

The image features a white background with a black silhouette of a grassy hill at the bottom. On the left, there are two trees and several children in various playful poses, such as jumping and running. Two birds are flying in the sky above the trees. The text is centered on the white background.

Learning

to **PLAY** in **Nature**

An Urban Playground for Adolescents

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Design Thesis 2013
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How can design support and encourage **children** to be more active and mentally engaged while promoting a **healthy lifestyle** in an urban area?



WHY?

Why focus on children's education and physical activity in an urban area?



LESS THAN **25%**
OF HIGH SCHOOLERS
TAKE **DAILY** GYM CLASSES

CHILDREN SPEND AN AVERAGE OF
7.5 hours
A DAY USING ENTERTAINMENT MEDIA



NATURE-DEFICIT DISORDER: 
the combined *psychological, physical, and cognitive* costs
we suffer due to our *alienation from nature*, especially
affecting children in vulnerable developing years

CHILDHOOD OBESITY IS AN **EPIDEMIC**
Since 1980, childhood obesity rates have **TRIPLED!**

1 in 3
AMERICAN CHILDREN



Causes



Parental fears



Restricted access to natural areas



Increasing consumption of
electronic media

Costs

Attention and mood
disorders

Lower Grades

Obesity

Limited respect for the
environment

If current trends continue, more than **85%** of adults in the
United States will be overweight or obese by the year **2030**.

"Modern day playgrounds aren't interesting for kids. As a result, they are fueling an INCREASE in sedentary lifestyles, accelerating childhood obesity rates and obesity-related diseases such as diabetes."

Alex Gilliam, director of The Public Workshop

Stages of Cognitive Development

As much as some people would like to believe and society has tried to project, children are not little adults. Until the age of 15 or so, they are not capable of reasoning as an adult.

The human brain is not fully developed until late adolescence or in the case of males, sometimes early adulthood. We often expect children to think like adults when they are not yet capable of doing so.

It is important when designing for children to know what to expect from each age group regarding their intellectual abilities and how they develop.

Developmental Changes

Infants learn things continue to exist even though they cannot be seen ~ **Object Permanence**

Learning they are **separate beings** from other people and objects around them

Realizing their **actions** cause things to **happen** around them

Learning occurs through **assimilation** and **accommodation**

Developmental Changes

At this stage, children tend to be **egocentric** and struggle to see things from the perspective of others

While getting better with **language** and **thinking**, they still tend to think about things in very concrete terms

Developmental Changes

Begin to understand the concept of **conservation** ~ although shape has changed, the amount is the same

Start thinking more logical and **organized** but still very concrete

Begin using **inductive** logic or reasoning from *specific* information to a *general* principle

Developmental Changes

Abstract thoughts begin to emerge

Teens begin to think more about moral, philosophical, ethical, social, and political issues that require **theoretical** and abstract reasoning

Begin to use **deductive** logic or reasoning from a *general* principle to *specific* information

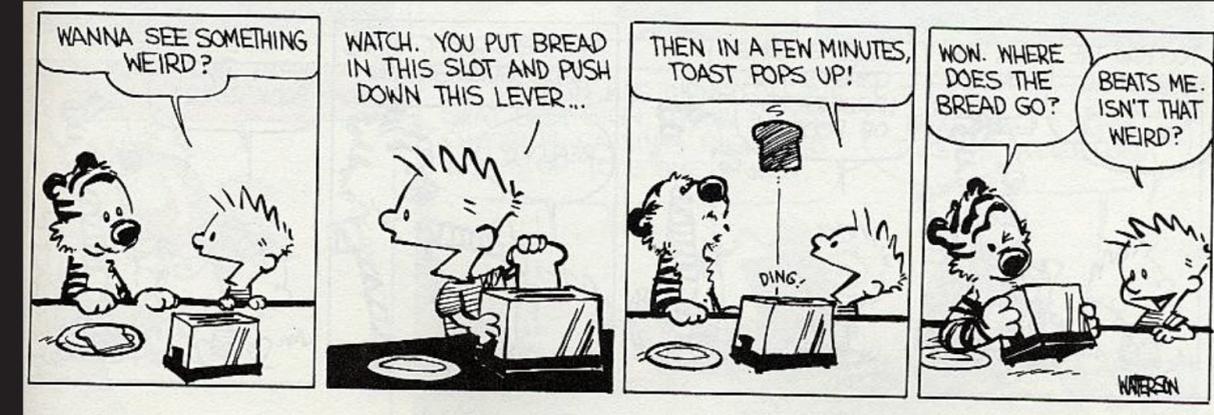


Sensory Motor
0-2

Preoperational
2-7

Concrete Operational
7-12

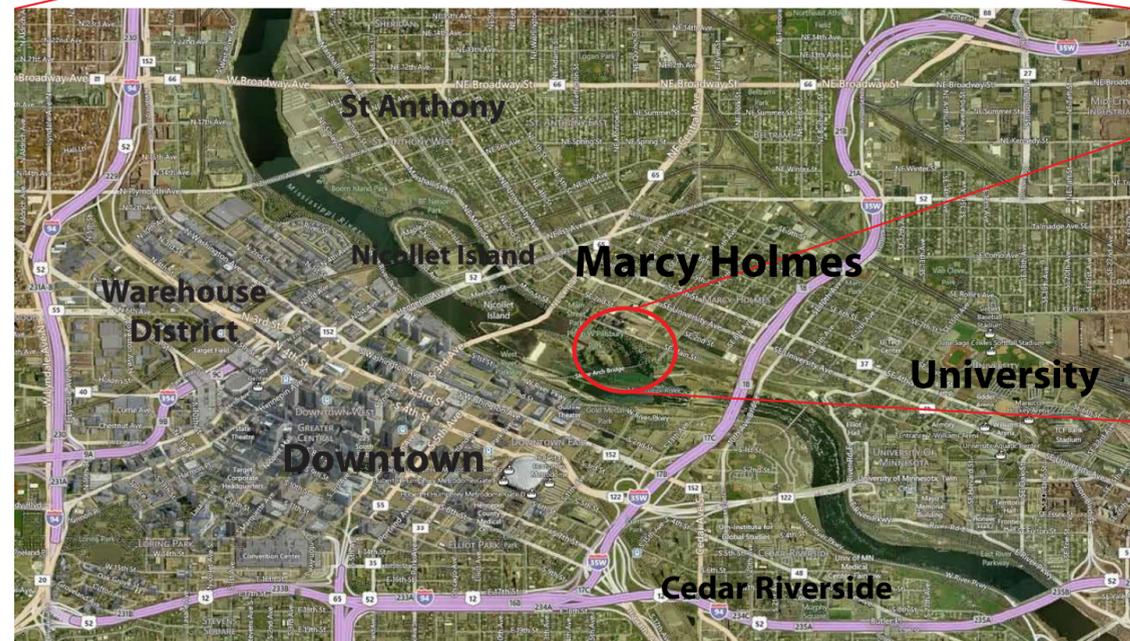
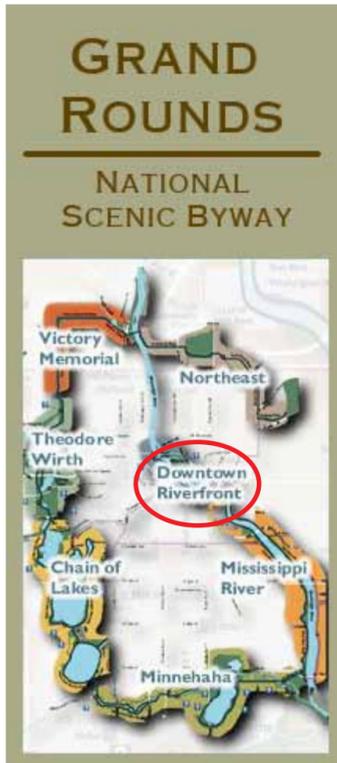
Formal Operational
12 and up



