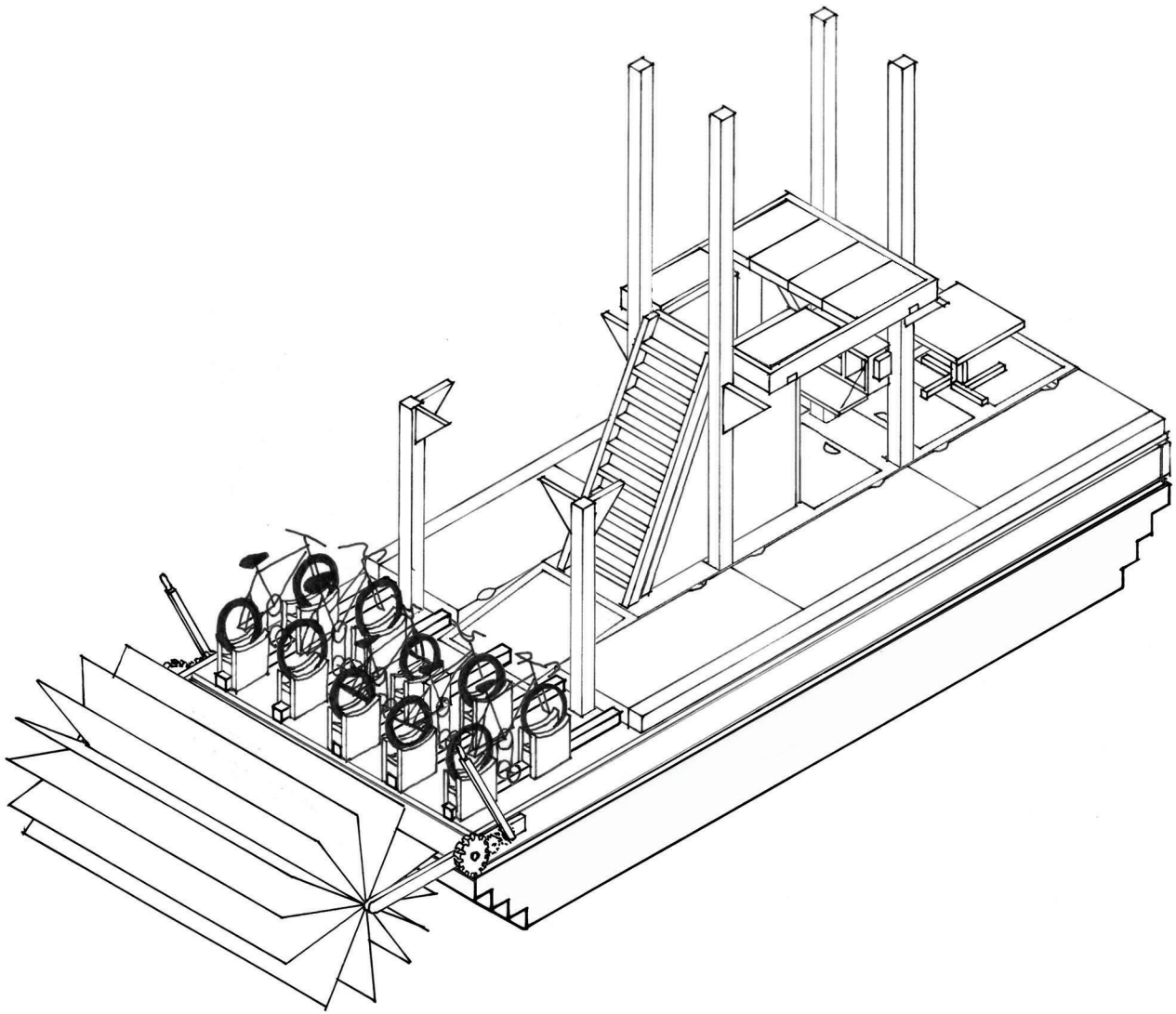

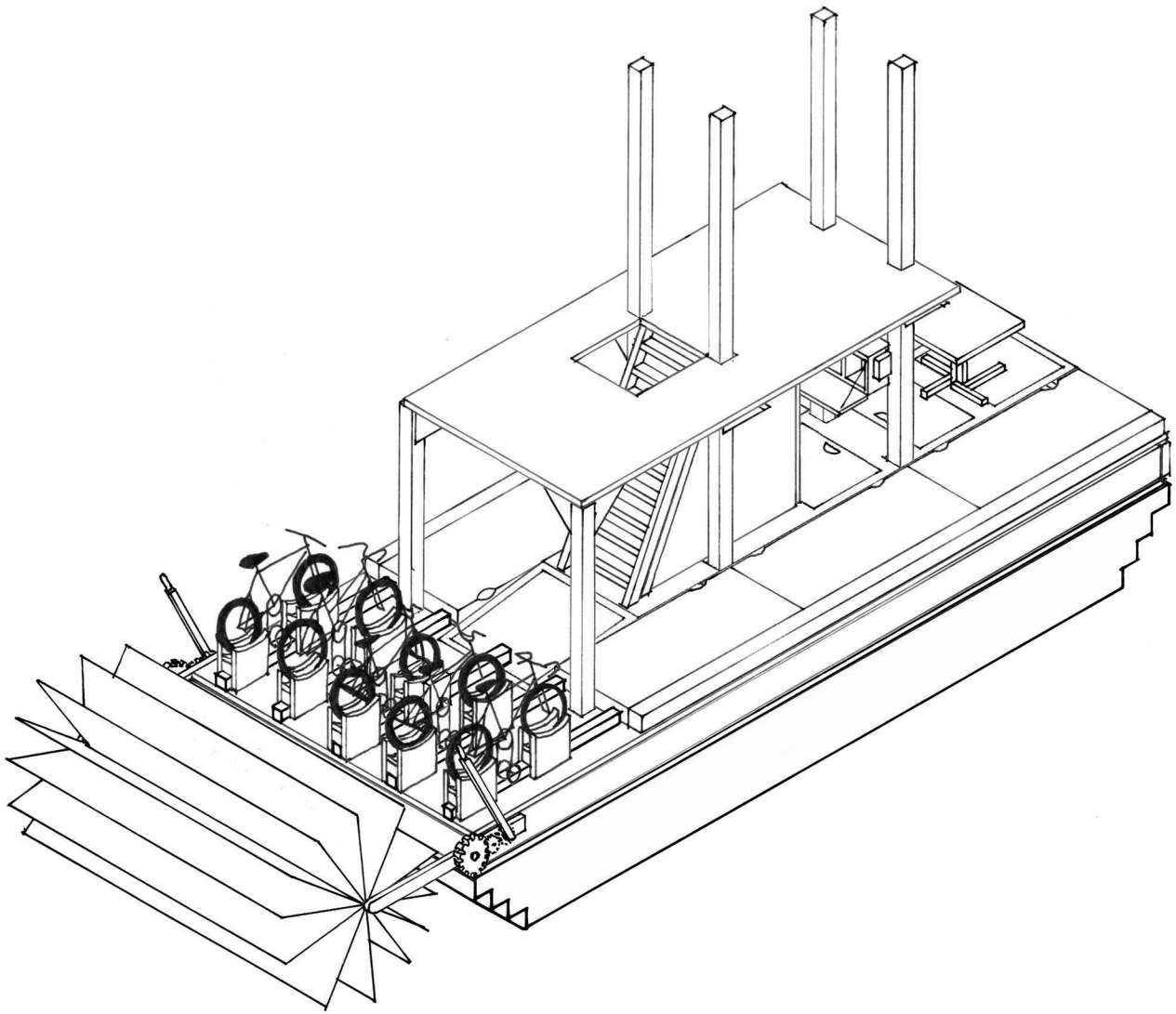

