

SPARSHA REDDY KOTHA 2022 - 2023

"ARCHITECTURE IS BASICALLY A CONTAINER OF SOMETHING. I HOPE THEY WILL ENJOY NOT SO MUCH THE TEACUP, BUT THE TEA."

- YOSHIO TANIGUCHI

C O N T E N T S

I have always been passionate about photography and travel. This is one of the pictures taken by me in Dubai

1	COMMON GROUNDS Highway adaptive reuse project	4	
2	SECOND SKIN ADU design project	12	
3	VERONA RIVERSIDE sustainable urban development	16	

COMMON GROUNDS

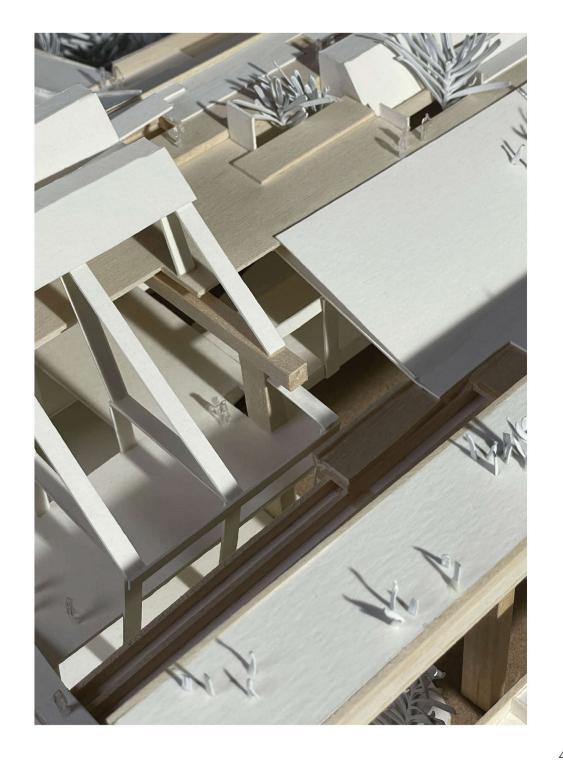
FALL 2023

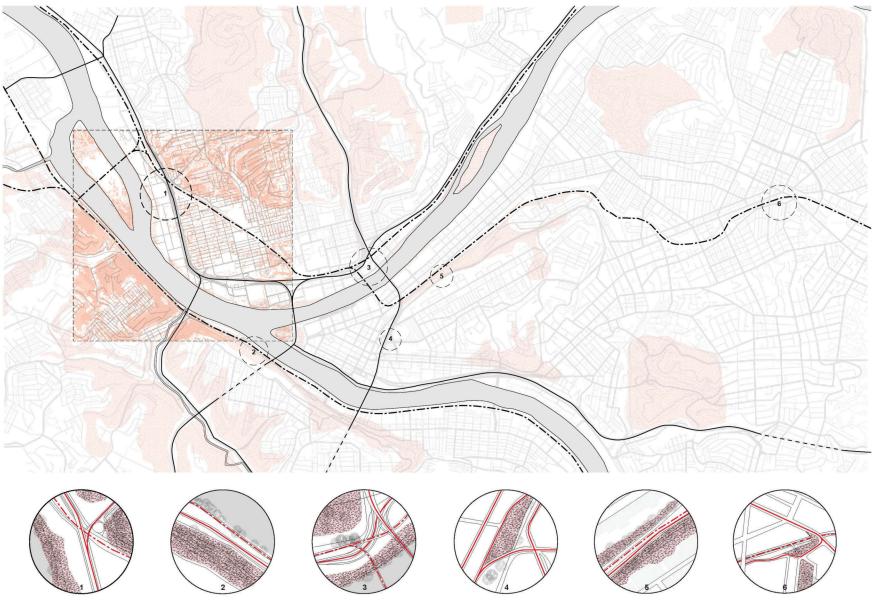
In the Anthropocene, humanity's impact on the environment is more amplified than ever, calling for new approaches to urban life and day-to-day interactions.

Common Grounds proposes to transform an inhumane highway into a verdant "living matrix" that blurs the lines between human infrastructure and ecological systems. By preserving and repurposing the concrete and steel structures, we tell a story of multiscalar transition, framing ambitions of reconciliation within the industrial past.