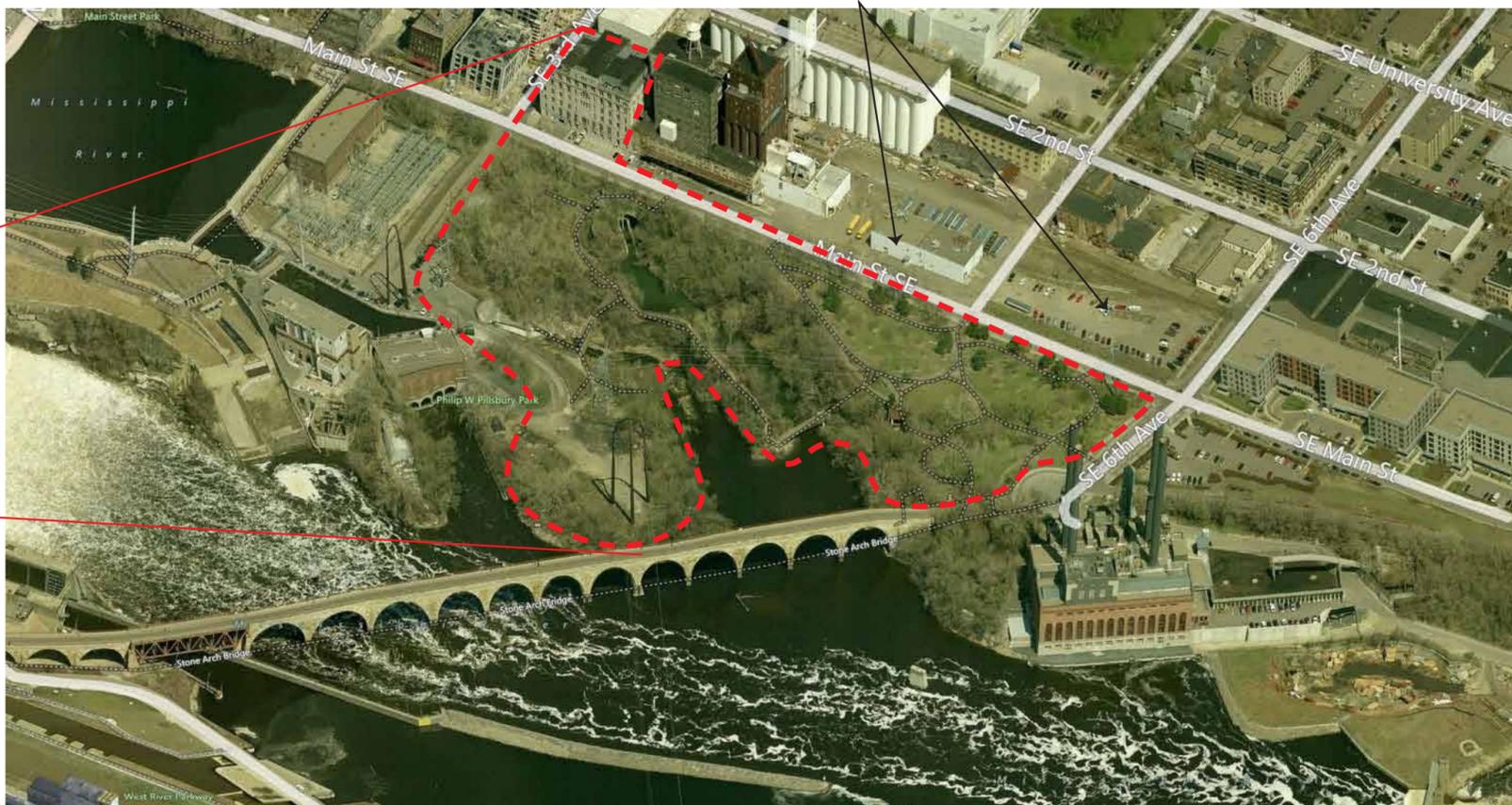
Location



Minneapolis, Minnesota



Located in the Marcy Holmes Neighborhood - oldest in Minneapolis.



Hennepin Bluff Park Site Stats:

14.6 Acres along the Mississippi River
 Along Main Street in the Historic District
 Adjacent to Stone Arch Bridge
 Land donated to city by Pillsbury Family

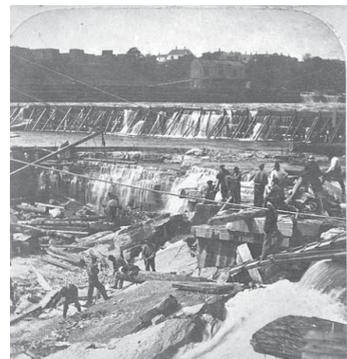
The park is a small portion along *The Grand Rounds*, a network of linked parks throughout Minneapolis designed by Landscape Architect Horace Cleveland in the **1880's**.

WHY?

Why does the history of the area matter to my analysis and future design?



Artist Albert Bierstadt rendering of how St Anthony Falls looked like prior to 1860's development



1865-1880 Construction on the Falls to harness power for Saw Mill and Flour Mills

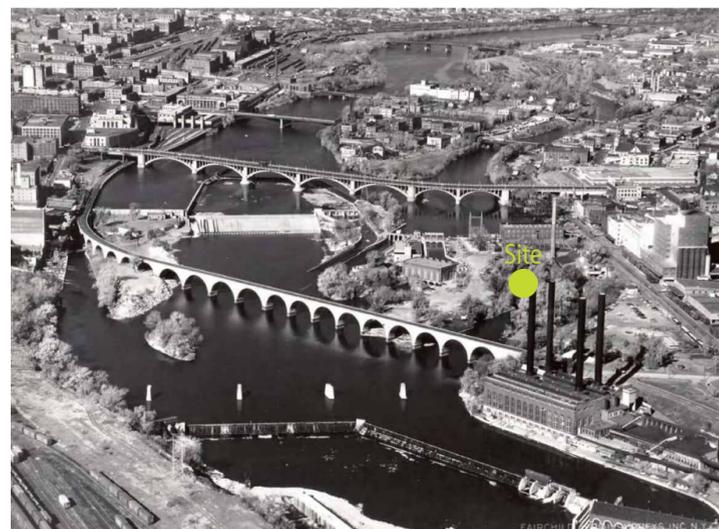


Alexis J. Fournier rendering of 1885 Falls



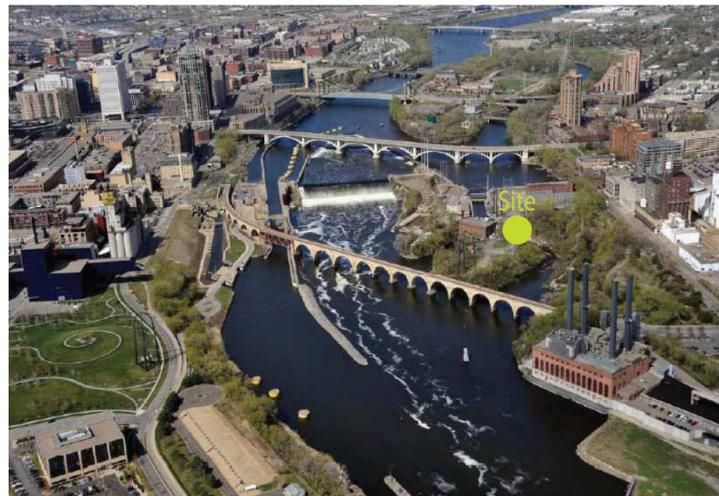
1938 birds eye of St Anthony Falls. It is evident the Rail Road is still a MAJOR part of the downtown network.

Construction of tunnels through the sandstone and limestone base of the falls made the construction of canals to harness power easy, but tunneling under the east side of the river collapsed part of the falls, changing the face of its natural beauty forever.



1955 the Railroad is becoming less prominent in the downtown district.

A current birds eye showing the revitalization of the Central Riverfront Corridor of Minneapolis.



Points of Interest



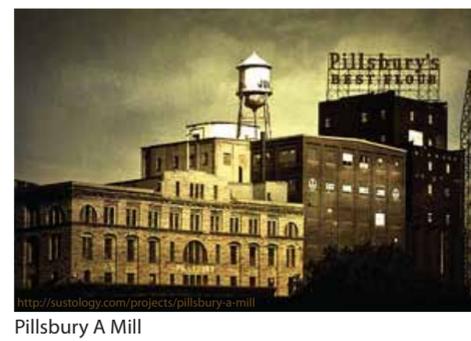
WHERE?