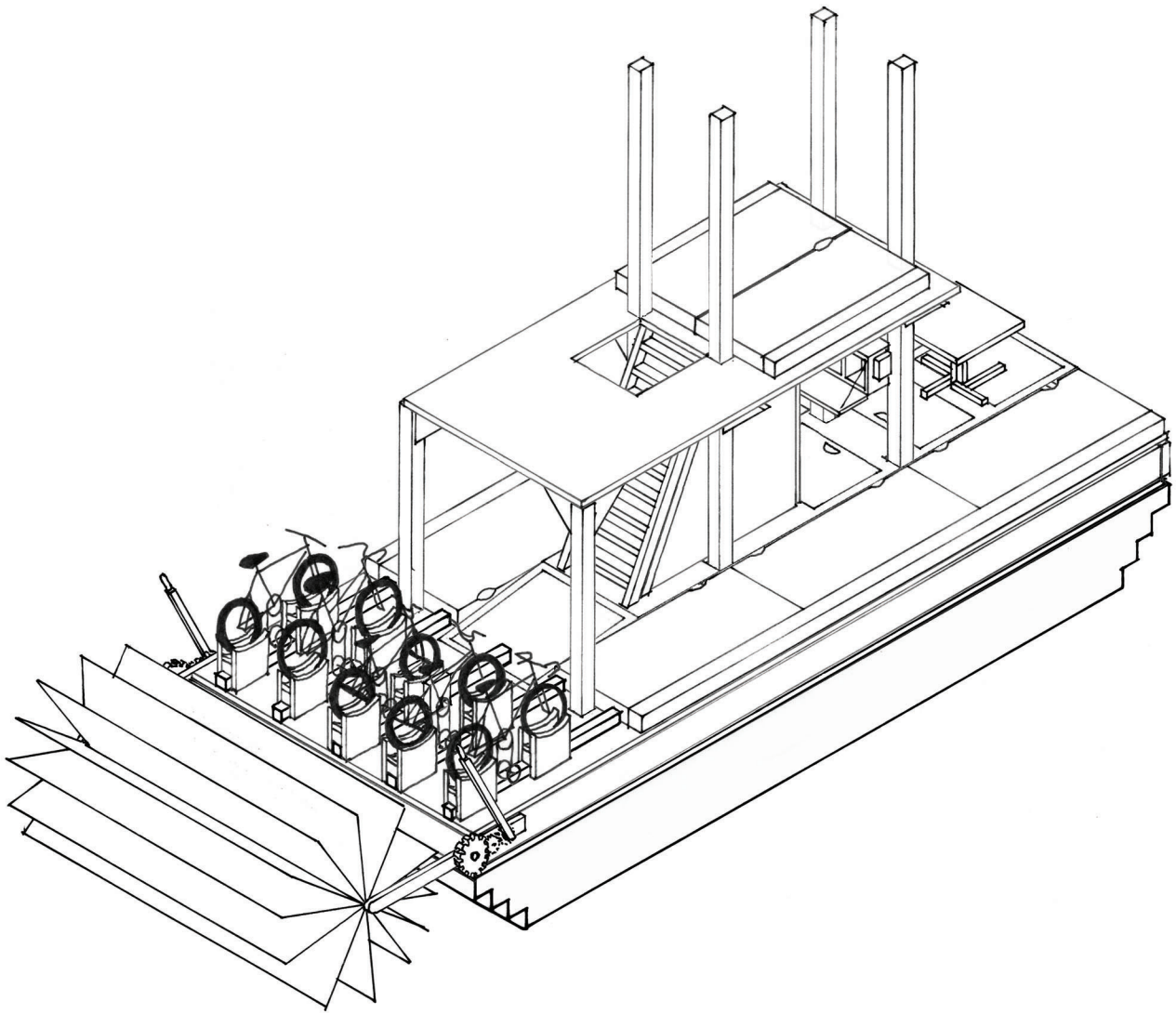