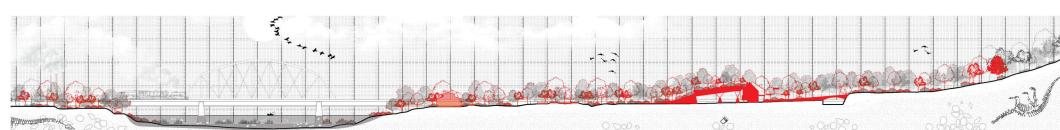
The Commons harmonizes the beauty of native landscapes with the functionality of cultivated gardens, offering spaces for exploration and relaxation. The design creates opportunities for both quiet reflection and lively community gathering, fostering a sense of belonging and connection.

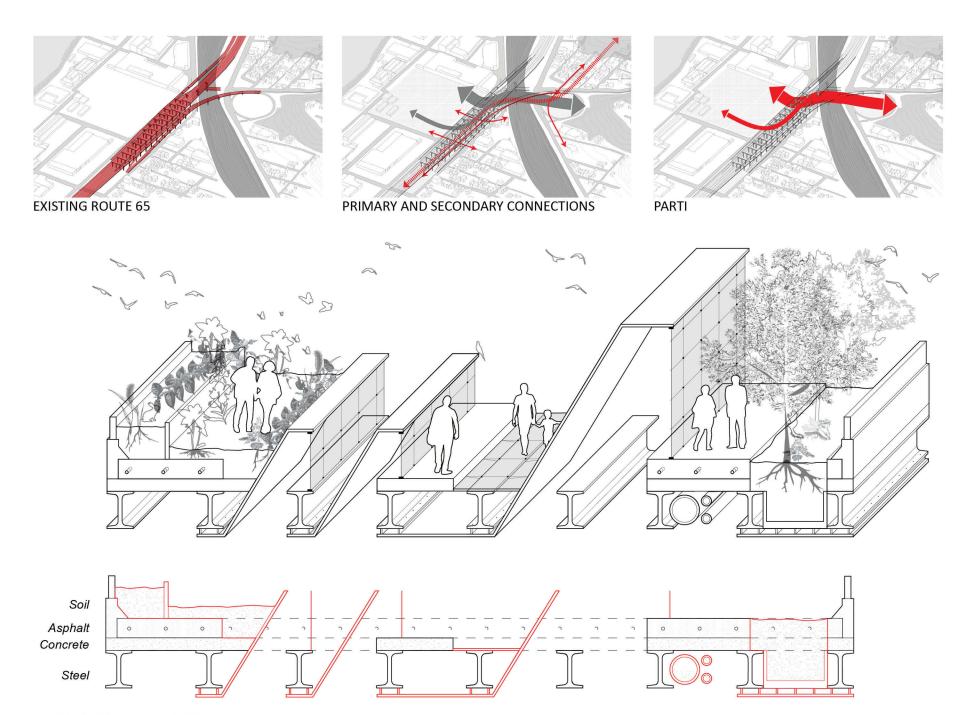
This is a three member group project where the drawings were produced iteratively and in layers; all members participated in the development.