Legend

- 1 St Anthony Falls
- 2 Northern States Power Station, Main St Station
- 3 1850's Historic Buildings
- 4 Pillsbury A Mill
- 5 Father Hennepin Park, Hennepin Bluff Park
- 6 Stone Arch Bridge
- 7 Southwest Steam Plant
- 8 Lower St Anthony Falls Lock and Dam
- 9 35-W Remembrance Garden
- 10 Gold Medal Park
- 11 Upper St Anthony Falls Lock and Visitor Center
- 12 Nicollet Island & Amphitheater
- 13 Ard Godfrey House
- 14 Holmes Park
- 15 Marcy Open School
- 16 Loss of open space to Condos

- X Old Park
- ★ Marcy Open School
- - - 1/2 Mile Radius - 5 min walk
- 🌳 Parks and Open Space
- 🌿 River bank
- 🌊 Mississippi River
- 🔴 20 Acre Site



Pillsbury A Mill

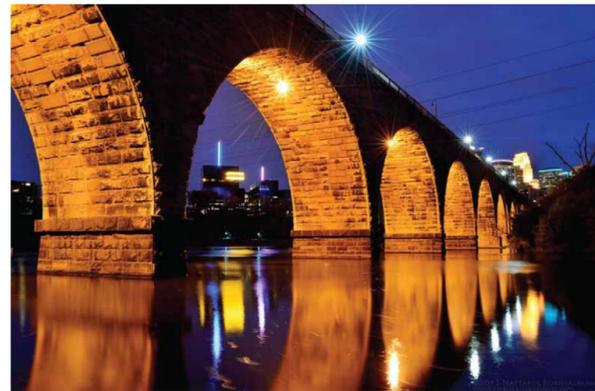


St Anthony Falls

WHAT?

Of the **1,626,000** visitors to Central Riverfront of Minneapolis, **50%** are **non-local**.

There are many destinations to explore for tourists and young adults, but not necessarily **adolescents**.



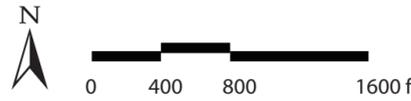
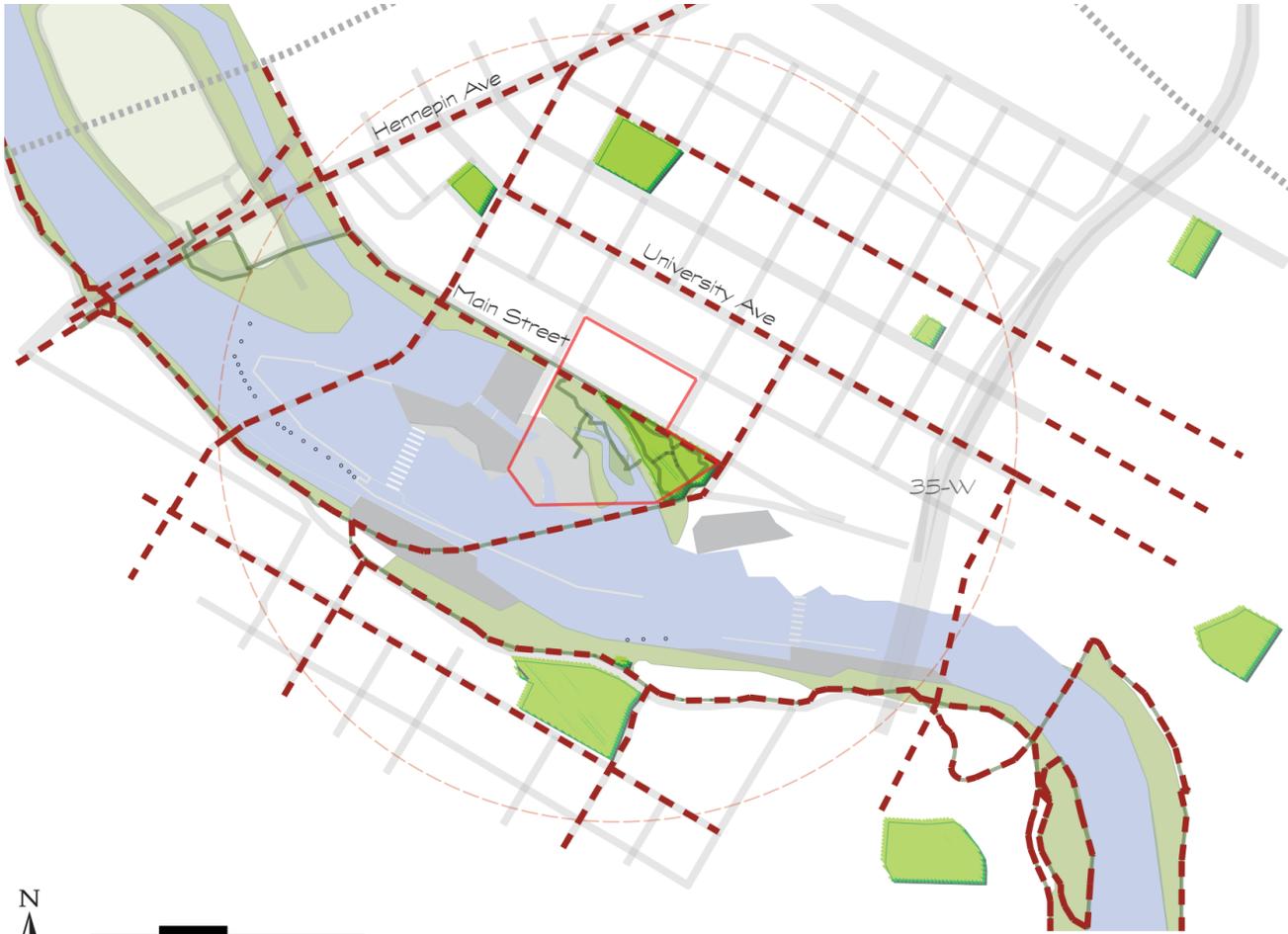
Stone Arch Bridge



35-W Remembrance Garden

<http://redravine.wordpress.com/2012/08/05>

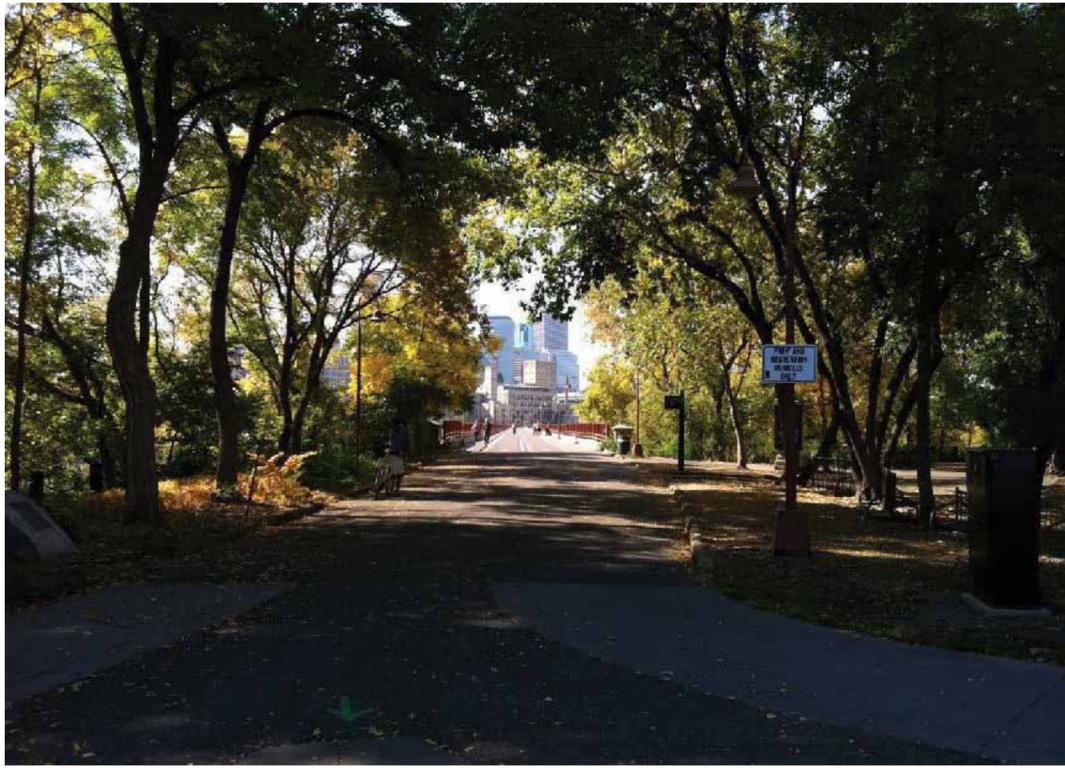
Bike Trails



To adolescents,
Bike Trails = Freedom

The use of bike trails to the park is essential for children as it is their main transportation of choice as they transition to more independence.

