charleston county

One of the largest city in South Carolina with rapidly expanding population, regional healthcare demand and potential hurricane casualty events.

charleston peninsula

Entire peninsula is in 100-year flood zone. Site on the major pathway to downtown Charleston, surrounded by a large low-income neighborhood with no walk distance accessible healthcare or primary care clinic.

cooper river bridge neighborhood

Located between two major highway into Charleston, cooper river bridge neighborhood is waiting for a road segment to reconnect east and west street, recapture lands for development of public/civic green spaces.
a green/sustainable community oriented primary care clinic
A GREEN COMMUNITY ORIENTED PRIMARY CARE CLINIC IN CHARLESTON

Healthcare facilities consume more energy and produce more waste than most other building types. And usually offer limited therapeutic experiences and frequently disconnected from the community at large. A lot of research shows that healthcare settings are unhealthy for their occupants and collectively one of the largest building types destroying natural ecosystems.

This project will examine the premise that “green” and sustainable design is inherently more therapeutic and healthful, is more patient and staff centered, and potentially provides more efficient and effective settings for delivering a broad range of health services. It should also explore how green design can positively impact health at multiple scales, individual, community and global health.
site access
roads+transit lines

access to public green space
public/civic space

access to care
doctor offices+MUSC

cooper river bridge neighborhood

residential commercial

residential commercial mix-use
architecture impact on environment
nature green space  I  dream  I  playground  I  growth  I  water  I  gathering  I  harvest  I  green and sustainable architecture

site current condition

more green space to lower carbon footprint
DESIGN GOALS AND PRINCIPLES

- Promote more/better greenspaces and a positive public realm
- Dedicate highest priority to recapturing lands to develop new greenspaces envisioned as recreational/active park spaces
- Increase permeable surface area and possible water features to address drainage issues
- Connect meeting street and the crosstown to east bay/morrison drive
- Link up pedestrian and bicycle connections/improve alternative transportation by creating a dedicated bike/pedestrian way along median
- Knit the neighborhoods/re-establish block and street patterns
- re-knit the neighborhood
- improve public/civic space
- create new east/west street
- develop a new bicycle infrastructure

- undeveloped land
  visioned as future
  recaptured green space

- neighborhood
  buildings

- neighborhood
  streets

- neighborhood
  grid

- city texture

- site aerial view
  photo collage

- recapture green spaces
redevelopment of neighborhood | landscape | water feature
parking lot entrance
accessible parking lot green roof
roof garden
pedestrian entrance/patient drop-off
clinic courtyard
community center green roof
water feature
cooper river bridge neighborhood redevelopment
view from highway 17
view from highway 52
site redevelopment
major functional programs on first floor are pharmacy and lab, which are the most frequently used department in the entire clinic. Located next to the major circulation spine makes the access to those spaces even easier for patients.

Curved community center and healthy bar form a shaded courtyard featured as a green space for clinic use. Trees, landscape and water fountain for children playing activate that space in a positive way.

The shape of community center is designed to minimize the volume contrast between clinic and the single house across the street in order to create a welcoming entrance to encourage people from the neighborhood to use the community center for social activities.

Accessible green roof from parking lot and community center is also a green feature of this clinic.
patient experience series

- Green entrance for patient drop off with self sustainable digital screen displaying health information for neighborhoods
- Main entrance interior view
- Entrance reception information center
- Great view to nature and clinic courtyard from main atrium
- Clinic information desk on the major circulation spine
- Community center for clinic and neighborhood use. Water feature for kids playing
green entrance | atrium | courtyard | community center
women clinic, adult clinic and imaging department locate on the second floor. Put imaging clinic in the corner to reduce staff walking distance from both women clinic and adult clinic. Waiting areas are next to the major circulation spine, resolve way-finding issue. Patients and family members will have great views to nature and daylight. No waiting in a dark and closed space experience any more. Access to parking lot green roof directly from elevator vestibule and adult clinic. This clinic is not just patient-centered, but also staff-centered. Courtyard and lightwells are designed for staff working stations to create a therapeutic environment for staff.
patient experience series

women clinic waiting area has natural daylight and great view to the clinic courtyard and the landscape and water feature across the entire site.

adult clinic waiting area lightshelves to minimize solar gain on south facade sense the space transition from public, semi-private to private clinic space.

accessible community center green roof, with great view to new landscape in cooper river bridge neighborhood.
atrium | courtyard | water fountain | accessible green roof
Pediatric clinic, administration and staff support are on the third floor. Administration and clinic department are still programmed to have direct access from major circulation spine. Staff support area are put at the back corner to separate the patient and staff flow. Glazing frosted with patterns distracted from trees on west facade can help shade the building and reduce the solar gain in an effective way.

Steel structure for clinic and community center, with steel column, open-web beams, open-web steel floor joists and metal decking. Parking lot is constructed with site case concrete column and slab to support the green roof on top.

Third floor axonometric view

Patient experience series

- At the end of the waiting area corridor of pediatric clinic to see the entire site landscape and cooper river bridge neighborhood.
- Stairs on the left can reach the green roof too.
- Nursing station in the pediatric clinic around the main courtyard, with ample daylighting two nursing unit mirrored around the courtyard, taking care of the exam rooms on each side to improve work efficiency.
section perspective rendering | main atrium | circulation spine | landscape
Lin Zhang

28
detail 1 green roof

building section B-B

wall section

green roof
detail green roof

plant
soil
root barrier
waterproof
drainage
concrete floor
on metal deck
interior
intermediate block
recycled brick
plastic pipe
flexible pipe
flashing
seal
ingestion
self ventilated ceiling cavity
rigid insulation
self ventilated ceiling cavity
interior roof soil
protection layer
root barrier
waterproof membrane
insulation
vapor barrier
courtyard
providing daylight to staff workstations

flashing
seal
recycled brick
intermediate block
plastic pipe
flexible pipe
flashing
seal
courtyards and atrium are designed to provide view to nature green space and daylight for most public spaces, such as clinic waiting area, community center, healthy bar.

Even in this extreme high heat and humidity site, a lot of glazing are used on south and west facade to create a open, bright and welcoming green clinic for community. Low-E glass panels are used on curtain wall of public community center. Float glass with elegantly coated nature pattern are used on west facade which can effectively reduce solar-heat gain. The shadow casting on the wall will change during the day to give a more interesting visual experience for patients and staff.

accessible green roof are used on most roof surfaces in this clinic which will reduce more than 25 percent solar gain in a year and could significantly reduce energy consume for heating and cooling.
green pattern coating float glass panel

nature patterns used for coating
insulating glass units incorporate various glass surface treatments to transform to a basic float glass. Reflective or low-E coatings can significantly improve the solar-heat-gain coefficient and thermal insulating properties of glass. Custom patterns can create different aesthetic effects as well as increased solar shading

building exploded axon diagram

accessible green roof
third floor
second floor
first floor
site context
site context
green roof 1 light shelves 1 float glass