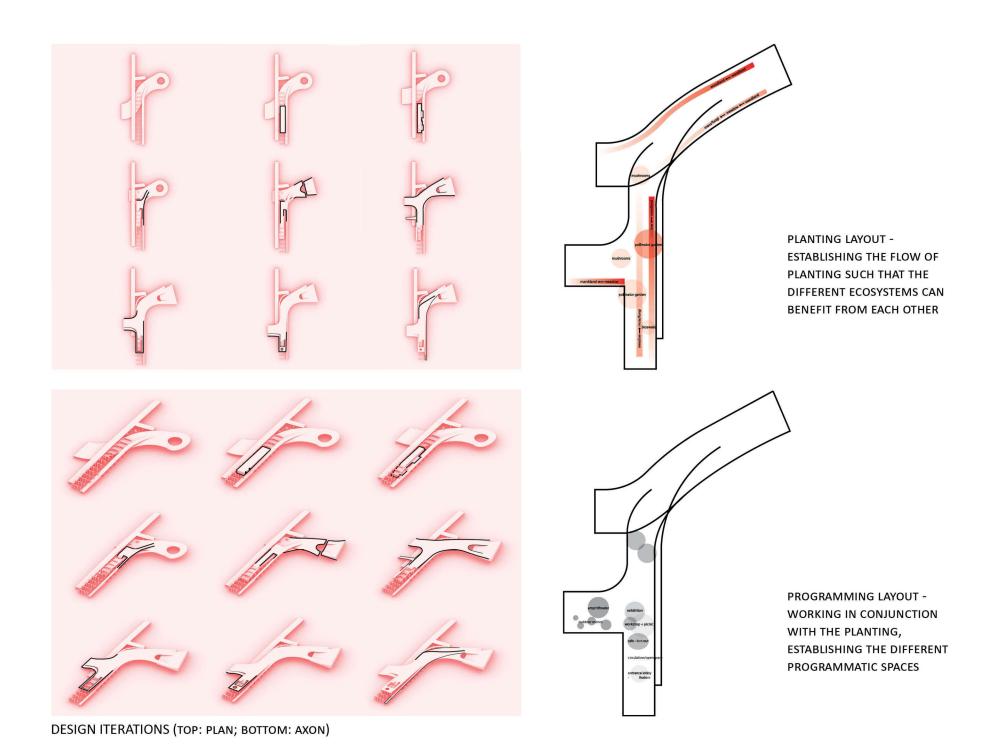


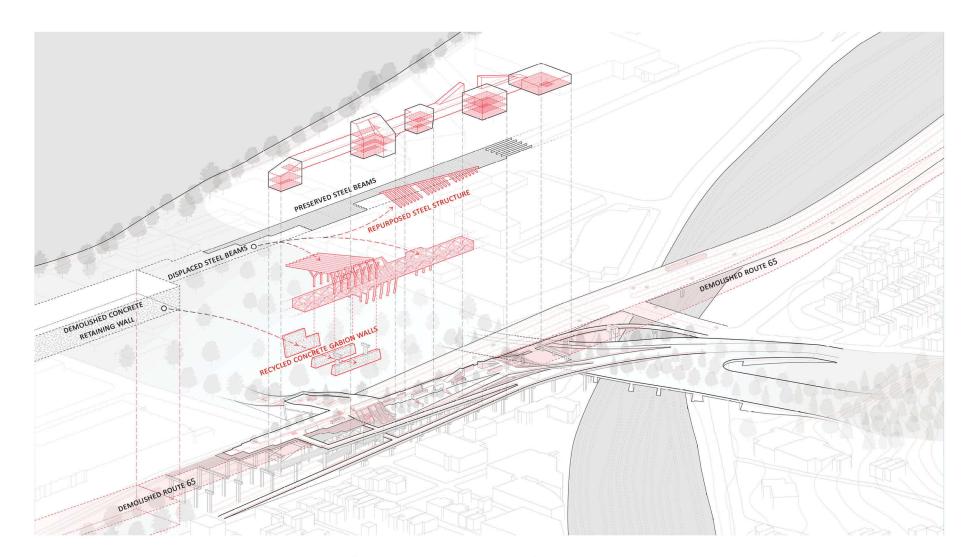
SITE CONTEXT - INFRASTRUCTURE HAS SEPARATED COMMUNITIES AND ECOLOGY; THIS PROJECT HOPES TO RECONNECT THE TWO ACROSS THE HIGHWAY AND THE RIVER