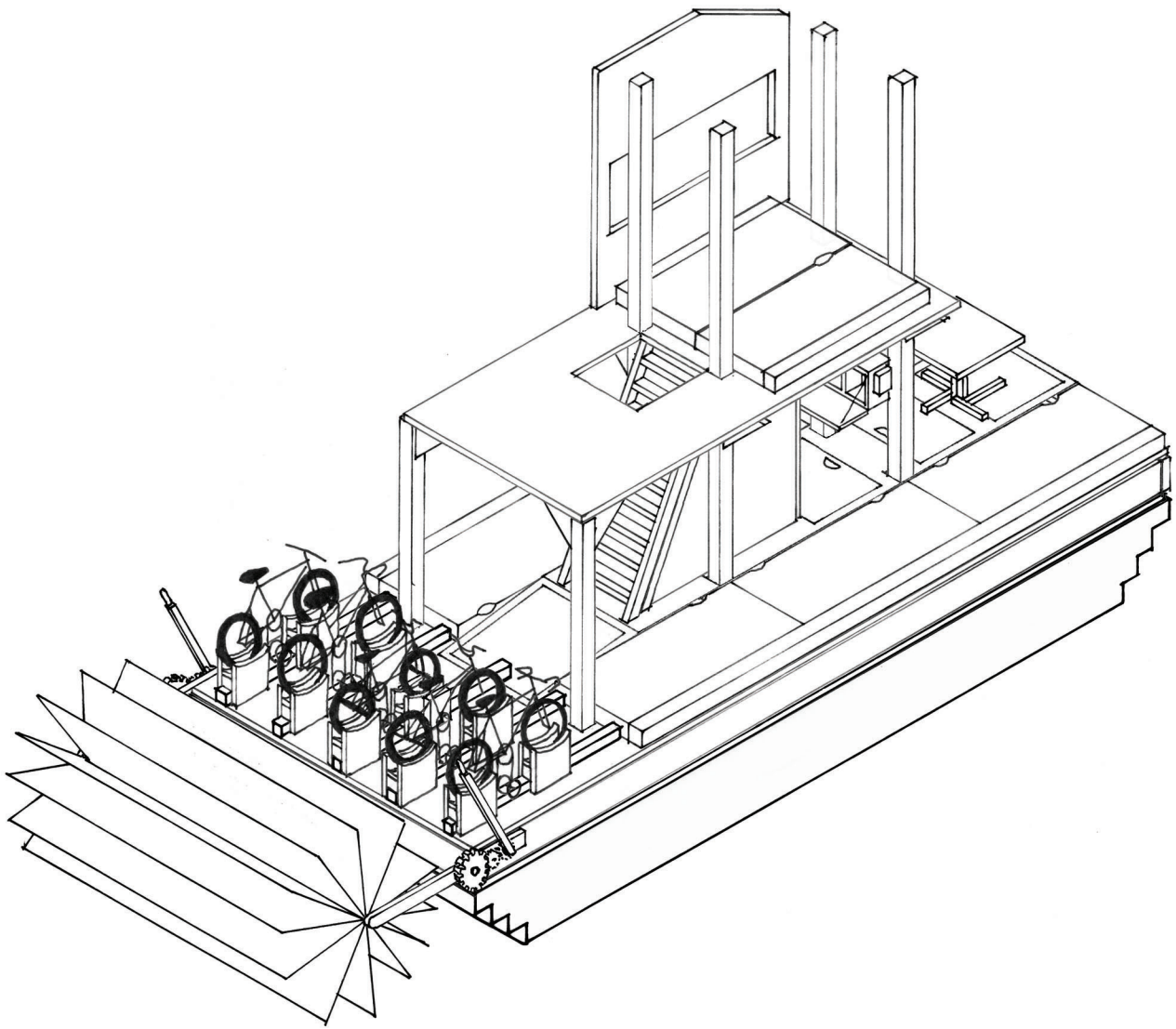

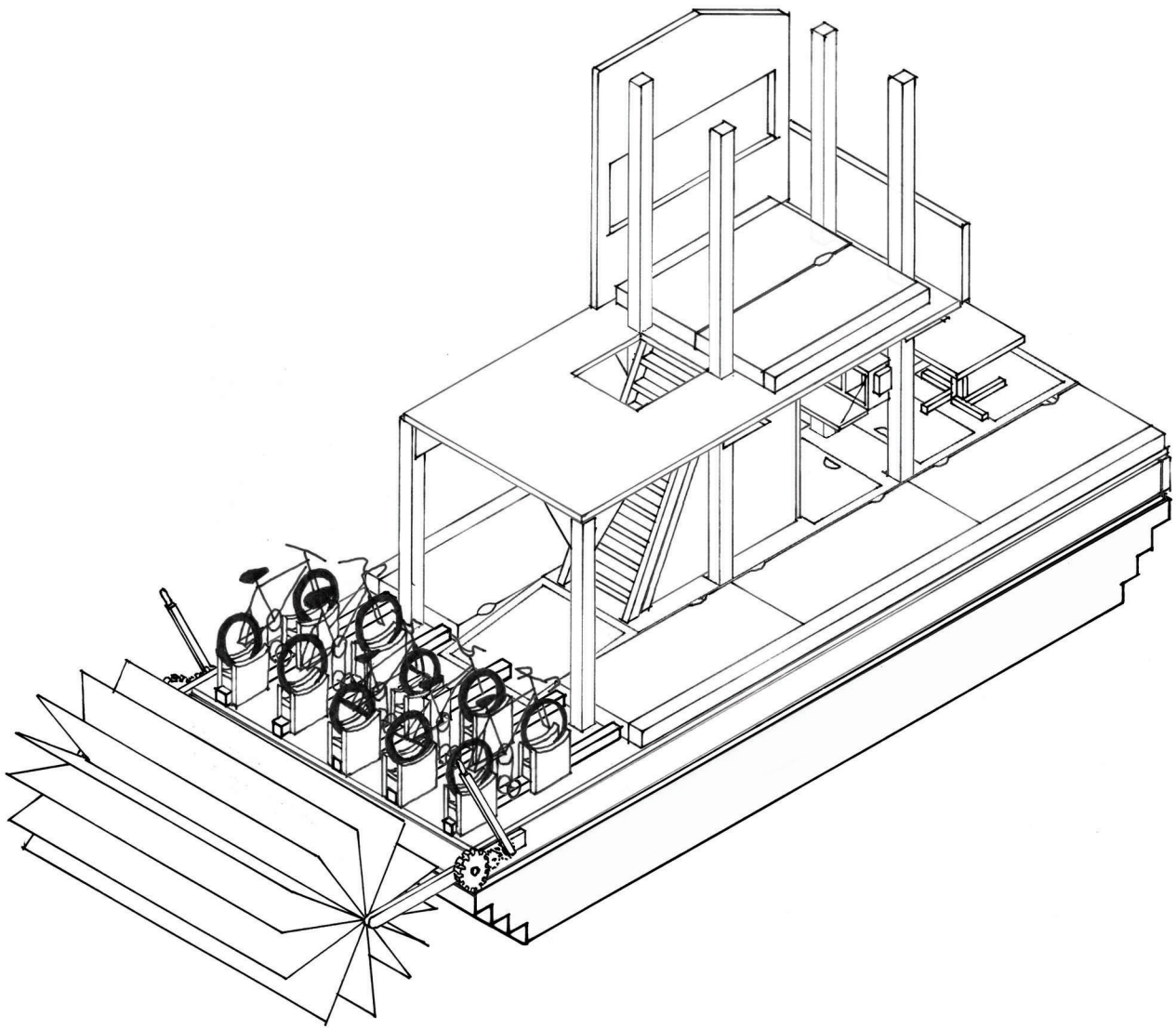