The disconnect along the river is evident in the large gap in the red trail.

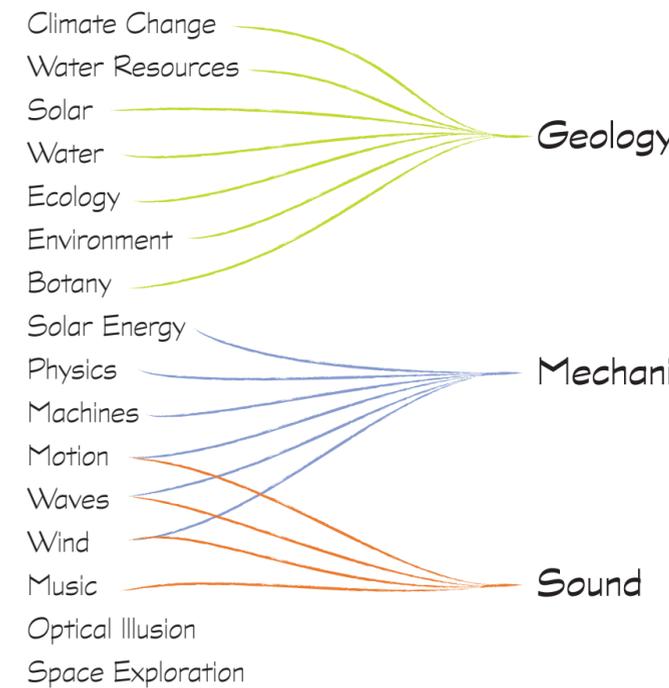


Entrance to Stone Arch Bridge

Design Vision

Hennepin Bluff Park provides children the opportunity to be physically, mentally and educationally engaged by weaving together landscapes of man and nature to benefit both.

Active Learning Themes



Geology

- light ray
- heat tube/tunnel
- sun fountain
- water cannons
- earth mounds
- wave pool
- dam
- rainbow
- steam power
- sand
- vortex propellor
- native fauna and flora
- meteorological station
- archeological dig
- sundial
- water = rapids & pools

Mechanics

- pulleys
- levers
- bridges/rope walk
- slides = straight, cycloid, inverted, others
- inverted Yo-Yo
- climbing
- see-saw
- coupled swing
- pendulum
- inertial trajectory
- incline
- wedge
- screw
- wheel and axle
- logs

Sound

- sound pipe
- pan pipes
- echo tubes
- accoustic mirrors
- lithophone
- water
- drums
- musical rocks
- metal drums
- xylophone

Preference Criteria:

- size requirements for each element
- cultural significance
- historic importance
- age appropriate for users

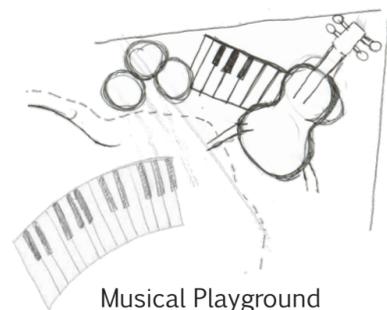


Design Development

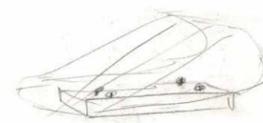
Design Process Drawings



Oversized Wheat field



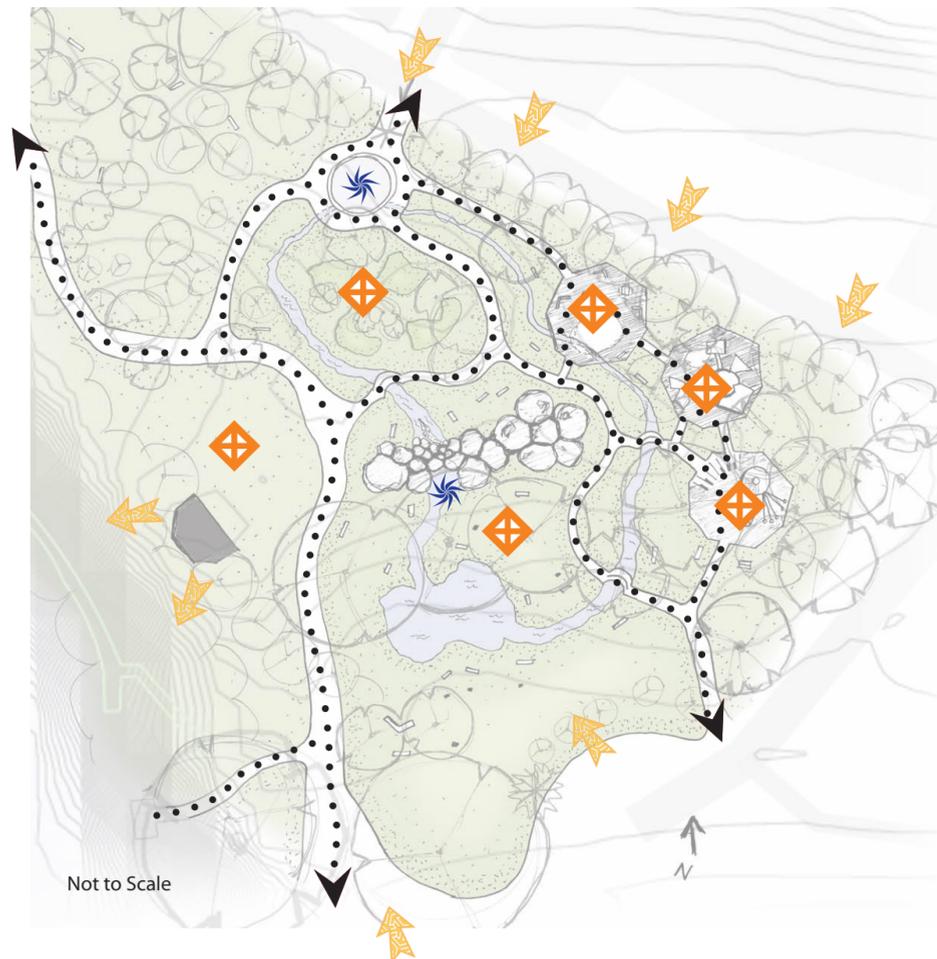
Musical Playground



Earth Harp

The upper concept explores Geology and Sound themes.

Upper Concept



Pathways & Access

A network of pathways connect each play zone and section of the park.

Views

Views into the site include the sight line down 5th Ave, the condos to the north as well as from the Stone Arch Bridge entrance from the south.

The Gazebo offers an overlook of the river and into the bluffs.

Nodes

Nodes within the park provide reference and destination points, opportunities for sun bathing, relaxation, gathering, picnicking and more. Paths connect and lead to nodes.

Landmarks

A fountain provides a landmark for the park as does the 'rapids' near the boulders.