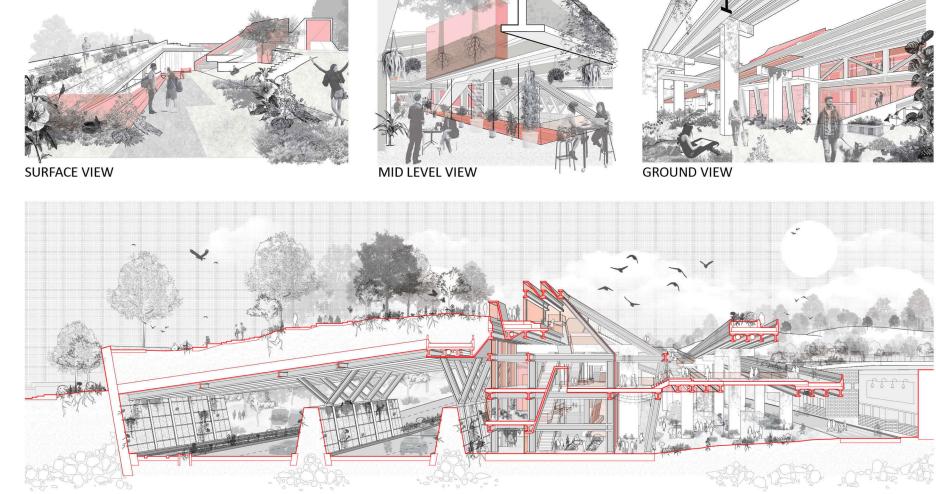


SURFACE DESIGN CONCEPT - DELAYERING THE HIGHWAY SURFACE TO REVEAL CONCRETE AND STEEL AND INTRODUCING LIGHT; ADDITION OF SOIL AND VEGETATION

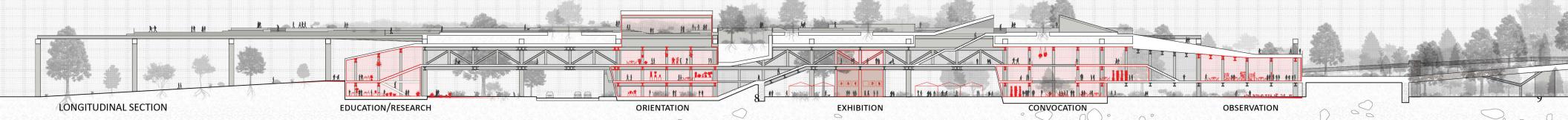




EXPLODED AXON - ARCHITECTURAL MASSES, STRUCTURE (EXISTING, REUSED, REPURPOSED)



SECTION PERSPECTIVE - HIGHLIGHTS THE VARIOUS TREATMENTS AND USES OF THE HIGHWAY AND ITS RAMPS; THE SECTION CUTS THROUGH THE ORIENTATION AREA















HANDMADE CHUNK MODEL **GYPSUM BOARD IS NEW** BASSWOOD IS EXISTING

LEFT: TOP VIEW OTHER IMAGES: DETAILS TO SHOW THE FEEL OF SPACE

Native Plants Butterfly Milkweed 4-9 Hardiness zones Needs full or partial sun Water needs - Low Mature height – 1.5-2' 3b – 8b Hardiness zones Needs full or partial sun Water needs - Low Mature Height - 1-3' Black-eyes Susan 2-11 Hardiness zones Full Sun Moderate Water needs Mature height - 2-3' Aromatic Aster 4-7 Hardiness zones Full sun, partial shade Low water needs Dry to mod, well drained, Mature height - 1-3' 2-7 Hardiness zones Full sun, shade partial Low water needs Moist, well-drained soil Mature height - 4-6' But can go 9' Buttonbush 4-9 Hardiness zones Partial or full sun High water needs Well-drained, moist soil Mature height - 3 - 10' Black Birch 4-9 Hardiness zones Partial Shade High water needs Sandy, clay, moist soils Mature height - 30-50' Red Oak 3-8 Hardiness zones Moderate lies over sandstone or limestone Mature height - 60-70'

Soil conditions - Medium soils Soil conditions - well drained Well drained, rich, acidic soil Moist, acidic, infertile soils that

Bald Eagle

American Woodcock Scrub-shrub, hardwood forests Spring, Fall migration Earthworms, larvae, snails Crepuscular Sky, Tree bases Near rivers/lakes, forests

Fall migration Fish, squirrels, frogs Diurnal Sky, tree branches, open water

Native Animals

Mourning Dove Grasslands, parks, urban areas Do not migrate/winter migration Weed seeds, waste grains, fruit Sky, trees, ground

Gray Squirrels Deciduous forests, woodland edges Acorns, walnuts, berries, pine seeds Trees, ground

Woodland edges, coniferous forests Herbs, blackberry canes, bark Crepuscular Trees, underground

roadsides Irruptive migration Nectar, fresh fruit

Plants, sky Eastern Chipmunk

Open deciduous woods, city parks Nuts, seeds, berries, insects Trees, ground, underground

Cottontail Rabbit

Open meadows and fields

(Cantharellus cibarius)

Oyster mushroom

(Pleurotus ostreatus)

Shiitake mushroom

(Lentinula edodes)

Morel mushroom

(Morchella esculenta)

Lion's mane mushroo

(Hericium erinaceus)

Enoki mushroom

(Flammulina velutipes)

(Pleurotus eryngii)

Painted Lady Butterfly

King oyster mushroom Reishi mushroom

(Ganoderma lucidum) Chaga mushroom (Inonotus obliquus)

Turkey tail mushroom (Trametes versicolor) Puffball mushroom (Lycoperdon sp.)