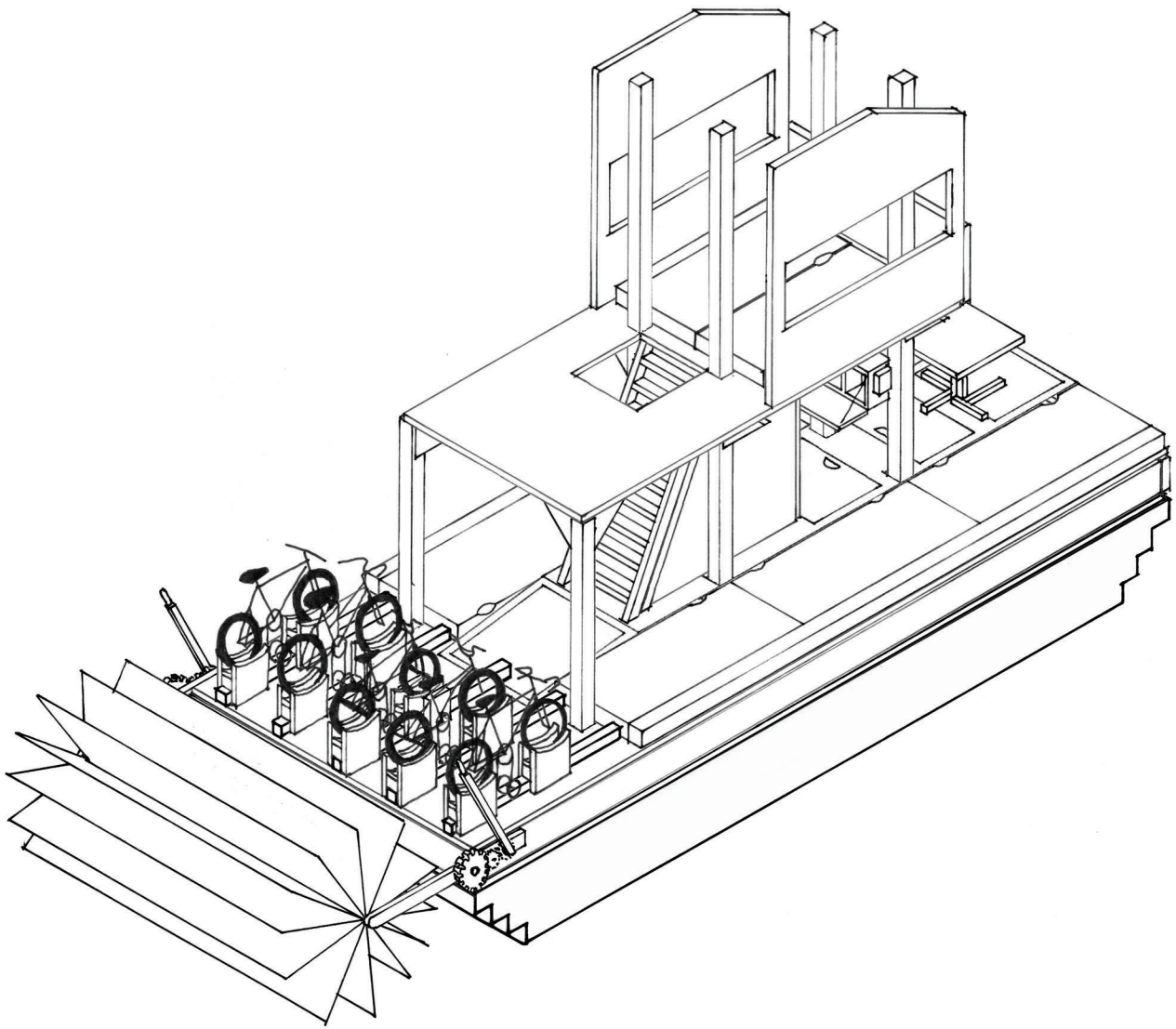

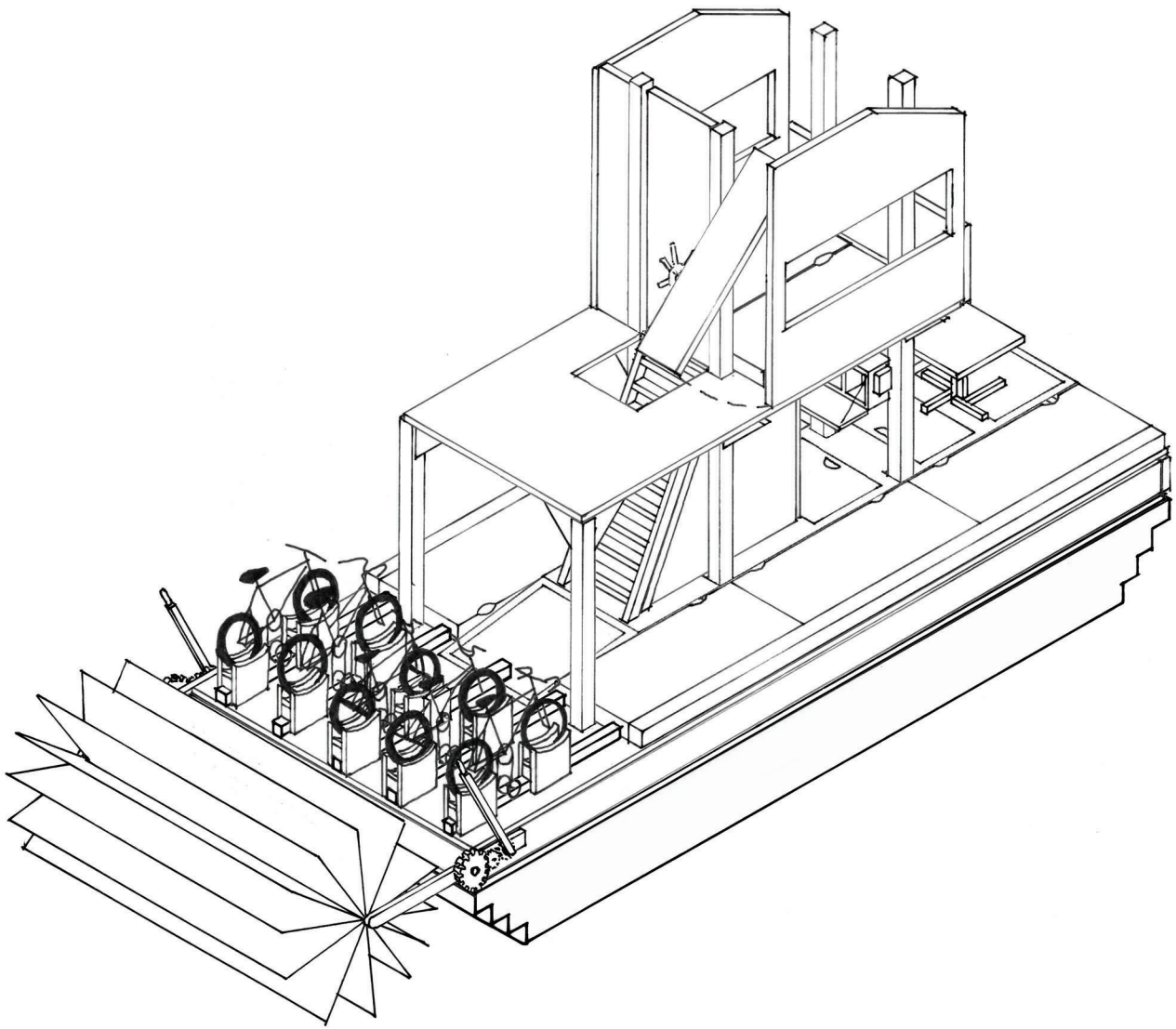