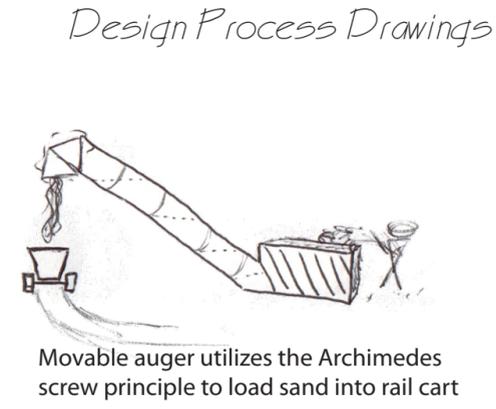
Lower Concept



This tucked away area is where children are free to make as big of a mess as they please.

- 1 - sand play area
- 2 - simple machine exploration
- 3 - fire pit for sponsored/supervised events
- 4- Patio as an outdoor learning space
- 5 - Adventure Playground

The building is for storage, a restroom, and shelter.



Design Development

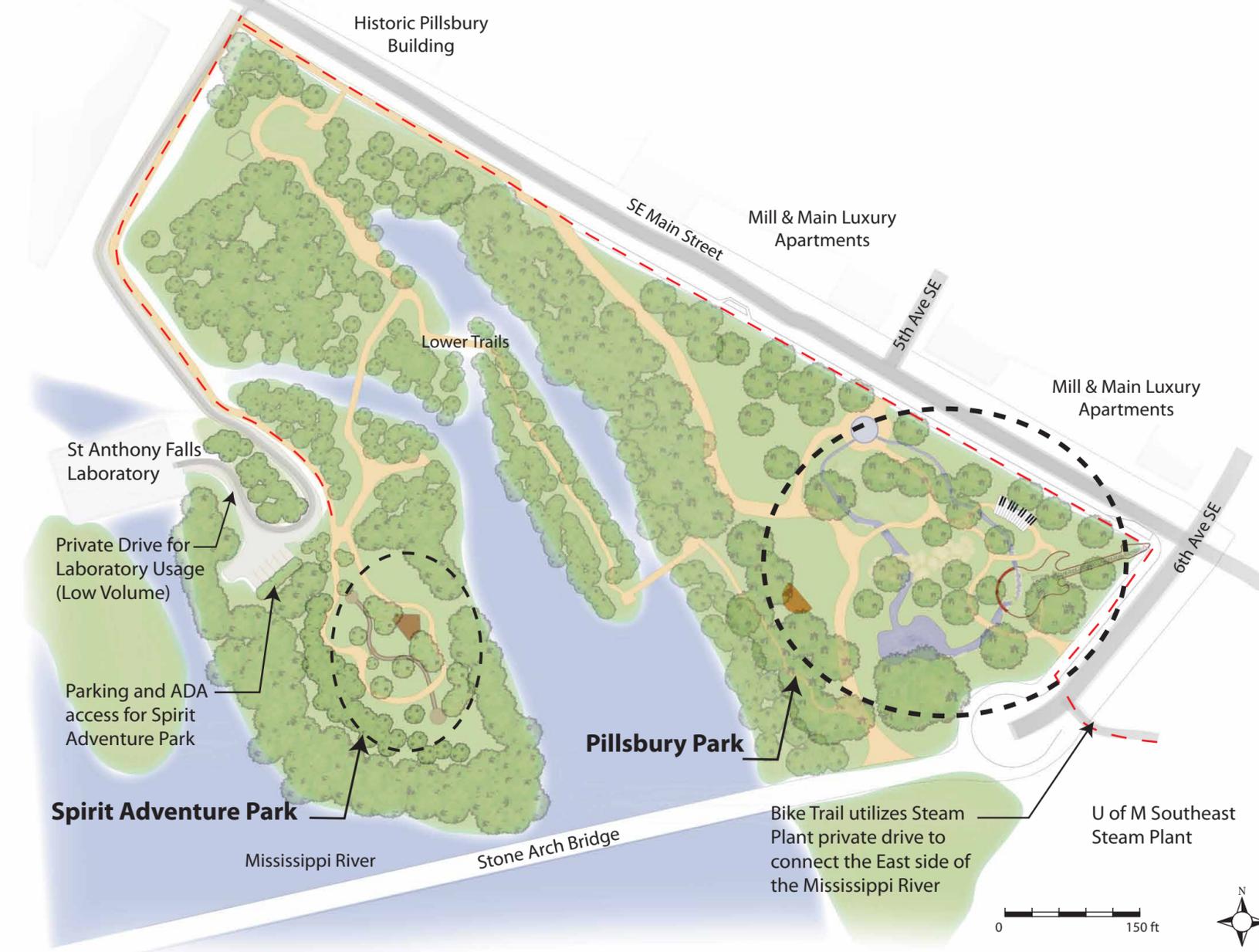
Design Process Drawings

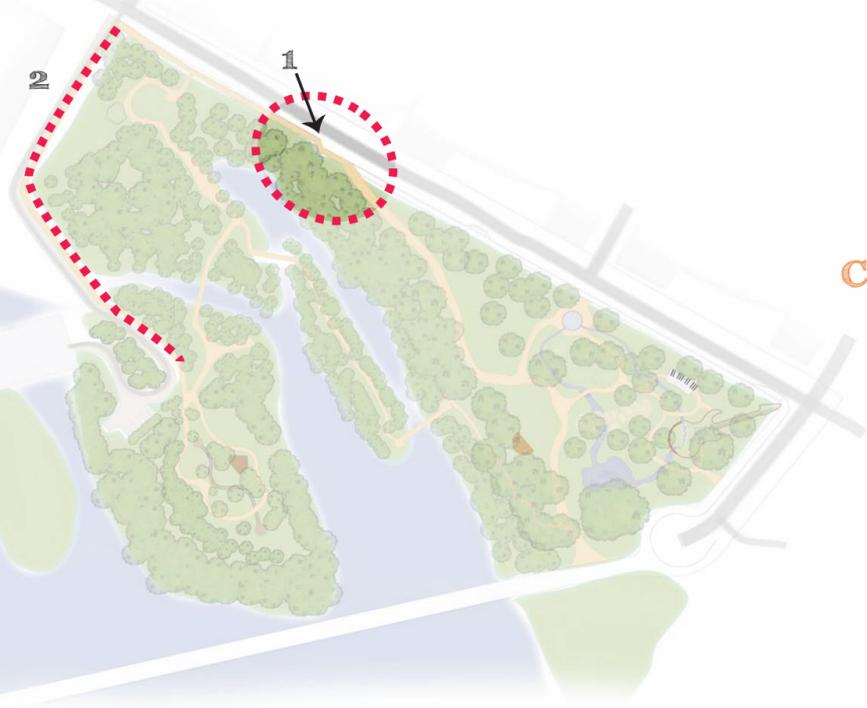
Not to Scale

The lower concept embraces a Mechanics theme - specifically the 5 simple machines: wedge, pulleys, inclined plane, screw, and lever.

Design Proposal

Cohesive Masterplan





Connections

GEOLOGY and SOUND



Rumble strips along the bike path play tunes when the grooves are spaces at specific intervals - **the closer together = the higher the tone.**

Beethoven's **5th Symphony** will be the tune along the path to the lower portion of the site.



'Jumping Bells' are stationed along the paths to encourage physical activity.

Edging and stamped concrete define the park pathway while it is intersected with the city sidewalk and continues through the park unifying both sections.



Pillsbury Park Design



Wheat Field and Fountain

GEOLOGY and SOUND



3



The musical tones of the Wheat mimic wind chimes. This sculpture provides a cultural landmark for the park - paying homage to the early establishment of the area.

- 30' circular area house clusters of 10 to 12' tall 2" metal rods which represent wheat fields
- the metal rods sway in the wind producing a subtle musical tune

a

Earthen Mounds

The rolling hills are a great space for adolescents to run and play as well as soak up some energizing rays.