> Hedgehog mushroom (Hydnum repandum)

> > Matsutake mushroon (Tricholoma matsutake)

> > > (Gastropoda)

Insects & Worms

(Gastropoda)

(Diplopoda)

Centipedes (Chilopoda)

(Oniscidea)

(Collembola)

Nematodes Nematoda)

(Lumbricus terrestris)

Red Wigglers (Eisenia fetida)

Eastern purple coneflower

novae-angliae)

Goldenrod

Bee balm

(Solidago spp.)

(Monarda didyma)

Cardinal flower

(Vernonia spp.)

Pollinators

(Lobelia cardinalis)

Monarch butterfly

(Danaus plexippus)

(Papilio glaucus)

(Bombus spp.)

Honeybees

(Apis mellifera)

(Trochilidae spp.)

Mason bees

(Osmia spp.)

Leafcutter bees

(Megachile spp.)

Sweat bees

(Halictus spp.)

(Echinacea purpurea) Temperature Summer - 60 F to 82 F Winter - 21 F to 40 F New England aster (Symphyotrichum -

Solar Gain / Direction Sun hours -Summer - 10 hours avg Winter - 4 hours avg

> Summer - horizontal , south Winter - south, west

Environmental Conditions and Patterns

Wind Patterns West, southwest (stronger in winter) 0.5 to 10.7 m/s, up to 13.8 m/s in winter Rain and Intensity (Runoff likelihood)

Spring, summer rain 39 Inches/year rain Avg least 2.5" (July) Avg most 4.5" (February) 39 Inches/year snowfall Flood prone

(Eupatorium perfoliatum) Air quality / Polluted Air "Good" AQI Joe-pye weed (Seasonal pattern Eutrochium purpureum)

Dominant pollutants: O3, PM, NO2 Soil Conditions/Pollution

Silt loam (sand, silt, clay) Well-drained Particulate runoff Susceptible to wind erosion D0 abnormally dry (no severe drought)

Water Pollution Eastern swallowtail butterfly Improper water circulation and filtration

Material Circularities and Usage Commons

29,000 sqft - Cardello building - Architectural Clay Products Incorporated

Route 65 demolition Parking Lots

> Route 65 demolition Reused as is

Steel (I-Beams) Route 65 demolition Reused as is

Route 65 demolition

Removed and Relocated within the site

Methods of Collection or Management Water Run-off Wind Patterns Solar Illumination Thermal Gain

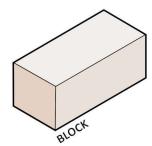
Catch Basin

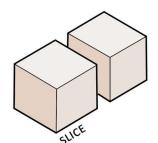
SECOND SKIN SPRING 2022

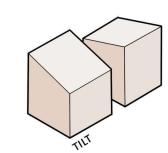
Good architecture is said to be invisible; the space feels natural. Second Skin is an accessory dwelling unit (ADU) project that addresses the interaction between people and the environment as mediated by architecture. Thus, creating a space that feels like "second skin".

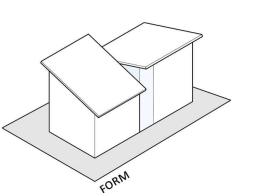
Located in Seattle, Washington, this 600 sq. ft. secondary unit was developed through thematic investigations in climate positive design.







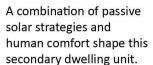




The climate in Seattle, WA is temperate/oceanic with cool, wet winters and mild, relatively dry summers. Frequent drizzles and opalescent skies are characteristic features of the region.

secondary dwelling unit.

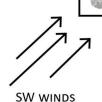
- south-facing orientation
- high performing windows
- overhangs and shading
- windows and clerestories



Design features:

- strategically placed
- high thermal mass
- natural ventilation

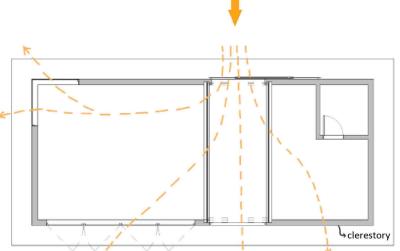
ORIENTATION DIAGRAM



E-W orientation to maximize southern glass exposure for maximum solar gains.