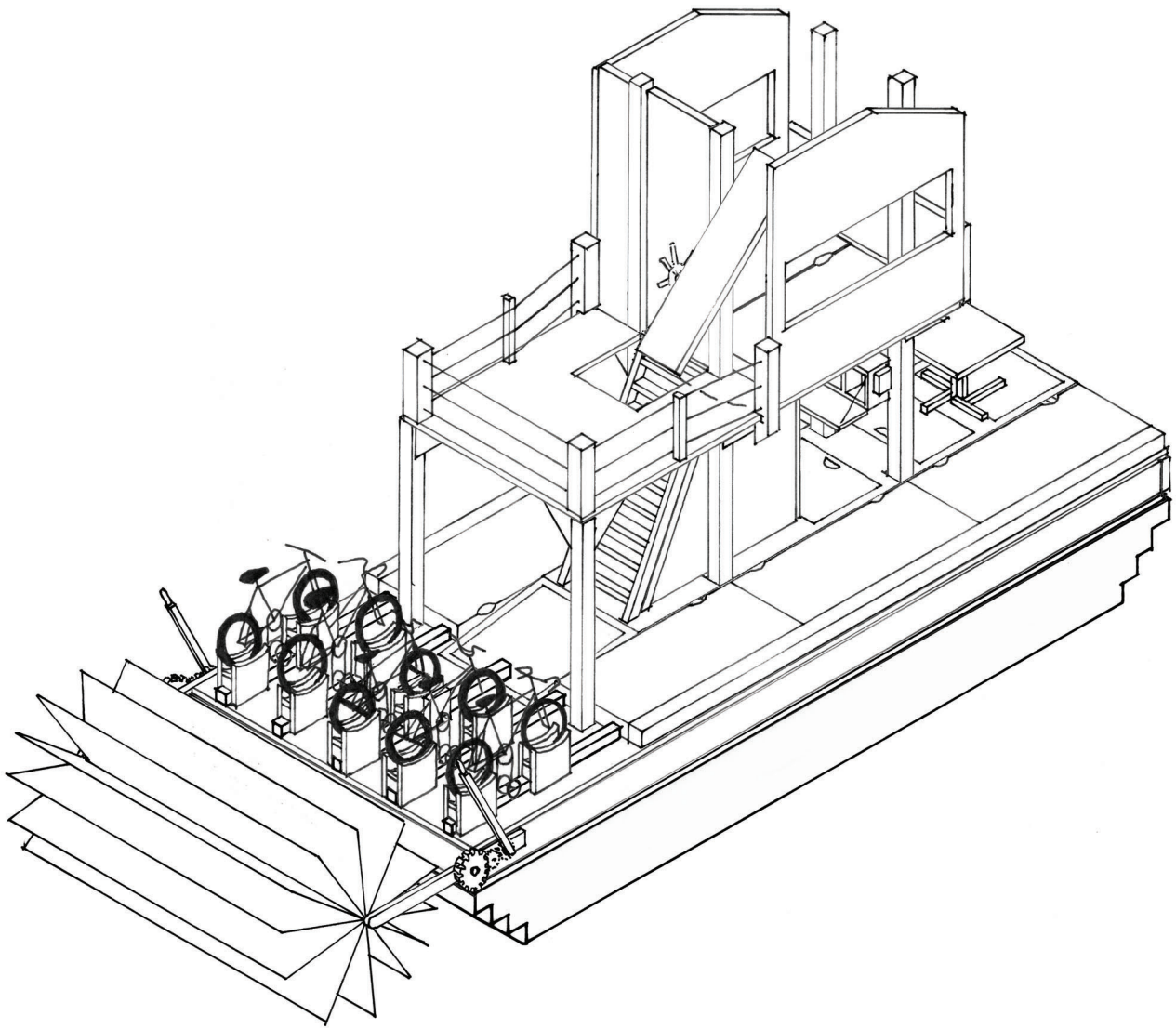