5' Path

Fountain surrounded by 1' ledge

Metal Wheat Sculpture

A



Rocking Orchestra and Babbling Brook

GEOLOGY and SOUND



Earth Harp

7 nylon strings with differing gauges create different tones

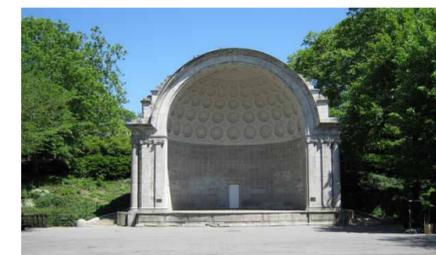
Steel grid covered with molded vinyl

Bolted to concrete base

0 10 ft

Sand area with Stream

Earth Harp



The Harp form is similar to an outdoor performance area. The acoustics vibrate off the curved back.

The music play area includes chimes and pipe drums and any other type of instruments imaginative children come up with.



Boulder Dam

GEOLOGY and SOUND



Children can interact with the stream utilizing **hands on learning** of many topics including: current, velocity, obstructions, erosion and vegetation.

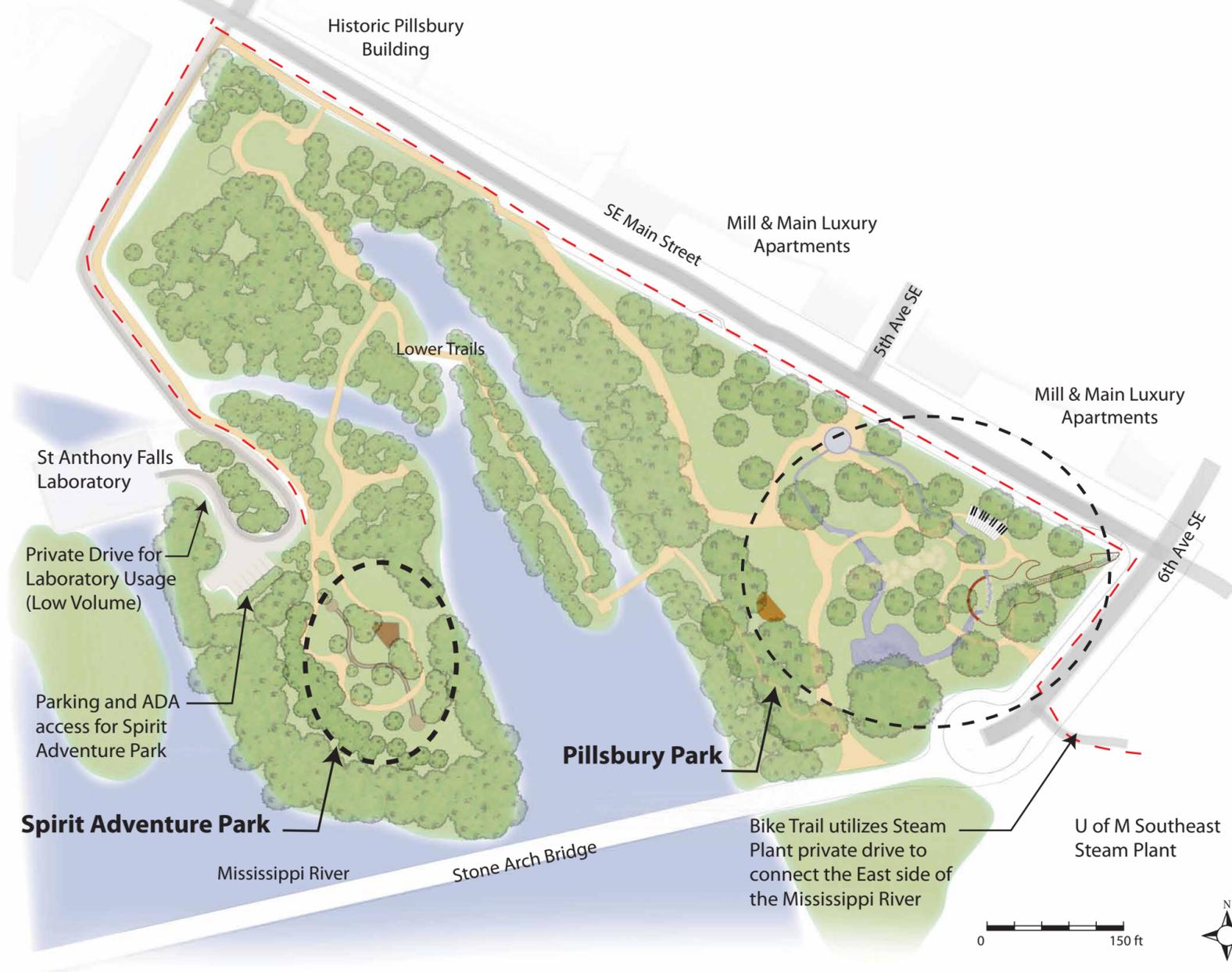
- Winter Activities= **Ice Skating** on the pond
- Forts in the earthen mounds for **snowball fights**
- Learning how to **snowboard** on earthen mounds

The boulders in this image demonstrate an example of possible variables involved regarding obstacles. This is a great way to learn and explore how **hydrodynamics** play an important role in the life of a river.

This lesson was learned through **trial and error** while digging canals under the St Anthony Falls in 1869. The collapse of a tunnel under a portion of the Falls changed the face of the Falls forever.

Design Proposal

Cohesive Masterplan





Spirit Adventure Park Design



Barge Lift Station

MECHANICS: Pulley

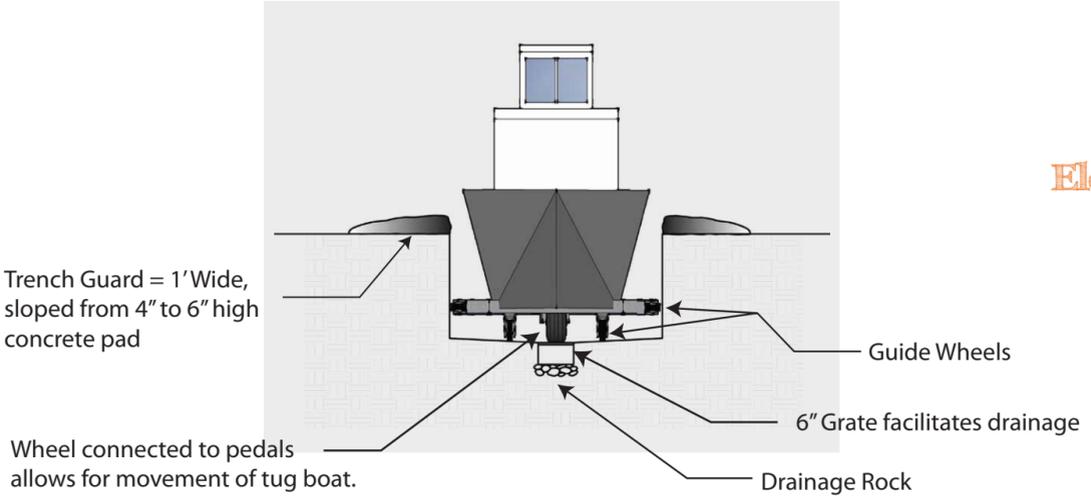
Designed with the topography, children use manual power in the tug boat and barge to transport materials from one side of the site to the other.



Multiple pulley system designed for greater weight to be hoisted with less work = allows children to lift a barge full of sand

Wheel is much like a boat lift, locking as it raises to minimize safety hazard.