Minimized glass on the north facades since it is a thermal laibility.

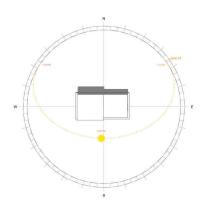
Plantings to block the SW winds prevelant throughout the year.



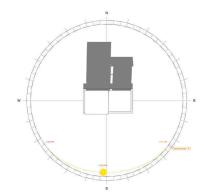
In the summers, the dogtrot will act as a breezeway, creating air currents to draw in cooler outside air and provides relief from the heat.

In the winters and long periods of rain, the dogtrot can be closed to create a warmer space.

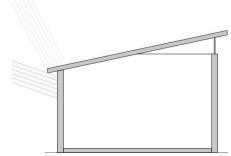




12 PM SUMMER SOLSTICE



12 PM WINTER SOLSTICE



SUMMER & WINTER SOLAR ANGLES

— summer — winter

tilted roof with overhang to block heat gain in the summers but still let in the low winter sun



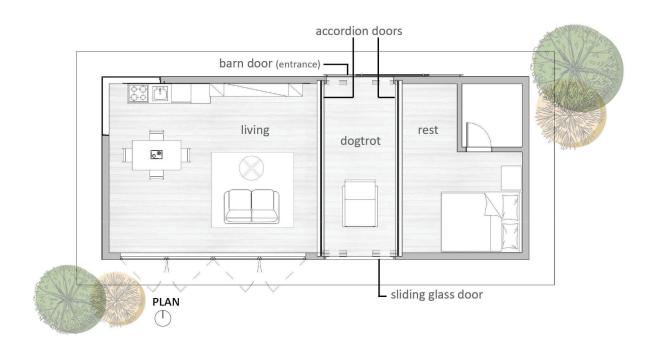
VIEW THROUGH THE DOGTROT DURING SUNRISE



VIEW LOOKING TOWARDS THE ENTRANCE DURING SUNSET







 customizable house, doors can be opened and closed according to seasons and comfort levels

 insulated walls for thermal comfort covered in wood siding local to the Seattle region







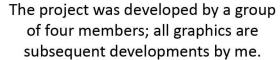
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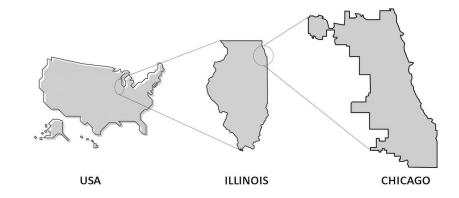
VERONA RIVERSIDE

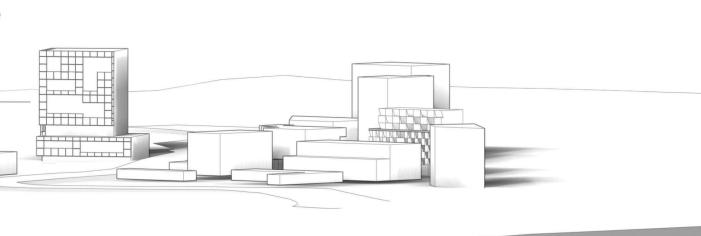
FALL 2022

This is an urban development project that utilizes data-driven and simulation-based methodologies to develop a sustainable built enevironment through performance evaluation and design interventions.

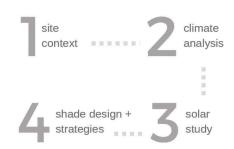
The 30 acre site is situated to the north of the Chicago downtown area and was previously an industrial site. This project aims to revitalize the neighborhood through sustainable building practices.







WORKFLOW







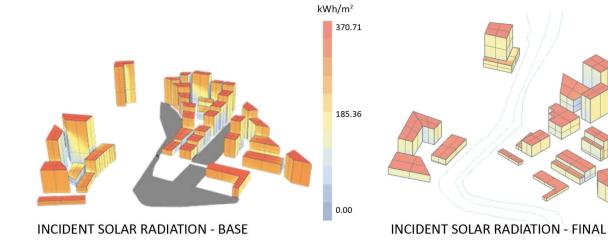
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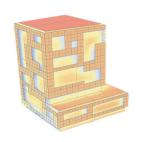


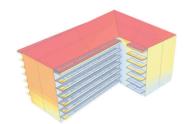


Chicago experiences warm summers, cold winters, and frequent fluctuations in humidity and storms. The area experiences high winds usually blowing from the southwest.