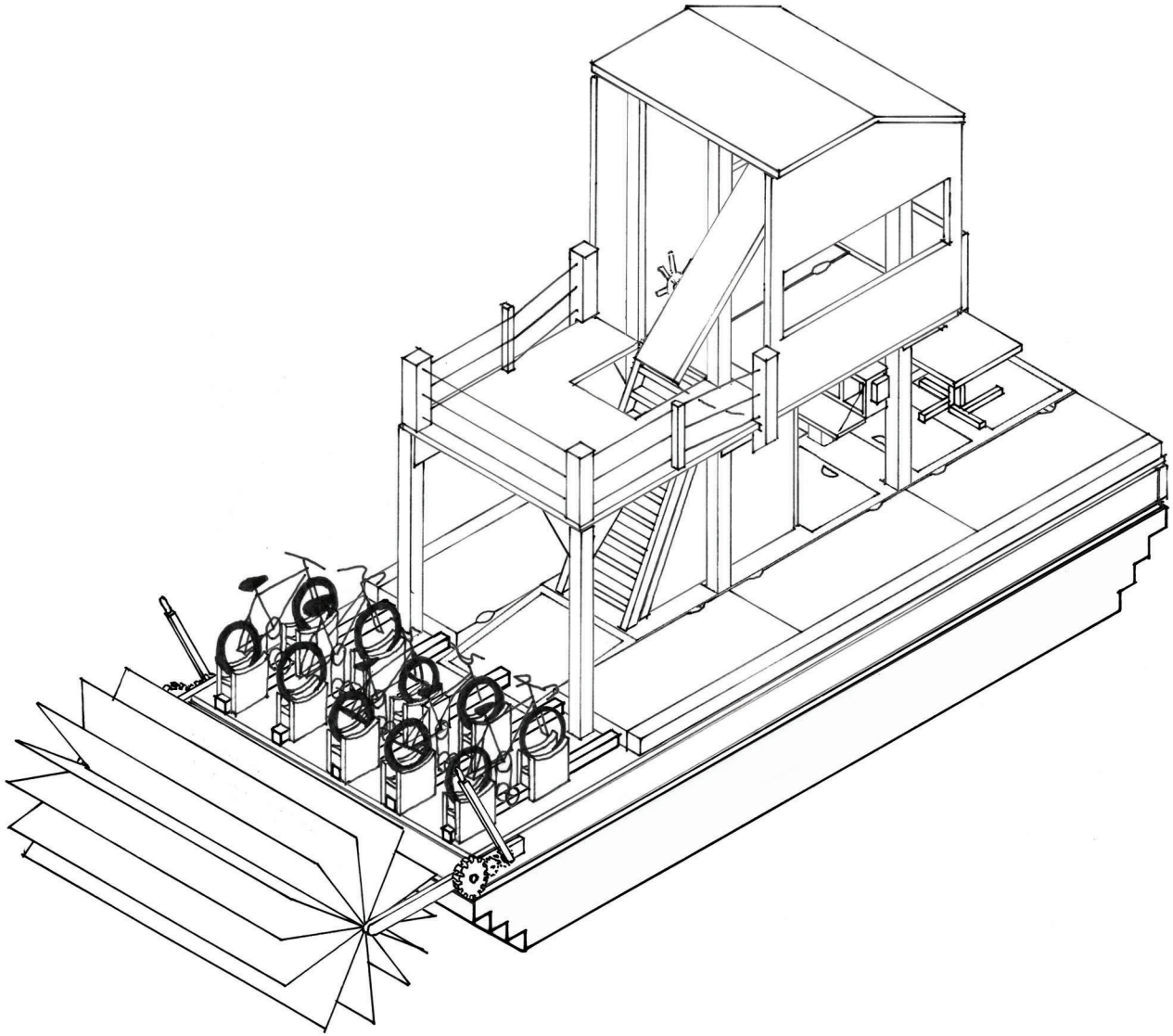

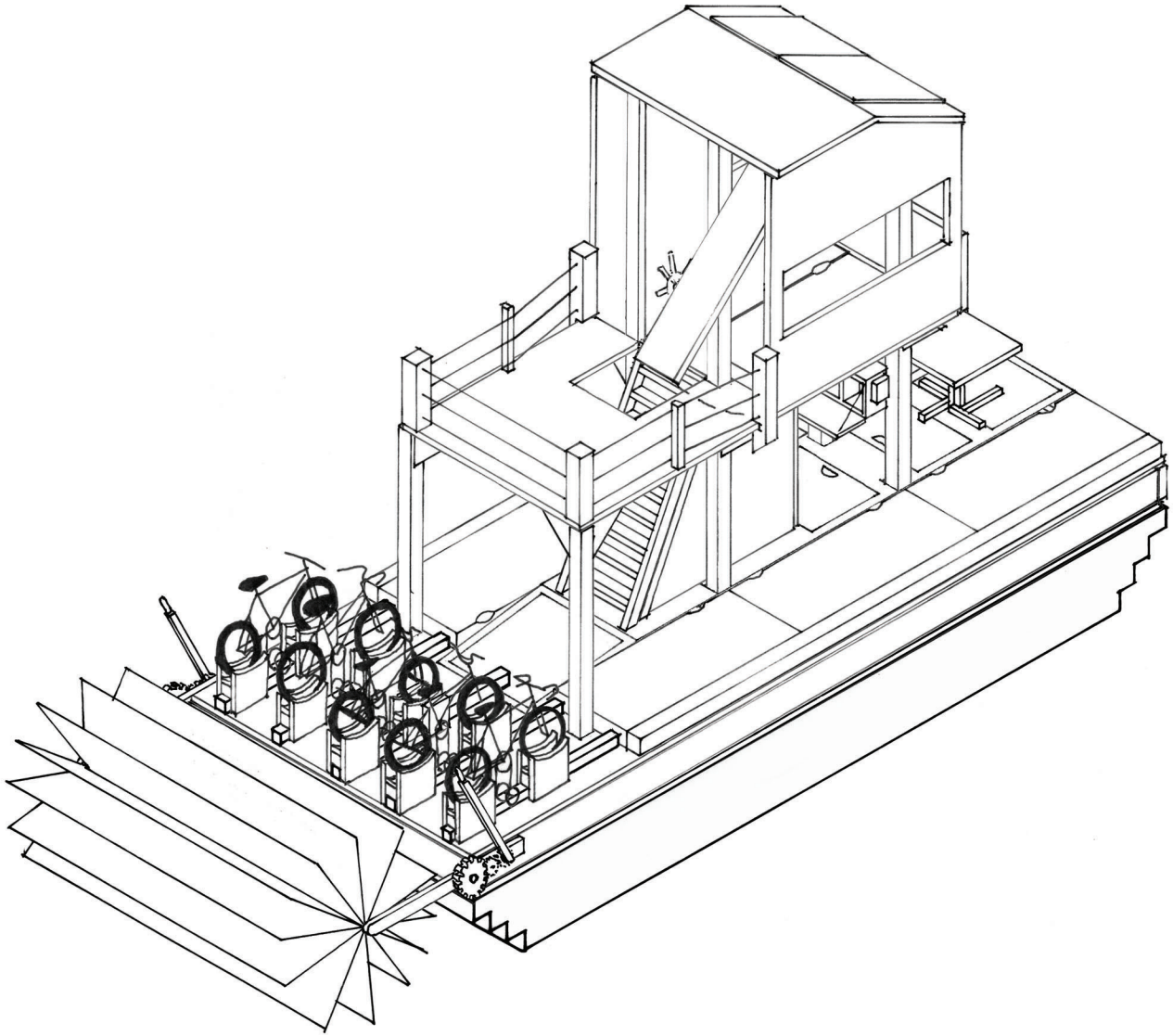