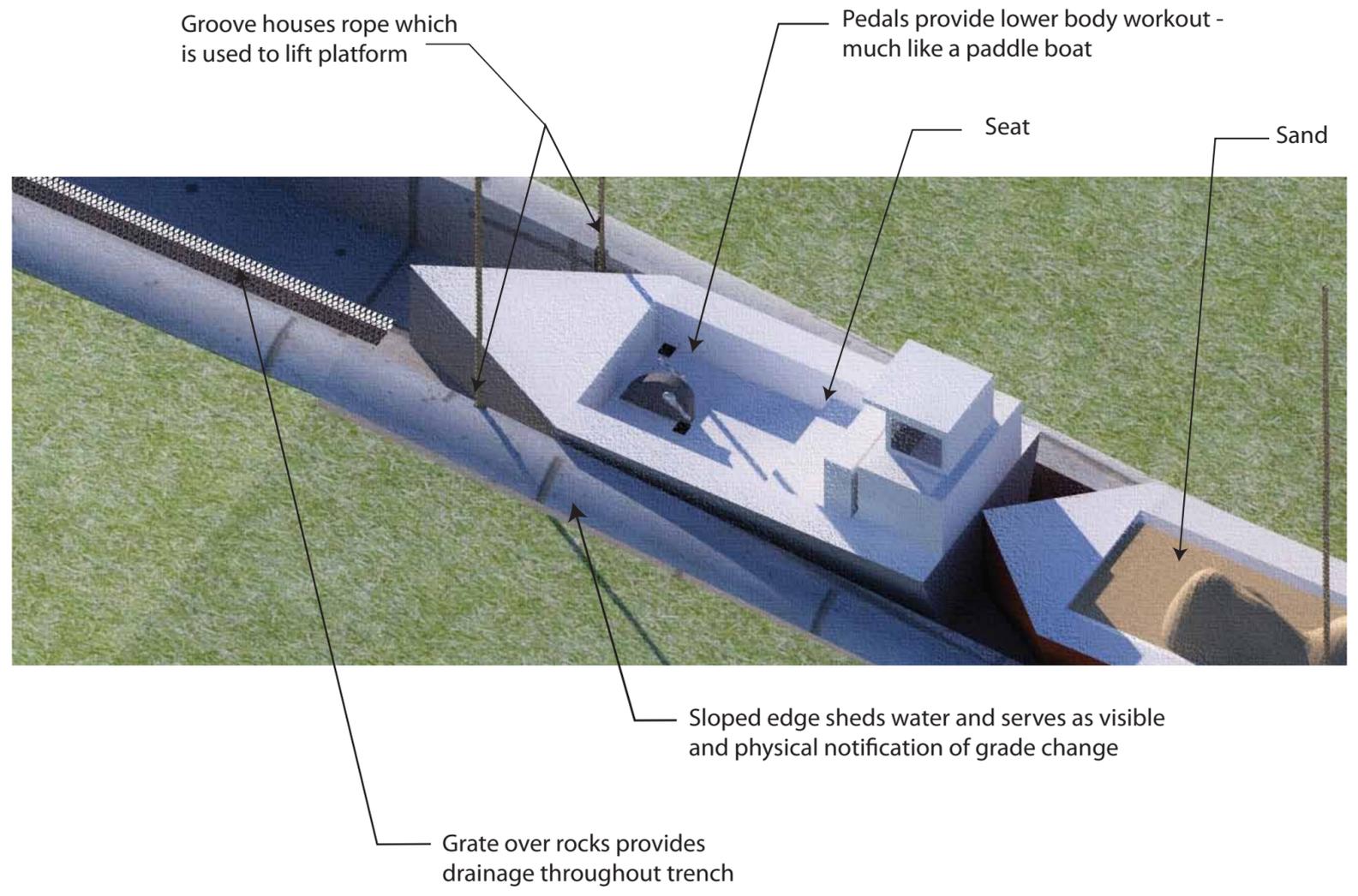
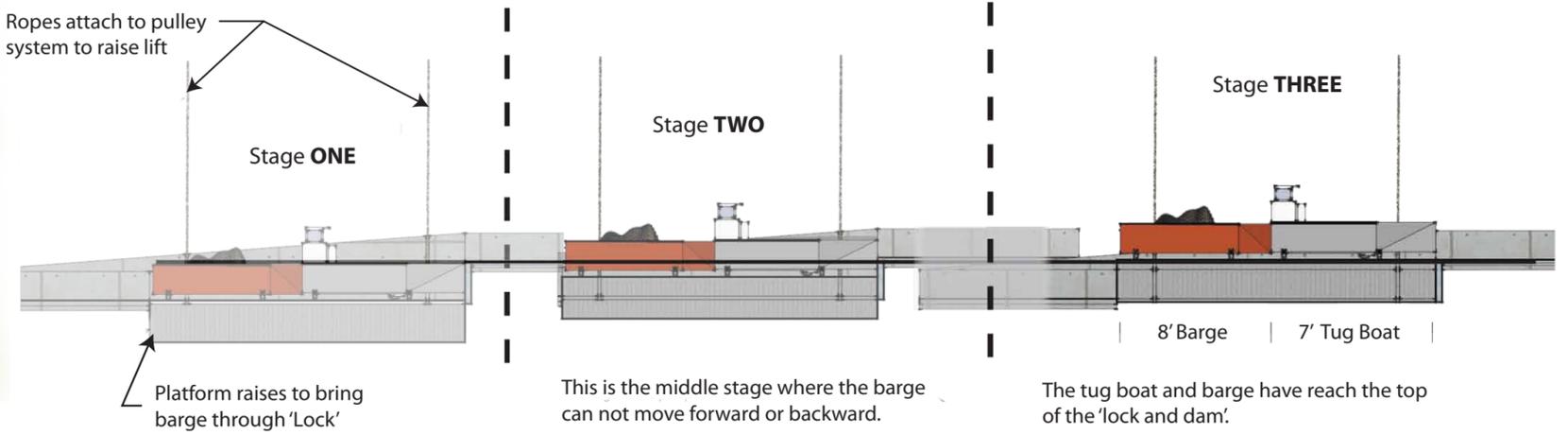
Tug Boat Detail

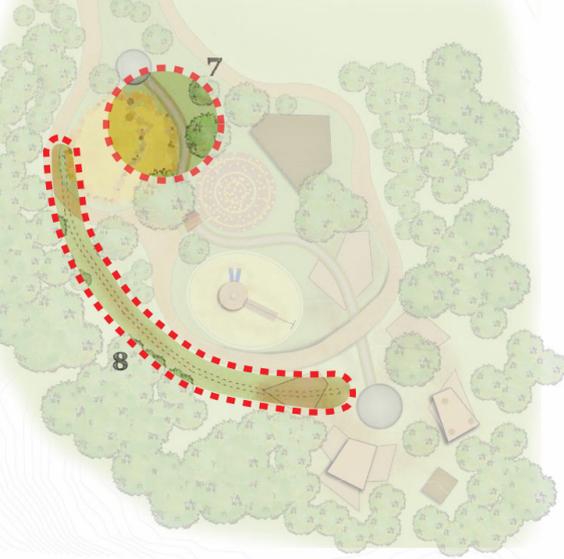


Element Details

MECHANICS

Lock and Dam Lift Station Process





Element Details

MECHANICS: Screw, Lever, wheel & Axel

Sand Auger

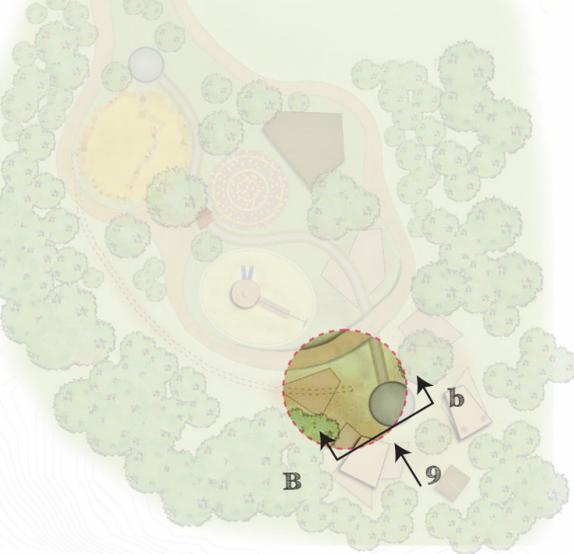


Turning the red wheel powers the auger. The sand from the bin travels up and is dumped into the barge.