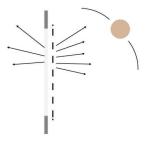
Primarily based on climatic conditions, this mixed use development project aims to create a high performance development with net zero energy.





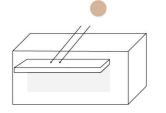


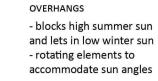


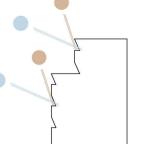




kWh/m²



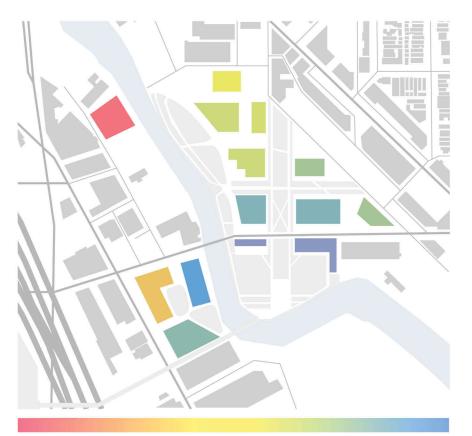




SOLSTICE ANGLES

- angled depressions keep away heat gains on the longest day of the year while letting in maximum heat and light during the shortest day

17

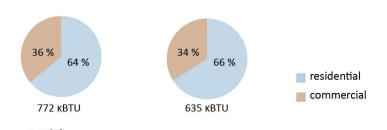


7,654,173 kWh 203,713 kWh

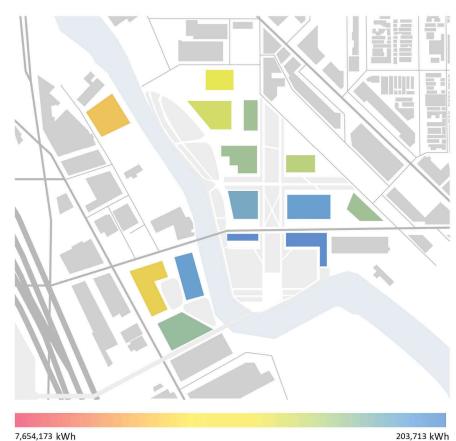
SITE OPERATIONAL ENERGY - BASE

BASE:

- 40 % window to wall ratio on all facades
- no shading strategies
- 3 m floor to floor height



18% reduction from base to final



SITE OPERATIONAL ENERGY - FINAL

FINAL:

- varying window to wall ratios
- shading strategies included
- varying heights: 4 m to 5 m



ELECTRICITY YIELD =
RADIATION X PANEL AREA X PANEL EFFICIENCY X INVERTER EFFICIENCY

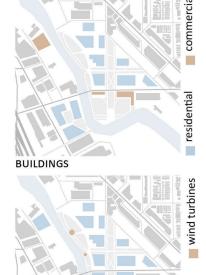
= 3,824,018 KWH ENERGY GENERATED

① 25 50 100m









PROJECT GOALS



practices



space

technological explorations

community

connections



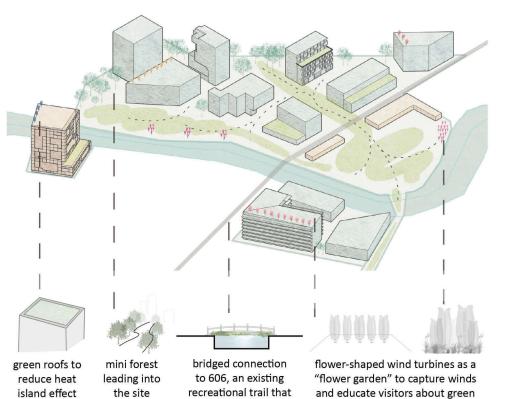
riverfront activation



energy generation

19

responsive development



runs E-W

GREEN SPACE ENERGY GENERATION
18