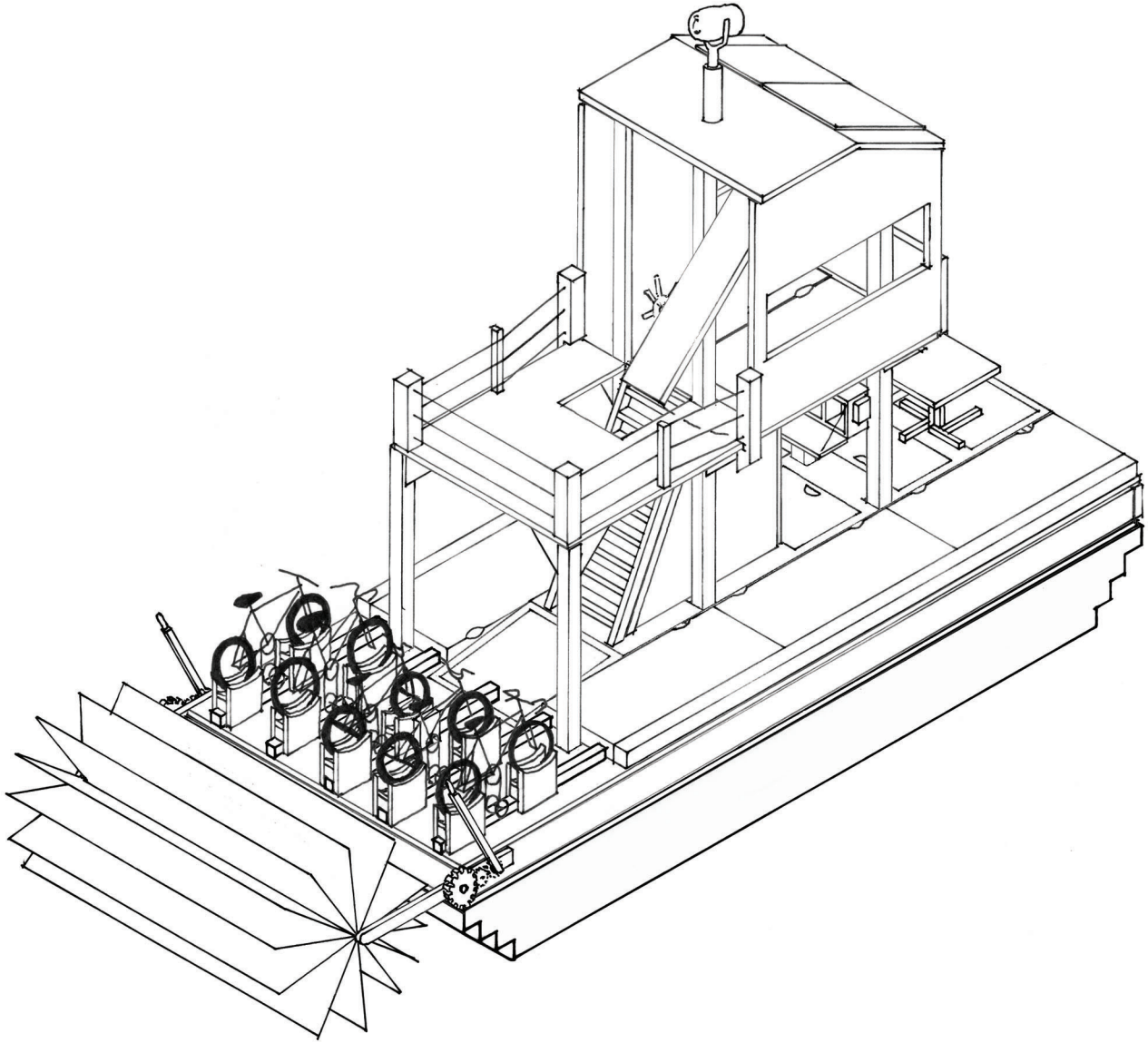

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“Go forth and be bold.”
-Darryl Booker