Rail Cart

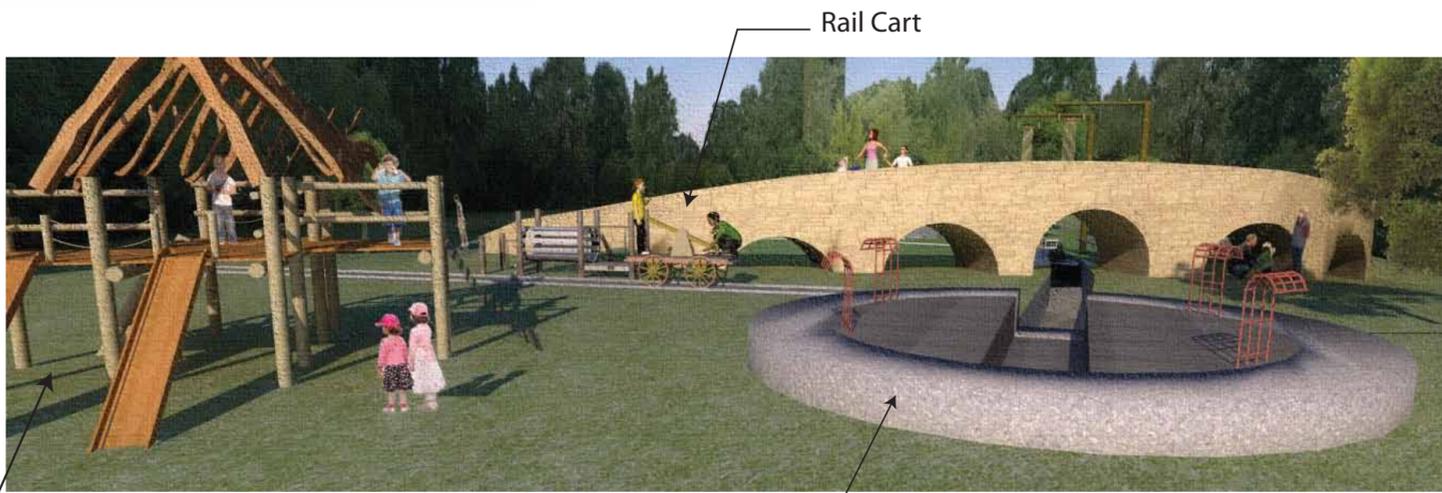


Measuring 4' wide 8' long, the Rail Cart provides an upper body workout to transport materials from one side of the park to the other. The lever operating system teaches and is physical activity all in one.



Adventure Forts and Turn Table

MECHANICS: Multiple



Rail Cart

Adventure Fort - Children build their own forts and are free to decorate and redesign to make their imaginations come to life.

Turn Table allows the Tug Boat to turn around - much like a Trolley or Train. Children **push** the hand rail to change the direction of the barge.



Fort Building area for children - Tools such as hammers, nails, saws, wood scraps, and other material are provided to **build** and **foster creativity**.

2' Base
4' Turn Table
3' trench
4' Turn Table
2' Base



Screwy Tower

MECHANICS: Screw, Inclined Plane, & Pulley



The height of the tower is adjusted by turning the wheel in the center of the platform. It uses a screw in the base to raise and lower the tower and all items attached.

Wheels are the base of the ladder and slides to allow for the height of the tower to change accordingly. The cargo net is stationed under the zip-line and is used for climbing and catching. A rope is used to bring the zipline back to the top of the tower.



Many lessons can be learned about inclined planes and gravity with the Screw Tower.

How can design support and encourage **children** to be more active and mentally engaged while promoting a **healthy lifestyle** in an urban area?



Questions

An Urban Playground for Adolescents



Musical Playground:

- Singing Swings
Light up and make a note as the swing back and forth
- Trombone Slide
As the user goes through the slide- it makes a sound
- Musical Monkey Bars
Shaped like notes, as you swing from one to another it plays a tune specific to that bar
- Twittering Teeter Totter
Tunes can be heard as the base teeters and totters back and forth



Marcy-Holmes Neighborhood

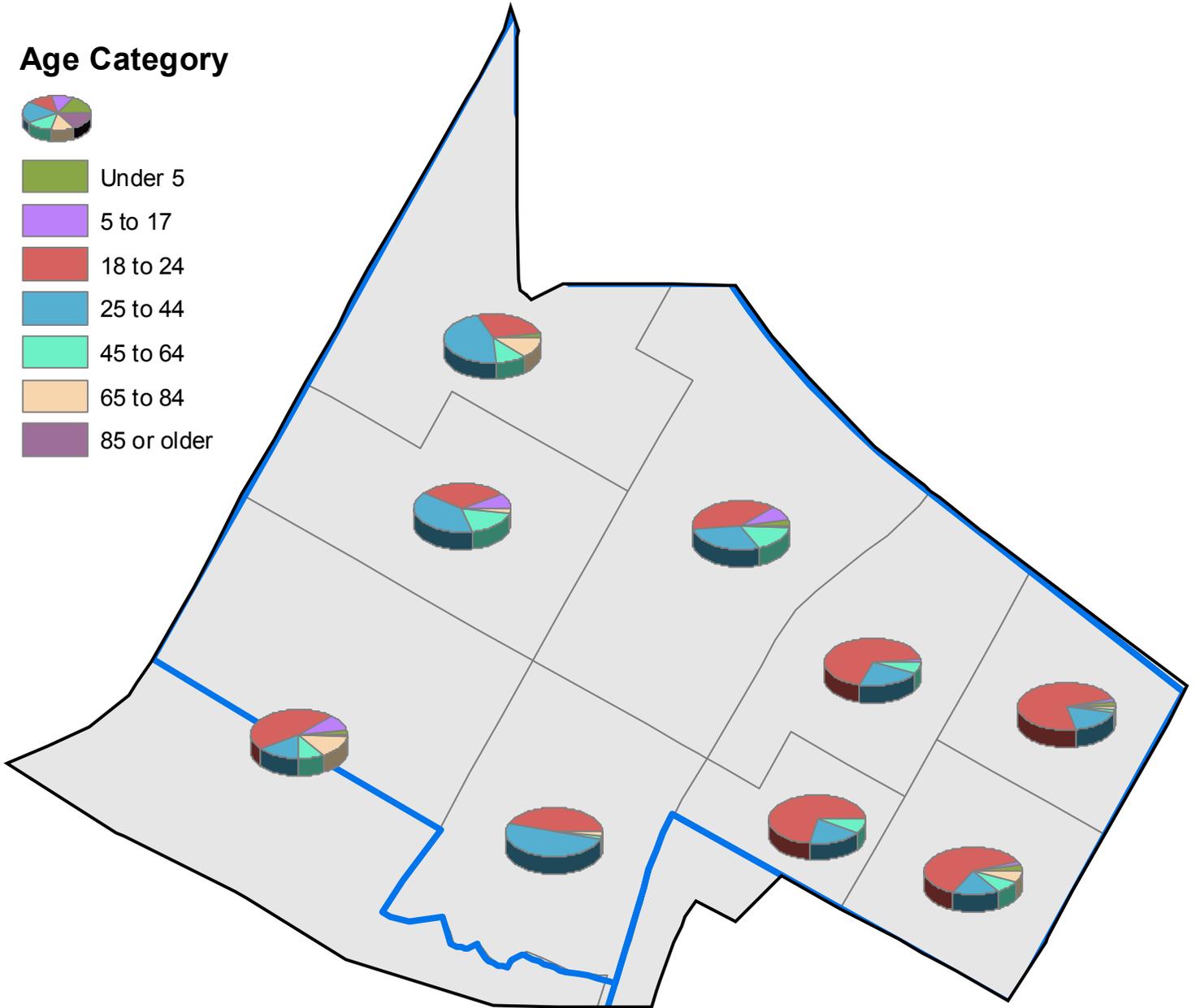
American Communities Survey 5-year Estimates 2005 -2009

Population by Age Categories

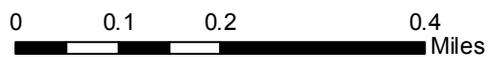
Age Category



- Under 5
- 5 to 17
- 18 to 24
- 25 to 44
- 45 to 64
- 65 to 84
- 85 or older



Marcy-Holmes Neighborhood			
	2000 Census	2009 5-yr ACS	% Change
Total	9,009	8,889	-1%
Under 5	172	136	-21%
5-17	286	347	21%
18-24	4,972	4,636	-7%
25-44	2,494	2,578	3%
45-64	739	868	17%
65-84	289	308	7%
85+	57	16	-72%



Map created February 2011
by CURA staff

